

# Strategies for Developing On-Line Business Models in Retail Banking

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*The purpose of the article is to present the current state of development of on-line services in retail banking and to discuss their future development. It covers a high level analysis of functional morphology of on-line banking in view of historical banking channel development. The final study provides a view on key strategies that can be used in the future to foster further development of on-line business models. The strategies are divided into organic growth, partnerships/intermediation and accelerated growth. Concluding remarks point out the leading role of banks in the digitalization of economic systems and support for e-government. They also emphasize the potential for further development of on-line banking towards universal service platforms which provide a secure environment for execution of auditable business transactions between known parties.*

**Keywords:** on-line banking, digitalization, e-government, on-line strategies, banking channels, self-service, on-line functionality, business models, strategy development, public-private partnerships, service platforms, on-line integration, on-line security.

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## Strategie rozwoju modeli biznesowych on-line w bankowości detalicznej

*Celem artykułu jest przedstawienie obecnego stanu rozwoju usług on-line w bankowości detalicznej oraz dyskusja ich dalszego rozwoju. Artykuł obejmuje ogólną analizę morfologii funkcjonalnej bankowości on-line w kontekście historycznego rozwoju kanałów w bankowości. Strategie podzielone są na wzrost organiczny, partnerstwo/pośrednictwo oraz przyspieszony wzrost. W zakończeniu jest wskazana wiodąca rola banków w digitalizacji systemu ekonomicznego oraz wsparcia usług e-administracji (e-government). Podkreślono również potencjał do dalszego rozwoju bankowości on-line w kierunku uniwersalnych platform usługowych, które zapewniają bezpieczne środowisko do realizowania audytowalnych transakcji biznesowych pomiędzy znanymi stronami.*

**Słowa kluczowe:** bankowość on-line, digitalizacja, e-administracja (e-government), funkcjonalności on-line, modele biznesowe, rozwój strategii, partnerstwo publiczno-prawne, platformy usługowe, integracja on-line, bezpieczeństwo on-line.

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## 1. Introduction

Looking briefly at the history of trade and finance, we observe how civilizations have been coping with the setup of transactions to assure that they are properly closed by the buyer and the seller. The invention of barter exchange and later of money, as an expression of value, gave a solid base for the transactional systems that we still use today. Transactional activity carries the burden of involving humans as dealers and operators of trade systems, driving the complexity and costs of sales and after-sales processes. Therefore we observe efforts to reduce the dependency on employees via automation, allowing clients to manage their own service demand. Historical evidence shows that as early as in the beginning of the 1<sup>st</sup> century ancient engineers were constructing machinery designed for self-service by the clients. Heron of Alexandria (10–70 AD) is believed to be one of the first inventors of a vending machine. In his construction, used in a temple, a sacramental amount of holy water was released from a device after feeding it with a coin (Valavanis et al., 2007, p. 266). After two millenniums of almost complete absence, Heron's invention makes a very strong reappearance in the 18<sup>th</sup> and 19<sup>th</sup> centuries, when the world economy is bursting with effects of the industrial revolution. Growth of production and service capacity fueled the rise of corporations, for which the main objective was to search for new clients and markets where mass produced goods and services could be sold. Vending machines allowed corporations to largely avoid having to deal with personnel, which on the one hand represents a strategic resource, but on the other drives the complexity and cost of operations. Machines offered the possibility to sell and provide after-sales services in the 24x7 mode, in locations of high natural demand and convenience, serving as a natural method of expanding the distribution network.

The banking sector reused the concept of self-service vending in the automated teller machines (ATM) that entered the mainstream market in the 1970s (Allison, 1995). In their initial role, ATMs were tightly linked to handling of physical cash and evolved today to “mini-branch” kiosks with digital transaction processing, multi-currency cash recycling, as well as biomet-

rics, near field communications (NFC), printing and document scanning. The creators of ATMs were pioneers in developing a number of technologies required for “vending of money”. First of all, they had to solve the issue of authentication and authorization, which ended up in the widespread use of bank cards (with secret access codes – the personal information numbers/PIN), later merged with payment schemes to create a universal payment and cash handling ecosystem. The next set of problems was related to the security of transactions and the physical safety of the cash deposited in the machine. Last but not least, machines had to be designed with a high level of reliability to prevent failures and client claims. Today, the primary limitation of ATMs remains the same as at their inception – the number of locations where ATMs can be hosted is limited by cost and geographical location constraints. Physically linked, dependent on energy sources and hosted in a security-assuring environment, ATMs remain a fixed and static network<sup>1</sup>.

The origins of on-line banking are traced back to 1980s (Cronin, 1997, p.41) and the first appearance of home banking that allowed for execution of simple operations, such as accessing account statements or executing payments. The dynamic development of this banking channel is deeply rooted in the technological progress related to the rise of electronic payment systems (cashless operations) and the connectivity of people, companies and economic systems. The Internet allowed for meeting the ultimate dream of the “self-service vending” in financial services. Geographical barriers were removed and the actual value exchange transactions started to take place in real time, via self-service, on the devices owned by the client. Moreover, no later than 40 years after the first attempts at remote on-line transactions there is nothing odd in the existence of financial institutions that are pure digital players, with limited or no physical channel presence<sup>2</sup>.

