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How war in Ukraine influence aviation globally?

The impact of the war on the development of aviation in the world and opportunities for growth in Ukraine. Comparison of data and research results, including statistics and reports. Advantages and disadvantages of forced changes.

Russian-Ukrainian war and its negative impact.

The war, which began in the east of Ukraine and turned into a full-scale one, has had a significant impact on the development of aviation in the world from 2014 until now. The conflict caused not only human losses and material damage, but also changed approaches to the development of aviation. One of the most tangible consequences of the war for aviation is the restriction of access to Ukrainian airspace, which creates difficulties for airlines, which are forced to look for alternative routes and increase fuel and logistics costs.

Many airlines, such as Turkish Airlines, LOT Polish Airlines, Wizz Air, Ryanair, Lufthansa and so on had to stop flights to Ukrainian cities, which significantly affected their passenger traffic and general budget. Airlines that did not stop, but only flew over Ukraine, had to rebuild their routes, taking into account the physical and financial capabilities, characteristics and capabilities of aircraft, the location of the nearest airports near the borders of past routes, etc.

Table 1.

Airline operations in Ukraine (domestic and international)

	2018	2019	2020	2021	2022*
Transported passengers (thsd.pass.)	12529.0	13705.8	4797.5	9300	500
Passengers turnover (mln.pass.km)	25889.3	30241.8	10106.9	18729.7	1338.5
Transported cargo and mail (mln.t)	0.1	0.1	0.1	0.1	0.01
Cargo turnover (mln.tkm)	339,7	295,6	316.2	346.3	39.9

*Data given only for January, since the airspace was closed after that and exclude the temporary occupied territories of Ukraine

As we can see in Table 1, the 2022 data is the smallest, given that aviation was only available for the first month, which is where we can get the statistics from. These indicators are even lower than in the year of the global pandemic.

Also, an example can be not only logistics or technical expenses, but also expanses for design. Japanese air company ZIPAIR has drawing of the capital letter “Z”, which directly symbolizes the aggressor in the Russian-Ukrainian war. After the full-scale invasion, the airline was forced to repaint its planes so as not to be associated

with supporting the Russian invasion of Ukraine. It also brought significant financial and reputational losses, which the company did not count on from the very beginning.

In the first months of the full-scale invasion, some airlines, such as Wizz Air, offered Ukrainian refugees free flights from countries closest to the border to safer places. Considering this fact, it is possible to calculate the large financial costs of the airline for tickets for everyone who took advantage of this opportunity, and there were about 100,000 such tickets. This affects not only the airline's losses, but also the carrier's country, as the allocated funds were from previously paid taxes of local residents and users of the airline's services.

One cannot avoid the fact that many airlines lost a significant indicator both in finance and in reporting on the total number of passengers and baggage, as they were forced to stop flights to the aggressor country of Russia. Airlines that, despite the terrible actions of the country, still continued flights, came under the influence of imposed sanctions, which also has a negative impact and many restrictions in relation to themselves. Last year, against the backdrop of Western sanctions, Royal Flight, business operator Sirius Aero, Atran cargo and AirBridgeCargo ceased operations, but they keep their certificates. After cancellation, the operator's certificate is not renewed. In the previous five years, five companies lost their certificates.

During the war in Ukraine, some Ukrainian airlines relocated their operations to other airports outside the conflict zone. This has been done to ensure the safety of their aircraft, staff, and passengers. For example, Ukraine International Airlines (UIA) temporarily moved its hub from Kyiv's Boryspil International Airport to Lviv Danylo Halytskyi International Airport in Western Ukraine. This move allowed UIA to continue operating flights to destinations in Europe without having to fly over the conflict zone in Eastern Ukraine. Other Ukrainian airlines such as Windrose Airlines and Azur Air Ukraine also relocated their operations to Lviv during the conflict. In addition to Lviv, some airlines also shifted their focus to airports in other neighboring countries such as Poland and Romania. Relocating operations can be a challenging process for airlines, as it involves transferring staff, equipment, and facilities to a new location. However, for Ukrainian airlines during the war, this was seen as a necessary measure to continue operating safely and maintain their business.

As an example, it can be presented SkyUp Airlines, that are continued flying now. During the full-scale war in Ukraine and the complete impossibility of operating in Ukrainian skies, the airline has already proven itself as a reliable partner in cooperation on air leasing contracts. Starting from February and ending in September 2022, they performed 4,219 flights within the framework of wet-lease cooperation. Wizz Air, Freebird Airlines, Tailwind Airlines, Air Albania, SmartWings started renting SkyUp - about 10 air carriers in total. Currently, the SkyUp fleet consists of 12 Boeing 737 aircraft. Eight aircraft make flights in Europe, two in Sudan. It definitely has a positive impact. Thanks to partner airlines, SkyUP is able to pay taxes to the state treasury during the war, keep more than 1,500 employees working and support Ukrainians.

