

Mateja
Grmača

**TEHNOLOŠKE INOVACIJE
I „DIZAJNIRANJE“
DIGITALNE BANKE**

**TECHNOLOGICAL
INNOVATIONS
AND “DESIGNING”
A DIGITAL BANK**

SAŽETAK: Bankarstvo – djelatnost koja datira još iz razdoblja antike – promijenilo je razne faze i načine obavljanja poslova novčanog prometa. Uslijed tehnološke i internetske revolucije diljem svijeta koja traje već desetljećima, sva područja društva morala su se prilagoditi suvremenim promjenama i izazovima. U suvremenom svijetu informacija dolazi u središte pozornosti te se svi procesi automatiziraju i ubrzavaju da bi se postigla veća učinkovitost i djelotvornost u gospodarstvu i svakodnevnom životu ljudi. Zahvaljujući informacijskoj tehnologiji, i financijske institucije bivaju zahvaćene modernizacijom, neophodnom da bi se mogle nositi sa zahtjevima tržišta. Bankarstvo, kao i mnoge druge grane ekonomije, prebacilo se u virtualni svijet interneta, gdje još uvijek traži načine pružanja potpune i kvalitetne usluge i proizvoda. Novi poslovni model zauvijek je promijenio način upravljanja novcem i financijama za mnoštvo ljudi, a sa sobom nosi mnoge prednosti, ali i nedostatke. Digitalne banke danas su uobičajena pojava u razvijenim državama, no trebalo je vremena da se djelatnost razvije i izgradi do sadašnjega oblika. Ovaj rad kroz teorijska istraživanja nastoji prezentirati kako se djelatnost bankarstva promijenila u suvremenom dobu i procesu

ABSTRACT: Banking – an activity which dates back to ancient times – has changed various stages and ways of conducting money transactions. Due to the technological and Internet revolution around the world that has been going on for decades, all areas of society have had to adapt to modern changes and challenges. In the modern world, information is central and all processes are automated and accelerated to achieve greater efficiency and effectiveness in economy and everyday life of people. Thanks to information technology, financial institutions are also affected by modernization, which is necessary to cope with market demands. Banking, like many other economy branches, has shifted to the virtual world of the Internet, where it is still looking for ways to provide complete and quality services and products. The new business model has forever changed the way we manage money and finances for a lot of people, and it involves numerous advantages, but disadvantages, as well. Digital banks are a common phenomenon in developed countries today, but it took some time for this business to develop to its current form. Through theoretical research, this paper seeks to present how the banking industry has changed



This work is licensed under a CC BY-NC 4.0 license
© author(s)
Ovaj je rad licenciran pod licencom CC BY-NC 4.0
© autor(i)

digitalizacije te koji se zaključci u pogledu razvoja, popularizacije i uspjeha digitalnih banaka mogu generirati iz provedenog istraživanja.

KLJUČNE RIJEČI: digitalne banke, modernizacija, digitalizacija, financijske institucije, internet, elektroničko poslovanje

UVOD

„Digitalna banka je financijska institucija koja u potpunosti posluje putem interneta.“ (joker.gg, 2023)

„Digitalne banke su još poznate kao neobanke, mobilne banke, internetske banke ili pak virtualne banke.“ (moj-bankar.hr, 2020)

Suvremeni svijet i moderno društvo obilježava uspon i razvoj tehnologije u svim područjima života. Digitalna je revolucija započela izumom interneta, kojemu su prve imale pristup državne organizacije, a zatim privatne organizacije i pojedinci koji su prepoznali potencijal i korist informatizacije. Postupno, tehnologija je postala neophodna za učinkovito funkcioniranje društva i jedan od glavnih čimbenika koji utječu na profitabilnost poduzeća i ostvarivanje uspjeha na globalnoj razini raznih organizacija (MinnaLearn, 2023).

Na financijskom tržištu, koje se temelji na novčanom posredovanju, digitalizacija se posebice rasprostranila u mnoštvu sektora od pojave digitalnog novca. Financijske su institucije najprije koristile digitalne platforme kao nadopunu fizičkim podružnicama da bi pružile bolje i brže proizvode i usluge klijentima sve do potpune digitalizacije u nekim poduzećima. Bankarstvo je, kao i ostale djelatnosti, prošlo kroz veliku promjenu u pogledu upravljanja poslovanjem i pružanja svojih proizvoda i usluga. Razvojem tehnologije, djelatnost bankarstva pojednostavljena je i unaprijeđena. Popularnost i praktičnost digitalnog novca i digitalnog plaćanja u razvijenim zemljama dovela je do smanjenja gotovinskog

in the modern age and through the process of digitization, and what conclusions regarding the development, popularization and success of digital banks can be generated from the conducted research.

KEY WORDS: digital banks, modernization, digitalization, financial institutions, Internet, electronic business

INTRODUCTION

“A digital bank is a financial institution that operates entirely online.” (joker.gg, 2023)

“Digital banks are also known as neobanks, mobile banks, internet banks or virtual banks.” (moj-bankar.hr, 2020)

The modern world and modern society are marked by the rise and development of technology in all areas of life. The digital revolution began with the invention of the Internet, which was first accessed by state organizations, and then by private organizations and individuals who recognized the potential and benefits of computerization. Gradually, technology has become indispensable for effective functioning of society and one of the main factors which influence the profitability of companies and success level of various organizations on global level (MinnaLearn, 2023).

In the financial market, which is based on money intermediation, digitalization has spread in many sectors since the advent of digital money. Financial institutions first used digital platforms as a complement to physical subsidiaries to provide better and faster products and services to customers up by full digitalization in some businesses. Banking, like other activities as well, has undergone a major change in terms of business management and the provision of their products and services. With the development of technology, the banking industry has been simplified and improved. The popularity and convenience of digital money and

plaćanja i „držanja gotovine“ pri ruci. Neke su od promjena do kojih je dovela digitalizacija načini pružanja usluga: *online* i beskontaktna plaćanja i transakcije, automatizirani procesi pružanja zajmova, vlastito upravljanje imovinom i slično (Atlantis Press, 2022).

Neki sudionici na financijskom tržištu prepoznali su prilike koje nudi tehnološki uzlet te su svoje poslovanje u potpunosti prebacili u digitalni oblik. Elektroničko poslovanje obavlja sve poslovne aktivnosti upotrebljavajući informacijsko-komunikacijske sustave, a glavna mu je platforma internet, koji osigurava najniže troškove poslovanja uz najučinkovitije obavljanje poslovnih operacija (Ris, 2013). Osim ekonomske isplativosti interneta za poduzeća, on predstavlja i modernizaciju poslovanja, koja je neophodna ako organizacije žele biti konkurentne na financijskom tržištu. Elektroničko je poslovanje u zadnjih nekoliko godina učestala i uobičajena pojava, no donedavno to nije bio slučaj. Banke su u svojem tradicionalnom obliku pružale proizvode i usluge u fizičkim poslovnicama, uz osoblje koje se brinulo o klijentima i njihovim financijama. Budući da je informatizacija stigla i u bankarstvo, mnogi su procesi tradicionalnog bankarstva uklonjeni ili barem drastično prorijeđeni zbog nedostatka potrebe (Atlantis Press 2022).

Temeljni cilj ovoga rada bio je ponajprije prikazati što su digitalne banke i koje su njihove najvažnije prednosti i nedostaci nakon analize glavnih karakteristika te koji su im čimbenici uspjeha odnosno neuspjeha. Za izradu ovog stručnog rada provedeno je istraživanje za stolom (*desk research*). Primjenjivalo se sekundarno prikupljanje podataka iz općih načela metodologije za izradu seminarskih, diplomskih i sličnih radova. Podaci korišteni i primijenjeni u ovome radu prikupljeni su iz knjiga, znanstvenih i stručnih članaka iz područja ekonomije, s internetskih stranica i iz dostupnih službenih podataka HNB-a te s drugih europskih stranica. Da bi se utvrdilo što su digitalne banke bilo je potrebno istražiti što je uzrokovalo promjene u načinu pružanja

digital payment in developed countries has led to a decrease in cash payment and “having cash” handy. Some of the changes brought about by digitalization are the ways of providing services: online and contactless payments and transactions, automated loan processes, own asset management, and the like (Atlantis Press, 2022).

Some financial market participants have recognized the opportunities offered by the technological take-off and have completely shifted their business into a digital form. Electronic business performs all business activities using information and communication systems, and its main platform is the Internet, which ensures the lowest operating costs with the most efficient performance of business operations (Ris, 2013). In addition to the economic viability of the Internet for companies, it also represents the modernization of business, which is necessary if organizations want to be competitive in the financial market. E-commerce has become a common occurrence in the last few years, but until recently this was not the case. Banks, in their traditional form, provided products and services in physical branches, with staff who took care of clients and their finances. Since computerization has also arrived in banking, many traditional banking processes have been removed or at least drastically reduced due to lack of need for them (Atlantis Press 2022).

The main goal of this paper was primarily to show what digital banks are and what their most important advantages and disadvantages are after analyzing their main characteristics, and also to present their success or failure factors. For the preparation of this professional paper, desk research was conducted. We have applied secondary data collection from the general principles of the methodology for the writing of seminar, graduate and similar papers. The data used and applied in this paper were collected from books, scientific and professional papers from the field of economics, from Croatian National Bank website and available official data and from other European websites. In order to determine what

financijskih usluga i kako su se digitalne banke razvile na tržištu. U ostalim poglavljima razrađeni su „dizajn“ digitalnih banaka, vrsta proizvoda i usluga koje nude, njihova profitabilnost u usporedbi s tradicionalnim oblikom banaka te neizostavni zakonodavni okvir i regulacija *online* banaka. Na primjeru nekoliko poznatih digitalnih banaka prikazano je kako novi modeli djeluju na tržištu i koji su izazovi s kojima su se morali sučeljavati. U posljednjem poglavlju prezentirana su zaključna razmatranja.

