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Jan Polowczyk, PhD habilitation, Associate Professor Poznan University of Economics and Business**NEW BUSINESS MODELS BASED ON INTERNET**

The goal of the paper is to investigate how digital technologies support new business models. Globalization and digitalisation are constantly shifting the sources of market advantage forcing companies to adapt. New technologies, products and services are continuously appearing. They create new business models which replace the old and contribute to new ways of corporate value creation. The paper presents new business models based on examples of companies such as Uber, or Airbnb. Changes in technology have been explained by the so-called G.Moore's law which supports new business models as well as the Internet of Things and the Internet of Energy, and 3D printing technology. Sharing, openness and transparency have become the foundations of new business models. Breakthrough technologies diversify opportunities for new businesses and new ways of value creation. Internet technologies create new combinations of products, services and business models and, step-by-step, replace the old technologies and traditional business dogmas.

Keywords: business model, Internet, Moore's law, evolutionary algorithm, sharing economy, digital disruption, total outsourcing

Introduction. The foundation of the first and second industrial revolutions was a high concentration of economic power. Vertically integrated companies were the most efficient means of organizing the production and distribution of mass produced goods and services. They reduced transaction costs, increased productivity, lowered the marginal costs of production and distribution and lowered the price of goods and services allowing the economy to flourish [The third great wave 2014].

The third industrial revolution is based on Internet and digital technologies. It has brought an exponential increase in productivity and the growth of GDP per capita at the end of 20th century. This phenomenon can be largely explained by the so called Moore's law. It is the observation that during the history of computing hardware the number of transistors on integrated circuits doubles approximately every two years. The law is named after Intel co-founder Gordon E. Moore who described the trend in 1965. His prediction has proven to be accurate for 50 years and Moore's law was used in the semiconductor industry to guide long-term planning and to set targets for research and development [Bauer, Veira and Weig 2013].

The capabilities of many digital electronic devices are strongly linked to Moore's law: processing speed, memory capacity, the number and size of pixels in digital cameras, etc.. This exponential improvement has dramatically enhanced the impact of digital electronics in nearly every segment of the world economy. Moore's law describes a driving force of technological and social change in the late 20th and early 21st centuries [The future of computing 2016].

The further improvement in productivity will be possible because the emerging Internet of Things is the first smart infrastructure in history. In future it will connect every machine, vehicle, residence and business in an intelligent network comprised of a Communications Internet, Energy Internet and Logistic Internet. According to Rifkin [2014] before 2040 most of the energy to heat houses, power plants and drive vehicles, will be nearly free thanks to decreasing marginal costs.

The sharing economy (also known as collaborative economy, or collaborative consumption) is a new economic and social phenomenon based on the sharing of human and physical resources. It includes the shared creation, production, distribution, trade and consumption of goods and services by different people and organizations. Although it is a relatively new phenomenon it has been widespread across the globe in the form of peer-to-

peer ride-sharing, accommodation-sharing, or renting household items, etc. [All eyes on the sharing economy 2013].

The proliferation of Internet and mobile devices has accelerated a digital evolution and it serves as a growth catalyst. Technology is crucial to the growing concept of a sharing economy to enable scale and enhance economic impact. A number of Internet sharing platforms have emerged which enable individuals to share goods and services such as houses, cars, garden tools, professional skills and so on [Botsman and Rogers 2010].

The main advantage of the sharing economy is the fact that the sharing platforms create a win-win situation for all the stakeholders. The amenities of the sharing economy are diversified: on-demand access to goods and services, efficient utilization of unused assets, leading to a multiplier effect such as increased employment and the rise of micro-entrepreneurship. Enterprising citizens can now generate income by renting assets as varied as furniture, camping equipment, or even parking spots.

The sharing economy. The sharing economy is a hybrid form of economic and social organizations between private ownership and peer-to-peer-based sharing of access to goods and services. New firms are experimenting with new organisational forms. The main difference lies in ownership. At the beginning of a company's life, the founders and first employees own a majority stake—and they motivate people with ownership stakes or performance-related rewards. That has always been a practice in start-ups but today the rights and responsibilities are precisely defined in contracts. This aligns interests and creates a culture of hard work and friendship.

