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# Electronic Markets on platform transformation

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Platform complexity and platform dualities have been topics of the last two editorials of Electronic Markets and are now succeeded by a third composite called platform transformation. It is another fascinating term that has a long tradition in the domain of information systems and has received growing attention within the larger context of digital transformation. Only recently, an online article in McKinsey Digital discussed platform transformation as broad concept that reaches from “building a new platform as a business model or participating in an external one [towards reshaping the] IT operating model, or offering a technology platform. The IT operating model and tech foundations can be “platform based” even if [the] business model has nothing to do with platforms” (Lansing et al., 2021).

To substantiate this view from practice, a brief literature review on platform transformation was initiated (see Table 1). It confirmed the distinction that is embodied in the quote from McKinsey with literature that reflects a technological-operational and an socio-organizational-strategic perspective on platform transformation. Both streams feature the essence of transformation, which in general denotes an activity that changes parts of a system or an entire system from one state to another (Collins Dictionary, 2022). Following systems theory, different types of systems exist, from biological to economic as well as social and technological systems. For example, in the context of economic systems, the term “fundamental transformation” has been introduced in transaction costs economics to denote a shift from a competitive to rather monopolistic situation (Williamson 1985, pp. 61ff). For the research included in the present issue of

Electronic Markets, platform transformation obviously relates to technological and socio-organizational systems.

## Technological platform transformation

From the technological perspective, the main architectural elements of information systems are their hardware and software, which in turn comprise further subsystems (e.g. the storage and computing hardware or the business and operating software). In sum, they form an information technology (IT) stack. During the last decades, the world of enterprise information systems has seen a variety of architectural developments from monolithic, two- and three tier towards multi-layer as well as component concepts. To benefit from improvements that were attributed to newer architectures, such as flexibility, specialization and upgradeability, businesses have initiated transformation projects for migrating from one platform design (or version) to another. Platform transformation has therefore become an important area in software engineering, which is concerned with the redesign and modernization of (legacy) software platforms (e.g., Anjorin et al., 2013, Djogic et al., 2018, Kerr et al., 2011). It may include the adaption of software to support different hardware platforms (e.g., gaming or mobile hardware as described by Anunpattana et al., 2019) or updated elements in the IT stack (e.g., the change of an operating system or the move to a cloud platform as described by Huang & Kar-duck 2017) to include new functionalities of the system or to adopt changes in the software’s architectural design (e.g., regarding modularity, see Chénard et al., 2012).

In addition to the traditional IT stacks in enterprise computing, stacks for specific technological platforms have emerged. For example, internet of things (IoT) platforms comprise distinct combinations of hardware, software and networking elements, which differ from the enterprise stacks that have emerged in many companies since the early

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2000s (Perry, 2016). The same applies to the recent technology platforms in the automotive sector where manufacturers have joined two large alliances around the hardware providers Nvidia and Qualcomm (Abuelsamid, 2022). To manage platform transformations, software engineering has suggested model-driven approaches that use domain-specific languages in metamodels to update and regenerate software systems (Anjorin et al., 2013). They may be directed towards achieving changes that are specific for a platform or aim at platform-independence to allow application systems to operate on multiple platforms, e.g., on both the Android and the iOS operating system. Such migrations may also be associated with a move to standard components and packaged software, which relieve businesses from proprietary developments. While it often makes sense to use standard software, transformation may also point in the opposite direction when achieving strategic advantage in new functional areas often necessitates the development of individual solutions. In fact, a recent survey among 1331 executives reasoned that businesses should rather pursue a transformation strategy that favors proprietary developments than relying on off-the-shelf tools (LaBerge et al., 2022).

## Socio-organizational platform transformation

The second stream of literature links to the understanding that “digital transformation is the reinvention of the company - its vision and strategy, organizational structures, processes, capabilities, and culture” (Gurbaxani & Dunkle 2019, p. 209). It recognizes platform transformation as a specific digital transformation strategy that comprises the transformation to digital platforms and the transformation of digital platforms.