The on-line channels in financial institutions (FI) and specifically in retail banking<sup>3</sup> are increasingly growing in importance, becoming either a primary/preferred or the only method of communication with the clients. It is rather hard to imagine that the supremacy of on-line channels would be diminished in the near future. On the contrary, FIs continue to

move away from traditional “brick-and-mortar” business models, going towards further digitalization and virtualization, e.g. via robotic-advisory or an application of expert systems. From both scientific and commercial point of view, it is worthwhile to understand the factors propelling the success of on-line channels, with a clear goal of providing a perspective on their future development. The focus of the article is placed on the functional side of on-line channels rather than on the technical infrastructure or the aspects of usability and marketing appearance. The functionality is understood as a distinct service that provides value to the clients and allows for execution of sales and after-sales transactions, including the delivery of information required for the decision processes of the client. Such services, when used alone or in combination with other services, allow a financial institution to operate various business models, supporting value generation chains in either sales or after-sales. The article is aimed at addressing three primary research problems:

- (P1) At present, there are no comprehensive reference directories of on-line banking functionalities offered by the

banks operating in Poland. Creation of a reference is needed to understand the current state of on-line banking for use in business and regulatory purposes.

- (P2) Hypothesis: the functionality of on-line banking solutions in Poland is evolving both in the area of pure financial services as well as the non-banking, value added services.
- (P3) There are no established and structured views on the strategies of on-line banking development with respect to the functional maturity of such solutions. The understanding of available strategies is required for use in business and regulatory purposes.

## 2. Materials and Methods

### – Functional Morphology of On-Line Banking Solutions

The research problems outlined in the introduction were first addressed by the study of literature, including commercial and regulatory reports. Some examples of previous literature coverage are provided in Table 1, which summarizes views on the strategic focus and evolution in on-line services.

Table 1. Results of previous studies on the on-line banking strategic focus

Source	Description of strategic focus and evolution in on-line services
Szwajkowska, Kwaśniewski, Leżoń, Woźniczka, 2010, p. 24	Key descriptor: maturity model The development of on-line banking is split into 4 phases: 1. informative – presenting offers and information about the bank, 2. interactive (passive) – account browsing and contact with the bank, 3. transactional – remote execution of standard banking operations, 4. strategic – interactive personal or institutional finance management, including broad access to banking and insurance products, brokerage and advisory.
Adamiec, 2009	Key descriptor: staged approach • First – development in accounts, payments and deposits. • Second wave – opportunities outside of banking: pre-paid telephone top-ups, bancassurance. • New frontiers: – electronic bill presentment and payment (e-invoices), – interface personalization, – support for disabilities, – mobile device adaptability, including mobile payments. • Future of on-line banking: – on-line loan sales (e-Credit).

continued Table 1

Source	Description of strategic focus and evolution in on-line services
Kaszubski, Widawski, 2006, p. 7	Key descriptor: steady evolution On-line banking evolved: <ul style="list-style-type: none"> <li>– from simple marketing and informational sources,</li> <li>– to full scope of services offered in other channels (branch, call center).</li> </ul> There are also innovative services that go beyond traditional channels: <ul style="list-style-type: none"> <li>– personalized financial information,</li> <li>– on-line brokerage and investments (aka “financial supermarkets”),</li> <li>– bank account management – financial aggregators,</li> <li>– on-line tax settlements.</li> </ul>
Woźnicka, 2001, pp. 2–4	Key descriptor: development phases with benefits: <ul style="list-style-type: none"> <li>– Phase 1: marketing and promotion – bank information, map of automated teller machines, email contact, electronic brochures; core benefits: distribution of information/promotion.</li> <li>– Phase 2: introducing client interactions – two-side communications, calculators of product conditions, articles and tips, interactive advisors (expert systems), on-line applications, account information, search engines, employee recruitment; core benefits: building a relationship with the clients, limiting paperwork, lower transaction costs.</li> <li>– Phase 3: full scope of transactions – connectivity to the core system for processing of banking transactions; core benefits: new client acquisition, on-line transactions and balance checking, bank’s public image and reputation, cost reduction, new products (e.g. virtual payment cards).</li> <li>– Phase 4: strategic usage of the Internet – on-line banking as a key channel, client profitability accounting, cross-sell, personalization, customer relationship management, new products (e.g. e-invoices); core benefits: new sources of profitability, market growth potential, systems integration, broader product and service scope.</li> </ul>

Sources: indicated above.

While providing some pioneer insights on the topic, most studies verified by the author are characterized by rather loose structuring of conclusions and a limited depth of analysis that can be enhanced via further research and modeling.

This lack of a reference directory was addressed with an author driven research study. Between 1999 and 2017<sup>4</sup>, the author was conducting on-going monitoring of strategies in the functional development of on-line banking solutions in Poland. The monitoring included top 15 commercial banks<sup>5</sup> holding over 90% of commercial banking assets, pure Internet banks<sup>6</sup> and three innovative cooperative banks<sup>7</sup> in the country. It is important to mention that in the observation period the majority of the banking sector was managed (usually via full or partial ownership) by significant international financial groups. This

situation increases the value of research by expanding the diversity of strategic decisions, often inspired by the experience gathered on other markets by the mother companies. The goal of the monitoring was to understand strategic investment preferences of banks in the area of on-line banking, providing a view on mainstream trends as well as innovative first movers. Similar attempts at describing the strategic focus or on-line evolution were undertaken in the past by both academic and commercial entities, however the view of the author proposed a new, structured perspective.

### 3. Results – Building Blocks of On-Line Banking

Based on the monitoring conducted by the author, the functional morphology of on-line solutions can be structured

in a form of “on-line DNA<sup>8</sup>” building blocks. Each block supports a particular set of client needs and objectives assumed in the strategy of a financial institution. The blocks are either directly available in the on-line systems (desktop/mobile) or launched (redirected to) from these systems. For the purpose of this paper, the

blocks are grouped by the elements of the business model they enable or support. Blocks related to the regulatory compliance<sup>9</sup> are excluded to retain focus on the business aspects.

