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CRIANDO UM MODELO DE NEGÓCIO BASEADO EM PLATAFORMA NA INDÚSTRIA DENTAL

CREATING A PLATFORM BASED BUSINESS MODEL IN DENTAL INDUSTRY

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ABSTRACT

Purpose: The article considers one of the possible approaches to building a fundamentally new business model for dental industry with a concept of a self-organizing industry management system based on blockchain platform, crypto currency and reward for consumer target behavior. **Design/methodology/approach:** The theoretical design based on literature review, the content analysis and practical experience of business model transformation in digital platform economy and innovative blockchain technology, while the authors develop, describe and implement a new concept of a new business model in dentistry. The factual basis was the materials of an experiment conducted in the Netherlands to create a platform community Dentacoin based on blockchain platform. **Findings:** The developed concept of the business model in dentistry shows the main mechanisms that make the model attractive to the consumer services: obtaining objective information about services and producers; formation of a contract on the basis of independent diagnostics and its insurance; financial and logistical support of the service. **Research/practical implications:** The results of theoretical and practical research confirmed the possibility and expediency of the business model innovation of dental industry. The analysis of the current stage of Dentacoin Project implementation shows that business model works. **Originality / significance.** The proposed concept of business model based on blockchain technology is fundamentally new for the dental industry. It is the first time describe and systemize a new management mechanism of value creation together with utilizing the blockchain advantages. The creation and implementation of the first blockchain-based platform in dentistry allows achieving transformative change of a whole industry and will greatly enrich both the theory and practice of transformational phenomena.

Keywords: Business model innovation; Dentistry; Blockchain; Self-organization; Self-development

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INTRODUCTION

The digital platform economy today is one of the most important trends in the cardinal change in the construction of business model systems both for companies and entire industry. The process of platform business model construction is a main part of digital business strategy, as it drives the innovation model, creates an environment for collaboration and enables ecosystem-value creation. Tapscot and Tapscot (2016) wrote, that blockchain technology is bringing us the Internet of value: a new, distributed platform that can help us reshape the world of business and transform the old order of human affairs for the better. As a result of digital transformation it will be the predominant business model of the 21st century.

The companies that run a business in the platform business model, whether they go from scratch or already operate on some other business model, cause a profound disruption to the existing traditional business models in the competing industries, challenging the status quo of these industries. Today, these same types of disruptive business models are popping up not only in telecommunications, media, financial-services, energy, retail sector, but also in a health care. That is why it is very important and timely to introduce the concept of fundamentally new platform based business model based on blockchain technology with new management mechanism for dental industry and the first steps of model implementation.

Business model innovation in digital platform economy: literature review and practice perspective

The business model concept is well established in academic disciplines, but in recent years of the so called digital transformation

(revolution), the business model transformation and innovation has been the focus of great attention from both academics and practitioners. It is accepted that technology itself has a small or no inherent value, and on its own, is not a source of sustainable competitive advantage (Peppard and Ward, 2004). What is valuable is a business model behind the technology determining the success of this technology, leading to achieve the company's strategic objectives and business success (Kavadias et al., 2016). Most of the business model definitions comprise out of three broad categories: value proposition, value creation, and value capture (Amit and Zott, 2001; Osterwalder and Pigneur, 2010). The reliability of the business model architecture to generate and capture value depends on a deep and comprehensive understanding of customer needs (Teece, 2010). The success rate of created business model innovation can be multiplied by rationally set regulation criteria, which in the long-term leads to sustainability of the system (Špaček and Vacík, 2016). Validating a business model is the most crucial part of starting a company. Entrepreneurs create business models based on their individual beliefs and perceptions, imaginations, and social interacting with the environment (Alvarez et.al., 2013).

Digitization enables the development of entirely new forms of creating and capturing value and entirely novel value proposition (Westerman et al., 2014). After introduction the platform technology, innovative platform based business model arrived. We are moving from linear to networked business models, from dumb pipes to intelligent platforms. A platform is a business model that creates value by facilitating exchanges between two or more interdependent groups (usually consumers and producers) of a

given value. While a linear business creates value by manufacturing products or services, platforms create value by building connections and “manufacturing” transactions (Mozard, 2016). In the context of the economy of the platform, the supply side of economy represents an effort of the platform management to attract as many customers as possible to create and continuously increase the network effect. Demand economies of scale are driven by efficiencies in social networks, demand aggregation, app development, and other phenomena that make bigger networks more valuable to their users. They can give the company in a platform market a network effect advantage, that extremely difficult from competitor to overcome (Parker et.al., 2016).

