DIGITAL TRANSFORMATION OF BUSINESS MODELS

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Abstract: The goal of the article is to present the scope of changes in the morphology of business models in contemporary organizations that took place in the recent decades, because of the massive technological development, framed under the concept of "digital transformation (DT)." An enhanced business model canvas concept is used as a base for presenting the changes, with a general time cutoff set in the year 2000. For the period before and after this measurement date, key elements of the business model and the drivers of their transformation are documented in a structured form and commented, together with practical conclusions and proposed further study areas.

Keywords: digital transformation, business model, organization, organizational management, strategy, digitalization, business model canvas, consumer behavior, social trends, change management.

JEL: D02, O14, O32, O33.

1 Introduction

Within the recent years, the concept of "digital transformation (DT)[1]" reached a solid and high position in the discussion of leading elements that influence the development and survival of contemporary organizations. In the general sense, the DT can be defined as the modification (or adaptation) of business models, resulting from the dynamic pace of technological progress and innovation that trigger changes in consumer and social behaviors. It is important to note that this definition is only one of the many approaches proposed by both academic and business communities.

The interdisciplinary nature and a relatively short history of the DT result in the lack of commonly accepted definitions, ontologies, and taxonomies. Also, one may argue that DT is not a new concept, but merely a commercially driven refreshment of a previous trend, similar in shape and intensity to the "Web 1.0/dotcom" trend we experienced in the years 1995–2001. There are many resemblances between the "dotcom era" and today's intensive digital development: the emergence of several core technologies that started gathering the critical mass of usage, enormous and unjustified investments in innovative enterprises (despite their nebulous financials), rapid onboarding of technological tools by consumers and businesses, and the parallel, tech-driven growth of stock prices and profit expectations.

In this retrospective view, we cannot ignore the fact that the dot-com development was an economic bubble that burst in a wave of business disasters, market crashes, and significant financial losses within global economies. A learning organization will then pose a question on whether the current technological revolution carries a risk of repeating the same destiny. The risk of a significant trend collapsing under its own growth is always present, especially when it comes to a strong dependency on new technologies (including resources for their production) or reliance on new or modified social behaviors.

At the same time, today's DT is founded on years of development experience and broader understanding of past flaws. It is being conducted by digital teams that are better adjusted to manage the change brought about by innovation. Also, it is important to highlight that digitalization permeated public domains on various levels, with digital strategies being address by countries (e.g., Estonia's "e-Estonia" or "the Digital Republic")[2], economic alliances (e.g., the European Union's Digital Single Market)[3], or regulators (e.g., the Polish Financial Authority setting up the task force and department for regula-

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[1] In numerous publications available on the Internet, there are different acronyms used for the digital transformation. While the academia uses the "DT" as a shortcut, the industry is commonly using the "DX" term. The DX is, however, also referred to as the "digital economy."

[2] https://e-estonia.com/.

[3] https://ec.europa.eu/commission/priorities/digital-single-market_en.

tion and support of FinTech activity)[4]. With this development, we may expect that, at present, the digitalization is under tighter monitoring and supervision with respect to investor and customer protection. Setting aside the historical comparison, it is important to emphasize that mass trends tend to have both their negative and positive sides. Organizations that properly avoid the threats and seize the opportunities have a chance to achieve better than average growth rates, securing their position on existing or exploring new markets. It is, therefore, important to build the understanding of digital transformation as a motivation for introducing beneficial changes to organizational strategies and behaviors.

The goal of this article is to present important impacts of digital transformation on the business model of an organization. It is a practical view on diagnosing the current situation and the factors that drive business model changes. The changes are twofold: either voluntary, where the organization is actively shaping its future strategies via optimizations and investments, or reactive, where unplanned and unexpected changes adversely affect the business model and call for restructuring or emergency operations.

Business model adjustments to the digital / technological and social changes can, therefore, be understood as a transformation to a new organizational form − better fit for functioning in the digital economy, in relationships to the digital clients and partners as well as with the increasing usage of digital assets.

2   Business models in the digital economy

The definition of a "business model" is subject to typical academic debates that range from simple statements[5] and dictionary views[6] to philosophical

visions, such as P. Drucker's "answer to two most important questions: who is the customer and what does the customer value" (Ovans, 2015). Some researchers openly admit being highly surprised over no universally accepted definitions (Weill, 2011), whereas others question the necessity to have one definition (Jensen, 2013). This lack of mainstream taxonomy is also visible in various approaches to defining the relationship between the business models and the strategy. As investigated by Burkhardt, business model is (a) equalized with the strategy, (b) treated as a subset of strategy, (c) seen as a superset of the strategy, or (d) both concepts overlap, with various levels of the shared area reflecting their interdependencies (Burkhardt, et al., 2011).

This broad variety of definitions provides an interesting, multidimensional view on the core concept of a business model. However, for practical purposes, either business or academic, it is important to fix at least a general conceptual baseline of the analyzed phenomenon, with base ontology and taxonomy. Examples of such successful baselines often trace back to large consulting companies and their effort to develop frameworks for structured thinking and organizing of a solution/problem domain, for example, the Ansoff Matrix[7], the BCG[8] Matrix or Gartner Hype Cycles. In case of the business model, the most commonly used framework was proposed by Osterwalder and Pigneur in the form of a "business model canvas" (BMC) promoted via the strategyzer.com portal. The authors worked with 470 practitioners in 45 countries to gather all core elements of a business model in a single view. The resulting "canvas" contains the following components: key partners, key activities, key resources, value propositions, customer relationships, channels, customer segments, cost structure, and revenues (Osterwalder, 2010).

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[4] https://www.knf.gov.pl/en/MARKET/Fintech/Special_Task_Force_for_Financial_Innovation.

[5] Sample definitions gathered by the author from students in the "strategic management" class (spontaneous query): for example, it is a plan to generate profit, composition of key business dimensions, strategic plan, value proposition, or layout of business components.

[6] For example, "a plan for the successful operation of a business, identifying sources of revenue, the intended customer base, products, and details of financing" (Oxford, 2017).

[7] Definition available at https://www.ue.wroc.pl/p/aktualnosci/2014/Ansoff_Matrix_1_1.pdf.

[8] Boston Consulting Group (BCG), one of the top strategy consulting companies globally.
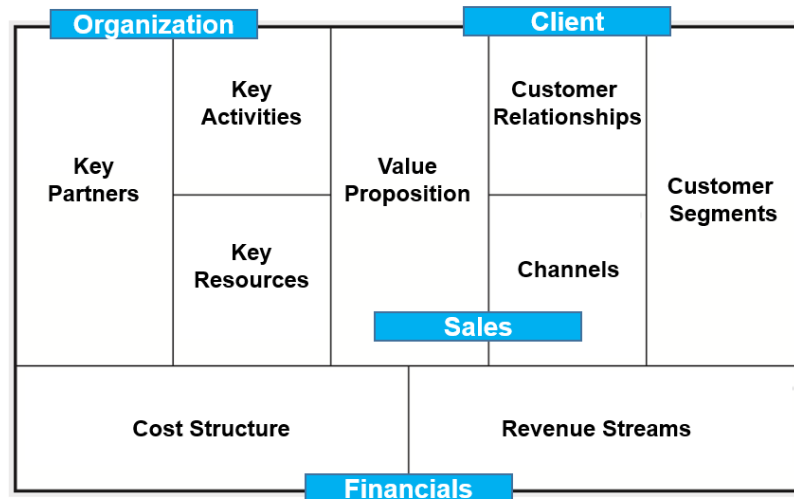
Figure 1. Elements of the business model canvas of www.strategyzer.com
(*Source:* Author's interpretation based on: Osterwalder, 2010)

The items are loosely coupled with minor grouping into the aspects of the organization, client, sales, and financials; however, no integration or relationship between the elements is provided (Fig. 1).

