E-MARKETING TOOLS IN SHAPING OPERATION STRATEGY FOR TRADE ENTERPRISES

ІНСТРУМЕНТАРІЙ ІНТЕРНЕТ-МАРКЕТИНГУ В ФОРМУВАННІСТРАТЕГІЇ ФУНКЦІОНУВАННЯ ТОРГІВЕЛЬНИХ ПІДПРИЄМСТВ

Zoia M. Sokolovska, Doctor of Economics, Professor
Odessa National Polytechnic University, Odessa, Ukraine
ORCID: 0000-0001-5595-7692
Email: nadin_zs@te.net.ua

Natalia V. Yatsenko
Odessa National Polytechnic University, Odessa, Ukraine
ORCID: 0000-0002-0355-0871
Email: natali.jazenko@gmail.com

Marina M. Fedorova
Odessa National Polytechnic University, Odessa, Ukraine
ORCID: 0000-0002-5781-9856
Email: mmarmorina@gmail.com
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Соколовська З.М., Яценко Н.В., Федорова М.М. Інструментарій інтернет-маркетингу в формуванні стратегії функціонування торгівельних підприємств. Науково-методична стаття.

Стаття присвячена розгляду інструментальної бази розробки маркетингових стратегій торгівельних підприємств та демонстрації дії конкретних промислових додатків. Представлена імітаційна модель діяльності типового торгівельного підприємства, розроблена з використанням системно-динамічної та агентної методології. Програмна платформа реалізації імітаційних експериментів − система багатопідходного імітаційного моделювання AnyLogic. Модель призначена для дослідження динаміки потоків клієнтів підприємства; процесів формування попиту та корегування пропозиції в залежності від політики управління запасами; оцінювання впливу ефективності реклами на кінцеві показники функціонування. Запропонований торговий веб-сайт, створений для досліджуваного підприємства галузі.

Ключові слова: торгівельне підприємство, стратегія функціонування, інтернет-маркетинг, імітаційна модель, імітаційний експеримент, система AnyLogic

Sokolovska Z.M., Yatsenko N.V., Fedorova M.M. E-marketing tools in shaping operation strategy for trade enterprises. Scientific and methodical article.

The article is devoted to consideration of the tool base for the development of marketing strategies for trading enterprises and the demonstration of the impact of specific industrial applications. The simulation model of activity of a typical trading company is presented, using the system-dynamic and agent methodology. The software platform for the implementation of simulation experiments - the system of multilevel imitative modeling AnyLogic. The model is designed to study the dynamics of customers` flow of the company; demand formation processes and supply adjustments depending on stockpile management policies; evaluation of the impact of advertising effectiveness on the final performance indicators. A trading website for the research industry is proposed and created.

Keywords: trading company, operation strategy, internet marketing, e-marketing, simulation model, simulation experiment, AnyLogic system

Trade is an important component of the economy of any state. Today, in the context of developing market relations, constant economic and political reforms, trade relates to the most progressive types of activity that affect all segments of the population. As an industry, trade has its own specificity. It is necessary to keep track of demand in the current mode and adjust the proposal as quickly as possible, comply with market pricing laws, understand and be able to attract own target audience, remember about taxes and excises, trade with the use of settlement registrars operations in accordance with the legislation, keep an accounting book, ensure consumer rights, adhere to sanitary requirements, carry out expert's examination of the goods quality, observe the terms of its storage and many more, depending on the specifics of the product and the way of trading. In addition, any market is a stochastic system which events occur randomly. Consequently, are needed flexible regulation and management tools, including e-marketing tools.

Analysis of recent researches and publications

A lot of studies had been devoted to the businesses management and development-promotion strategies, for example R. Hamiltoin's article "Consumer-based strategy: using multiple methods to generate consumer insights that inform strategies" [1] describes the importance of using the math apparatus, econometrics, analytical modeling, experimental design and even ethnographic distribution for understanding the user and his reaction to the product or service. Considering marketing as a separate field of activity, it focuses on the integrity of a

variety of approaches to studying the desires and needs of the client, caring about them. "It is necessary not just to investigate the consumer, but to understand him" – emphasizes the article. With regard to specific tools, it is proposed to conduct tests, create and analyze information databases, identify the potential of both the client and the sales representative as an assistant and the client's development tool. However, the author emphasizes the complexity of such studies and the need for a more flexible approach.

