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Vitadio Case Study

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Vitadio
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INTRODUCTION

Type 2 diabetes is one of the most common lifestyle diseases today. Nearly 600 million people worldwide suffer from this disease, with approximately 70 million people affected in Europe. The number of people with diabetes in the Czech Republic exceeded one million in 2023, meaning that one in ten Czech citizens will encounter this disease during their lifetime. It usually develops in patients after the age of 40, unlike type 1 diabetes, which is congenital, and is therefore also referred to as adult-onset diabetes. A typical symptom of type 2 diabetes is insulin resistance. In insulin resistance, the pancreas produces increased amounts of the hormone insulin, but the body of the affected person cannot use it effectively, and thus excessive amounts of sugar remain in the blood. Genetic predisposition has a significant influence on the development of this disease, but so does an unhealthy lifestyle. In recent decades, the incidence of type 2 diabetes in developed countries has increased many times, mainly due to a sedentary lifestyle, lack of exercise, and excessive stress. Type 2 diabetes is also associated with obesity, unhealthy eating habits, and consumption of industrially processed foods. Patients with diabetes are at increased risk of cardiovascular disease, retinopathy, kidney failure, and circulatory problems, which can lead to lower limb amputations.

Treatment for type 2 diabetes is primarily based on lifestyle changes, which include improving eating habits, getting enough physical activity, and reducing stress. Depending on the severity of the disease, a diabetologist may prescribe oral antidiabetic drugs, insulin, or other medications that help maintain proper blood sugar levels. Diabetes treatment is based on the principle of balance, similar to a scale. While food increases blood sugar levels, insulin and physical activity lower them. Therefore, in order to improve their health, every patient with diabetes should strictly adhere to their treatment regimen and strive for stable blood sugar levels, which must be monitored through regular measurements. However, this is where a fundamental problem arises that often complicates the treatment of diabetics. Patients usually see their doctor only once every three months, and the check-up itself takes only a few minutes. During the visit, the diabetologist assesses the patient's current state of health and prescribes the necessary medication to last until the next check-up. However, there is a lack of ongoing monitoring to ensure that the patient is actually following the prescribed dietary measures and getting enough physical exercise, which are key factors for effective treatment. This degree of freedom and liberty often leads to patients not adhering to the recommended treatment regimen, which in turn leads to a deterioration in their health. Many of them do not feel sufficiently motivated, and changing long-established habits can be very difficult.

However, daily monitoring of all patients with diabetes is impossible from a practical point of view, both logistically and in terms of personnel. In the Czech Republic alone, approximately

one in ten people suffer from diabetes, and as a result of this disease, more than ten thousand limb amputations are performed each year. However, these complications are often caused precisely by failure to follow the recommended lifestyle.

Improving lifestyle habits could significantly contribute to more successful results in the fight against diabetes at the national level. Not only would it lead to better health for patients, but it would also bring significant savings for the healthcare system, as it would significantly reduce the resources spent on prevention, treatment of associated diseases, and management of complications associated with diabetes. Furthermore, research shows that in some cases, mild forms of type 2 diabetes can even be completely reversed by consistently following a healthy lifestyle. This only underscores the importance of regular physical activity, a balanced diet, and overall lifestyle changes as key factors not only in treatment but also in the possible complete management of the disease.

The startup Vitadio offers hope for more successful treatment of type 2 diabetes with its app for monitoring patients with this disease. While doctors prescribe medication and set up appropriate treatment, the Vitadio app tracks patients' progress in improving their lifestyle. The app not only monitors blood sugar levels over the long term, but also motivates users to engage in physical activity, eat healthier, and regularly record their habits on a daily basis. It works on the basis of artificial intelligence and can, for example, evaluate the suitability of a meal based on a photo of it and offer more suitable alternatives or recipes if necessary. In addition to nutritional coaching, Vitadio also offers social support. Users can communicate directly with a nutrition therapist within the app, who helps them cope with the challenging period of treatment and can guide them in the right direction. There is also a discussion forum where users can exchange experiences, share their progress, and support each other.

This case study will focus on the origins and idea behind the creation of the Vitadio startup, its main principles, scope of activity, and plans for the future. It will also include a description of the company's business model. Subsequently, the application itself and its functioning will be presented in detail, from its key features to the way it supports patients with type 2 diabetes in their everyday lives.[1]

[1] I would like to thank Ms. Šomvárská for providing key materials and for her willingness to answer questions, both of which significantly contributed to the preparation of this study.