The relative simplicity behind the BMC provides support for quick and efficient content documentation in the process of identifying crucial components of an organization. Each area has a set of own, specific questions to be answered, for example, in "customer segments," it is necessary to describe who is the target of organizational value creation, how do we identify the most important customers, or how do we segment our customer base. The process of filling out the canvas is expected to gather not only the explicit knowledge of operations and numbers but also its tacit resources. It is the latter that provides valuable insights into what makes (or not) the model innovative, unique, and competitive.

The canvas built by various organizations may display a number of shared elements, especially on the level of industries or between direct competitors on the highly developed markets. The sum of shared and exclusive elements provides a blueprint of possible building blocks of a business model.

Such a compound view can be used by organizations to understand their business morphology and to analyze possible strategic adjustments (permanent or tested in a "champion-challenger" mode) − via adopting a new component, discontinuing or limiting the old one, or innovating beyond what is presently practiced on the market.

The BMC can be adopted to reflect the DT of the business model of an organization, supporting the primary goal of this article. However, before we proceed with the mapping of digitally driven transformation, it is necessary to settle the approach to the definition of the term "digital." Apart for the mathematical explanation of "digits" in the binary system[9], dating back to Gottfried Leibniz and his predecessors (Leibniz, 1703), the taxonomy of the digital area is equally unarranged as in the case of the business model.

There are many definitions and descriptions that have not yet been consolidated into an agreed reference point for scientific research or business usage. In the sample definitions collected by the author[10], we observe a wide variety of views. The meaning of "digital" and "digitalization" (as a process to introduce the "digital" into a selected aspect of reality) tends to be either highly underestimated (e.g., it is the conversion from analog to digital media) or highly overrated, turning the topic into a mystical "invis-

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[9] https://scholarworks.umt.edu/cgi/viewcontent.cgi?referer= htt ps://www.google.pl/&httpsredir=1&article=1315&cont.ext=tme.
[10] On the basis of literature, interviews, and polls run on linkedin.com, facebook.com. Names of contributors are not used.

ible hand" of innovation and social development[11]. As Ovid would most likely conclude – "*medio tutissimus ibis*"[12] – the safest is to go in the middle. The common "middle" denominator found in the definitions is that digital is the **formation of new entities and relationships driven by application of information technology**. In this statement, the information technology is seen as an enabler of changes to the paradigms of organizations and individuals. New entities and relationships come about in all aspects of reality – in business, society, or individual beliefs and decisions. This permeation into every domain of our life is, therefore, a key rationale for seeking the understanding of the digital drivers and their already observable and expected impacts on the business reality today and in the future.

With the above definition in mind, we may undertake the mapping of DT drivers onto the BMC. The approach taken by the author included several steps. First, the canvas was adopted to a view that has a different layout and content of components, modifying the ordering contained in the original BMC (by strategyzer.com)[13]. The boxes were arranged in two rows of rectangles, with the upper row being larger than the bottom, because of the quantity of list items. The revenue streams and cost structure were consolidated into a single category of Financials and Economics. The customer segments area was renamed to client and client segments to emphasize that the client is a broader term than just the segmentation itself. The value proposition title was extended with "advantage" to reflect the competitive aspect of every organization. The key activities were rephrased to "activities and energy usage" in order to reflect that organizational energy is consumed also while idling. In the second step, the canvas was filled elements reflecting the ontology of each business model domain. These ontological elements were combined into three groups:

1) Classical mainstream ontology

It is widely present in the organizational business models before the 1980s, containing elements that persisted (are still in use today) since ancient times and the first organizations formed by humans; it also covers selected base technologies (e.g., Intel microprocessors, TCP/IP[14], liquid crystal display (LCD), email, first home computers) and companies (e.g., Apple, Microsoft) that laid a foundation for further digital development.

2) Wave 1 (1980–2000) ontology

It is the changes brought about by the digital transformation, triggered mainly by the rise of the Internet[15], the popularity of personal computers and entertainment stations (e.g., the Atari computers), graphical user interfaces, and mobile telephony (wide adoption of Motorola and Nokia devices) and introduction of information platforms, such as the Global Positioning System (GPS). The end of this period is marked in the times of the "dotcom" bubble burst, when a number of digitally driven business models failed to provide sufficient scale of business and economic returns from the investments. In the general sense, this period corresponds to the Web 1.0[16] term used by the business and academia.

3) Wave 2 (Beyond 2000) ontology

The period of further dynamic growth of Internet usage accelerated by data mobility, storage and processing capacity development, and widespread technological innovation in hardware and software. In the "Web/WWW" taxonomy, this period is already being classified as high as Web 4.0, definitely going further than Tim O'Reilly's Web 2.0[17], however, without a commonly accepted distinction of phases.

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[11] Sample presented by McKinsey: "We view digital as the nearly instant, free, and flawless ability to connect people, devices, and physical objects anywhere" (Bughin, 2018).

[12] Ovid, Metamorphoses, Book II, verse 137. Source: http://ovid.lib.virginia.edu/trans/Metamorph2.htm#476707493.

[13] The BMC, released under Creative Commons license, is open for building other approaches and variations on the concept. http://support.strategyzer.com/knowledgebase/articles/506842-can-i-use-the-business-model-canvas-or-value-propo.

[14] Transmission Control Protocol/Internet Protocol.

[15] Driven by the global adoption of the TCP/IP standard.

[16] https://www.researchgate.net/publication/264845599_Comparative_Study_of_Web_10_Web_20_and_Web_30.