S.N. Ramaswami and S. Arunachalam in their article "Divided attitudinal loyalty and customer value: role of dealers in an indirect channel" [2], on the contrary, note that in many product categories consumers are showing loyalty to more than one product and it is necessary not only to study the user, but also to take into account and explain the competition between manufacturers and the role of dealers in increasing brand loyalty. The authors conducted a study using several output data in the B2B settings. The results showed that the dealer's recommendations could increase the value of the customer's trust and loyalty, and that the strategy of creating a customer value, taken by the supplier with the dealer, could increase the willingness of the dealer to intervene on behalf of the vendor. At the same time, the dynamics of incoming indicators and the willingness of dealers to intervene in the sales policy of the manufacturer were not taken into account.

"The value of marketing for an organization can and must be determined, evaluated and transmitted" say Hanssens, D.M. and Pauwels, K.H. in their article "Demonstrating the value of marketing" [4]. To eliminate the informing gaps about the market situation and the results of demand research, the authors suggest applying a scientific approach - balancing the short-and long-term prospects, determining the effectiveness of online and offline analysis of rigid and mild indicators, taking into account risks, plans, past experience and conducting future experiments. At the same time, they were focusing on increasing influence only at the local level.

Finally, a group of Internet marketing researchers in the article "Gamification and Mobile Marketing Effectiveness" [5] noted that for today's profitable business, retailers will have to adapt and apply mobile gaming applications using the process known as "gamification". The authors used a systematic approach to the work of Shell (2008) and the "Elemental Game Tetrad model", which allowed analyzing and reflecting the psychological aspects and marketing results of the gameplay. It's more interesting and easier for people to perceive information provided in an interactive format, besides, they are inclined to make purchases under the good mood because of attractive interactive advertising game. The authors say nothing about determining which kind and format of mobile marketing it is expedient to choose for each individual sales representative.

Consequently, in spite of all existing developments, marketing as a type of activity by itself and its individual tools (for example, simulation, as a simulator for making managerial decisions and creating and optimizing a site as a means of promotion) is a complex and ambiguous topic and therefore remains relevant for researches. A number of existing problems of modern marketing includes the lack of formation, unreliability of the information market – "empty" information and its contradictions, the existence of fictional facts, pseudo-experts and incompetent specialists; complexity of client base development – attraction and, most importantly, customer retention; saturation of the Ukrainian market with advertising and as a consequence of lowering its efficiency; necessity of differentiation of approaches for influence on separate segments of the market; heterogeneity and stochasticity of the market; influence on the perception of advertising and purchasing power not only economic, but also cultural, political and social factors.

Based on all of the above, it becomes clear the special need to apply and develop specific tools (models and programs) to verify the effectiveness of a particular marketing strategy before its implementation in a particular enterprise, for example, trading.

The aim of the article is to offer an instrumental basis for the development of marketing strategies for trading enterprises and to demonstrate the performance of specific industrial applications.

The main part

As an example was choosen the private enterprise "Elekon & V" – a classic representative of small business in the Ukrainian trading market. The company has been operating since 2011 and engaged in the sale of trading and cash equipment. The enterprise does not have its own production capacity, but only represents a representative of certain manufacturers of the indicated equipment. The staff is small – only 8 people. The current orientation is the market of the Odessa region and Ukraine. As the product is specific and equity with corporate income are limited, then the marketing strategy should be narrowly targeted and thoroughly worked out. The Internet was chosen as the most effective channel of promotion, and imitation modeling was used for the development and analysis of individual strategies.

The task was: to simulate the activity of PE "Elekon & V", analyze the flow of customers, the formation of demand and adjustment of the proposal, depending on the inventory management policy, to investigate the impact of advertising effectiveness. Separately, was created a web-site to attract new clients and collect statistical information.

