Internet technologies in medical projects’ funding

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Abstract. In modern society, it is difficult to imagine a scope of activity that would not be associated with Internet technologies. They provide opportunities not only to activate the information resources of society, but also to organize information interaction between people, that certainly helps in promotion of scientific projects cost-effectively. However, it is often the case that many projects, ideas and research programs remain at the development stage. Initially it is very important to determine what exactly are the final goal and the main advantage of the project. Only then, after defining the specific tasks it will be possible to identify stakeholders who can bring funding in the project. In the article we analyze different ways of search for funding of medical projects like crowdfunding, investment funds, and government resources. The problems of the use of crowdfunding in fundraising for medical and clinical research are analyzed. We came to two conclusions. Firstly we suggest inviting graduates who specialize in innovation promotion in this process and reveal some benefits for both students and scientists/business. Secondly, we propose the concept of digital services connection, which can make crowdfunding of medical research a safe and effective means of developing domestic medicine.

1. Introduction
Each project goes through five stages of development: plan (concept), the birth of an idea, development, creation of a project plan, the beginning and formation of a team of executors, and implementation [1]. Frequently, research especially scientific ones can last for years even at the last stage of projects until the government or sponsors finance the project. This is especially true for medical projects, since, for example, to launch clinical trials of pharmaceuticals needs millions of dollars and a long period, and may not reach the appropriate result. Therefore, it is initially very important to determine what will be exactly the final goal and the main advantage of the project. For instance, it includes fundamental scientific research, verification of an existing idea or an attempt to implement the idea in the basic industry. Only then, after defining specific tasks it will be possible to identify stakeholders who can bring funding in the project. “There is no need to try to solve the problems of the whole world - find the one who will buy your idea or development,” said the editor-in-chief of the Expir portal, Sergey Ivashko [2].

2. Crowdfunding as a source of investment
An alternative way of investors’ finding is crowdfunding as collective financing of projects, in which money for creating a new product comes from its end-users. Crowdfunding gives a chance to closely
study and expand the audience, investigate its needs and test the idea [3]. However, collecting private donations of various sizes is not so simple task, as the sponsors cannot count on remuneration. The variant in which investors still receive financial bonuses is called crowd investing (until 2012, this direction was dominant in the whole crowdfunding framework). The Kickstarter (https://www.kickstarter.com/) which was created in 2009 is the most popular platform for international crowdfunding. American corporations, government agencies and venture funds track projects on this platform and choose those for investments. Fundraising is carried out according to the “All-Or-Nothing” model, which means that the authors of the project can spend the money only if they collected up to 100% of the declared amount [4]. The main competitor is Indiegogo platform (https://www.indiegogo.com/), which operates on a more flexible “Keep-It-All” funding model, i.e. sponsors receive money even when the financial goal is not achieve. The main advantage of searching on this platform is the ability to select and access anywhere in the world: in Germany - Startnext (https://www.startnext.com/) and betterplace.org (http://www.betterplace.org/de), in France - Ulule (https://www.ulule.com/), in Austria – Respekt.net (https://www.respekt.net/crowdfunding-fuer-eine-bessere-gesellschaft/), one of the most successful European platforms is in Denmark – BOOMERANG.dk (http://www.boomerang.dk/), in the Middle East (Dubai (UAE)) - Aflamnah (https://www.crunchbase.com/organization/aflamnah). A significant contribution to this industry made by China and its largest platform - Demohour (http://www.demohour.com/), which receives investments of several million dollars a year from Intel Capital and Matrix Partners China. Since mid-2012, the most famous in Russia are Boomstarter (https://boomstarter.ru/) and planeta.ru (https://planeta.ru/).

Each of these platforms is helpful in finding ideas how to solve the problem with financing, but all of them are either highly specialized, or do not make it possible to collect such large amounts that are necessary for medical research. Also they do not make it possible to raise money for treating people with serious diseases that require expensive treatment and medication. For example, Kickstarter officially prohibits the registration of health, fitness and medical projects. In this case, it is advisable to search for crowdfunding services that are focused exclusively on health care or search for alternative sources of fundraising.

3. Crowdfunding in medicine

Usually, medical crowdfunding involves collecting money to pay bills for medical manipulations. There are many examples of such platforms (GoFundMe, YouCaring, CrowdRise, and FundRazr, Cofundhealth, in total for 2019 there were 13 such large platforms around the world [5]). The practice of the platforms suggests that the donor can see the direction of spending, can monitor the progress of treatment, recipient can be included in communication with social networks, get help with promotion and many other options. In Russia there are analogues of such platforms (Blago.ru (at the time of writing this paper there are no running projects in medicine), Planeta.ru (section Charity) and a number of others [6]), but only as aggregators of the activities of non-profit organizations.

In addition to raising funds for treatment, crowdfunding in medicine has research goals (conducting clinical trials and access to experimental equipment) [7].

The international platforms which helps to raise funds for scientific research in medicine include Experiment, USEED, Consano, MedStartr and others. Examples of fundraising for medical research are presented in Figures 1 and 2.
Can we grow a supply of red blood cells by differentiating stem cells to replace donor blood?

Stem cells have progressed into a common treatment for various diseases including cancers, immune disorders...

Lucas Vining-Reckles
The George Washington University

102% funded $3,000 goal

Figure 1. An example of a successful medical project (Experiment.com).

Source: https://experiment.com/projects/can-we-grow-a-supply-of-red-blood-cells-by-differentiating-stem-cells-to-replace-donor-blood?

Figure 2. Progress in crowdsourcing for a medical project (Medstartr).