Table 2 presents a list of blocks, together with samples of their industry representation.

Table 2. On-line DNA building blocks

Business model element	On-line DNA blocks	Industry sample
1. Identity, security and non-repudiation services	digital credentials (login, password), 2 <sup>nd</sup> factor codes (token, SMS, TAN, PIN, biometrics/TouchID), masking, digital signature (qualified or unqualified), anti-virus protection	omnipresent authentication and authorization, security assurance
2. Master data management	storage and management of client master data (personal details), linked parties and control accounts for 1 <sup>st</sup> or 2 <sup>nd</sup> level authorizations, service preferences, personalization	omnipresent
3. Financial asset storage – cash accounts	current, savings, foreign currency (FX) account, foreign country linked account	omnipresent, eKonto (mBank), dbNet (DB)
4. Interbank asset storage facilitation	account opening via transfer from another bank (“PLN 0.01 transfer process), eDeposit	NeoBank, BGZ Optima
5. Access to standard payment systems	payments: domestic, international, debit and credit card, direct debit, standing order	omnipresent Elixir, Swift, SEPA, 3D Secure
6. Access to enhanced payment systems	payments: high volume, express, mobile, micro-payments	Sorbnet, Express Elixir, BlueMedia, BLIK
7. Support for e-commerce transactions	e-commerce (pay-by-link), application payments, ticketing (e.g. public transportation)	omnipresent PayU, DotPay, Przelewy24, Android Pay, SkyCash
8. Transactional limit management	time and volume buckets and conditions: permanent or temporary, direct payments and card transactions	omnipresent
9. Access to markets: foreign exchange (FX)	FX static table based conversions, negotiated FX, on-line access to FX trading systems	omnipresent, RKantor
10. Access to markets: stock exchange	stock quotes and news services, stock trading, portfolio reporting, cash and credit settlements	omnipresent, bossaNOL3, DB Trader, Supermakler
11. Access to trade support services	trade finance, export financing, factoring/invoice discounting, market information	Santander Trade Portal (BZ WBK)
12. Trade and procurement platform	public and private tender/bid process, auctions, presentation of company profiles	Aleo (ING)
13. Supporting sales of non-bank products	shopping and service discounts available for bank clients only	mOkazje (mBank)

continued Table 2

<b>Business model element</b>	<b>On-line DNA blocks</b>	<b>Industry sample</b>
14. Electronic invoice payments	electronic bill presentment and payment (EBPP)	Bilix/Invoobil (mBank/Millennium)
15. Liquidity management/deposit product sales	deposits: sight, term; cash management, structured deposits (with FX), overdraft	omnipresent
16. Savings programs	savings goals, automated allocation of funds to savings (rounding, regular fixed amounts)	omnipresent, Moje ING, BGZ Optima
17. Credit product sales	credit applications, pre-approvals	mBank
18. Investment product sales	distribution and management of investment funds, structured products, certificates, unit-linked insurance, expert systems, investment risk questionnaires	Supermarket Funduszy Inwestycyjnych, dbNavi (DB)
19. Investment portfolio reporting	asset/stock information and valuation, alerts and notifications, portfolio value forecasting, expert systems	Citibank, Raiffeisen
20. Personal finance management (PFM)	categorization of costs (automated and manual), reports on past costs, cost forecasting, budgets/limits/targets, discounts	omnipresent
21. After-sales self-service	forms to request after sales services: product operations (shift, cancellation), statements, official confirmations; full text search engine to browse transactions	omnipresent ePoint (ING), mBank
22. Bank – telecommunications company	mobile phone top-ups, new number sales, free phone service for usage of banking products, cross-sell of banking products to telecommunication clients in other banks	Orange Finanse (mBank), T-Mobile Usługi Finansowe (Alior), Plus GSM (Plus Bank)
23. Bankassurance, bank – insurance company	life and asset insurance, long and short term policies linked to bank products or stand-alone, comparison of insurance prices and conditions	Market ubezpieczeniowy Blue Media
24. Bank – government	setup and confirmation of the trusted profile for use in government on-line services; applications for government services (e.g. the 500+ program), providing information	mBank, Citibank, PKO BP
25. Bank – accounting services	on-line accounting and invoicing, financial reporting (business and regulatory/statutory), business plan development	Alior, Idea Bank, ING, DB
26. Bank – legal	intermediation between law firms and clients of a financial institution – legal case management	Alior Doradztwo Prawne/Legal Counsel
27. Bank as a provider of cloud services	3 <sup>rd</sup> party data management, invoicing, automated payment matching, collections, factoring, document safe, document sharing, accounting, cash flow analysis, screen scraping* to consolidate accounts from other banks	Idea Cloud (Idea) Toyota Bank (Sejf na Dokumenty)

continued Table 2

Business model element	On-line DNA blocks	Industry sample
28. Non-bank investment vehicles	precious metals (gold, silver) sales, valuation	Mennica Polska (PKOBP) Mennica Wroclawska (DB)
29. Loyalty generation	calculation of loyalty points for usage of banking products, integration of loyalty points reporting into on-line banking, redemption of rewards, integration of various loyalty programs	Citibank, Pekao
30. Brand building	providing information on a broad scope of bank's offering and performance	omnipresent
31. Communications gateway	email, attachments, voice chat, text chat, video chat, on-line polls/surveys, educational services, educational and promotional games, contextual documentation	omnipresent mGra (mBank) – internal gaming concept
32. Information aggregator	portal with information on selected business topics, access to competitive reports and market data	Santander Trade Portal (BZ WBK)
33. Member-get-member	programs aimed at using the clients to bring other new clients (e.g. friends and family/F&F) in return for a direct financial benefit (cash payment) or favorable product conditions	mBank, GetinBank, Citibank

\* This functionality was blocked by the Regulator due to security/legal concerns (storage of user credentials by the bank).

