A NEW GENERATION OF DISRUPTORS IS PLANNING TO REDEFINE AIR TRAVEL – SO WHAT DOES THIS MEAN FOR AIRLINES AND AIRPORTS?
[NOWA GENERACJA CZYNNIKÓW MAJĄCYCH WPŁYW ORAZ MOGĄCA PRZEDEFINIOWAĆ PODRÓŻ SAMOLOTEM - CO TO OZNACZA DLA LINII LOTNICZYCH I LOTNISK?]

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ABSTRACT: The commercial air transport industry is facing a defining period and whichever way you look change is on the horizon. Technological, digital and engineering advancements are reshaping almost every industry on the planet, and the air transport sector (and the wider travel industry for that matter) is no exception. The passenger is at the core of our 2050 thinking. Over the last four decades the real cost of travel has fallen by about 60% and the number of travelers increased tenfold. We must continue to provide this great value to individual consumers and to society. To do so we need the right technology, efficient and sufficient infrastructure. And we need financial sustainability. Nobody has all the answers or a crystal ball to see the industry in 2050. But there was consensus among all present that there is strategic value in thinking together. And there was general consensus that one of the industry's biggest challenges is to evolve from the financial disaster of a partial deregulation that has created fierce competition among airlines but without giving them the normal commercial freedoms to do business. The industry is sick. To protect the value that aviation delivers to consumers, companies, countries and the global economy, we need a common vision to change as we move forward.

STRESZCZENIE: Branża komercyjnego transportu lotniczego znajduje się w okresie, w którym zachodzą duże zmiany. Postępy technologiczne, cyfrowe i inżynieryjne kształtują prawie każdą branżę na świecie, a sektor transportu lotniczego (i szeroko rozumiany przemysł turystyczny) nie jest wyjątkiem. Pasażer w perspektywie 2050 roku nadal będzie priorytetem dla branży lotniczej. W ciągu ostatnich czterech dekad rzeczywisty koszt podróży spadł o około 60%, a liczba podróżnych wzrosła dziesięciokrotnie. Branża lotnicza musi nadal zapewniać podstawową wartość indywidualnym konsumentom i społeczeństwu. Aby to zrobić, potrzebuje odpowiedniej technologii oraz wydajnej i wystarczającej infrastruktury. Potrzebuje stabilności finansowej. Nikt

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nie zna wszystkich odpowiedzi ani nie posiada kryształowej kuli, aby zobaczyć branżę w 2050 roku. Ale wszyscy są zgodni co do strategicznej wartości wspólnego myślenia. Panuje powszechny konsensus, że jednym z największych wyzwań branży jest ewolucja od finansowej katastrofy, która miała miejsce jeszcze kilka lat temu, częściowej deregulacji, która stworzyła zaciekłą konkurencję między liniami lotniczymi, nie dając im normalnej swobody handlowej do prowadzenia działalności gospodarczej. Branża lotnicza przechodzi poważne zmiany i co jakiś czas kryzysy. Aby chronić wartość, jaką lotnictwo zapewnia konsumentom, firmom, krajom i globalnej gospodarce, potrzebuje wspólnej wizji zmian i kierunków postępu.

KEY WORDS: Innovation, Transport Policy, Aviation Policy, Airport, Aerodrome.

KLUCZOWE SŁOWA: innowacje, polityka transportowa, polityka lotnicza, port lotniczy, lotnisko.

1. *Introduction*

In recent times, a number of companies, projects, concepts and visions have inspired some to predict a "revolution", although when exactly this revolution will materialise has been harder to pinpoint. Predictions of an industry-wide overhaul are often met with scepticism, but it is now becoming increasingly clear that the air transport industry is likely to look wildly different in 10 years' time compared to today, leaving airlines, airports and their partners wondering what steps need to be taken now to prepare for the future. Companies often confide in their future visions but the sheer scale of their ambition suggests that the foundations are being laid for major change in the years ahead.

Figure 1. Supersonic travel and electric aircraft (Zunum Aero is planning to have its hybrid electric aircraft in operation by 2020. (Source:

http://www.futuretravelexperience.com/2017/08/a-new-generation-of-disruptors-is-planning-to-redefine-air-travel)

Some developments that are already in the public domain add weight to the theory that commercial air travel could be the subject of major change in the relatively near future. The return of supersonic air travel and the development of electric aircraft were considered hugely ambitious just a few years ago, but companies like Zunum Aero (backed by Boeing's HorizonX and JetBlue Technology Ventures) and Boom Supersonic are making big strides in these areas.

