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Abstract. In an era of rapid technological development and increasing competition, the value of the mass customer as a source of profit is growing steadily. The client becomes the main asset of the bank, its needs and requirements are in the focus of the banking business. The survival strategy in the struggle for the mass customer is based on the submission of all business processes and procedures to one single goal – customer satisfaction. In the future, business performance will be determined by the degree of customer satisfaction. The economic crisis, the crisis of industrial production is pushing for a review of key aspects of banking marketing, which should explore the interaction of the industrial and banking sectors and generate solutions to increase the effectiveness of their interaction. The crisis confirms that it is necessary to improve the tools of banking marketing in the industrial sector of the economy of the region. Computer models, where the atoms are agents, are called agent-based models. In most works devoted to the construction and study of agent-based models, the rules for interaction between agents are extremely simple. Nevertheless, the result is quite meaningful meaningful results.

The issues of improving the use of bank marketing tool to improve the efficiency of interaction between the industrial and banking sectors of the economy are considered. Reasoning upon the economic aspects of the effectiveness of bank marketing, the authors state that a marketing performance evaluation system should have not only mechanisms for a posteriori analysis (that is, analysis of the results of acceptance or rejection of an offer), but also possibility of priori assessment of marketing offers, campaigns, profitability, and even marketing budgets. The system should contain a tool that simulates the appearance of clients, the selection of offers to clients and assessing the acceptance or rejection of offers, probable consumption or non-consumption of the proposed product.

Key words: bank marketing, bank product, industrial enterprises, the theory of artificial societies, sustainable development, economic crisis.

Introduction. Bank marketing, as an instrument of a market economy, has been fully investigated and has a number of definitions. A thorough market study, analysis of the changing tastes and preferences of consumers of bank services is necessary. This definition is a concretization of more general approaches, the essence of which is that marketing (from the English word market) is a purposeful application of various instruments of market policy, focused on satisfying the interests of consumers, to overcome the differences arising between supply and demand [1]. In the work of Khabarov V.I. and Popov N.Yu. [5] is indicated that bank marketing can be defined as the search and use by the bank of the most profitable banking products markets, taking into account the needs of the clientele.

The financial and economic crisis of 2008 showed all the shortcomings in the interaction of the banking and industrial sectors of the economy. The regional aspects of the problem also emerged as a result of the crisis. That is, it is necessary to talk about the lack of effectiveness of bank marketing in modern conditions. Obviously, bank marketing needs to improve its own tools.

Research methods. Reasoning upon the economic aspects of the effectiveness of bank marketing, the authors state [5], that a marketing performance evaluation system should have not only mechanisms for a posteriori analysis (that is, analysis of the results of acceptance or rejection of an offer), but also possibility of priori assessment of marketing offers, campaigns, profitability, and even marketing budgets. The system should contain a tool that simulates the appearance of clients, the selection of offers to clients and assessing the acceptance or rejection of offers, probable consumption or non-consumption of the proposed product.

Results and discussion. In the time of rapid technological development and increasing competition, the value of the mass customer as a source of profit is growing steadily. The client becomes the main asset
of the bank, its needs and requirements are in the focus of the banking business. The survival strategy in
the struggle for the mass customer is based on the subordination of all business processes and procedures
to one single goal - the satisfaction of customer needs. In the future, business performance will be
determined by the degree of client satisfaction.

The economic crisis, crisis of industrial production is pushing for a review of key aspects of bank
marketing, which should explore the interaction of the industrial and banking sectors and generate
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of the region’s economy.

Makarov V.L. positions artificial societies as a fundamentally new tool of cognition [3]. He believes
that the key phrase of the new methodology can be considered a quote from the book of Epstein and
Axtell: “Once people in relation to a social phenomenon, instead of the question “Can you explain this?”
will ask another question: “Can you build (grow) it?”. What is the essence of an artificial society? For its
existence, first of all, a certain environment is required, where "members of society" should live. It can be
a certain landscape, or space, or even a point. And in this environment some creatures function, which are
usually called “agents”.

Computer models, where the atoms are the agents, are called agent-based models. In most works
devoted to the construction and study of agent-based models, the rules for interaction between agents are
extremely simple. Nevertheless, the result is quite meaningful informative results.

Makarov V.L. notes there [3]: “Nowadays there is a crisis in mathematical economics and in
mathematical modeling in general. Why? The second half of the twentieth century can be called the
"golden age" of the use of mathematics in economics. The achievements of all the great economists of this
period are connected with mathematics. Paul Samuelson, Jan Tinbergen, Kenneth Arrow, Gerald Debre,
Vasily Vasilyevich Leontyev, my teacher Leonid Vitalievich Kantorovich are Nobel laureates, and their
main achievements were possible because they used mathematics to explain economic phenomena. But
now mathematics, one might say, is at a dead end, because the models operated by these remarkable
scientists reflect reality in a simplified way, and they need to be complicated. As, for example, in the
ingenious Arrow-Debreu model to consider ethical standards – at least the fact that an entrepreneur does
not always seek to maximize profits by any means. You come to a model where mathematics is already
useless. That is, the complexity has reached the limit in mathematics.” Models based on the theory of
artificial societies are a new tool where unlimited complication of the model is possible. In research works
on the economics of knowledge currently being conducted in the Russian Federation and the Republic of
Kazakhstan, the most interesting are studies related to the use of social networks in the formation of the
“knowledge society”, the creation of virtual laboratories for the formation of “world knowledge”, and the
modeling of artificial societies [2 ].