Source: author's own work.

The view gathered in Table 2 allows for making a number of observations:

1. Banks are the operators of large information technology (IT) solutions that allow for direct, bi-directional, paperless, non-stop and mobile interactions with the client base. In this respect, they are increasingly turning into technology enterprises.
2. The services cover a complete customer experience (CX) cycle, from building awareness and providing information to conversion of requirements into offers, leading to the sales/settlement and the after-sales servicing of the product or service sold. Participation in all elements of the CX cycle allows banks to execute a higher level of process control, increasing the probability of successful sales.
3. The wide scope of on-line DNA blocks shows that banks are heavily investing into expanding their solutions across main<sup>10</sup> value generation levers: a) revenue generation (e.g. product sales), b) cost optimization (e.g. client self-service in obtaining account history details), c) risk reduction (e.g. investment portfolio reporting and alerts), d) brand and loyalty building (e.g. communications).
4. On-line digital services offered by banks are primarily oriented on financial and insurance products, however we note a visible representation of value added services coming from other industries (e.g. government, telecommunications, e-commerce). It is clear that banks undertake risks related to the expansion of their business models, in search of achieving commercial goals.
5. Importing non-financial services into on-line banking is supported via alliances and partnerships (e.g. bank-telecommunications). While the underlying reason for partnerships is rooted in business synergy effects (e.g. exploring economies of scale), there are also regulatory considerations that give an advantage to

cooperation models (e.g. statutory limitations for a holder of a banking license to explore other business areas, outside of the banking perimeter).

6. Several functional blocks became a common core, which is “omnipresent” in on-line solutions of all banks covered by the study. This core DNA encompasses mainly: identity and security management used for client authentication, transaction authorizations, safe storage of financial assets and data, access to markets, payment and settlement services, bi-directional communication between the institutions and their clients, with exchange of data via forms and attachments, as well as a wide range of base account and cash flow services with access to financial markets. This core set of on-line blocks serves as a base for other services.

In summary, by gradual and significant investments in the on-line DNA blocks, banks obtained a unique position in the digital world. Thanks to the common core, banks create service platforms which provide a trusted and secure environment for executing transactions with a known (authenticated) and aware (authorized) client. Usage of standard interconnectivity (e.g. SWIFT) and accessing many of the same markets allows the platforms to communicate between each other, which makes the banking sector one of the most connected industries. At present, we are facing strong pressure to direct this digital development towards further opening of banks’ platforms for use by external 3<sup>rd</sup> parties as well as clients themselves. This next wave of interconnectivity is inspired by clients (demanding more advanced services, e.g. account integration), competitors (especially the FinTech<sup>11</sup> industry) as well as the regulators (e.g. as expressed in the Payment Services Directive/PSD<sup>12</sup>). It is expected that banks provide open application programming interfaces (API) for a wide range of the on-line DNA blocks, providing opportunities for new value added services.

#### **4. Discussion – Future Strategies of On-Line Banking DNA Development**

The results of the study on the on-line banking DNA blocks provide strong incentives to make an attempt at portraying

their further development. The discussions about the future of on-line banking are quite common and represent various viewpoints on what (and how) is expected to affect either the creation or modification of the on-line DNA blocks. Sample elements for consideration include:

- user oriented CX, personalization, data analytics, agile development (Broeders 2015),
- the “digital congruence” concept (adopted from the original thinking of D. Nadler and M. Tushman): alignment of core organizational dimensions around the digital future: structure (embracing the risk of digital ventures), people (continuous training and acquisition of digital talent), tasks (agile and open) and the digital culture (Kane, 2016); altogether this alignment should lead to the development of new functionalities best matched with client expectations and prototyped early enough to justify final development vs. the termination of the project,
- hyper-personalization, adoption of a customer-centric innovation model, integrating banking into everyday life (Wharton, 2017),
- integrated services, capitalization on trust and security, continued paperless revolution, attracting clients with enticing products and services, leveraging of the social media (Valor, 2015),
- disintermediation of traditional value chains via continued creation of functional solutions outside of the financial sector, later the fall of banks or absorption of externally developed functionalities by banks; optionally a “peaceful” integration of external providers with the banks (Chicago Booth, 2016).

Current discussions bring a variety of interesting perspectives, pointing frequently to the areas of customer experience or integration technologies. A lot of attention is dedicated to the improvement of quality or versatility of the existing on-line DNA blocks, providing enhancements to the existing business models. This trend is also linked to the necessity of replacing solutions that reached their maximum technological capabilities and are approaching their end-of-life. While re-doing the functional blocks, financial organizations have an opportunity to implement a number of updates or revolutionary extensions, benefitting from the

newest available technologies, usage patterns and customer preferences.

In this chapter, the author is proposing to draw a unified perspective on the wide range of digital strategies that can be assumed by banks in the design of the future on-line DNA, enabling new business models. It is assumed that DNA blocks can be created by the organization internally or acquired externally. Both methods can be used to create new business models by either extending a set of the existing functionalities or by introducing a new section of the DNA. The strategies can be used

on the standalone basis or in combination with others. The implementation can be run in parallel or sequentially, in line with the available resources and the overall strategic goals. Table 3 contains a set of strategic choices, together with their general description and samples. The choices are grouped into 2 categories: (A) Organic growth, meaning internal development and (B) Partnerships/Intermediation, representing joint ventures with other institutions in order to benefit from external value chains that can be integrated with on-line banking.

