Modelling the Complex of Automation of Company Marketing Activity in Online Communities

Oksana Peleshchyshyn [1 [0000-0002-1641-7340]], Kateryna Molodetska[3[0000-0001-9864-2463]],
Alla Solianyk[2 [0000-0002-7167-6695]], Ruslan Kravets [1 [0000-0003-2837-9190]]

[1]Lviv Polytechnic National University, Ukraine
[2]Kharkiv State Academy of Culture, Ukraine
[3]Head of educational and scientific center of IT, Zhytomyr National Agroecological University, Zhytomyr, Ukraine

oksana.p.peleshchyshyn@lpnu.ua, kmolodetska@gmail.com, allasolyanik164@gmail.com, ruslan.b.kravets@lpnu.ua

Abstract. This paper deals with actual problem of investigation the usage of online communities in the company marketing activities. Based on a formal description of characteristics, data on online communities and discussions and their analysis results, an information model of a community for online marketing has been built, which serves as the basis for a database structure for accounting of information flows in online communities. The task of determination of indicators of relevance and importance of online communities marketing was proposed. The use of tproposed indicators in solving community selection tasks for representatives' participation of the company was considered. The usage of the database provisioning in the process of creating, verifying and distributing marketing messages in online communities was suggested. By formalizing and computerizing the online communication process proposed methods in this work helps defined threats in discussions and violations of online rules and traditions.

Keywords: online marketing, online community, information threat, marketing, information model.

1 Introduction

Modern companies and organizations often use online communities to share marketing information about a company and its products. In this case, the active involvement of the marketer in online communities involves work, which relates to the accounting and analysis of online communities and their content. By formalizing and computerizing the communication process, you can avoid undesirable risks for the company. Threats may arise from unqualified discussions or violations of online rules and traditions.

Among the typical tasks, the key ones with regard to the activities in online communities are the choice of the strategy for using communities in marketing; selection

of online communities for certain activities; analysis of the effectiveness of marketing information flows in the virtual environment.

A significant aspect of effective online marketing in an information-intensive environment of the online communities is the use of the modern information technology solutions, user-oriented mathematical services and software. These services process the large volumes of data in real-time.

The main up-to-date investigations of marketing activities in online community are divided into the following fields:

- information retrieval and web content analysis [1-3];
- approaches for creating and managing of online communities [4];
- web sites positioning in the web, information activities management of the company in the sites networks [5-7];
- approaches of online communities marketing [8-10];
- quality management system in universities [11-15];
- conception of relevant and important for marketing online communities and discussions [17-23];
- resources and risks in marketing strategies for online communities [24-27].

2   Database for accounting for marketing communications

For the full accounting of marketing communications in online communities, we use an expanded Information Flows Database. The database consists of the following components:

- Community Database is used for basic information about online communities;
- Discussion Database is used for information about discussions in online communities;
- Service Database is used for accounting of service information.

Depending on the functional duties and the area of responsibility, data bases are filled by specialists in different workplaces of the system complex. This process is gradual and continuous if the activities of business representatives in online communities are constant. Let us consider the structure of each component of the extended database.

2.1   Accounting for online communities

The online Communities Database is used for accounting of the online communities covered by the company's marketing activities, their technical and statistical characteristics.

Database filling is performed in the process of performing tasks:

- search and account of relevant online communities based on the elected strategy;