Among the research results, the following main provisions of the basic version of the computer model
of society can be noted.

1. Agents are in one of several possible states (actions). States or actions are divided into two types.
The first type includes actions that are not directly related to interaction with other agents. The second
type, on the contrary, includes actions affecting other people. More formally, these are actions in a group
of two or more agents, that is, group actions. Moreover, individual actions are set once and for all, their set
is fixed. As for group actions, their set is variable.

2. In the simulation process, an agent is randomly activated, which selects an action in a certain
period of time. The choice of action is determined by the level of attractiveness expressed by the number.
The agent chooses the action that is currently the most attractive.

3. As mentioned earlier, the set of group actions (and the groups themselves) is changing. If the set of
actions as such is relatively small and fixed, then the same action from this set, but carried out in different
groups, is by definition different actions. Therefore, theoretically group actions are unimaginably many.
Under the conditions of the well-known postulate of limited rationality, the agent’s memory is limited, for
example, by the maximum number of group actions that he can remember.

For bank marketing, the most appropriate model is based on the concept of partner attractiveness. That
is, the model by which social networks are formed.
There are N agents in this model. Each i agent is characterized by ai number, showing its attractiveness to other agents, \(0 < ai < 1\). Ai is not known in advance to either itself or other agents.

It is revealed in the process of interactions (as market value).

The definition given in the article by Misharin Yu.V. [4], also corresponds to the construction of such a model of bank marketing in the industrial sector of the economy, the essence of which is that attractiveness is such a concentration of interests at which their effective intersection begins. Through this definition, the author enters into a balance of supply and demand, which is necessary for the effective interaction of the banking and industrial sectors of the region’s economy in present and in the future.

Numerous studies and models confirm the cyclical development of the economy. Development management is feasible only with an understanding of the nature and properties of economic cyclicality. There are quite a lot of views. Misharin Yu.V. proposes the following approach.

Balance of supply and demand - the coordination of interests of the interacting parties, including in the real sector of the regional economy, is, in fact, a technological process if the technological process is considered as a set and sequence of actions aimed at the final, predetermined result [4].

**Conclusion.** The balance of supply and demand is in essence a balance of effectively crossed interests of the parties engaged in certain activities. As a result of the intersection of interests, a certain result or effect is obtained. From the point of view of sustainable development, it is advisable to consider this effect as a combination of its social, economic, environmental and institutional components. Obviously, the interests agreed upon within the framework of the “artificial society” model are reflected in the aggregate of certain values – state, regional, municipal, corporate, individual/private, public group, etc.

Based on the above written, it can be assumed that the concept of “artificial societies” is a key aspect of improving the tools of bank marketing in the industrial sector of the region’s economy.

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**ЭКОНОМИЧЕСКИЕ АСПЕКТЫ БАНКОВСКОГО МАРКЕТИНГА И РЕАЛЬНОГО СЕКТОРА**

**Аннотация.** В эпоху бурного развития технологий и нарастающей конкуренции ценность массового клиента как источника прибыли неуклонно растет. Клиент становится основным активом банка, его нужды и потребности оказывают в фокусе банковского бизнеса. Стратегия выживания в борьбе за массового клиента основывается на подчинении всех бизнес-процессов и процедур одной единицей цели – удовлетворению потребностей клиента. В дальнейшем эффективность бизнеса будет определяться степенью удовлетворенности клиента. Экономический кризис, кризис промышленного производства подталкивает к пересмотру ключевых аспектов банковского маркетинга, который должен исследовать взаимодействие промышленного и банковского секторов и генерировать решения для повышения эффективности их взаимодействия. Кризис подтверждает, что необходимо совершенствование инструментов банковского маркетинга в промышленном секторе экономики региона. Компьютерные модели, где атомами являются агенты, называются агенториентированными моделями (agent-based models). В большинстве работ, посвященных построению и изучению агент-ориентированных моделей, правила взаимодействия между агентами чрезвычайно просты. Тем не менее, в результате получаются вполне осмысленные содержательные результаты.

Рассмотрены вопросы совершенствования использования инструментов банковского маркетинга для повышения эффективности взаимодействия промышленного и банковского секторов экономики. Рассуждая с точки экономических аспектов об эффективности банковского маркетинга, авторы утверждают, что система оценки эффективности маркетинга должна иметь не только механизмы апостериорного анализа (то есть анализ результатов принятия или неприятия предложений), но и возможность априорной оценки маркетинговых предложений, компаний, рентабельностей и даже бюджетов маркетинга. Система должна содержать инструмент, моделирующий появление клиентов, подбор предложений клиентам и оценивающий принятие или неприятие предложений, вероятностное потребление или не потребление предлагаемого продукта.

**Ключевые слова:** банковский маркетинг, банковский продукт, промышленные предприятия, устойчивое развитие, экономический кризис.
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