

Holding their hand: gamifying for children in medical trials and beyond



By Kathryn Reilly
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CATEGORIES:

DIGITAL DIGITAL HEALTH INNOVATION PRODUCT DEVELOPMENT TECHNOLOGY

To be truly effective, today's software development companies need to understand their customers' business needs and industry specific issues before embracing new technologies, says Russia-based Olga Azimbaeva, Business Analyst and usability expert at DataArt



As a global company, [DataArt](#) carefully tracks industry developments at its Research and Development Centre, which is an important part of our Healthcare and Life Sciences Practice. The R&D Center generates ideas for promising new areas in the industry and develops these ideas at the concept level. Several years ago, [Daniel Piekarz](#) (Vice President, Healthcare & Life Sciences), worked with a client whose electronic system for monitoring clinical trial outcomes was ineffective. The system was intended to collect data during clinical trials – for example, the reaction to drugs administered, what side effects were felt, how the patient estimates the

effectiveness of the treatment, etc. At that time, ePRO (Electronic Patient-Reported Outcome) systems included digitised questionnaires and other documents to be completed by test subjects during the trials. Because of its poor usability, the system was hard to use, especially for children and adolescents.

Given the broad interest in organising clinical trials and improving the quantity and quality of data obtained, the R&D centre decided to create a concept application to address the specific clinical trial needs for children.

Initially, the idea was to use gamification elements to attract attention and motivate children to use the solution. We used a concept resembling that of the once popular Tamagotchi, with children being asked to take care of a virtual pet.

Learning while developing

While analysing the target audience, we concluded that the Tamagotchi concept would not work in our case. If not cared for properly, the virtual pet could die and since our target audience is chronically ill children (those with diabetes, asthma, cancer) who were stressed and depressed, we felt that a positive reinforcement would yield better results. Several character concepts were created and, after collecting feedback from children, a squirrel was chosen.

In our application, the child and the squirrel are treated together: the squirrel takes medication and becomes sad when a child feels unwell. In other words, we established an empathic connection: the child need not feel alone because he or she has a virtual friend who is always nearby. Moreover, the child receives bonus stars for completing tasks like taking medicine on time, and these stars can later be used to dress their character in different costumes or to buy new toys, making the virtual friend happy.



Olga Azimbaeva

At the start, the application was planned for inpatient clinical trials, but later we realised that it could also be used at home, for diseases like diabetes or cancer that require constant monitoring. We created another application, this time for parents – Care Companion – which took into consideration the fact that children at home (unsupervised by medical staff) might not be able to comply with prescriptions properly and would need adult supervision for safe and effective treatment. The Care Companion allows the adults to configure the children's portion of the application with the frequency and dosage of medication to be taken, complete a diary, and answer questions about the child's wellbeing. In order to collect feedback, the Care Companion analyses all data obtained from the child's application and displays it in clear graphics. In addition, a separate interface for the child's physician provides access to all the data from the child's application and sets the daily schedule.

Further discoveries

Our team realised that one of the factors of medication non-compliance is the fear of side effects and the belief that the treatment can be stopped after the symptoms have disappeared. In light of this, an education section was added to the application, in which both the child and the parents can learn more about the disease, side effects, and recommendations. Another section was added to contact a doctor with questions.

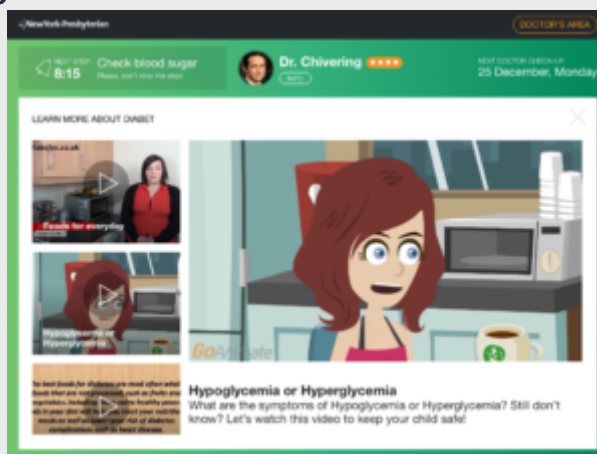
We believe that a system works well when it meets the needs of the target audience, so we tried to focus on a specific chronic disease – diabetes.

For this purpose, we added a food tracking function (calories/carbs) and the ability to scan the glucometer, so that the application could recognise the numbers on the screen of the device and display the blood sugar level.

Two years ago, the application won third place at the [InnovateNYP event: Pediatric App Challenge](#). Since then, we have developed the idea further, adding the Care Companion, and won [the Pfizer Healthcare Challenge 2017](#).

The team was also invited to speak at the prestigious [Frontiers Health conference](#) to present our achievements to the participants, including both start-ups and leaders in the pharmaceutical industry.

Building for the future



KidPro's interface

The [KidPRO](#) team has planned several additional improvements for the application. These include additional customisation. While the current application revolves around diabetes, it can help with any clinical state. Yet, to make it more appealing to different categories of young patients (different age groups, e.g. teenagers) we are going to completely revamp the UI of the application.

New gamification elements will also be added. We are going to introduce new characters and types of rewards, customise the environment (like 'the room'), and embed mini-games and other ways to better engage the child. There will be improved FHIR integration, which means the app will pull more details about the treatment plan and prescriptions so that the doctor can use that information to prepare an individual daily schedule for the patient to give better results.

The analytics capabilities of the application make it possible to analyse the treatment process and engagement aspects (eg how many times the child has watched a certain video) and recommend personalised actions accordingly. For instance, if the child is not following the diet properly, he or she can be prompted to watch a video on the importance of diet. Notifications will be developed, too. If the child misses certain procedures or routine steps, the parent will be notified. Important events, like doctor check-ups, can be scheduled directly in the parent's device calendar. Finally, inpatient and outpatient modes will be added so that when the patient visits a hospital, the application provides additional information and instructions.

We're very proud of our KidPRO concept and believe it can help children and their parents cope with the difficult situations associated with chronic diseases. For KidPRO to enter the market and be used in clinical trials, we must take it through the psychometric validation, and to do that we are looking to work with experts from companies interested in implementing this system in their processes who have a deep understanding of the specifics of the industry.

Original article can be found here: <https://medtechengine.com/article/gamification-children-medical/>