Сучасний стан наукових досліджень та технологій в промисловості. 2018. № 1 (3)
ISSN 2522-9818 (print)
ISSN 2524-2296 (online)

UDC 004.942
DOI: https://doi.org/10.30837/2522-9818.2018.3.005

B. HAIDAI, R. ARTIUKH, O. MALEEVA

ANALYSIS AND MODELLING THE PREFERENCES OF SOCIAL NETWORKS USERS

The **subject matter** of the research is the models and technologies of analyzing the processes of developing the loyalty and preferences of social networks users. The **goal** of the research is to increase the efficiency of marketing analysis of clients' preferences and promoting products and services. The following **tasks** are solved in the article: the analysis of the methods and technologies of simulation modelling; the survey of available simulation packages; designing a datalogical context chart; developing the agent-based model of the impact of social networks on preferences; developing a database for data storage; a graphical analysis of preferences. The following research **methods** are used – simulation modelling methods, Laravel and YouTube Data and Analytics API methods. The following **results** were obtained: the model that explains how advertising affects the development of clients' preferences, as well as the impact of clients' communication on loyalty, the information system for the graphical analysis of Wow–How Studio of YouTube channel The model that reveals the impact of advertising and clients' communication was developed. The suggested model proves the fact that the communication of social networks users greatly increases a number of actual clients as well as the level of loyalty. Using such technologies as Laravel and YouTube Data API, the designed application enables clear and timely monitoring and analyzing Wow-How Studio channel, which is very important to be always aware of the preferences of potential clients and to know what can be interesting for them and how to meet their expectations. The **results** can be implemented in enterprises of various spheres that offer their products and services. Any company is interested in obtaining the maximum profit and integration into social networks is free advertising and as a result attracts additional profit.

Keywords: social CRM, CRM-marketing, simulation modelling methods, YouTube API, loyalty, clients' preferences.

Introduction

The worldwide network is widely known and popular all over the world and every day a large number of people access the Internet visiting social networks as well. Business cannot ignore such a popular structure and therefore it also participates in this communication. However, selecting the method appropriate for achieving this goal is rather problematic today. Therefore, the sphere of building the preferences of social networks users is one of the promising areas of business development, so it draws the great attention of both scientists and business. Such factor as the loyalty of client to the company is of great interest for analyzing preferences [1, 2, 3].

Many companies join social networks, but largely for advertising. However, the client relationship can be monitored and their loyalty can be developed through social networks [4]. This is a new type of management which is called Social CRM (social client relationship management) [5, 6]. Using Social CRM, companies can develop client loyalty, as a certain category of buyers spends a lot of time on social networks.

Modern marketing strategy is aimed at acquiring and retaining clients, at finding opportunities for increasing sales. That is why a modern business is interested in turning potential clients into actual ones. To predict the behaviour of potential and actual clients in social networks, the means of simulation modelling should be used, particularly, the agent-based modelling [7, 8].

The analysis of literary sources and problem statement

In the process of simulation modelling, the researcher deals with four basic elements:

1) a real system;

2) the logical and mathematical model of an object being modelled;

3) a simulation (machine) model;

4) a computer which is used for simulating – directed simulation experiment.

The simulative nature of the research involves logical or logical and mathematical models that describe the process under investigation.

Due to a composite nature, a complex system is represented as:

$$<A, S, T>,$$

where A is a set of elements (including the external environment);

S is a set of admissible links among the elements (the structure of the model);

T is a set of considered moments of time.

A key moment in the simulation modelling is dedicating and describing the system state. The system is characterized by a set of variable states, each combination of which describes a particular state. So, by changing the values of these variables, the transition of the system from one state to another can be simulated. These changes in states can occur either continuously or at discrete instants of time [8].

Therefore, while simulation modelling, the logical structure of a real system is reflected in a model and the dynamics of subsystem interactions in a modelled system is simulated.

The following packages are used as dominating basic concepts of formalizing and structuring in the modern systems of modelling: AnyLogic, Arena, AutoMod, eM-Plant, Extend Industry, ProModel, QUEST, Witness.

The characteristics of various systems of modelling are given in Table 1.

ISSN 2522-9818 (print)
ISSN 2524-2296 (online) Innovative technologies and scientific solutions for industries. 2018. No. 1 (3)