Table 3. Organic and partnership strategies to develop the on-line DNA

Strategic approach	Description	Sample on-line DNA block development
<b>A. Organic growth</b>		
1. Market follower (passive)	Steady development of the existing solutions via market trend/competition monitoring. Adding DNA blocks in line with the mainstream to avoid the claim of being outdated. Laissez-faire, no innovation.	<ul style="list-style-type: none"> <li>• On-boarding new technology standards (e.g. Responsive Web Design/RWD),</li> <li>• joining new payment schemes,</li> <li>• joining new transactional and service platforms (e.g. the e-Government).</li> </ul>
2. Aggressive new technology adoption	Selecting high risk technologies and business concepts that challenge the base elements of the business model or introduce breakthrough innovation, with high risk of failure.	<ul style="list-style-type: none"> <li>• Crypto-currency storage and trade,</li> <li>• e-commerce based on crypto-currencies,</li> <li>• augmented reality (“Pokemonization” of CX).</li> </ul>
3. Niche based on the Voice of Customer (VoC)	Close cooperation with the customer base and collection of the VoC via questionnaires, on-line polls, contests to propose new functionalities. Satisfying the expectations of the already known customers segments.	<ul style="list-style-type: none"> <li>• User community banking (e.g. servicing the needs of a real estate cooperative organization to support voting, payments, financial reporting and collections with legal support,</li> <li>• interbank client-to client (C2C) sales and cooperation: sharing information about professional interests/skills of clients and allowing for trusted exchange of value between clients.</li> </ul>
4. Maslow Pyramid climb	Implementing increasingly higher levels of the Maslow pyramid (Maslow, 1954) to cover most advanced client needs with respect to their financial situation and management (especially “esteem” and “self-actualization”); allowing clients to “do meaningful and noble things” with their money.	<ul style="list-style-type: none"> <li>• Charity services built into the on-line banking, with links to the beneficiaries to confirm that funding reaches the needy and is not subject to fraud,</li> <li>• succession/inheritance planning linked to legal advice and simplified activation of benefit distribution (post-mortem),</li> <li>• assisted care planning,</li> <li>• joint financing of startup ventures (with or without share ownership).</li> </ul>

continued Table 3

Strategic approach	Description	Sample on-line DNA block development
5. "Uberization" of the sales or after-sales areas	Extension of the Member-Get-Member program by giving clients the roles of advisors.	<ul style="list-style-type: none"> <li>• Clients providing sales leads (instant sales agents),</li> <li>• clients providing after-sales services including remote authentication,</li> <li>• publishing a list of services being purchased by the bank which can be outsourced to clients.</li> </ul>
6. Social media reach and presence	Broad investment in social media connectivity for cash flow management/payments, lead searching, product sales, client communication, provision of information.	<ul style="list-style-type: none"> <li>• Facebook credit scoring,</li> <li>• LinkedIn client search and sales,</li> <li>• LinkedIn credit scoring,</li> <li>• media streaming,</li> <li>• ticketing (linked to events).</li> </ul>
7. Expenditure optimization (cash outflows)	Full study of expenditure cash flows managed for the clients in order to offer client solutions on decreasing cost.	<ul style="list-style-type: none"> <li>• Management of volume discounts to be offered to clients based on concentration of purchasing from a number of clients, e.g. energy/utility costs where vendor switching is possible,</li> <li>• group payment calendar with payment collection (e.g. lists related to joint financing of school events),</li> <li>• tax statements (voluntarily shared with the bank).</li> </ul>
8. Universal educational services	Offering an open educational platform where clients can set up a training/information program and invite others in a simplified manner. Testing the knowledge and reporting on the participation/progress.	<ul style="list-style-type: none"> <li>• eLearning Anything – invitations via phone numbers, bank account numbers of universal identifiers.</li> </ul>
9. Cross-generational document repository	Eternal storage service with inheritance rules: historical/family pictures, documents, certificates, diplomas.	<ul style="list-style-type: none"> <li>• Cloud/block-chain based digital family archive,</li> <li>• mobile archiving stations (digitizing content on demand).</li> </ul>
10. Product guarantee information service	Information from transactions (e.g. purchase of consumer electronics or software) copied from payments into a database with reminders and actions. Automated claims and returns.	<ul style="list-style-type: none"> <li>• Universal gateway to retailers and producers, providing a centralized warranty information service, cross sell of extended warranties, replacement offers.</li> </ul>
<b>B. Partnerships/Intermediation</b>		
11. Universal on-line client service desk	Importing service desks from other institutions into on-line banking. Usage measurement, invoicing, forecasting, claims, ordering services, document storage. Digital concierge and digital assistance services.	<ul style="list-style-type: none"> <li>• Utility companies,</li> <li>• telecommunications,</li> <li>• real estate cooperatives,</li> <li>• automotive companies (car servicing, reminding clients about technical checks, proposing a new car discount, service actions).</li> </ul>

