Keeping rail passengers connected today and tomorrow

Ralph Wagner, Chief Operating Officer, Axinom

Robert Negre, Head of Business Line Transportation, Kontron

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Henry Ford, a man who knew a thing or two about innovative transport technology, is quoted as saying; "If everyone is moving forward together, then success takes care of itself." And here at SmartRail World we are always keen to hear about partnerships and collaboration, seeing them as key to developing our industry. So when we heard that since 2011, Kontron, a leading global provider for Embedded Computing Technology (ECT) and Axinom, a global software solution provider have been working together we were keen to find out more. We've written about both companies separately, so what has brought them together? A quick investigation and we gleaned that they are working together to deliver the rail industry's first entertainment-ready passenger connectivity platform, and we were keen to learn more!

Now for anyone reading this who travels on a train, which I think should be all of you, you will know the familiar frustration of not being able to access stable Wi-Fi on-board and that the connected experience is typically lagging behind that experienced on an airplane. So to dig deeper into this collaboration and for some insights into the next generation of train connectivity, passenger entertainment and passenger infotainment, our Editor **Luke Upton** met with **Robert Negre,** Head of Business Line Transportation at Kontron and **Ralph Wagner,** Chief Operating Officer at Axinom, so read on to see what the future holds.

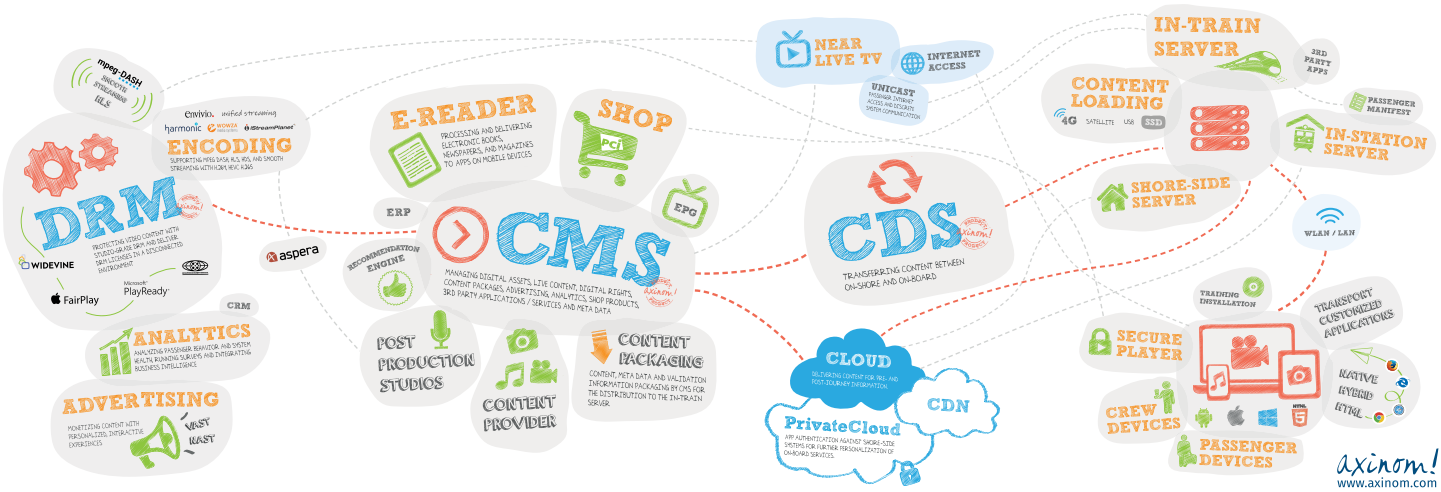
Luke Upton (LU): Thanks for the time today gentlemen. Here at SmartRail World we've regularly covered the work Axinom and Kontron do in the rail sector but how did you come to be working together?