Table 1. *Modelling packages characteristics*

Package	Package typical modules	Areas of packages use	Support of the output data analysis
AnyLogic 7.3	Analysis of system dynamics, market analysis, optimization, scheduling, support for approval of the decision, agent-based approach	Strategic management, production, servicing, logistics, supply chain, medicine, transport, IT-management, telecommunications, science	Data collection and statistical processing (deviation from the average probability distribution, etc.), the representation (Gantt charts, histograms, etc.)
Arena	Manufacturing, supply chain, business processes, medicine, military production industry, warehousing, logistics	Manufacturing, supply chain/logistics, business process management, medicine, military production industry	Output Analyzer (deviation from the mean, Anova, bar graphs, charts)
AutoMod	Transport systems, packaging lines, manufacturing	Automobile and aerospace branches, simulating airports, manufacturing, warehousing and selling	AutoStat module provides increased statistical analysis over the whole period of experimenting with the object
eM-Plant	Manufacturing, transportation, loading-unloading operations, simulating business processes, logistics, selling, scheduling, process verification	Discrete manufacturing (automobile branch, electronics, shipbuilding, machine tool building, warehouse facilities), logistics, marketing, consulting, healthcare, banking	Standard tool for data analysis DataFit is included (CI, medium, etc.)
Extend Industry	Modelling of large-scale systems with heavy loads. It includes an internal relational database and modelling unit	Queue system, including sales logistics, call centres with a large load, package lines, etc.	Confidence intervals, etc.
ProModel	Variance analysis, six sigma, portfolio design and scheduling, assessing capacity, cost analysis, modelling of cyclic improvements, supply chain	Manufacturing, logistics, pharmaceutics	The complete analysis of the output data, the use of graphs, export to Excel and Access for further analysis
QUEST	Manufacturing, supply chain, business processes, verification	Manufacturing (automobile, aviation, aerospace, electronics, shipbuilding)	Performs a combined analysis, stochastic analysis of general probabilities of events
Witness	Manufacturing, optimization, planning, modelling of business processes	Six Sigma, call-centres, BIS, modelling of business processes, production	None

The advantages of the AnyLogic package lies in the fact that its standard modules correspond to the simulated domain that enables building a graphical model; using software and step-by-step debugging; simulating an experiment; viewing animations on a real-time basis; animation export is also available.

Therefore, to determine the preferences of social networks users, the agent-based simulation modelling will be used as well as a set of technologies such as Laravel framework and YouTube Data and Analytics API.

The goal and objectives of the research

The goal of the article is to develop the informational and analytical system that should contain the agent-based model of social networks impact on the preferences of users, should enable graphical analysis of data on users' preferences provided by Wow-How Studio of YouTube channel.

The following tasks are solved:

- the agent-based model of social networks impact on preferences is developed;
- the database (DB) for storing the received data is developed;
- the graphical analysis of preferences is carried out.

The materials and methods of the research

1. The agent-based model of the impact of social networks on the preferences of clients

An elementary model of social networks impact on a client's loyalty is the model that grounds the fact that a client's loyalty is influenced by only one parameter, i.e. "the degree of advertising impact".

The diffuse model of Frank Bass is the basis for building an elementary model. The probability that a new product will be purchased at the time T is a linear function of a number of previous clients:

$$P(T) = p + \frac{q}{m} Y(T), \quad (1)$$

where p is the probability of purchase at the time $T = 0$ (const); $Y(T)$ is a number of previous clients; q and m are constants.

Сучасний стан наукових досліджень та технологій в промисловості. 2018. № 1 (3)
ISSN 2522-9818 (print)
ISSN 2524-2296 (online)

One of the ways to build complex models in computer simulations is the step-by-step construction when the basic model is considered as a primary basis and then a new model is built as a result of step-by-step complication and this model is included in a set of hierarchical models with increasing complexity.

With the help of the AnyLogic package, an agent model for 1000 agents was built. The network of 1000 agents is a small network. It was chosen as a point of consideration for this study due to the fact that the smaller model, the greater the confidence in the agents and the more obvious the impact of any indicators.

The behaviour of an agent is generally described in the class of this agent (this is the Person class in the model) using a statechart. The statechart consists of two states – a potential client (a person who has not bought the company's product/ has not used its services yet) and a current client. There is a transition between these two states. This transition will model the purchase of a product. To build an elementary model, let us assume that once a person has used the services of the company, they will forever remain a client and, therefore, there is no transition from "Client" to "Potential Client". The parameter which determined whether a potential client will become an actual one is the degree of impact of social networks advertisement on the agents that are registered there. The time spent by a person to buy a product/use service exponentially depends on the degree of impact of a product/service advertisement:

$$t_{buy} = \exp(a), \qquad (2)$$

where t_{buy} is the time spent by a person to buy a product;

a is the degree of an advertisement impact or the information influence of social networks, i.e. it shows how effective an informational message is and how it influences a potential client.

An elementary model assumes that a person will always remain a regular client if they have bought a product/ have used the company's services at least once. That's why there is no transition from "Client" to "Potential Client" (fig. 1).

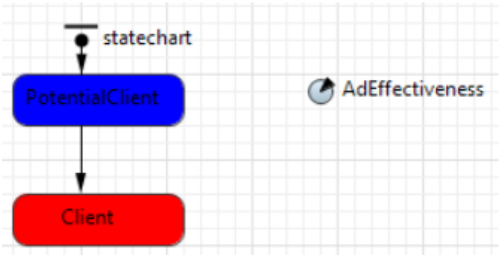

Fig. 1. The Statechart of the elementary model of the influence on clients' loyalty

The model is built for 7 units of simulation time that can be interpreted as a week.

