WHITE PAPER

WHAT MOBILITY TRENDS MEAN FOR THE PROFESSIONAL USE OF IT IN EUROPEAN RAIL, 2015-2025

PROFESSIONAL USE OF IT IN EUROPEAN RAIL

2015-2025

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1. WORLDWIDE CONTROVERSIES AND TRENDS IN RAIL

Perhaps the growing attention given to major disasters at sea, on the roads, in the air and on the railways is just to do with the speed and video quality of news now available on the Web. Yet when Amtrak train 188 from Washington to New York City derailed round a bend at 106mph on 12 May 2015, killing eight people, media attention quickly turned to deep controversy.

That's the thing about transport, nowadays. Worldwide, transport inflames passions and prompts debates more than it ever did in the past.

After train 188, Americans worried that, compared with Europe and China, their homeland was no longer in the global railway business.[1] Some felt America's low spending on infrastructure was to blame for the accident. Others held that the villain was Congress, which had earlier refused to give away the exclusive radio spectrum needed to install Positive Train Control – automatic speed reduction systems – on Amtrak's northbound line. [2]

These kinds of controversies highlight some key trends for the future of rail not just in America, but in Europe, too. First, **operator safety and reputation management** will be more critical than ever.

Second, the fate of rail systems will hang on **globalisation** and international **competition**. Chinese investment and expertise, for example, is now a serious factor to be reckoned with – and not just because of China's growing links with Russia. [3] Chinese train manufacturer CSR Qingdao Sifang, for example, will work with three UK universities to research rolling stock energy applications, and with two German universities to develop **lightweight materials**. [4]

Third, investment **budgets** for rail and every kind of transport infrastructure will be scrutinised.

Last, the **use of IT**, and in particular **the relations between IT systems and the human beings that use them**, will come under the microscope.

It's time for rail operators to stand up for the kind of mobile IT their staff will need in future.

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1 http://nyti.ms/1Qm5fkX
2 http://nyti.ms/1K4UKTu Then again, in an era of shared spectrum usage, unlicensed spectrum and fibre optics, Positive Train Control might be an old, outdated technology that never should have been waited for in the first place. http://bit.ly/1M0fzxR
3 China still links to Moscow and Vladivostok through the Trans-Siberian Railway. Today, more and longer freight lines run from China to Russia, through Kazakhstan and on to Europe. Chongqing has linked to Duisburg since 2011; Chengdu to Lodz, since 2013; http://bit.ly/1KZun1G Yiwu, to Madrid, since 2014. http://bit.ly/1Tud6kQ In 2014 China, Hungary and Serbia announced a new line from Belgrade to Budapest as part of China's New Silk Road project. http://bit.ly/1IfsTAA There is also the Zhengzhou-Europe Shuttle Train, which runs freight over more than 10,000km, from Zhengzhou, Henan, to reach Hamburg, Germany, in 15 days. That can be half or less of what a choppier sea route can take. http://bit.ly/1SVdEjl
4 http://bit.ly/1Fsx2u2
5 One part of the aftermath of train 188 is that Amtrak has installed cameras to monitor the actions of train drivers. http://nyti.ms/1M3ZxDc

2. EUROPE'S NEW RAIL LANDSCAPE: SOME STRUGGLES AHEAD

In Europe the rail industry is **modernising**. Yet while Europe's continuing shift from goods to services may make rail freight continue to stagnate, **passenger demand will often exceed supply**.[6] Worse, given the size and complexity of rail investments today, and the financial heavy lifting that accompanies them, operators will tend to **sweat assets**.

The plain truth could be that, for some years to come, the promise of a modern rail service in Europe may not be matched by the quality of service delivery.

This rather bald statement should not surprise. After all, in the realm of **telecommunications connectivity**, the promise of broadband and 4G in Europe is frequently not realised.

European rail services face a struggle to keep up capacity and reliability. They also look like encountering larger **security** considerations than in the past. Last, **regulation** will remain a bugbear for rail in Europe. For every operator reaching across borders, and for every liberalisation of EU markets, there will often emerge a statist response, involving yet more regulation.