Robert Negre (RN): The origins date back to 2011, when we first began working together in developing solutions for the aviation industry. Of course trains are different to planes, the more controlled environment and the prevalence of proprietary infrastructure and hardware see to that. But we saw in train passengers the same desire as those on airlines, to connect their own devices. We saw the opportunity to work with ground transportation companies and to improve the passenger experience significantly and make "bring your own device" (BYOD) a reality on trains, trams and in stations.

Ralph Wagner (RW): Just like in the aviation industry, where you have proprietary infrastructure, proprietary hardware and personal user devices, there is a need of standardizing the infrastructure on the rail market as well. Rail operators need standard access points, standard protocols, streaming services to stream the content and standard protection mechanisms which are also used in the media industry. It is clear to us that there is a demand for standardizing infrastructure so that it´s certified and regulated. In order to seize this opportunity, we decided to work together and combine Axinom´s content, digital rights and delivery management software solutions with Kontron's proven standards-based commercial off the shelf (COTS) computing building blocks. Through our collaboration, we help create, manage and maintain a wide range of entertainment, infotainment, e-commerce and other connected services for passengers in a simple, secure and cost-effective way.

LU: You've both placed passengers at the heart of your plans, so let's take a moment to focus on them. How are their expectations changing? And what are some of the challenges that transport companies face in matching them?

RW: Quite simply, passengers expect everything that they have at home to have on the train. They want to be involved in every part of their journey, stay productive and have access to content that is relevant at the point of time. Of course, there are certain things that are not the same when talking about different industries. For example, you cannot run the same hardware used in an airplane, as it needs to be specified for the train. Whilst for the software, if there are 300 passengers all streaming Netflix at the same time through a cellular network, maintaining a reliable, permanent connection will be difficult to handle. To overcome this challenge, rail operators need a platform that provides the content and content protection in the train and the connectivity to use for add on services. For example, connectivity is needed for purchasing the tickets, delivering passenger information, and combining it with intelligent systems that preposition content (e.g. movies) on the vessel to reduce load on connectivity. I believe what the passenger expects is a seamless experience that connects everything with each other. At the end, it all comes to one complete user experience that rail operators offer to their passengers and that is extremely important to remember.



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RN: Operators are aware of passenger expectations and are keen to fulfil them. But from the hardware provider's perspective we face requirements from the rail operator or integrator that is focussed on not compromising the safety of the train in any way. As in a plane, you don't put anything in a train that is not compliant with a number of standards. And of course, entertainment doesn't have the same level of requirements as for example, train control, but we still have to provide high-quality and high-safety equipment so passenger demands are just one factor to consider into a bigger view of the train systems.