The *transformation to digital platforms* corresponds to the term “platformization”, which denotes a move of existing business models and industry structures (often referred to as pipeline businesses) to platform-based business models and industry structures (Parker et al., 2016; Yablonsky, 2018; Jiang, 2021). Although such change is technologically enabled, this type of platform transformation emphasizes achieving sustainable competitive advantage by building on platform resources (Yablonsky, 2020, p. 8). Transformation may either comprise the development of platforms or the integration of services into external platform ecosystems. Among the examples associated with this interpretation of platform transformation at industry level are the platformization of the higher education (Tolmayer & Bedo 2019), the insurance (Nicoletti, 2021) and the legal industry (Andreae, 2020), the platformization of supply chain management (Liu et al., 2019, p. 45) and manufacturing (Luo et al., 2018)

as well as the migration towards platform ecosystems for sustainable development (Zhang & Chen, 2020). Platform transformation has also been mentioned for specific business models and occurs when a company decides to migrate its business model towards a platform business model. For example, this occurs if a lightning products company aim to become a connected service provider based on an IoT platform (Mancha & Gordon, 2020), if a real estate broker establishes a platform business (Zhang & Yao, 2022) and if a news media company adopts a platform strategy (Jääskeläinen et al., 2021).

The *transformation of digital platforms*, however, assumes the existence of a digital platform, which often also comprises a “surrounding” ecosystem of customers and complementors. In this respect Paavola (2018, p. 138) summarizes that “research on change in platforms has traditionally focused on transformations in the overall ecosystem and its components (macro-level) or on individual processes and routines in a given component, i.e., a module or platform (micro-level).” The modifications on either of these two levels might be driven by the formulation of transformation goals, such as key success factors for value creation, value delivery, and value capture (Rohn et al., 2021). They lead to transformation strategies that cover various steps over time as illustrated in these three examples:

- Huateng et al., (2021, p. 197f) mention four platform transformation models: First, new functions from third parties are added, second, subdivided ecosystems are established for customers or developers, third, the business model is enhanced (e.g., by opening the platform to additional user groups), and fourth, network effects are intended via cooperation with other platforms.
- Hu et al., (2020) describe the transformation of an e-commerce platform that supports the cooperation and co-creation between buyers and sellers for a manufacturing company to make the platform more sustainable. The three stages in this transformation comprise the move from a hub type to a network type and, finally, to a symbiosis type platform model.
- Senyo et al., (2021) portray the transformation of the digital platform in the port of Ghana from a software platform for customer customs clearance towards a comprehensive platform for a paperless port along four transformation phases with the goal of “making the port as smart as those in Singapore and other developed countries” (p. 4).

**Table 1** Literature search for platform transformation

Database (per June 13, 2022)	Hits for search string “platform transformation” (all fields) / selected based on title and abstract
EBSCOhost	29 / 1 (Zhang & Yao 2021)
Google Scholar	502 / 14 (Chénard et al., 2012; Anjorin et al., 2013; Huang & Karduck, 2017; Djogic et al., 2018; Yablonsky, 2018; Anunpattana et al., 2019, Yablonsky 2019, Hu et al., 2020, Mancha & Gordon, 2020, Zhang & Chen, 2020, Huateng et al., 2021, Jiang, 2021, Rohn et al., 2021, Senyo et al., 2021)
ProQuest	35 / 4 (Liu et al., 2019, Tolmayer & Bedo 2019, Hu et al., 2020, Yablonsky, 2020)
Springer Link	77 / 6 (Kerr et al., 2011; Luo et al., 2018; Paavola, 2018; Andreae, 2020; Sadykova et al., 2021, Nicoletti 2020)
Web of Science	8 / 1 (Jääskeläinen et al., 2021)

