

THE HOTDOG MODEL – HOW TURN A TIER 1 AUTOMOTIVE COMPANY INTO AN AGILE ORGANIZATION

Atzberger, Alexander (1);
Dethloff, Conny (2)

1: Webasto SE;
2: borisgloger consulting

ABSTRACT

The more dynamic the markets become, i.e., the more surprises the markets have in store for companies, the more important it becomes for companies to react quickly to these changes in order to have market-driven and individual solutions. This is especially important for tier 1 suppliers, as competition is fierce and the customers, the OEMs, also have to adapt to the changing market and thus customer needs.

In order to be best prepared for this, it is necessary to align one's own company in a flexible and responsive manner. In particular, the context-specific development and application of a framework as well as a model for the improvement of internal collaboration in companies is necessary.

In this paper, exactly such a framework has been developed in several pilot projects within the framework of an agile transformation at a tier 1 supplier over a period of two years by means of participative action research.

As a result, the conception and development of an individually scaled agile framework for a tier 1 supplier in the automotive industry, the AHEAD framework, is presented here. The Hotdog model is the central basis for the collaboration model, which is scalable to all company levels.

Keywords: Case study, Multi- / Cross- / Trans-disciplinary processes, Organisation of product development, Design methodology, scaled agile framework

Contact:

Atzberger, Alexander
Webasto SE
Germany
alexander.atzberger@webasto.com

Cite this article: Atzberger, A., Dethloff, C. (2023) 'The Hotdog Model – How Turn a Tier 1 Automotive Company into an Agile Organization', in *Proceedings of the International Conference on Engineering Design (ICED23)*, Bordeaux, France, 24-28 July 2023. DOI:10.1017/pds.2023.340

1 INTRODUCTION

The beginning of the ever-golden 2020's has shown that change is omnipresent in today's world. The Covid crisis, followed by the war in Ukraine, have had a significant impact and led to harsh disruptions on the supply chains across almost all industrial sectors. Thus, the new decade is bound to changing circumstances on even the highest (company-external) level ("environment"), when following the scheme regarding the influencing factors for product development by [Gericke et al. \(2013\)](#). Even on the second highest, macro-economic level ("market"), competition is having a tremendous impact with the rising enterprises which are dictating the pace in the far east.

These changes have a crucial impact on the automotive industry as well. Whereas OEMs were able to circumvent most of these harsh disruptions, the Tier 1 (and 2) automotive suppliers have been hit quite hard by these changes. Thence, it is vital for these companies to be able to respond to those changes quickly in order to stay competitive, and, in the long term, survive such far reaching disruptions.

Agile product development has proven to be a very meaningful and effective approach to counteract changes across several hardware-heavy, mechatronic industrial sectors, as shown by [Atzberger \(2022\)](#). Yet, agility as a development approach is focusing primarily on the product creation and delivery of dedicated teams. In the context of mechatronic product development, multi-team (scaled) setups are necessary due to the nature and complexity of the products. In line with that, these teams should be staffed in a cross-functional manner with high autonomy, when considering Conway's Law ([Conway, 1968](#)). Hence, multi-team setups in scaled agile development projects require experts of different disciplines with various competencies. Moreover, for an entire business line or business (which is referred to as "operative unit" later on) to leverage the benefits of agility, the entire value chain has to be investigated and the entire setup has to be tailored accordingly. By taking into account the value chain from the initial idea until the SOP (start of production) and even beyond, synergies across the different product development projects in the respective operative unit can be leveraged. In line with this, when another disruption impacts the company, the operative unit as a whole is able to respond by adapting wherever necessary. This concept can also be taken one step further onto the company level. On an enterprise level, the entire company should have the capability to move and shift quickly when its various business lines (or units) are designed accordingly. Thus, when following this line of thought, the overarching goal is to align the entire company flexibly. Here, the term "agile organization" comes into play, which describes an enterprise that bears the characteristic to respond to changes on every level quickly and steadily ([Dove, 1999](#)).

As a result, in order to turn an existing organization into an agile organization, a framework is necessary which enables agile modes of action a) on (multi-) team level, b) for scaled product developments along the entire value on the level of an operative unit, and c) on enterprise level. Moreover, for the framework to be applicable in practice, contextual characteristics and restrictions have to be considered.

