

NOMINATION FORM

Name of Program: AerinX Smart Inspection System

Name of Program Leader: Antal Bence Kiss, Chief Executive Officer

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Customer Approved

o Date: 2022 04 19

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Supplier Approved (if named in this nomination form)

o Date: _____

o Supplier Contact (name/title/organization/phone): _____

PLEASE REFER TO PROGRAM EXCELLENCE DIRECTIONS
AS YOU COMPLETE THIS FORM.

AVIATION WEEK

Program Excellence Awards 2022

November 2, 2022

The Watergate Hotel • Washington, DC

Nomination Form

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Individuals outside your company, including the companies listed above and other third parties, potentially including your competitors and others in your industry, may receive and/or review award submissions. All information submitted should address the program's management, leadership, and processes in a manner that you are comfortable sharing with third parties freely and without restriction and may not include any classified or proprietary information or materials. Do not include any materials marked Confidential or Proprietary or bearing any similar legend. All responses and other submissions, whether in whole or in part ("Submissions"), shall be deemed not to be confidential, proprietary, and/or nonpublic information of any sort for any purpose.

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Thank you for participating,




Gregory Hamilton
President
Aviation Week Network

Acknowledged, agreed, and submitted by



Nominee's Signature



Date

Nominee's Name (please print): Antal Bence Kiss

Title (please print): Chief Executive Officer

Company (please print): AerinX

POINT DISTRIBUTION

Executive Summary: Make the Case for Excellence (10 pts) As you executed this program over the past three years, what made it stand out - beyond Technology - in how it performed? Also, what category did you select for this entry and why?		
<p align="center">Metrics</p> <p align="center">15 Points</p> <p>Describe use of predictive metrics (10 pts)</p> <p>Provide metric performance/scale (5 pts)</p>	<p align="center">Program Volatility / Uncertainty / Complexity / Ambiguity</p> <p align="center">25 Points</p> <p>Describe the areas of VUCA faced by your program and why (schedule, market dynamics, engineering) such as schedule, changes in engineering processes, supply chain dynamics, geopolitical pressures, cost/affordability, other (10 pts)</p> <p>Provide narrative explaining how your team responded (15 pts)</p>	<p align="center">Organizational Best Practices & Team Leadership</p> <p align="center">35 Points</p> <p>Innovative Tools & Systems (what is it, how is it used, what resulted) (15 pts)</p> <p>People (achieving equity in hybrid work situation, transferring knowledge, identifying and developing key talent) (10 pts)</p> <p>Leveraging unique skills/technologies of suppliers - how did you do it and why? (10 pts)</p>
<p>Value Creation 15 Points</p>		

CATEGORY ENTERED

Based on your initial nomination for this program, your program has been determined to fit within the category identified below. Please double check this against the directions provided with this form. If you wish to change categories, please contact Carole.Hedden@aviation week.com

- | | |
|--|---|
| <input type="checkbox"/> Special Projects | <input type="checkbox"/> Supplier System Design and Development |
| <input type="checkbox"/> OEM/Prime Contractor Systems Design and Development | <input type="checkbox"/> Supplier System Production |
| <input type="checkbox"/> OEM/Prime Contractor Production | <input type="checkbox"/> Supplier System Sustainment |
| <input type="checkbox"/> OEM/Prime Contractor Sustainment | |

EXECUTIVE SUMMARY: Make the Case for Excellence (Value: 10 pts)

What is the vision for this program/project? What unique characteristics and properties qualify this program for consideration?

(12 pt. Times New Roman) LIMIT YOUR NARRATIVE TO THIS PAGE.

AerinX was established in 2015 with the aim of supporting the aviation industry through digitalization and innovation. Our mission is to help aerospace stakeholders to reduce maintenance time and costs by making aircraft inspections radically faster, more reliable, and better documented with a cutting-edge mixed reality solution. We envision ourselves as a lead accelerator of digital evolution alongside our aims and strive to become the provider of such innovative tools, so aircraft condition, damage status, and even assessment results will be instantly available regardless of the location, without the burden of the current processes.