Washington-based Zunum Aero plans to have its hybrid electric aircraft in operation by 2020, initially with a range of around 700 miles, extending to over 1,000 miles by 2030. It hopes that by routing more traffic to under-utilised regional and general aviation airports, and providing much lower operating costs, it will make air travel more efficient and convenient and simplify the door-to-door travel experience.

Figure 2. A trial flight of Boom Supersonic's 55-seat passenger aircraft could happen as soon as 2018. Boom Technology has already produced concept images of its aircraft at London Heathrow Airport. (Source : http://www.futuretravelexperience.com/2017/08/a-new-generation-of-disruptors-is-planning-to-redefine-air-travel)

Meanwhile, in Colorado Boom Supersonic is making use of breakthroughs in aerodynamic design, state-of-the-art engines and advanced composites to try to bring efficient and affordable supersonic air travel to the masses. The company expects a prototype of its 55-seat passenger plane to make its first test flight before the end of 2018.

If all goes to plan, its first transatlantic passenger flight could become a reality by 2023, cutting travel time between New York and London by around four

hours, to just three hours and 15 minutes. According to Boom, five airlines have already placed orders for a total of 76 supersonic aircraft.
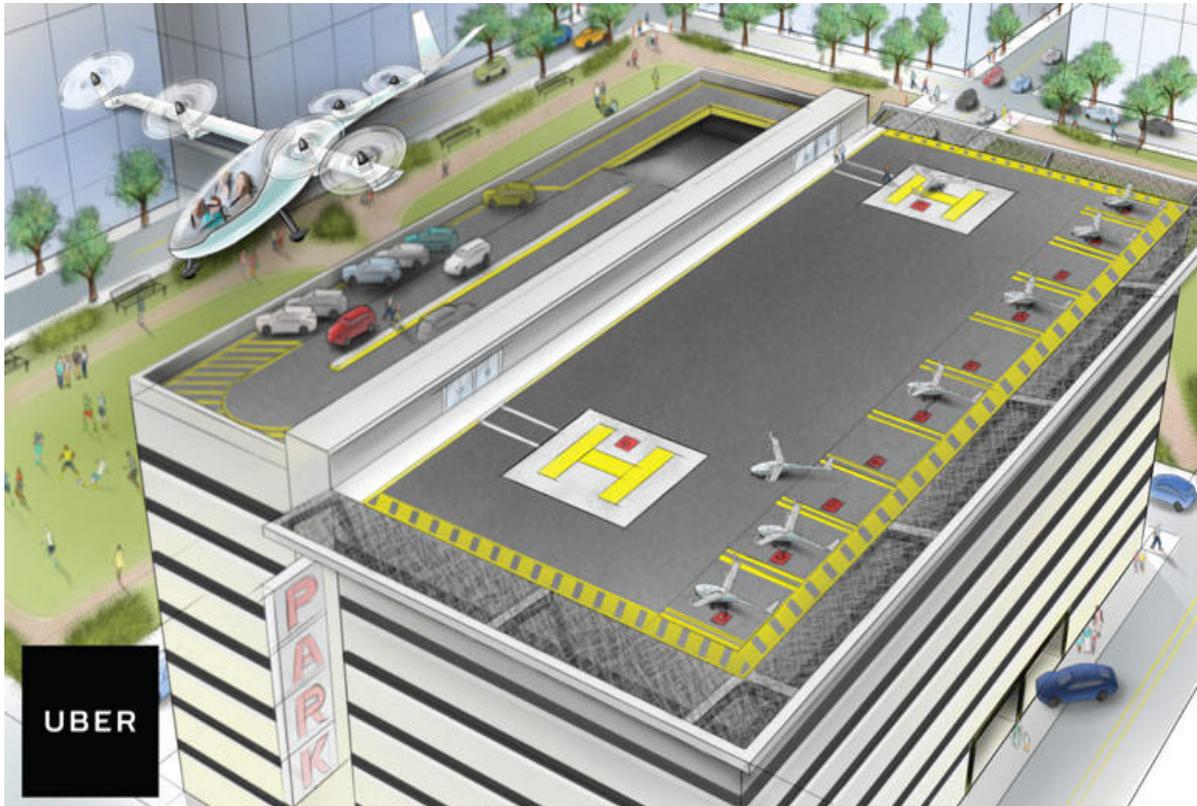

Figure 3. Uber Elevate, Project Vahana and Hyperloop (Uber is exploring the potential of aircraft with vertical take-off and landing capabilities. The company is hoping to trial a fleet of new aircraft in Dubai and Dallas-Fort Worth in 2020. (Source: http://www.futuretravelexperience.com/2017/08/a-new-generation-of-disruptors-is-planning-to-redefine-air-travel).