In this work, a framework is presented which is tailored specifically to the context of a tier 1 supplier in the automotive industry. Based on previous experiences with agile methods, it has been designed on the practical experiences during an agile transformation at a tier 1 automotive supplier. It shall be referred to as AHEAD framework in this work. One central element is the underlying collaboration model, which is called the "Hotdog model".

2 STATE OF THE ART

2.1 Scaled agility frameworks

Agile methods and methodologies have been around for decades already. As visualized by [Atzberger \(2022\)](#), there has been a transition from agile methods on team level to larger scopes at around 2007. With the advent of the so-called scaling period (2007 until today), the focus of the methodologies shifted beyond single team setups towards large-scale product developments as well as portfolio level. For the sake of comparison, the most prominent scaled agile frameworks are contrasted briefly. A detailed description of each of these methods and methodologies can be found in [Atzberger \(2022\)](#).

As recent surveys have shown, *Scrum of Scrums (SoS)*, *Large Scale Scrum (LeSS)*, *DevOps*, *Scaled Agile Framework (SAFe)*, *Disciplined Agile Delivery (DAD)*, *Spotify model*, *Nexus* and *Scrum@Scale* can be considered scaled agile methodologies which are actually applied by practitioners, in

comparison to several others which have been developed, yet lack practical application (VersionOne, 2020; Nicklas et al., 2021; Michalides et al., 2022). They are rather generic in nature, which allows for context-independent application across several industrial sectors. *Scrum of Scrums* represents an extension of regular Scrum to display how several Scrum teams can work alongside each other. In contrast, *Large Scale Scrum* (LeSS) can be considered a true scaling framework, as it focuses on the collaboration of several Scrum teams to reach a common goal. Here, multiple teams are collaborating by having only one Product Owner and one Backlog overall, where in SoS, each team has its Product Owner and Backlog. *DevOps*, on the contrary, focuses on the collaboration of different areas, as indicated by its name, Development and Operations. This consolidation aims for a higher deployment rate and decreasing failure rate. The *Scaled Agile Framework (SAFe)* is the most popular scaling framework, as it consists of three levels (portfolio, program, team level) with specific roles. The work is separated in value streams, which are referred to as release trains, with each release train consisting of five to fifteen teams each. Leffingwell states that due to its manifold character, the suitability of SAFe ranges up to large enterprises (Leffingwell, 2011). The *Disciplined Agile Delivery (DAD)* framework considers itself a hybrid agile toolkit adopting several elements from other agile methodologies. It has evolved to Disciplined Agile Enterprise for an application on enterprise level as well over the years. The *Spotify* model, in contrast to all other methodologies, has been designed by practitioners of the company. It is an advancement of existing methodologies to satisfy their specific, software-based needs and is augmented by additional elements such as squads, tribes, and guilds, and is intended to serve for large-scale product development. *Nexus* is an advancement of Scrum, and it can be applied for up to nine Scrum teams working on a single product backlog. It aims for an Integrated Increment at the end of each sprint, thus focuses on the collaboration of several teams to achieve a common goal with respect to the value creation. Lastly, *Scrum@Scale* is referred to as a meta-level framework which relies on Scrum. It acts as a scaled version of Scrum by providing a Product Owner and Scrum Master Cycle. As a result, due to the absence of strict guidelines, its aim is to enable the creation of a tailored scaled agile framework.

All of the above-mentioned frameworks have a dedicated focus which make them suitable for particular applications. Due to the specific boundary conditions of a tier 1 supplier, which are highlighted in chapter 2.2 in more detail, the aim was to create a framework which includes the following aspects: It shall enable agile ways of working in scaled setups, hence it needs to be a) a *scaled agile framework*, b) be applicable on every company level, thus represent all *scaling levels* within the company, c) explain its modes of action on each of the *organizational dimensions*, and d) exhibit a *context-specific alignment*, hence the framework should be tailored to the needs of an automotive context with a tier one focus.

As these aspects are explained in more detail in chapter 4, a brief comparison regarding these aspects is illustrated in table 1. The "+" sign stands for *fully expressed*, "o" for *has been partially addressed* and "-" for *has not been considered*.