The AerinX Smart Inspection System gives maintenance engineers a hand through digital technologies to avoid manual and paper-heavy operations, such as damage localization or damage assessment according to 10k+ pages of printed technical documents. Using AerinX' solution, inspectors and system users can eliminate misunderstandings and speed up their inspection processes. In addition, the system provides instant information about exterior damages during the aircraft skin inspection process, and the aircraft status is instantly available in our database, which means a direct pipeline of information between parties like the engineer, MRO, operator, owner, lessor, and manufacturer.

The essences of AerinX' solution are Augmented Reality and Digital Twin technology which are unique on the market, as modeling and placing a huge object accurately to somewhere such an aircraft is not just challenging but requires long development life-cycle where the developer team solves the upcoming barriers that are coming from the technological maturity of the existing hardware.

Due to our previous successful system roll-outs, our partners' operation has significantly increased operational development, time-saving, and maintenance engineers have clearly stated that the system eases their day-by-day work.

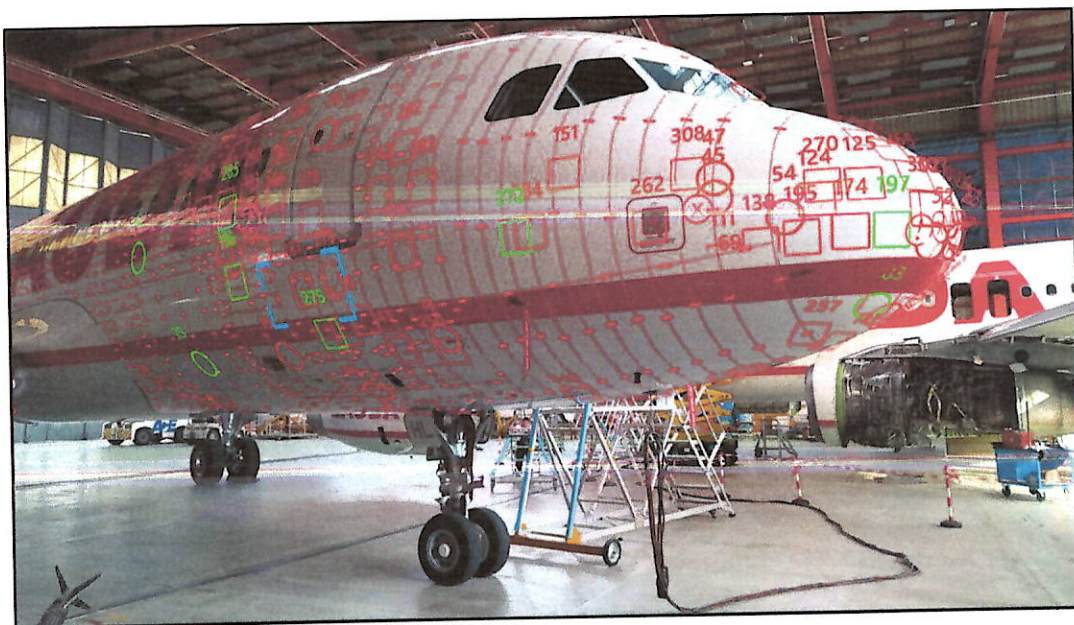


Figure1: Augmented Reality in Hangar Environment

Do not exceed 10 pages in responding to the following four descriptions; allocate these 10 pages as you deem appropriate, but it is important that you respond to all four sections. DO NOT REMOVE THE GUIDANCE PROVIDED FOR EACH SECTION.

VALUE CREATION (Value: 15 pts)

Please respond to the following prompt:

- Clearly define the value of this program/project for the corporation

The AerinX Smart Inspection Concept still means the whole company profile. Industrial stakeholders identify our brand identity according to this solution. To show our future partners our company identity - a flexible, fast-reacting, and user-centric approach with high-quality deliverables - it is necessary to show these personality traits in our first product. AerinX is planning an end-to-end ecosystem for aircraft maintenance; this is why our flagship product's usefulness and innovative approach should reflect the value of what we are bringing into the market. The aerospace world should know the benefits that we are offering and understand that this is only the tip of the iceberg of what we are planning to offer in the future. Market acceptance and the growing usage of our flagship product mean we are in the right direction to be a valuable service provider on the digital MRO market.