PROMJENE U PRUŽANJU FINANCIJSKIH USLUGA

Političke, demografske, tehnološke i gospodarske promjene uzrokovale su razne prilagodbe u bankarskom sektoru. Novčani su se tokovi globalizirali, a društvo se liberaliziralo, što je utjecalo na transformaciju u strukturi i veličini potražnje za bankarskim uslugama i proizvodima. Uslijed povoljnih ekonomskih prilika, konkurencija među bankama i drugim financijskim institucijama potaknula je tržišne sudionike na povećanje vlastite proizvodnosti, profitabilnosti i učinkovitosti da bi se nastavili nadmetati na perspektivnom tržištu i da bi korisnicima i klijentima omogućili bolje usluge.

Suvremenim klijentima u interesu je uštedjeti što više vremena i sredstava pri korištenju financijskih usluga. Digitalizacija je u tom smislu nastupila kao optimalno rješenje. Zbog razvoja i širenja elektroničkog poslovanja došlo je do prilagodbe u zapošljavanju u bankarskom sektoru. Osim osjetnog nedostatka osoblja u bankarstvu se primjećuje sve veća potreba za zaposlenicima koji su informatički pismeni i u skladu sa suvremenim potrebama i problemima. Novi način poslovanja uzrokuje povlačenje zaposlenika srednje i zrelije dobi zbog nesnalazjenja u novim uvjetima poslovanja i zahtjevnog dinamičnog društva (Rončević, 2006, str. 753-777).

Digitalni oblik poslovanja sa sobom nosi određene prednosti, koje se ogledaju u sljedećem:

digital banks are, it was necessary to investigate what caused the changes in the way financial services are provided and how digital banks have developed in the market. Other chapters elaborate on the “design” of digital banks, the types of products and services they offer, their profitability compared to the traditional form of banks, and the undisputable online bank legislative framework and regulations. The examples of several well-known digital banks show how the new models operate in the market and what challenges they had to face. In the last chapter, concluding considerations are presented.

CHANGES IN THE PROVISION OF FINANCIAL SERVICES

Political, demographic, technological and economic changes have caused various adjustments in the banking sector. Cash flows have been globalized and society has been liberalized, which has influenced the transformation of the structure and magnitude of demand for banking services and products. Due to favourable economic conditions, competition among banks and other financial institutions has encouraged market participants to increase their own productivity, profitability and efficiency in order to continue to compete in a promising market and to provide better services to customers and clients.

It is in the interest of modern clients to save as much time and resources as possible when using financial services. Digitalization has emerged as the optimal solution in this regard. Due to the development and expansion of electronic business, there have been adjustments in employment in the banking sector. In addition to the significant lack of staff in banking, there is a growing need for employees who are computer literate and keep up with contemporary needs and problems. The new way of doing business causes the withdrawal of middle-aged and mature employees due to their difficulties coping with the new business circumstances and a demanding dynamic society (Rončević, 2006, p. 753-777).

1. Došlo je do optimizacije tijeka rada. Dokumenti su se nekoć fizički prikupljali i pohranjivali, za njih je bilo potrebno izdvojiti mnogo prostora u poslovnica i kadrova koje će voditi evidenciju o spisima i dokumentima. Od digitalizacije, dokumenti se pohranjuju na računalima, na sigurnom poslužitelju kojemu ima pristup cijela organizacija.
2. Banke se više orijentiraju na kupce. Potrebno je sagledati kako klijenti i kupci vide banku kao cjelinu te optimizirati procese i strukture prema njihovim potrebama.
3. Promatranje ponašanja klijenata pogoduje bankama ako žele zadržati postojeće klijente i privući nove. Putem društvenih mreža i drugih kanala banke mogu provesti istraživanja u vezi ponašanja kupaca i njihove potrošnje.
4. Višekanalni proizvodi i digitalno bankarstvo preispituju postojeće tradicionalne strukture banaka. Klijenti očekuju jedinstveno iskustvo u svim kanalima interakcije s bankom, što ih čini manje izoliranim i pojednostavljuje njihovo iskustvo u svim kanalima isporuke.
5. Poboljšana komunikacija s klijentima u stvarnom vremenu ogleda se u dostupnoj korisničkoj službi 0-24 na raznim platformama umjesto dogovorenog sastanka s bankarskim službenicima (Singh, 2015).

RAZVOJ DIGITALNIH BANAKA

U posljednjih dvadesetak godina na tržištu financija pojavili su se prvi oblici digitalnih banaka. U njima se posluje djelomice ili u potpunosti *online*, a pružaju većinu ili sve bankarske usluge koje nude tradicionalne banke. Digitalne banke mogu biti dio postojeće „fizičke“ banke koja ima mogućnost i virtualnog pružanja usluga ili mogu poslovati isključivo elektronički. Najpopularnije banke koje posluju u Hrvatskoj, poput PBZ banke, Erste banke, Zagrebačke banke i drugih, već dugi niz godina korisnicima nude digitalne aplikacije *online* bankarstva, koje su se pokazale uspješnima,

The digital form of business brings with it certain advantages, which are reflected in the following:

1. There has been workflow optimization. Documents were once physically collected and stored, and required a lot of space in branches and staff who will keep records of files and documents. Since digitization, documents have been stored on computers, on a secure server that the entire organization has access to.
2. Banks are more customer-oriented. It is necessary to look at how clients and customers see the bank as a whole and optimize processes and structures according to their needs.
3. Observing customer behavior benefits banks if they want to retain existing customers and attract new ones. Through social networks and other channels, banks can conduct research regarding customer behavior and consumption.
4. Multichannel products and digital banking are rethinking existing traditional bank structures. Customers expect a unique experience across all channels of interaction with the bank, making them less isolated and simplifying their experience across all delivery channels.
5. Improved communication with customers in real time is reflected in the available 24/7 customer service on various platforms instead of an agreed meeting with banking officers (Singh, 2015).

DEVELOPMENT OF DIGITAL BANKS

In the last twenty years, the first forms of digital banks have appeared in the financial market. They operate partially or fully online and provide most or all of the banking services offered by traditional banks. Digital banks can be part of an existing “physical” bank that also has the ability to provide services virtually or can operate exclusively electronically. The most popular banks operating in Croatia, such as PBZ Bank, Erste Bank, Zagrebačka Banka and others, have been

no to ne znači da tim bankama u skorije vrijeme slijedi potpuna digitalizacija i djelovanje isključivo virtualnim putem. Neobanke, s druge strane, predstavljaju najsuvremeniji oblik bankarstva, koji posluje isključivo *online*, bez fizičkih poslovnica. Pojavile su se na tržištu prije nekoliko godina te predstavljaju najpoznatiji segment nove, inovativne *fintech* industrije. Najbitnije karakteristike digitalnih banaka jesu automatizirani procesi bez čekanja u redovima, dostupnost, manji operativni troškovi, osobno upravljanje financijama, orijentacija na mladu populaciju i nedostatak fizičkih poslovnica (InSolve, 2022).

„DIZAJN“ DIGITALNE BANKE

Tradicionalne banke decentralizirane su kroz široku mrežu poslovnica koje nude klasične, standardizirane bankarske proizvode i usluge. U tim poslovnicama bankarski službenici obavljaju bankarsku djelatnost za klijente koji su primorani izdvojiti svoje slobodno vrijeme i sredstva za dolazak u banku da bi dobili traženu uslugu. Kada su digitalne banke u pitanju, u središtu se nalazi mobilna aplikacija koju korisnici instaliraju na svoje mobilne ili slične uređaje, na kojima dobiju cjelokupno bankarsko iskustvo u bilo koje vrijeme u koje im je ono potrebno. Pri preuzimanju aplikacije korisnici moraju proći kroz određene sigurnosne mjere i uspostavu računa, no jednom kada je digitalni račun otvoren, korisnik sam upravlja svojim financijama.

Pri programiranju digitalne banke trebalo bi se usredotočiti na izgradnju procesa i struktura koje će osigurati optimalnu podršku i kvalitetno korisničko iskustvo, no osim kao skup *bitova* i *byteova* digitalne se banke može promatrati kao nekoliko digitalnih poslovanja u jednome. One su proizvođači proizvoda, u smislu da su skup aplikacija koje korisnici rabe prema vlastitim potrebama. Procesor su transakcija, odnosno posrednik između više subjekata, i trgovac usluga u virtualnom svijetu u kojemu je komunikacija personalizirana.

offering users digital online banking applications for many years, which have proven to be successful, but this does not mean that these banks are going to transfer their business to full digitization and operation exclusively by virtual means any time soon. Neobanks, on the other hand, represent the most modern form of banking, which operates exclusively online, without physical branches. They appeared on the market a few years ago and represent the most famous segment of the new, innovative fintech industry. The most important characteristics of digital banks are automated processes without queuing, availability, lower operating costs, personal financial management, orientation to the younger population and lack of physical branches (InSolve, 2022).