The main task of the model of product distribution is to study how fast people are buying a new product. To do this, a number of clients and potential clients should be counted. In AnyLogic it can be done with the help of collecting statistics.

In order to count potential clients, the following function for collecting statistics was created:

item.statechart.isStateActive (item.PotentialClient)

This function will count a number of agents for whom the specified condition is true, that means those agents that are currently in the state of PotentialClients. An item here is an agent (the replication of the object "people").

One more function was created for collecting statistics about clients:

item.statechart.isStateActive (item.Client).

This function will count a number of agents who are in the state of "Client" (who has already purchased a product).

To visualize the results, the time graph was added; this graph reflects the dynamics of changes in a number of clients and potential clients of a product.

Fig. 2 shows the result of the dynamics of the process being modeled.

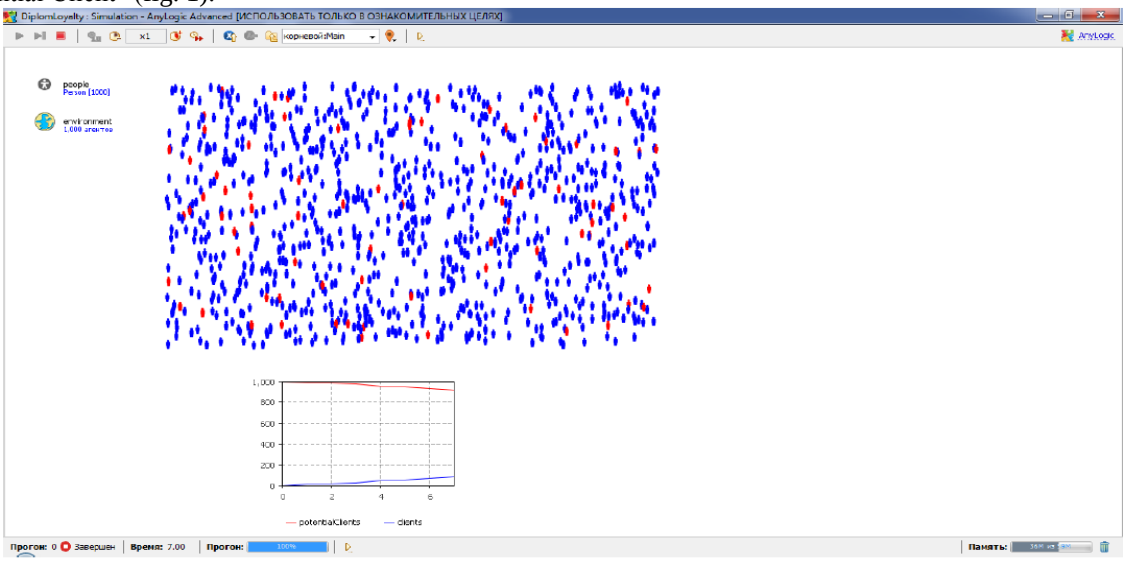

Fig. 2. The result of the dynamics of the impact of social networks on the loyalty of clients in the network of 1000 agents

ISSN 2522-9818 (print)
ISSN 2524-2296 (online) Innovative technologies and scientific solutions for industries. 2018. No. 1 (3)

Thus, this model can be built for any number of agents and the result will be identical – a number of potential clients decreases while the amount of actual ones grows and soon all the agents of the model will become actual clients. This is a drawback of the model, so it cannot be applied as it is in real life all the time since it takes into account only one factor whose duration is limited – "the degree of an advertisement impact". Also, this model does not take into account the fact that an actual client can again become a potential client. Therefore, this model will be further modified and parameters that take into account the degree of the trust of agents and the average annual number of new contacts will be added to it.

The advertising effect is of great importance only at the time when a product is launched on the market. In future, communication among people will play an increasingly important role – people who have already purchased this product share their opinion with their acquaintances and recommend that they also purchase a new product. This process is somewhat similar to the spread of the epidemic.

The following parameters were added to the existing model to enlarge it:

1) ContactRate parameter that is the annual average number of an agent's new contacts. Suppose that on average the agent has contacts with 100 agents per year;

2) ClientFraction parameter that is a person's strength of words; it shows how many people can be persuaded to buy the product. The default value is 0.015. The type is double.

The statechart should also be changed. The internal transition is added to the state "Client". The intensity of the transition is ContactRate. This transition will model the purchasing of the product by a buyer's acquaintance. The speed at which the client can convince his friend to purchase will depend on the strength of words of the buyer and on a number of friends the buyer meets a year. The transition is actuated when the agent's state diagram receives "Buy!" message from another agent

send ("Buy!", RANDOM).

This transition sends a message to a randomly selected person. The method "send ()" transmits the message to another agent. The first argument specifies a message to be sent, and the second one specifies the agent the message is addressed to. In this case, the message is sent to any randomly chosen agent as the argument value uses the special constant RANDOM.

This transition generates a signal for the statechart of any friend. Then the statechart is actuated and it models the purchasing of a product by this friend.

Also, another transition from the state of PotentialClient to the state of Client was added (fig. 3). It is actuated by a signal which is generated by the inner transition of the state "Client".

