Why you need data-driven decision-making

Thrive with better data-driven decision-making for strategic choices, operational execution, continuous improvement and as-a-service.

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The world is becoming increasingly dynamic and complex, which makes it harder to understand and predict outcomes of any system or process, let alone the impact of any interventions.

Thanks to new technologies we have a tsunami of data, which we could use for better analyse and predictions. However, we still struggle to collect the right data, turn them into actionable insights and to become more data-driven in our decisions.

In this article:

Recently, Yvo Saanen, Commercial Director and Founder of the TBA Group was guest in one of the Best Practices Meetings of the moreMomentum Services Community. The topic was "Managing Complexity Trough Digital Services". This article is part of the output of this community event.

TBA Group serves global port, terminal and warehousing markets to optimise operations and automation and is part of Konecranes.

THE CHALLENGE

There are two major trends which make data-driven decision-making increasingly mission-critical for any type of business and function, including services in technology sectors:

- The world, our industries and business are rapidly becoming **more complex**.
- The availability and **adoption of digital** technologies and data is accelerating.

This has a major impact on how we - and your clients - should take decisions, whether it is for:

- Making strategic choices.
- Deciding on tactics.
- Taking operation decisions, for example related to a failing machine or planning for spare parts.
- Working on continuous improvement initiatives.

Increasing complexity - VUCA

VUCA is an acronym describing several aspects about the complexity of our world and industries:

- **Volatility**: the nature and dynamics of change, and the nature and speed of change forces and change catalysts.
- **Uncertainty**: the lack of predictability, the prospects for surprise, and the sense of awareness and understanding of issues and events.
- **Complexity**: the multiplex of forces, the confounding of issues, no cause-and-effect chain and confusion that surrounds organization.
- **Ambiguity**: the haziness of reality, the potential for misreads, and the mixed meanings of conditions; cause-and-effect confusion.

The particular meaning and relevance of VUCA often relates to how people view the conditions under which they make decisions, plan forward, manage risks, foster change and solve problems. In general, an adequate view on these aspects shapes an organization's capacity to:

- Anticipate the issues that shape
- Understand the consequences of issues and actions
- Appreciate the interdependence of variables
- Prepare for alternative realities and challenges
- Interpret and address relevant opportunities

Source of the above: Wikipedia

Digital Acceleration

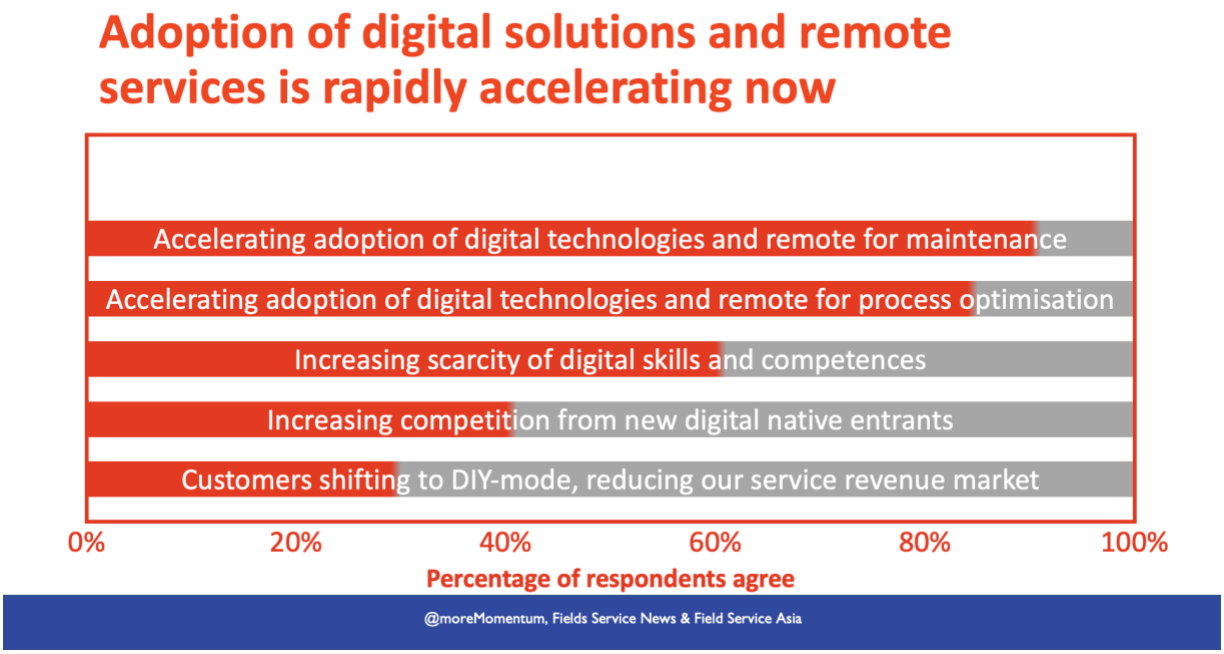
Already for quite a while we see an acceleration of the development of useable technologies, like:

- Sensors and connectivity to capture data from equipment.
- Data storage, processing and algorithms.

- Troubleshooting and decision support systems.
- Augmented reality.
- Remote monitoring and diagnostic tools.
- And more.

At the same time, we see a major acceleration of the adoption of the digital technologies. Your clients, vendors, partners and competitors are becoming increasingly proficient in data-driven decision-making. This will change the way they work, compete, buy equipment and services and who they choose to work with.

Mid 2020 we did a global research amongst service leaders of 94 companies about their views and approach around Covid-19 and digital services. This confirmed our experiences that the adoption has got a major boost during the Covid Pandemic. Below is one of the graphs from the report "Innovate your way out of the Covid-Crisis"



Why common decision-making is not good enough

Too often, decisions we make do not take into account the complexity and unpredictability. As a result, we take wrong decisions leading to lack of improvement, missing opportunities and maybe even making things worse.

If we recognise the decision was wrong, we may correct and try again. This could become rather expensive trial-and-error with:

- High risks.
- Overspending.
- Too slow pace.
- Derailing of your strategic agenda.
- Deteriorating confidence and support from your stakeholders.

Making more of these critical decisions based on the right data, insights and models, will allow you to analyse and test new solutions in a safe and controlled environment, taking away many of the risks and cost of wrong decision.

Struggles for many companies

Many companies, including manufacturers and their clients, struggle to build the necessary capabilities and be proficient in data-driven decisions. For example, they:

- Have too little data or drown in lakes of data.
- Struggle to get actionable insights from these data.
- Are stuck in old decision-making habits, not properly using the data and insights.
- Are unclear how to build proper data-analytics and data-engineering capabilities.

WHAT IS DATA-DRIVEN DECISION-MAKING

The essence of data-driven decision-making is to use data to better:

- Understand a process or system.
- Analyse a problem or opportunity.
- Test potential solutions.

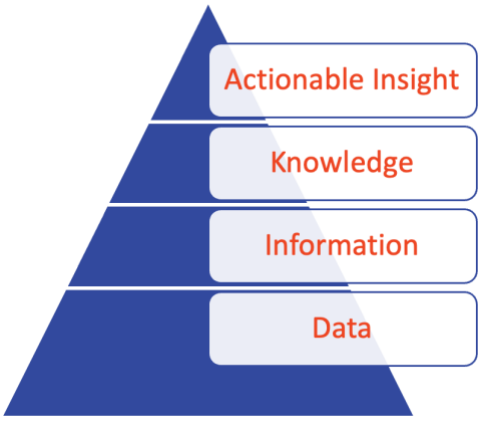
This can be for any kind of decision, whether it is about a new strategy, designing a new service, process or system, improving these or adjusting these for new applications or events.

Data-paradox

Data is available in heaps, there is so much data available that we actually do not know how to find our way around it, nor how to really get something out of this data. Often, these data are coming from complex systems and processes, with many variances and interdependencies, making it even harder to discover valid patterns and relations. The data itself is not what provides us with value. We need to create structures for analysing data to get actually value out of it.

