How to develop a Sustainable Digital Platform

By Eskil Swende and Svein Oliver Vedaa, IRM, April 2020

"The digital world is here but our old companies are simply not yet designed for digital."
 – stated by Jeanne Ross in her new book "Designed for Digital"

The article below is based on our assistance since 2016 to the Data Architect at Cambridge University and their global assessment business. It is also based on our experience of more than 50 Business Architecture Plans developed for both Private and Public businesses in Scandinavia starting at Scandinavian Airlines (SAS) in 1980.

The development of our approach was inspired by the Swedish Professor Bo Sundgren and his close relationship with Ted Codd; the British mathematician that developed the Normalization Theory, that still is very important to achieve the sustainability in your IT Portfolio.

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1   Introduction

Your business may need to develop a new digital platform to replace your existing application-centric IT solution. Your current application portfolio may have reached a size and level of complexity that is expensive and difficult to develop further. You are then on a non-sustainable track. If you want your new digital platform to be **sustainable**, you have to be very careful and understand the capabilities needed to achieve such a sustainability.

This article does not cover the Information Technology needed to establish a Sustainable Digital Platform.

2   Why sustainability

In our rapidly changing environment the business, need to be agile. Our new digital platform must allow for changes in the Organization, the Business Processes and the Capabilities when new products or services are developed, and even when new strategies are decided.

A Digital Platform based on a high-quality **Information Architecture** is sustainable and flexible, allowing these changes to be made without adding complexity. Your Digital Platform will consist of a number of modules, where the same data is only captured and updated **in one and only one module**.

Allowing the same data to be captured in more than one module, may after a few years result in the same "unsustainable level of complexity" as your current IT systems have reached after 20+ years of application-centric development. (Further reading see 8.1)

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3 Achieving sustainability

In your business, you may have 10.000+ different data elements like *customer address* or *product price*. To group these data elements into **the correct module** must not be done randomly. Together with your business experts, you, as an architect, must establish a number of **Information Groups** – say 30-50 groups, divided into **Master Data** like *Customer*, *Personnel* or *Product* and **Event Data** like *Customer Order, Delivery* or *Supplier Invoice.* (Further reading see 8.2)

Your information architecture must be based on your business, and not derived from your IT solutions. Your current IT solution came with an architecture often deviating from the one in your business.

The Business Model Canvas developed by Alexander Osterwalder is based on Building Blocks that easily can be related to your Information Groups. A new Value Proposition may reuse existing Building Blocks and existing Modules in your Digital Platform. This will add speed and keep complexity and Integration at a low level. (Further reading see 8.3)

Designed for Digital is a new book by Jeanne Ross, written for management to understand the importance of the digital transformation and to leave the application-centric legacy systems behind us. She was also co-author of EA as Strategy; the first management book to describe Business Modularity based on shared data. (Further reading see 8.4)

4 Consequences

A new sustainable digital platform has to **be built from scratch**. The existing legacy systems have to be eliminated step-by-step, and replaced by modules in a new digital platform. The current legacy system cannot be transformed into a digital platform in a step-by-step approach.

5 The Architecture and Development Cooperation

You will need a loose coupling between application and data. No application will be allowed to own its own data. Data is a common resource and will be available for all applications. Data bases will be designed and implemented based on the Information Groups.

You should establish a number of autonomous Development Teams. Spotify has several hundred teams working in three continents. You will need a number of teams to take care of applications and Information Groups. One team can have responsibility for one or more applications and one or more database (based in Information Groups). However, responsibility for one application or one database (Information Groups) must not be divided between teams.

The development teams will have to work in close cooperation with the Business Architecture Team including Data and Process Architecture.

CEO   Architecture Team   Development Teams   Customer
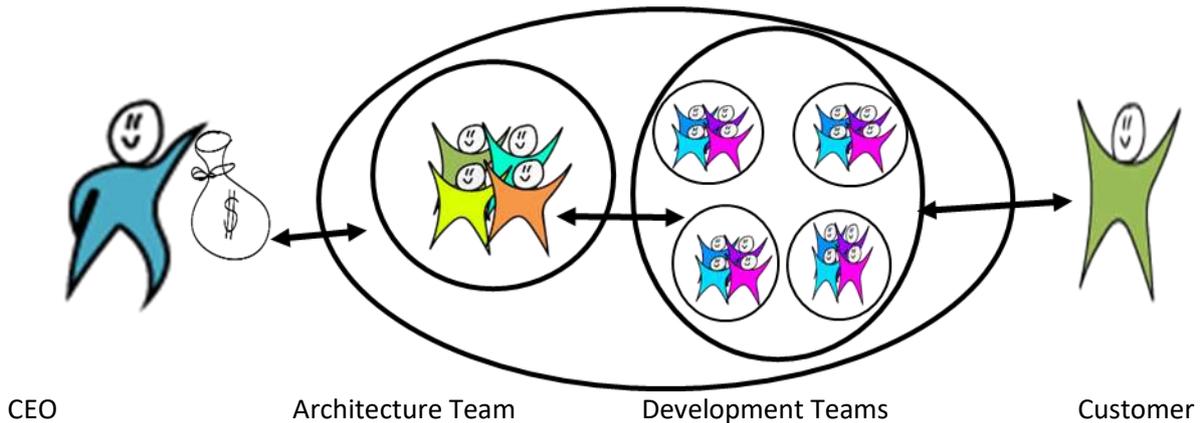
The autonomous development teams (Scrum) delivers **speed and quality**, the Business Architecture Teams secures direction, **and a sustainable solution** prepared for future changes. The Business Architect will support Development Teams, but also further develop the overall architecture. (Further reading see 8.5)

The Business Information Models are the key artefact to combine the Development with the Business Architecture. The Overall Business Information Model shows the total Digital Platform and the Detailed Business Information Models show the structure of each module.