“DESIGN” OF THE DIGITAL BANK

Traditional banks are decentralized through a wide network of branches offering classic, standardized banking products and services. In these branches, banking officers perform banking activities for clients who are forced to allocate their free time and resources to come to the bank to receive the requested service. When it comes to digital banks, there is a mobile application that users install on their mobile phone or similar devices, where they get the entire banking experience at any time they need it. When downloading the app, users must go through certain security measures and establish an account, but once the digital account is open, the user manages their own finances.

When programming a digital bank, the focus should be on creating processes and structures that will ensure optimal support and a quality customer experience, but apart from being a set of bits and bytes, a digital bank can be seen as several digital businesses in one. They are product manufacturers, in the sense that they are a set of applications that users use according to their own needs. A processor is a transaction, i.e. an intermediary between multiple entities,

Od pojave *online* banaka, broj fizičkih podružnica drastično se smanjio. Osim digitalizacije, i financijska je kriza 2008. dala svoj doprinos smanjenju obujma tradicionalnog oblika bankarstva te je utjecala na način korištenja usluga banaka i potrebu za inovacijama. Za vrijeme krize zatvoreno je više od 20 000 podružnica diljem Europe, a najveći rezovi dogodili su se u Španjolskoj, Francuskoj i Velikoj Britaniji. Svakako se u prilog digitalnim bankama može uvrstiti i primjer PNC banke, koja uštedi 3,88 američkih dolara po transakciji svaki put kad korisnik položi ček fotografiranjem na mobilnom telefonu, umjesto odlaskom na šalter u poslovnicu banke. Mobilno je bankarstvo u Europi najviše zaživjelo u skandinavskim zemljama i u Nizozemskoj, gdje ga koristi više od 80 % stanovništva, a ponajmanje u balkanskim zemljama poput Bugarske, Rumunjske, Bosne i Hercegovine, Crne Gore i Sjeverne Makedonije. Unatoč drastičnom smanjenju potrebe za odlaskom u poslovnice, čak i najmoderniji i najaktivniji klijenti preferiraju imati opciju odlaska u banku i razgovora uživo za složenija financijska i imovinska pitanja (Skinner, 2013, str. 35-44).

PROIZVODI I USLUGE DIGITALNIH BANAKA

Digitalne bankarske usluge i proizvodi ne razlikuju se mnogo od tradicionalnih po svojoj svrsi, više po načinu izvođenja. Glavna je razlika digitalnog bankarstva u odnosu na tradicionalno odsutnost fizičke prisutnosti i sveprisutnost usluga *online*. Ovisno o odluci regulatora o dozvoli za rad digitalne banke, ona može ponuditi ili širok spektar bankarskih i drugih financijskih posredničkih usluga i proizvoda ili nešto skromniji skup osnovnih transakcijskih usluga banke. U usluge koje nisu toliko česte i karakteristične za tradicionalni model ubrajamo mogućnost „instant“ plaćanja, plaćanja QR kodom putem mobilnih uređaja, trgovanje kriptovalutama i drugim obveznicama, vlastito upravljanje imovinom te partnerstva s drugim kompanijama koje putem digitalne banke nude

and a service trader in a virtual world in which communication is personalized.

Since the advent of online banks, the number of physical branches has drastically decreased. In addition to digitalization, the financial crisis of 2008 also contributed to the reduction of the volume of traditional banking forms and influenced the way banks use their services and the need for innovation. More than 20,000 branches across Europe were closed during the crisis, with the largest cuts occurring in Spain, France and the UK. Certainly, an example of a PNC bank can be to the advantage of digital banks, which saves US \$3.88 per transaction every time a customer deposits a check by taking a photo on a mobile phone, instead of going to the counter at the bank's branch. Mobile banking in Europe is most alive in the Scandinavian countries and in the Netherlands, where it is used by more than 80% of the population, and least in Balkan countries such as Bulgaria, Romania, Bosnia and Herzegovina, Montenegro and North Macedonia. Despite the drastic reduction in the need to go to branches, even the most modern and active clients prefer to have the option of going to the bank and talking in person for more complex financial and property issues (Skinner, 2013, p. 35-44).

DIGITAL BANK PRODUCTS AND SERVICES

Digital banking services and products do not differ much from traditional ones in their purpose, more in the way they are performed. The main difference between digital and traditional banking is the absence of physical presence and the ubiquity of online services. Depending on the regulator's decision on the digital bank license, it can offer either a wide range of banking and other financial intermediation services and products or a somewhat less versatile set of basic bank transaction services. Services that are not so common and characteristic of the traditional model include the possibility of “instant” payments, QR code payments via mobile

svoje usluge i pogodnosti. Pristup *online* bankarskim uslugama najčešće je besplatan, a naknadu najčešće zahtijevaju u kategoriji investiranja. Jedna je od prednosti ovog poslovnog modela poslovanje izvan granica države ili kontinenta, gdje, ovisno o području, nude specijalizirane usluge za različite industrije. Kod neobanaka karakterističan je fokus na jedan specifičan proizvod kojim se ističu od drugih banaka, a često zbog nedostatka kapaciteta bivaju primorane sklapati partnerstva s drugim kompanijama da bi poboljšale asortiman usluga (Anđelić & Jakica, 2023, str. 127-133).

REGULACIJA DIGITALNIH BANAKA

Digitalno je bankarstvo još uvijek novi pojam u očima regulatornih tijela te se u tom smislu pokušava pronaći ravnoteža između zaštite interesa klijenata i podržavanja inovacija. Nadležne institucije imaju dosadašnja iskustva iz područja financija i bankarstva, koja im služe za izradu zakonodavnog okvira za suvremeno digitalno bankarstvo pa većina jurisdikcija na digitalne banke i *fintech* primjenjuje postojeće pravne norme i standarde. Regulatori su novim sudionicima na tržištu dodjeljivali nekoliko licenci odjedanput, što je bankama poput WeBank, MyBank i KakaoBank omogućilo stjecanje mnoštva klijenata. Mnoge su virtualne banke iskoristile svoje temeljne karakteristike da bi uspostavile svoju „nišu“, odnosno čimbenik kojim se diferenciraju na tržištu (McKinsey & Company, 2021).

Postoje dva modela za dobivanje bankarske licence. Prvi je tradicionalni model, popularan u SAD-u i mnogim europskim zemljama. *Online* banke započinju s radom nakon dobivanja alternativnih licenci za elektronička plaćanja ili elektronički novčanik, a nakon što razviju svoju djelatnost traže licence za ostale bankarske usluge. Odličan primjer je Revolut, koji je započeo s licencom za e-plaćanja dok nije stekao bankarsku licencu Litve, s kojom posluje kao

devices, trading in cryptocurrencies and other bonds, own asset management and partnerships with other companies that offer their services and benefits through a digital bank. Access to online banking services is usually free, and the fee is most often requested in the investment category. One of the advantages of this business model is operation outside the borders of a country or continent, where, depending on the area, they offer specialized services for different industries. In the case of neobanks, there is a characteristic focus on one specific product that distinguishes them from other banks, and often due to a lack of capacity, they are forced to enter into partnerships with other companies in order to improve their assortment of services (Anđelić & Jakica, 2023, p. 127-133).

REGULATION OF DIGITAL BANKS

Digital banking is still a new concept in the eyes of regulators, and in this regard, a balance is being sought between protecting the interests of customers and supporting innovation. Competent institutions possess previous experience in the field of finance and banking, which serves them to develop a legislative framework for modern digital banking, so most jurisdictions apply existing legal norms and standards to digital banks and fintech. Regulators were awarding several licenses to new entrants at once, allowing banks such as WeBank, MyBank and KakaoBank to acquire a multitude of customers. Many virtual banks have used their core features to establish their “niche”, that is, the factor which differentiates them in the market (McKinsey & Company, 2021).

There are two models for obtaining a banking license. The first is a traditional model, popular in the US and many European countries. Online banks start operating after obtaining alternative licenses for digital payments or digital wallets, and once they develop their business, they seek licenses for other banking services. A great example is Revolut, which started with an e-payment license

banka na području Europske unije. Drugi model je posebna licenca za digitalno bankarstvo, popularna u azijskim državama. Podrazumijeva digitalnu licencu u kojoj su navedeni svi uvjeti koji određuju koji su proizvodi i usluge dopušteni, koje segmente digitalnih banaka treba ciljati te ostali dopušteni i nedopušteni čimbenici. Ono što je prednost posebnih licenci jest otvaranje tržišta novim potencijalnim igračima u područjima u kojima ih tradicionalni model ograničava. Tehnološke kompanije često kupuju manje tradicionalne banke i pretvaraju ih u digitalne ili im dodaju neke dodatne bankarske proizvode. Kada regulatorna tijela najave izdavanje licenci, zainteresirani su dužni podnijeti svoje zahtjeve u roku koji odredi zakonodavac. Nakon isteka roka, odbor za licenciranje pregledava prijave na temelju zadanih kriterija te odlučuje o podnesenim zahtjevima. Kandidatima je omogućeno razdoblje u kojem započinju s izgradnjom svoje banke, a sveprisutan je nadzor središnje banke u početnom razdoblju i nakon osnivanja.

Postoje određeni čimbenici koji utječu na dozvolu za sudjelovanje na bankarskom tržištu na koje regulatori moraju obratiti pozornost, a neki su od njih uvjeti koji se odnose na vlasništvo i strukturu dionica, poslovni plan, upravljanje rizikom, ciljeve proizvoda, minimalne razine uplaćenog kapitala, dovoljan pristup likvidnosti, prisutnost fizičkih lokacija i bankomata, izlazne planove, primjenu KYC standarda (provjeravanje identiteta korisnika da bi se spriječilo pranje novca, koje se prilagođava od regulatora do regulatora) i druge sigurnosne provjere (McKinsey & Company, 2021).