Take the European Commission's much-debated Fourth Rail Package (2013). It doesn't just want member states to privatise their networks, in the manner of Britain and Sweden. The Commission also wants to take direct control over how rail workers train for and perform their jobs. For 'other' train crewmembers (that is, those who are not drivers), the Commission has identified 48 typical operational safety tasks and 11 commercial ones, including ticket inspection and customer announcements. It wants EU member states to subordinate their national laws about such tasks to what it decreed in a Decision made back in 11 August 2006.[7]

Yet **research, innovation and investment** are more urgent for Europe than harmonising regulation at a supranational level. Here, the goals of the EU's research coordination initiative, the Shift2Rail Joint Undertaking, are worthy enough: halving the **life-cycle cost** of the system, doubling capacity, improving reliability and punctuality by half, better **interoperability** and efficiency, **lower environmental impact** (including noise and vibration, not just CO_2). However, the Commission has provided just €450m in backing for this research.[8] In addition, eight rail equipment manufacturers and infrastructure managers have each given €30m or more to Shift2Rail,[9] and EU private interests are meant to more than match Commission funds by stumping up a total of €470m. Still, all of this amounts to a total of less than €1bn to spend over 2014-20 – seven years. In a world where Central Japan Railway has already reached speeds of 600kph in experiments with magnetic levitation trains,[7] European rail has a lot of innovating to do.

European rail operators need to make ambitious innovations. IT can help them here.

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6 For more on this, see James Woudhuysen, 'Transport: breaking through the impasse', on http://bit.ly/1IPaxnt

7 http://bit.ly/1ALDvo0

8 http://bit.ly/1Q6AiGE

9 Names include Alstom, Ansaldo STS, Bombardier, Construcciones y Auxiliar de Ferrocarriles (CAF), Siemens and Thales, as well as infrastructure managers Network Rail and Trafikverket. http://bit.ly/1GkljEp

10 http://bbc.in/1JHldDN

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3.   DRIVING, AND INSPECTION ON THE MOVE

In Europe's New Rail Landscape, drivers will still use tablet computers, and so will other rail staff in the field – to inspect and improve the condition of the system, of local engineering, and of passengers and their luggage. Yet in the next 10 years the insights that staff members bring to these different kinds of work will grow, as rail operators seek new efficiencies and new sources of revenue.

A more varied, more professional rail service will demand more professional IT.

Trains will move at higher speeds. Rail will also see the more agile and mobile management, maintenance, repair and resupply of its assets, through a regime of sensors, data analytics and online part ordering – just as is happening around grids in energy. Altogether, **drivers and engineers will require that IT tools such as tablets are designed for their industry and no other**. Drivers will want tablets that display personalised schedules. Safety, reputation, new rounds of regulation, new versions of drivers' manuals, how best to handle complex situations, a growing role for cameras: all this will make dedicated IT tools imperative. So, too, will cyber-security on the railway.

It is the same story with passenger-facing staff. In conventional retail environments, mobile phones more and more form the point of contact between staff and customers.[11] **What on-train staff now do in relation to timetables, directions, ticketing, scanning, reading and payments will, in future, be assisted by special tablets, not general-purpose devices.** The press of Europe's rail passenger numbers, and operators' continued interest in raising load factors, will demand nothing less. So, too, will the growing coordination that rail passengers will come to expect when they combine rail, bus and air services on long-distance journeys. [12]

The scale of new rail developments in Europe, the inroads made by foreign rail operators, the growth of inter-modal travel will each put a premium on **multi-role tablets that can handle long journeys, different nationalities and taxing situations**. This implies that such devices have a **long battery life**, especially in situations where there is no access to power.

In fact what rail will demand of tablets is not so different from what their professional users prioritise across all industry sectors. In research commissioned by Panasonic Computer Product Solutions, battery life and reliability counted much more for tablet users than price considerations. [13]

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11 For a brief discussion on this, see http://bit.ly/1IhlS2b

12 To achieve more coordination a €12m EU research programme, IT2RAIL, will push 'an open web-based framework to encourage full service interoperability', as well as new online apps 'guaranteeing constant improvement and self-sustainability of e-services in the long-term'. http://bit.ly/1G67OWQ

13 Battery life and reliability were named by 30 per cent of respondents as being among their top three must-haves of tablets; by contrast, price competitiveness was a top priority for little more than 20 per cent. David Krebs, 'Enterprise and Government Tablet Solutions: Realizing the Gift of Time', VDC, March 2014, ftp://ftp.panasonic.com/computer/whitepaper/enterprise_mobility_whitepaper.pdf

Tablet screens must shine bright in daylight, and must be able to accommodate the latest and best data visualisations. Their connectivity must be as good as can be got. Tablets must be light and durable. Equally they must be simple to charge, accessorise, and input to and output from. On the other hand, they must be able to survive dust, moisture, varied temperatures and the experience of being dropped. They must last and last, and must be able to handle regularly distributed upgrades with ease.