## Journal transformation

The first link between platform transformation and the present issue is visible in the high number of articles included. Together with this editorial, the 31 papers make it the largest issue of Electronic Markets that was ever published. This more than doubled amount of papers per issue is related to the migration of Electronic Markets to the continuous article publishing model (CAP). Contrary to the existing publishing model, which arranges accepted and published papers by issues, CAP disposes individual issues and assigns all articles to an annual volume. It is recognized as a model that reflects the transformation of the scientific journal industry from print to online by eliminating the restrictions of printed physical issues. In particular, it streamlines the publication process, which is reflected in the following aspects:

- In the existing model, articles were published online first (OF) with the digital object identifier (DOI) and the initial year of OF publication. Although published articles were fully citeable with the DOI, the entire metadata remained uncomplete. It was only after the article was assigned to a specific issue that all other metadata were created including volume and issue number and page range. In case the year of OF appearance differed from the year of the issue, this number was also adjusted, which could lead to confusions if the OF was already cited.
- In the CAP model there is no OF section and camera-ready articles are directly moved to a volume that is continuously enhanced. This means that all articles are published with the definitive metadata from the beginning and that there is no need to await the compilation of issues to obtain the final metadata. The referencing of articles itself changes and now includes the respective

volume number, a unique article number (so-called Article Citation ID) as well as the DOI. Page numbering is per article only and always starts anew.

For Electronic Markets this means that it discontinues the print version (ISSN 1019–6781) and focuses on the digital version (ISSN 1422–8890). This journal transformation towards digital publishing also implies that limitations such as figures and tables in black and white no longer exist. In view of the high relevance of special issues for Electronic Markets, the CAP model will allow to continue this section and publish special issues as topical collections. Similar to the hitherto special issues, these collections will be organized by a team of guest editors who may also contribute a preface to their set of articles. At the same time, topical collections may be enhanced at a later stage. If guest editors decide to add further papers to their collection, this will be feasible in the future even if papers are published different volumes.

## Special issue articles

Since the transformation to CAP requires all accepted and camera-ready manuscripts to be included in a 2022 issue, all volume 32 issues exceed the usual amount of papers per issue by far. In the present issue this is reflected in the exceptional high number of 17 general research articles. They complement the 13 special issue papers that are distributed among two special issue initiatives, which both introduce new concepts in the field of platform transformation.

The first special issue introduces a major transformation regarding the goals of digital platforms and aims to initiate a new research discipline called Social Welfare Computing. Instead of striving for the competitive advantage of platform and service providers, it advocates that societal issues need to complement the business and technological aspects that have dominated platform strategies so far. With the success of digital platform companies (so-called “big tech”), the infrastructural nature of these platforms and the associated network effects have accumulated unprecedented power with these companies. While traditional strategies would focus on maximizing competitive advantage, the suggested discipline of Social Welfare Computing “attempts to limit the harm caused by computing itself” (Clemons et al., 2022). It follows the duality of use inherent in the context of digital platforms (Alt, 2022a), which may be positive or negative. However, these dualities are challenging to predict and to design since effects may be unintended, differ on the individual perspective of the participating actors, comprise soft factors that are less amenable to design than “harder” functional as well as technological aspects and require an

understanding of multiple disciplines. Titled “Social Welfare Computing and the management and regulation of new online business models”, the guest editors Eric K. Clemons, Maximilian Schrieck, Helmut Krcmar, and Tung Bui present an exceptional collection of discussion papers that discuss these challenges from various backgrounds, in particular, (business) information systems, law and social sciences.

To complete the special issue on Social Welfare Computing, a separate interview with Eric K. Clemons as the corresponding guest editor complements the five special issue papers. In this interview with Electronic Markets’ editorial team, he reports on the motivation of shifting – or in this editorial’s terminology “of transforming” – the direction of his research activities from the provider perspective with the goal of competitive advantage towards the users’ perspective with the goal of human values (Alt, 2022b). It might not only be regarded as a plea for transforming the perspective on digital platforms towards the (human) users and their quality of life (see also Werthner 2022 and Osterle 2020), but also as a call to the information systems community to develop appropriate platform transformation methodologies. These could be a next step in the transformation literature, which on the one hand distinguishes IT-enabled organizational transformation methodologies that define single organizations as their target entity. On the other hand, digital transformation methodologies are broader and focus on organizations, platforms, ecosystems, industries and societies (Vial, 2019, p. 132, Alt 2019). However, the perspective of these methodologies is still rather business-oriented, which leads to the question how cross-organizational settings and the broader societal perspective could be reflected in these methodologies.