Jedna je od bitnih stavki kod regulacije digitalnih banaka sigurnost. Unatoč svim prednostima koje suvremeno bankarstvo nudi, većoj dostupnosti, jednostavnosti i korisničkom iskustvu na višoj razini, nadležna su tijela dužna pobrinuti se da modernizacija ne dođe na štetu stabilnosti i sigurnosti cijelog financijskog tržišta. Razvoj tehnologije, osim prednosti, sa sobom nosi i rapidan razvoj kibernetičkog kriminala, a posljedice financijskog kriminala uvelike utječu na digitalne

until it obtained a banking license from Lithuania, with which it operates as a bank in the territory of the European Union. The second model is a special license for digital banking, popular in Asian countries. It implies a digital license that lists all the conditions that determine which products and services are allowed, which segments of digital banks should be targeted, and other permissible and impermissible factors. An advantage of special licenses is that it opens the market to new potential players in areas where the traditional model limits them. Technology companies often buy smaller traditional banks and turn them into digital or add some additional banking products to them. When the regulatory authorities announce the issuance of licences, the interested parties are obliged to submit their applications within the deadline set by the legislator. After the deadline, the Licensing Board reviews applications based on the given criteria and decides on the submitted applications. Candidates are allowed a period to start building their bank, and the supervision of the central bank is ubiquitous in the initial period and after its establishment.

There are certain factors that affect the license to participate in the banking market that regulators need to pay attention to, some of them are the conditions related to the ownership and structure of shares, the business plan, risk management, product objectives, minimum levels of paid-in capital, sufficient access to liquidity, the presence of physical locations and ATMs, exit plans, the application of the KYC standard (verifying the identity of users to prevent money laundering, which is being adjusted depending on the individual regulator) and other security checks (McKinsey & Company, 2021).

One of the important items in the regulation of digital banks is security. Despite all the advantages that modern banking offers, greater availability, simplicity and user experience at a higher level, the competent authorities are obliged to ensure that modernization does not come at the expense of the stability and security of the entire financial market. The development of technology, in addition

banke, koje kao novi sudionici na tržištu pokušavaju zadobiti povjerenje i regulatora i tržišta i korisnika. Posljedice se ogledaju na više načina. Najvažniji teret jest onaj financijski, koji se odnosi na gubitke koji proizlaze iz lažnih aktivnosti, povrata plaćanja, kaznenih mjera i pravnih troškova. Šteta za ugled podrazumijeva potkopavanje integriteta *branda* tvrtke, negativnu medijska pozornost i neodobranje regulatora. Posljednja znatna posljedica jesu pravni izazovi, koji uključuju nepridržavanje utvrđenih propisa i direktiva protiv pranja novca i drugih sigurnosnih standarda.

Inovativne neobanke nose se s problemom učestalih internetskih prijevara i krađa identiteta koje narušavaju ugled kompanije te su stoga primorane poduzeti sve sigurnosne mjere kojima će umanjiti ili spriječiti potencijalne skandale, račune klijenata, narušeno povjerenje i imidž tvrtke. Kada je u pitanju registracija korisnika, usvojeni kriteriji za identifikaciju variraju od banke do banke. Na primjer, Revolut ne zahtijeva visoku razinu provjere identiteta pri registraciji računa, dok sve digitalne banke registrirane u Njemačkoj zahtijevaju detaljnu provjeru identiteta korisnika prije otvaranja računa sukladno Zakonu o sprječavanju pranja novca, koji je 2018. revidiran u sklopu direktive Europske unije o sprječavanju pranja novca. Njemački financijski regulator BaFin (Bundesanstalt für Finanzdienstleistungsaufsicht) određuje standarde videoidentifikacije prema kojima se ti procesi moraju provoditi. Kada je identifikacija neophodna za otvaranje digitalnog računa, agenti koji je provode najčešće predstavljaju jedini kontakt uživo s klijentima, iz vanjske *outsourcing* kompanije specijalizirane za to područje (InvestGlass, 2023).

Sigurnost i N26

N26, prva mobilna banka kojoj je BaFin dodijelio potpunu njemačku bankarsku licencu, osnovana je 2013. godine, a kao financijska institucija započela je poslovati 2015. godine. Osim dobivanja bankarske licence, postignut je golem uspjeh banke, ne samo u Njemačkoj nego i globalno. U 2018. godini N26 dosegao je dva milijuna korisnika u 24 zemlje,

to its advantages, also brings with it the rapid development of cybercrime, and the consequences of financial crime greatly affect digital banks, which, being new market participants, are trying to gain the trust of both regulators and markets and users. The consequences are reflected in several ways. The most important burden is the financial one, which refers to losses arising from fraudulent activities, payment refunds, penalty measures and legal costs. Damage to reputation implies undermining the integrity of the company's brand, negative media attention and regulators' disapproval. The last significant consequence is legal challenges, which include non-compliance with established anti-money laundering regulations and directives and other security standards.

Innovative neobanks deal with the problem of frequent online fraud and identity theft that damage the company's reputation and are therefore forced to take all security measures to reduce or prevent potential scandals, customer accounts, damaged trust and company image. When it comes to customer registration, the identification criteria adopted vary from one bank to another. For example, Revolut does not require a high level of identity verification when registering an account, while all digital banks registered in Germany require detailed user identity verification before opening an account, in accordance with the Anti-Money Laundering Act, which was revised in 2018 as part of the European Union Anti-Money Laundering Directive. The German financial regulator BaFin (Bundesanstalt für Finanzdienstleistungsaufsicht) determines the video-identification standards according to which these processes must be carried out. When identification is necessary to open a digital account, the agents who carry it out most often represent the only live contact with clients, working from an external outsourcing company specialized in that field (InvestGlass, 2023).

Safety and N26

N26, the first mobile bank to be granted a full German banking license by BaFin, was established

a prema LinkedInu su *startup* broj 1 za rad u Njemačkoj. Osim toga, Forbes ih 2021. proglašava najboljom bankom svijeta te u Njemačkoj postaju najcjenjenija *fintech* kompanija s financiranjem u seriji E od 900+ milijuna dolara i procjenom od 9+ milijardi dolara. Unatoč velikom uspjehu postignutom u relativno kratkom razdoblju (N26, 2024), banka N26 morala se suočiti i sa sigurnosnim propustima, koji su izazvali novčane kazne, loš imidž i pojačani nadzor regulatora. Posljednjih nekoliko godina uočen je povećani kibernetički kriminal pri registraciji i identifikaciji korisnika koji pokušavaju otvoriti digitalni račun, a koji je posljedično rezultirao pranjem novca. Za navedene prekršaje BaFin je novčano kaznio N26 s 4,25 milijuna eura, a svakako im nije išlo u korist kašnjenje s podnošenjem prijave za pedesetak sumnjivih aktivnosti u razdoblju od 2019. do 2020. godine. Takav ugled tjera potencijalne klijente na preispitivanje sigurnosti elektroničkog poslovanja i digitalnog bankarstva, jer je novac ipak najemocijalnije pitanje na svijetu. U cilju popravljivanja javne slike, banka N26 počela je znatno ozbiljnije shvaćati propise i standarde vezane za sigurnost i sprječavanje pranja novca te je uvela izrazito visoke sigurnosne metode za svakog pojedinca koji pokušava otvoriti *online* račun. Regulator BaFin kontinuirano obavlja nadzor nad poslovanjem N26. Kibernetički se kriminal u njihovom slučaju zasigurno smanjio, što je prouzrokovalo isključivanje popriličnog broja ljudi iz korištenja usluga banke (InvestGlass, 2023; Best Money Transfer, 2024).

PROFITABILNOST DIGITALNIH BANAKA

Učinkovitost banaka najčešće se procjenjuje *ex post* zbog složenosti određivanja profitabilnosti i financijskih učinaka. Razlozi za to uključuju zahtjevnost odvajanja resursa od njihove upotrebe, nemogućnost utvrđivanja profitabilnosti u kratkom roku zbog neizvjesnosti prijevremenih otplata kredita, parnica i nenadanih situacija, jaka regulacija nekih proizvoda i lakoća kopiranja određenih

in 2013 and started operating as a financial institution in 2015. In addition to obtaining a banking license, the bank has achieved tremendous success, not only in Germany but also globally. In 2018, N26 reached two million users in 24 countries, and according to LinkedIn, they are the number 1 startup in Germany. In addition, Forbes declared them the best bank in the world in 2021 and in Germany they became the most valued fintech company, financing in the E series of \$900+ million and an estimate of \$9+ billion. Despite the great success achieved in a relatively short period (N26, 2024), N26 also had to face security failures, which caused fines, poor image and increased supervision of regulators. In the last few years, increased cybercrime has been observed when registering and identifying users trying to open a digital account, which has consequently resulted in money laundering. For these violations, BaFin fined N26 4.25 million euros, and they certainly did not benefit from the delay in filing reports for about fifty suspicious activities in the period from 2019 to 2020. Such reputation makes potential clients question the security of e-commerce and digital banking, because money is still the most emotional issue in the world. In order to improve the public image, N26 Bank has begun to take regulations and standards related to security and prevention of money laundering much more seriously and has introduced extremely high security methods for every individual trying to open an online account. The BaFin regulator continuously supervises the operations of N26. Cybercrime has certainly decreased in their case, which caused a significant number of people to be excluded from using the bank's services (InvestGlass, 2023; Best Money Transfer, 2024).