The nature of this product determines our company structure and culture. Teams and their identities have been established, respecting the solution we are offering. It determines a stable core operation that will be essential to widen our product portfolio and build the next pillars.

- Clearly define the value of this program/project to your customer

Aircraft inspection is key to the proper performance and airworthiness of any aircraft. Inspection engineers' tasks are rather administrative currently instead of the ability to focus on decision-making. It is still often paper-based, manual, therefore highly error-prone in the A/C maintenance industry. At this stage of maintenance, data about A/C is being produced in high volume (D&B Chart; damage control; work order management). In order to keep them accurately, consistently, and without losing any, a safe, digital platform is essential. The later the inspection decision is made, the longer it takes to finalize the whole A/C maintenance.

Time-saving

The main benefit of the AerinX system is time-saving to shorten aircraft inspection significantly. This results in reduced maintenance costs, better hangar utilization, and higher inspection capacity with current hangars and workforce.

Existing software capabilities allow engineers and project managers to

- determine frames, stations, stringers on the aircraft and also ribs, beams, and rivets on their wings,
- easily differentiate damages from each other and register new ones with their relevant data,
- localize damages automatically and measure their dimensions in a couple of seconds,
- visualize all the mentioned information on the aircraft's surface and take photos, videos about them as attachments.
- Work-card generation and damage assessment are also becoming an intuitive digital procedure where appropriate data is immediately exchanged between systems, and relevant SRM chapters can be opened in a matter of seconds.

-
- Report and D&B chart generation and sharing are becoming a few-click processes where data misspelling converges with zero.

Further significant benefits

AerinX Smart Inspection System and its digital platform are much more than time-saving. Our solution provides several benefits that are harder to be measured, but as a whole, it helps the partner become more competitive, effective and as a sum, in the end, the result will also be monetized advantages.

The benefits that AerinX provides to its customer are the followings:

- More efficient, controlled, systematic, transparent, and auditable fully digital inspection process
- Elimination/reduction of a bottleneck coming from the skin inspection stage in the aircraft maintenance process
- Skin inspection is possible with engineers of lower expertise and less experience
- Better in-house communication between departments or with the partners, manufacturer via direct web-based access to digital damage data with photos, videos, documents, and 3D visualization
- Integration and data exchange with corporate software systems
- Better employee satisfaction, employer branding with a cutting-edge AR technology
- Train and onboard new engineers faster and less time required from trainers
- Potential for using the SmartGlass in additional scenarios and use-cases
- Higher quality damage data: uniform, very detailed and more accurate data with the elimination of potential human errors
- More detailed and precise data of legacy damages on the damage chart
- Precise and detailed damage database simplifies maintenance tasks and events (audits, end of lease, etc.)
- Reduced operational risks and enhanced aviation safety through optimal maintenance

- Clearly define the value of this program/project to members of your team

AerinX is a young and dynamic company where, due to the size of the corporate, the flat organizational hierarchy enables the management to take care of everyone's personal and professional growth. Therefore, employee preferences could lead to new career directions within the company or further training from which both parties can benefit.

The solution we are developing is unique and cutting-edge regardless of the sector. This is the reason why employees often find themselves in challenging situations where their ambitious personality meets with the opportunity to grow. New technologies mean continuous experiments and prototyping where common problem solving is key to always stepping forward and expanding the product's capabilities.

Of course, the nature of the product is alone not enough; the management's conscious organizational culture building is also an important part of the appropriate working environment. On top of that, we are holding knowledge-sharing nights where development groups share their thoughts not just regarding the in-company developments but on the hottest trends from all over the world. This is also inspiring and allows for establishing something new, just like a function or process.

- Clearly define the contribution of this program/project to the greater good (society, security, etc.)

Generally speaking, our operation focuses on two main points in terms of the contribution to the greater good.