continued Table 3

Strategic approach	Description	Sample on-line DNA block development
12. Digital eco-system creation	Providing a base service at low or no cost in order to facilitate user activity and value added services.	<ul style="list-style-type: none"> <li>• Health and fitness (“the Nike Run Club” of banking),</li> <li>• alumni services,</li> <li>• hobby forums.</li> </ul>
13. Advanced e-government	Support for more active communication between the client and all levels of administration.	<ul style="list-style-type: none"> <li>• Digital voting, authorized by the bank,</li> <li>• school information (grading and announcements) integrated into on-line banking,</li> <li>• license/ID/driving information, traffic tickets,</li> <li>• e-court,</li> <li>• real estate management and information,</li> <li>• e-taxation.</li> </ul>
14. Medical gateway provider	Integration of medical information from public and private sources assuring continuity of medical records despite change of service providers. Links to providers of associated services (e.g. pharmacies, doctor’s offices, laboratories, hospitals).	<ul style="list-style-type: none"> <li>• Medicine search and price optimization,</li> <li>• medical score (to be used by insurance companies for life policies),</li> <li>• vaccination and regular visit calendar,</li> <li>• lifestyle advisor – combining telemetry with financial behavior and providing tips on possible optimization options (“don’t drive the car, a bike will save you x hours per week”),</li> <li>• veterinarian services.</li> </ul>
15. Advertising agency	Bank’s channels used for commercial advertising. Client rewarded for viewing ads with competitive pricing.	<ul style="list-style-type: none"> <li>• Daily ads,</li> <li>• transactional ads (event based),</li> <li>• ads for goods and services and financing of such offers,</li> <li>• augmented reality,</li> <li>• account analysis unlocked after viewing ads.</li> </ul>
16. Media cloud	Selling and storage of content: video, sound, text, subscriptions, gaming licenses.	<ul style="list-style-type: none"> <li>• Integrated virtual library of content purchased via different sources.</li> </ul>

Source: author's own work.

Apart from the above strategies of organic growth and partnership development, banks may choose to follow the accelerated path, by engaging in capital based transactions (Table 4).

The study presented in this paper allows us to draw several observations about the present and future functionalities of on-line solutions in retail banking, reflecting previously applied and possible on-line development strategies. The most important conclusions include:

1. The on-line DNA in retail banking is evolving from early forms focused on cli-

ent self-service towards an open service architecture. The evolution is expected to continue on a large scale with more innovative services and more open market integration.

2. Through their on-line banking solutions, banks create universal service platforms which provide a secure environment (with various levels of security) for execution of auditable business transactions between known<sup>13</sup> parties.

3. Resulting from high and steady investments in technology and innovation, the financial sector can be considered

Table 4. Accelerated growth strategies to develop the on-line DNA

C. Accelerated growth		
Strategic approach	Description	On-line DNA block development
1. M&A transactions	M&A (Mergers and Acquisitions) with other banks with unique digital capabilities.	<ul style="list-style-type: none"> <li>• Adding external DNA,</li> <li>• merging good solutions to obtain the best (broadest functionality, cost synergies to be achieved).</li> </ul>
2. Acquisition of FinTech companies	On-going search for and selective acquisitions of FinTech ventures.	<ul style="list-style-type: none"> <li>• Adding external DNA, possibly more advanced than developed internally.</li> </ul>
3. Startup financing	Investing in ventures with strong business concepts and developer teams.	<ul style="list-style-type: none"> <li>• Manufacture or acquisition of new DNA.</li> </ul>
4. Participation in accelerator platforms	Connecting small companies and startups (ideas and technologies) with large institutions and investors.	<ul style="list-style-type: none"> <li>• Manufacture or acquisition of new DNA,</li> <li>• Sample: “The Heart Warsaw”.</li> </ul>
5. In-housing the digital talent	Becoming a digital player by recruiting top experts in the digital areas of interest.	<ul style="list-style-type: none"> <li>• Manufacture of new DNA.</li> </ul>

Source: author's own work.

an industrial leader of digitalization, with significant further growth potential within and outside of the sector.

4. The evolution of services offered by banks will continue to cover a wide range of financial functionalities as well as non-banking options that visibly explore partnerships and new business models.
5. There are several strategies that can be selected by banks to continue their on-line banking development. These strategies cover continuous improvement and extension of the already implemented functionalities as well as introduction of new business models.

## 5. Conclusions

The work conducted by the author allowed for proposing responses to all three research problems. Referring to problem P1 – it was confirmed that there are no comprehensive reference directories of on-line banking functionalities offered by the banks operating in Poland. In chapter 3, a proposal of such a reference was formulated, in the form of “the DNA on-line” banking building blocks.

The hypothesis stated in problem P2 was confirmed, showing that despite strong focus on core-banking functionalities the evolution towards non-banking elements is evident. This should spark a discussion on the regulatory level to determine whether such development is desired or poses risks with respect to e.g. customer protection. In order to facilitate the resolution of problem P3, the author proposed a consolidated view on possible on-line banking development strategies. This structured view can be used both by business entities to study their competitive environment and by regulators to understand the changes in the Polish banking system.

The research on the functionalities of on-line banking solutions presented in this paper is limited and should be continued to further detail the development potential and strategies, providing valuable insights for the financial community of service providers and clients. The key question that requires further attention relates to the motivation of banks to continue developing functionalities that reach beyond banking and finance. On the one hand, all new on-line DNA blocks carry the potential to attract or retain clients and

