Maximizing the value of
in-vehicle WiFi systems for
media streaming onboard.

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The new era of media streaming

Media consumption patterns are changing dramatically. Traditional linear TV is experiencing a significant decline and shift in viewership towards streaming platforms. In Europe, numerous launches of international and national direct-to-consumer SVOD services (subscription video on demand services, such as Netflix) by media players have led to a rapid consumers preferences for accessing content anytime, anywhere and on any device: OTT SVOD subscriptions have passed from 300 000 subscriptions in 2010 to over 140 million in 2020. And this starts to lead to advertisement budgets being rebalanced towards digital media streaming channels.

source: European Audiovisual Observatory "Trends in the VOD market in EU28"

Vehicle´s WiFi network under pressure

Therefore, passengers are now expecting to stream their media onboard on their connected devices the same way they do it regularly at home: as they wish, seamlessly and reliably. In an ideal world, to make this work, transport operators would then have to provide easily enough bandwidth for everybody to consume as a basic service.

The reality is however somewhat different. It remains a challenge for the transport industry: the number of existing 4G/5G towers to offer a good coverage is still insufficient in some areas. When the coverage is there, the number of

sim cards required to support the ever-increasing media streaming consumption would translate into a real financial burden for transport operators. Even when more 5G towers are deployed, the growth of streaming will continue to cause a bandwidth bottleneck.

How can we easily bring the WiFi systems installed in vehicles in line with media streaming consumption? How to offer passengers an as-at-home streaming experience and achieve realistic levels of infrastructure and service costs?
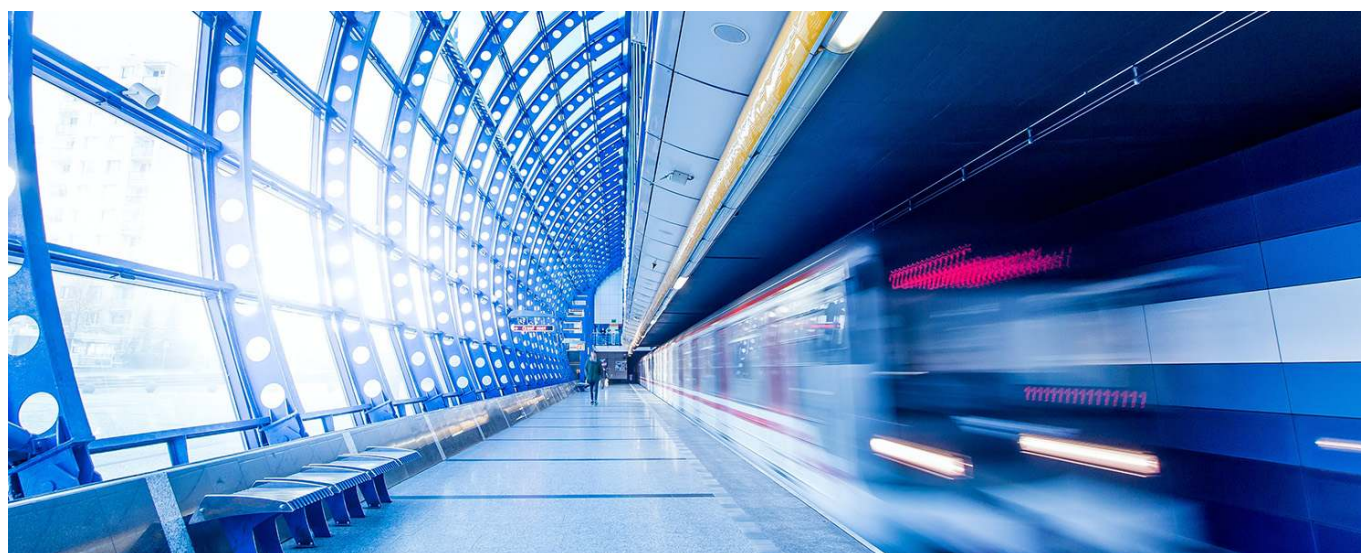
What we offer

PaxLife Innovations GmbH specializes in content delivery software solutions for transport operators, systems integrators, vehicle manufacturers or telecommunications providers to maximize the benefit of installed WiFi systems for media streaming onboard.