[17] Web 2.0 is widely accepted as a term coined by Tim O'Reilly between 2002 and2004, explaining the difference between the dotcom era web systems and their development toward being more open, interoperable, and driven by user-generated content. http://www.oreilly.com/pub/a/web2/archive/what-is-web-20.html.
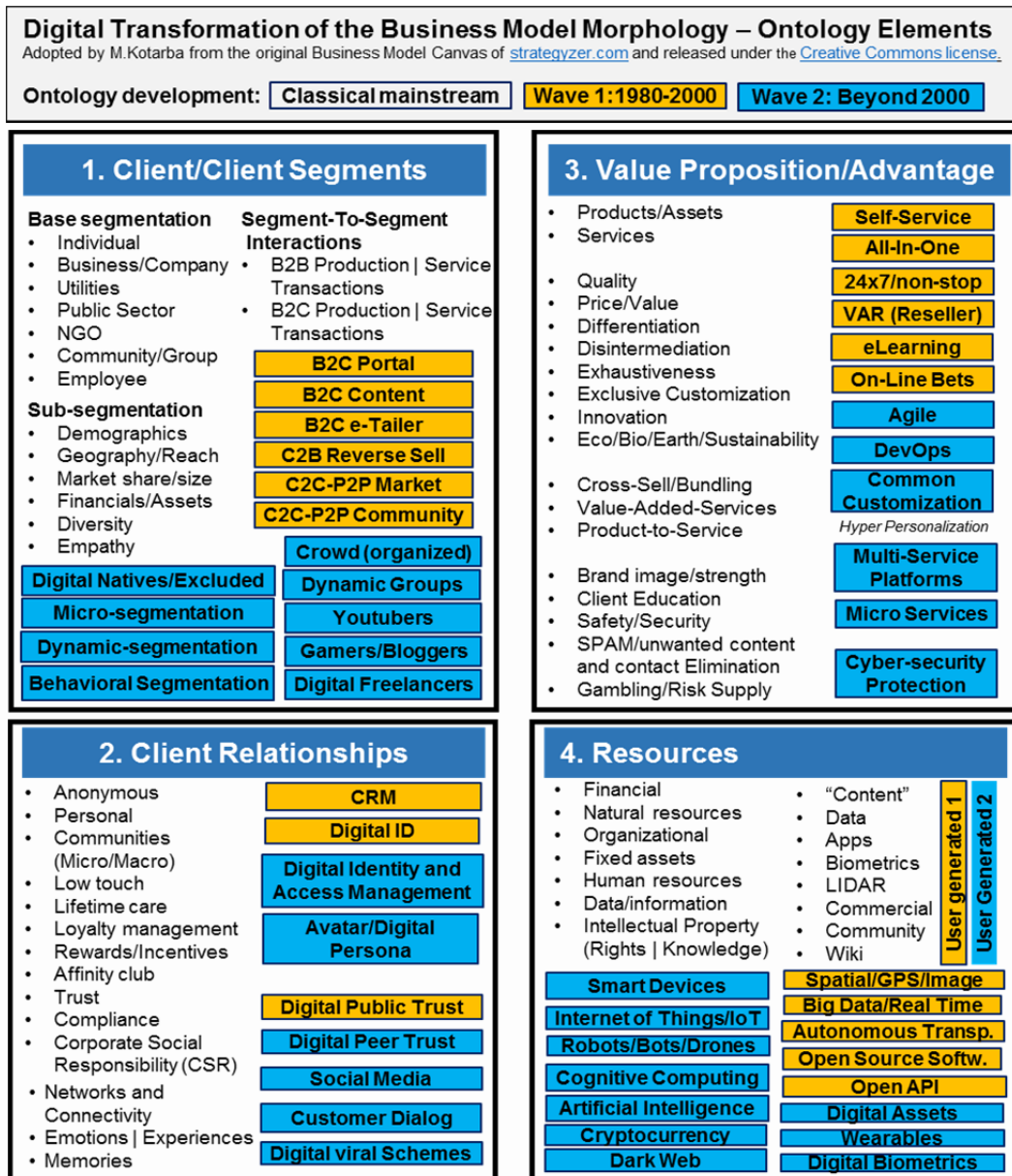
Digital Transformation of the Business Model Morphology – Ontology Elements
Adopted by M.Kotarba from the original Business Model Canvas of strategyzer.com and released under the Creative Commons license.

Ontology development: Classical mainstream | Wave 1:1980-2000 | Wave 2: Beyond 2000

1. Client/Client Segments

Base segmentation
- Individual
- Business/Company
- Utilities
- Public Sector
- NGO
- Community/Group
- Employee

Sub-segmentation
- Demographics
- Geography/Reach
- Market share/size
- Financials/Assets
- Diversity
- Empathy

Segment-To-Segment Interactions
- B2B Production | Service Transactions
- B2C Production | Service Transactions

B2C Portal
B2C Content
B2C e-Tailer
C2B Reverse Sell
C2C-P2P Market
C2C-P2P Community

Crowd (organized)
Digital Natives/Excluded | Dynamic Groups
Micro-segmentation | Youtubers
Dynamic-segmentation | Gamers/Bloggers
Behavioral Segmentation | Digital Freelancers

3. Value Proposition/Advantage
- Products/Assets
- Services
- Quality
- Price/Value
- Differentiation
- Disintermediation
- Exhaustiveness
- Exclusive Customization
- Innovation
- Eco/Bio/Earth/Sustainability
- Cross-Sell/Bundling
- Value-Added-Services
- Product-to-Service
- Brand image/strength
- Client Education
- Safety/Security
- SPAM/unwanted content and contact Elimination
- Gambling/Risk Supply

Self-Service
All-In-One
24x7/non-stop
VAR (Reseller)
eLearning
On-Line Bets
Agile
DevOps
Common Customization
Hyper Personalization
Multi-Service Platforms
Micro Services
Cyber-security Protection

2. Client Relationships
- Anonymous
- Personal
- Communities (Micro/Macro)
- Low touch
- Lifetime care
- Loyalty management
- Rewards/Incentives
- Affinity club
- Trust
- Compliance
- Corporate Social Responsibility (CSR)
- Networks and Connectivity
- Emotions | Experiences
- Memories

CRM
Digital ID
Digital Identity and Access Management
Avatar/Digital Persona
Digital Public Trust
Digital Peer Trust
Social Media
Customer Dialog
Digital viral Schemes

4. Resources
- Financial
- Natural resources
- Organizational
- Fixed assets
- Human resources
- Data/information
- Intellectual Property (Rights | Knowledge)

- "Content"
- Data
- Apps
- Biometrics
- LIDAR
- Commercial
- Community
- Wiki

User generated 1 | User Generated 2

Smart Devices | Spatial/GPS/Image
Internet of Things/IoT | Big Data/Real Time
Robots/Bots/Drones | Autonomous Transp.
Cognitive Computing | Open Source Softw.
Artificial Intelligence | Open API
Cryptocurrency | Digital Assets
Dark Web | Wearables
 | Digital Biometrics

Figure 2 (Part 1). The Digital Transformation of the Business Model Morphology
(*Source:* Author's interpretation, based on the BMC: Osterwalder, 2010)

It is important to mention that providing a very precise cutoff between the above groups/periods and the assignment of individual morphological elements to these periods was not a goal of this research.

The assignment to time periods was done based on expert knowledge and not with the precise date-based information[18]. Such precision does not add value to the overall concept of assembling the current ontology of business modeling and highlighting the most recent trends. The ontological elements in Wave 1 and Wave 2 are displayed in the form of blocks that extend the morphology of potential business models. The final result of the above steps is delivered in the form of a BMC entitled: The Digital Transformation of the Business Model Morphology – Ontology Elements (Fig. 2).

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[18] The reason to abandon precise dating is mainly due to the fact that the appearance of a new technology/business concept is not linked to its market adoption. The availability of detailed calendar data and market size/usage is limited, and it would not add