A number of other big-name disruptors are also staking a claim to help define the future of air travel. Uber, for example, is getting serious about making "on-demand urban aviation" a reality. Uber Elevate aims to take ride sharing to the skies and has announced partnerships with manufacturers, real estate, and electric charging companies. In April 2017, Uber announced plans to trial an electric fleet with vertical take-off and landing capabilities in Dubai and Dallas-Fort Worth by 2020.

Also, A³ by Airbus Group last year launched Project Vahana, which is based around the development of an aircraft that doesn't need a runway, is self-piloted and can automatically detect and avoid obstacles and other aircraft. A³'s aim is to make the first certified passenger aircraft without a pilot and it is hoping to fly a full-size prototype within a matter of months, not years.

Then, of course, we have Hyperloop, the brainchild of Elon Musk, who claims the concept would allow for passengers to be transported at 760 miles per hour and could cut travel time between Los Angeles and San Francisco to just 35 minutes. Many remain unconvinced of its viability but the state of Dubai has

already commissioned a feasibility study to explore Hyperloop's potential. Estimates suggest that it could cut travel time between Dubai and Abu Dhabi – which are the best part of 90 miles apart – to just 12 minutes.

2. *A new role for airlines and airports?*

So, what does all of this mean for airlines and airports? Should airlines be preparing for the return of supersonic travel and the imminent introduction of hybrid electric aircraft? Should they be preparing for new competition on short-haul routes from Hyperloop? Will they compete or partner with these alternative forms of travel? While these questions may not be at the forefront of most airlines' thinking today, this June IAG's Director of Strategy, Robert Boyle, hinted at the potential of autonomous aircraft, suggesting that the more progressive airlines and groups are indeed keeping a close eye on developments in this space.
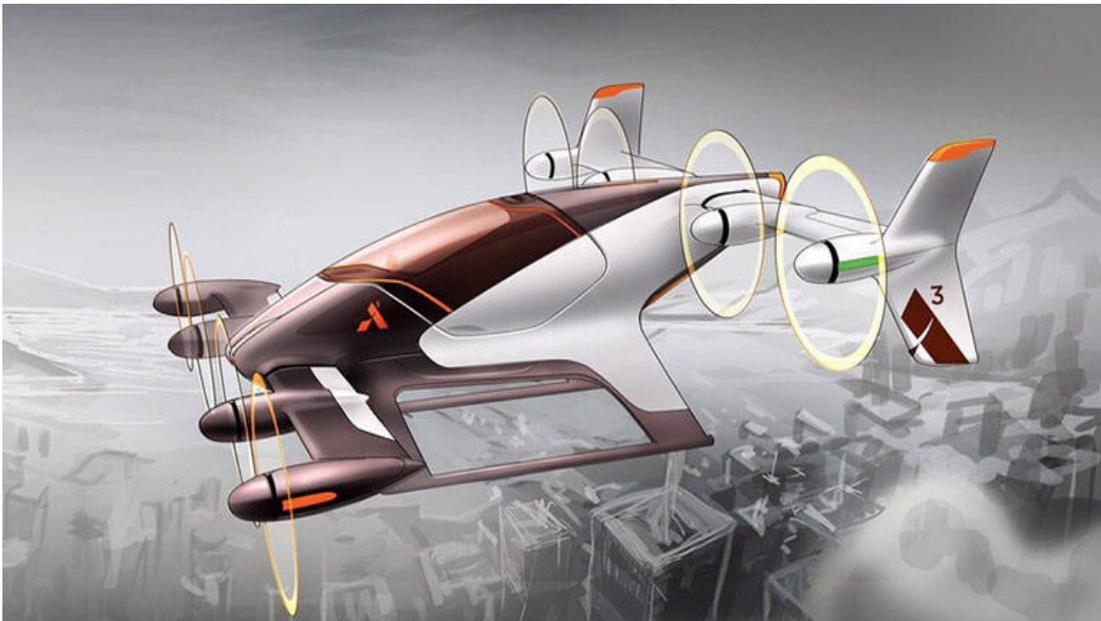

Figure 4. A³ by Airbus Group's Project Vahana is based around an aircraft that is self-piloted and does not need a runway to take off and land. (Source: http://www.futuretravelexperience.com/2017/08/a-new-generation-of-disruptors-is-planning-to-redefine-air-travel)

As for airports, what does the future hold if Vahana or Uber Elevate-style aircraft take to the mainstream, and a new generation of supersonic aircraft are embraced by their airline customers? What impact will this have on existing airport infrastructure? All of these are the types of questions that senior figures from the likes of Zunum Aero, Boom Supersonic, Hyperloop Transportation Technologies and A³ by Airbus Group will be discussing in a dedicated "disruptors" session on day one of Future Travel Experience Global 2017 (6-8 September, Las Vegas).