Source: https://www.medstartr.com/project/detail/201035-Personalized-medical-guidelines-in-seconds

The advantage of crowdfunding for medical research is that in some unclear situations when official medical sources of funding refuse to issue support (for instance, homeopathy / naturopathy for cancer treatments, hyperbaric oxygen therapy (HBOT) for brain injury, etc.), the researcher can raise money from less informed sources [8].

That is the source of risk. In 2015, in Nature paper [9] there was a statement suggested that it is strongly inadmissible to finance medical trials with funds received from crowdfunding. The reasons are primarily ethical. It may turn out that project promotion will raise unjustified expectations of "cure" from donors, which in the future will undermine public confidence in medical crowdfunding.

Nevertheless, modern crowdfunding medical research platforms include internal project review mechanisms (such as specific medical platform - Crowdacure). It is worth mentioning that so far expertise is based on a closed committee, and not on crowdsourcing.

On the other hand, the lack of funding for promising researchers leads to their failure to carry out their planned prospective studies and to quit research profession [10], even the incomplete collection of money in the absence of federal funding allows carrying out the initial, most risky stage of research [11].

Most likely, a restrained approach to crowdfunding of medical research and clinical trials will be correct, which could involve in expertise a wide expert community.
4. Alternative ways of investment findings

Before The American Watsi service (https://watsi.org/) involves “creating technologies to finance healthcare for all” by administering health insurance systems. The service allows lowering the prices of operations through cooperation with medical organizations and doctors who are ready to invest materials, time and equipment for free, due to which the procedures are much cheaper than they usually cost in the USA. According to the Medicare & Medicaid Service Center, US health care spending will be around 20% of GDP by 2020. Nowadays, medicine has great potential for the use of modern technology. However, according to Lewis Mitchell from the largest American medical group Mayo, the use of information technology in medicine is 25-30 years behind the rest of the business [2].

Unfortunately, Russia does not yet have a platform like the American Watsi, but there is another one namely Expir. This online resource was created to help scientists, leaders of scientific teams in the provision and organization of scientific and applied research. Every day, this site publishes information about contests for both young scientists already experienced scientists and entrepreneurs. For the founders of Expir it is important not only to provide information about existing contests, but also to explain how to properly apply for them.

Another important issue is in finding investors not for all projects. This is especially the case when projects concern the well-being of the population and the improvement of the state of its unprotected social classes, for example, elderly people [12]. When an investor definitely decides on what is needed, it will become much easier to find resources for project. “The main thing is to get away from thinking in research terms and come to thinking in the project framework” [2]. As a rule, authors of innovative projects in the field of biology and medicine are doctors or scientists who do not have experience in marketing and promoting their products as business projects. As a result, misunderstandings and disagreements arise between them and the investor or sponsor of the project regarding the final product or goals of the company. Therefore, the involvement of innovators, who are specialists involved in the promotion of projects and the commercialization of the scientific and technical results, can increase the chances of obtaining financing and bringing projects to the stage of appearing on the market. However, in Russia this profession is not widespread. Additionally, attracting experienced innovators is costly, so it is better to invite graduates of the R&D faculties or business schools as project managers. They could be volunteers or part time employees in research institutes and take part in solving promotion and marketing problems, and students benefit in preparing their diploma works, at the same time creating ready-made and free projects for scientists. As a variant students would help in identifying and searching for persons interested in the project, and participating in the regulatory impact assessment [13].

In Russian medicine, a new form of interaction begins to emerge, namely public-private partnerships and private investment. According to experts, 54% of investors today are interested in medical projects, calling them one of the most attractive areas for investments [14]. Funding for medical research can be obtained from funds such as the I.M. Bortnik or Primer Capital. The last is the only private fund in Russia that invests in projects connected with new medicines and medical devices with an average investment of 20 million rubles. It is noteworthy that Primer Capital is the only fund focused on seed investments, which means research funding at the early stages.

However, in Russia there is a shortage of sources of funding for medical research. Receiving funds from foreign platforms is difficult in terms of organizing money transfer and control of the use of funds from foreign agents. Nevertheless, foreign experience shows good results. It means that there is a need in designing Russian platform, integrated with other domestic online services (Sberbank Online, research legal registration base, patent services, medical and scientific institutions, doctors integrated into a social network). But before creating such a complex system, it is necessary, firstly, to develop separate parts of the system (social networks in medicine, Internet expert community to evaluate projects, high-grade digital services of medical institutions), and secondly, to establish links between the medical community and the general population (via social networks on the Internet), which will allow reporting information about the possibilities of supporting research projects in medicine and promptly receive funding for researchers at a glance.
5. Conclusion
Nowadays, concerning innovation in the medical industry there are the following features.

- Scientists and doctors do not always have sufficient competencies to turn scientific and technological products into reasonable commercially viable projects for investment, so it is worth attracting specialists in the promotion of high-tech products.
- In medicine, there is a strong confrontation between the interested players such as large medical clinics, individual doctors, research institutes, the state, technology companies that create health-oriented products, non-governmental organizations and, finally, clients which are most often perceived medical institutions as patients. [2].
- Investing in startups that can generate revenue after a year and a half is much more interesting and profitable for many sponsors than investing in long-term projects such as medical research and development.

However, the above difficulties can be solved with the help of Internet technologies. They are in troth to help find sources of financing for various projects both among investors in their own country and abroad.

The connection of various beneficiaries of medical and clinical research with broad groups of the population will allow getting away from being tied to the narrow bureaucratic interests of domestic medicine and to link research with the social mandate of Russian society.

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