The properties of this transition were changed. The probability of making a decision about buying a product will depend on the strength of a person's words. In this model, this feature is set by ClientFraction parameter.

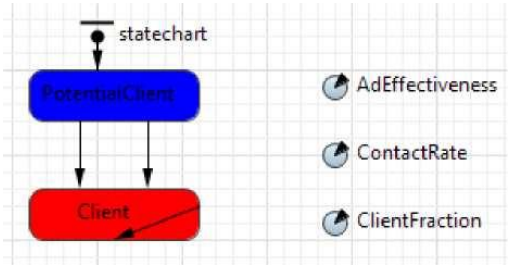

Fig. 3. The Statechart of the model that takes into account the impact of agents' communication

The field "Extra condition" was added by

randomTrue (ClientFraction)

As a result of the introduction of an extra condition, the product is purchased with the probability specified by the ClientFraction parameter.

The properties of an agent were changed. The field "Action after receiving a message" was added by

statechart.receiveMessage (msg).

The created model is shown in fig. 4.

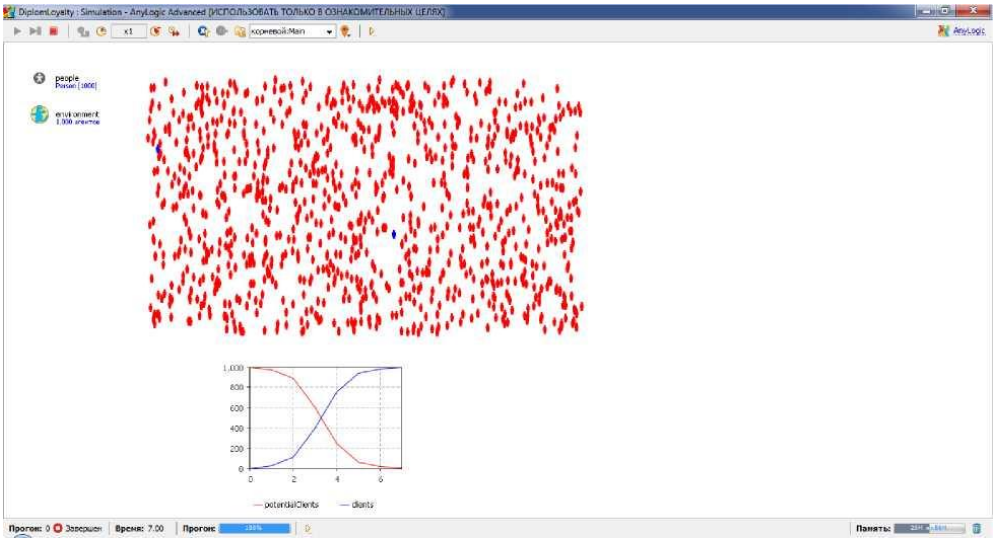

Fig. 4. The model that takes into consideration the impact of people's communication

ISSN 2522-9818 (print)
Сучасний стан наукових досліджень та технологій в промисловості. 2018. № 1 (3) ISSN 2524-2296 (online)

Thus, after studying the dynamics of changes in a number of clients and potential clients, the conclusion can be made that a number of actual and potential clients is gradually changing. The graphs of variables are S-shaped curves. A number of potential clients varies from the maximum to the minimum, while a number of potential clients changes from the minimum to the maximum. But this model does not take into account the fact that clients can transit from the state of actual clients to the state of potential ones.

2. Developing the DB for storing the received data

The data base was developed for the efficient work; this data base enables storing the data received from the requests to YouTube API. The data base is presented in fig. 5.

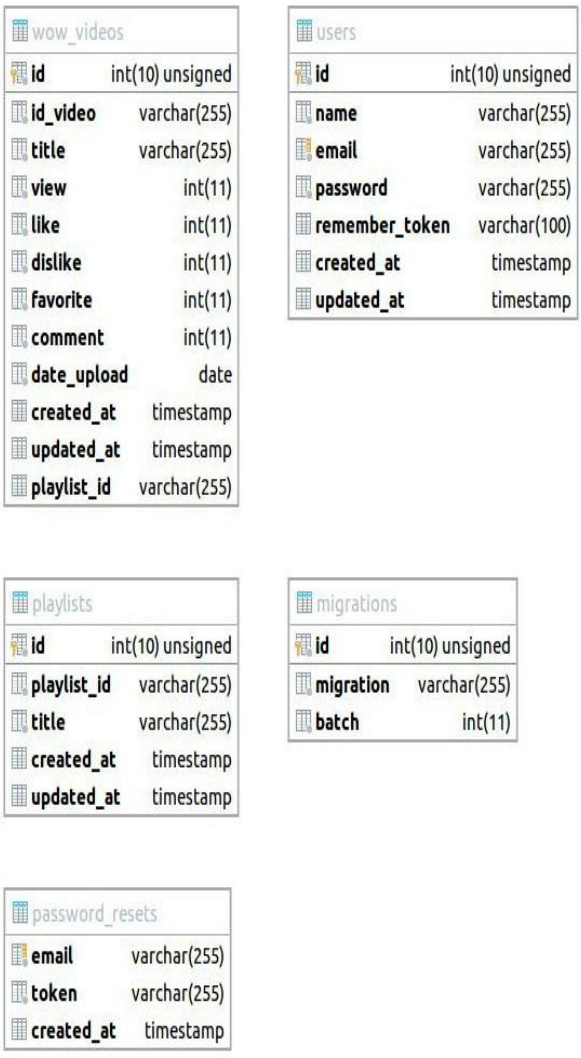

Fig. 5. The data base

The table "migrations" is the system table Laravel that contains migrations.