While business model innovation may require new capabilities, these new capabilities will constitute business innovation only when they significantly disrupt the competitive dynamics of an industry (Euchner and Ganguly, 2014). When a platform enters the marketplace of a pure pipeline business, the platform nearly always wins, causing the transformative change to the industries: so, Amazon changed retail buying patterns; Bitcoin challenged traditional currency; Tesla reshaped the auto industry; Airbnb upset the status quo of hotel industry; Uber disrupted the taxi industry.

Today is a decade from the time when the first blockchain technology was created. There are many definitions of blockchain. In its core, blockchain is a public, cryptographic database, or a distributed, cryptographic ledger. A distributed ledger is a digital record of ownership that is not centrally owned, but distributed across an open network that validates the transactions to lead to consensus within the network. There is a widespread recognition by academics and

practitioners about revolutionary role of this technology, who named it as institutional technology or foundation technology. This is more foundation technology with the potential to create new foundations for global economic and social systems—than a disruptive technology, which typically “attack a traditional business model with a lower-cost solution and overtake incumbent firms quickly” (Iansiti, Lakhani, 2017).

On our mind, blockchain technology can be integrated into multiple areas. This means that specific blockchain applications may be a disruptive innovation, because substantially lower-cost solutions can be instantiated, which can disrupt existing business models. Blockchain protocols facilitate businesses to use new methods of processing digital transactions. Examples include a payment system in digital currency such as Bitcoin, Ethereum and Bitshares, crowdsales, or implementing decentralized Prediction markets.

What differentiates blockchain technology from other ledger technologies is that blockchain is an enabler for decentralization. Decentralization makes a system more robust, flexible, secure and efficient. This makes blockchain technology as an institutional technology, a potential competitor of organizations or markets (Davidson et al., 2016). The transparent nature of the technology, and the integrity and immutability of the data in a blockchain creates trust among participants. The peer-to-peer network that is used as base for the blockchain technology, and the pseudonyms that are used to secure the participants privacy on the other hand encourage people to participate in the network (Seebacher & Schüritz, 2017). Modern Information Technologies are creating network structures in which the main

mechanisms are self-organization and self-development (Molodchick et.al., 2013).

The use of platform technologies, Blockchain, in combination with fundamentally new management technologies, can fundamentally change the industry for the benefit of the consumer and the manufacturer. Platforms with blockchain – based technologies are shaking up heavy industry, global logistics, energy, financial services, FMCG market. They have the potential to transform health care, placing the patient at the center of the health care ecosystem, increasing the security and privacy of health data.

Research questions and methodology used

Our research is based on a comprehensive literature review (in the areas of business model innovation research, especially in a field of blockchain technology). By the use of existing contemporary literature reviews we attempted to apply conceptual approach to design a novel blockchain business model which can transform dentistry and to show the concrete steps of its implementation through real Dentacoin Project. There is also important gap between the academic perspective and the practical needs of entrepreneurs, who want to create and develop the novel business model. Over the past years the platform based business models have been developed in healthcare companies, but they neither developed themselves on blockchain platform, nor in dental industry. The research questions are:

(1) what business models are workable /feasible in dentistry environment?

(2) What is the concept of a new platform business model in dentistry; the conceptual mechanism of value creation and value capture for both parties (consumers and producers i.e.

dental service providers) and ecosystem as whole?

(3) What are the novel propositions, instruments, the concrete steps and the results of the concept implementation through Dentacoin Project in Dentistry? Practical aspects of the research were explored in a rapidly changing dental industry. The factual basis was the materials of an experiment conducted in the Netherlands to create a platform community Dentacoin based on blockchain platform.

Blockchain implementation in dental industry.

Dentistry is on a period of transformation

It is obvious that dentistry today is a growing, high-tech oriented industry and in a period of transformation. We should mention a few challenges and obstacles for industry's rapidly transformation.

Dental industry is global, massive and fragmented, with high-cost barrier to entry and time-consuming customer attraction and retention. In the dentistry system, interactions between different organizations or entities are not solely limited to collaboration; competition between the different actors can also exist. Consumers are becoming more astute purchasers of health care and seeking value for their spending. There are conflicts of interest between dentists and patients, because the costs of acquiring and nurturing patients are getting higher and this naturally leads to increase in the costs for end customers. Nowadays a treatment with crowns and bridges fixed on implants is not affordable for most people. Patients are forced to choose unreliable, insufficient dentures. With time, this leads to a number of health issues, problems with self-esteem and an overall low quality of life. Thus, the presence of these factors confirms that the industry in the provision of

dental services requires a reform. It is in this industry that an experiment has now begun on the formation of a new business model and its IT infrastructure.