Some insights in this direction are provided with the second special theme of this issue. Titled “From private digital platforms to public data spaces”, the guest editors Daniel Beverungen, Thomas Hess, Antonia Köster and Christiane Lehrer introduce the five special issue papers in their preface and offer implications for the field of digital transformation (Beverungen et al., 2022). The evolution they describe may be interpreted as the journey of digital transformation from the “transformation to digital platforms” towards the “transformation of digital platforms”. While digital transformation was first limited to the intraorganizational area, it increasingly focused on transforming businesses towards “interorganizational cooperation and platform ecosystems”. The guest editors recognize that over time numerous types of digital platforms have emerged, such as cloud, service, social and market platforms, which might complement each other and increase platform complexity (Alt, 2021). Following established definitions from literature, these digital platforms always comprise a core of technologies and

organizational arrangements as well as compatible and complementary third-party resources (e.g., hardware, software, or content). As a matter of fact, the technological and the organizational dimension of platform transformation often go hand in hand. An important contribution of the preface relates to the transformation of platforms from private to public platforms where no longer a commercial company but a public organization is acting as platform provider. This coincides with the claim that public platforms are in the public interest and emphasize values such as transparency and openness, digital sovereignty and self-determination, free market access and trust, modularity and interoperability as well as user friendliness (Beverungen et al., 2022). Thus, the move towards public platforms may be seen as a potential move towards Social Welfare Computing. Similar to the discipline of Social Welfare Computing, multiple challenges exist for making this new type of digital platforms successful. They are described together with five areas for future research in the guest editors’ preface.

## General research articles

Most of the general research papers also feature a link to the areas of platform transformation. The first paper adopts an interdisciplinary approach (as postulated in Social Welfare Computing) and conceives digital transformation as an interaction-driven perspective between business, society, and technology. The authors Ziboud Van Veldhoven and Jan Vanthienen present a thorough analysis of 41 digital transformation frameworks and identify four shortcomings in the existing frameworks: the absence of the role of society, of a holistic perspective, of included drivers and enablers and of a consistent terminology. These are addressed by consolidating the main concepts from the analyzed artefact in a new framework that structures digital transformation along the three dimensions digital technologies, society and business with five specific development (or maturity) levels each. A total of 23 drivers and enablers – referred to as digital transformation interactions – are clustered in six categories that are relevant when organizations embark on digital transformation. The authors also see their framework as helpful in providing more structure to the key terms digitization, digitalization, IT-enabled transformation and digital transformation (Van Veldhoven & Vanthienen, 2022).

The second research paper recognizes the growing need of many businesses to adopt sustainable business models and aims at embedding the goals of sustainability in the tools that are used for business model development. The authors Thorsten Schoormann, Maren Stadtländer and Ralf Knackstedt present the Green business modeling editor, which is a software prototype that includes five design principles and



16 features that were derived from reflection theory within a design science approach. Several evaluations confirm that business model tooling contributes to achieving a transformation towards sustainable business models. The paper comprises a comprehensive appendix that elaborates on the design of the prototype, the evolution of the design principles and the setup of the evaluations (Schoormann et al., 2022).

The third paper presents an in-depth case study of Reliance Jio, which is a mobile communications service provider in India that has been investigated by the authors Sandip Mukhopadhyay and Jason Whalley over a period of four years. It reports the transformation to digital platforms by an incumbent who decided to create a platform ecosystem from scratch. The authors identify the lack of literature on the emergence of a new platform as an important research gap and emphasize that the goal to establish a disruptive platform requires a “vibrant ecosystem”, which in turn relies on the presence of complementors and network effects (Mukhopadhyay & Whalley, 2022). In their research they confirm the need to actively develop complements and to aim for strong complementors as “multipliers”. A variety of guidelines (or success factors) is identified to support businesses in their platform transformation endeavors.