PROFITABILITY OF DIGITAL BANKS

The efficiency of banks is most often assessed *ex post* due to the complexity of determining profitability and financial impacts. The reasons for this include the difficulty of distinguishing resources from their use, the inability to determine profitability in

inovacija u bankarstvu koje se ne mogu patentirati. Povrat na imovinu i povrat na kapital kao glavni računovodstveni čimbenici nisu toliko bitni kada su u pitanju internetske banke, jer je neto prihod u početnim razdobljima, dok je djelatnost u ranoj fazi, često negativan (Sahut, 2011, str. 7).

Raniji rezultati pokazali su da digitalne banke ostvaruju nižu dobit od tradicionalnih banaka zbog poteškoća u otvaranju depozitnih računa i većih beskamatnih troškova. Neminovno je da su fiksni troškovi znatno niži kod digitalizacije bankarstva, što svakako ide u prilog suvremenom pristupu, no u početku se internet koristio više kao komplementarni kanal nego kao potpuna zamjena za banke u fizičkom obliku (DeYoung, 2005). Elektronička plaćanja u posljednjih su se nekoliko godina pokazala kao preferirani oblik plaćanja. Samo u Hrvatskoj obavljeno je više od 130 milijuna elektroničkih uplata, a njihov konstantan rast vidljiv je i na razini Europske unije: u 2017. godini 184,2 bilijuna eura, a u 2021. – 240 bilijuna eura. Digitalizacija bankarstva nedvojbeno dugoročno vodi većoj učinkovitosti poslovanja banaka, no zahtijeva velika ulaganja i dulje vremensko razdoblje pozitivnih rezultata u profitabilnosti. Jedan od glavnih motiva digitalizacije u doba velike konkurencije jest zadržavanje postojećih i akvizicija novih klijenata uz povećanje prihoda i smanjenje troškova (Ožvald, 2023).

Tri najuspješnije banke po dobiti u 2023. godini u Hrvatskoj komercijalne su banke s tradicionalnom strukturom: Zagrebačka banka, Privredna banka Zagreb i Erste&Steiermärkische Bank (Forbes, 2024). Gotovo 70 % klijenata Zagrebačke banke koristi digitalne usluge, a više od 95 % transakcija provodi se putem digitalnih kanala. Privredna banka Zagreb uvela je responzivnu internetsku aplikaciju i aplikaciju za pametne satove koje korisnicima pružaju osnovne bankarske funkcije, što je velik iskorak na hrvatskom tržištu u pogledu osuvremenjivanja bankarstva (Ožvald, 2023, str. 75-78).

Unatoč rastu popularnosti i stjecanju velikog broja novih korisnika, statistike kažu da je profitabilnost

the short term due to the uncertainty of early loan repayments, litigation and unexpected events, the strong regulation of some products and the ease of copying certain non-patentable innovations in banking. Return on assets and return on equity as the main accounting factors are not so important when it comes to online banks, because the net income in the initial periods, while the activity is still in the early stage, is often negative (Sahut, 2011, p. 7).

Earlier results showed that digital banks generate lower profits than traditional banks due to difficulties in opening deposit accounts and higher interest-free costs. It is inevitable that fixed costs are much lower in the digitalization of banking, which certainly supports the modern approach, but initially the Internet was used more as a complementary channel than as a complete replacement for banks in physical form (DeYoung, 2005). Digital payments have proven to be the preferred form of payment in recent years. In Croatia alone, more than 130 million digital payments were made, and their constant growth is also visible at the European Union level: in 2017, EUR 184.2 trillion, and in 2021 – EUR 240 trillion. The digitalization of banking undoubtedly leads to greater efficiency of banks' operations in the long run, but it requires large investments and a longer period of time of positive results in profitability. One of the main motives of digitalization in times of high competition is the retention of the existing and acquisition of new clients, while increasing revenues and reducing costs (Ožvald, 2023).

The three most successful banks in terms of profit in 2023 in Croatia are commercial banks with a traditional structure: Zagrebačka banka, Privredna banka Zagreb and Erste&Steiermärkische Bank (Forbes, 2024). Almost 70% of Zagrebačka banka's clients use digital services, and more than 95% of transactions are carried out through digital channels. Privredna banka Zagreb has introduced a responsive web application and smartwatch application that provide users with basic banking functions, which is a major step forward in the

za većinu virtualnih banaka nedostižna. Samo 5 % od 400 svjetskih virtualnih banaka ostvaruje profit (InvestGlass, 2023). Otvaranje *online* računa besplatno ili s niskim naknadama podrazumijeva i niske marže, što ne ide u prilog profitabilnosti u doba visoke inflacije i visokih kamatnih stopa. Za digitalne se banke smanjilo i financiranje rizičnog kapitala, a i regulatorna kontrola stvara veći pritisak na virtualne banke da pokažu održivi poslovni model.

Većina profitabilnih digitalnih banaka, njih 60 %, nalazi se u Aziji – Japanu, Kini, Južnoj Koreji i Indoneziji. Podlogu za njihov uspjeh čini prisutnost velikih tehnoloških tvrtki, koje imaju uspostavljene digitalne kapacitete i opsežnu bazu korisnika. Te su tvrtke Akulaku, Gojek, Grab i Sea Group, koje preuzimaju postojeće banke i pretvaraju ih u digitalne (Kumar i Singh, 2023). Banka WeLab, sa sjedištem u Hong Kongu, preselila se na indonezijsko tržište i udružila s konglomeratom Astra, s kojim je pokrenula *brand* Bank Saqu, koji je u samo nekoliko mjeseci prikupio pola milijuna korisnika. Banka Trust, na primjer, sklopila je partnerstvo s vodećim trgovačkim lancima u Singapuru prilikom lansiranja na tržište, čime je potaknula klijente trgovina na korištenje njezinih bankarskih usluga. Ta je suradnja pomogla banci prikupiti više od 100 tisuća korisnika u manje od dva tjedna, u Singapuru, koji je poznat kao tržište zasićeno digitalnim bankama. Osim toga, poznato je da su *online* banke popularnije među mlađom populacijom, a banka Trust tim je partnerstvom uspjela privući više od 30 % korisnika starijih od 55 godina (Amdocs, 2024). Postoje i banke u Indiji koje posluju s posebnim licencama, djeluju kao banke za plaćanje te putem diverzificiranog skupa tokova prihoda postižu profitabilnost.

Europske su profitabilne digitalne banke Starling Bank, OakNorth Bank, Zopa i oдавно Revolut. Kreditiranje malih i srednjih poduzeća u središtu je profitabilnosti banke OakNorth, a kreditnu sposobnost procjenjuju putem programa za obradu podataka. Revolut svoju učinkovitost temelji na strategiji financijske „super aplikacije“ i različitih

Croatian market in terms of modernising banking (Ožvald, 2023, p. 75-78).

Despite the growth in popularity and the acquisition of a large number of new users, statistics say that profitability is unattainable for most virtual banks. Only 5% of the world’s 400 virtual banks are making a profit (InvestGlass, 2023). Opening an online account for free or with low fees also implies low margins, which does not favor profitability in times of high inflation and high interest rates. For digital banks, venture capital financing has also decreased, and regulatory control is putting more pressure on virtual banks, forcing them to demonstrate a sustainable business model.

The majority of profitable digital banks, 60% of them, are located in Asia – Japan, China, South Korea and Indonesia. The basis for their success is the presence of large technology companies, which have established digital capacities and an extensive user base. These companies are Akulaku, Gojek, Grab and Sea Group, which take over the existing banks and convert them into digital ones (Kumar and Singh, 2023). Hong Kong-based WeLab Bank has moved to the Indonesian market and partnered with Astra, with which it launched the Bank Saqu brand, which has amassed half a million users in just a few months. The Trust Bank, for example, partnered with leading retailers in Singapore at market launch, encouraging merchant customers to use their banking services. This collaboration helped the bank gather more than 100,000 users in less than two weeks, in Singapore, which is known as a market saturated with digital banks. In addition, online banks are known to be more popular among the younger population, and Trust Bank managed to attract more than 30% of users over the age of 55 through this partnership (Amdocs, 2024). There are also banks in India that operate with special licenses, act as payment banks and achieve profitability through a diversified set of revenue streams.

Europe’s profitable digital banks are Starling Bank, OakNorth Bank, Zopa and more recently Revolut.

planova pretplate na usluge s dodanom vrijednošću. Brazilska digitalna banka Nubank profit ostvaruje generiranjem prihoda iz više izvora, na primjer bankarskih naknada, kreditiranja, osiguranja, prihoda od trgovanja kriptovalutama i drugih programa vjernosti (Kumar i Singh, 2023).

Revolut

Najpopularnija neobanka u Europi, Revolut, britanska je *fintech* kompanija sa sjedištem u Londonu, no posjeduje bankarsku licencu Litve. I mnoge druge financijske institucije podvrgavaju se zakonodavstvu Litve, zbog njezina pravodobnog pravnog uređenja financijsko-tehnoških djelatnosti. Revolut je osnovan 2015. godine i tada su njegove glavne usluge bile vezane za elektronička plaćanja, poput plaćanja računa, međunarodnih transakcija i drugih vrsta plaćanja, koja je digitalizacija pojednostavila i olakšala. Jedan je od glavnih ciljeva kompanije korisnicima pojednostaviti sve što ima veze s novcem i pomoći im da na taj način ostvare svoje financijske ciljeve. Ponuda Revoluta temelji se na četiri kartice koje biraju novi korisnici, a one mogu biti besplatne ili uz naknadu, prema potrebama i pogodnostima za korisnike. Poznata kao prva svjetska „super“ financijska aplikacija, banka Revolut prikupila je od 2015. do 2023. godine više od 30 milijuna korisnika diljem svijeta. Aplikacija je podržana u više od 200 država i regija, na 29 jezika. Revolut svake godine uspješno na tržište plasira nove usluge i značajke kojima se diferencira od konkurencije (Revolut, 2024).

