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Countries that have been hit hard by the pandemic, especially in southern Europe, are now much more eager to learn from Denmark and our digitalised systems

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Henrik Jespersen introduces software and systems provider Systematic's work in the healthcare space, where the Danish firm looks to help provide a continuum of care across the entire system. Jespersen outlines why it makes sense for Systematic to work alongside other solution providers if requested by its clients, how the firm's international footprint is expanding, and the ways in which it contributed to Denmark's robust response to the COVID-19 pandemic.

For our international audience that might not be familiar with Systematic, could you begin by introducing the company and the services it provides?

Systematic was founded in 1985 by Michael Holm, who still serves as our CEO. Since then, the company has achieved very solid growth and today has 1200 employees. We service two major industries: defence, where we are the market leader in command-and-control systems (C2), and healthcare which started in Denmark 15 years ago. Alongside these, we also do more traditional IT development work in other industries.

In healthcare, Systematic has moved from hospital information systems to today offering a full care suite containing modules for home care, social care, and home nursing, as well as a large brand focused on real time logistics in hospitals, both for service personnel and for clinicians. We do advanced control rooms, as we do in defence, gathering large amounts of data and presenting them

in the same way as traffic control at airports.

Our mission in healthcare is to help provide a continuum of care, seamlessly transforming and transporting information across the entire system in a citizen-centred manner, thereby enabling healthcare practitioners and caregivers to make better decisions.

Why is having a digital solution that covers the whole continuum of care important?

Denmark and Danish healthcare in particular is highly digitalised. All Danes have access to smart technologies, which we use intensively. Nonetheless, Danish patients must still currently give their data several times to different caregivers across their treatment journey, in the first visit to the GP and on follow up visits or rehabilitation at home following surgery etc.

Integration of these data streams can give clinicians faster overviews and improve the patient interaction process. Rapid insights into patients' diagnosis history i.e., help ensure they are not prescribed conflicting or doubled medications. We believe that digitalization is one of the most powerful enablers of interoperability, co-operation and decision making between caregivers and for connecting Hospitals, GPs and municipal caregivers with the patient across the Continuum of Care.

One of the first initiatives was the digital common medication card used all over Denmark; allowing for medication to be validated very quickly. Once a patient is, for example, acutely transported to the hospital, it is easy for the doctor to get a digital overview of their prescriptions. Another example is if an elderly citizen is discharged from the hospital on a Friday afternoon and is very dependent on having food and clinical visits during the weekend, these things have been digitalized so they are not forgotten.

Presumably, having this information available on mobile phones and tablets which can be used in different environments is crucial. What work has Systematic engaged in on this front?

When we decided to pursue this strategy a couple of years back, we decided that everything we do needs to be mobile first. Now, doctors can i.e., prescribe or discontinue medication in real time on their portable device, freeing up time that would otherwise be spent sitting in their offices inputting data to a desktop computer.

However, ensuring that doctors have the necessary bandwidth and connection to use these tools anywhere has been a challenge. If you are basing a lot of decisions on real time data, you need to be able to access and report that data. Therefore, we have also designed solutions for working offline where, as soon as the data can be pulled, it is. This is not just relevant to rural areas, but also in-between tall buildings in the middle of cities.

Given the high level of uptake of these solutions already in Denmark, is there any market left to be gained in your home country?

Yes! We have long accepted that Systematic should not try and do everything. We do certain things very well; for example, our EMR is very solidly focused on making sure that doctors and nurses

cooperate in the right way and that that they have all relevant overviews and clinical content in one place. However, Systematic does not necessarily do the best X Rays, pathology systems, or microbiology. Therefore, part of our continuum of care strategy is also about opening up to partnerships with other companies.

As part of our renewed strategy five years ago, we chose to let the customer decide the best solutions for them. We believe they should have the freedom to choose and innovate and have hence built an ecosystem that allows for collaboration between service providers. Systematic has agreements with all our customers that we will assist and help other companies with access to data, interfaces, and understanding the platform, as long as it's the customer that asks for it.

Denmark is very digitalized with patient data sets on the entire population, fitting well with the kinds of solutions that Systematic provides. However, in countries like the US data is much more siloed; to what extent can these solutions be rolled out globally?

We are exporting *parts* of the solution. Currently, our focus is on Scandinavia, but our system is now running in six or seven other countries, as far away as New Zealand and Australia, and we count the entire Scottish NHS as customers for our logistics platform. Nevertheless, we must be very careful in our market selection process, looking for healthcare systems which, like Denmark, utilise a Beveridge Model whereby the government provides healthcare for all its citizens through income tax payments. We would be very cautious about exporting our entire EMR solution to insurance-based systems like the US or even systems that utilise the Bismarck Model, like Germany, for example. However, we would have no qualms with taking the logistical part of our entire healthcare suite, to these markets.