Firstly, we aim to make air transportation safer through increased data quality, digitization, and standardization. Making this data more accessible for parties gives the chance to make critical decisions as soon as possible regarding the aircraft. Maintenance & repair organizations are able to operate more effectively, allowing them to focus on critical parts of aircraft maintenance and also reducing the chance of error-prone miscalculations and data registration. By giving this product to our partners, data can play a more significant role in decision-making, not just for the decisions made from historical data but also for predictive maintenance.

Nowadays' industry operation is mainly paper-based. Avoiding the paper and transforming maintenance operations onto a digital basis means not just time-saving and ruling-out human misunderstandings from the inspection process but excluding PAPER which is in line with nowadays' social expectations of contributing to the environmental protection and reduction of a company's ecological footprint.

METRICS (Value: 15 pts)

Please respond to the following prompt:

- What are your predictive metrics?

According to the agile development methodology, AerinX uses various metrics to predict company-wide and employee-based performances. As a result, decision-makers are able to respond directly and immediately if something emerges during software development. Like several companies, we are also using JIRA for project management and issue tracking, which is not just for predictions, but corrective actions based on historical data as well.

Individual and team-based velocity metrics allow planning, predicting performance from sprint to sprint and reacting to the development's quantity and scope in a flexible way. Furthermore, the well-optimized project methodology enables the team and individuals to put their resources onto tasks that require them the most. As a result, the team is able to deliver the required developments of high quality with the appropriate velocity.

- How did you perform against these metrics?

Metrics appear in JIRA, and our team handles them with special attention. For instance, continuous overviewing of our velocity burndown chart helps to react and optimize resources between and over tasks which are vital for keeping the team on track in the context of the sprint goals.

On the other hand, these metrics remain with us so we can conclude our consequences regarding the volatility between sprints and take action if it is required.

- How do your predictive metrics drive action toward program excellence? Please provide examples.

Interventions or responses can be broken down into two segments. On the one side, planning and predictive decision-making are based on the statics of individual and sprint goals. For example, during sprint planning, we can always work with individual velocity numbers and consider not just holidays

but also individual competencies and preferences. On the other hand, the product owner and our business analyst are able to break down the customer needs into tailor-made development tasks and divide them amongst the software developers in the most appropriate way.

On the other side, corrective actions can be based on historical data. We are aware of both our team and individual velocities. If a development task is becoming harder to deliver, thanks to the metrics, we immediately know how to react, who would be the most suitable person to help in the emerging situation and what this means regarding developer capacity optimization.

DEALING WITH PROGRAM COMPLEXITY (VOLATILITY, UNCERTAINTY, COMPLEXITY, AMBIGUITY, OR VUCA) (Value: 25 pts)

Please respond to the following prompts:

- 10 pts: Describe areas of VUCA faced by your program and why.

As an emerging company whose aim is to revolutionize the industry and work with cutting-edge technologies, we always face challenges to be addressed. Alongside the technical challenges, there are always questions related to the business and operation side. Finally, there are external factors and risks which are hardly predictable and mitigable.

Technological Challenges

When the idea was established in 2015, the global VR/AR market was rudimentary. The concept was a big dream that feasibility depended on developing hardware capabilities. This factor or so-called technological uncertainty is still accompanying our operation. Every hardware has its limitations, what has to be solved by workarounds. However, the past years proved that the designated direction is right. The market is continuously growing, the products have been developing, and we are still at the beginning of this long journey.

Complexity of the existing technologies is also a mentionable point. In most cases, customer needs are valid, and from the perspective of functional feasibility, they seem to be not as complex. Nonetheless, sometimes technological barriers emerge during the implementation when the team has to find out how they handle these tasks regardless of the current level of the hardware capabilities.

Operational Challenges

The market of Virtual and Augmented Reality is just in its infancy. We have already found and implemented some use-cases, though several others could give value to our customers or open new directions in our company's future. Resource planning for new experiments sometimes requires tough decisions and postponing/cutting promising ones.

The workforce market is getting more concentrated nowadays, and it is quite challenging to expand our resources with a competitive workforce. Moreover, the novelty of the technology also makes it harder to find professionals with experience on the market.