S druge strane, Revolut se našao na meti kritika zbog svoje upitne korporativne kulture. Optužuju ga za loše postupanje prema zaposlenicima, neplaćanje osoblja i postavljanje nedostižnih ciljeva, što je dovelo do velike fluktuacije osoblja. Osim kritika korporativne kulture, izražena je i zabrinutost revizora i regulatora zbog kasnog podnošenja računa i izvješća, što je posljedično dovelo do toga da Revolut kasnije dobije bankarsku licencu (Melino, 2019). Dodatni problem Revoluta, kao i mnogih

Lending to SMEs is at the heart of OakNorth’s profitability, and credit standing is assessed through a data-processing program. Revolut bases its effectiveness on the strategy of a financial “super-application” and various value-added service subscription plans. Brazilian digital bank Nubank generates profits by generating revenue from multiple sources, for example banking fees, lending, insurance, cryptocurrency trading revenue and other loyalty programs (Kumar and Singh, 2023).

Revolut

The most popular neobank in Europe, Revolut, is a British fintech company based in London, but holds a banking license from Lithuania. Many other financial institutions also submit to the legislation of Lithuania, due to its timely legal regulation of financial-technological activities. Revolut was founded in 2015 and at that time its main services were related to digital payments, such as invoice payments, international transactions and other types of payments, which were simplified and facilitated by digitalization. One of the main goals of the company is to simplify everything related to money for users and help them achieve their financial goals in this way. The Revolut offer is based on four cards selected by new users, which can be free or for a fee, according to the needs and benefits of the users. Known as the world’s first “super” financial application, Revolut Bank collected more than 30 million users worldwide from 2015 to 2023. The app is supported in more than 200 countries and regions, in 29 languages. Revolut successfully markets new services and features that differentiate it from their competitors every year (Revolut, 2024).

On the other hand, Revolut has been criticized for their questionable corporate culture. Revolut has been accused of employees’ mistreatment, non-payment of salary and setting unattainable goals, which led to high staff turnover. In addition to criticism of the corporate culture, the concern of auditors and regulators about the late submission of invoices and reports was also expressed, which

drugih virtualnih banaka, jest sigurnost. Jedan je britanski državljanin prijavio prijevaru zbog sigurnosnih propusta u visini od 165 000 funti, koja se dogodila zbog zakašnjele reakcije banke. Action Fraud, nacionalni centar Ujedinjenog Kraljevstva za prijavu prijevara i *cyber* kriminala, zaprimio je gotovo 10 000 prijavi prijevara u kojima se spominje Revolut, što ga svrstava na prvo mjesto među bankama prema broju korisnika žrtava prijevara. Najveća britanska banka Barclays, s druge strane, spominje se 2000 puta manje (Forbes, 2024).

Nubank

Prema broju korisnika, brazilski Nubank predstavlja najveću digitalnu banku svijeta, koja broji više od 90 milijuna korisnika. Nubank ima ponajviše klijenata u Brazilu i drugim zemljama Južne Amerike, poput Meksika i Kolumbije, a počeo je poslovati i u Sjedinjenim Američkim Državama i u Njemačkoj. Prema ponudi usluga ne razlikuje se mnogo od ostalih digitalnih banaka na tržištu, no postoje određene prednosti koje ga stavljaju u pogodnu poziciju, osobito kada se uzme u obzir područje na kojemu posluje. Za razliku od Revoluta, od Nubanka je moguće zatražiti digitalni prijenos plaće i postoji određena zarada od kamate na depozite. Glede postignuća, Nubank je 2023. godine došao do broja od 79,1 milijuna klijenata na kraju prvog tromjesečja i 80 milijuna u sljedećem mjesecu, To mu je donijelo prihod od 1,6 milijardi američkih dolara i dobit od 141,8 milijuna dolara, što predstavlja povećanje od 87 % u odnosu na isto razdoblje prethodne godine. Uspjeh se ogleda i u činjenici da gotovo polovina odrasle populacije Brazila (46 %) koristi usluge Nubanka, a poslovanje je posljednjih nekoliko godina profitabilno. Činjenica je da su *online* banke poznate po nedostatku podružnica i manjem broju zaposlenika, što nipošto ne znači da zaposlenici uopće nisu potrebni. Kod Nubanka omjer pokazuje strukturno poboljšanu učinkovitost u pogledu broja zaposlenika po

consequently led to Revolut later obtaining a banking license (Melino, 2019). An additional problem of Revolut, like many other virtual banks, is security. A British citizen reported fraud for security breaches amounting to £165,000, which occurred due to a delayed reaction from the bank. Action Fraud, the UK’s national centre for reporting fraud and cybercrime, has received nearly 10,000 fraud reports mentioning Revolut, ranking it first among banks in terms of the number of fraud victims. Britain’s largest bank, Barclays, on the other hand, is mentioned 2,000 times less (Forbes, 2024).

Nubank

According to the number of users, Brazil’s Nubank is the largest digital bank in the world, with more than 90 million users. Nubank has the most customers in Brazil and other South American countries, such as Mexico and Colombia, and has also started operations in the United States and Germany. According to the service offer, they are not much different from other digital banks on the market, but there are certain advantages that put them in a convenient position, especially when considering the area in which they operate. Unlike Revolut, it is possible to request a digital salary transfer from Nubank and there is some interest earnings on deposits. In terms of results, in 2023, Nubank reached 79.1 million clients at the end of the first quarter and 80 million in the following month. This brought them the revenue of US \$1.6 billion and profit of US \$141.8 million, an increase of 87% compared to the same period of the previous year. Success is also reflected in the fact that almost half of the adult population of Brazil (46%) uses the services of Nubank, and business has been profitable in recent years. The fact is that online banks are known for their lack of branches and fewer employees, which by no means that employees are not needed at all. With Nubank, the ratio shows structurally improved efficiency in terms of the number of employees per active client, almost 20

aktivnom klijentu, gotovo 20 puta veću od ostalih vodećih banaka (Nubank, 2024; Furman, 2023).

Na profitabilnost *online* banaka utječe više različitih čimbenika. Azijske digitalne banke svoj uspjeh temelje na bazi klijenata koje su uspostavili tehnološki konglomerati, što podrazumijeva i manje troškova stjecanja novih kupaca, na uspješnom iskorištavanju tehnologije za brže i učinkovitije implementiranje proizvoda i usluga te smanjivanje fiksnih troškova, na dodatnoj prodaji proizvoda i usluga tehnoloških kompanija, prepoznatljivosti *branda* da bi se povećali povjerenje i vjernost kupaca te na posjedovanju bankovne licence kojom se lakše dolazi do jeftinijih izvora kapitala te se povećava povjerenje i ponuda proizvoda i usluga (Kumar i Singh, 2023).

PREDNOSTI I NEDOSTACI DIGITALNIH BANAKA

Na temelju analize novog tržišnog igrača – digitalnih banaka, potrebno je utvrditi koje su temeljne komponente ovog poslovnog modela koje privlače nove klijente i investitore, a koje predstavljaju prepreku za daljnji razvoj djelatnosti i odvlače korisnike od korištenja digitalnih bankarskih usluga.

Prednosti

U suvremenom, tehnološki razvijenom vremenu dostupnost digitalnih bankarskih usluga i proizvoda zasigurno predstavlja prednost za fizičke i pravne osobe te povećava zadovoljstvo pri korištenju digitalnih banaka. Osim dostupnosti, sofisticirana tehnologija pruža sveobuhvatno, dinamično i olakšano bankarsko iskustvo, u kojem korisnici bilo gdje u nekoliko klikova mogu obaviti prijenos novca, plaćati račune, rezervirati putovanja, zatražiti zajmove, investirati novac i generalno samostalno upravljati svojim financijama. Bankarstvo „u oblaku“ konsolidirano je u digitalnu platformu na kojoj nije potrebno razgovarati s više predstavnika

times higher than other leading banks (Nubank, 2024; Furman, 2023).

The profitability of online banks is influenced by several different factors. Asian digital banks base their success on the customer base established by technology conglomerates, which also means lower costs of acquiring new customers, on the successful exploitation of technology for faster and more efficient implementation of products and services and reduction of fixed costs, on additional sales of products and services of technology companies, on brand identity to increase customer trust and loyalty, and on the possession of a banking license that makes it easier to obtain cheaper sources of capital and increases the trust and supply of products and services (Kumar and Singh, 2023).

ADVANTAGES AND DISADVANTAGES OF DIGITAL BANKS

Based on the analysis of the new market player – digital banks, it is necessary to determine which are the fundamental components of this business model that attract new clients and investors, and which pose an obstacle to further development of activities and distract users from the use of digital banking services.