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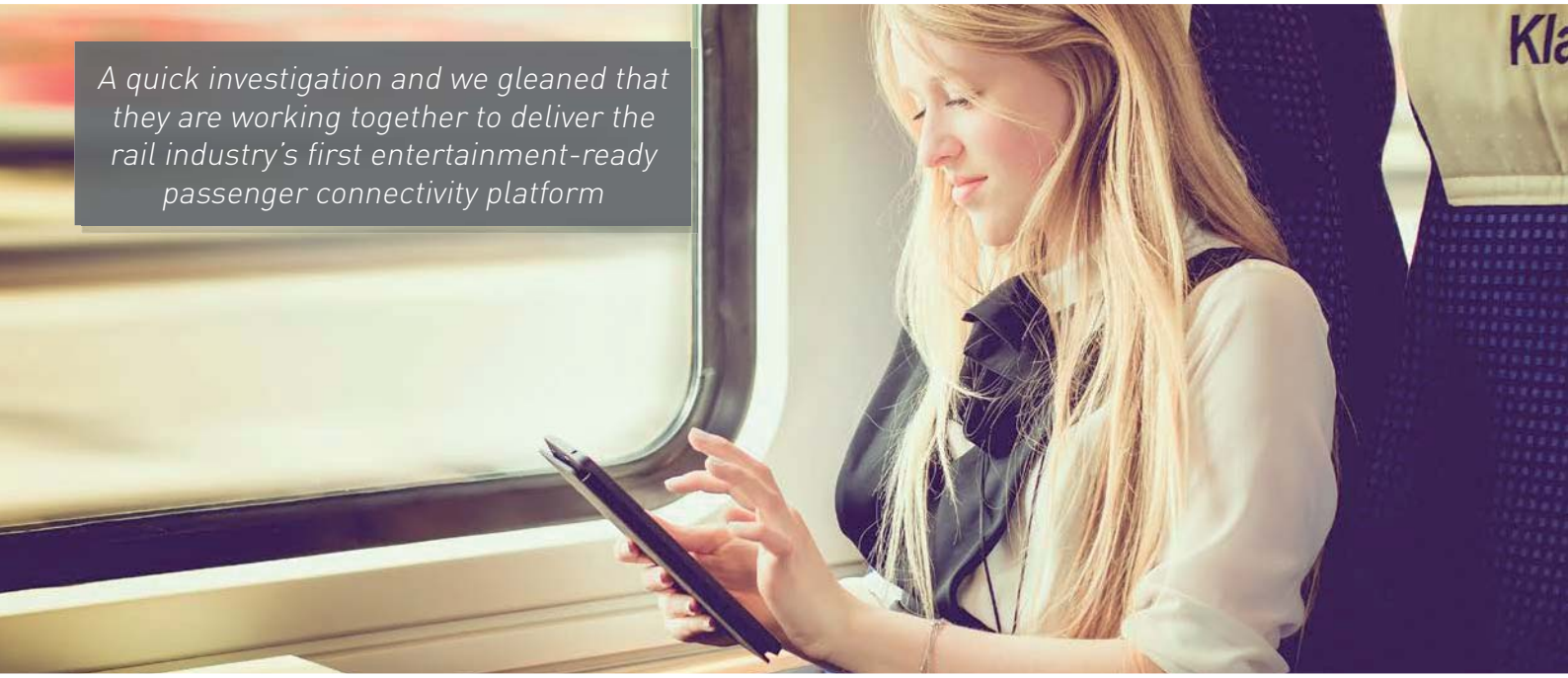
LU: It's an interesting point, and a growing focus of rail companies is digital security, how is this system kept secure?

RN: It's a very important issue, our systems need to be interoperable, but also be secure so that no one can take advantage of this via Wi-Fi and interfere with the train management system. There are increasing requirements when it comes to safety and encryption. And we always ensure that the open part of the solution is isolated from the rest of the system. This is what Kontron is pursuing, and all future Transportation products will offer a level of security on Data Protection and Authentication thanks the IoT Kontron stack.

LU: A few years ago, passenger Wi-Fi and entertainment or infotainment systems were viewed as a source for new revenue streams. But 3G/4G and tablets, smartphones etc. have nixed many of these plans. So how do rail companies match up passenger demands with financial constraints?

RW: The main challenge is in constructing the platform. It has to be structured so that it is capable of integrating other services, fulfilling the upcoming demands for features, extensions, and new possibilities. If rail operators wish to integrate passenger information needed at the time of travel, ticket services, location specific media (destination information, local facilities, attractions etc.) and similar, they need software, a concept and an open platform that is extensible and adaptable to their needs. For example, a tourist would like to set an alarm for the station he needs to exit, so that his entertainment is interrupted, or he would like to receive the information at which station he can see what kind of attractions, combined with a magazine or a video. This way he can already learn something about the city he´s visiting during the journey on board.

The important point to underline here are the expectations of rail passengers that need to be fulfilled. In today´s increasingly innovative digital environment, rail operators need to differentiate themselves on the market and make their services more attractive and appealing to passengers. If they choose a closed system, introducing new services will require adding another hardware, another software, or even another communication layer. This is why an open platform, with two or three securely protected servers that are able to synchronize with each other inside the vessel becomes a key to creating a rail offering that will drive passenger satisfaction and new business efficiencies.