Modelling

So, we need a process to bring us from data to information, knowledge and actionable insights; we need modelling. We use data to build a model of a current situation and/or an envisioned situation that can predict future behaviour.



A model is a simplified representation of a reality, which allows us to come to very good conclusions about a topic we want to make a decision about. A model is always an approximation of the real system. A model is not the real system.

A model could be anything between:

- A correlation analysis with which you can predict the outcome of one parameter by changing another.
- Traffic simulation of an intersection.
- Digital twin model.

Simplification or reduction

Simplification, or reduction is key to address complexity of a system or process. Reduction in the context of modelling means that we:

- Leave out details that are **not** relevant for a decision we want to make.
- Keep in the details that are relevant for a decision we want to make.

Only that way we get a useful and valid model of the reality that contains enough level of realism to represent a good basis of decision-making.

Although, simplification sounds like a simple task, it actually is pretty hard work and requires a deep understanding of data, modelling and the real-life system you are modelling.

Data-driven decision-making = Modelling with data

THE BENEFITS OF DATA-DRIVEN DECISION-MAKING

There are various ways how data-driven decision-making with models can improve your decision, like:

- Address dynamic behaviour.
- Affordable and safe trial and error.
- Prepare for extreme or non-repetitive events.
- Visualise process.
- Quantify and prioritise.
- Avoid guessing.

Address dynamic behaviour

Most systems and operations have a rather dynamic behaviour in which many elements show a variation in characteristics like frequency, duration and complexity. For example:

- One day, you get more service requests than the other.
- Travel from A to B takes 1 to 2 hours, depending on traffic and weather.

- Identifying a root cause takes on average 1 hour, but often more than 3 hours.

The more elements and the more variations in a system or process, the more complex it is to identify critical paths, root causes of an issue and to take the right decisions to operate and to improve.

Affordable and safe trial and error

Once you have identified a few options how to act or improve a system or process, you will not be 100% sure which option is the best and how well the different options will work out. So, an often-used approach is trial and error: test and pilot in real-life situations and try to get feedback as quickly as possible, to avoid unnecessary negative consequences.

The quickest, safest and most affordable way to try and fail fast is to start testing in a simulation or model. Here you can try different scenarios, fine-tune the solutions, assess the risks and gain confidence before implementing the solutions.

Fail fast, learn fast in a safe and low-risk environment!

Prepare for extreme or non-repetitive events

Every now and then you are preparing for this unique, extreme event, which you need to get right the first time. Think about how a flower auction can prepare a process improvement for Mother's Day or Valentine's Day where everything will be tested to the extreme. There is no way to test this live. These are once-in-a-year opportunities and failure is not an option for those days.

In a safe model environment, you can develop and test different scenario's time after time until you are satisfied with your solutions. You will better understand critical factors and will be better prepared for unexpected situations during such event.

Visualise process

Most of us struggle to really understand more complex processes with many variances and interdependencies. A process simulation and visualisation can help us better understand the process, how different parts interact and how the process will react in specific circumstances. This will enable us to better analyse current behaviour, find new solutions and test them in a visual way.

Quantify and prioritise

A very important benefit of using models and data to drive decisions is that you can test scenarios of the current process, as well as alternative solutions to improve performance to see which solutions have the best impact.

This allows you to prioritise the alternative solutions, quantify the impact of the chosen solution and justify this against the resources to invest and the potential disturbance from the implementation project.

Avoid guessing

One of the biggest enemies for adequate decision-making is making assumptions that are not tested. We assume a lot about our businesses, operations and systems, how our clients work and how "best practices" work.

The modelling, which goes hand in hand with data-driven decision-making, is very useful to increase our understanding and avoid guessing:

- Models are data-hungry. They require a lot of analysis of how system components behave in different situations. This requires a lot of data and measurements. This alone already increases the knowledge and reduces the number of untested assumptions.
- Throughout the creation of the model, so many questions need to be asked about the real system, that not only the modeller gets insights, but also the owner of the real process. He will know the process better than he did before.