In the round, these are exacting requirements. They evoke the need for what Panasonic calls **'enterprise-class' tablets, rather than less durable, less versatile consumer devices.**[14] That class of device is what Panasonic offers with its Toughpad tablets.

We can sum up our argument in a different way. For some years, it's been clear that rail operators have had a chance to surpass the airline industry in all-round passenger care. However, a moment's thought shows that dispensing insightful care depends more on staff than on machines.

For European rail to make the kind of innovations it needs to make, the hardware and software that its IT chiefs specify for their staff will have to be the very best – so that those staff can turn all their efforts to making the kind of judgments that only humans can make. **The kind of IT that's now needed, therefore, must work with staff, not against them.**

For workers at the sharp end of the Europe's burgeoning rail business, only the very best will be good enough.

ABOUT THE AUTHOR

A physics graduate, James Woudhuysen is visiting professor at London South Bank University.
He helped introduce Britain's first computer-controlled car park in 1968 and devised an instruction manual for a word processor in 1983. *Robots*, published by the V&A, 1984;
multi-client study, e-commerce, 1988; proposed Internet TV, 1993; head of worldwide market intelligence, Philips Consumer Electronics, the Netherlands, 1995-7; *Cult IT*, published by the Institute of Contemporary Arts, 1999.

James has worked with most of the world's top IT organisations. These include Amadeus, Brother, BT, EMC, Fujitsu, Mahindra, Microsoft, the International Security Forum, Oracle, Orange, IBM, Sabre, Sage, SAP and Vodafone.

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14 Panasonic Computer Product Solutions/VDC, 'Realising the Gift of Time: Enterprise and Government Solutions', March 2014, http://bit.ly/1Gijs0W
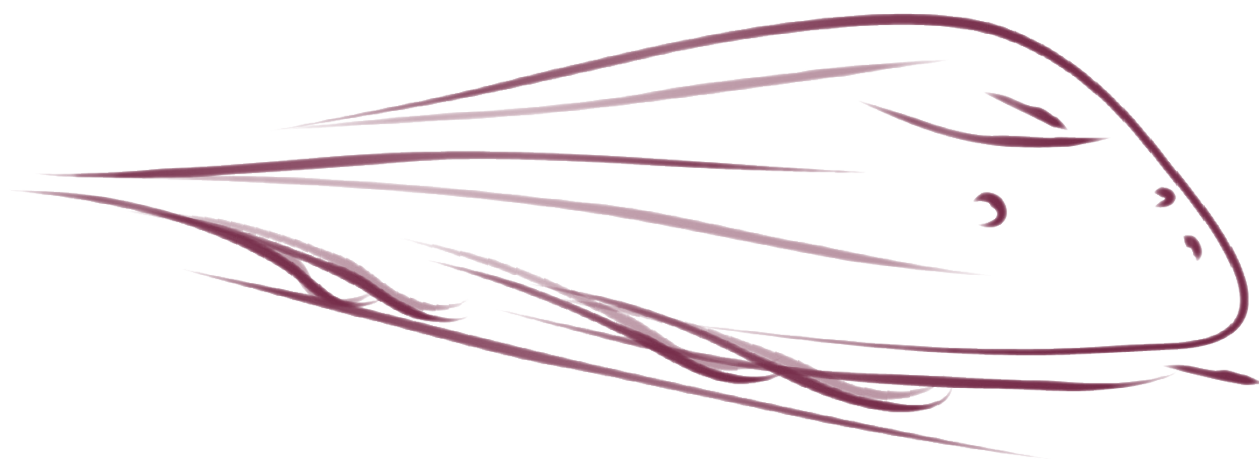
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