The table "users" is the system table for saving the users of the system.

The table "playlists" is necessary for saving the playlists that are on the YouTube channel.

The table "wow-videos" is designed for saving meta-information about videos on the channel.

The table "password_resets" is used to restore the passwords of the users registered in the system.

The table "wow-videos" and "playlists" are connected as one-to-many.

3. Integration with WOW-HOW Studio of YouTube channel

The API YouTube data enables connecting the functions of YouTube to the application. The API can also be used to receive the search results and to retrieve, insert, update, and delete such resources as videos or playlists.

Along with the API-interface YouTube Player and API YouTube Analytics, API allows the application to provide full access to YouTube, which includes searching and detecting, creating the content, video playback, account management and spectator statistics.

Table 2. *A list of API references to the site of request*

API end point	Description
youtube.videoCategories.list	Returns a list of categories that can be related to YouTube channels
youtube.videos.list	Returns a list of videos that correspond to the API request parameters
youtube.playlistItems.list	Returns a collection of playlist items that corresponds to the API request parameters. All the playlist items in a specified playlist can be retrieved or one or more playlist items can be retrieved according to their unique IDs
youtube.channels.list	Returns a collection from zero or more channel resources that meet the request criteria

Wow-How Studio of the YouTube channel was integrated using the YouTube API. Basing on the data obtained, the preferences of customers can be analyzed. Using the YouTube API, a number of opportunities for further analysis of the channel was obtained. First of all, videos were analyzed according to a number of views and the graph "Top-20" was constructed; this graph is presented in fig. 6.

The graph was constructed according to a number of video likes/dislikes in 2017+, as updated videos should be used to analyze preferences. The graph is presented in fig. 7.

The playlists were analyzed according to a number of videos to understand what type of video is the most widespread among the clients of Wow-How. The chart is presented in fig. 8.

ISSN 2522-9818 (print)
ISSN 2524-2296 (online) Innovative technologies and scientific solutions for industries. 2018. No. 1 (3)