1 VITADIO STARTUP

The startup Vitadio was founded in 2017, when its founders Jan Šomvársky, Ondřej Kulatka, Boleslav Kristián, and Lenka Röhryová (now Šomvárská) decided to combine their experience in management, software development, and healthy lifestyles to contribute to the modernization and improvement of Czech healthcare. With a vision that changing lifestyle and eating habits can significantly improve the results of conventional pharmacological treatment and the overall quality of life of patients, they created the Fitjoy app focused on nutritional coaching and motivating users to adopt a healthier lifestyle. However, the initial version of the Fitjoy app, which was paid, did not attract much interest from the general public. Nevertheless, the startup received a number of positive responses, especially from chronically ill users, primarily those with type 2 diabetes, who saw real potential in the app. In addition, all four founders of the startup had personal experience with this disease in their families, which motivated them to create a new version of the app designed exclusively for diabetes patients. The newly created Vitadio app now includes blood sugar level monitoring and mood tracking, which are key indicators for diabetes patients. In 2021, the startup began collaborating with Gauss Algorithmic, a company specializing in artificial intelligence and data analysis. This collaboration resulted in the introduction of a feature that recognizes meals from photographs in the app. Users simply take a photo of their plate, and the app automatically analyzes its nutritional value. This innovation has significantly increased the app's appeal among users and brought Vitadio closer to its goal of becoming an effective digital care tool for patients with diabetes.

Founders of Vitadio: Boleslav Kristián, Lenka Šomvárská, Jan Šomvársky, Ondřej Kulatka

The app has undergone extensive development since its original version. However, Vitadio is not a standard mobile app, but a classified medical device that must meet a number of strict requirements and undergo clinical evaluation. Vitadio therefore established cooperation with the University Hospital Olomouc and the Dresden University of Technology with the aim of verifying the effectiveness of its solution in practice. After evaluating the results, which were more than favorable, Vitadio obtained CE certification for medical devices. This certification proves that the application meets all the requirements of European legislation regarding safety, health protection, the environment, and consumer rights, and allows it to be sold freely throughout the European Union. The application also complies with the ISO 27001 standard, which guarantees the protection of sensitive user data and its encryption in accordance with internationally recognized information security rules.

Vitadio currently operates in several European countries, and its app is used by thousands of satisfied users. Three of the original founders continue to work at the Prague-based company. Jan Šomvárský is the CEO, Bolek Kristián is responsible for the startup's technology strategy, and Lenka Šomvárská has moved from the app's research and development department to the position of sales director.

In the future, the startup plans to expand its activities to the field of women's health, which, according to Vitadio's founders, is key to effective and modern healthcare.

1.1 Startup Business Model

Vitadio's journey from its founding to its successful presence on the European market was not easy and required overcoming a number of obstacles. The original version of the app, in which the founders invested a considerable amount of time, energy, and financial resources, was focused on promoting a healthy lifestyle. However, after its long-awaited launch, an unexpected sobering moment arrived. User interest in the app was minimal, and it turned out that people at that time were not willing to invest in prevention and improving their lifestyle. This initial failure was a considerable disappointment for the founders of Vitadio and forced them to rethink their original strategy. However, the founders did not give up and began to look for new ways to use their app. It was then that their app began to attract the attention of patients with type 2 diabetes, who saw it as a real benefit for managing their disease. Feedback from this target group prompted a fundamental change in the startup's strategy, and the new demand created space for the development of a product that met the expectations of this customer group. The founders decided to completely redesign the app and focus exclusively on the needs of diabetics in order to strategically fill a previously untapped gap in the market. The new, specialized version of the app began to receive positive

feedback from both users and professional community. Thanks to the ability to adapt and listen to patients' needs, the unsuccessful project became an innovative digital healthcare tool with growing international recognition.

One of the key partners in the development of the Vitadio startup was the EIT Health accelerator, founded by the European Union. In 2019, Vitadio joined its Health Venture Lab initiative, which gave it access to valuable contacts, mentors, and financial support. Among the most significant contacts gained was the collaboration with Smart Ageing Camp, which supports innovations focused on the aging European population. During the eight-week acceleration process, the Vitadio team visited five European countries, where it tested its business model and established partnerships with key players in the field of digital healthcare. At the same time, the company also participated in the prestigious Bridgehead program, which aims to help healthcare startups expand into foreign markets. As part of this program, Vitadio collaborated with Medical Valley in Erlangen (a cluster in the field of healthcare and medical technology) to develop a strategy for entering the German market. Vitadio returned to the Bridgehead program in 2021, this time with the aim of supporting its entry into other foreign markets. This was an important strategic decision, which will be described in more detail in the following sections of this chapter.