Dentacoin Foundation is a an innovative start-up (already established and registered in Maastricht, The Netherlands on the 03.03.2017) which was founded with a mission to improve the quality of dental care worldwide, reduce treatment costs and create a global dental community, by putting power in the hands of the people. So, Dentacoin is one-of-a-kind feedback platform which uses the current state of the existing industry and introduces strategic organizational and technological value-creation solutions to specific problems. It is of great importance to have more precise appreciation of how these technological innovations can help overcome the majority of the dental industries'

major constraints, how they might be adopted by users and link with the performance through the conceptual design and implementation of a novel business model for dentistry.

The conceptual design for blockchain based model implementation

The conceptual design of the newly developed model for the dental industry focused on feedback with a new management system is presented in Fig1. The basis of the model is a self-organizing and self-developing industry management system based on the information platform blockchain, crypto-currencies and rewarding the target behavior of producers and consumers. Essentially important is a new mechanism for motivating the consumer, forming his loyal behavior to enter and actively participate in the self-organizing community.

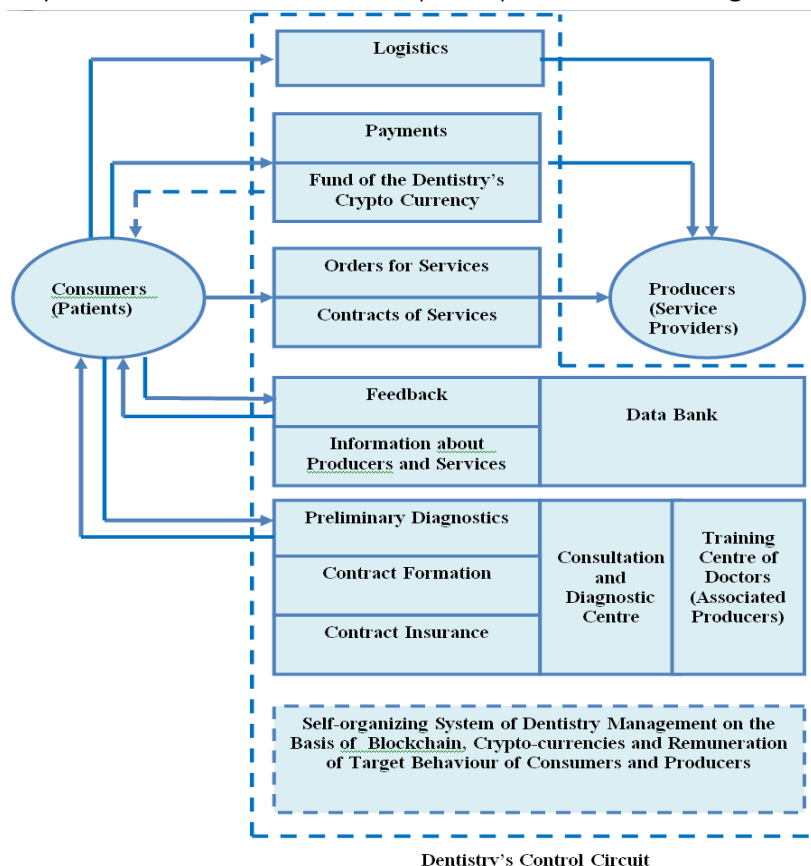


Figure 1 - Design of novel business model for dentistry
Source: author's elaboration

The concept assumes that the control circuit is removed from the subordination of the service producer and is built on the principles of self-organization of consumers actualizing their expectations in the new values. Values for consumers: 1) objective information about services and manufacturers (price, quality); 2) free diagnostics and preparation of insured contract (service selection, risk reduction); 3) logistics services (time, transportation, accommodation); 4) motivation of a loyal consumer (fair price, discounts for loyal customers, opportunity of financial participation in business and obtaining long-term benefits).

A fundamentally new basis for the realization of these values is a unified global information platform on the services of producers, which is based on objective feedback from consumers using blockchain technology. To implement the system, an independent infrastructure is formed that allows the client to undergo preliminary free diagnostics, choose the most suitable dental clinic and doctor, prepare a service contract and an insurance contract in case of possible deviations. To this end, the training, consulting and diagnostic center for the doctors of associated dental clinics is created from among highly qualified specialists. The prepared service contract is sent for agreement to the service's producer, and then signed by both parties. The proposed business model allows user to choose a dental clinic belonging to the association of service producers from another country. In this case, the client is provided with a convenient logistic scheme (transport, hotel, food, etc.), which allows optimal price and comfort to get to the right place for the period of treatment. The aggregate of services provided to the consumer and the guaranteed quality of dental treatment