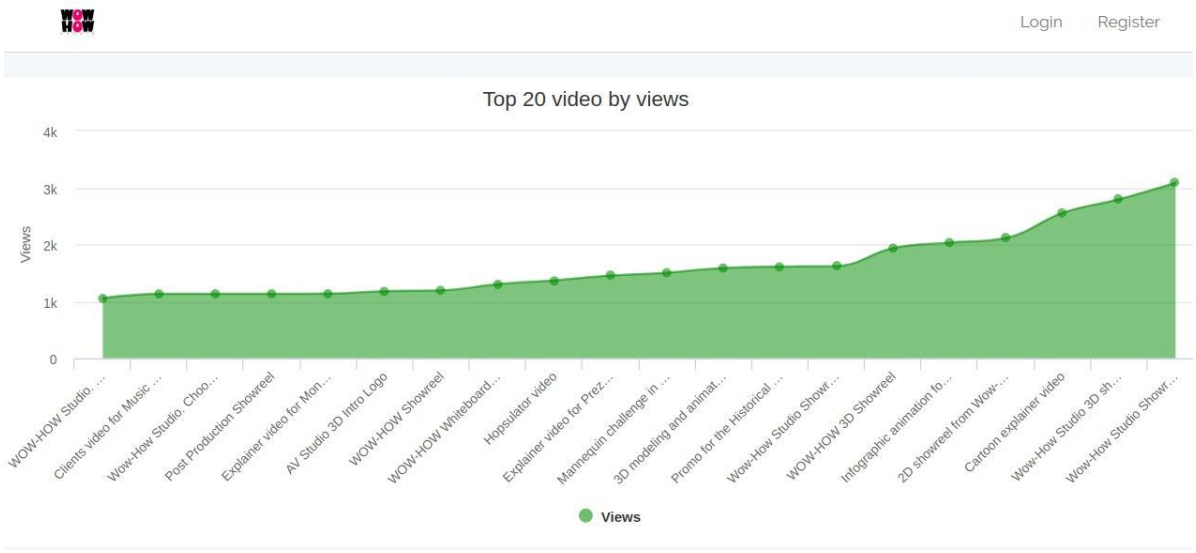

Fig. 6. Top-20 according to a number of views

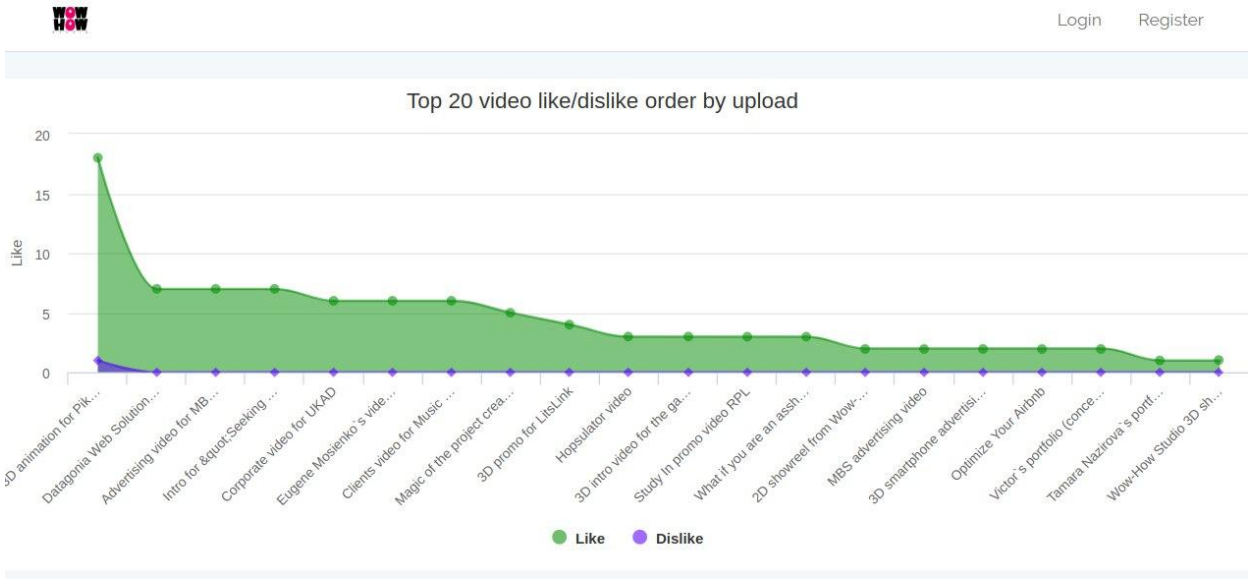

Fig. 7. Top-20 according to a number of likes/dislikes (2017+)

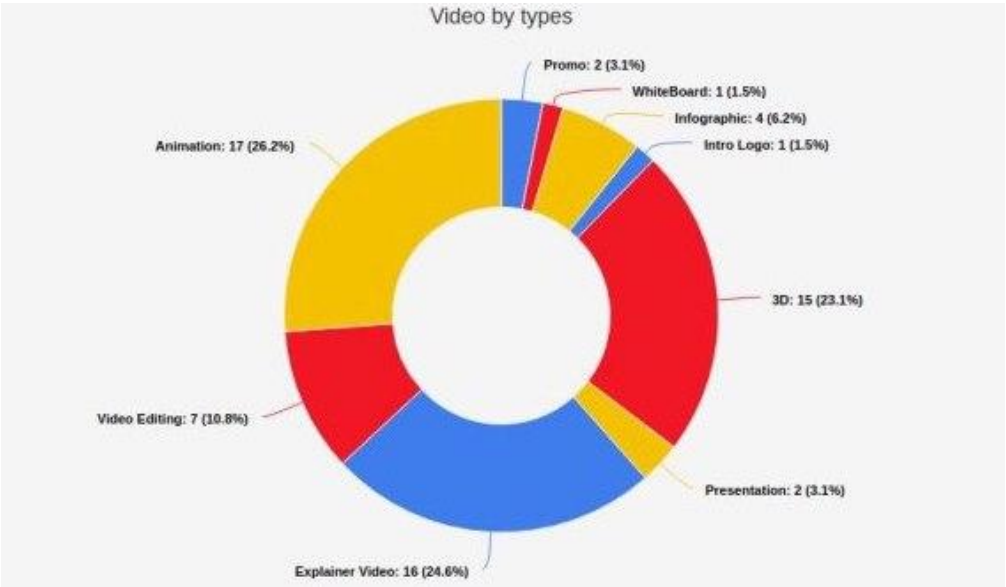

Fig. 8. A number of videos in playlists

ISSN 2522-9818 (print)
Сучасний стан наукових досліджень та технологій в промисловості. 2018. № 1 (3) ISSN 2524-2296 (online)

Basing on the received graphs, the conclusion can be made that various 2D videos (animation, advertising, explainer) and 3D products commercials have been and still are the most popular ones.

Conclusions

As a result of the analysis of literature sources, the loyalty of clients was determined as a certain positive attitude of clients to the activities of a company, its products and services, its personnel, image, trademarks, logo and so on. This loyalty, that is a favourable attitude of a client to a target company or to a product is the basis for a stable sales volume.

The created model enables detecting the fact that communication among clients greatly increases a number of actual clients as well as the level of loyalty.