In 2020, the Vitadio startup received further significant support, this time as part of the Vodafone Foundation's acceleration program, which focuses on supporting technological innovations with a positive impact on society. At that time, the startup received an investment of CZK 16 million from the Nation 1 capital fund and angel investor Petr Skrla, who subsequently joined the Vitadio team as a strategic advisor and continues to hold this position today. In 2022, the Pilulka Lab accelerator also invested in the startup, supporting further development of the application, clinical trials, and marketing activities. The year 2023 brought another important investment round, in which Vitadio received three million euros from the Italian company Theras Group, specializing in healthcare technologies, and from the German investor Jafam Holding. This investment will be used primarily to increase sales, expand into other European markets, and develop new digital therapies.

The startup Vitadio actively uses professional conferences as a means of promoting its application and establishing cooperation with experts in the fields of medicine, technology, and business. One of the first major events where the application was presented to the public was the Masters&Robots technology conference, which took place in Warsaw in the fall of 2019. In December of the same year, the startup took the opportunity to present its project at Demo Day in Budapest, organized by the Health Venture Lab acceleration program under the patronage of EIT Health. In February 2020, the founders of Vitadio presented the app to the professional public at the

Advanced Technologies and Treatments for Diabetes (ATTD) conference in Madrid. Since 2022, Vitadio has been participating annually in the prestigious DDG Diabetes Congress held in Berlin.

Since its founding, Vitadio has also won several prestigious awards. In 2019, it won the Czech Idea of the Year competition in the Demo Day category. In the same year, it also won the CEE Unlimited competition, whose main goal is to connect and strengthen startup and investor ecosystems in Central and Eastern Europe. Part of the prize for the winning startups was the opportunity to participate in a European tour and present their ideas. In 2023, Vitadio won a global innovation challenge organized by Theras and MassChallenge. In this international competition, Vitadio succeeded in competing with a number of digital diabetes solutions from Europe, Asia, and the United States.

Vitadio receiving the prestigious Idea of the Year 2019 award

At the beginning, the Vitadio app worked by collecting user data in the Czech Republic. Vitadio approached selected diabetes clinics and offered them the chance to give the app to patients for free for a year as part of a pilot test. Hundreds of patients took part in this initial phase, which aimed to test the app's functionality and load. Thanks to their data, it was possible to further improve the app, refine its functions, and make its use more efficient. The startup's long-term goal was for the app to become officially covered by all health insurance companies in the Czech Republic.

However, Czech legislation does not yet allow state health insurance companies to cover telemedicine applications because they are not yet considered officially recognized medical devices. The startup gradually realized that it was unlikely to win the battle with the Czech healthcare system. At the same time, it was clear that if patients had to pay for the app themselves, it would discourage a large number of them, and targeted care would not reach many of those in need, which would also significantly limit Vitadio's business growth. The startup therefore decided to turn its attention to other European markets whose legislation would allow the reimbursement for the app.

The choice fell on Germany, where, unlike in the Czech Republic, there is an extensive network of public and private health insurance companies, and digital healthcare is experiencing significant growth, especially after the coronavirus pandemic, which severely limited access to healthcare. In Germany, doctors are able to prescribe digital health applications as part of patient treatment since 2020. In order for an app to be prescribed and fully covered by insurance companies, it must be listed in the so-called DiGA directory. Inclusion in DiGA requires meeting strict criteria set by the Federal Institute for Drugs and Medical Devices (BfArM, Bundesamt für Arzneimittel und Medizinprodukte). The app must demonstrate not only technical safety but also its actual benefit to patient health, which includes providing evidence from clinical studies. It took Vitadio approximately a year and a half to obtain the necessary certification. Since 2024, the Vitadio app has been available in Germany completely free of charge if the patient has health insurance. It can be obtained either on the basis of a doctor's prescription or directly through a health insurance company after providing proof of a diagnosis of type 2 diabetes. At the time when Vitadio entered the DiGA directory, it included 31 prescription health applications, only one of which was not of German origin. Vitadio became the first foreign application to succeed in the demanding selection process. Currently, the DiGA directory consists of 55 applications, only four of which are not of German origin (apart from the aforementioned Vitadio, these are applications created in the Netherlands, Austria, and Italy).