The fourth general research article is a Fundamentals paper, which differs from a regular research paper in that it aims to provide a structured overview on a specific subject. In this case, Christiane Lehrer and Manuel Trenz substantiate the phenomenon of omnichannel business from a technological, organizational and market perspective. It is a concept that leads many firms to transform their interaction with customers from an inside-out view and separated channels towards an outside-in view and holistic cross-channels where customers (or consumers) are empowered. Based on an extensive literature review, the authors identify three themes for omnichannel business, which comprise transformational aspects to move from multichannel to omnichannel solutions as well as aspects related to the management and to the impact assessment of omnichannel businesses. In addition, a comprehensive research agenda is formulated along these three themes (Lehrer & Trenz, 2022).

The fifth article delivers important groundwork for understanding digital business models and, thus, also for the transformation of digital business models when they are enhanced or renewed. The author team consisting of Frederik Möller, Maleen Stachon, Can Azkan and Boris Otto presents a profound analysis of business model taxonomies in the literature and develops a structured view that comprises four meta-dimensions (data, development, representation, application), which are detailed in 13 dimensions with a total of 39 characteristics (Möller et al., 2022). On the one hand, they serve to characterize existing business

model taxonomies, for example, along the “industry scope” dimension where the authors found four different types of taxonomies. On the other hand, the taxonomy supports the design of new business model taxonomies where the article offers additional recommendations for building taxonomies.

The sixth paper was written partly by the same researchers as paper five and also reflects the authors’ research goal to add structure to the domain of business models. In this case, the author team Estelle Duparc, Frederik Möller, Ilke Jussen, Maleen Stachon, Sükran Algac and Boris Otto investigated 120 open-source business models that were derived from literature and databases. Again, the taxonomy consists of four meta-dimensions (value proposition, value network, value architecture, value finance), which are detailed in 17 dimensions that comprise 75 characteristics here (Duparc et al., 2022). The taxonomy is used on the one hand to characterize seven existing examples of open-source business models and to derive seven archetype patterns for open-source business models on the other.

Another research on business model archetypes is provided in the seventh paper that was authored by Romy Bergman, Antragama Ewa Abbas, Sven Jung, Claudia Werker and Mark de Reuver. It links to the preface on public data spaces mentioned above (Beverungen et al., 2022) and focuses on the domain of data marketplaces, which are key for networked business models with multiple collaborating partners. By deriving the four different archetypes “aggregating data marketplace”, “aggregating data marketplace with additional broker service”, “consulting data marketplace” and “facilitating data marketplace”, this research may be associated with the “transformation of digital platforms” as introduced in this editorial. The archetypes are specific for the automotive industry and based on a business model taxonomy with three main categories (value capture, value delivery, value creation) and eight sub-categories (or components), which possess 13 dimensions with 36 characteristics. Six established data marketplaces from the automotive industry are used to illustrate the application of the artefact (Bergman et al., 2022).

An in-depth case study that also stems from the automotive industry is reported in the eighth paper. Matthias Förster, Bastian Bansemir and Angela Roth start from the ambivalent observation that data-driven business models promise substantial business opportunities, but encounter difficulties in deriving business value for their providers. In sum, twelve data-driven business models are analyzed at a German automotive manufacturer based on interviews with 70 employees. By adopting a stakeholder theory approach, the authors were successful in shedding light on the role of employees in data-driven business models. They identify eight employee perspectives, which differ along five dimensions and suggest that assigning employees to the suitable

roles contributes to deriving value from data-driven business models, especially in the process of developing these models (Förster et al., 2022).

