What is your train thinking?

by Marcel van Velthoven, CEO

One of the industries that is reinventing itself quickly and completely is the Rail Industry. With external factors – like pollution and the environment, our younger generations' need to have constant access to their social media and the economic pressures Europe has (had) over recent years – the Train is more attractive than ever before. However, this is also forcing the Rail companies to re-evaluate the product they bring to the market. The adage "The Train takes you from a place where you are not, to a place where you don't want to be" has gone out of the window. Information and data are key ingredients of developing the Rail Industry into a modern way of transport in high demand.

This modernisation needs to be realised on the aging, existing infrastructure and with the existing trains, while maintaining the schedules and improving the services. All under the guidance of the strict Regulators. This is not a sinecure. There is only one prescription that can be taken to enable this process, Asset Management.

plan. And this brings us to the realisation: What is it that we expect from our trains?

Challenges

Moving away from the adage, the Rail companies consider how they can offer a full transport service for the passenger, from the location they are, to the location they want to go, at a time they want to travel. Obviously fully informed, ticketless, fast and reliable. Not an easy task.

Of course, not all Rail companies operate in the same environment. The Netherlands have, together with the Swiss, the highest density in the network and even these Rail companies have vast differences in how they operate. Also, these countries are two of the smaller countries in Europe. Switzerland has improved its punctuality last year from 96.7% to 97%, now that is what I would call running like clockwork. Maintaining this at an affordable price however is a challenge even the Swiss struggle with.

In the Netherlands, we are beginning trials with a 10-minute schedule for the trains on the main lines in December of this year. For me as a passenger that sounds quite convenient. With this challenging goal, the critics have voiced their opinions well before the project started. Having a high frequency service is adding to the customer service level. The London Underground started this year with a 24/7 operation, with a very high frequency most of the day.

In Saudi Arabia, the SAR is working on a project that people will be picked up from home, taken to the station by car and at the end of the train journey taken to their final destination also by car. A fast and comfortable journey, again adding the customers' expectations and requirements.

So, what is your Train Thinking about this?

Asset Management and ISO 55000

Coming from our background, we take the tools and the guidance we have adopted over the years and use them in this journey. Our tool is Asset Management. Asset Management that materialised in February 2014 with the launch of the ISO 55000 standard. The first step as defined under ISO 55000 is the alignment of the business plan with the strategic asset

The Swedes are the most advanced in their ticketless travel with a project using a chip system for their passengers, enabling them to hop on and off the train without any worries of paying, while allowing the Traffikverket (Swedish Rail) to get paid for all kilometers people travel by train.

Developing these services is easier said than done.

What is your train thinking from an "On Demand" service, door-to-door?

Infrastructure and Rolling Stock

One of the characteristics of the Rail Industry is the two completely different Asset types they have; Infrastructure and Trains. Two different Asset types which are inseparable for delivering the required service. This too is a characteristic of Asset Management, and we need to start thinking about the ultimate product/service that must be produced/delivered. No longer the classical silo thinking, which still exists in many companies.

A classic example of this, again, is the Netherlands. We were one of the last countries in Europe to realise that a high-speed train would be beneficial and would deliver a service the public is asking for. ProRail invested heavily in the completely new infrastructure for the high-speed line and NS invested in the high-speed trains. The total cost was around €11 billion. Unfortunately, the trains failed and had to be send back to the supplier. The result: the high-speed service the Dutch and international passengers were expecting is nowhere near what the original plan was and far insufficient regarding the needs of the modern train traveler.

One of the biggest challenges in Asset Management is integrated thinking. Another

major challenge is to think of all our activities over the lifetime of the Asset. Finally, what is the product/service we are delivering. When I am taking the train, one of the perceived advantages is to be able to get some work done. I, like many other business men, have become dependent on the internet for most of my work. It is very nice when my train has Wi-Fi on-board. This is a service I expect and am willing to pay for. It is very frustrating when this service is abruptly interrupted each time we pass through a tunnel or viaduct. Something was not taken into account, or fully developed when laying out the infrastructure.

Infrastructure and rolling-stock are very different Asset types, with a very different demand in Asset and Maintenance management. They are so interrelated that the management of this form of transport needs a close cooperation to deliver the service, despite the legal obligation to have it in completey separate companies.

Besides the different Asset types, there are other challenges to be able to deliver the expected services.

Asset Management Systems

ZNAPZ objective is to deliver the best Asset Management Information Systems to its customers to enable them to do full Asset Management. We have recognised three areas that encompass Asset Management:

• Asset Investment Planning
• Asset Performance Management
• Enterprise Asset Management

These different domains are also individually assessed by the likes of Gartner.