Vitadio is currently preparing to launch sales in Italy. A pilot program is currently underway, allowing selected patients to use the app for free. The goal of this testing phase is to gather sufficient data to modify the app's content so that it better reflects the specifics of the Italian lifestyle and different eating habits.

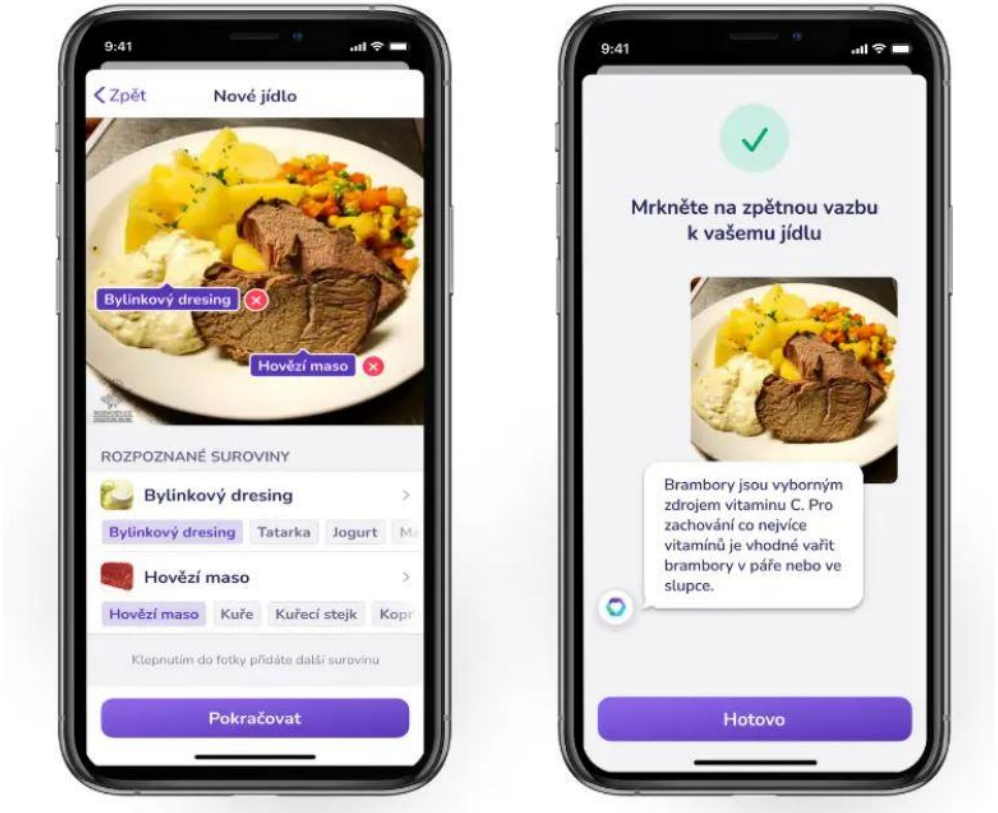
Unfortunately, there is currently no possibility of Vitadio being covered by health insurance in the Czech Republic. However, the startup is actively working to change this situation in the future and make the app available to all patients without distinction. However, some private health insurance companies already offer their policyholders the option of applying for reimbursement for the application. State insurance companies are also becoming more open to new technologies and

offer various bonuses and contributions as part of their preventive programs, which can cover part of the costs of digital therapy.

2 VITADIO APP

Vitadio is a mobile app designed for patients with type 2 diabetes, helping users develop healthy habits and supporting their physical and mental health. Both aspects are essential for successfully managing this disease. The app provides personalized coaching and monitoring, including motivation to exercise, dietary recommendations, and tools for tracking health status. Vitadio is available for download on smartphones with Android and iOS operating systems, making it easily accessible to a wide range of users.

Users can regularly record their data in the app, especially their blood sugar levels, which are a key indicator of the current health status of diabetes patients. Users also have the option of entering their daily diet into the app. The app then evaluates the nutritional values of individual meals and suggests healthier alternatives. The app also offers an extensive database of recipes from which users can draw inspiration. Meals can also be conveniently photographed. Thanks to a built-in algorithm called Alfred, the app recognizes what is on the plate, evaluates the dish nutritionally, and provides feedback to the user. If users have any questions about a balanced diet or need individual advice, they can chat online with qualified nutrition therapists who can offer personalized expert advice and specific recommendations.