Start-ups used to face difficult choices about how to invest in large assets such as property and computer systems. Currently young companies exploit new technology which enables them to be global without having big assets. They can develop very fast by buying in services as and when they need them: „*They can incorporate online for a few hundred dollars, raise money from crowdsourcing sites such as Kickstarter, hire programmers from Upwork, rent computer-processing power from Amazon, find manufacturers on Alibaba, arrange payments systems at Square, etc.*” [Reinventing the company 2015].

New business models applied by innovative companies are based on principles of wkinomics. It is the new internet business approach. Wkinomics is an innovative art and science of peer production. The idea was introduced by D.Tapscott and A.Williams in their book „*Wkinomics. How Mass Collaboration Changes Everything*” [2006]. The new art and science of wkinomics is based on four important ideas: openness, peering, sharing and acting globally.

Sharing, openness and transparency have become new business rules. For example Tesla Motors, Silicon Valley's electric carmaker, in the spirit of the “open source” movement, shares patents that cover its electric vehicles technology for free. Tesla believes that applying the open source philosophy to its patents will strengthen rather than diminish its position. E.Musk, Tesla founder and CEO, is convinced that other companies making electric cars will benefit from a common, rapidly-evolving technology platform. Technology leadership is not defined by patents but rather by the ability to attract and motivate the world's most talented engineers.

Tesla's strategy is imitated by the more „traditional” carmaker Toyota. Toyota is focused on making longer-range hydrogen-fuel-cell vehicles, the future standard for clean transportation, and is working with the Japanese government to build a fueling infrastructure for hydrogen. Toyota shares its 5,680 patents related to its new Mirai car for free to promote hydrogen-powered vehicle technology. This is the first time the Japanese carmaker has released patents to competitors without charging a royalty fee.

Sharing and openness are present in many very different industries such as: gold mines [Tapscott and Williams 2006], software [Meyer and Kirby 2012], or robotics [Special Report: Robots 2014]. The Open Source Robotics Foundation (OSRF) has been created and it

supports development of Robot Open Source (ROS). ROS is free to use and easily customised and is being taken up by more and more researchers, many of whom happily share their ideas [Pratt 2015]. Using a ROS navigation and a Kinect, it is now relatively easy to build a simple robot.

New business models. A business model is a key element of each business strategy. It is a set of assumptions about how an organization will perform to create value for all stakeholders [Magretta 2002, p.44]. Each business model should describe the rationale of how an organization creates value. According to Magretta [2002, p.46] the business model is a story of how an enterprise works and makes money. Many great business models began not with analytic efforts of a planning committee but were developed through serendipity and experimentation or with a very human experience of frustration.

Literature on the newest business models is quite dispersed. Academics are trying to follow and present a new business models' explosion. A common conceptual base is still lacking [Zott, Amit and Massa 2010]. In this paper we have tried to capture and describe new business phenomena which are based on Internet technology.

Each new invention expands the scope of possible future projects. The process of evolution increases the econosphere potential in the development of welfare. Every invention is the combination of prior ideas. Therefore every new technology expands the scope of possible combinations of subsequent inventions. Simultaneously each new technology reduces the influence of earlier technologies by creative destruction [Schumpeter 1934; 1942].

After a century of dominance the model of the public company is showing signs of decline. A public listing has become burdensome. Regulations have become more complicated after the Enron scandal of 2001-02 and the financial crisis of 2007-08. Many managers feel that their jobs depend upon producing good quarterly results for shareholders instead of the long term, sustainable growth for all stakeholders.

As a result of the above mentioned issues business people are experimenting with "hybrids" that enter public markets whilst remaining privately held. Thousands of young people are creating new firms in temporary office spaces. Their companies are pioneering new organisational forms. Start-ups used to face difficult choices about how to invest in large assets such as property and computer systems. Currently young companies exploit new technology which enables them to be global without having big assets. They can develop very fast by buying in services as and when they need them.