Table 1: Analysis of scaling frameworks regarding focus aspects

Scaling framework	Scaling levels	Organizational dimensions	Context alignment
SoS	–	–	–
LeSS	o	–	–
DevOps	–	–	o
SAFe	+/o	o	–
DAD/DAE	+/o	o	–
Spotify	o	–	o
Nexus	o	–	–
Scrum@Scale	o	–	–
AHEAD	+	+	+

As none of the scaling frameworks features all these aspects to date, the goal was to derive a scaled agile framework which incorporates all of them into one single framework. Thence, the result of the work at hand is the so-called AHEAD framework, which was self-designed by the authors and thus, covers all of these aspects. In chapter 5, the framework is validated by applying the validation criteria of Patzak (1982).

2.2 Context-specific boundary conditions of a tier one automotive supplier

Most scaling frameworks are designed in a way, that they can be applied across several industrial sectors, hence they are generic in nature. Here, the aim was to design a context-specific framework which had been developed based on the needs of a tier one supplier in the automotive industry. Due to this, the boundary conditions for this specific context are highlighted briefly for the sake of comprehension. Moreover, company-specific aspects are included as well.

As many medium- to large-sized enterprises aim at obtaining a large market share, a variety of different products is developed and manufactured to generate revenue. Hence, the company exhibits a broad portfolio of different *product types*. The products across different business units vary significantly in their product structure. In line with this, when developing products of different types, the disciplines involved (and competencies needed) differ as well. Especially when being a market leader in a specific segment, which is the case here, a company is bound to provide products exhibiting a lower degree of innovation with a focus on cost-effectiveness and the potential to supply high volumes, but also offer products which are top notch, featuring the latest inventions. As a result, a company has varying product types within each business unit (or business line) and across different business units, which increases the product complexity significantly. For the sake of understanding, a roof system for a car has distinct different requirements compared to a heating system or a battery system.

In line with this, the *product development efforts* differentiate from one another. Taking the example of the market leader mentioned before, the development projects range from standard carry-over projects to adaptation projects to cutting-edge new product developments. In addition to that, new product developments of different product types show also varying efforts. Another major influential factor is the presence or absence of a direct customer in a development project, meaning the development for a specific customer or a development without any customer interlink. For this, the AHEAD framework has developed an "agile slider", which determines the degree of freedom of a development project to determine a suitable way of working.

The *customer orientation* is mainly one of the distinct differences any tier one (or two) supplier is facing compared to other enterprises along the value chain. In most cases, a certain product is developed for or tailored to a direct customer, which is an OEM in most cases. Thus, a strong customer orientation and interaction is inevitable, and every customer has its own specific wishes and requirements. Due to this, the company has defined certain "customer groups". Here, a customer group is a specific group of employees, who develop products for a dedicated group of OEMs, as they have experience with that group of customers (OEMs) and know their customer-specific requirements best.

Another aspect, which represents another facet of the company of investigation, is the topic of *steering dimensions*. Typically, a company is internally structured according to a) product (lines), b) regions, c) customer groups, or a combination of these. In line with that, the profit and loss (P+L) responsibility is either in one dimension or shared among several. This is of high relevance, as a strict orientation towards one steering dimension enables fast decision-making at the cost of another steering dimension, whereas a combination enables to leverage synergies. This is elucidated in more detail in chapter 4.

3 METHODOLOGY

The framework at hand has been developed in the course of a scaled agile transformation at a tier one automotive supplier. As it is common for such a transformation, the company has gained experience with agile methods on team level previously. In 2016, the first agile methods have been introduced and over the course of five years, several agile methods and methodologies have been applied in various development projects. At the beginning of 2021, the company has decided to start a scaled agile transformation to move beyond agility on team level towards scaled setups. In the span of two years, several learnings have been derived, which are summarized in this work, the AHEAD framework.

The findings in this work have been obtained by participatory action research. As this type is typical for transformations (Bradbury et al., 2019), the authors have been part of the agile transformation team (ATT) which is responsible for driving the transformation. In the beginning, two pilot projects have been identified, and the initial version of the HotDog model has been derived. Here, the authors acted as consultants in so-called agile implementation teams (AITs). An AIT is commonly set up by people from the respective business line to be transformed, agile coaches, as well as members from the ATT.