value to the goal of this study. The year of launch was provided in selected cases, where it is not debatable.
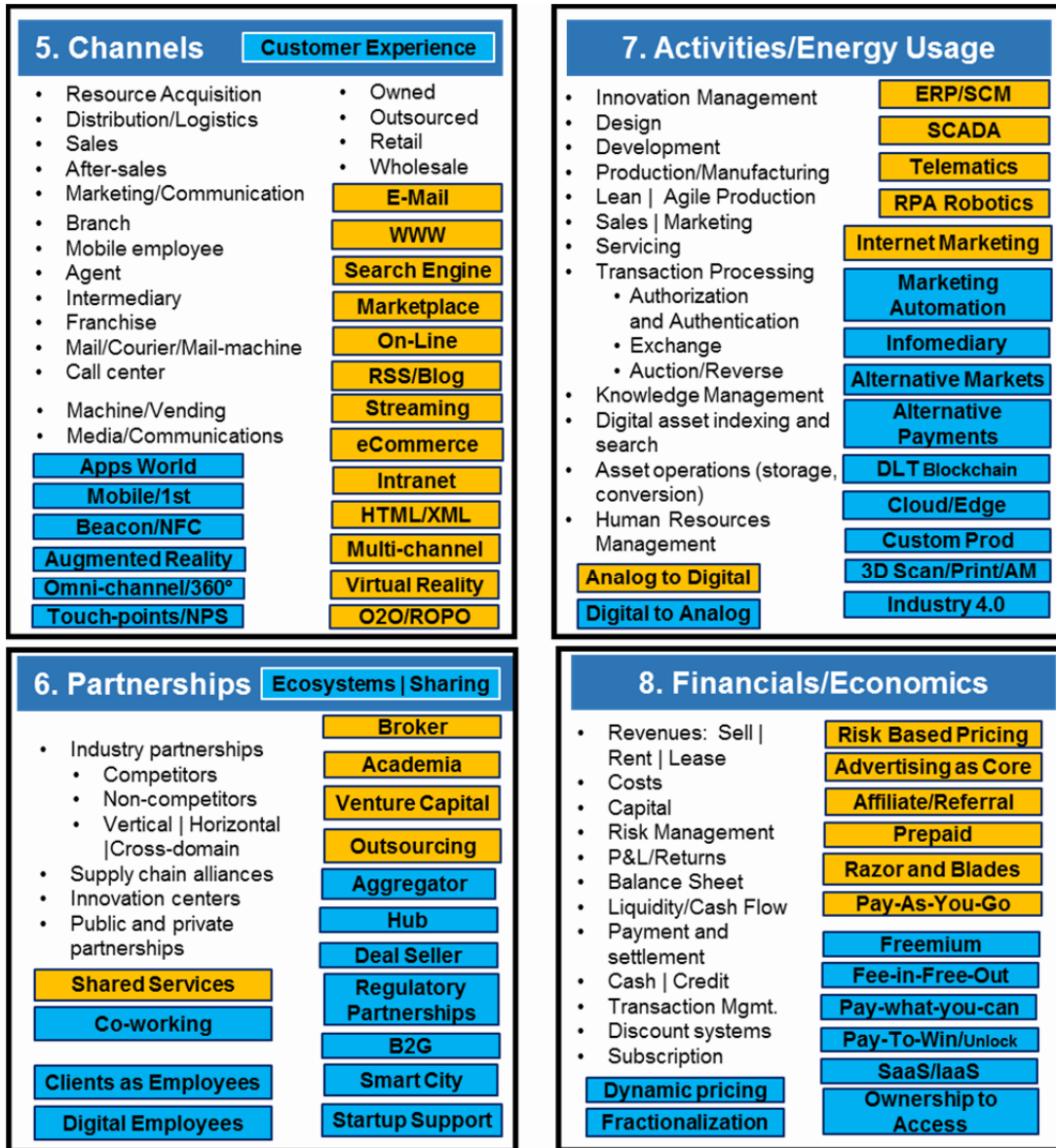
Figure 2 (Part 2). The Digital Transformation of the Business Model Morphology
(*Source:* Author's interpretation, based on the BMC: Osterwalder, 2010)

For reference purposes, the one-pager version of the morphology is presented in Appendix 1.

In the next sections, each domain of the canvas is discussed in more detail, providing highlights of the DT of the business model.

2.1   Client/Client Segments

The client domain was selected as a starting point for the discussion of the business model (Table 1),

in line with the widely adopted client-centric[19] paradigm of contemporary organizations. Primarily, it covers the aspects of segmentation and also the relationships between the segments, forming various configurations of mutual interactions in both standard production and services, as well as transactions. The following elements can be allocated to each ontology group.

[19] According to McKinsey, about 30% of Fortune 500 companies in 2015 already implemented the customer-centric structure aimed at organizing the activities around customer groups; https://hbr.org/2015/06/customer-centric-org-charts-arent-right-for-every-company.

Table 1. Digital transformation of business models – the client domain
(*Source:* Author)

2.1 Client/Client Segments – Classical Mainstream	

1. Base segmentation:
  a) individual,
  b) business/company,
  c) utilities,
  d) public sector,
  e) nongovernmental organizations (NGO),
  f) community/group.
2. Sub-segmentation:
  a) demographics,
  b) geography, territorial reach,
  c) market share/size,
	d) financials/assets,
	  e) diversity.
	3. Empathy
	4. Segment-to-segment interactions[20]:
	  a) B2B – Business to Business (standard form: production and services),
	  b) B2B – Transaction processing (e.g., FX trading),
	  c) B2C – Business to consumer transaction processing (e.g., home banking).

2.1 Client/Client Segments – Wave 1 (1980–2000)
New segment to segment business interactions: 1. B2C portal – vertical or horizontal data collection and presentation, 2. B2C content delivery, e.g., digital media sales, 3. B2C eTailer (e-Commerce retailer), such as a bookstore, with online sales and offline delivery, 4. C2B (consumer to business) – e.g., clients reverse selling previously purchased goods, 5. C2C-P2P (consumer to consumer or person to person)[21] market – e.g., local auction services, local classified ads, 6. C2C-P2P Community, e.g., alumni sites.

2.1 Client/Client Segments – Wave 2 (Beyond 2000)

1. New segments:
  a) digital natives,
  b) digitally excluded,
  c) digital freelancers – individuals whose digital competencies can be used across the world as long as they are able to access the Internet (programmers, designers, consultants),
  d) crowd (organized groups with particular interests, demands, or capacity),
  e) dynamic groups (e.g., participants of an event or people grouped for a short period of time in a geographical location),
  f) influencers | promoters – people or groups shaping the opinions (both positive and negative) or decisions of others:
    • bloggers (online publishers and trend setters),
    • youtubers[22] – content generating individuals with commercial gratification (fees),
    • gamers (game players, shifting from digital to analog).
2. Microsegmentation (e.g., using Big Data to further explore the unique characteristics of subpopulations).
3. Dynamic segmentation (e.g., using online information from real-time sensors to identify specific segmentation parameters).
4. Behavioral segmentation (e.g., using lifetime data to observe trends and forecast their development).

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[20] In the literature, we frequently find these concepts under the category of "e-Commerce or e-Business business models." This may be considered misleading as these basic interactions existed before introduction of the Internet but were simply delivered via other collaboration and market media/technologies.

[21] There is no clear border between C2C and P2P – both reflect the interactions between individuals. P2P is also referred to as "peer-to-peer," reflecting individuals of similar profile/nature.

[22] The tern "youtubers" describes a person who operates a channel on Google's YouTube service and generates content for subscribers and occasional (search or viral) users. Youtubers collect fees for high numbers of subscribers and views.

Table 2. Digital transformation of business models – the client relationship domain
(*Source:* Author)

2.2 Client Relationships – Classical Mainstream	

Nature of relationships:
1. Privacy: anonymous | named/identified | tracked/stealth,
2. Depth:
   a) low touch – transaction based,
   b) high touch – personal | intimate,
3. Time | frequency:
   a) lifetime care,
   b) one-time | occasional,
4. Trigger:
   a) regular usage,
   b) spontaneous | event based,
5. Emotional content:
   a) feelings | indifference,
   b) experiences (good and bad),
   c) memories.
	6. Communities (micro | macro | global).
	7. Networks and connectivity:
	   a) correlation,
	   b) dependence.
	8. Loyalty management:
	   a) loyalty | affinity clubs/circles,
	   b) rewards | incentives (bonus and malus systems),
	9. Trust management.
	10. Regulatory compliance.
	11. Corporate Social Responsibility (CSR).

2.2 Client Relationships – Wave 1 (1980–2000)
1. Customer Relationship Management (CRM) systems and organizational philosophies. 2. Digital ID (identification) as a digital or hybrid equivalent of public proof of identity. 3. Digital public trust | public key infrastructure | root certificates | digital signature – formation of trusted third parties to form a safety and control layer in digital deals. 4. Privacy | consent | permission management (opt-in and opt-out).