In the model were used system-dynamic and agent approaches. Orders occur under the influence of advertising and personal users' communication (taking into account the fate of the interested in the goods among the all contacts of existing customers). The consumer market is realized on the basis of the model of the distribution of goods and services by Bass [10]. Due to the PE "Elecon & V" ability to execute both individual and wholesale orders, the supply chain is divided into 3 agents – retailer, wholesaler and factory (which can sell its goods to other companies). The general view of the model is presented at fig. 1.
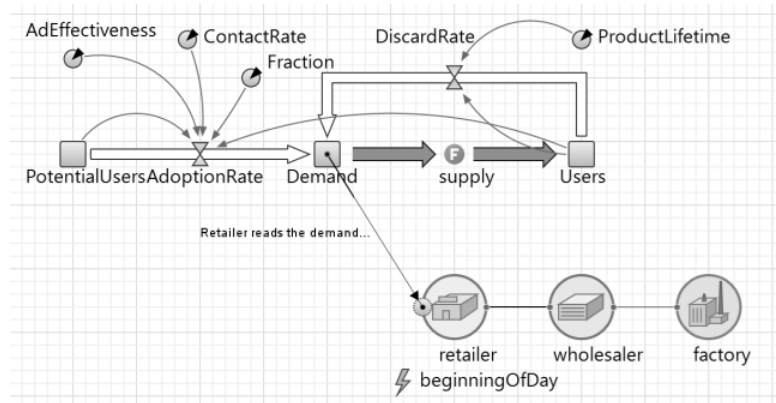
Fig. 1. General structure of the enterprise activity model
Source: own elaboration

The elements used in the model are considered in details in tab. 1 and 2.

Table 1. Used elements of the system dynamics library

Element	Characteristic
stream	flow – specifies the system dynamics, changes over time
drive	stock – accumulates certain resources in the model
parameter	parameter – specifies static values for certain model elements

Source: own elaboration

Table 2. Used elements of the agents' library

Element	Characteristic
function	function – specifies a sequence of actions;
event	event – plans some action in the model;
collection	collection – represents a group of object-elements
dynamic event	dynamic event – plans an unlimited number of events that are similar in content

Source: own elaboration

For the best understanding and visual display were added timelines: one reflects the intensity of the transition of potential consumers to consumers, the other – the total demand for enterprise products, the intensity of individual and wholesale orders, the factory supplies. Some elements of the model were given initial values, such as:
— PotentialUsers – 1000 men;
— AdEffectiveness – 0.0011 intensity/day;
— ContactRate – 10 intensity/day;
— Fraction – 0.0007 intensity/day;
— ProductLifetime – 60 months.
Others were defined using formulas, such as:
— AdoptionRate = PotentialUsers * AdEffectiveness+ Users * ContactRate * Fraction * PotentialUsers / (PotentialUsers + Users);
— DiscardRate = Users / ProductLifetime;
— Demand = DiscardRate + AdoptionRate.
Separate ones were specified using the functions and the java programming language, for example supply function (fig. 2) and a daily check of the status of orders for all model agents (fig. 3).
Each link in the supply chain is a separate modeling element and maintains its own inventory management policy, so each agent was built in a separate window with its own parameters and constraints.
The first one is "Retailer" – so PE "Elekon & V" negotiates individual products for individual clients. The parameters of the inventory management policy are: the company has a stock of 50 units, the minimum order size is also set to 50 units, and the maximum is 500. The second one is "Wholesaler" – there the company represents another parameters of the inventory management policy: minimum order is 500 units of goods, maximum – 1500 units. The stock is the same – 50 units. Were used a collection of orders in the "orders" class

of the bidirectional list LinkedList (type of Order items). With the use of the internal function Any Logic and the object-oriented paradigm of the java programming language were formed reserves (fig. 4), also was implemented the dynamic delivery (fig. 5).

Fig. 2. Element "supply" in the model of PE "Elekon & V"
Source: own elaboration

Fig. 3. Data synchronization between the elements
Source: own elaboration

Fig. 4. Backlog formulation
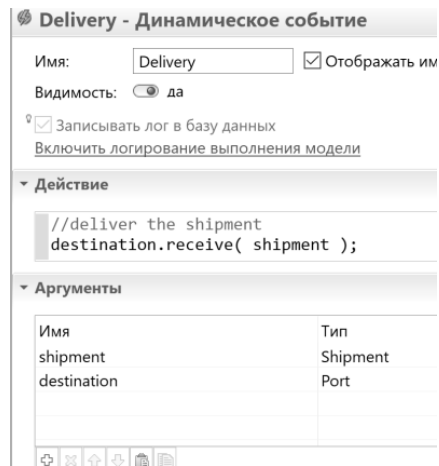*Source: own elaboration*

Fig. 5. Dynamic delivery
Source: own elaboration

Third one is representing independent from the PE "Elekon & V" activity, the production of goods at the factory, its policies for managing inventories and sales. The similar elements and algorithms described above were used.