A quick investigation and we gleaned that they are working together to deliver the rail industry's first entertainment-ready passenger connectivity platform

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RN: I agree, you won't be able to control access on a train, the same way as you can on a plane. But the bottom line is that getting the access to the web, in a train is no longer a matter of monetisation, it's a matter of providing a passenger service that is expected. Passengers get Wi-Fi everywhere, at home, in the office, at Starbucks. So the monetisation for rail companies also comes through attracting more passengers to the railway, and gaining more ticket revenues because they are offering a better service. This is good news for Axinom and Kontron, because this area has huge growth potential.

RW: That´s right Robert, it´s an expectation. If rail operators don´t at least offer connectivity to synchronize passenger´s emails, they will easily lose them to another transport vehicle or to another competitor. But the question is, if they have such an infrastructure with a couple of servers and access points, planned as a closed-system where providing internet access is the only offering, then something is wrong.

We need to think about the future. If we look at the Internet of Things (IoT) with sensors measuring how many seats are occupied, how fast the train is going, and with different devices for maintenance of the train, then we need an open platform.

LU: Open platforms are a big area of interest for our readers. Is this something Kontron is finding as well?

RN: Yes, a platform that is able to easily and securely incorporate new services is an area that Kontron has invested in heavily. All the building blocks we've built have a comprehensive set of API's. That mean providers can build their own solutions efficiently. Plus, our solutions also interact with third party systems that may be required. One of the biggest advantages of these solutions is not just providing entertainment but other needed interoperable solutions.

Let me give you an example, more and more rail operators are wanting IP cameras on the trains so they can react in real time when something goes wrong. For this, you need a very efficient solution, where you can collect the online data being entered. The existing networks aren't able to cope with this level of data, so to introduce this, it would be faster to use wireless technology and the Internet of Things to gather this data and deliver this solution.

LU: It's been fascinating to learn about the technology and the engagement with the operator, I'm always interested to speak to companies who come together like this. From a collaborations perspective what have you learned? How have two separate companies fit together?

RN: The Kontron and Axinom relationship is about leveraging each other's expertise. We cross-reference our technology, so we reach the market quicker. And ensure we multiply our contacts and knowledge to the benefit of our customer.

RW: Even though Axinom software and Kontron hardware are independent offerings, through our collaboration we have optimized them into a fully operational solution. We are happy to bring our customers a solution that takes advantage of the latest innovations coming from avionics and the media industry fitted to the rail environment. Nevertheless, both Kontron and Axinom are companies who offer a solution that is standard on the one hand, and extensible on the other. Our customers can run on a Kontron server not only Axinom software, but different kind of software. And also Axinom software can run on different standardized platforms. What makes our collaboration unique is the fact that we are very early into this market and our solutions fit very well together.

LU: Thanks, and just to conclude here at SmartRail World we are always very future focused. So I'm interested to hear the thoughts of two rail innovators like yourselves, on what some of the main difference between rail now and in 2026 might be?

RN: Interesting question! One thing for me is that when we talk to rail operators or system providers, the first concern is 'will you still be able to support our equipment in 30 years'? Obsolescence is a big issue when making purchasing decisions. Buyers want longevity, whether we are talking 5 or 25 years. They want a proven solution that is still able to evolve. In 10 years' time, we may well have connectivity at 7x the speed but they don't want to have to do recertification before they are able to offer it to passengers. The key is trying to figure out what the service will be. Kontron will provide an IoT stack dedicated to Transportation, ensuring that the customer solution can evolve seamlessly, without requiring full re-certification, e.g. with minimum impact.

RW: The future will be exciting for sure! In 10 years, we will not have software and hardware that cannot be split from each other. We will be able to update our hardware without updating the software, add new cellular network without consequences, or even update access points without changing any infrastructure components.

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Further details can be found **here.** Or contact Olga Pakula, Business Development **pakula@axinom.com** to schedule a meeting at Innotrans.

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