2.2 Client Relationships – Wave 2 (Beyond 2000)
1. Digital identity and access management (DIM) – comprehensive and integrated processing of user identification and activity tracking, including authentication, authorization, non-repudiation, prevention of fraud, identity theft, data breaches, and privacy/secrecy violations. 2. Avatar[23] | digital persona – a unique entity present in digital transactions or content, as either a reflection of or an alternative to a real human being. 3. Digital peer trust – the institution of creating mutual trust within user communities rather than via trusted third parties. 4. Social media | social networks – highly interactive platforms for exchanging human and group information mostly related to daily life and emotional aspect of expressing basic feelings such as liking, being surprised, or angry. 5. Customer dialog – the philosophy of building a planned narration for every customer interaction, based on the available preferences and data. 6. Digital viral schemes – utilization of the asymmetry between propagation of negative and positive opinions to achieve communication targets.

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[23] From the Sanskrit language, it means the material appearance of a deity. In reality, it is the opposite – the human form is reflected in the digital world in form of close to real or alternative complexion, for example, an imaginary organism.

Within the client domain, the following key insights can be provided:

1) Further deep-dive into customer segments: micro, behavioral, and dynamic segmentation, based on broader accessibility and use of data on objects and their relationships, including a wide range of sources such as Big Data, cross-industry databases, public data, or digital archives.

2) The appearance of new segments, such as the digital natives – clients who have not experienced the majority of recent technologically driven changes but treat the current reality as the only proper paradigm or the natural order of things. On the other side of the spectrum, we observe the segment of "digitally excluded" people who lack digital knowledge/ skills or access to the technology.

3) Growth of peer-to-peer (P2P) and crowd solutions: from information-based to transactionality and wide sharing of life interests, capital, risk, or financial gain/wealth.

4) The rise of new social profiles such as gamers, bloggers, youtubers, freelancers, and their associated capacity to influence the decisions and behaviors of others. These profiles disrupt the popularity paradigms based on traditional media appearance (such as classical television or "movie theater" film industry) by capturing attention of consumers in the digital media only.

5) Dynamic groups (e.g., clients of a store at a given moment in time or participants of a conference or a public event) with their common, but volatile interests or emotions that can or need to be explored/ serviced momentarily.

2.2 Client Relationships

The client relationships domain describes the nature of interactions that organizations may have with their clients (Table 2). The relationships are described by several parameters, for example, intimacy (anonymous to personal), duration (one time to lifetime), span/reach (networks, groups), true nature (financial, emotion, or trust based), or the level of regulations (compliance).

The relationships with the clients are being impacted mainly by the rapid growth and swiftness of connec-

tivity within human and corporate networks. Key insights include the following:

1) The emergence of digital identity management as a separate field, seen as a key to enable advanced digital business models.

2) Social media becoming a mandatory consideration for organizations, to be addressed in the form of either an entry or avoidance strategy.

3) Introduction of customer dialog as a new discipline to a multiangle customer relationship management.

4) Peer trust is becoming a visible alternative to traditionally trusted institutions (e.g., banks or highly reputable consumer brands). Social trust capital is moving toward crowd-based opinion centers.

2.3 Value proposition/advantage

The value proposition and competitive advantage domain is aimed at describing the core elements that determine the principal purpose for the clients and client relationships and distinguish a given organization from competition (Table 3).

One of the core developments in the value proposition is related to multiservice platforms created to attract not only direct customers but also other service providers. In order to achieve this effect, the platform needs to provide a development environment or a set of open application programming interfaces (API) allowing for remote transactions.
These third party providers can enhance the ecosystem by developing specialized and innovative solutions that would not be originated by the platform founder, because of various internal and external considerations.

Platform creation runs in parallel to the appearance of microservices that provide a narrow scope of specialized functions and can be offered as building blocks of larger workflows, regardless of the number or type of their ultimate operators. In the process of platform and microservice development, as well as in other value proposition modifications, it is important to increase the dexterity of the organization – especially via application of agile tools and methods.

Table 3. Digital transformation of business models – the value proposition/advantage domain
(*Source:* Author)

2.3 Value proposition/advantage – Classical Mainstream

| 1. Object of trade/market participation: products \| assets \| services.
2. Value chain focus points:
   a) quality,
   b) price/value ratio (performance),
   c) differentiation,
   d) disintermediation of existing value chains,
   e) exhaustiveness of service,
   f) exclusive customization, | g) innovation,
   h) ECO/Bio/Earth/Sustainability,
   i) cross-sell/bundling,
   j) value-added-services,
   k) brand image/strength,
   l) client education,
   m) safety/security,
   n) SPAM/unwanted content and contact elimination,
   o) gambling/risk supply.
3. Product-to-service conversion. |

2.3 Value proposition/advantage – Wave 1 (1980–2000)

1. **Digital self-service**: enabling sales and aftersales activities for direct execution by clients and partners.
2. **All-in-one** service point (e.g., purchase of all financial and insurance services in one institution for simplified processing).
3. **24x7** operation, increasing the availability of the solutions for self-service.
4. **Value-added reseller** (VAR) – scheme of enhancing original products or building them into a larger offering.
5. **eLearning** – remote delivery of knowledge services/human resources development and aptitude verification.
6. **Online bets/gambling** – provision of risk-based services in the online mode.

2.3 Value proposition/advantage – Wave 2 (Beyond 2000)

1. **Common customization and hyper-personalization** – the digital ecosystem allows to process the information on very detailed customer needs and preferences to reflect them in the production or service delivery processes.
2. **Agile methodology** and philosophy, aimed at shortening the development cycles, optimizing expected commercialization (decreasing the risk of low end solution adoption), and increasing the flexibility of the organization to quickly adapt to changes.
3. **DevOps** – software engineering concept of streamlining software code development and software operations management; the value proposition here is related to shorter development cycles and more dependable/stable releases.
4. **Multiservice platforms** – wide range of services offered in a single user environment are expected to increase the cross-sell and client loyalty, for example, through means of convenience or bundle pricing.
5. **Microservices** – atomization of previously integrated value chains toward a set of small services with low unit cost of usage (large scale, low price).
6. **Cybersecurity protection** – assuring digital solutions that display high resistance to security hazards and fraud schemes.

Table 4. Digital transformation of business models – the resources domain
(*Source:* Author)

2.4 Resources – Classical Mainstream	

1. Common and traditional resources[24]:
   a) financial | capital | liquidity,
   b) human resources,
   c) natural resources,
   d) organizational resources,
   e) fixed assets | equipment,
   f) legal (agreements, intellectual property).
	2. Digital resources:
	   a) base data/information (mainly databases), structured | unstructured,
	   b) software solutions,
	   c) biometrics (fingerprint, 1891),
	   d) data from light detection and ranging – LIDAR (1960s).

2.4 Resources – Wave 1 (1980–2000)

1. **Internet "content"** (organized, grouped, and openly sourced documents of all types).
2. **User-generated resources – phase 1:** blogs, forums, WWW sites.
3. **Spatial data** on geographical objects (Geographical Information Systems).
4. **Global Positioning System** (GPS) and the associated data (1983 reaching the initial operating capability).
5. **Autonomous** (and automated[25]) **transportation** – driverless cars and transportation systems (e.g., 1984 Eureka Prometheus).
6. **Open Source Software** (OSS) – movement (1998) to jointly develop source code that would be rich in functionality, secure, affordable (potentially offered as **free-ware**), transparent, flexible, perpetual, and interoperable (e.g., web browsers – Firefox, Opera).
7. **Open API** (Application Programming Interface) – access for developers to proprietary software solutions or web services, frequently following some form of Systems Open Architecture – SOA (90s).
8. **Big Data** – the term coined in the 1990s, describes data sets of high volume, variety, velocity, variability, and veracity.