The basis of the model's operation is the calculation of demand and verification of its satisfaction. For each link this feature is similar, but it takes into account its own inventory management policy and special output data. Fig. 6-8 show the corresponding functions of each link in the simulation.
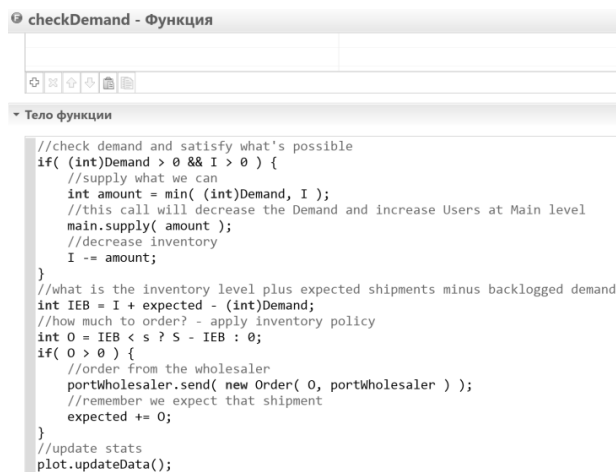

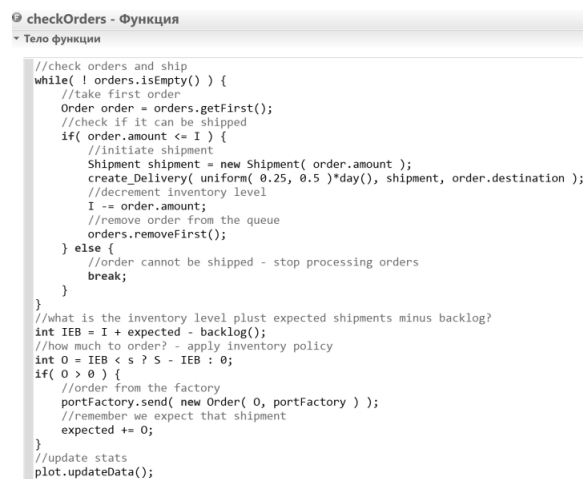Fig. 6. Checking function for single agents
Source: own elaboration

Fig. 7. Checking function for wholesalers
Source: own elaboration

```
checkOrders - Функция
▾ Тело функции

//check orders and ship
while( ! orders.isEmpty() ) {
    //take first order
    Order order = orders.getFirst();
    //check if it can be shipped
    if( order.amount <= I ) {
        //initiate shipment
        Shipment shipment = new Shipment( order.amount );
        create_Delivery( uniform( 0.5, 1 )*day(), shipment, order.destination );
        //decrement inventory level
        I -= order.amount;
        //remove order from the queue
        orders.removeFirst();
    } else {
        //order cannot be shipped - stop processing orders
        break;
    }
}
//what is the inventory level if we account backlogged orders?
int IB = (int)I - backlog();
//continue or stop manufacture - apply inventory policy
ManufacturingRate = IB > S ? 0 : NormalManufacturingRate;
//update stats
plot.updateData();
```

Fig. 8. Checking function for the factory
Source: own elaboration

In general, we get the following situation (fig. 9), which clearly shows how demand and supply change, potential consumers and consumers, how often it is necessary to pre-order products at the factory and which orders are more popular – single one or wholesale.
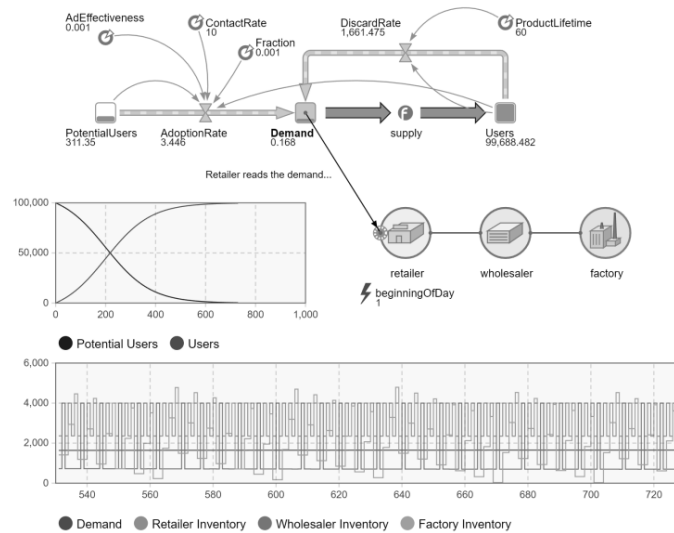

Fig. 9. The result of modeling the enterprise's activity
Source: own elaboration

The obtained results prove that over time the number of potential consumers decreases and the number of active consumers increases. It can also be concluded that individual orders are more important than wholesale, and demand is at a roughly stable level. But it is necessary to take into account that a lot of factors affect the sales – the effectiveness of advertising, the number of consumer contacts and the number of interested among them, the lifetime of each particular product (in the model was taken the average one). In addition, this model does not take into account the price factor because the goods are mandatory for entrepreneurs whose income is more than 250 000 or 500 000 hryvnias per year, according to the Ukraine legislation. And according to agreements between members of UKRECCR, prices are at approximately the same level.