GENERATING VALUE WITH DATA

In the services business of manufacturers, there are several ways to create value from data and data-driven decision-making:

- Deliver value in a better way - so your processes and operating model.
- Offer other or more value - your services and solutions.
- Generate extra revenue from digital capabilities and services.

Deliver value in a better way – your operating model

- Predictive or condition-based maintenance.
- Remote diagnostics and on-board diagnostics.
- Remote support automation, for example using VR and troubleshooting support.
- Predictive spare parts planning and logistics.
- Scheduling and dispatching service engineers, tools and spare parts.
- Continuous process improvement.
- Market intelligence for advanced marketing and sales.
- Improve customer interactions and experience.
- Advanced customer success processes, to make sure your clients get value from your solutions and also see the value.
- And many more.

Offer other or more value – your offerings

The opportunity here is not only to increase the value of existing services (for example higher uptimes or less unplanned downtime through predictive maintenance), but also to offer services at a lower price (with the same margin) and expanding the scope of your services and hence increasing your relevance for clients.

A couple of examples are:

- Reduce **hidden** downtime, your clients are not aware of yet.
- Quicker resolution time, partly by supported self-service (do-it-yourself and do-it-with-me).
- Performance improvement of inhouse maintenance departments of your clients, for example with better troubleshooting, predictive analytics, raw data and benchmarking.
- Optimizing utilization and output of the production lines of your clients.
- Improving the processes and workflow of your clients to improve their overall outcome.
- Ongoing training of users or operators to improve performance, reduce failure and downtime.
- Developing data-driven capabilities of your clients.
- Transformation of the operating models of your clients.
- And many other advanced services.

How you monetise digital services

Generating additional revenues from digital services is easier said than done. Quite a few manufacturers struggle with this and see their service development stagnating or not picking up momentum.

Data analysis can help you solve a couple of critical challenges:

- How to articulate a clear and compelling benefit for your clients?
  If your aim is to reduce (unplanned) downtime through predictive maintenance and remote diagnostics, how much will the downtime reduce? On average? For a specific client? What will be the financial value of this? How much do your clients typically achieve in practice?
  Without clear answers, backed with data, many clients will be hesitant to pay, open up connections and let you use their data.
- What is the right price level?
  - From a market perspective: How much will clients pay for the service? How does that differ between different customer segments? What happens if you increase or reduce the price with 10%?
    These decisions now often become political and polarised, leading to poor decision. Proper data and analytics would make life much easier.
  - From an internal perspective: What is the cost level per service type and customer type? Which portion of the indirect or overhead cost to allocate to each?
    We often miss the data and analytics to properly calculate this. As a result, we risk pricing us out of the market for some services, and making too little margin on other services.

THE STAKES – MARKET DISRUPTION AHEAD

The name of the game today is “adapt or die”. All companies are on their journey of a digital transformation and are becoming more proficient with data-driven decision-making. This has been the case for years and is now significantly accelerating due to COVID.

Also your clients are changing the way they operate. They will be looking for service providers for running and developing their data capabilities.

System integrators and digital-native service providers are on the fence too. They are entering your industry with advanced digital and data-driven solutions and will become your new competitors (or partners). A few examples:

- Amazon (AWS) Kinesis Data Analytics.
- Siemens Mindsphere.
- Google's Cloudypedia.

The competitive landscape will change dramatically:

- New players may build strategic partnerships and dominant positions with your clients.
- Competitors will develop new competitive advantages.
- Platform-offerings may take position between suppliers and clients.

This could lead to disruption of the services business in the true meaning of disruption - market disruption. Some players will lose their market position, struggle to reap the benefits of the new growth opportunities, while others will steal away the new opportunities and thrive.

CONCLUSION

There is a unique and critical opportunity for manufacturers to be a leading player in this transformation of their industry. Which at the same time is a critical threat for the laggards.

Manufacturers can only thrive during the digital transformation when developing strong data and digital capabilities, becoming more data-driven in their decision-making and advancing their customers' solutions.

In the coming weeks will publish more articles, like:

- 4 steps of modelling.
- Common mistakes with data-driven services.
- The commodity trap of predictive maintenance.
- Monetising digital solutions.

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