Therefore we can speak of total outsourcing. Without the Internet it would not be possible. After 20 years of the Internet new firms emerged with their online platforms efficiently combining supply and demand for goods and services. They do this often without expanding their assets merely using the free or redundant assets on the supply side. What is more they create new opportunities for consumption because they increase transparency in social and economic interaction. In this way they build social capital which is the basis for developing cooperative communities [Diamandis and Kotler 2014; Diamandis and Kotler 2015].

There are two companies, both created in San Francisco, which are regarded as the pioneers of the sharing economy: Airbnb created in October 2008, and Uber founded in March 2009. Uber a taxi operator is now the most valuable American company of the newest generation. Uber is a private company and its capitalization is estimated on level above \$60 billion at the beginning of 2016. That is higher than 80% of the firms in the S&P 500 index, many of which are decades old. Uber's value has grown faster than those of Facebook and Twitter in their early years.

In 2016 Uber operates in more than 450 cities in about 70 countries, providing more than 1 million rides each day. Consumers like Uber because its cars are cheaper than conventional taxis, clean and reliable. Uber's freelance drivers, who typically pay it around 20% of their fares, enjoy flexible working hours and are spared the formalities of qualifying

as a conventional taxi driver. Uber has an advantage that most transport firms lack: it does not have the cost of maintaining and insuring its own fleet of vehicles because its drivers supply their own [Taxis v Uber. Substitutes or complements? 2015].

Uber can be used as a case study presenting how to construct a platform for a digital service on top of which other businesses can be built. As it arrives in a city it launches a vigorous recruiting programme for drivers by offering them incentives to sign up. Its fares are flexible - they undercut conventional taxis most of the time, but go up when it is snowing, or when there is some other reason why demand for rides is growing [Uber. Driving hard 2015].

Airbnb an Internet holiday accommodation company, currently has about 1400 employees and operates 1,5 million listings in 33,000 cities and 190 countries. Airbnb owns no physical assets and is worth more than \$20 billion. That is more than the value of Hyatt Hotels, which has 45,000 employees spread across 549 properties and whilst Hyatt's business is comparatively flat, Airbnb's activity indicators are growing exponentially.

The story of Airbnb versus Hyatt Hotels presents a fundamental difference in the approaches to ownership. Hyatt Hotels spent enormous resources to purchase and own billions of dollars in physical assets, whilst Airbnb connects users with property to rent (hosts) with users looking to rent the space (guests). Airbnb runs its business without owning any rooms itself. Such platforms disrupt traditional industries by creating new sources of supply and rely on curation for developing quality. Unlike traditional hotels, Airbnb develops not by scaling assets but by increasing the hosts and travellers and matching them with each other using Internet tools [The rise of the sharing economy 2013].

Digital disruption. The sharing economy has a great potential to disrupt mature industries, such as automotives and hotels, by providing consumers with convenient and cost efficient access to resources and services without the financial encumbrance connected with ownership [Dawson, Hirt and Scanlan 2016]. At the beginning (mutation or search phase in an evolutionary algorithm) of innovation traditional producers are usually against the novelty if it is a threat to its market share. They defend its competitive advantages and try to maintain the status quo. They bring actions against innovators and start law-suits. But it is not possible to stop progress and new, profitable business models appear sooner or later (the selection phase of evolution). In the third stage the new business models are accepted by business and are replicated [Bradley and O'Toole 2016]. The above three evolutionary stages (mutation, selection, and amplification) could be observed in many cases of the introduction of new digital technology during the three last decades [Beinhocker 2007; Gintis 2007].