- accounting and analyzing rules, statistics and semantic characteristics of relevant online communities, keeping them topicality;
- forming and accounting of standard for evaluating the importance of the online community in terms of specific marketing activities (advertising, public action, positioning of the site of the company, work with clients, etc.);
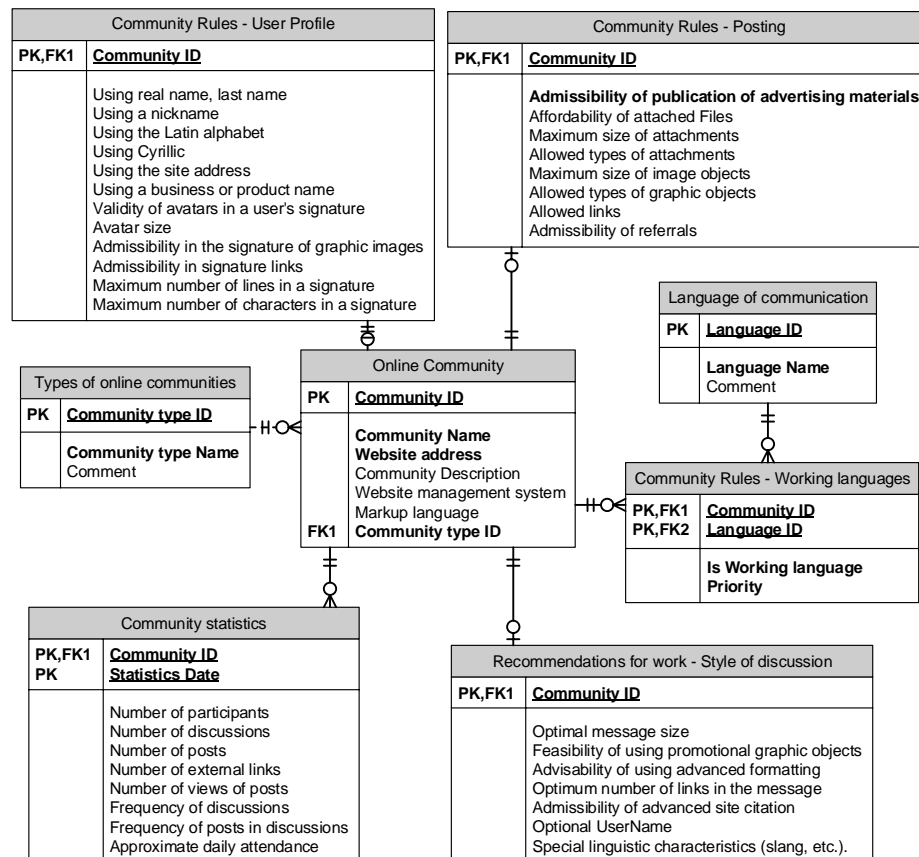- selection of important online communities in accordance with defined standards for marketing activities.

Community Rules - User Profile	
PK,FK1	__Community ID__
	Using real name, last name
	Using a nickname
	Using the Latin alphabet
	Using Cyrillic
	Using the site address
	Using a business or product name
	Validity of avatars in a user's signature
	Avatar size
	Admissibility in the signature of graphic images
	Admissibility in signature links
	Maximum number of lines in a signature
	Maximum number of characters in a signature

Community Rules - Posting	
PK,FK1	__Community ID__
	Admissibility of publication of advertising materials
	Affordability of attached Files
	Maximum size of attachments
	Allowed types of attachments
	Maximum size of image objects
	Allowed types of graphic objects
	Allowed links
	Admissibility of referrals

Language of communication	
PK	__Language ID__
	Language Name
	Comment

Types of online communities	
PK	__Community type ID__
	Community type Name
	Comment

Online Community	
PK	__Community ID__
	Community Name
	Website address
	Community Description
	Website management system
	Markup language
FK1	**Community type ID**

Community Rules - Working languages	
PK,FK1	__Community ID__
PK,FK2	__Language ID__
	Is Working language
	Priority

Community statistics	
PK,FK1	__Community ID__
PK	__Statistics Date__
	Number of participants
	Number of discussions
	Number of posts
	Number of external links
	Number of views of posts
	Frequency of discussions
	Frequency of posts in discussions
	Approximate daily attendance

Recommendations for work - Style of discussion	
PK,FK1	__Community ID__
	Optimal message size
	Feasibility of using promotional graphic objects
	Advisability of using advanced formatting
	Optimum number of links in the message
	Admissibility of advanced site citation
	Optional UserName
	Special linguistic characteristics (slang, etc.).

Fig. 1. ER-diagram of the "Community" database.

2.2 Database for accounting data and discussion characteristics

In addition to the characteristics of online accounting communities, discussions that contain valuable marketing information and reflect the activities of business representatives in online communities are also a subject for discussion. Discussion database is used for accounting for discussion information. The result is:

- research and recording relevant discussions;

- accounting for technical and semantic characteristics of relevant discussions.