The developed application with the help of such technologies as Laravel and YouTube Data API enables accurate and timely monitoring and analyzing the Wow-How Studio channel, which is very important to understand the preferences of potential clients, to know what they are interested in and what can satisfy them.

The results of the research can be implemented at enterprises of various fields that offer their goods and services. Any company is interested in maximizing profits; integrating into social networks is free advertising and, due to it, a way of attracting additional profits.

References

1. Reichheld, F. (2001), *The Loyalty Effect: The Hidden Force Behind Growth, Profits, and Lasting Value*, Harvard Business School Press, 323 p.
2. El Sheikh, A. (2007), *Simulation and Modeling: Current Technologies and Applications*, IGI Global, 466 p.
3. Reicheld, F. Research and evaluation of consumer loyalty [Issledovaniya i otsenka loyal'nosti potrebiteley], available at : http://www.satio.by/publications/researches/76.html.
4. Goldenberg, B. (2015), *The Definitive Guide to Social CRM: Maximizing Client Relationships with Social Media to Gain Market Insights, Clients, and Profits*, Pearson Education, 272 p.
5. Rabayah, W., Khasawneh, W. (2016), *Strategic Uses of Social Media for Improved Client Retention*, IGI Global, 311 p.
6. Tarasov, V. B. (2009), *Agents, multi-agent systems, virtual communities: a strategic direction in computer science and artificial intelligence* [*Agenty, mnogoagentnyye sistemy, virtual'nyye soobshchestva: strategicheskoye napravleniye v informatike i iskusstvennom intellekte*], Moscow : Editorial URSS, 47 p.
7. Odden, L. (2012), *Optimize: How to Attract and Engage More Clients by Integrating SEO, Social Media, and Content Marketing*, John Wiley & Sons, 256 p.
8. Ushakova, I. A. (2012), *Social networks as a tool for relationships with customers* [*Sotsial'nyye seti kak instrumentariy vzaimootnosheniy s kliyentami*], Moscow : Akademiya, 145 p.
9. Roebuck, K. (2011), *Social CRM: High-impact Strategies - What You Need to Know: Definitions, Adoptions, Impact, Benefits, Maturity, Vendor*, Lightning Source, 116 p.
10. Shih, C. *The Facebook Era: Tapping Online Social Networks to Build Better Products, Reach New Audience, and Sell More Stuff*, Prentice Hall, 2009, 256 p.
10. Greenberg, P. (2009), *CRM at the Speed of Light, Fourth Edition: Social CRM 2.0 Strategies, Tools, and Techniques for Engaging Your Clients*, McGraw-Hill Education, 688 p.
11. Kotler, F. (2003), *Marketing from A to Z* [*Marketing ot A do Ya*], St. Petersburg : Neva Publishing House, 224 p.
12. Khill, N., Sel'f, B., Roshe, G. (2004), *Measurement of customer satisfaction according to ISO 9000: 2000 standards* [*Izmereniye udovletvorennosti potrebitelya po standartam ISO serii 9000:2000*], Moscow : Publishing House Technologies, 192 p.

Receive 17.02.2018

Відомості про авторів / Сведения об авторах / About the Authors

Гайдай Богдан Олегович - Національний аерокосмічний університет імені М.Є. Жуковського "ХАІ", магістр кафедри інформаційні управляючі системи, м. Харків, Україна; e-mail: bogdg95@gmail.com; ORCID: 0000-0003-0018-5896.

Гайдай Богдан Олегович – магистр кафедры информационные управляющие системы, Национальный аэрокосмический университет им. Н. Е. Жуковского «Харьковский авиационный институт», г. Харьков, Украина; e-mail: bogdg95@gmail. com; ORCID: 0000-0003-0018-5896.

Haidai Bohdan – National Aerospace University – Kharkiv Aviation Institute, Student at the Department of Information Control Systems, Kharkiv, Ukraine; e-mail: bogdg95@gmail.com; ORCID: 0000-0003-0018-5896.

Артюх Роман Володимирович – кандидат технічних наук, Державне підприємство "Південний державний проектно-конструкторський та науково-дослідний інститут авіаційної промисловості", директор, м. Харків, Україна; e-mail: roman.artyuh77@gmail.com; ORCID: 0000-0002-5129-2221.

Артюх Роман Владимирович – кандидат технических наук, Государственное предприятие "Южный государственный проектно-конструкторский и научно-исследовательский институт авиационной промышленности", директор, г. Харьков, Украина; e-mail: roman.artyuh77@gmail.com; ORCID: 0000-0002-5129-2221.

Artiukh Roman – PhD (Engineering), State Enterprise "National Design & Research Institute of Aerospace Industries", Director, Kharkiv, Ukraine; e-mail: roman.artyuh77@gmail.com; ORCID: 0000-0002-5129-2221.

Малєєва Ольга Володимирівна – доктор технічних наук, професор, Національний аерокосмічний університет імені М.Є. Жуковського "ХАІ", професор кафедри інформаційні управляючі системи, м. Харків, Україна; e-mail: omaleyeva@ukr.net; ORCID: 0000-0002-9336-4182.