A domain of rising importance for data-driven business models is described in the ninth research paper. It focuses on the highly fragmented industry of road cargo where platform-based business models ensure the sharing of data among many participants. Although the sector has seen IT-based solutions, such as electronic data interchange (EDI) and transportation exchanges for decades (e.g., Alt & Klein, 1999), digital platforms have experienced growing relevance with the digital transformation over the past years. In particular, this pertains to models, such as data-driven forwarding as analyzed by Christoph Heinbach, Jan Beinke, Friedemann Kammeler and Oliver Thomas in their research on digital platforms for road freight transport management. Based on eleven interviews, they propose a taxonomy for digital platforms in this sector that consists of five meta-dimensions with 14 dimensions and 64 characteristics. It is used to derive a typology for digital platforms that comprises eight different platform types in four categories, which are further detailed with specific services (Heinbach et al., 2022). From the perspective of platform transformation, the results might contribute to the future “transformation of platforms” in this sector.

Among the established digital platforms in the transportation sector are community systems, which are the topic of the tenth general research paper. As geographically bounded multi-sided platforms, they enable digital relationships among the variety of participants in many large seaports and airports worldwide. Combined with the strong role of customs, this makes them competitive B2B networks with varying governmental influence (Tessmann & Elbert, 2022). The research of Ruben Tessmann and Ralf Elbert pursues a structured taxonomy development approach based on a comprehensive analysis of real-life systems and of the extant literature to propose a taxonomy of Port and Cargo Community System business models. It consists of the four perspectives stakeholder ecosystem, value creation, platform architecture and organizing model as well as value capture, which are decomposed in 18 dimensions with 62 characteristics. These elements are used to formulate the four community system archetypes “innovation-oriented port eco-systems”, “B2B-focused community systems”, “non-profit community systems”, and “non-specialized single windows”, which may again be regarded as options in the “transformation of platforms”. This is especially the case if the models are generalized and applicable to other multi-sided platforms as well.

A link to supply chains in general is provided in article eleven. The authors Natalia Szozda and Artur Świerczek recognize a three-tier (or triadic) structure consisting of

a focal company and the adjacent suppliers and customers as the traditional configuration of many supply chains in manufacturing. Titled “Upstream and downstream dyad governance within the network structures: Creating supply chain governance for the customized products” they scrutinize the modes of governance in the dyadic relationships on both sides of the focal company. Based on transaction cost and relational contracting theory, a typology with different modes of dyadic governance was used in a questionnaire that led to 34 answers from manufacturing companies from Poland. A specific concern was how the modes of governance, especially regarding the price mechanism, bureaucratic structures and the socialization process, allowed for customization to changing customer requirements in these triads (Szozda & Świerczek, 2022). The results reveal that nonmarket mechanisms are important for customization and offer the basis for strategies such as combining market and nonmarket mechanisms and sharing the same modes of governance in upstream and downstream relationships to safeguard similar relationship qualities in the triad.

An important transformation of supply chains is driven by internet of things technologies (IoT). The twelfth paper proposes a framework for value propositions that emerge when traditional products evolve towards smart products and enable new services. To unleash this business potential of IoT, the authors Graziela Molling and Amarolinda Zanela Klein argue that the specifics and complexities of IoT are not sufficiently reflected in generic business model frameworks. Using design science research and an affordance perspective, the multidimensional framework Value 4.0 was developed and applied in four companies (Molling et al., 2022). It combines elements from prior business modeling and IoT research and proposes the four dimensions, actors, perspectives, strategy and IoT architecture. The authors show in detail how current value propositions are transformed into new value propositions by asking what the IoT offering consists of and for whom the solution is intended to generate value. They conclude that value should not only be created for customers, but also for supply chain partners and investors.

A specific application of IoT solutions may be found in industrial settings. In particular, dedicated digital platforms act as middleware systems to integrate the heterogeneous hardware and yield a foundation for offering service, such as monitoring and anomaly detection. The research by Laurin Arnold, Jan Jöhnk, Florian Vogt and Nils Urbach investigates these industrial IoT (IIoT) platforms and recognizes the platforms’ architecture as an important element to understand the IT stack of IIoT platforms. During their structured taxonomy development approach, the authors analyze literature as well as 78 case examples and conduct seven expert interviews. The proposed taxonomy of IIoT

platforms' architectural features then comprises the four layers infrastructure, network, middleware and application, which are detailed in 13 dimensions with 38 characteristics. Specific configurations of these characteristics are reflected in the five archetypes that were derived from the case sample (Arnold et al., 2022). Again, these archetypes may be valuable for platform transformation, in particular, the transformation of the IT stack and the transformation of platforms in the socio-organizational sense.