make this system as attractive as possible, since it is aimed primarily at solving customer problems. In our case, the self-organizing community of patients is the best controller of the development of the industry, focused on long-term success. Active and objective participation of patients in the formation of the information platform is encouraged from the industry-specific crypto currency (also named Dentacoin, DCN) fund. By creating and implementing the first Ethereum - based blockchain platform for trusted reviews of dental treatment, the Dentacoin Foundation will allow patients to increase their voices. At the same time, dentists will have access to the latest, extremely valuable data on market research and qualified feedback from the patient - the most powerful tool for improving the quality of care and creating a local patient base. Thanks to the self-enforcing Smart Contract (the platform is already on the market), the Dentacoin reviews` platform ensures optimal autonomy, trust, speed and security.

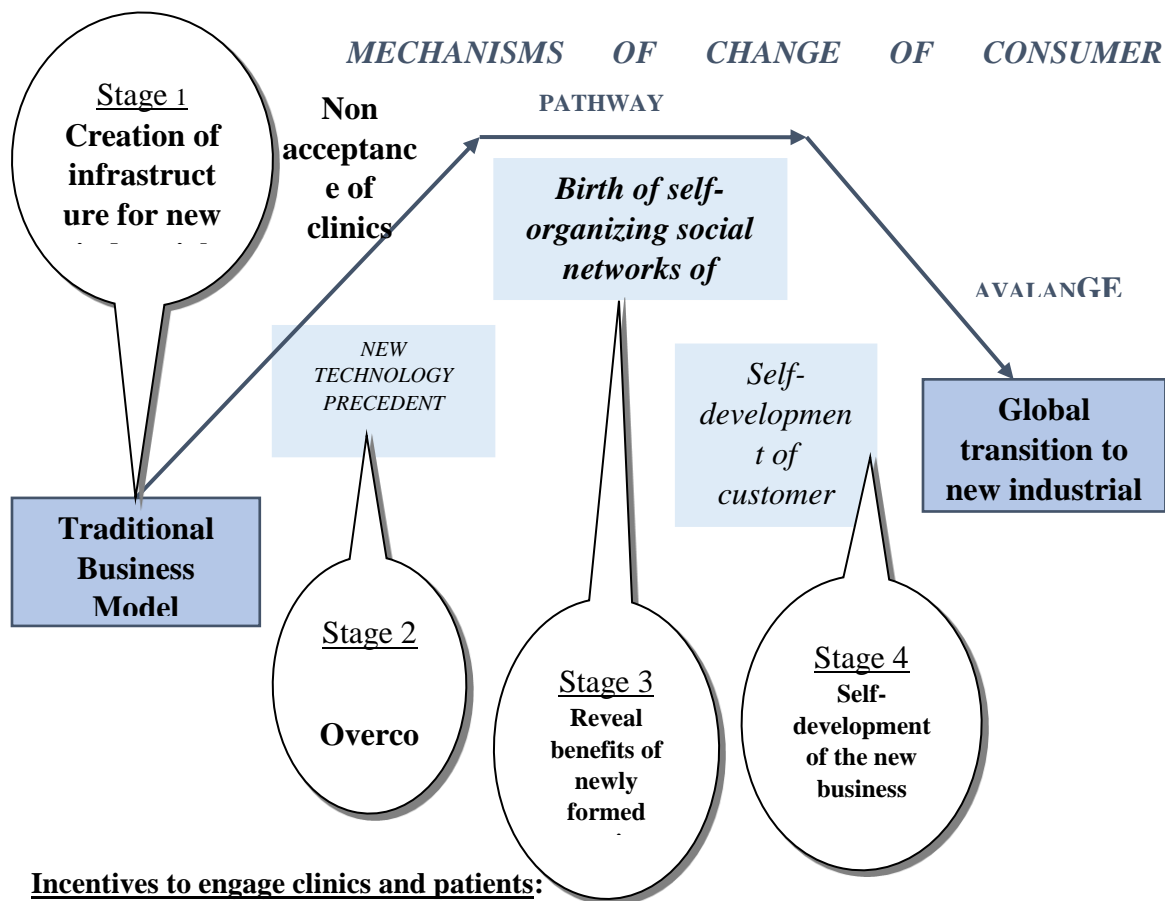
Having dealt with the mechanisms of consumer loyalty in relation to the new business model of managing the dental industry, it is natural to ask the question, what is the benefit for service providers - private practices, dental clinics and hospitals, institutions? The answer is quite simple. This is beneficial only for clinics and doctors, focused on long-term success and winning a high reputation. The new model will be selected only by bona fide companies, and do not leave chances for clinics focused on short-term "at any cost" financial success. As a reward, medical service providers, early adopters of a new industry management system will receive: 1) guaranteed order flow; 2) reduced marketing costs (Self-developed Marketing); 3) improving

the quality and development of technology based on constructive feedback and shared experience; 4) development of doctors' competence; 5) opportunity for monetary share.