One of the factors in the need for Ukrainian aircraft in foreign countries was the shortage of aircraft on the European market due to the active growth of transportation, especially considering the demand after the easing of quarantine conditions. No one was ready for this growth: neither carriers, nor airports, nor

handling companies, nor tour operators. Such a situation helped the Ukrainian low-cost carrier to enter the market.

Not only airlines, but also airports have lost demand for their services, as they are strategic facilities that are particularly at risk during wartime. Since the early days, most airports have suffered significant damage, including the attack and destruction of technical facilities, runways, loss or damage to passenger property, damage to ships left on the territory during the invasion, and more. A lot of equipment is very expensive compared to other types of transport. So, frames, metal detectors, detectors of explosive substances, which were in limited quantities for use at each airport, will need replacement or restoration, which will be felt in the costs after the restoration of aviation.

The impact of the lack of aviation on other modes of transport.

Taking into account the suspension of air transport, all demand has shifted to other types of transport: road, rail and sea (only cargo). This has increased the demand for transport, necessary services, logistics routes, which also now need to be built, taking into account hostilities and more. Considering that since the start of the full-scale invasion, a large number of people not subject to mobilization have left, the number of passengers is less than it could be. Thanks to this, there are enough resources for transportation in Ukraine, and it also provides wider opportunities for road transport due to less traffic jams than last year.

Table 2.

Volume of freight traffic, number of passengers transported in 2022*

Indicator	Data	in % until the corresponding period of 2021
Volume of transported goods	318.2 mln.t.	51.2%
Cargo turnover	165935.7 mln.tkm.	57.3%
Number of transported passengers	1600.6 mln.pass.	60.3%
Passenger traffic	31142.8 mln.pass.km.	49.6%

*Preliminary data and exclude the temporary occupied territories of Ukraine

Prospects for the development of aviation.

However, taking into account all the above facts, one can also find advantages. For example, in Ukraine, the development of military aviation has increased significantly, due to the high need, as well as the support of other countries, both financially and technically, as well as helping in the training of the Ukrainian military. Also, older equipment can now be replaced with newer ones, which will improve the quality of service in the future and extend the life of the technologies.

During the war conflict in Ukraine, non-pilot aviation has been used to support various military and humanitarian operations. Here are some examples: Unmanned aerial vehicles (UAVs): UAVs or drones have been used extensively by the Ukrainian military for reconnaissance and surveillance missions. They have also

been used to gather intelligence, monitor troop movements, and provide real-time situational awareness in the conflict zone. Cargo planes have been used to transport troops, supplies, and equipment to and from the conflict zone. For example, the Ukrainian military has used the Antonov An-124 Ruslan cargo plane to transport heavy equipment and supplies to the front lines. Helicopters have been used for medical evacuation, search and rescue, and transportation of troops and supplies. The Ukrainian military has used the Mil Mi-8 and Mil Mi-24 helicopters extensively for these purposes.

The Ukrainian military has been using both domestically produced and imported drones in the conflict. For example, the Bayraktar TB2 drone, manufactured by Turkey's Baykar company, has been used extensively by the Ukrainian military for reconnaissance and strike missions. The Ukrainian military has also developed its own drones, such as the PD-1 unmanned aerial vehicle. In addition to military use, drones have also been used by civilian volunteers to monitor the ceasefire and document the conflict. These drones have been used to capture aerial footage of the conflict zone and to provide real-time updates on the situation. In summary, the war in Ukraine has led to the development and deployment of drones by the Ukrainian military for reconnaissance, surveillance, and strike missions. The use of drones has also led to the establishment of a drone industry in Ukraine.

Conclusions.

In conclusions, the war in Ukraine is not local and has a great impact not only on its own territories, but also throughout the world. In 9 years, the world adjusted to change, even if it caused significant losses at the beginning, but gave prospects for the future. So, the war in Ukraine has a complex and multifaceted impact on the development of aviation. And although the war led to difficulties and limitations in the development of this industry, it also gave an impetus to the development of other types of transport, the strengthening of military aviation, medicine and the call for help from other countries. It also became an opportunity to show oneself, build new international communications, sign valuable contracts and get the support of the whole world.

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