The AITs are formed temporarily over a period of six to twelve months to accompany the pilot project from set up to the starting and roll out phase. After the first projects, the authors were part of additional AITs, and shifted their focus towards the gathering of the findings into the first draft of the framework presented here. The framework matured over time as additional learnings and adaptations have been included.

The first pilot projects were in two different business units with 40 and 60 people, respectively. As the pilots matured, additional teams along the value chain have been part of the transformation as well. As of today, the entire business lines (of the initial pilot projects) have been transformed, including around 200 people overall. Over the course of the transformation, several pilot projects have been prepared or set up, as indicated by figure 1. After two years, more than 250 people are working in this framework, with a steady increase as the new pilot projects are "ready for take-off". In the next step, further pilots will be launched outside of the region of Europe, with one pilot starting in India and another one in the USA, among others in Europe.

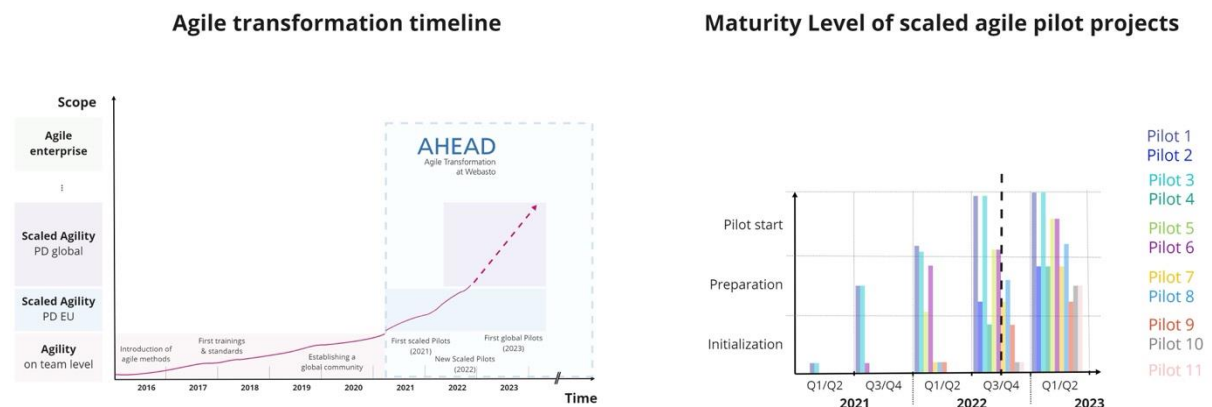


Figure 1. Agile transformation timeline (left), maturity level of scaled agile pilots (right)

4 THE AHEAD FRAMEWORK

The AHEAD framework consists of three meta structures: Organizational dimensions, Scaling levels, and the model structure. One essential part of the framework is the structural model, which can be scaled onto several levels, which is referred to as *Hotdog model* here.

4.1 Organizational dimensions

In the context of the design of organizations, the terms "organizational structure" and "process organization" are often used hoping that, if both organizational dimensions have been designed appropriately, a good organizational design will be the result. Are these two dimensions sufficient? Let's take a closer look at our human body. What does one have to understand in order to understand the functioning of the human body holistically?

Organizational Structure – On the one hand, there is anatomy. One should know which organs form the human body and what tasks and responsibilities each organ has. This can be understood as organizational structure in the sense of defining departments, teams, roles, meetings, etc. that are necessary for organizational viability.

Process Organization – On the other hand, there is physiology. The processes within the organs and between the organs, such as the digestive process, must be understood. This could be designed as a process organization in the sense of organizations where the interaction of teams and departments is defined to create value for customers and ensure profitability via the delivery of products and services. Yet, are anatomy and physiology enough to fully understand human beings? What about, for example, the planning of certain events, such as vacations, weddings, or job changes? Or about acting in traffic? So to speak about organizing, deciding and communicating with the environment? Can these phenomena be explained by anatomy or physiology solely?

Steering & Communication Organization – No. Here, one must consult the so-called third dimension, neurology. And this is exactly where conventional organizational models are mostly blank (Pfiffner, 2020). This gap can be closed with this "AHEAD Framework". Stafford Beer's Viable

System Model was used to model the third dimension of organizations, which is the "steering and communication" dimension, thus fully designing organizations in their three dimensions.