External Factors, Risks & Challenges

The COVID 19 pandemic came from the blue to the globe, which has had negative effects on nearly every sector including aviation as well. As a software supplier company, we have met with a tough situation as we have started our international expansion around that time. Most companies cut R&D investments and costs, resulting in a drastically diminishing demand for these cutting-edge digital products and investments just like ours. Instead, they have preferred their existing tools and processes, which has been obvious in these unwelcome times.

Acceptance is also a challenging part of building our business. The technology is one of the latest ones, and people cannot imagine what this could mean for them and their company's operation. To beware of new things and insist on proven processes is also an understandable behavior. Ambiguity often comes up during first discussions and online meetings from a part of the potential client as they can not imagine what they should expect from the product.

Moreover, the pandemic has accelerated the intention for digitization. As a result, the digital MRO market has become more concentrated, volatile, and competitive. Many sectoral and third-party organizations have started to develop systems in many areas, which makes it harder to excel in the crowd.

- 15 pts: Explain how your team responded to these challenges.

Technological Challenges

As a software developer company, we have no influence on hardware capabilities. However, to offer the best solution and experience for our customers, we continuously monitor the smartglass market and try-out the latest ones to change if a newcomer has better capabilities than the previous models.

Hardware limitations can be shown in virtual object inaccuracies and other undesirable side-effects. Despite this, we were able to eliminate all these limitations with the help of our talented colleagues. The results do not seem complex, such as a mm accurate length measurement for a dent, but behind that, there are complex coordinate geometric mathematic models and calculations developed by our professionals, which allows us to measure that. Workarounds are sometimes unavoidable, but creative thinking and susceptibility to problem-solving with an encouraging attitude have always pioneered us for the next-level operation.

Operational Challenges

Resource planning at smaller companies with finite resources is crucial. Therefore, we pay considerable attention to preparation, planning, profound analysis, continuous customer discussions, prioritization decisions, and experiments amongst developments. With the analyze-driven culture, we are able to avoid wasting our resources and focus on concepts and tasks, which give the highest value for both parties at the moment.

For the matter of workforce, the core team has been set up. Nevertheless, to expand our team, we look for freshly graduated talents or people with a few years of experience and invest in them. Younger generations are always more familiar with new technologies. This was the reason why we have started cooperation with national universities in Hungary to execute common projects and give an opportunity

to these young adults to improve their skill set, get practical experience with cutting-edge technologies, and as a possibility, offer them positions in the firm.

External Factors, Risks & Challenges

External factors are the ones that cannot be avoided, but everyone wants to mitigate the dependencies and risks. The pandemic affected R&D budgets and investments negatively. However, some stakeholders believed in the escape forward strategy. We have started to rely heavily on online video meetings, focusing on virtual (video) content generations. Creating well-scripted demonstration videos with narration seemed to pay off, as potential customers could get a secondhand experience of how the system and its functionalities work. Fortunately, depending on travel restrictions, we were starting to demonstrate our solution also on-site due to the increasing interest.

We were experiencing the same regarding product acceptance. We were able to reduce ambiguous thoughts in people's minds by introducing them to the whole system through videos. In spite of that, based on the feedback and impressions, people were getting to understand the product entirely when they put it on for the first time on their heads. Firsthand experience helps them understand the potential, the assistance that it offers, and they are starting to think about new ideas, use-cases. According to our experience, we realized that on-site demonstration has the real power where people can get the knowledge that is necessary to understand the AerinX Smart Inspection System. Therefore, we aim to reach this product demonstration step with every client lead.

As I mentioned earlier, the digital MRO service providers market is increasingly concentrated. Not just because of the pandemic but the maturity level of digital technologies as well. We are taking part in conferences and promoting ourselves in many different ways, but the most important direction is that we are following to remain amongst the first movers is the immediate system roll-out. Still, several features can be implemented in our solution; however, AerinX Smart Inspection System is a stable solution that is ready to use and bring value in live operation.