ISSN 2522-9818 (print)
ISSN 2524-2296 (online) Innovative technologies and scientific solutions for industries. 2018. No. 1 (3)

Малеева Ольга Владимировна – доктор технических наук, профессор, Национальный аэрокосмический университет имени Н.Е. Жуковского "ХАИ", профессор кафедры информационные управляющие системы, г. Харьков, Украина; e-mail: omaleyeva@ukr.net; ORCID: 0000-0002-9336-4182.

Malyeyeva Olga – Doctor of Sciences (Engineering), Professor, National Aerospace University – Kharkiv Aviation Institute, Professor at the Department of Information Control Systems, Kharkiv, Ukraine; e-mail: omaleyeva@ukr.net; ORCID: 0000-0002-9336-4182.

АНАЛІЗ І МОДЕЛЮВАННЯ ПЕРЕВАГ КОРИСТУВАЧІВ СОЦІАЛЬНИХ МЕРЕЖ

Предметом дослідження в статті є моделі і технології аналізу процесів формування лояльності і переваг користувачів соціальних мереж. **Мета** роботи - підвищення ефективності маркетингового аналізу переваг споживачів і просування продуктів і послуг. У статті вирішуються наступні **завдання:** аналіз методів і технологій імітаційного моделювання; оглядовий аналіз існуючих систем моделювання; проектування даталогічної контекстної діаграми; розробка агентної моделі впливу соціальних мереж на переваги; розробка БД для зберігання отриманих даних; проведення графічного аналізу переваг. Використовуються такі **методи** дослідження - методи імітаційного моделювання, методи Laravel і YouTube Data and Analytics API. Отримані наступні **результати:** розроблена модель, яка дозволяє зрозуміти вплив реклами на формування споживчих переваг, а також вплив спілкування клієнтів на лояльність, інформаційна система для графічного аналізу YouTube каналу Wow-How Studio. Розроблена модель відображає вплив реклами і фактор спілкування користувачів соціальних мереж. Створена модель дозволяє відстежити той факт, що спілкування клієнтів між собою значно збільшує кількість реальних клієнтів, а також рівень лояльності. Додаток, розроблений за допомогою таких технологій як Laravel і YouTube Data API дає можливість чітко і своєчасно відстежувати, і проводити аналіз каналу Wow-How Studio, що дуже важливо для того, щоб завжди бути в курсі про переваги потенційних клієнтів, знати, що їм цікаво і що можливо їх може задовільнити. Результати дослідження можуть бути впроваджені на підприємствах різних сфер, що пропонують свої товари і послуги. Будь-яка компанія зацікавлена в отриманні максимального прибутку, а інтегрування в соціальні мережі є безкоштовною рекламою і, таким чином, інструментом залучення додаткового прибутку.

Ключові слова: соціальний CRM, CRM-маркетинг, методи імітаційного моделювання, API YouTube, лояльність, переваги клієнтів.

АНАЛИЗ И МОДЕЛИРОВАНИЕ ПРЕДПОЧТЕНИЙ ПОЛЬЗОВАТЕЛЕЙ СОЦИАЛЬНЫХ СЕТЕЙ

Предметом исследования в статье являются модели и технологии анализа процессов формирования лояльности и предпочтений пользователей социальных сетей. **Цель** работы – повышение эффективности маркетингового анализа предпочтений потребителей и продвижение продуктов и услуг. В статье решаются следующие **задачи**: анализ методов и технологий имитационного моделирования; обзорный анализ существующих систем моделирования; проектирование даталогической контекстной диаграммы; разработка агентной модели влияния социальных сетей на предпочтения; разработка БД для хранения полученных данных; проведение графического анализа предпочтений. Используются следующие **методы** исследования – методы имитационного моделирования, методы Laravel и YouTube Data and Analytics API. Получены следующие **результаты**: разработана модель, которая позволяет понять влияние рекламы на формирование потребительских предпочтений, а также влияние общения клиентов на лояльность, информационная система для графического анализа YouTube канала Wow-How Studio. Разработана модель отображающая влияние рекламы и фактор общение пользователей социальных сетей. Созданная модель позволяет отследить тот факт, что общение клиентов между собой сильно увеличивает число реальных клиентов, а также уровень лояльности. Разработанное приложение при помощи таких технологий как Laravel и YouTube Data API дает возможность четко и своевременно отслеживать, и проводить анализ канала Wow-How Studio, что очень важно для чтобы всегда быть в курсе о предпочтениях потенциальных клиентов, знать, что им интересно и что возможно их может удовлетворить. Результаты исследования могут быть внедрены на предприятиях различных сфер, предлагающих свои товары и услуги. Любая компания заинтересована в получении максимальной прибыли, а интегрирования в социальные сети является бесплатной рекламой и, таким образом, привлечением дополнительной прибыли.

Ключевые слова: социальный CRM, CRM-маркетинг, методы имитационного моделирования, API YouTube, лояльность, предпочтения клиентов.