2.4 Resources – Wave 2 (Beyond 2000)

1. **Digital assets** – although already present in the business models, in Wave 2, the digital assets group grows in size and form to contain among others: documents in various forms (text, graphics, video, audio), programs and applications, data sets, and also indexes, expert systems, neural networks, or artificial intelligence devices.
2. **Apps** (applications) – atomized software packages aimed to perform specialized functions and developed primarily by third parties (companies and individuals) based on a software development kit (SDK) and code admission policies.
3. **Smart devices** – tablets, phones, pods, watches.
4. **Mobile applications** – optimized for usage on portable smart devices.
5. **Multimodal and advanced biometrics** (iris finger vein, face recognition, voice recognition, life parameter tracking).
6. **Wikipedia** (2001) – reference site for high level knowledge sources, maintained by volunteers (content creation and verification).
7. **User-generated resources – phase 2:** Youtube video and sound (2005), Flickr images (2004), Instagram images (2010).

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[24] Partially based on Seppänen (2009) — see the source for an extended the resource categorization discussion.

[25] For details, see the SAE Taxonomy and Definitions for Terms Related to Driving Automation Systems for On-Road Motor Vehicles, https://www.sae.org/standards/content/j3016_201609/.

8. **Internet of Things** (**IoT**) – equipping the products with various types of input/output devices (I/O; such as sensors or radio frequency identification/RFiD tags) and allowing **real-time** data acquisition and control[26]. IoT devices worn directly by humans/live creatures – **wearables** (e.g., activity trackers or life data monitors).
9. **Robots** – further development of the robots in their physical capacity to replace human labor and their purely digital form (**bots**).
10. **Drones (Unmanned Aerial Vehicle, UAV)** – devices used for a wide range of functions from imaging and inspection to logistics and battlefield reconnaissance and combat.
11. **Cognitive computing** – **artificial intelligence** (**AI**) and signal/sensor processing: machine learning and reasoning (expert systems), natural language processing (NLP), object/behavior/sentiment recognition, human computer/machine interaction.
12. **Cryptocurrency** – cryptography-based coins as means of value storage, transaction intermediation, and an investment vehicle (Bitcoin 2008).
13. **Darkweb** – networks located on the Internet but require additional user authentication, in form of software, configuration, or tokens. Owing to its frequently illegal uses, the Darkweb allows for public security institutions to infiltrate and destroy harmful forms of human activity.

Table 5. Digital transformation of business models – the channels and customer experience domain
(*Source:* Author)

2.5 Channels and customer experience – Classical Mainstream

1. Channel purpose:
   a) resource acquisition,
   b) distribution/logistics,
   c) sales,
   d) aftersales,
   e) marketing/communication.
2. Channel core features:
   a) owned | outsourced | shared,
   b) retail | wholesale | direct.

3. Channel form:
   a) branch,
   b) mobile employee,
   c) agent,
   d) intermediary,
   e) franchise,
   f) mail/courier/mail machine,
   g) call center,
   h) machine/vending,
   i) media/communications.

2.5 Channels and customer experience – Wave 1 (1980–2000)

1. **Email** (1980s) – exchange of messages and attachments, active email content with tracking of read/response.
2. **World Wide Web, also known as The Web** (WWW) – Internet-based content storage and service (1989, Tim Berners-Lee).
3. **Search engine** – index of WWW content, allowing for faster identification and access (1992 The Whois user search, 1991 Gopher, 1993 W3Catalog, 1994 Webcrawler, Lycos, 2000 Google, Yahoo/Inktomi, 2009 Bing).
4. **Marketplace** – variety of commercial sites constructed to enable transactions between Internet users (Amazon 1994).
5. **Online** – access to services via the Internet, especially popular in finance and banking; shifting more functionalities to self-service.

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[26] The IoT may be considered an extension of the SCADA concept (see the subchapter on business model – activities), where the primary concept is the ability to measure a part of a process and control it remotely based on I/O devices.

6. **Hypertext Markup Language/Extensible Markup Language** (HTML/XML) – core programming language of web content (1990s).

7. **Rich Site Summary/Really Simple Syndication** (RSS) – feeding mechanism providing summarized web site information that can be used by content aggregators (e.g., news aggregation).

8. **Blog/Streaming** – a range of mechanisms to publish content originated by popular users (no necessity to have extensive WWW knowledge or programming skills).

9. **eCommerce** – Internet-based trade systems.

10. **Intranet** – application of WWW technologies inside the organizations to structure the knowledge resources and foster employee collaboration.

11. **Multichannel** – providing access to services of an organization via a mix of channels, for example, stationary shops, call center, and online.

12. **Virtual reality** – computer-generated reality, typically with a use of 3D goggles (broad development in the 1990s).

13. **O2O** (online-to-offline and reverse) or **ROPO** (research online purchase offline and reverse) – shifting channels to benefit from either physical inspection and human sales advice or the pricing/convenience of Internet commerce.

2.5 Channels and customer experience – Wave 2 (Beyond 2000)

1. **Apps world** – shift from the previously dominant "boxed software/license key" model to an online store with various licensing models (e.g., eternal license, freemium, "1$" fee, or "in-app purchases"). Direct sales channel for computer/smart device applications (Apple 2008, Microsoft 2011, Google 2012) with a significant benefit of remote update services (no need to distribute physical software media).

2. **Mobile 1st** philosophy of designing the user experience starting from mobile devices (focus of development) and later upscaling to traditional computers or workstations.

3. **Beacons** – devices that detect the presence of smart devices and are capable of assuming a push–pull information exchange in a given location (indoor navigation and positioning). Owing to operation based on the advanced Bluetooth protocol (BLE), beacons are ousting the previously developed **NFC** (near-field communication) standard.

4. **Augmented reality** – combining live views with digital content, for example, to provide additional information on the objects being viewed (developed in the 1990s, with notable Google Glasses in 2013, PokemonGo 2017).

5. **Omnichannel** – evolution of the multichannel architecture by assuring the information in all channels is completely synchronized and continuous (e.g., start of the process in one channel can be resumed and completed in another). It also covers a **360° view** of the client/trade/object position.

6. **Customer experience** – the concept of designing client products and services based on all client touch points (e.g., purchase thoughts/ideas, information gathering, offer evaluation and presentment, sales and aftersales) assuring positive emotions and satisfaction, frequently measured by the **Net Promoter Score** (NPS).

2.4 Resources

The resource domain describes key sources and supplies used by the business model (Table 4).

The wealth of new digital resources presented above suggests that organizations need to be increasingly aware of the changes they are bringing to the existing value chains. Traditional products and services (e.g., physical book or human financial advice) will continue the migration to their digital equivalents, frequently superior across many dimensions (e.g., user experience, availability, resilience, flexibility or unit cost). Moreover, new digital resources will continue to emerge, either disrupting or creating sources of value.

This will be mainly fueled by the rapid development of new data sources collected in real time and the availability of non-human intelligence to use the data in the decision-making processes.

2.5   Channels and customer experience

Channels in the business model reflect means of communicating and exchanging value (products and services) with the clients (Table 5). This domain was extended by the author with customer experience, which is becoming a core dimension of evaluating channel advancement and their usability.

