Question	Answer
Who would drive this development towards virtualization service--infrastructure decoupling? if there is architecture/system available who is the customer? We still have very fragmented airspace governed individually.	The fragmentation of service provision generates cost-inefficiencies and a rigidity that makes it impossible to properly address the capacity challenges of tomorrow. Modern-day general-purpose communication and computer processing capabilities allow for better performing and more cost-efficient solutions, where physical processing capabilities no longer need to be close to the point of use.. in the Future airspace Architecture study three recommendations were proposed to be considered by European commission. One recommendation is: Realise the de-fragmentation of European skies through virtualisation and the free flow of data among trusted users across borders. this recommendation encourage European Commission to: • Review policy options which, on their own or in addition to FABs, could effectively deliver a virtual defragmentation of European skies and potentially generate higher levels of resilience by encouraging industry-based alliances to deliver core interoperability through common service delivery. • Implement a certification and economic framework for ATM data services providers taking also into account possible restructuring of ANSP services as well as an EU framework for on-demand cross-border use of services (capacity-on-demand). • Continue to support timely delivery of SESAR solutions contributing to the delivery of the proposed target architecture (SESAR vision).
What is the organizational and legal side of the technical side to virtual solution?	If I understood the question, in the Future airspace Architecture study three recommendations were proposed to be considered by European commission. One recommendation is: Realise the de-fragmentation of European skies through virtualisation and the free flow of data among trusted users across borders. this recommendation encourage European Commission to: • Review policy options which, on their own or in addition to FABs, could effectively deliver a virtual defragmentation of European skies and potentially generate higher levels of resilience by encouraging industry-based alliances to deliver core interoperability through common service delivery. • Implement a certification and economic framework for ATM data services providers taking also into account possible restructuring of ANSP services as well as an EU framework for on-demand cross-border use of services (capacity-on-demand).
As far as I understand, one of the main point to allow UAV (mainly related to U-Space) and other aircrafts to fly "together" consists to make the same risk analysis method. Regarding UAV, the specific SORA method will take place. How consider this specificity? Maybe is it not the good forum?	In the MP the vision for drone integration is that drones (civil and military) will be completely and seamlessly integrated into all environments and classes of airspace, operating safely and efficiently alongside manned aircraft. The ATM Master Plan does not mention SORA explicitly however one of the recommendation coming from SESAR is to update SORA to consider the risk of air collisions (for both manned and unmanned).

What is the expectation for the future of the aviation, like CORONA and Climate has been a game changer for the automobile industry, In my opinion, less aviation traffics by current players and a much higher number of smaller and individual players (like air taxis style). How does it ATM scale?	the SESAR vision remains valid. Due to the current crisis the vision of the ATM Master Plan calls for an acceleration of the digitalisation of aviation infrastructure to offer new capabilities like a fully scalable traffic management system capable of operating seamlessly and safely in all environment and classes of airspace and adapting quickly and flexibly to traffic demand, considering manned or unmanned traffic, a system infrastructure more modular and agile relying on data sharing and open to the sector, Elimination of environmental inefficiencies caused by the aviation infrastructure and capable of fully exploiting the potential offered by the next generation aircraft for cleaner and quieter flight.
New UAM/UTM solution providers must work with ATM solution providers to make urban flying possible. In reality, ATM providers pursue their own interests and smell new business opportunities, which limits their willingness to cooperate. How can new providers of UAS/UTM solutions solve this problem?	There are different perspectives to answer to this question. The first one is the political one, mainly driven by the EC as U-space has some key principles for U-space is the open-market, the multiple service provision and the will to ensure access to new solution/service providers. From the technical perspective, the development of standards will be the enabler. This is especially applicable to information sharing, data exchange, roles & responsibilities. The coming update of the U-space brochure will further develop these aspects. As an example, the creation of acceptability criteria and best practices needed to support all the open source or proprietary developments done in parallel could be a way to secure the open development of U-space.
There must be a clear statement in the Master Plan of how uam and GA can co exist for the issue in previous comment to be achieved. Please provide this information and reference the statements in the Master Plan that provide for this.	The Master plan includes the roadmap for the safe integration of drones in the airspace. This covers UAM which will be one of the most demanding use cases for U-space (which covers services that could also be provided to e.g. GA). The MP outlines in section 4.3 that further R&D is need on the topic and the on-going consultation on the future content of the R&I programme during 2021-2027 is further detailing these research needs.
For safety and practical reasons, in class G, rpas and uam airspace users MUST be capable of keeping clear of GA aircraft in ALL circumstances, without an unreasonable burden of additional equipment in the GA cockpit.	See response on previous point.