Asset Investment Planning is performed at an organisation level. Decisions are required where and when to spend money to achieve

Switzerland improved the punctuality of its trains last year from 96.7% to 97%

the goals set by the organisation in the business plan. All spending, as well as Capex and Opex need to be taken in account. This is fully in line with the lifetime thinking of Asset Management and the integrated approach. In Asset Management, we more often speak about Totex, the combination of Capex and Opex as the true driver. All costs, new build, maintenance, overhaul, renewal and salvage need to be taken into account. The most modern thinking in this area assigns the total cost to the products delivered over time, enabling a direct relationship between cost and product/service.

When our Assets are installed they start deteriorating from day one. Deteriorating means the ability to resist failure is decreasing, hence the risk is increasing. In our Asset strategy it is defined what an acceptable risk level is. This gives guidance on the need to spend money to maintain Assets. Monitoring the Asset Health is done in Asset Performance Management. It is in this area that we see the biggest innovation today. The Internet of

Things is a key driver that creates a better insight and enables organisations to do the maintenance tasks that are fully aligned with the specific needs of the Assets.

When the need for maintenance is defined, based on the actual health and maintenance strategy, this should be performed as efficiently as possible. We use the "Right First Time" principle. In the Enterprise Asset Management area, it is also essential to give the right information to the team that needs to execute the Asset/Maintenance management. Not only giving them the full information on; what needs to be done, where (especially in the Rail Infrastructure), when, by whom and how. But also, what information do we expect back from the team that does the work. They are on-sight and best equipped to assess the Assets.

These three domains work fully integrated, enabling the Rail companies to achieve the best results, against the products/services they have defined to deliver at the lowest cost.

ISO 55000

ISO 55000 in brief says:

1. Align your strategic Asset plan with your Business Plan
2. Manage over the lifetime of the Asset:
   a. Value = product/service to be delivered
   b. Risk
   c. Cost
3. Implement a continuous improvement plan and mentality in your organisation.

These are the right guidelines for companies who want to move towards Asset Management. What is discussed and presented in the ISO 55000 training is your Asset Strategy, Asset Policy, Asset Plan and in lesser strict terms also your Asset Management organisation. Several Rail organisations implementing Asset Management have, during their journey, admitted: "We manage our Assets, but we don't do Asset Management".

ZNAPZ support organisations, many in the Rail Industry, on their journey to learn about Asset Management. The Institute of Asset Management has a very good education program for certification and diploma level, to get the teams educated to the requirements and benefits of Asset Management.

How it works in the Rail Industry

Many Rail companies are adopting Asset Management many of those by adopting the ISO 55000 standard. It helps especially for companies with aging Assets, which we have in the Rail, delivery obligations and under guidance of a government body.

Being able to present and defend the activities and related cost to the Regulator, against the specific product/service that is delivered is a great benefit for both the Rail company and the Regulator. Since Asset Management is over the lifetime of the Asset, the Rail company can justify decisions, spending and activities for many years when this is done using the Asset Management strategy.

Enabling systems support the companies so they can justify and track the cost and monitor the performance of the deliverables.

The integrated thinking, e.g. install ERTMS and remove X number of switches, this balances out the risk of the infrastructure and is a nice vision to aim for in the Decision Support Tools we can deliver today to the Rail industry.

Supporting the Rail Companies, the UIC has developed its Asset Management Maturity Assessment model. This differentiates from many other Maturity Assessment models since it is specifically focused on the Rail Industry with relevant and specific examples.

It goes even further, with the aim to fundamentally change the service delivered to the public, the need exists to have not only an investment planning optimisation tool, but also modelling tools for the demand in transport and behavior of Rail Assets, both for Rolling Stock and Infra. Both exist today and are making inroads. We can now have a closer look and see where this innovation will bring the Rail industry.
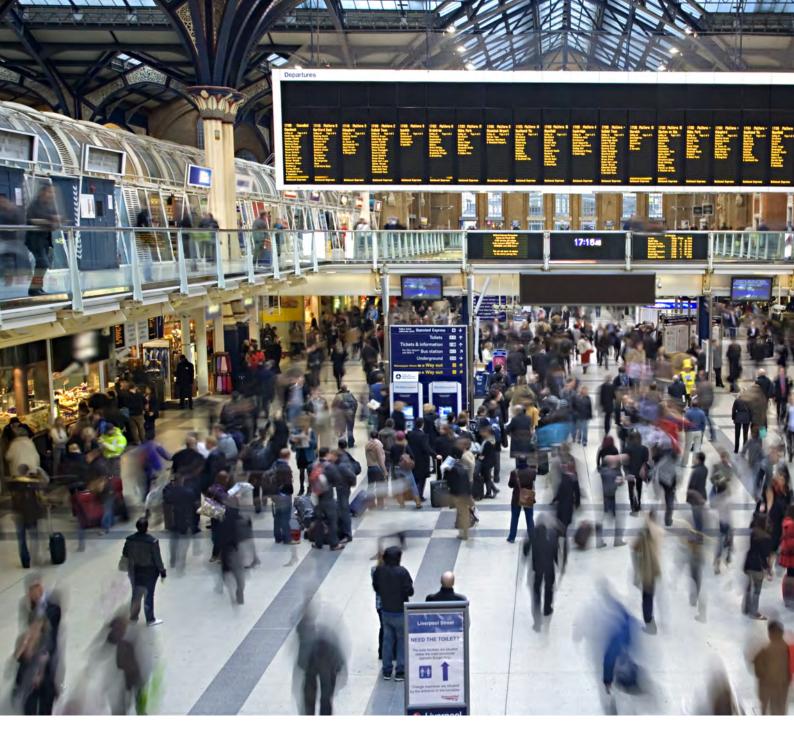
Innovation