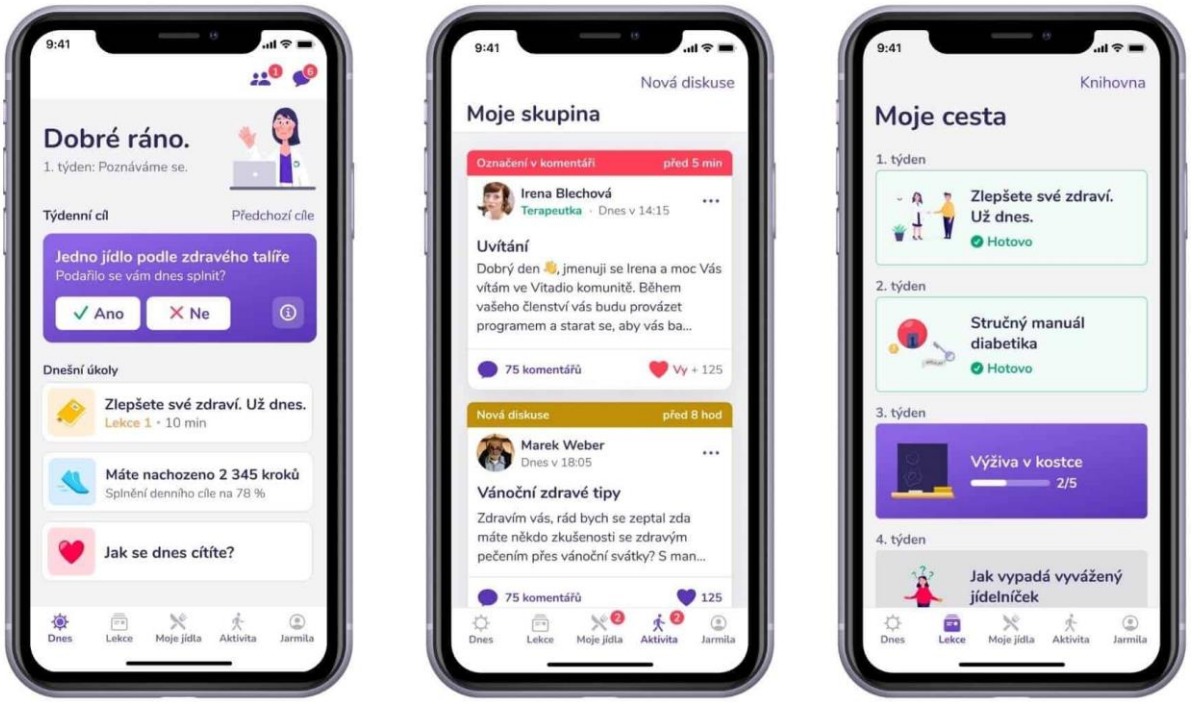


Food recognition algorithm Alfred

However, the app is not only about nutrition, but also focuses on promoting physical activity. When connected to a smart bracelet or watch, it can record, for example, the number of steps or other physical activities that the user has engaged in during the day. An integral part of the app is also mental well-being. Users can record their current mood and track its development over time. There is also a community forum where users can share their experiences, motivation, and difficulties associated with managing their illness.

The app also offers access to motivational and educational materials that help users better understand their condition and learn how to manage it in the long term. The materials focus on topics such as motivation, nutrition, physical activity, sleep hygiene, mental well-being, and the social aspects of living with diabetes. These educational courses use gamification principles, where users receive symbolic rewards in the form of badges for successfully completing individual tasks, which increases their motivation to continue the course in the following days.

The Vitadio app is designed to adapt as much as possible to the individual needs of each user. The content of the app is fully personalized, and its individual functions are tailored to the preferences, behavior, and progress of the specific user. The daily tasks and goals set by the app are created with the user's lifestyle and health in mind so as not to create excessive pressure, but rather to support the permanent integration of healthy habits into everyday life.



Vitadio app

Before Vitadio was approved as an official medical device, it was necessary to verify its effectiveness through scientific and medical testing. Clinical studies conducted in collaboration with the University Hospital in Olomouc focused on comparing the effectiveness of Vitadio with traditional treatment methods. The main objective of these studies was to determine the extent to which Vitadio can help patients with type 2 diabetes, prediabetes, or insulin intolerance reduce their body weight, which is essential for the patient's overall health. The results of a group of patients using Vitadio for six months were compared with the results of patients who followed a classic diet program prescribed by a doctor for the same period of time and had regular consultations with nutrition therapists. The research thus provided objective data on whether alternative solutions such as Vitadio can fully compete with traditional treatment approaches.