Looking at the pie charts, it seems 10% of projects have delivered but have no implementation decision. Is this an acceptable number for SJU?	The Master Plan brings together SESAR development and deployment activities and therefore also provides an overall state of implementation. Deployment is based on the flow of mature and tested SESAR solutions delivered from the R&I activities. It is true that today, some SESAR Solutions that have been delivered from R&I are still awaiting a deployment decision at EU level. To help address this the Commission is currently reviewing the SESAR deployment framework in the context of the on-going PCP review.
The ATM systems (virtualized or not) has to be installed to be able to serve the needed maximum capacity. Is there any study available how scalable costs of running the technical systems are in case of reduced traffic like CORONA?	The MP outlines that the future ATM system should be scalable to fluctuations (up or down) of traffic demand. As outlined also in the Airspace Architecture Study (where you will also find pre-COVID simulation results) this is not the case today.

Hello, how are the deployment roadmaps in the Master Plan coordinated with the SESAR Deployment Manager ?	SDM and SJU signed a Memorandum of Understanding regarding the alignment of the Master Plan and the Deployment Programme. In addition, the SESAR Deployment Manager participates in the ATM Master Planning Committee. This committee is focused on providing advice to the Executive Director (ED) on the progress of the execution and the implementation of the Master Plan and identifying possible opportunities for improving the Master Plan priorities.
To facilitate both drone operations and ensure the safety of manned aircraft operations: Which steps are actively taken to ensure electronic visibility of all aircraft (manned and unmanned)? (This is very much needed to make scaling and implementation of drone ops)	We agree, there are needs to develop cheap, reliable electronic conspicuity as it is needed to develop operational procedures for pilots reacting to electronic conspicuity. This is a need to be considered in the future R&D programme (SESAR 3)
What was the URL Marie-France Deslandes was referring to?	https://www.sesarju.eu/index.php/in-practice and www.atmmasterplan.eu/exec/deployment-scenarios.
What do you mean by saying "Initial U-space services" and "Advanced U-space services"?	The MP outlines the roll-out of U-space in 4 phases. U1: U-space foundation services covering e-registration, e-identification and geofencing. U2: U-space initial services for drone operations management, including flight planning, flight approval, tracking, and interfacing with conventional air traffic control. U3: U-space advanced services supporting more complex operations in dense areas such as assistance for conflict detection and automated detect and avoid functionalities. U4: U-space full services, offering very high levels of automation, connectivity and digitalisation for both the drone. For further information please refer to section 5.1.5 of the MP or directly to the U-space Blueprint. and the U-space system.
Aircraft CNS equipage and mandate compliance is an important factor post COVID. The fleet will be different and airlines reluctant to spend on avionic upgrades without guaranteed near term benefits. Is this reality a significant element of the SESAR digital near term future?	The MP includes a standardisation & regulatory roadmap (section 5.5). The MP also includes an overall incentivisation strategy to help accelerate the digital transformation (section 6.3). It is worth stressing here that the Commission is currently reviewing the SESAR deployment framework in the context also of COVID (on-going PCP review).
As Airlines are currently downsizing their fleets and put A380s out of service., do you expect any impact on the operations after traffic levels rise again?	The MP outlines a vision for the ATM system to be scalable to fluctuations in demand of air traffic (up or down) and be able to exploit to the maximum possible extent the capability of modern aircraft that will be more fuel efficient. It is too early to estimate the exact extent of the COVID implication on future fleet sized and mix but the target vision is addressing this challenge for the medium to long term.
Will there still be room for uncontrolled flights in Airspace G in the future and if so, will U-Space restrict these flight?	The vision of the MP is for the safe integration of drones in all classes of airspace. The U-space Concept of Operations further details implications for various types of operations.

Do you foreseen/plan an acceleration on Remote Tower implementation?	More and more airports, including airports with medium traffic volumes, are expressing their interest in the deployment of remote tower either for the provision of services or as contingency locations. The number of implementations is expected to quadruple in the next 3 years. Taking into account the improved cost-efficiency brought by the remote tower services, both in terms of infrastructure deployment, maintenance and operation as well as in terms ATCOs optimisation it is expected that the current implementation pace to be maintained or even accelerated. You can check further information about remote towers in the European ATM Master Plan Level 3 – Implementation Report 2020.
One of the problems related to Human performances is how to guarantee that atcos proficiencies levels remain current in this long period of very low traffic flow.Is SESAR elaborating something on this side?	The gradual implementation of the virtualisation of service provision will allow diversification of the controllers' tasks and the acquisition of new skills and will enable closer collaboration between controllers' teams to address capacity issues. The proposed target architecture enables enhanced collaboration between ATSPs, to bring flexibility to service provision and therefore better align capacity offer to the demand.