The channel domain is characterized by disruptive changes that open many new opportunities for building client interactions and relationships. The paradigm of channels is shifting from the previous focus on distribution logistics and simple communications to an architecture of customer dialog, where the sales process is managed already on the very early stages of client interest in a given product or services and continued to yield an uninterrupted client experience, as a seed of further sales growth. This is becoming especially relevant for traditional organizations oriented toward classical supply and demand theories.

2.6   Partnerships, ecosystems, sharing

The partnership domain describes cooperation arrangements between various market participants (Table 6). The original BMC taxonomy was extended with the concept of ecosystems (sets of interconnected organizations, usually sharing certain transaction and communication platforms). Although various forms of partnerships existed at the dawn of entrepreneurship, the digital transformation allows to create new types of partnership enabled by the usage of advanced technologies. Instant connectivity and access to the ever-growing sources of data support new cross-sell or cross-service opportunities. On the other hand, the cooperation forms and settlement mechanism are becoming more complex and more challenging from the legal and regulatory point of view (e.g., because of the allocation of responsibilities and indemnity). One of the key trends to recognize in this domain is the creation of original ecosystems where new, digitally enabled products or services encourage the demand via nontraditional methods (e.g., with a dominating share of P2P networking). A good example of entirely new ecosystems is provided by crypto-currencies (e.g., Bitcoin or Ethereum) that attracted massive, global attention of investors, despite being largely not understood. Another key trend is related to the strengthening of different forms of sharing (e.g., "ride share," "parcel delivery by travelers") and atomization of product/service usage (e.g., car rentals "per minute"). In both cases, the purpose is to minimize the cost for each individual consumer (removing fixed costs, obtaining revenues from a resource that already bears fixed cost).

2.7   Activities/Energy usage

The activities domain contains a description of core actions performed by the resources within the business model (Table 7).

In the activities domain, we observe two primary trends. First, the evolution of well-established activities toward more digital forms and new levels of advancement (e.g., marketing automation or cloud computing). Here we should point out that some activities from Wave 1 served as a base for influencing other areas of the business model morphology in Wave 2. For example, the supervisory control and data acquisition (SCADA) concept that was developed in the industrial setting can be considered a predecessor of the Internet of Things enabled in the personal world, mainly thanks to the advancement in sensor and communication technology and costs. The second trend covers innovative solutions that challenge current paradigms (e.g., safety of transactions is guaranteed by a public distributed ledger rather than the core systems of large "trusted" institutions).

2.8   Financials/economics

The financials and economics domain covers the performance aspects of the business model, expressed mainly in financial terms and also in the form of performance indicators and systems of measures (Table 8).

The financial and economics domain shows a strong disruptive movement in the area of revenue generation. In Wave 1, the industry was first exposed to business models that built their cash inflows on sources not related to their primary value proposition. In Wave 2, this trend is further extended by exploring economies of scale (collection of small fees from a large pool of users or identifying a community interested in the service to the point of providing the financing for it). Another very important phenomenon is the growth of concepts that abandon classical ownership and encourage usage of a service/product only for the time or application needed by the client.

Table 6. Digital transformation of business models − Partnerships, ecosystems, sharing
(*Source:* Author)

2.6 Partnerships, ecosystems, sharing − Classical Mainstream
1. Industry partnerships.   2. Competitors.   3. Noncompetitors.   4. Vertical | Horizontal |Cross-domain.   5. Supply chain alliances.   6. Innovation centers.   7. Public and private partnerships (PPP).

2.6 Partnerships, ecosystems, sharing − Wave 1 (1980–2000)
1. **Broker** − specialized intermediary working either exclusively for clients or also on internal risk, with either advisory or discount approach. Information brokers are oriented toward collecting and transforming the data into insights required by clients.   2. **Academia** (academic partnerships) − established as win–win cooperation models aimed at fostering innovation, problem solving, and development of student/researcher skills needed in the digital economy.   3. **Venture capital (VC)** − although the primary "capital investment/private equity" concept has been developed already in the 18th century[27], Wave 1 of digital transformation brought a strong development of venture capitalists focused on new technologies and innovation with new valuation schemes.   4. **Shared Services** − concept of sharing some of the cost of internal/external services to achieve economies of scale and to reduce complexity. Seen in both commoditized or standardized processes (e.g., human resources management, finance) and highly specialized/high cost functions (e.g., research laboratory, usage of expensive machinery).   5. **Outsourcing** (**insourcing** for the receiving party) − transfer of selected elements of the business to a third party, primarily to achieve cost benefits.

2.6 Partnerships, ecosystems, sharing − Wave 2 (Beyond 2000)
1. **Aggregator** − entity that centralizes a domain or its part to service multiple clients by offering access to multiple providers (e.g., trade portal helping both importers and exporters to find connections and obtain specialized knowledge).   2. **Hub** − similar to the aggregator, central point for servicing; however, the term is more frequently seen with reference to internal functions of a multientity organization (e.g., finance or anti-money laundering hubs of financial institutions).   3. **Deal Seller** − organizations specialized in managing surplus of supply or overcapacity of businesses by price reductions or discounts, however, under the condition of providing mass volumes (e.g., Groupon).   4. **Regulatory partnership** − cooperation of private businesses with public services (e.g., allowing for banking clients to access government services online).   5. **B2G (Business-to-Government**) − management of public tender cycles.

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[27] For example, Transcontinental Railroad (https://ap.gilderlehrman.org/essays/financing-transcontinental-railroad).

6. **Smart city** − alliance of service providers in municipal areas to build an ecosystem of high convenience and care for the inhabitants, typically with the use of modern communication technologies, telematics, and digital documents/administration.
7. **Startup support** − a subset of the private equity domain, dedicated to identifying, evaluating, financing, and mentoring of startup businesses.
8. **Co-working** − joint office spaces for nonrelated businesses (also only in the phase of idea generation), fostering the dialog and mutual support.
9. **Clients as employees** − opening partnership opportunities to a wide public, assuming ground rules (e.g., no criminal records) are met − for example, the uberization[28] of business (in this case, taxis are replaced by standard card owners; however, the rules of conduct are managed via a system of quality gates).
10. **Digital employees** − people capable of working from any place in the world, delivering their services over the Internet.

Table 7. Digital transformation of business models − activities/energy usage
(*Source:* Author)

2.7 Activities/Energy Usage − Classical Mainstream	
1. Innovation management.	9. Authorization and authentication.
2. Design.	10. Exchange.
3. Development.	11. Auction/reverse.
4. Production/manufacturing.	12. Knowledge management.
5. Sales.	13. Digital asset indexing and search.
6. Marketing.	14. Asset operations (storage, conversion).
7. Servicing.	15. Human resources management.
8. Transaction processing.	

2.7 Activities/Energy Usage − Wave 1 (1980–2000)

1. **ERP/SCM** (1990s): **Enterprise Resource Planning** and **Supply Chain Management** − suites of products designed to cover key organizational processes (procurement, sales and distribution, finance, accounts payable and receivables).
2. **SCADA** (1990s) (**Supervisory Control and Data Acquisition**) − systems supporting control processes via measurement and steering of flows and states, via input/output sensors.
3. **Telematics** − remote control of devices to either read their state (e.g., utility meters, emergency systems), control their position (e.g., mining machinery), or perform actions (e.g., unlocking the car).
4. **RPA Robotics (Robotic Process Automation)** − replacing human labor in process chains with hardware or software replacements, especially in highly uniform and repetitive tasks.
5. **Internet marketing** − passive (ad display) or active (lead collection or direct referral) campaigning to the users of Internet based services.
6. **Analog to digital** − digitization of traditional content from analog to digital archives.