There will be a community of Dentacoin, which will create the preconditions for further steps of penetration to the world market, will provide valuable results of market research. That would generate benefits for the whole dental industry by transforming the existing industry into a pro-active one.

Findings and Discussion

From the beginning of its implementation, i.e. less than one year, blockchain based model proved to be working effectively in dentistry, forming the challenge to traditional ways of doing business. In Figure 2 we present the logic way of long term Dentacoin Project with the first Blockchain concept designed for the Global Dental Industry.



- Quality service at fair price
- Inclusiveness in the management process
- Bonus and discount system
- Insurance and security
- Logistical ease
- Participation in the Dentacoin token system

Figure 2 - Stages of Dentacoin concept implementation
Source: author's elaboration

The platform supports the dental community by building and creating solutions devoted to improving the quality of dental care worldwide. Certainly there are risks and challenges, especially on the first phase on Dentacoin Project implementation. The main is to overcome mistrust within the both parties (producers and customers) who decided already or who are coming to use cryptocurrency. We mean, that cryptocurrency requires every party that does monetary transactions to adopt it, challenging governments and institutions, that have long handled and overseen such transactions. It is a high level of inertia among patients and dentists. Consumers have to change their behavior and understand how to implement the new functional capability of the cryptocurrency.

Another kind of risk is, that a tremendous degree of coordination and clarity on how smart contracts are designed, verified, implemented, and enforced will be required (Iansiti, M., Lakhani 2017). So, several rationally set regulation criteria and added value creation solutions were created, which with mechanism of self-developing determined the success rate of created business model innovation and lead to sustainability of the whole ecosystem. With a first tool (Trusted Review Platform) to give voting rights to all coin holders and being used as an united cryptocurrency for the dental industry, - DCN provides other value-creating tools: a feedback system, a dental care app, an educational website.

Nowadays there already some metrics to measure the first results of business model performance. The Trusted Review Platform for global use already functioning on the main Ethereum net as the first transparent, tamper-resistant and manipulation-protected platform

of its kind. The Dentacoin Token is already traded in many international exchange platforms. The first partner dental clinics such as: LifDental (New York), Dental on Flinders (Melbourne, Australia); Dentech Dental Care (Pure, India); Contident (Budapest, Hungary); F3T Dental Clinic (London, UK); Bredent (Germany); Swiss Dentaprim (Varna, Bulgaria) have already implemented Dentacoin as a payment method and as a basis of their Patient Loyalty Program which rewards patients for sending feedback, writing reviews, making recommendations. According to partners and from the first experiences gathered, Dentacoin is a highly beneficial tool for creating a community with the patients and for improving the service quality by aligning it with patients needs.

Conclusion

The paper deals with industry model innovation. We determined business innovation model possibilities and advantages which give blockchain technology. These possibilities of new technology can become the advantages through business model concept implementation, when they are working together with new management mechanism of value creation. On the example of Dentistry and the first step of Dentacoin project implementation we introduced the management mechanism, where a new frontier, the new system of value creation emerging, replete with fresh opportunities. We have been demonstrated, that focusing on the patient's needs is the driving engine of the Dentacoin concept. In the classical business model, there is independence between dental practices' management and patients' needs. With a platform-driven model based on blockchain

technology, the self-organizing ecosystem of customers is the utmost force shaping and driving the industry towards long-term success. In this new frontier the role of the consumer has changed from isolated to connected, from unaware to informed, from passive to active. We have also shown, that model is viable for produces and early adopters. The implementation of DNC as payment methods by digitalized world clinics proved the organizational and financial model validation.

Experience of the implementation of the Dentacoin Project going together with new management mechanisms discussed in the article are unique, both from the perspective of practice and from the development of new

approaches to the transformation of industry business models. Many industries in the near future will face with this reality. There are no ready-made recipes yet on this path. One thing is clear, only innovative approaches, using the behavioral mechanisms of people management, motivating the processes of self-organization and self-development, combined with modern IT on the basis of blockchain advantages are highly relevant to the healthcare services market and can radically change the industry for the benefit of the consumer and conscientious producer. Further validation of this model in dentistry practice is the future challenge for the applied research.

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