The newest example of the evolutionary algorithm is the case of Uber (now Uber Technologies). Uber operates worldwide and everywhere is a great threat to traditional taxi corporations. For this reason it is the subject of constant protests from very aggressive taxi companies and legal action from governments around the world who are trying to stop Uber from activity in their areas. Protests have been organized in such countries such as Germany, India, Spain, Colombia, France, Italy, Denmark, Canada, China and England. Uber managers were arrested in France in June 2015. In December 2014 Uber was banned in Spain and two cities in India. In 2015 the Brussels court decided to ban Uber and 26 cars were confiscated because, according to the court, the ride-sharing service does not respect taxi regulations in the Belgian capital. In the court opinion Uber drivers generally do not have the permits required of taxi drivers which gives them an unfair advantage and makes them a danger to the safety of their passengers. A traditional taxi driver needs several permits, a diploma and a declaration of good health in order to operate.

Protests against Uber were also organized in Poland. The Polish Office of Competition and Consumer Protection (UOKiK) as with other competition and consumer protection authorities around the world, is closely monitoring and analysing the effects of the emergence on the market of online platforms including those facilitating contact between drivers and passengers, such as Uber. In May 2016 UOKiK published its official statement regarding

Uber activity in Polish towns [Statement of UOKiK's position, 2016]. In Poland Uber services are available in Warsaw (since August 2014), in Cracow (since April 2015), Gdansk, Gdynia and Sopot region (since June 2015), Poznan and Wrocław (since November 2015). As of February 2016 all Polish drivers cooperating with Uber have been required to show proof that they have registered as businesses.

UOKiK's view is that the monitoring carried out so far does not give reasons for opening proceedings in this case with regard to protection of consumer interests or competition. According to UOKiK Uber's entry in local passenger transportation service markets in Poland contributes to the development of competition in these markets and has a positive impact on consumers. For consumers the emergence of a new carrier means wider choice, whilst for other market players it presents a challenge to them to raise the quality and innovativeness of their services.

UOKiK considers Uber's main competitive advantage to be the use of modern information technology which on the one hand allows consumers access to functionalities that traditional taxi services do not provide and on the other lowers the costs of the core service due to more efficient use of a fleet of vehicles. In this way Uber puts competitive pressure on the traditional taxi service market. An analogy can be drawn between Uber's expansion and the rise in popularity of taxi firms in Polish cities at the end of the twentieth century.

At the same time UOKiK stressed that the innovative nature of Uber cannot be categorized as an activity intended to eliminate competition. The basic technology used by Uber is not patent protected and therefore rival firms can use this business model and modify it further, thereby benefiting the development of competition and thereby consumers. This is confirmed by the availability of rival applications similar to Uber in Poland and other countries. Also, the type of service that Uber offers might not be the optimal solution for every consumer as it does not guarantee certain features such as anonymity of the passenger or the option of paying by cash, which might be important for some passengers.

Nowadays the pioneering technology implemented by Uber has many followers: Lyft operating in above 70 towns in the United States, Didi Chuxing from China, Gett from Israel, Grab from Malaysia and many others. The innovative taxi companies inspired the whole car manufacturing industry. The famous and very conventional producers of cars such as General Motors, Toyota or Volkswagen started to think how to reinvent themselves as mobility companies, selling transport as a service. The big carmakers have initiated different forms of collaboration with above mentioned internet taxi corporations in order to become mobility providers [The future of carmakers. Upward mobility 2016].

Conclusions. Breakthrough technologies enrich and diversify opportunities for new businesses. Internet technologies, according to the evolutionary algorithm, create new combinations of products, services and business models, and step-by-step replace the old technologies and traditional business dogmas. Sharing, openness and transparency have become the foundations of new business models.

The sharing economy has a great potential to disrupt mature industries, such as automotives and hotels, by providing consumers with convenient and cost efficient access to resources and services without the financial encumbrance connected with ownership. The famous and traditional producers of cars started to think how to reinvent themselves as mobility companies selling transport as a service. The big carmakers have initiated different forms of collaboration with internet taxi corporations in order to become mobility providers.

The concept of the sharing economy is still at a nascent stage. There are many new, very different business activities which are collected under the umbrella of a sharing economy. The theory of business is trying to follow this dynamic phenomenon based on creative entrepreneurs all over the world. Step-by-step the taxonomy of these new processes is being developed.

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