2.7 Activities/Energy Usage − Wave 2 (Beyond 2000)

1. **Custom production** − customization of products and services to best fit to client needs and preferences.
2. **3D scanning** − obtaining 3D representations (vector graphics) of physical objects (e.g., a factory, tooth, part of a tool) that can be used for studying or recreating of the object.

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[28] The term comes from the name of the company (Uber) that invented this approach, https://www.uber.com/.

3. **3D printing** – usage of 3D scans to create their structure.

4. **Additive manufacturing (AM)** – manufacturing by adding layers of source material.

5. **Marketing automation** – evolution of Internet marketing toward automated lead generation, segmentation, tracking and nurturing, cross/up-sell.

6. **Infomediary** – agents entrusted by individuals to manage personal information in a way that allows to monetize its value while assuring consumer privacy (paid access to personal data).

7. **Alternative Markets** – new digital markets that bypass current market infrastructure (e.g., mutual work services where traditional cash flow is replaced with merit points).

8. **Alternative Payments** – payment systems that bypass existing market mechanisms or use them to provide additional services (e.g., interbank payments based on a central hub that holds accounts in all banks ("alternative commercial nostro") and serves as an alternative clearinghouse).

9. **Distributed Ledger Technology** (e.g., blockchain) – creation of digital records that are managed on distributed computer systems and cannot be modified once signed with a cryptographic signature, preventing any records abuse.

10. **Cloud computing** – transfer of storage and processing power to a server site located on the Internet (off-premise) and managed/secured by a professional technological entity.

11. **Edge computing** – performing calculations as close as possible to the source of data to minimize latency issues.

12. **Digital to analog** – providing an option for digital only processes to convert their output to physical media (e.g., printouts of digital content).

13. **Industry 4.0** – manufacturing based on cyber physical systems, the Internet of Things, and the networked infrastructure with machine-to-machine communication.

Table 8. Digital transformation of business models – financials/economics
(*Source*: Author)

2.8 Financials/Economics – Classical Mainstream	
1. Revenues: a) barter| sell | rent | lease, b) up-front fee | deferred | success fee, c) discount systems, d) subscription, e) anonymous/gift card. 2. Costs | fixed/variable | internal/external. 3. Capital | ownership | shares.	4. Risk management. 5. P&L/returns (on capital, investments, assets). 6. Balance sheet. 7. Liquidity/cash flow. 8. Payment and settlement. 9. Cash | credit. 10. Transaction management.

2.8 Financials/Economics – Wave 1 (1980–2000)

1. **Risk-based pricing** – matching the cost of goods/services with the risk profile of the buyer, sub-segmented pricing schemes, sub-brands/sub-portfolios.

2. **Advertising as core** – selling advertising as the only source of revenues in the business.

3. **Affiliate/Referral** – usage of the network to increase cross-sell and close the sales in alternative channels to collect a commission.

4. **Prepaid** – creating upfront cash flows to assure product/service payment, often with **automated top-ups.**

5. **Razor and blades** – providing a low entry cost platform and collecting revenues from supplies or maintenance (e.g., ink printers and ink cartridges).

6. **Pay-as-you-go** – cash flows directly linked to the usage of the product/service, with no long-term arrangements.

2.8 Financials/Economics – Wave 2 (Beyond 2000)

1. **Freemium** – usage of products/services at the cost of advertising (service is either interrupted or interweaved with ads).
2. **Fee-in-Free-Out** – once the provider's revenue goal is met, the service/product becomes free for others to use; the entire revenue can be supplied by a sponsor.
3. **Pay-what-you-can** (PWYC) – users provide "donation" based revenue sources (e.g., the case of Wikipedia, the online reference information site/free encyclopedia).
4. **Pay-to-win** (unlock) – the product is sold with a number of locked features (e.g., games)
5. **Software-as-a-service (SaaS)**, Infrastructure-as-a-service (IaaS) – conversion of a classical software development effort/ownership into a subscription-based service.
6. **Ownership-to-access** – the overall trend of shifting from the ownership of resources to being able to access the resources on the as-needed basis at a fractional cost.
7. **Dynamic pricing** – ability to manage the price based on a wide range of internal and external criteria (e.g., travel insurance sold to people boarding the planes).
8. **Fractionalization** – splitting the overall cost of a product or services into the smallest manageable elements that can be manufactured, offered, and paid for by various parties.

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3   Conclusions

The mapping of DT drivers onto the business model canvas is a source of several important observations:

1) The change of business models is already well seen, and it is imminent that the drivers will continue to impact the way organizations strategically structure their future morphology. Every new or refreshed strategy should include an approach to DT.

2) It is, therefore, important to undertake the assessment of organizational business models against their necessity to embrace the new paradigms. Failure to do so may result in the inability to compete or even survive.

3) The changes to business models result from

  a) the evolution of certain previous concepts (classical mainstream or Wave 1), mainly thanks to technological advancements,

  b) achieving social/user acceptance for previous concepts, generating economies of scale or the snowball effect,

  c) disruptive and breakthrough innovations.

In all cases, the emergence of various business and network platforms (or ecosystems) acts as a catalyst for the development of new elements within the morphology of business models.

4) The platforms are enabled via the underlying technologies (e.g., the Internet, mobility), the outburst of end-user-generated data (with the majority being free), and also by social aspects such as networking or data sharing.

5) Currently available definitions of DT are not precise. The BMC provides a systematized view on what constitutes the DT. By being broad and descriptive, it may serve as a far better base for further discussions and research and can be used as a reference point within the digital transformation community.

6) In order to facilitate the assessment of digital maturity, the proposed business model canvas can be used to evaluate the necessity for adaptation to the constantly developing new digital economy concepts. The BMC can be adopted to a given business or industry ontology.

7) The results of this study are highly encouraging to continue the research work, especially in the following directions:

  a) further detailing of the business model morphology to create a commonly accepted reference model for the digital transformation, especially with reference to the review and creation of new or updated organizational strategies,

  b) practical application of the model in a selected industry, with practitioners that could reflect on the model's content and usability,

  c) a study of the dependency of the digital transformation on selected platforms (e.g., what conse-

quences could occur for the global economy if the GPS was switched off) or the risks of platforms being comprised by illegal practices,

d) a study of the legal framework to understand which elements of the business model morphology are characterized by stable regulations and which can be expected to face development deterrents (or acceleration) because of governmental regulations (e.g., crypto-currencies or personal data usage).

In the concluding remark, it should be mentioned that the business model morphology is a universal tool that can be applied to any type of organization or human activity, including a personal perspective.

The interactions of digital clients with digital organizations opens up a new perspective for everyone: the necessity to learn and understand new solutions, including their legal framework, the need to overcome anxiety, for example, related to increasing presence of artificial intelligence in our life or to the sensation of being constantly subject to monitoring by various organizations and devices.

With every technological advancement, we enter new routes, but their perception does not necessarily have to be positive. Regardless of these perceptions, both organizations and humans must strive to understand the changes in the surrounding world. The goal of this article was to provide more clarity about the phenomenon of DT. It is a structured view of the DT, and it provides the insights on the way "the digital" is altering our daily life paradigms.

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Appendix 1

The Digital Transformation of the Business Model Morphology.

Source: Interpretation of Marcin Kotarba, based on the Business Model Canvas described in Osterwalder, A., Pigneur, Y., 2010. *Business Model Generation.* John Wiley & Sons.