The remaining papers shift the focus towards product innovation and marketing. First, paper fourteen recognizes lead users as valuable resources to generate and develop new ideas in product development. However, companies face the challenge to identify and characterize these lead users. Isabel Schmid, Janik Wörner and Susanne Leist show how IT may support the process of an automatic lead user identification in the context of online communities. Their lead user identification tool is based on a design science approach that adopts techniques of social network analysis to characterize users via six characteristics in various phases of the innovation process, i.e. product innovation or market entry (Schmid et al., 2022). The application of this tool in an online kiteboarding forum led to the conclusion that the large volume of data in social networking platforms is not only helpful in identifying lead users for co-creation, but also in differentiating these users by various phases of the innovation process.

Second, paper fifteen investigates the concept of gamblification, which has emerged as a novel marketing instrument on digital platforms. In this case, gambling design elements such as loot boxes or lottery tickets are applied to entertain and to motivate potential buyers to purchase digital products. In contrast to gamification, users need to invest and realize that the rewards they receive may be uncertain. Using prospect theory, the authors Martin Adam, Konstantin Roethke and Alexander Benlian developed a contest-based online experiment with 159 participants, which confirms that the expected probability of winning rewards depends on previous loss experiences and the certainty of receiving rewards influences whether users engage in the gamble. The results offer insights into designing these gamblification elements, which have the potential to positively increase revenues (Adam et al., 2022).

Third, paper sixteen focuses on product innovations in the gaming industry. The authors Franziska Handrich, Sven Heidenreich and Tobias Kraemer observe that the positive impact of investments in product innovation are lacking in the video games market (Handrich et al., 2022). In the title of their research "Innovate or game over?" they examine the innovations of 351 computer games regarding quantitative criteria such as sales data as well as regarding qualitative criteria such as innovativeness of presentation, game

principle and game storyline. Over a period of three years they assessed whether the product innovations had short-or/and long-term effects. The authors reveal that due to the high pace of hardware performance (based on Moore's "law"), innovations in presentation were only short-term in nature. Similarly, modifications of the game principle were successful in the short-term, but neither innovations in the game principle nor innovations in the game storyline could generate long-term successes. Based on these results, the authors formulate recommendations how providers of video games should aim for a constant innovation (or transformation) of their product offerings.

The final paper of the general research section ties in with the education sector, which has experienced a "transformation to digital platforms". In particular, massive online open courses (MOOCs) have spread from numerous education institutions worldwide and are offered on digital platforms such as Coursera and edX. As stated by the authors Xiaoyan Chen and Wei Geng, the MOOCs business model is challenged by offering at least some free access and by attaining financial sustainability. In their research "Enroll now, pay later" they develop a mathematical model to determine the optimal pricing for MOOCs services that are packaged under a paid version (the so-called verified track). To motivate users to opt for this version, MOOC providers have pursued nudges, such as reminders or challenges, which in turn incur costs for the provider. The authors show that improvements of the verified track and lower unit costs of the nudges are important determinants of pricing strategies on such platforms (Chen & Geng, 2022).

In summary, the two special issues and the papers in the general research section are convincing examples of the vivid research activity in the context of digital transformation and platform transformation, in particular. The increased consideration of social aspects, the rise of public platforms and the many taxonomies and archetypes for digital (platform) business models included in this issue contribute novel aspects as well as structure to the domain of digital transformation. It is apparent that this comprehensive issue of Electronic Markets was only possible with the convincing support of all guest editors, authors and reviewers. Many thanks go to all of them!

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