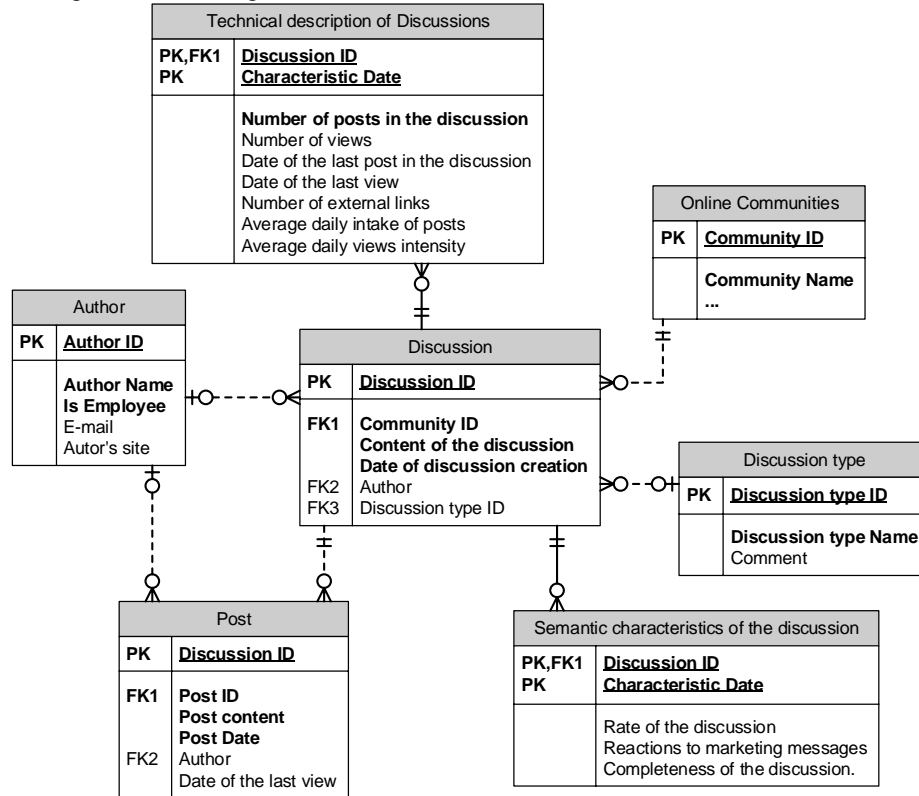On Fig. 2 is an ER diagram of the "Discussion" Database.

Fig. 2. ER diagram of the "Discussion" Database.

2.3 Database for accounting of business information

Singly from the chosen strategy for using online communities, for the effective work of the marketer, all the results of the analysis of communities and discussions must be recorded in the databases and actively used in future work.

This especially concern with the information of the relevance and importance of the community and the data needed to evaluate them.

In Fig. 3 is an ER diagram of the database in part of accounting for the relevance and importance of online communities and discussions.
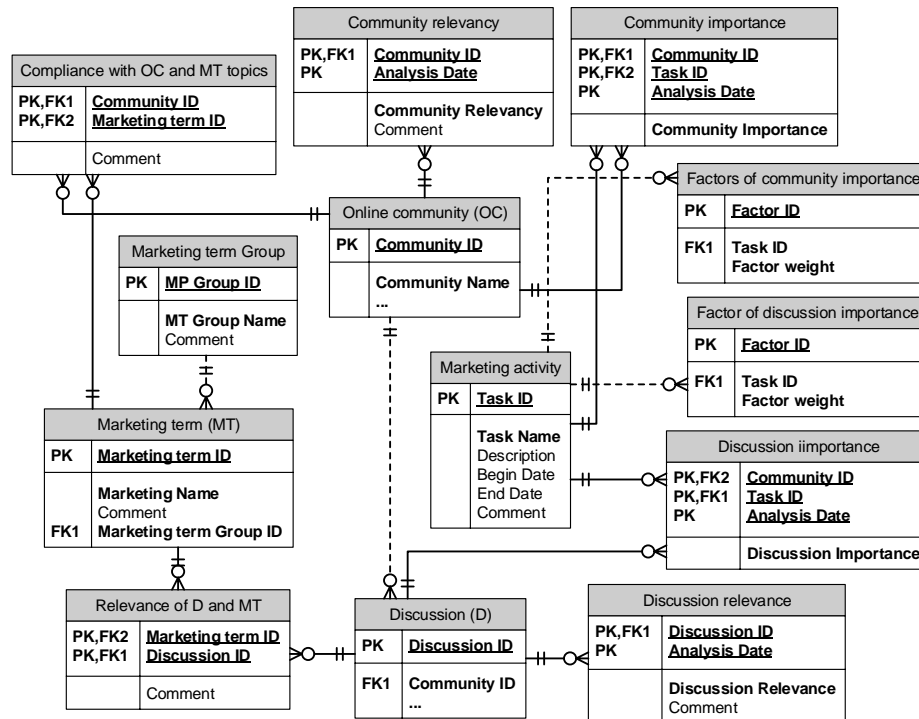
Fig. 3. ER diagram of the database in part of accounting for the relevance and importance of online communities and discussions

In general, all the activities of the marketer, the activities he took part in, the results of the analysis and evaluation of the online content of online communities should also be recorded in the database. This will also add transparency and validity to the - process of making decision of marketing in online communities.