Partnering with media providers, PaxLife enables virtually unlimited onboard WiFi bandwidth for passengers' delight, providing a as-at-home entertainment experience during the journey while preserving most of the vehicles´ existing cellular bandwidth for other uses.

Our Software-as-a-Service portfolio includes:

» Hybrid Content Delivery Network, for video-on-demand streaming apps & digital services to be hosted onboard and seamlessly delivered to passengers´ devices

» Live streaming for video and audio

» A bouquet of DAB+ radio channels, uninterrupted live broadcasting

» Ultra high-speed, burst-mode rail-to-ground data exchange

» Digital Out-Of-Home Advertising Service for Passenger Information System displays

Powered by railSTACK. PaxLife delivers its solutions based on railSTACK, a powerful cloud onboard hosting platform to deploy and securely manage any applications that run on a train or a bus. It allows the flexible update of adding value digital services at any time, maximizing end customer satisfaction and, ultimately, better business outcomes.

Benefits.
Our customers benefit from a simple, affordable, fully managed and modular proposition:

» We deliver simple plug-in software modules or a virtual machine embedded in the vehicle´s server. If requested, we can also propose a rail certified server-based solution, for better performance and service levels.

» From management/integration of media players/services providers to monitoring, support and maintenance, we provide a fully managed service to allow our customers to focus on their own core role and expertise.

» Supplied as part of the existing WiFi product, or contracted separately as an add-on, our solutions work similarly for rail or for buses.

» Since our early days, our objective has been to improve the passenger entertainment onboard in a way that is smart and affordable for operators while optimising costs and on-board systems.

This is our contribution to support public transport as tomorrow´s mobility of choice.

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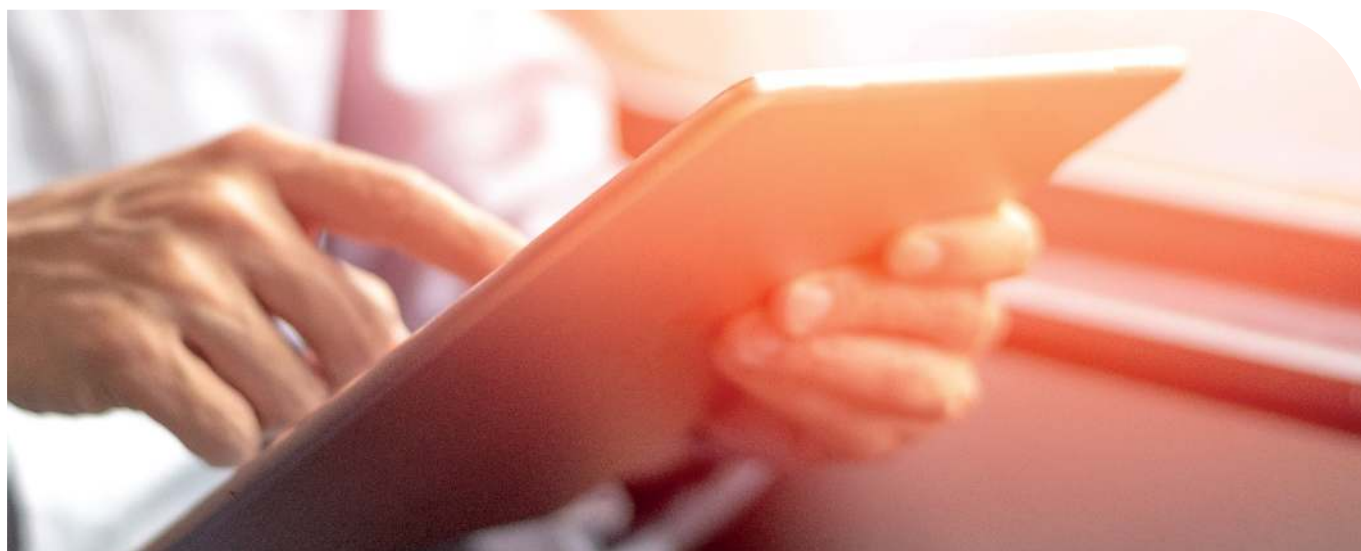
Content Delivery Network for VOD streaming apps delivery onboard

paxCDN

The delivery of on-demand video platforms or apps to people at home relies on Content Delivery Network companies that ensure the quality of the content delivery up to the end user's devices, in a "static" environment.