It is also necessary to take into account that the following factors may have an influence at the enterprise`s activity:
— changing the competitors' position of;
— barriers for free trade, such as natural disasters, bad weather conditions, accidents at factories etc;
— political decisions about changing the conditions of the RSO;
— general growth / degradation of the world economy;
— scientific developments, adoption of certain bills.

So, after making several experiments on the model (in the first was raised the value of the ad's influence to 0.03, in the second – was decreased the number of current clients' contacts, but increased the rate of interested ones in purchasing products), the following results were obtained (fig. 10-11).
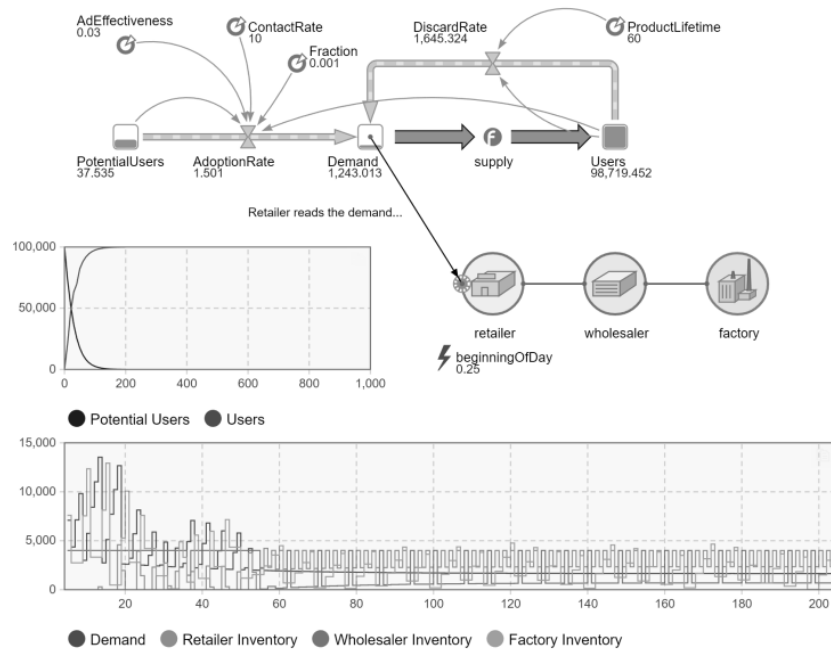
Fig. 10. The experiment to determine the impact of advertising
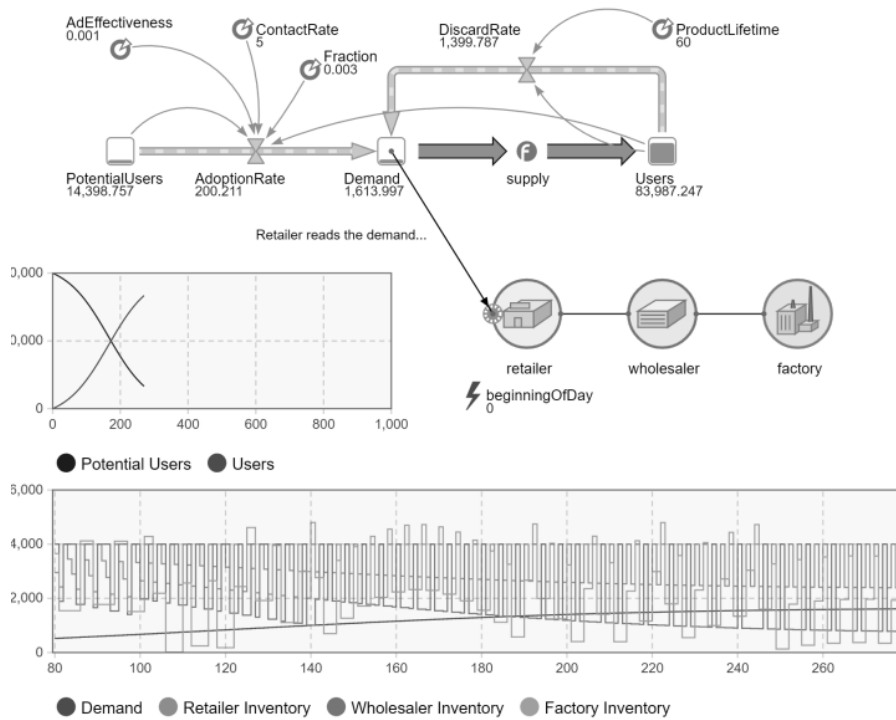*Source: own elaboration*