generate or defend revenue streams. On the other hand, in the primary obligations of the banking license banks have a task of securing client deposits, managing the capital and the operating model in a way to prevent any deterioration of liabilities. In this respect, regulators might be reluctant to shape the legal environment in the direction of allowing banks to undertake more ventures that might defocus them from their primary purpose in the economy. The motivation of banks may also be affected by limited returns achieved from investments in advanced functionalities. DNA blocks that do not generate scalable returns become counterproductive – generating platform maintenance cost and overall management complexity. This is especially valid in cooperation of banks with governments. Taking as an example the recent development in Poland, banks filled a significant gap in the availability of mass scale solutions to process citizen applications for the “500+” government subsidy program. The financial sector was requested to collect the forms from their clients in a digital form (later transferred to the appropriate government entities), which greatly simplified (or even made it possible in a short timeframe) the operation for the government. While the program was a great success of private-public partnership, the financial results for the banks are debatable, pointing to the surplus of investment costs over returns (e.g. from acquiring new clients, increasing the loyalty or managing increased cash flows). At the same time, in a recent panel of financial experts<sup>14</sup>, banks declared that despite negative investment results they were willing to continue their partnership with the government to serve a leading role in the digital economy. This is especially encouraging taking into account the assumptions of the government program called “From Paper to Digital Poland” (Ministerstwo Cyfryzacji, 2017), where 9 large streams of work were defined to cover: digital public services, electronic identification (e-ID), IT architecture, cyber-security, e-health, cashless payments, country API, e-invoices, e-public-tributes/e-public-benefits. The positive approach towards private-public partnership in the digital government might change if the level of necessary investments (estimated as relatively low for the 500+ program) goes up, with continued lack

of visible business returns. Also at a certain point in time, the government might reach a level of digital maturity that might decrease the necessity for continued cooperation with the private sector, giving the full control of the process back to the state.

Another interesting research topic is to develop a view on competition between on-line banking applications (especially mobile versions) with the world of purely mobile applications (aka “apps”) that provide dedicated functionalities added up to the platform created by providers of mobile device systems, such as iOS/Apple Store and Android/Google Play. There are two primary philosophies stemming from client preferences: one approach is to use a “super” banking application for hosting a myriad of functionalities. As an alternative to the domination of a banking application, we may envision specialized applications developed by “XTech”<sup>15</sup> companies and integrated with financial applications via common application programming interfaces. The struggle between these two approaches has no clear winner, with banks developing and discontinuing both “super” or smaller dedicated apps. In the ring of pro-con arguments we can see the dimensions of user security, personal data protection, liability or synergies from internal integration.

In the final statement, the author would like to re-emphasize that on-line banking platforms and eco-systems that they support have the potential to play a leading role in the development of the digital economy. The core benefit comes from the fact that banks manage to create a safe transactional environment which is simultaneously open for interactions with markets and third parties. Another advantage is that banks in general have sufficient surplus of investment funding that is permanently allocated to the digitalization project. It is therefore a natural state of growth that can be used for the good of the banking clients and the entire economy in a local and global context.

#### Endnotes

- <sup>1</sup> Mobile ATM versions are available (example of Idea Bank in Poland), however this business model remains a minority and is oriented towards cash collection, in this case directly from SME clients.

- <sup>2</sup> Sample institutions of this profile include: Hello Bank!, Moven, Revolut, (<https://thefinancial-brand.com/69560/25-direct-online-digital-banks/>).
- <sup>3</sup> Retail banking is defined as servicing private and business clients with the annual net sales < PLN 1 billion.
- <sup>4</sup> The author was a member of the BRE7 project team, whose goal was to develop a retail bank based on the concept of small branches and strong remote channels (Internet and call center). The project was later transformed into making of mBank, the first digital bank in Poland.
- <sup>5</sup> Due to merger and aquisition/entry/exit activity on the Polish market, the “top 15” list was subject to fluctuation. In various points in time, the list included: Bank PKO BP, Pekao S.A., BPH, GE, Bank Handlowy, Citibank, Deutsche Bank, BRE Bank, Bank Zachodni (BZ), Wielkopolski Bank Kredytowy (WBK), Millennium, ING, Getin, Noble, Raiffeisen, Bank Gospodarki Zywnosciowej (BGZ), Fortis, BNP Paribas, Lukas Bank, Credit Agricole, Alior Bank, BOŚ Bank, Idea Bank, DNB Nord, Nordea Bank, Eurobank, Bank Pocztowy, Meritum, Nest Bank.
- <sup>6</sup> mBank, Intelligo (part of PKO BP), Volkswagen Bank, Toyota Bank, Alior Sync.
- <sup>7</sup> Bank Spółdzielczy we Wschowej (SGB Group), SK Bank (PBS Group) – now in liquidation due to insolvency and NeoBank (SGB Group).
- <sup>8</sup> The original term “DNA” refers to the deoxyribonucleic acid, serving as a carrier of genetic information used to grow, to develop and to enable the functioning and reconstruction of a living organism. The reference to this term is widely used in discussions on the composition of various models or concepts.
- <sup>9</sup> Regulatory blocks include compliance with regulations related among other to: customer protection (e.g. marketing opt-outs), suitability checks (e.g. for the Markets in Financial Instruments Directive, MIFID), control functions (e.g. FATCA, anti-money laundering) but also assuring accessibility for the disabled.
- <sup>10</sup> The levers related to capital, liquidity and regulations are excluded due to the author’s focus on business related drivers of the profit and loss (P&L) statement.
- <sup>11</sup> The FinTech industry covers technology firms specializing in the development of highly innovative technological solutions for financial companies, either by re-inventing/re-engineering of the existing value chains or by creating new value added services.
- <sup>12</sup> Payment Services Directive (PSD) 2 stipulates that banks launch the account information service (AIS) and the payment initiation service (PIS) that will be used by third party providers (TTP). It also covers the strong customer authentication (SCA) – assuring that 2 of 3 authentication factors are used: knowledge (e.g. a login/password), possession (e.g. SMS code on the telephone) and inherence (something a user has, e.g. fingerprint, iris pattern). For the full text of the PSD2 regulation please visit: <http://eur-lex.europa.eu/legal-content/en/TXT/?uri=CELEX%3A32015L2366>.
- <sup>13</sup> A known party signifies an individual who was adopted in the bank in the know-your-customer (KYC) process where legal proof of identification was provided to confirm the identity of the person. On-line credentials are associated to the known party, assuming that their usage in on-line transactions is performed by that party (excluding fraud and crime/identity theft).
- <sup>14</sup> The Banking Technology Forum (Forum Technologii Bankowej/FTB) took place in Jachranka on 26-27.04.2017. It covered a wide agenda of discussions on the expected leading role of banks in building the digital state, with broad functional coverage of the most citizen client needs. The FTB is organized by the Association of Polish Banks (ZBP) in cooperation with several key institutions, e.g. the Ministry of Digital Affairs.
- <sup>15</sup> The term XTech is introduced by the author to represent a wide range of companies that specialize in the development of technological solutions with high focus on user experience and advanced coverage of selected elements of value chains from various industries. The examples of such companies cover among others: FinTech (Financial), InsurTech (Insurance), RegTech (Regulations), IOT (Internet of Things).