Benefits

In modern, technologically developed times, the availability of digital banking services and products is certainly an advantage for natural and legal persons and it increases satisfaction with the use of digital banks. In addition to availability, sophisticated technology provides a comprehensive, dynamic and facilitated banking experience, in which users can transfer money anywhere in a few clicks, pay bills, book trips, request loans, invest money and generally manage their finances independently. Cloud banking has been consolidated into a digital platform where it is not necessary to talk to

korisničke podrške iz različitih odjela. U slučaju gubitka ili krađe kartice aplikacija nudi mogućnost njezina otkazivanja ili zamrzavanja, a autentifikacija transakcija jednostavna je. *Online* bankarstvo pruža određene pogodnosti financijskim kompanijama i zaposlenicima. Mnogi digitalni bankarski proizvodi omogućuju kompanijama pametnije i brže poslovanje, s opširnom dostupnom količinom podataka o klijentima i njihovim kupovnim i potrošačkim navikama, zbog čega mogu ciljati konkretne prilike te stvarati individualizirane i promotivne ponude kojima povećavaju prihode. Pogodnosti za zaposlenike uključuju bolju komunikaciju, koordinaciju, smanjenu administraciju, uštedu vremena te povećanje transparentnosti i nadzora potrošnje, izvješća i faktura pri obavljanju djelatnosti (Spendesk, 2021). Nemoguće je govoriti o prednostima digitalnog bankarstva bez spominjanja najvažnije i najočiglednije prednosti, a to je smanjenje operativnih troškova. Odsutnošću podružnica i osjetno manjim brojem potrebnog osoblja osigurane su povoljnije kamate na štednju, manje naknade za osiguranja i općenito manji operativni troškovi za klijente, koji te iste naknade podmiruju samo zato što su klijenti određene banke. Osim nižih kamata, internetske banke često ne zahtijevaju čak ni minimalne depozite za otvaranje računa (Investopedia, 2024). Istodobno se korisnicima pruža povoljnija usluga, a rukovodstvo banaka ne mora voditi računa o fiksnim troškovima održavanja poslovnica i upravljanja većeg broja ljudskih resursa (InSolve, 2022).

Nedostaci

Jedna od nepravilnosti *online* bankarstva jest neistraženost elektroničkog plaćanja uz nedostatno pravno uređenje ovoga financijskog područja u mnogim državama i regijama. Mnoga pitanja vezana za virtualni novac i usluge te sredstva plaćanja tek treba istražiti, evaluirati i odgovoriti na njih, uz neprestanu nadopunu pravnog okvira i zadovoljenje zahtjeva dinamičnog tržišta. Mnogi su se okoristili ovim neistraženim područjem i pritom

multiple customer support representatives from different departments. In case of a loss or theft of the card, the app offers the option to cancel or freeze it, and the authentication of transactions is easy. Online banking provides certain benefits to financial companies and employees. Many digital banking products enable companies to do business smarter and faster, with an extensive amount of information available about customers and their buying and spending habits, which is why they can target specific opportunities and create individualized and promotional offers that increase revenues. Employee benefits include better communication, coordination, reduced administration, time saving, and increased transparency and control of spending, reports, and invoices when performing activities (Spendesk, 2021). It is impossible to speak about the benefits of digital banking without mentioning the most important and obvious advantage, which is the reduction of operating costs. The absence of branches and the significantly lower number of necessary staff provide more favorable interest on savings, lower insurance fees and generally lower operating costs for clients, who settle these same fees only because they are clients of a particular bank. In addition to lower interest rates, online banks often do not require even minimum deposits to open an account (Investopedia, 2024). At the same time, customers are provided with a more favorable service, and bank management does not have to deal with the fixed costs of maintaining branches and managing a large number of human resources (InSolve, 2022).

Deficiencies

One of the disadvantages of online banking is the fact that digital payment is still pretty unexplored and there is insufficient legal regulation of this financial area in many countries and regions. Many questions related to virtual money and services and means of payment have yet to be investigated, evaluated and answered, with the continuous updating of the legal framework and meeting

potencijalno naštetili sigurnosti klijenata (Phuong et al., 2023, str. 13). Kod neobanaka nailazimo na korisničku podršku u isključivo digitalnom obliku, koja je doduše dostupna 0-24, no često je riječ o automatiziranom virtualnom robotu koji na upite klijenata odgovara unaprijed postavljenim uputama i savjetima koji ne zadovoljavaju potrebe i ne odgovaraju na pitanja, pa su korisnici frustrirani time što ne mogu jednostavno otići u poslovnicu po odgovor i pomoć. Očigledno je da je digitalizacija olakšala mnoge društvene procese i da su se mlađe generacije uspješno snašle u okruženju koje se iz godine u godinu dinamično i ubrzano mijenja, no iste te promjene predstavljaju izazove za manje informatički pismene osobe, koje ostaju isključene iz informatizacije društva. Bilo da je riječ o starijim generacijama ili o građanima iz slabije razvijenih država koje nemaju dostupnu najnoviju tehnologiju, digitalne banke predstavljaju im nepoznato područje u koje se ustručavaju ulaziti zbog straha za sigurnost svojih financija i osobnih podataka (InSolve, 2022). Upravo je sigurnost jedna od najvažnijih tema *online* bankarstva. Iako se počelo raditi na uspostavljanju sigurnijeg okruženja na internetu i u elektroničkom poslovanju, digitalizacija još uvijek sa sobom nosi mnoštvo kibernetičkih napada, *online* prijevara, krađa osobnih podataka i velikih gubitaka za pojedince i organizacije zbog nedostatka znanja o sigurnosti i opasnosti interneta. Kibernetički su napadi maliciozne aktivnosti usmjerene na računalo ili informacijski sustav s namjerom krađe, promjene, iskorištavanja ili uništavanja podataka i nanošenja štete na mreži. Zbog nedovoljne razine sigurnosti na uređajima i nepažnje korisnika kriminalci pristupaju bazama podataka, iz kojih izvlače željene podatke i zloupotrebljavaju ih. Najčešći objekti kiberkriminala su softveri za mobilne uređaje i računala, društvene mreže, oblaci za pohranu podataka te *online* transakcije i *online* bankarstvo (Lider, 2023; Veresha, 2018, str. 189-199).

the dynamic market requirements. Many have benefited from this unexplored area, potentially damaging client safety (Phuong et al., 2023, p. 13). In neobanks we find customer support in exclusively digital form, which is available 24/7, but often it is an automated virtual robot that responds to customer queries with pre-set instructions and advice that does not meet the needs and does not answer questions, so users are frustrated that they cannot simply go to the branch to get an answer and adequate help. It is obvious that digitalization has facilitated many social processes and that younger generations are successfully navigating an environment that is changing dynamically and rapidly from year to year, but these changes pose challenges for less computer-literate people, who remain excluded from the computerization of society. Whether they are older generations or citizens from less developed countries who do not have access to the latest technology, digital banks present an unknown area that they are hesitant to enter due to fears for the security of their finances and personal data (InSolve, 2022). Security is one of the most important subjects of online banking. Although establishing a safer environment on the Internet and in e-commerce is a work in progress, digitalization still implies a plethora of cyber attacks, online fraud, theft of personal data and major losses for individuals and organizations, all due to lack of knowledge about the safety and dangers of the Internet. Cyber attacks are malicious activities directed at a computer or information system with the intention of stealing, changing, exploiting or destroying data and causing damage to the network. Due to insufficient level of security on devices and carelessness of users, criminals access databases, from which they extract the desired data and abuse them. The most common objects of cybercrime are mobile and computer software, social networks, data storage clouds, and online transactions and online banking (Lider, 2023; Veresha, 2018, p. 189-199).

ZAKLJUČAK

Godina je 2024., dovoljno je već rečeno o značenju tehnologije, informacija i interneta u današnjem društvu. Nemoguće je zamisliti današnji svijet bez luksuza koji nam visoka tehnologija omogućuje u svakom aspektu života. Jedan je od tih aspekata i upravljanje financijama, za koje su nam, željeli mi to ili ne, potrebne banke. Banke danas posluju na tržištu preplavljenom konkurencijom i ne mogu se usporediti s bankama i njihovim poslovnim modelima od prije pedesetak godina, kada nije bilo toliko različitih tržišnih igrača koji su zauzimali tržišne udjele. Tada su banke bile u mogućnosti postavljati takozvana pravila igre i predstavljati se kao jedini izbor za klijente kada je u pitanju upravljanje novcem, što je podrazumijevalo da klijenti nemaju mnogo opcija i da moraju pristati na njihove uvjete i ponudu.

U suvremeno doba, a posebice u posljednjih nekoliko godina, na svjetskom tržištu primjećuje se velik broj bankarskih institucija svih vrsta. Da bi preživjele na tržištu i da bi bile u skladu s potrebama današnjega društva, banke su svoje poslovne modele morale prilagoditi suvremenim zahtjevima. Suvremeni zahtjevi uključuju digitalizaciju poslovanja i uvođenje inovacija koje će pružiti nove proizvode i usluge, nova rješenja i poboljšano iskustvo korisnika. Banke su kao rješenje predstavile uspostavljanje bankarskih usluga i proizvoda u digitalnom obliku, u obliku mobilne aplikacije, internet bankarstva ili bilo kojeg drugog bankarskog proizvoda. Digitalna bankarska infrastruktura znatno je promijenila način na koji većina korisnika upotrebljava bankarske usluge, a promijenila je i interne procese u bankama. Prednosti su razne i svima već poznate. Svi navedeni čimbenici karakteristični za digitalno bankarstvo zasigurno ovaj poslovni model čine atraktivnim, jer je u interesu svakog poslovanja smanjiti troškove i osigurati dobru uslugu uz pojednostavljene poslovne procese.