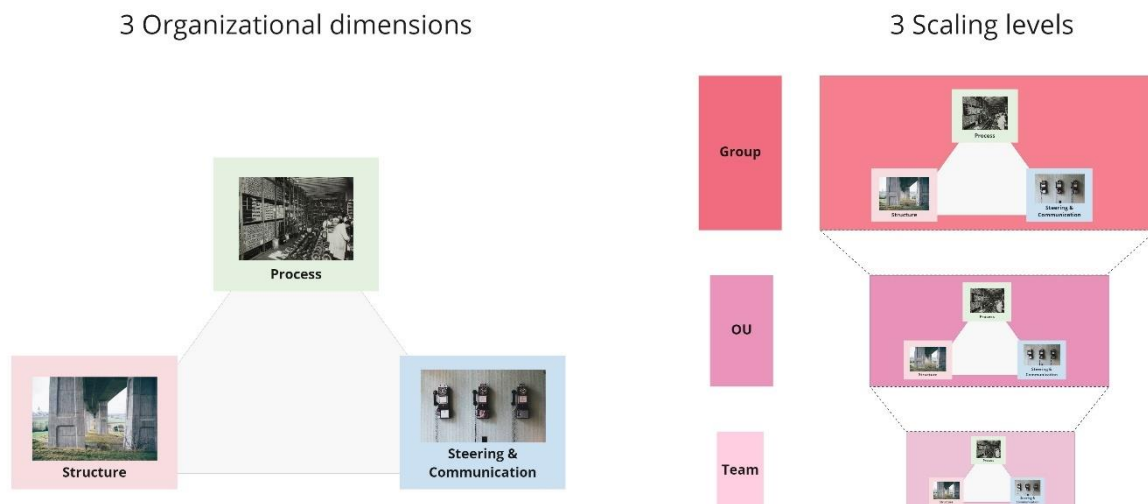


Figure 2. Organizational dimensions represented by triangles (left), b) Scaling levels indicated by level structure (right)

4.2 Scaling levels

At each scaling level, two of the three organizational dimensions mentioned above, "organizational structure" and "steering and communication organization", are designed. The third organizational dimension, "process organization," can only be designed at the lowest scaling level, since direct value creation for the market only takes place at this level.

When scaling down, one always starts at the level of the overall organization and then, in the first step, breaks down the so-called operational units along market-relevant criteria, the "steering dimensions". Steering dimensions can be "product", "customer" or even "region". This is then used to derive the second scaling level, on which a similar procedure is followed. At this level, too, the operational units are cut, again based on steering dimensions. The result could be "Product 1 Region 1," "Product 1 Region 2," "Product 1 Region 3," as well as "Product 2 Region 1," "Product 2 Region 4," etc. This process of scaling down is carried out until a scale level is reached that is sufficiently small, but at the same time large enough to independently generate value for the market. Conway's Law was applied in this sense to obtain operating units with a high degree of autonomy at each scaling level, so that profit and loss (P&L) accountability could actually be exercised in the operating units.

In this case, it was started with the "Webasto Group" scaling level and three operating units were cut on the "Product" criterion, since for these products customers from all regions worldwide had similar product requirements. Another operating unit was cut on the "Customer" criterion, as for this product customers had significantly different requirements. After the downsizing process described above, 3 scaling levels were sufficient for Webasto, as the third level is small but also large enough to independently generate value for the markets. This 3rd scaling level "Team" or "Team of Teams" was able to operate as a true micro-enterprise. The two scaling levels above it "Webasto Group" and "Operational Units Product"/ "Operational Units Customer" serve to control and organize the respective scaling level. The scaling levels must be designed in such a way that the units at this level are so independent of each other that they can be spun off as independent companies (company within a company).

4.3 Model structure with its three layers

Functions that must be implemented at each scale level to make them viable were analyzed to obtain a valid model structure (Beer, 1994a, 1994b, 2007). Those functions are:

1. Value Generation (refer to Viable System Model (VSM) system 1)
2. Operational Management including balancing autonomy and alignment of the operational units (refer to VSM systems 2 and 3)
3. Strategic Management (refer to VSM system 4)
4. Normative Management (refer to VSM system 5)

These functions were then assigned to three layers of the model. In the middle layer (Value Generation), operating units were placed that perform direct value generation. In the upper layer (Service Generation), divisions were assigned to ensure the alignment of the operating units in the middle layer. Thus, synergies are leveraged through these divisions. Operational management takes place close to the activities to be performed, i.e. in each of these two areas. Strategic and normative management is mapped in the lower area (Strategy Generation). What has been achieved with this?