ORGANIZATIONAL BEST PRACTICES AND TEAM LEADERSHIP (Value: 35 pts)

Please respond to the following prompts

- 15 pts: Describe the innovative tools and systems used by your team

The AerinX Smart Inspection System consists of three main, closely related components, as shown in the figure below.

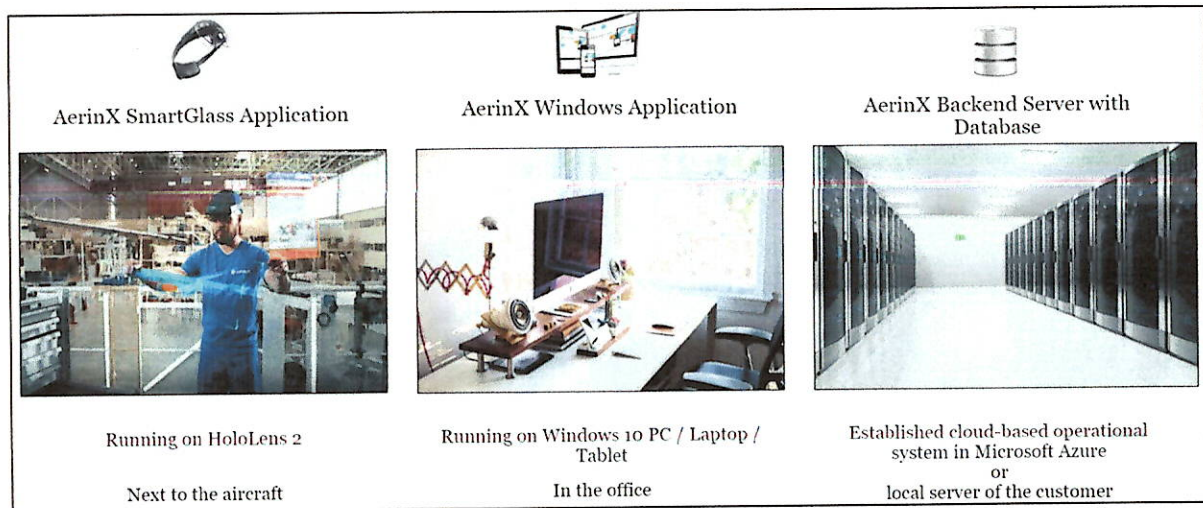


Figure 2: AerinX System Components

The most important and cutting-edge component of the AerinX system is the **AerinX SmartGlass Application**. It is running on Microsoft HoloLens 2 stereoscopic 3D mixed reality glasses. Microsoft's HoloLens 2 is a standalone holographic computer that refines the holographic computing journey to provide a more comfortable and engaging experience paired with more options for collaborating in mixed reality. HoloLens 2 has features that provide the user with audio, speech, and visual information. The device is designed not to obscure the real world from the user. This means that the wearer can still see and hear the real world around them.

With the help of the smartglasses, the system projects 3-dimensional virtual aircraft models (digital twin of real aircraft) on the physical aircrafts and the users are able to:

- visualizing structural elements like sections, frames, stations, stringers, beams, ribs, and on some parts also, rivets with their respective numbers
- projecting damages and their measurements to their exact location on the surface of the aircraft
- registering newly discovered damages with automatically determined location data (aircraft section, ATA number, frames, stringers) and distance data with a few clicks through virtual panels.
- handling damage assessment with built-in SRM functionality that always jumps to the relevant part according to the ATA number of the damage
- recording media attachment to damages just like photos, videos, voice memos with or without visual effects
- re-examining damages from the latest Dent & Buckle Chart
- interacting with the smartglass user interface with intuitive hand gestures and simple voice commands.

The **AerinX Windows Application** (running on Windows-based PC, laptop, or tablet) is used by engineers, technicians, and managers mainly in an office environment, but of course, there is the opportunity to work with it next to the aircraft. It is a comprehensive database of aircrafts, technicians, inspections, damages, and repairs with detailed administration, browsing, reporting, and communication functions.