The results of clinical trials conducted at the Olomouc University Hospital showed that patients using the Vitadio app reduced their body weight by an average of 5.5 percent after three months and achieved an average weight loss of approximately 6 percent after six months. These values are comparable to, and in some cases even better than, the results achieved with traditional diet programs and consultations. The results also showed that after a year of regular use of Vitadio, patients experienced a reduction in the amount of fat in their blood vessels, a significant decrease in insulin resistance (by an average of 2.5 units), a decrease in fasting blood glucose levels (by 0.5 mmol/l), and a decrease in glycated hemoglobin (HbA1c) levels (by an average of 0.2%). In contrast, the control group showed only a slight improvement in glycated hemoglobin levels, while the other parameters monitored changed only minimally. Insulin resistance in this group, on the other hand, paradoxically increased. The clinical study also showed that the Vitadio app has a high rate of user retention. After three months, 88% of patients continued to use it, and after six months, 80% still used it. More than a third of users used the app daily, and over 80% launched it at least every other day.

This was followed by an observational study conducted by the Dresden Technical University. This study examined the effect of using the Vitadio app on users after three months of use. After this period, the glycated hemoglobin value decreased by an average of 0.9% in the Vitadio user group, while the control group saw only an average decrease of 0.3%. Patients using Vitadio also experienced an average weight loss of 4.3 kilograms and a decrease in fasting blood glucose levels of 0.6 mmol/l.

A randomized controlled trial was recently completed at the Dresden Technical University. The aim of the study was to determine whether the Vitadio digital health app is more effective than standard care and whether it has a clinically significant impact on glycated hemoglobin (HbA1c) levels in patients with type 2 diabetes. A total of 149 patients were included in the study. The control group received standard diabetes care, while the intervention group received standard care plus a digital lifestyle intervention via the Vitadio app. The observation period was six months. Data was collected at the beginning of the study and after three and six months. Based on the data obtained, the following results were found:

Group	Initial average HbA1c	Average decrease of HbA1c after 6 months	Patients with the decrease ≥ 0,3 %	Patients with the decrease under 7 %
Intervention (Vitadio)	8,1 %	- 0,7 %	74 %	37 %
Control	8,2 %	- 0,2 %	48 %	9 %

The study clearly shows that the Vitadio digital health app delivers better results in reducing glycated hemoglobin levels compared to standard care.

CONCLUSION

Although digital diabetes treatment does not yet show significantly better results than traditional treatment under the guidance of qualified professionals, it does offer a number of advantages. The most significant of these is undoubtedly the reduction of pressure on the healthcare system and the prevention of complications associated with diabetes. If patients with diabetes regularly monitor their blood sugar levels and follow the principles of a healthy lifestyle, their health can remain stable in the long term. On the other hand, patients who rely solely on insulin but neglect exercise, smoke, drink alcohol, or eat an unhealthy diet often face a rapid deterioration in their health, which also increases the burden on the healthcare system. The Vitadio app helps prevent these conditions. In patients with prediabetes or a milder form of diabetes, proper lifestyle management supported by Vitadio can even prevent the development of the disease. The app is also suitable for people with a genetic predisposition who are at higher risk of developing diabetes.

If the Vitadio app were officially recognized as a fully-fledged part of diabetes treatment, it could bring significant relief to the healthcare system, not only in terms of personnel but also financially. The cost of making the app available to all diabetics in the Czech Republic would not exceed the amount that the state spends annually on treating complicated cases of type 2 diabetes. It is precisely these more severe forms of the disease that are often the result of a long-term neglect of a healthy lifestyle. The most costly aspect is the follow-up care for patients who have already suffered serious complications, such as blindness, kidney failure, or lower limb amputation. Rehabilitation and long-term treatment of these conditions cost the Czech healthcare system billions of crowns annually. According to an extensive study by Professor Bengt Jönsson, director of the Swedish Institute for Health Economics, the average annual expenditure per patient with type 2 diabetes in Europe was around €2,834 in 1999. The Vitadio app is available for €224 for three months, which comes to €896 per year. These statistics suggest that Vitadio could save the healthcare system up to 70% of the costs of caring for diabetics. In addition, current forecasts show that the number of patients with diabetes will continue to increase significantly in the coming years due to modern lifestyles. Early digital intervention can therefore play a key role in the prevention and effective management of this disease.