What services will be virtualised and what exactly does it mean in practice?	As presented in the webinar, virtualisation of service provision is an essential operational change required to delivered the SESAR vision. This EOC means the ability to provide ATS from a remote location in all operating environments:
is phase A (address known critical network performance deficiencies) still valid in today covid environment where traffic demand is very low?	The crisis should be used as an opportunity to further accelerate the implementation of the Master Plan towards a digital European sky towards a more scalable system.
Automation is often achieved through artificial intelligence, which is not easy to get certified in safety critical application. Does SESAR have any supporting activity dedicated to this goal?	Automation is at the centre of the SESAR transformation endeavour. Many SESAR projects have already brought ground breaking solutions alleviating workload and improving performance (e.g. Safety nets, Queue management...). The potential of AI has been recognised early in SESAR with smart applications for speech recognition and image processing. However, this remains marginal as most of the automation solutions available today do not use AI. When looking at the next 5 to 7 years, it is clear the AI will change the face of ATM solutions. This will include AI solutions safety critical applications (eg active control) but also for non-safety critical applications (e.g. resource planning...) For the first time, the newly adopted master plan put forward an automation roadmap with six levels of automation outlining the SESAR ambition. This roadmap presents critical steps that indeed require a joint human machine cognitive systems that will require AI for safety critical application. In this context, the ATM master plan fully recognises that safety science will evolve to cope with the safety challenges posed by the introduction of machine learning, developing new methodologies for the validation and certification of advanced automation that will ensure their transparency, robustness and stability under all conditions. All these important issues are part of the portfolio of activities of the Digital European Sky and are also fully aligned with the recently published EASA AI roadmap.
How is the cyber security of the Digital European Sky to be assured? The higher levels of integration, digitalisation and automation will potentially lead to gaps and vulnerabilities to attack. How are we to protect ourselves against those external actors who wish to do us harm?	In all activities perform in SESAR cyber security is considered as a key aspect, and indeed it is one of the core elements of the Master Plan vision. The evolution of the ATM system is related to the exchange of the information and progressively increase in terms of automation support. This will result in an increase on the exposure to the risk and to potential attacks. So there is some hard work that needs to be done in terms of securing each step in the evolution of the system. In SESAR activities, cyber security requirements are established
@Hortensia Is your presentation available?	the presentation is available in SJU website. Please see:

Will the "Digital European Sky" phase include u-space integration?	Yes
Defragmentation by Virtualisation? Can you explain how the 2 are related?	Defragmentation through virtualisation is the target of phase C of the Master Plan. By this phase, the ATM system will have gradually integrated greater levels of automation and connectivity, supporting higher productivity and full sharing of information among stakeholders. It will be using standardised and interoperable systems enabling TBO in a highly connected, service-oriented, network driven context. The collaborative planning and decision process will allow each flight to be managed and optimised as a whole rather than in relation to segmented portions of its trajectory (defragmentation). The data provided through ADSPs and a more flexible system with improved and new services, such as capacity on demand, will fully support the implementation of these operations. This integration will certainly be gradual; it may start at a regional level or for some alliances of ANSPs. The new architecture will make it possible to decouple the system infrastructure from ATC operations (virtualisation)
Do we have to consider that EASA includes SESAR researches in its Master Plan ?	For the first time ATM Master Plan 2020 edition is putting the plan for modernisation of ATM infrastructure that we have in SESAR directly in connection with European Plan for Aviation Safety (EPAS) and the safety dimension that is maintained by EASA. Now we have a strong link between those two plans. We have a chance to have a more aligned actions between SESAR activities and EASA priorities.
Should Airborne Self-Separation get back on the agenda as a resilient technology?	Together with the strategy for and phased approach to rolling out SESAR, it is necessary to connect the SESAR vision with trends and projects in the airborne segment, which can serve as milestones on the route towards the implementation of phase D. The airborne manufacturing industry's contribution to increased automation will result in more aircraft automation and autonomy. To that end SESAR should validate the seamless integration of autonomous aircraft into the ATM system both from a technical and an operational perspective. Fully autonomous flight will be supported by airborne self-separation and DAA functionalities.
The COVID19 situation has exposed the volatility of the aviation industry to crises that can affect infrastructure investment plans. An institutional/regulatory change is required to mitigate against shocks. How can the SESAR JU help with such change?	A key added value of SESAR is to facilitate interactions between breakthrough innovators, early movers and regulators to help develop regulatory frameworks that allow the benefits of digital technologies to be fully realised. This dimension is intended to be further strengthened in the context of the future R&I programme.