Asset Management requires insight into the behavior of the Assets and the behavior of the demand. Fortunately, the IT industry proves to be a great help in this area, with the development of the Internet of Things enabling Assets with sensors. This is useful in an environment where we demand this data and use it, not only to assess the Asset Health but also to inform the customers in real time what is happening with their trains. So, we really can say: "What is our Train Thinking?" All the collated sensor data

gives an indication of that specific performance, and with today's computer technology we can link further databases and data-sources. This moves us into the area of Big Data and unknown insights in the behavior of our Assets is created against the demand of the specific products and services. And the technology goes further.

IBM has developed Watson, a robust analytical tool that is even capable of "Cognitive Computing" – the learning computer. This is beneficial in many industries and for many processes, but in the Rail Industry with its vast Rail Infra Network and comparable situations all over the world. It is impossible for human beings to assess all various data elements and define the interrelationships, but Watson can. This gives tremendous new insight into the behavior of our Assets, leading to a better service – Value, lower Risk and Costs.

That this moves into the area of Artificial Intelligence is evident. How this will affect the Rail Industry performance still needs to be seen. There are already many examples, both on Rolling Stock and on Infra that the performance can be predicted by using easy and affordable techniques. An example of cognitive computing is the doors of the train. One of the sensitive areas of trains with a big effect on customer satisfaction. Doors not opening will lead to a delay and a delay could result in missing the connection, often with serious consequences. By monitoring the required electricity of the motor opening and closing doors we can predict wear over time – resulting in failure, or obstruction/dirt, also resulting in failure. With modern communication techniques already applied in many trains, the maintenance teams can monitor their trains

and assess the Asset health from a distance. If required an intervention can be executed to solve the problem before it causes any disruption.

This same methodology is available for switches. Strukton can now predict, with a sufficient degree of accuracy, the failure of switches currently up to two weeks in advance. They are aiming to extend this prediction to four weeks and have the required maintenance interval in most of the Rail companies planning cycles.

Business Benefits

Due to the huge volume of IT developments in the Rail Industry, this e-book is unfortunately too short to mention them all. When we are moving in the "Transport-on-demand" era, predictability is essential. This is only possible using powerful analytical tools and Big Data. This will allow Rail companies to assign their Assets to the specific demand.

With increased reliability, based on accurate predictability of the Asset Behavior will

passenger delay and late trains become an expression from the past. Where SBB stands apart with 97% punctuality, but at a very high cost, over time this will become the norm at a more affordable cost.

Many developments and innovations on IT, Infrastructure and Rolling Stock are still required, but a change is happening.

So, "**What is your train thinking?**"

About ZNAPZ

Today ZNAPZ is one of the European leaders in Asset Management Systems. We support our customers with best in class Asset Management Information Systems, delivering them world class Asset Management. We supply, manage and optimise IBM's MAXIMO Asset Management Systems. These systems guarantee better data quality and they support our customers to make better fact-based decisions. This results in maximum ease of use and the lowest cost of ownership.

At ZNAPZ we recognise that expertise is a prerequisite but real life experience is the key differentiator. Our team is a balanced combination of young talent with knowledge of the latest theory and highly experienced professionals with a deep understanding and the behavior of an organisation. This combination and our unique documented implementation methodology is perfect for delivering success quickly, whilst also creating value for our customers.

Too complex? We can make it simple.

Solutions: the right flexible tools for the job.

- **Asset Investment Planning:**
  MAXIMO AIP
- **Enterprise Asset Management:**
  MAXIMO
- **Effective Maintenance Management:**
  MAXIMO
- **Condition Based and Predictive Maintenance:**
  MAXIMO Asset Health Insight
- **Internet of Things:**
  Watson IoT

Services: on time, high quality services when you need them.

- **Solution Implementations**
- **Solutions Support**
- **Asset Management Training**

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