For "mobile" environments, PXI provides a similar CDN platform embedded in vehicles, ensuring that supported media apps are reliably delivered via the local WiFi from the onboard server to passengers´ devices, thus regardless of the outside 4G connectivity. The vehicle´s server is synchronising with media content via high-speed connections available along the route, keeping content available onboard up-to-date.

paxCDN enables virtually unlimited WiFi bandwidth onboard for passengers to seamlessly stream favorite media apps, without blocking the bandwidth for others and without increasing broadband data charges for transport operators.

We support the integration of national & local public radio/TV streaming apps or any private media streaming platforms (SVOD, AVOD) interested in connecting with viewers on the go.

Benefits.

» paxCDN frees up the cellular bandwidth capacity of the vehicle, because the supported media content is now delivered to passengers locally from the embedded vehicle´s server.

» There is no licensing cost for content to support, because paxCDN enables technically onboard the relation that already exists between media consumers and media providers.

» Transport operators can benefit from the market dynamics of media providers seeking exposure to the valuable passenger audience, opening potential new revenue streams.

» It offers a better experience to passengers: firstly, content is hosted closer to the users, so it is accessible with high quality reception and without interruption regardless of external connectivity. Secondly, an in-vehicle CDN solution allows passengers to seamlessly enjoy the infinite choice of content available from the market's streaming media players. paxCDN brings today's world of entertainment to the transport sector.

» Supplied as part of your WiFi product or contracted as a simple add-on, paxCDN maximizes the benefit of existing IT investment.

PaxLife Innovations is extremely proud and excited to have joined the 5G VICTORI consortium at the beginning of 2021. PaxLife Innovations' combined experience with media and transport operators brings expertise in software and content hosting as well as deployment and distribution to support the consortium in the development of an architecture and prototype suitable to (multi-) CDN based media distribution in the transport industry.

The *5G VICTORI* project has been funded by the European Commission as part of the H2020 program. www.5g-victori-project.eu/

Live streaming for video and audio to all passengers

paxSTREAM

4G is installed and running in vehicles. But streaming live events usually remains a major problem for transport operators: the vehicle's WiFi connectivity is not able to support all passengers watching live media at the same time and bandwidth capacity is quickly exhausted.

In order to preserve maximum availability of the standard cellular bandwidth, paxSTREAM manages and combines the numerous live streams requested by the passengers into one single reliable stream delivered to their connected devices via the vehicle´s server and thus requiring minimum 4G bandwidth capacity. It works for both live TV and radio, for both public and AVOD media.

Benefits.

» Delight passengers with supported live entertainment and a reliable live stream regardless of the numbers of connected users onboard.

» paxSTREAM relieves the pressure of the vehicle´s 4G/cellular network and preserves it for other uses.

» paxSTREAM is supplied as part of the existing WiFi product, or contracted separately as a simple add-on. It is a fully managed service

DAB+ interruption-free radio channels live broadcasting

paxDAB+

Why should transport operators and passengers not benefit from the numerous DAB+ radio channels that are already available and whose content is free of charge?

Thanks to a small receiving box plugging into local onboard WiFi, paxDAB+ allows each passenger to access up to 32 live radio channels* on its personal device without experiencing any interruption.
paxDAB+ achieves uninterrupted live radio transmission by combining both 4G connection and DAB+ stream delivery. It optimizes the buffering depending on the current train position.   *depending on the DAB+ coverage

Benefits.

» The high-quality content from the DAB+ radio broadcasters is free of charge

» Passengers can enjoy a continuous broadcasting regardless of the outside connectivity, thanks to paxDAB+ hybrid reception mechanism

» paxDAB+ is a simple add-on to existing systems with a fully managed service.

