Urban Air Mobility Vertiports within the Metaverse #2

Image: AIB Virtualised CCC Functionality

Virtual Centralised Command & Control Functionality

In our first whitepaper Airport in a Box (AIB) discussed how urban air mobility may be envisaged within the metaverse and the hardware/software components which may make up a future virtual passenger/logistics service. We also explored how the metaverse could be used to procure real world air services and add-ons to provide additional marketing and sales channels for airlines and airports.

This paper expands on the baseline services required, mainly the centralised command and control for virtual or real ports. When we talk about 'ports' it's in a general sense as the concept is similar for vertiports, airports, seaports, rail stations and so on. The first item to note is that there is no new technology to see here, it's just imaging the use of existing technologies in a certain way to provide a service which is cost efficient to the operator. For future vertiports especially, there needs to be a minimum viable product which the owner/operator may then add to with either their own technology services or selected from a tailored vertiport services list and then pay a service charge. Any eventual solution could be a mix of minimum viable product plus operator's service options and vertiport provider options.

To keep the vertiport infrastructure cost efficient and the passenger price per mile competitive with other forms of transport the operations of a vertiport can be centralised and made virtual. This already happens within some virtual air traffic control (ATC) operations within Norway, Sweden, Saudi and UK. In addition to ATC the ICT/Security & Building Management systems can also be virtualised and centralised to an off-site location anywhere in the world as long as there is redundant and high availability telecoms connectivity. There is no need for local operations rooms

or local staff. The ATC centralised location consists of various human controller positions for the different airport ground/air functions, high-definition screens to receive and display high quality sensor and video data. The next iteration of services seeking cost efficiencies may be the ability to provide the command and control through a VR headset in any physical location with internet connectivity which will free up the operations staff from a centralised location. For less critical systems such as ICT/BMS the operator could be sat at home managing multiples of vertiports for various eVTOL operators or vertiport owners.


Image: Swanwick, UK Virtual ATC (NATS)

Digital Twins for Virtual Building Control

In our latest illustrations we have shown a simple digital control box which is displaying security, ICT and building management functions. The user is wearing a VR headset to demonstrate that the operational centre could be accessed from anywhere. The user could also interact with other virtual avatars such as air traffic control, aircraft or port infrastructure owners. The user is shown monitoring health and information alarms such as whether motion has been picked up by a CCTV

camera or a fire detector head has sensed smoke/heat. From a central location the user can start/stop the devices, interact with emergency service providers, speak directly to the occupants inside the infrastructure or engage maintenance service crews.

Digital twin technology is a representation of the real-world asset in real time. It is not a metaverse as the technology platform is not decentralised and open to the public. The command-and-control centre needs to retain security and safety measures for the assets and passengers. Other metaverse avatars would not be allowed to develop or add to the virtualised centralised command and control functionality however if the services are only provided virtually such as virtual UAM from A to B then the control room may be part of the wider decentralised web space and could be modified as there would be no safety concerns. Monetisation of metaverse services may lead companies to encircle their services and disallow others to engage.
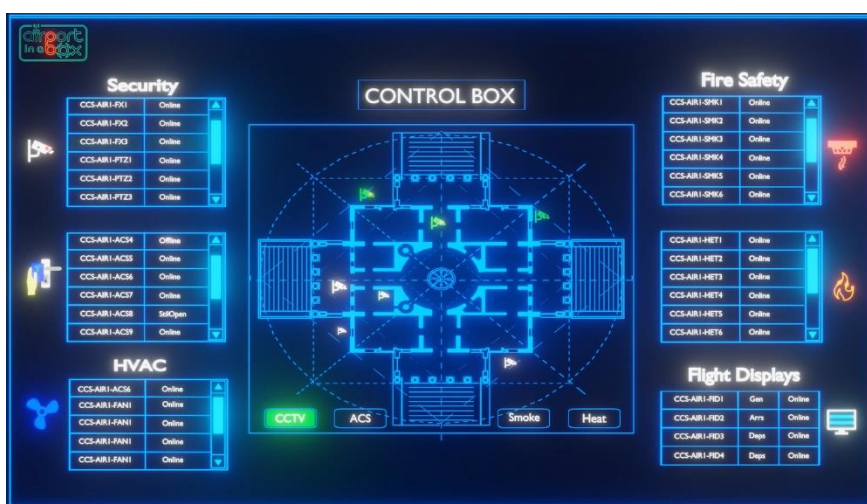
There is a lot of confusion in the industry now with many papers calling digital twin technology the metaverse. Digital twins may be part of the journey to providing components for the metaverse, but they are mostly in-house creations used for efficiency of operations or allowing public to view a place or product before attending or purchasing.

About Airport In a Box Limited

Airport in A Box (AIB) provides systems integration design and management consultancy for vertiports & Digital applications to support the operators, logistics and passenger booking/travel processes.

It is part of the Origin Group of companies. Origin specialises in major airport systems integration design and management. We also provide expert witness services in arbitration cases. Origin have provided services worldwide on some of the largest and most prestigious airports.

AIB intends to continue to explore the future possibilities of monetising mobility solutions within the metaverse and the use of digital twins. More information is available at airportinabox.com and originprojectsgroup.com

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