It is also important to accumulate and save the information related to process of finding data and creating content for online communities. Particulary, following information is a subject for accounting:

- multiple marketing terms for search communities and discussions;
- types of marketing activities and types of community outreach activities;
- global search engine query templates;
- regular expression templates for parse the content of the pages;
- options for assessing the importance of online communities and discussions;
- templates for typical posts.

In addition, in this database, it is advisable to account the distribution of executors on siteswhich are important for marketing online communities.

An important moment in the process of filling the database "Service Information" is to form comments about the conditions of obtaining and using practical experience:

when a particular query was used, template or set of parameters, etc. This data can be served as a knowledge base for contractors and experts.

3 Architecture of the Complex of Automation of Company Marketing Activity in Online Communities

The software for support the company marketing activity in online communities contains the following components:

- "Searcher" is use for search online communities and discussions;
- "Analyst" is use for analyzing the information flows in online communities;
- "Online Marketer" is use for interaction of the marketer with online communities;
- "Coordinator" is use for organizing and coordinating activities of marketers in communities;
- "Manager" is use for strategic planning and overall process control.

Figure 3 shows the functionality and basic information flows of the system.
Depending the chosen strategy for using online communities in your marketing activities, some features may not be involved. In this case of an analytical strategy, all activities are limitedfor finding relevant and important online communities, monitoring and analyzing their content, and therefore the functionality of "Coordinator" and "Online Marketer" is not required. In case of limited human resources one specialist can work in several workplaces, provided the functionality does not violate the logic of the system in a whole. Particulary, it's possible to combine the following features:

- "Searcher" and "Analyst";
- "Analyst" and "Coordinator";
- "Manager" and "Coordinator".

However, combining a "Coordinator" and an "Online Marketer" by same person can lead to abuse on her part and, as a consequence, a poor coordination of the activities of marketers in online communities.

The search of online communities and discussions is carried on the early stages of organizing the company's marketing activities in virtual environments. In the future, part of work is about monitoring selected online communities and discussions. In addition, when marketing topic changes or need to be in another (possibly larger) set of online communities, there is a need for repeated or expanded community searches and discussions that can be further used to retrieve and disseminate information.

The Searcher provides the following main features:

- accounting of primary and adjuvant information, including:
- accounting of the multiple marketing terms that are searched;
- formation and accounting of search query templates;
- rating of the relevance of found by marketing communities terms;
- accounting for relevant online communities and their characteristics;