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Passenger Audience Monetization

paxMEDIA
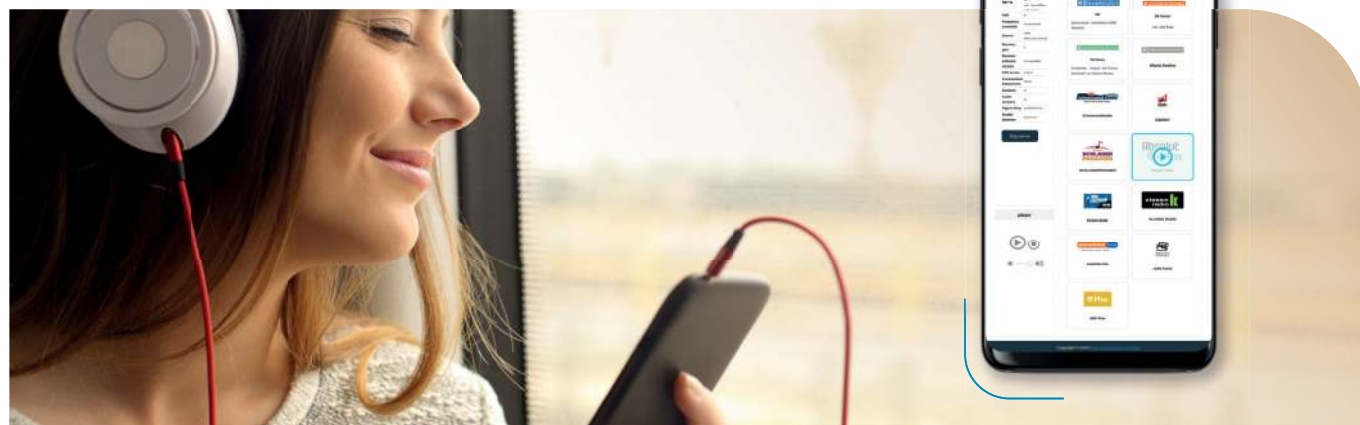
Digital Out-Of-Home Advert Service for PIS Displays.

On a regular basis transport operators connect with a captive audience that is highly valued by advertisers.

We have developed an access to multiple networks of placement buyers specialized in digital real time advertising (DOOH, programmatic), while in parallel our software embedded in the vehicle´s router feeds automatically the passenger information screens with advertising content.

Benefits.