## References

- Adamiec, J. (2009). Bankowość elektroniczna. In D. Grodzka (Ed.), *Spoleczeństwo informacyjne. Studia BAS*, 3(19). Retrieved from [http://orka.sejm.gov.pl/WydBAS.nsf/0/0507311B6922EAC6C1257A30003CD3D1/\\$file/7\\_19.pdf](http://orka.sejm.gov.pl/WydBAS.nsf/0/0507311B6922EAC6C1257A30003CD3D1/$file/7_19.pdf)
- Allison, D.K. (1995). *Interview with Mr. Don Wetzel, Co-Patentee of the Automatic Teller Machine*. National Museum of American History (NMAH). The Smithsonian Institute. Retrieved from <http://americanhistory.si.edu/comphist/wetzel.htm>
- Broeders, H. & Khanna, S. (2015). *Strategic choices for banks in the digital age*. McKinsey&Company Financial Services. Retrieved from <http://www.mckinsey.com/industries/financial-services/our-insights/strategic-choices-for-banks-in-the-digital-age>
- Chicago Booth. (2016). *The future of financial services – Marketplace lending: The challenges and opportunities posed by alternative lenders*. University of Chicago Booth School of Business. Retrieved from <https://www.chicagobooth.edu/~media/9b46a754c0fd4bb28ab91ae0f4fc28f0.pdf>

- Cronin, M.J. (1997). *Banking and finance on the Internet*. John Wiley and Sons. Retrieved from <https://books.google.pl/books?id=I94FEs-IMu4C>
- Kane, G. et al. (2016). Aligning the organization for its digital future. *MIT Sloan Management Review*. Retrieved from <http://sloanreview.mit.edu/projects/aligning-for-digital-future/>
- Kaszubski, R. & Widawski, P. (2006). Gospodarka elektroniczna w bankach. Warszawa: Związek Banków Polskich. Retrieved from [https://zbp.pl/public/repozytorium/dla\\_bankow/rady\\_i\\_komitetu/technologie\\_bankowe/publikacje/Gospodarka\\_elektroniczna\\_w\\_bankach.pdf](https://zbp.pl/public/repozytorium/dla_bankow/rady_i_komitetu/technologie_bankowe/publikacje/Gospodarka_elektroniczna_w_bankach.pdf)
- Maslow, A.H. (1954). *Motivation and personality*. New York: Harper and Row Publishers. Retrieved from [http://pages.ucsd.edu/~nchristenfeld/Happiness\\_Readings\\_files/Class%207%20-%20Maslow%201954.pdf](http://pages.ucsd.edu/~nchristenfeld/Happiness_Readings_files/Class%207%20-%20Maslow%201954.pdf)
- Ministerstwo Cyfryzacji. (2017). *Od papierowej do cyfrowej Polski* (A project of the Ministry of Digital Affairs. Ministry of Digital Affairs). Warszawa: Ministerstwo Cyfryzacji. Retrieved from <https://mc.gov.pl/projekty/od-papierowej-do-cyfrowej-polski/opis-projektu>
- Szwajkowska, G., Kwaśniewski, P., Leżoń K., & Woźniczka, F. (2010). *Usługi bankowości elektronicznej dla klientów detalicznych, charakterystyka i zagrożenia*. Warszawa: Urząd Komisji Nadzoru Finansowego. Retrieved from [https://www.knf.gov.pl/Images/Raport\\_Bankowosc\\_elektroniczna\\_tcm75-24666.pdf](https://www.knf.gov.pl/Images/Raport_Bankowosc_elektroniczna_tcm75-24666.pdf)
- Valavanis, K.P., Vachtivanos, G.J., & Antsaklis, P.J. (2007). *Technology and autonomous mechanisms in the Mediterranean: From ancient Greece to Byzantium*. Proceedings of the European Control Conference. Kos, Greece. Retrieved from <https://www3.nd.edu/~pantsakl/Publications/370-ECC07.pdf>
- Valor, J. (2015). Digitization of retail banking: The coming revolution. *IESE Face IT Blog Network*. Retrieved from <http://blog.iese.edu/faceit/2015/digitization-of-retail-banking-the-coming-revolution/>
- Wharton Opinion, Strategic Management. (2017). *How banks can keep up with digital disruptors*. Wharton Knowledge Publications. Retrieved from <http://knowledge.wharton.upenn.edu/article/banking-and-fintech/>
- Woźniczka, K. (2001). *Bankowość internetowa*. Kraków: Akademia Górniczo-Hutnicza w Krakowie. Retrieved from <http://home.agh.edu.pl/~woznicki/>