Fig. 11. The experiment to determine the effect of changing the number of interested in the product
Source: own elaboration

Although there were no influence at the other indicators, it becomes clear that even without global changes in the activities of a trading company, but only by manipulating marketing tools, it is possible to increase the demand or the number of customers and hence the enterprise's profit.

Thus, the model enables to make managerial decisions both operationally and strategically; to predict the dynamics of the studied processes.

The next important step in the formation and implementation of a trading company strategy is to find forms for promoting information and attracting customers. One of the tools to implement these actions is to create and host a website.

Fragments of a site created for the enterprise, are presented at the fig. 12.

Fig. 12. Fragments of the trading company's website
Source: own elaboration

The trading site was created with the help of a library of online templates of landing sites, technologies html 5, css3, JavaScript programming languages (in particular j-query libraries). The site represents a catalog of the company's products and a list of services provided; informs clients about the company's business hours, location address (with an interactive map); provides manager's contacts. In addition, there are small blocks of different information – a brief history of the company and its partners.

Conclusions

Nowadays it is impossible to imagine any business without a virtual planning and promotion tools. In conditions of high competition and technology development it is necessary not only to produce high-quality goods, but also to be able to interest and retain consumers. In the case of a limited initial budget, and in order to significantly reduce costs and increase revenue, there are a need to quickly "glance in the future". In another words – to simulate the process of business and without investing large amounts of money and real-time expenses to track possible progress and take the best management decisions.

The further, the more marketing and communication processes of interactions between manufacturers, traders and consumers should rely on fundamentally innovative ideas, creativity, interactivity, speed response and individualized approach.

Future researches are needed as for the taken as example company "Elecon & V", as in general for any trading company. It includes the developing of a math apparatus, collecting and analyzing statistics, connecting search engine algorithms (for example GoogleAdWords), optimizing the website with the CEO-technologies, advancing with the help of social networks and blogs, using not only classical marketing, but also e-mail marketing, viral marketing, hidden marketing, game marketing, interactive multimedia-technology, data clouds and other tools of modern high-tech economy.

Abstract

Trade enterprises have a pronounced specificity of activity, related to the need of constantly monitoring market trends with the operational adjustment of their own proposals. The market, as a stochastic and dynamic system, is in constant motion, which requires its subjects to take into account the numerous influences of factors of the external and internal environment, creating conditions of uncertainty and risk. According to these, trade enterprises, flexible regulation, and management tools are needed, including e-marketing tools. The meaning of simulation and Internet advertising are integral components of the tool base.

Using the system-dynamic and agent methodologies, an imitation model for the activity of a typical trading company has been developed. As a software platform for the implementation of simulation experiments was used the system of multilevel imitative modeling AnyLogic. The model investigates the dynamics of enterprise clients` flow; the processes of demand formation and adjustment of the offer depending on the policy of inventory management; the impact of advertising effectiveness on the final performance indicators is estimated. The consumer market trends are reproduced with the involvement of the Bass model of the distribution of goods and services. The model has a modular open structure. The general structure of the model and properties windows of its main elements are given. The work of the model is illustrated by the results of simulation experiments. The model is a simulator for working out operational and strategic decisions with changes in the values of specific parameters, timing and simulation steps. Parametric settings, the ability to conduct various types of experiments, a convenient and easy interface create the possibility of adapting the model to the specifics of special industry objects. A website created and hosted on the Internet is offered as an instrument for implementing a business strategy, promoting information and attracting clients. For the investigated company,

the trading site was created with the help of the library of online templates of landing sites, technologies html 5, css3, JavaScript programming languages (including j-query libraries). The site contains the catalog of the company's products, the list of services provided, the main and additional information for customers. The fragments of the trading company's website are given. The further attraction of the tools of a modern high-tech economy will significantly improve the efficiency of the operation of trade enterprises.

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