

Software-first Passenger Information Modernization

A practical guide for train operators assessing whether Software-first modernization could work for their fleet.

televic

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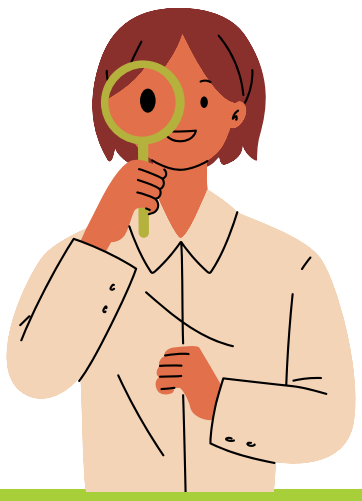
Why this guide exists

One question comes up in almost every conversation with operators considering passenger-information modernization:

> *“Do we really need to replace onboard hardware to improve passenger information — or can we modernize step by step, starting with software?”*

The honest answer is: it depends. This guide is a practical evaluation framework to help your team assess whether a Software-first modernization path could be feasible for your fleet.

- Which onboard components are typically reusable
- What enables or blocks a Software-first approach
- When Software-first makes sense across the fleet lifecycle
- Why a proof of concept may be a smarter first step than a tender



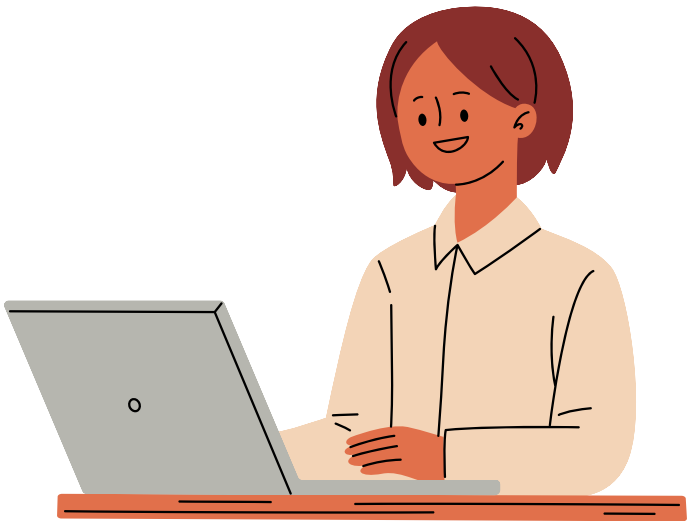
What does Software-first actually mean?

Software-first does not mean software-only. It means starting the modernization conversation from what can be achieved through software — before assuming that (full) hardware replacement is the only path forward.

In practice, many fleets already have onboard computer capacity, IP networks, displays, and audio systems that are underutilized or locked into supplier-specific configurations. A Software-first approach asks: can we deploy new functionality on top of what already exists?

This is not always possible. But in many cases, it is — and when it works, it means faster time to value, lower upfront cost, and less disruption to operations.

The key principle: Start from a concrete need on a specific fleet. Validate feasibility early. Expand only after the approach has been proven.



What hardware is reusable?

Not every piece of onboard hardware needs replacing. The components that matter most are the ones physically integrated into the passenger compartment — the end devices passengers see and hear. Everything behind the scenes is more manageable.



TFT / LCD displays

Reusable if they offer a web-based interface or a software update path. The key question is whether you can serve content over IP.



LED destination signs

Typically reusable if addressable through a standard interface — IBIS, IP, or serial. Most LED units support at least one common interface.



Audio systems

Speakers and amplifiers almost never need replacing. Often, a single converter device bridges analogue audio to a modern software layer.



Onboard computer

Does not have to be the existing PIS controller. A Wi-Fi gateway, onboard server, or vehicle computer may serve. Adding one is a contained intervention.

Software-first is not screens-only. Many fleets run on audio and LED displays alone. Centrally managing announcement triggers, updating route data, and controlling LED content are real improvements that don't require a single screen.

What about integration?

Network, connectivity and integrations

A Software-first approach works best with an IP network onboard combined with perfect connectivity, but it's not an absolute must to start bringing value.



IP network

Works best with IP onboard, but not a prerequisite. Older interfaces can also be re-used.



Train-to-wayside

Depot Wi-Fi or periodic LTE sync can be sufficient to bring more up-to-date information



Onboard data

Door signals, GPS, odometry provide context-aware triggers. Typically delivered by train control, but there are alternatives



Wayside systems

Integrating with real-time data sources can be done via standard interfaces or customer server-to-server integrations.

Existing mobile gateways, passenger Wi-Fi routers, or LTE units may already provide a usable connectivity path without additional hardware investment.

You do not need everything to be reusable to start. Begin with what is feasible today and expand step by step

Part Four

When are operators choosing Software-first?

Software and hardware have fundamentally different lifetimes — and that mismatch creates opportunities across the entire fleet lifecycle.

1

When passenger information needs to evolve

Passenger expectations evolve faster than onboard hardware. Even on relatively new trains, operators may find themselves looking for more flexibility, richer functionality or better control over passenger information.

2

More control over midlife refurbishment

Midlife refurbishment programmes can benefit from splitting the software scope from the hardware scope. Not because they're unrelated, but because they carry fundamentally different risks, timelines, and approval paths. Treating them separately can give more control over both.

3

Fleets approaching end of life

A fleet planned for withdrawal in five to eight years may not justify a major hardware investment — but a lean software upgrade could still deliver meaningful operational value for the remaining service life, at a fraction of the cost and disruption.



4

Operational fragmentation across fleets

When maintaining separate passenger-information systems for each fleet type becomes unsustainable, a software layer that runs across different fleet types can replace fragmented tools with a single operational workflow.

Software-first is not tied to a single moment in the fleet lifecycle. It can be relevant wherever there is a concrete need and a feasible path.

Part Five

Why start with a proof of concept now?

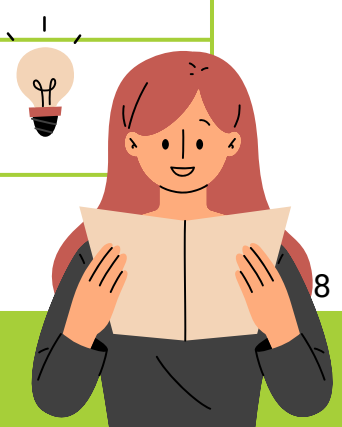
A proof of concept is not a commitment to a fleet-wide programme. It is the fastest, lowest-risk way to find out whether a Software-first approach could work for your fleet — before investing in a larger decision.

The traditional path — market research, RFI, tender, design phase — can easily take two to three years before anything runs on a train. A PoC gives you concrete insights. Within weeks, you have concrete answers based on real hardware and real interfaces — not paper specifications.

That doesn't mean the formal process goes away. But a PoC gives you something to base it on: validated evidence rather than assumptions.

What a good PoC validates

Area	What you learn
Infrastructure reuse	Which onboard components can remain, which need replacing
Integration complexity	How existing interfaces respond to the new software
Functional scope	Which use cases work immediately, which require additional work
Planning	What can be done by when



Part Six

Explore what this could mean for your fleet

Passenger-information modernization does not have to start with replacing everything. In many cases, meaningful improvements are already possible — if approached differently.

We are happy to exchange thoughts, compare approaches, or help you assess whether a Software-first path could be relevant in your specific context.

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