On the one hand, the user can start the inspection process by importing the latest Dent & Buckle Chart and continue it by browsing, searching, and viewing damage data, making assessment decisions, executing required updates, generating reports and work orders, exporting data, or the final D&B Chart. On the other hand, each task can be executed in the AerinX Windows Application on a PC or tablet instead of the AerinX SmartGlass Application. System users can add new damages or gather, examine, and modify data in a 3D and chart-based view.

As a plus, various communication interfaces are available for external systems. Due to this, the desired maintenance data can be transferred at any time between the connected systems, promoting digital operation to the next level. Last but not least, it allows system admins to execute administration-level assignments such as data and permission handling.

Both the AerinX SmartGlass and Windows Applications communicate with the **AerinX Backend Server**, which is responsible for storing, synchronizing, and retrieving the collected and maintained data. The common backend server and the communication between components ensure that that data is synchronized between the client applications, and newly registered or modified damages can instantly be seen by other users sitting in the office or at the other end of the world.

- *10 pts:* Define how you developed, led and managed people

The Team

AerinX employs approximately 30 individuals who cover all the necessary fields for the seamless operation of the company.

On the business side, we separated responsibilities and designated individuals both for front office sales activities and back-office market and trend analysis to make comprehensive strategic and operative decision-making materials for the board. As a result, we are able to cover all the aspects that matters related to the customer and market.

On the delivery side, we have three separated teams, each responsible for a part of the AerinX solution.

- Group 1 is developing the software for the smartglass. The team is using Unity for the 3D software development, and here we are also employing an external expert who is in a close relationship with Microsoft and a well-known professional in the field of smartglasses, virtual and augmented reality.
- Group 2 is responsible for the AerinX Windows Application and backend developments. Furthermore, we already employ developers in this group to expand our application-based solution to web-based accessibility as well.
- Group 3 is our modeling team. They build and tailor-made the real-size virtual aircraft with all their visual information in Cinema 4D and Blender. It is important to mention that the team is capable of producing mm precise 3D aircraft models due to our scanning capabilities and working according to SRM and other official documentation.

The company and the teams, as we mentioned before, are working with an agile-based project methodology and holding daily scrum meetings. With the daily meetings, every individual's questions/problem can be answered before it escalates to an issue. It was also a target to become a company where, over the customer needs, immediate responsiveness, and "meeting the schedule mindset" matters. Keeping the eyes on these priorities infiltrated in the company's DNA partly due to the project methodology.

Working in an environment like this results well-established communication both on and offline amongst colleagues. Our communication is based on SLACK, which enables us to open many channels on different topics to come closer those colleagues who are keen on to dig deeper and share knowledge from a given topic. Company culture always determines in-house communication, which means direct, transparent, and proactive discussions between parties to solve a problem, increase efficiency, and keep morale high. For this, it is crucial for everyone to understand their influence on the company's success as everyone has a significant impact on the successful partner acquisitions and deliverables. Therefore, established an open-minded corporation where the proactive attitude, common brainstorming, and thinking outside the box are essential to step forward and bring in new creative ideas.

➤ *10 pts:* How did you leverage skills and technologies of your suppliers?

AerinX, as a young company, does not need to employ many suppliers, and the nature of the product does not require that neither.

We cooperate with a corporation who maintains our IT infrastructure and supports us on our continuous and stable data storage operation. In case of any technical need f.e. upgrades, customization, error-handling we are able to connect them anytime and solve the emerging issues as soon as possible.

AerinX's only supplier, which is obviously our strategic and also key one is Microsoft. Microsoft HoloLens 2, based on our experience, the best product for us on the market. Microsoft is able to contribute to our stable operation with their responsive customer support regarding smartglasses. As we are speaking about hardware and technology, certain things can just happen with these tools. Microsoft and its customer office have always been there to help us with any issue. However, it is important to mention our external expert here, who is the part and leader of the technical and experimental part of our collaboration. His deep knowledge of virtual and mixed reality and contribution to our operation is unquestionable. With him, we could always implement new features into the application. Calibrating, moving, setting up virtual objects, and executing tasks in the virtual world, such as dimension measurement, Etc., have never been easy to implement. Even though his expertise related to augmented reality and cutting-edge technologies always helped us in these experiments.