One development team may be responsible for one Master Data Module like "Customer" or an Event Data Module like "Delivery". An Event Data Module will be related to your Business Processes like the "Delivery Process".

6   Ten Critical Success Factors

Many IT-managers, CIOs and CEOs agree that the old application-centric approach does not support a digital world. However, the transformation is very difficult and there is no guarantee for success. There are a number of very critical success factors (CSF) to handle when developing your future Sustainable Digital Platform.

Below we have listed and described some of these very critical success factors. You may try to evaluate them, discuss them, and start the transformation process being fully aware of which CSFs are most critical in your own business.

1.   Executive level support

Develop a new sustainable digital platform; in order to achieve speed and high quality when delivering new customer values, will require full support and understanding from your executive management, all the way from the IT Manager and CIO to the CEO and the Board. Do not hesitate to keep them informed, and at the same time develop their capabilities in an area where they so far are not the experts.

2. Internal and external forces working against the digital transformation

In your business, you have many highly qualified people that daily depend on a set of application-centric solutions. A transformation from this old approach to something new, may cause a lot of internal fear and resistance. Try to engage them in the transformation and make them understand that the digital transformation is necessary for the survival of your business. Keep them informed and try to develop their capabilities. **The Milky Way**, described below, is a good way to engage everyone.

3. Financing the digital transformation

Long-term and stable financing of the Digital transformation is important. At the same time, you should reduce financing of the current legacy systems to a minimum – only covering very critical adjustments. When you finance your digital transformation, it is important to avoid sub optimisation that will lead to new application silos. Building on a common Business Architecture with a quality Information Architecture does not imply any common expensive infrastructure – it just stops you from financing redundancy and unnecessary complexity.

4. Culture change

The hierarchical organization can be transformed into more self-organizing teams. Today the main knowledge exists down in the organization and less at the top and middle level. This transformation of decision-making must be aligned with a change of mind-set in the organization. IKEA is a global successful business based on a number of common culture principles established already 1976 by Ingvar Kamprad. Microsoft and the new CEO Satya Nadella is a current example of such a transformation of culture and new business model that goes hand in hand. (Further reading see 8.6)

5. Autonomous development team

Autonomous development teams with responsibility of both development and operation, makes it possible to deliver new customer values continuously, whenever they are ready to be released. In the classic application-centric approach a new release is risky and may take hours or days to accomplish, and will only happen a few times a year.

The autonomous team approach was first developed by Henrik Kniberg at Spotify and later also introduced at LEGO. Now it is widely introduced, at least in Scandinavia.

SBAB, a Swedish Bank, has established a number of development teams also responsible for the operations, called "Dev-Ops" teams. It took them only one month to have a new product on the market and their market share grew in one year from 9 to 17%. So far, they have got rid of 50% of their old integration making the business very agile. The teams are very close to the market and deliver new customer values every day.

6. The Milky Way – map, navigate and accelerate change

The Milky Way is a method and navigational tool showing the work of the entire enterprise and how to move from strategic considerations to results. The tool demonstrates how processes, information and IT support work together to support the company's value stream, and how the company interacts with its suppliers, partners and customers. It uses geographic maps as a metaphor to illustrate why and how an enterprise work. Building Milky Way models is largely done in workshops,

where it becomes clear how different parts affect each other and how change initiatives can be coordinated. (Further reading see 8.7)

7.   Common Information Model

Today many applications have their own data structures based on local data definitions, some of them are expressed explicitly, but most are only implicit. To make the transformation to a sustainable digital platform we need a common Overall Business Information Model (OBIM) divided into a number of Information Groups; some are Master Data, like customer or product, and some are Event Data like customer order, invoice or delivery. We call it an Information Model when it describes the business itself and a Data Model when it describes a specific IT Solution (existing or planned). These Information Groups are an important part of the information architecture. They are keys in design and planning to avoid data to be captured and managed by more than one development team. This avoids unnecessary duplication of work and solutions, and it saves complexity and money. Members of DAMA Chapter Scandinavia developed the OBIM approach in 2010.

8.   Integration

The integration between the various Service Modules must be based on the Service **Choreography** approach with an Event Stream. Read more at
https://specify.io/concepts/microservices#choreography.

An **Orchestration** approach may after a few years result in the same complexity as you have today, and it will not result in a sustainable digital platform.

9.   Process Components and Processes/Capabilities

Today we have to provide a Process & Capability Architecture that works in large companies that may have development, production and deliveries of IT solutions in several countries.