- assessment of the relevance of the discussions found;
- consideration of relevant discussions and their characteristics;
- updating statistics of online communities and discussions;
- monitor company web-sites and online communities to identify suspicious activity and likely information attacks on the company.
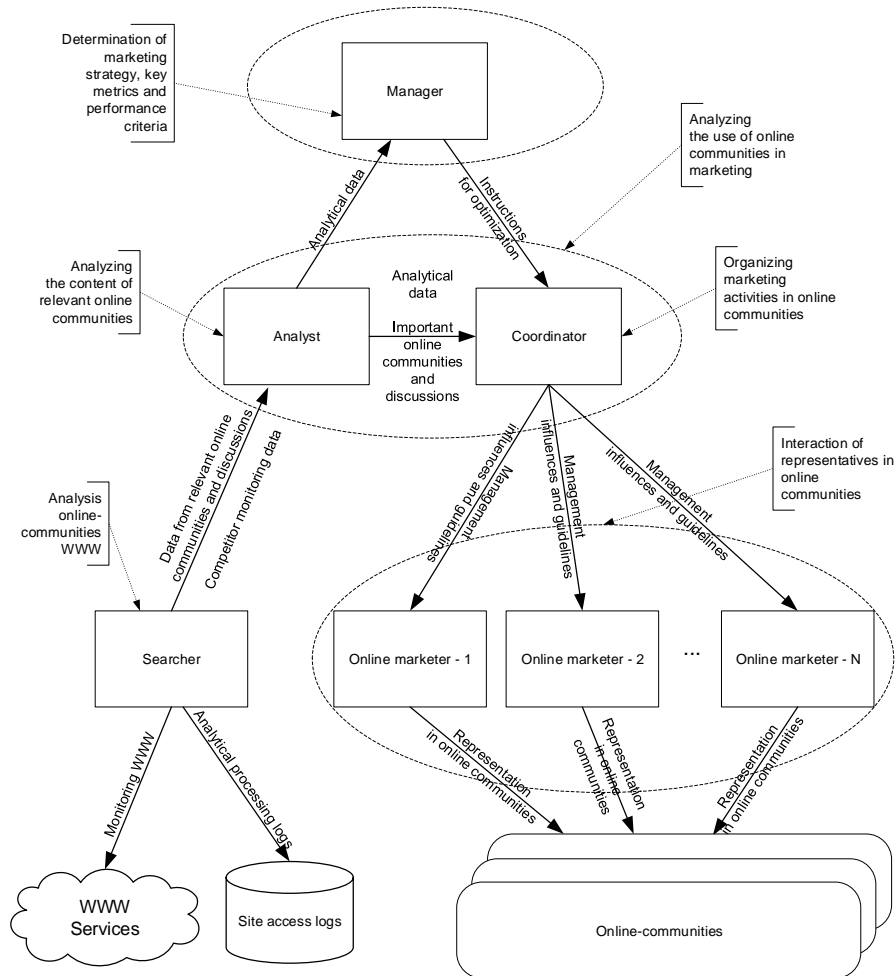

Fig. 4. The scheme of functionality and basic information flows of the system.

The analyst processes the content of online communities and performs the following functions:

- formation and analysis of multiple marketing terms;
- analysis of online community statistics and discussions;

- determining the criteria for selecting important online communities and discussions;
- identifying the importance of online communities and discussions;
- selection of important online communities and discussions to accomplish specific marketing tasks;
- analyzing the activity of competitors in online communities and taking them into account in the planning of the company activity;
- analyzing critical messages in online communities and identifying problem areas in their business.

An important function of the analyst is to analyze information flows on company sites and relevant communities and to identify threats for organization that arise from unqualified and malicious activity in online communities.

In case of confirmation of the information attack on the company in social media, the analyst sends the necessary information to the Coordinator to plan the counteraction measures and their further implementation by the online marketer.

Guided by the strategy chosen by the management, the analyst assesses the sufficiency of the many found relevant online marketing and statistical data. Next, the specialist analyzes the importance of online community and discussion characteristics for marketing tasks and determines the weighting factors that willbe used for evaluation the online community's importance for discussions and discussions.

An online marketer uses the "Information Streams" database to perform the following functions:

- forming and posting new messages, comments and replies to requests from users on community sites;
- monitoring discussions in online communities;
- interaction with the administration of online communities;
- accounting and analysis of their own marketing communications;
- analyzing the reaction of other online community members to actions of marketer.

The efficiency and transparency of the communication process and it independence from the contractors are determined by the completeness of accounting of the activities of marketers in the database "Information flows" and the activity of using their data (characteristics of online communities, supporting information, etc).

The coordinator provides support for the following features:

- analyzing the effectiveness of using online communities in marketing;
- determining restrictions on the activities of marketers in online communities;
- ensuring the best distribution of marketers across multiple communities;
- assessing the effectiveness of marketers in their assigned communities;
- coordinating of marketers' engagement with online communities.

"Coordinator" and "Analyst" generate analytic data to evaluate the effectiveness of the online community's communication capabilities to disseminate marketing information and consumer communication. Analyzing the effectiveness of communica-

tions, combined with the cost analysis of business representatives in online communities, allows management to review the strategy of using virtual environments, to plan marketing activities and resources for their implementation.

4 Conclusions

Computer support for marketing activities in a virtual environment can be done using a database that takes into account the search results of relevant and important online communities and the information flows of the company's interactions with the community. The strategy of using online communities determines the functionality of the system and the list of tasks for marketers, during the execution of which information content of the database is formed. The proposed database model can be the basis for building a knowledge base for communications in online communities. The implementation of the complex of automation supports the planning of marketing actions and decisions making to coordinate the activity of marketers and increases the efficiency of using virtual communities in marketing.

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