3. *A lesson from the automotive industry*

While it can be tempting to dismiss such radical developments as being futuristic and to play down the potential near-to-medium-term impact on the air transport industry, lessons can be taken from parallel sectors. It would be easy to draw comparisons to the sudden rise and significant impact of the likes of Uber and Airbnb in other industries, but perhaps the best example is the electric vehicles market in the automotive sector.

According to the International Energy Agency (IEA), the number of battery-powered cars on the roads worldwide rose by 60% year-on-year in 2016, up to around 2 million. Five years earlier, the electric car market was almost non-existent. A multi-government programme, the Electric Vehicles Initiative, recently set an ambitious goal for 30% market share for battery-powered vehicles by 2030 and the IEA estimates that there could be as many as 140 million electric cars on the road by that point.

Figure 5. The new Tesla Model 3 includes a number of features, such as Enhanced Autopilot, that were deemed futuristic just a few years ago. (Source: http://www.futuretravelexperience.com/2017/08/a-new-generation-of-disruptors-is-planning-to-redefine-air-travel, 07.08.2017)

One of the biggest players in this space is Tesla, which less than a decade after its first car – the Roadster – entered general production, has just unveiled its fourth model, the battery-powered Tesla Model 3. This comes complete with a 300-mile-plus range (for the Range+ version, at least) and Enhanced Autopilot feature, which paves the way for a fully-autonomous car in the future – features that were almost unthinkable a few short years ago.

The lesson for the air transport industry? If you think electric, on-demand and self-piloted aircraft are more science fiction than tomorrow's reality, that's exactly what many in the automotive industry thought about long-range battery-powered and self-driving cars in the not-too-distant past.

4. *Conclusions*

Technology has made the security and customs/immigration processes for passenger and luggage screening not only more efficient but also almost invisible to the passenger. These processes are now partially completed well in advance of the passenger journey through profiling that categorizes passengers and packages by levels of potential risk. The remaining processes are conducted using stand-off technologies that complete the screening processes without interrupting the passenger's journey through the airport (except for when these stand-off technologies reveal the need for closer inspection).

Technology has also been applied to passengers and their luggage. PDAs[1] and other hand-held or worn devices now enable passengers themselves to track their luggage at every stage of a journey, virtually eliminating the problem of mishandled baggage. Following the emergence of a new business model in the 2020s, companies now provide overnight door-to-door pick-up and delivery of baggage at surprisingly low cost, thereby relieving the passenger of this burden and making the airport process for the passenger far more efficient. Meanwhile, these same PDAs/other similar devices allow airlines, airports, and security agencies to track the whereabouts of the passengers themselves throughout the journey, ensuring that passengers no longer accidentally miss their flights.

A decade of change has transformed aviation. Airlines are leaner, greener, safer and stronger. The industry had also grown to meet the needs of a globalizing world. Compared to 2001, freight shipments expanded by 17 million tonnes to 46 million annually. At the same time, air travel became accessible to a billion more travelers a year and we expect 2.8 billion people to fly in 2011.[2]

The decade also saw industry revenues double to an expected $598 billion. But industry profits are much less impressive. Over the last 40 years, the average net margin is 0.1%. And even in the best year of the last decade – 2010 – the industry's $18 billion profit is equal to a pathetic margin of just 3.2%, that does not cover the 7-8% cost of capital.

Looking ahead, we can see that in 2050 aviation will fly 16 billion passengers and 400 million tonnes of cargo. We must be able to manage that with sustainable technologies and efficient infrastructure, while pleasing our passengers and rewarding our shareholders. At the 2010 IATA Annual General Meeting has been announced Vision 2050 with these principles as cornerstones.

So, the future has arrived faster than expected. If air travel as we know it does indeed undergo its own revolution in the coming years, the impact on every stakeholder will be massive. Airlines will be forced to re-think their fleet modernisation plans and their overall role in a new-look commercial air transport sector, OEMs will be forced to adapt to survive, airports will have to re-evaluate their real estate to accommodate new aircraft, and new strategies will have to be developed to counter the threat posed by new forms of travel that don't require a traditional airport terminal or runway.

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[1] PDA-Personal Digital Assistant.
[2] IATA Vision 2050, Report, Singapore 12 February 2011.

Clearly, things are moving quickly in the air transport space and a new wave of disruptors are trying to re-invent the experience of flying. In a recent interview with WIRED magazine, Zach Lovering, the head of Project Vahana, said: "It seems like the future has gotten here faster than we all expected". Anyone who ignores this could end up getting left in the past.

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