Avoiding redundancy is necessary in order to achieve effectivity. We need to combine both reuse of solution at the same time as we offer easy adoption to local conditions. A set of **Common process components** will handle a well-defined part of the total business flow. They should be easily combined in many different ways where changes can be handled fast. This will create flexibility and a more agile business.

10. Application Lifecycle

To be able to replace existing applications, we need a good description of our application portfolio (both legacy and new). Stages in their lifecycle may be; *1. Under development, 2. Installed to be finished, 3. Installed and finished 4. To be replaced and 5. Planned to be replaced*. To keep track of which Information Groups are handled in each specific application is a key factor to facilitate the transformation.

7   Summary – The Inca Foundation and your Platform Foundation

When building a sustainable house, the foundation is the most critical part. The Inca people learned that the hard way. Their foundation stones were cut so precisely, and wedged so closely together,

that a credit card cannot be inserted between them. When an earthquake occurred, the stones in an Inca building are said to "dance;" that is, they bounce through the tremors and then fall back into place. Without this building method, many of the best-known buildings at Machu Picchu would have collapsed long ago.

When creating a sustainable Digital Platform, the foundation consists of a number of Information Groups; they will not dance when the "earthquake" happen. Instead, you may just add or take away a data element or an entity. You may even have to add or take away an Information Group. Then you may change the Platform to achieve new requirements needed to continuously deliver your new customer value.

To establish a Platform Foundation Capability may take some time. If you need any assistance, we may offer mentoring, education, second opinion or direct support; just send a mail to Svein Oliver Vedaa (svein.oliver.vedaa@irmconsult.no).

8   Further reading

Below we recommend some further reading.

If you do not know the reasons why we have a lot of problem with our current legacy systems, Dave McComb has made an excellent analysis in his book. You may also find an interview with him in TDAN.

Knowing these reasons will motivate you not to repeat these mistakes again!

1. **Software Wasteland** – How the Application-Centric Mind-set is hobbling our Enterprises", 2018, by Dave McComb. Know what´s causing application development waste so you can turn the tide.

2. **Overall and Detailed Business Information Models** – Developed by the DAMA Chapter Scandinavia in 2010. http://tdan.com/defining-and-naming-data-models-related-to-the-zachman-framework/12655

3. **Business Model Generation** – By Alexander Osterwalder in 2010. His Business Model Canvas (BMC) is very important when designing a new Sustainable Digital Platform

4. **Designed for Digital** – How to Architect your Business for Sustained Success, by Jeanne Ross, 2019, also co-author of "EA as Strategy". The Digital World is here but our old companies are simply not designed for digital.

5. **Agile EA in Practise** – At Swedish Board of Agriculture (SBA) published in JEA, 2015, https://www.irm.se/2018/09/27/agile-in-practice/. This ambitious program at SBA may be regarded as a global breakthrough to achieve an Agile EA in Practice with the Chief Architect acting as the Program Manager.

6. **Hit Refresh** – The Quest to Rediscover Microsoft´s soul" by Satya Nadella, CEO, 2017. He asked everyone to identify their innermost passions and connect them to the new mission and culture.

7. **The Milky Way – map, navigate and accelerate change** – By Cecilia Nordén, 2019. It uses geographic maps as a metaphor. The work is largely done in workshop form, where it becomes clear how change initiatives can be coordinated and how to move from strategic considerations to results.

9 Your feedback!

So far, we have a lot of very useful comments, questions and feedback from our global network of experts.

Please, do not hesitate to mail us your comments, questions or other feedback on this article.

Our next article on "How to develop a Sustainable Digital Platform" will focus on the Information Modelling and Information Architecture including a number of example of Information Groups from various types of Business. Please send us your email address and we will mail you our draft before publishing.

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10 Biographys

Eskil Swende, IRM Sweden

Eskil is a co-founder of IRM Sweden in 1982, a Scandinavian consulting company focusing on Business Architecture. He initiated the education of Certified Business Architects already 1991 and so far 1500+ Architects has been educated. He is now focusing on the business use of new technologies like digital development. Eskil has been mentor to the Data Architect at Cambridge University and their assessment business since 2017. It has resulted in an approach "How to Develop a Sustainable Digital Platform". Our article is based on this approach. Eskil started DAMA Chapter Scandinavia in 1995 and was their President until 2016. He is also a co-founder of IRM UK and has developed a global network of leading expert of EA. Eskil has written a number of articles for TDAN since 2008.

Svein Oliver Vedaa, IRM Norway

Svein Oliver founded IRM Norway in 2000. Already as a University student in the 80s, Svein Oliver was interested in data and information as the core of value creation within IT. Despite all the brilliant technology that has emerged since then, data and information must still be managed as a resource to fully exploit its value. He believes fully that we must start with architecture to accomplish this. Today he focus on architectural debt (inspired by the theory of technical debt) with the goal of designing sustainable digital platforms. Svein Oliver has participated in many business architecture projects, many of them in the Oil & Gas industry. The ground for a sustainable digital platform will be described in more detail in our next article for TDAN.