U tom se slučaju postavlja pitanje: zašto sveukupna djelatnost bankarstva nije posve digitalizirana?

CONCLUSION

The year is 2024, enough has already been said about the importance of technology, information and the Internet in today's society. It is impossible to imagine today's world without the luxury that high technology allows us in every aspect of life. One of these aspects is financial management, for which, whether we like it or not, we need banks. Banks today operate in a market flooded with competition and cannot be compared to banks and their business models from about fifty years ago, when there were not so many different market players occupying market shares. At that time, banks were able to set the so-called rules of the game and present themselves as the only choice for clients when it comes to money management, which implied that clients did not have many options and that they had to agree to their terms and offer.

In modern times, and especially in recent years, a large number of banking institutions of all types has been present on the world market. In order to survive in the market and to be in line with the needs of today's society, banks had to adapt their business models to modern requirements. Contemporary requirements include the digitization of business and the introduction of innovations that will provide new products and services, new solutions and improved customer experience. As a solution, banks presented the launch of banking services and products in digital form, in the form of a mobile application, internet banking or any other banking product. The digital banking infrastructure has significantly changed the way most users use banking services, and it has also changed the internal processes in banks. The benefits are various and familiar to everyone. All these factors characteristic of digital banking certainly make this business model attractive, because it is in the interest of every business to reduce costs and provide good service with simplified business processes.

In this case, the question is: why is the overall banking activity not fully digitized? The results of

Rezultati istraživanja digitalnih banaka pokazuju da jako malen broj virtualnih banaka postiže profitabilnost, koja je ključna za opstanak na tržištu. Na primjeru banke N26 primjećuje se koliko nedostatak povjerenja i problemi sa sigurnošću utječu na ugled kompanije. Revolutu je, uz sigurnosne propuste, zbog nepovjerenja regulatora trebao dugi niz godina da dobije bankarsku licencu. Azijske digitalne banke, s druge strane, postale su prepoznatljive zbog udruživanja s velikim konglomeratima, koji imaju goleme baze korisnika i uspostavljenu digitalnu infrastrukturu.

Bankarska industrija kreće u smjeru koji se zasigurno neće vratiti na „stare načine“ odlaska u poslovnice radi jednostavnih transakcija. Digitalno i virtualno postali su „novo normalno“ u cijelome društvu, pa tako i u bankarstvu. Poslovni model digitalnih banaka svakako ima mnoštvo potencijala i principa bez kojih suvremeni poslovni svijet više ne može funkcionirati, poput usmjerenja na korištenje visoke i napredne tehnologije, poboljšanja iskustva za korisnike i smanjenja troškova, no to ne znači da ne postoji i mnogo prostora za unaprjeđenje poslovnih procesa, infrastrukture, a posebice sigurnosti. Bankarske grupe koje prakticiraju hibridni model, s fizičkim poslovnicama, decentraliziranom strukturom, ali s uspostavljenom digitalnom platformom bankarstva, i dalje na tržištu banaka prolaze najuspješnije upravo zato što, za razliku od digitalnih sudionika, klijentima ulijevaju više povjerenja i sigurnosti. Postoje i *online* banke koje su uspjele izgraditi ime i postati dovoljno velike da izazovu naklonost korisnika, što ulijeva nadu u poslovni model *online* banaka, no trebat će proći više godina da bi se utvrdio učinak ovog tipa banaka na dužji rok.

Poslovanja koja ne postoje u digitalnom svijetu ne opstaju dugoročno na tržištu jer nisu kompetitivna.

the research of digital banks show that a very small number of virtual banks achieve profitability, which is crucial for survival in the market. The example of N26 Bank shows how much lack of trust and security problems affect the company's reputation. Revolut, in addition to security flaws, due to the lack of confidence of the regulator, took many years to obtain a banking license. Asian digital banks, on the other hand, have become recognizable due to alliances with large conglomerates, which have huge customer bases and an established digital infrastructure.

The banking industry is heading in a direction that will certainly not return to the “old ways” of going to branches for simple transactions. Digital and virtual have become the “new normal” throughout society, banking included. The business model of digital banks certainly has many potentials and principles without which the modern business world can no longer function, such as focusing on the use of high and advanced technology, improving the experience for customers and reducing costs, but this does not mean that there is not much room for improvement of business processes, infrastructure, and especially security. Banking groups that practice a hybrid model, with physical branches, a decentralized structure, but with an established digital banking platform, continue to perform most successfully in the banking market precisely because, unlike digital participants, they inspire more confidence and security in customers. There are also online banks that have managed to build their name and become large enough to provoke the customers' affection, which gives hope to the online bank business model, but it will take several years to determine the long-term effect of this type of banks.

Businesses that do not exist in the digital world cannot survive in the market in the long run because they are not competitive.

LITERATURA / LITERATURE

Knjige

Skinner, C. (2013), *Digital Bank: Strategies to succeed as a digital bank*, str. 35-44

Znanstveni radovi

ANĐELIĆ, S., JAKICA, A. (2023), „Digitalna komunikacija i digitalne usluge u bankarstvu“, str. 127-133

DEYOUNG, R. (2005), „The Performance of Internet-Based Business Models: Evidence from the Banking Industry“

OŽVALD, S. (2023), „Digitalna transformacija banaka kao imperativ uspješnog poslovanja“

PHUONG THANH THI TRAN, THI THUY HANG LE, NGA THI HANG PHAN (2023), „Digital Transformation of the Banking Industry in Developing Countries“. *International Journal of Professional Business Review*, str. 13

RONČEVIĆ, A. (2006), „Nove usluge bankarskoga sektora: razvitak samoposlužnoga bankarstva u Hrvatskoj“. *Ekonomski prehled*, 57 (11), 753-777

SAHUT, J.-M. (2011), „Business Model of Internet Banks“, str. 7

YU QI (2022), „Digital Transformation of Business Models in the Banking Sector. Atlantis Press, Proceedings of the 2022 International Conference on Social Sciences and Humanities and Arts

Internetske stranice

BEERS, B. (2024), „Internet Banks: Pros and Cons“. Investopedia, <https://www.investopedia.com/articles/pf/11/benefits-and-drawbacks-of-internet-banks.asp>

BEST MONEY TRANSFER (2024), „N26 hrvatska iskustva – online banke u usporedbi“. <https://www.best-money-transfer.com/hr/n26-hrvatska-iskustva-online/>

FORBES (2024), <https://forbes.n1info.hr/>

FURMAN, I. (2023), „What to Know about Brazil's Largest Digital Bank Nubank?“ Nasdaq, <https://www.nasdaq.com/articles/what-to-know-about-brazils-largest-digital-bank-nubank>

INVESTGLASS (2023), „Less Than 5% od the World's 400 Neobanks are Profitable: The Digital Banking Conundrum“. <https://www.investglass.com/less-than-5-of-the-worlds-400-neobanks-are-profitable-the-digital-banking-conundrum/>

KNEZ, J. (2023), „Kibernetička sigurnost: Prvo pravilo u slučaju iznude je da djelujete brzo“. Lider, <https://lidermedia.hr/sto-i-kako/kiberneticka-sigurnost-prvo-pravilo-u-slucaju-iznude-je-da-djelujete-brzo-149310>

KUMAR, S. & SINGH, S. (2023), „Cracking the profitability code of successful digital banks“. Whitesight, <https://whitesight.net/digital-banks-profitability-2023/>

MACNAUGHTAN, M. (2024), „Achieving profitability: Insider insights from successful digital-only banks“. Amdocs, <https://www.amdocs.com/insights/blog/achieving-profitability-insider-insights-successful-digital-only-banks>

MCKINSEY & COMPANY (2021), „Lessons from the rapidly evolving regulation of digital banking“. <https://www.mckinsey.com/industries/financial-services/our-insights/lessons-from-the-rapidly-evolving-regulation-of-digital-banking>

MINNALEARN (2023), „Što je digitalna revolucija?“ <https://courses.minnalearn.com/hr/courses/digital-revolution/the-digital-revolution/what-is-the-digital-revolution/>

MOJ-BANKAR.HR (2020), „Digitalne banke: Revolucija, Transferwise, N26 i drugi u 2020.“, <https://www.moj-bankar.hr/Vijesti/Digitalne-banke-revolucija-transferwise-n26-i-drugi-u-2020>

N26 (2024), <https://n26.com/en-eu>

NUBANK (2024), <https://nubank.com.br/en/>

REVOLUT (2024), <https://www.revolut.com/>

RIS, K. (2013), „Elektronsko poslovanje mPayment“, <https://www.slideshare.net/krunoris/elektronsko-poslovanje-mpayment>

SEVER, N. (2023), „Kibernetička sigurnost – Ljudska psihologija zapravo otvara vrata hakerima“. Lider, <https://lidermedia.hr/sto-i-kako/kiberneticka-sigurnost-ljudska-psihologija-zapravo-otvara-vrata-hakerima-148407>

SPENDESK (2021), „What is digital banking?“ <https://www.spendsk.com/what-is-digital-banking/>

VERESHA, R. V. (2018), „Preventive Measures Against Computer Related Crimes: Approaching an Individual“. *Informator*, 51 (3-4), str. 189-199, <https://hrck.srce.hr/file/317498>

WIRED (2019), „Revolut insiders reveal the human cost of a fintech unicorn's wild rise“. <https://www.wired.com/story/revolut-trade-unions-labour-fintech-politics-storonsky/>