Everything we do has a focus on delivering a continuum of care for the benefit of the patients, but also to have strong products, that can internationalise. Some of the solutions we have built are so good that other countries can use them. We have several clients in Finland, for example, and seeing how it's working there is amazing. The fact that our solutions are making a difference for patients and clinicians outside of Denmark is very rewarding.

Does the fact that Systematic's full suite of solutions is not directly applicable in all countries limit the company's growth ambitions? What will be the growth drivers moving forward?

There is huge potential in real time access to hospital logistic data. There are certainly parts of the caregiving process that are generic and not too closely coupled to national infrastructure, meaning that, in this respect, the world is our oyster. The more dependent we get on national content and the more linked to the operating of the national healthcare model, the more difficult it gets, but there are few limitations.

Even though we are not as large as some of our international competitors, we have a strong belief in ourselves and a targeted strategy focused on solving a specific problem. This could include creating the ability to see real time data for service personnel or enabling nurses in a particular hospital to have a full overview of how the patients are in real time in their wards.

Patient data is an area where security is extremely important. How are you working to safeguard the data with which you deal?

There are a lot of regulations in place with which we need to comply. All the issues around safeguarding due to GDPR and other issues are naturally of high importance to us. We make sure we get certified and that we have external parties verifying the system. Having originated in the defence industry, we are used to very stringent security measures.

However, it is an ongoing battle. We have had security companies trying to breach us to see if our systems actually work and if the right safeguards are in place. So far, happily, none have succeeded.

Is there work being done to assuage concerns regarding data sharing with private companies as opposed to governments?

Systematic does not have access to patient data, period. All the data access is solely on the client side. The owners of data in Denmark are the citizens/patients.

Danes are used to working with private banking and using all our health data through some of the national portals. During the pandemic we have been extremely technology advanced, receiving notifications every time test results come in, and we were one of the first countries to digitalize Corona passes. This is now accelerating public acceptance of using smart technologies in healthcare, reporting data from wearables etc.

It seemed like Systematic responded quickly to the pandemic with the testing/booking solution it provided to the Danish authorities. How significant a contributor was this to Denmark's robust pandemic response and what adaptations have you had to make in the wake of COVID-19?

At the outset of the pandemic, it was clear that our solutions had the potential to assist the national authorities, so we made them freely available to the Danish Health Authorities. Within a month, we had assisted the authorities to digitalize the Test Centre Denmark facility to provide an overview of key data such as hospital capacity, PPE, testing etc, which represented a strong pandemic control solution. Together with the Danish Patient Safety Authority, we were able to develop a system for the tracking of contacts, infections, variants, and infections during i.e. travel. Data insights from the system are also used to get an overview of the development in the pandemic.

The background for this project is, of course, horrible, but it was fantastic to see how we could work together with the authorities in such an agile solution-oriented manner. For example, when variants became an issue, we worked out how to digitalize the segmentation of all tests to get an overview of trends.

In the words of the National Health Authority, there are three main reasons why Denmark has coped relatively well with the pandemic. Firstly, Danes are very disciplined when it comes to social distancing and we trust and follow the recommendations provided. Secondly, we tested, tested, and tested again, and invested a lot in a very comprehensive test facility. Thirdly, we already had a high level of digitisation and could rapidly be expanded, with strong IT support that made sure we knew what was going on. Even today, we can show heat maps of infections and our system is being used to brief the Prime Minister and the Health Authority.

Aside from a greater acceptance of using digital tools post-pandemic, do you see any other trends emerging from this period?

The rapid switch to remote working and video interaction has shown that digitalization and IT can help us a lot. Some of the national platforms have had four or six times more usage. There has been a huge acceptance of new ways of communicating one's health situation, which has been truly disruptive.

For Systematic, the learnings have i.e., been how to engage more digital as a company in our client-facing activities. We have also learned to deploy our systems remotely and work together in a new way. For example, in the past doing an IT transformation project in a hospital used to involve a lot of face-to-face meetings, but we now have proof that much of this can be done remotely.

Additionally, countries that have been hit hard by the pandemic, especially in southern Europe, are now much more eager to learn from Denmark and our digitalised systems. Against this backdrop, there is no reason why Systematic's healthcare business should not continue to grow in the next five to ten years.

Your field is getting increasingly crowded, but what makes Systematic the partner of choice for healthcare systems?

Our open approach is crucial, believing in a continuum of care, and accepting we should not do everything. Systematic's systems stand out in allowing nurses, doctors, therapists to work very closely together, which fits the agenda of governments now buying into the continuum of care concept while also looking for high quality at a low cost.

Of course, we have competition from both large and smaller players, but more importantly we have many collaborators. Systematic has both the scope of a large company with the agility of a smaller outfit, coming up with good ideas, driving innovation, and allowing our customers to innovate with other stakeholders both vertically and horizontally. We also believe in finding new ideas outside of Denmark with other vendors, taking them into Denmark, and taking some of our ideas and going the other way. Clients, both in Scandinavia and in the rest of Europe, respond very well to this openness. We really believe in the ecosystem, and being the best of breed, not necessarily supplying 'everything' in a single suite.

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