» Offer available advertising space on passenger displays directly to the online market to the highest bidder to enhance your ancillary revenue channel.
If done well, this can even potentially fund the onboard entertainment services portfolio.
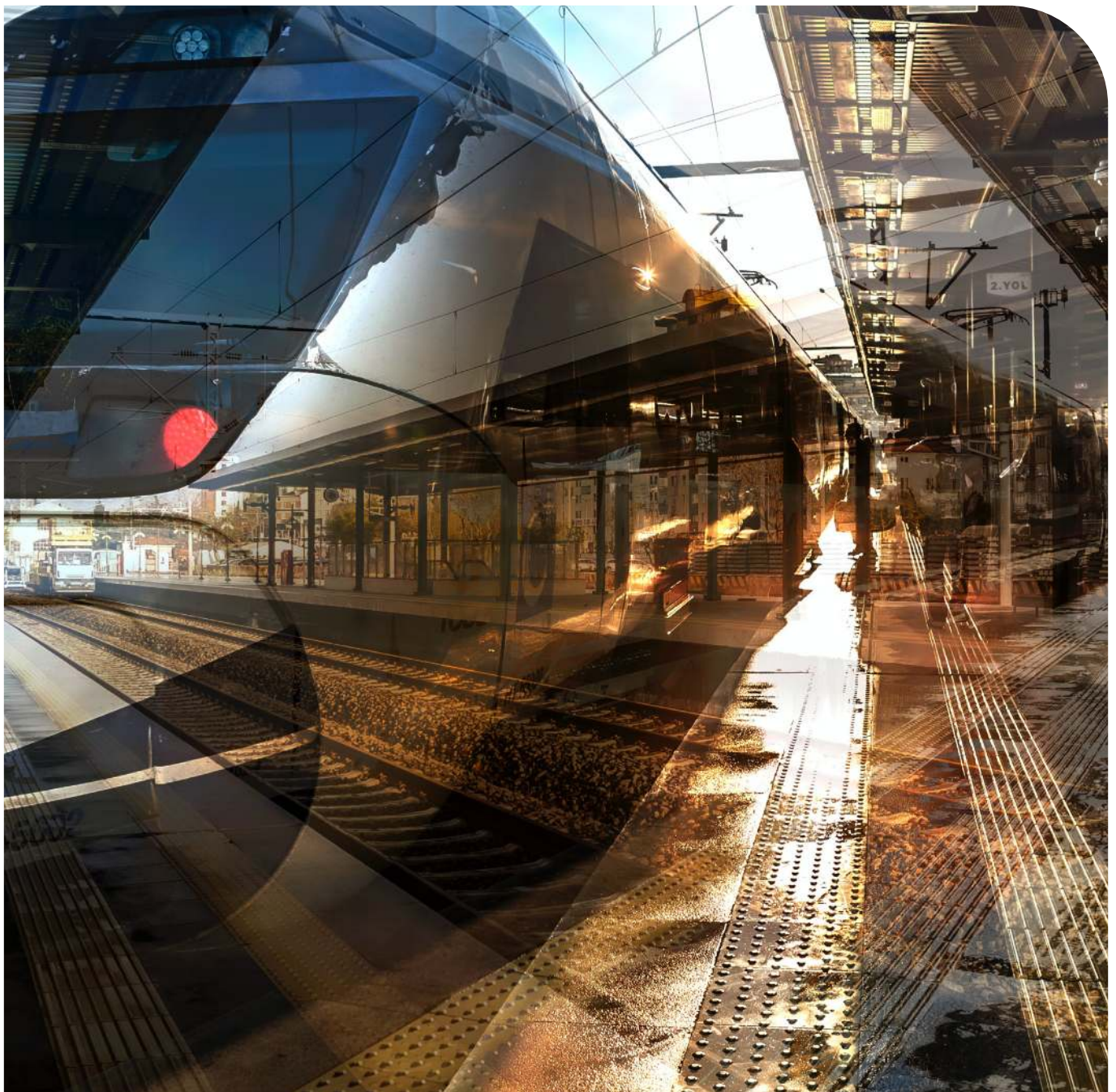
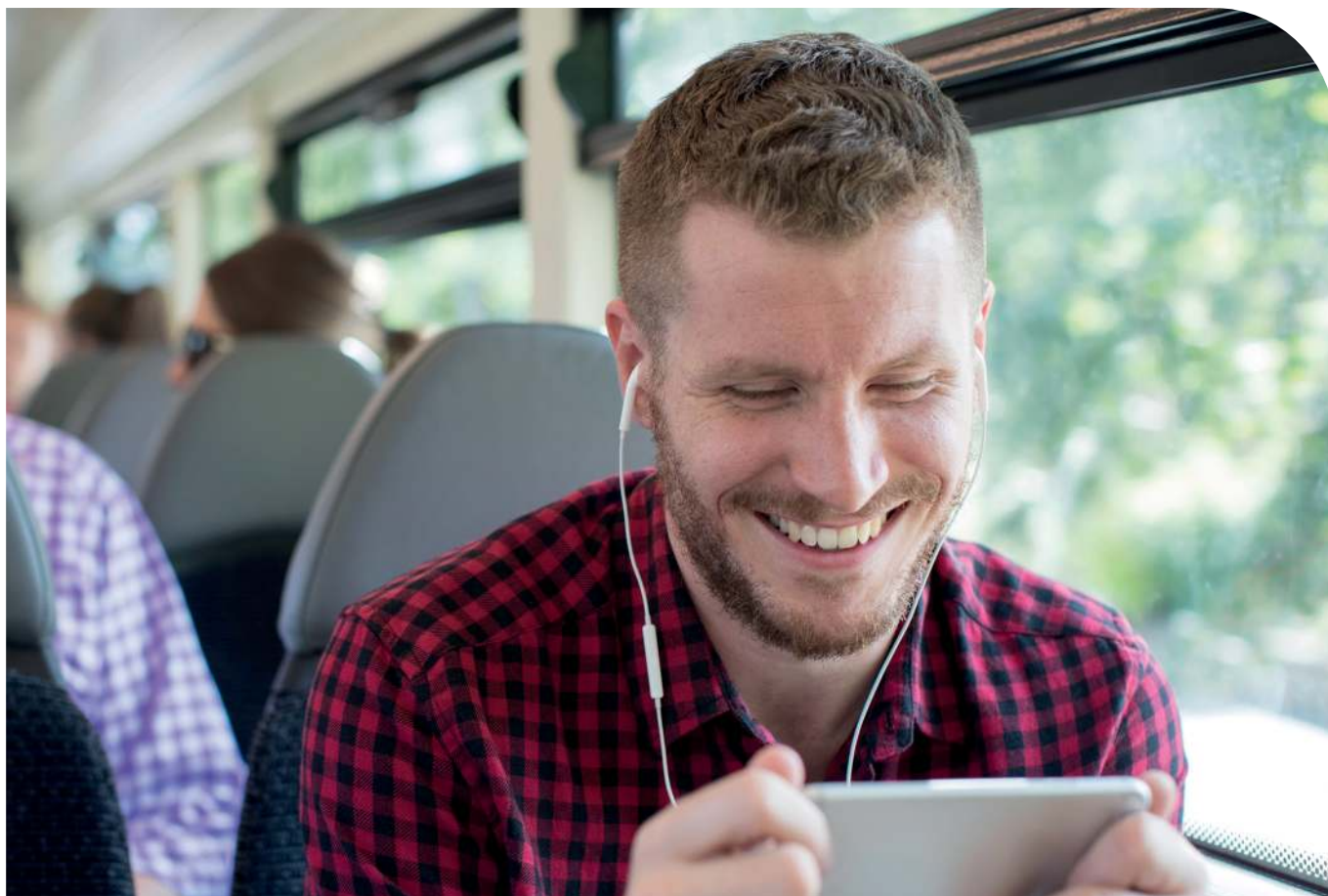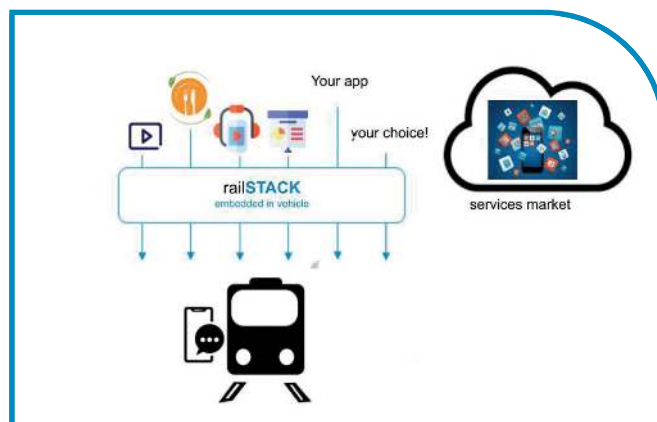# Maximizing passenger engagement from door to destination

The digital world and smartphones have increased the number of points of contact with passengers throughout the journey. Passengers expect everything to run smoothly before, during and after their journey, while in the vehicle it is also the ideal time to engage with passengers.

railSTACK is PaxLife´s versatile cloud hosting solution in-vehicle. railSTACK enables operators to deploy, manage, and upgrade any applications that run on rail or buses allowing the simple and flexible setup of adding value digital services at any time in any fleet.

With railSTACK, the operator keeps maximum flexibility with no commercial restrictions to iteratively change, upgrade and fine-tune its ecosystem of digital services or the ones from its partners, to maximize onboard experience, brand building, end customer satisfaction and, ultimately, better business outcomes.

railSTACK finally allows applications to work directly in the vehicle as if they were connected externally. Only they are now available even if the vehicle is experiencing poor connectivity or even if it is offline when travelling in remote areas.

PaxLife Innovations GmbH originally started out by connecting aircraft passengers to the digital world. To answer the challenge of bringing content and passenger services onboard in a modern fashion, PaxLife developed a cloudedge architecture that is at the heart of its infotainment solutions today. PaxLife Innovations brought its cutting-edge technology and media expertise to rail and public transit in 2019.

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www.paxlife.aero