Value Generation (middle layer) – This level represents the most important task, value generation for the markets. At the "Webasto Group" scaling level, the operating units are assigned here, and at the "Team" scaling level, teams for various phases of value creation are placed here: Advanced Engineering, Acquisition, Platform Development, Application Development and Series Support. These units are to act as micro-enterprises; they should be able to act like companies within the company and thus have P&L responsibility. They must therefore have sufficient autonomy to be able to exercise this P&L responsibility.

Service Generation (upper layer) – The service areas were modeled in the upper level. On the "Webasto Group" scaling level, the corporate functions such as HR, Purchasing, IT, etc. are placed here. On the "Team" scaling level, the chapters are assigned in this part.

Synergies between the units can be leveraged from the value creation part via this level. But caution is advised. Synergies should never be leveraged if it comes at the expense of potential value creation in the value creation units. Service generation should always engage when the value creation units do not want to form a USP through those. The units in the service generation part therefore act like cost centers and must subordinate themselves to the value generation units.

System/Product & Strategy Generation (lower level) – At this level, the fundamental direction for the value creation level is set and the scope required to execute the given direction, such as money, resources, etc., is provided. At the "Webasto Group" scaling level, this is where the Webasto Executive Board and those responsible for the operational units are located, and at the "Team" scaling level, this is where the strategic and normative management of the respective operational unit is located.

The result, the Hotdog model, is displayed in figure 3.

The Hotdog model

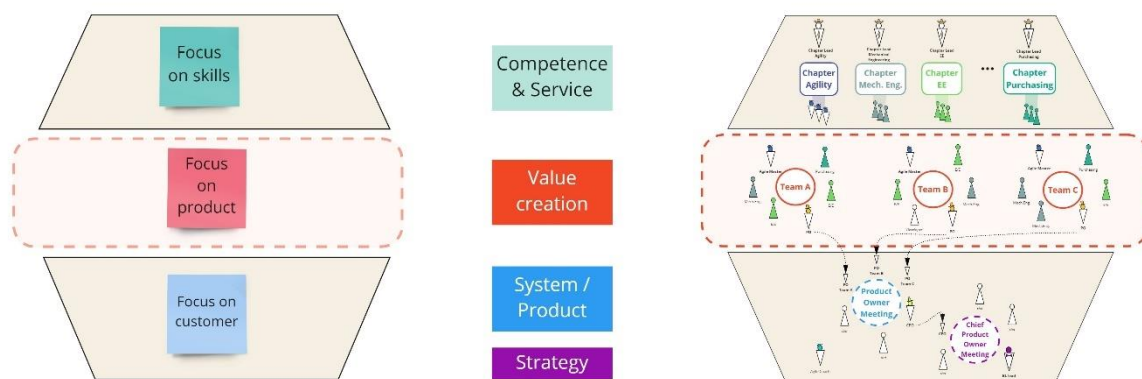


Figure 3. Generic Hotdog model (left), Hotdog model with roles (right)

4.4 Application in practice

With this type of modelling a framework, a necessary fractal design, was designed where all scaling levels have a similar model structure with the three layers ("Russian Dolls") in all three organizational dimensions. This is a workable basis to design and implement a viable organization.

Now the practical implementation of these 3 meta structures will be described, which is also visualized in figure 4. This is the development of a new heating and cooling system. It is started with scaling, namely with the scaling level "Webasto Group". At this level, the first task is to determine the operating units. Since customers have relatively similar requirements for the heating and cooling system, regardless of the region, the control dimension for scaling the operating units here is "product". It will therefore come down to the operational unit "heating systems (HS)".

Now it is scaled down further and results in the "Team" level. If one could imagine zooming into one of the operating units in the middle level, one gets the next scaling level, again with the same three levels. Here, the teams in the middle level operate in different phases of the value chain, as described above.

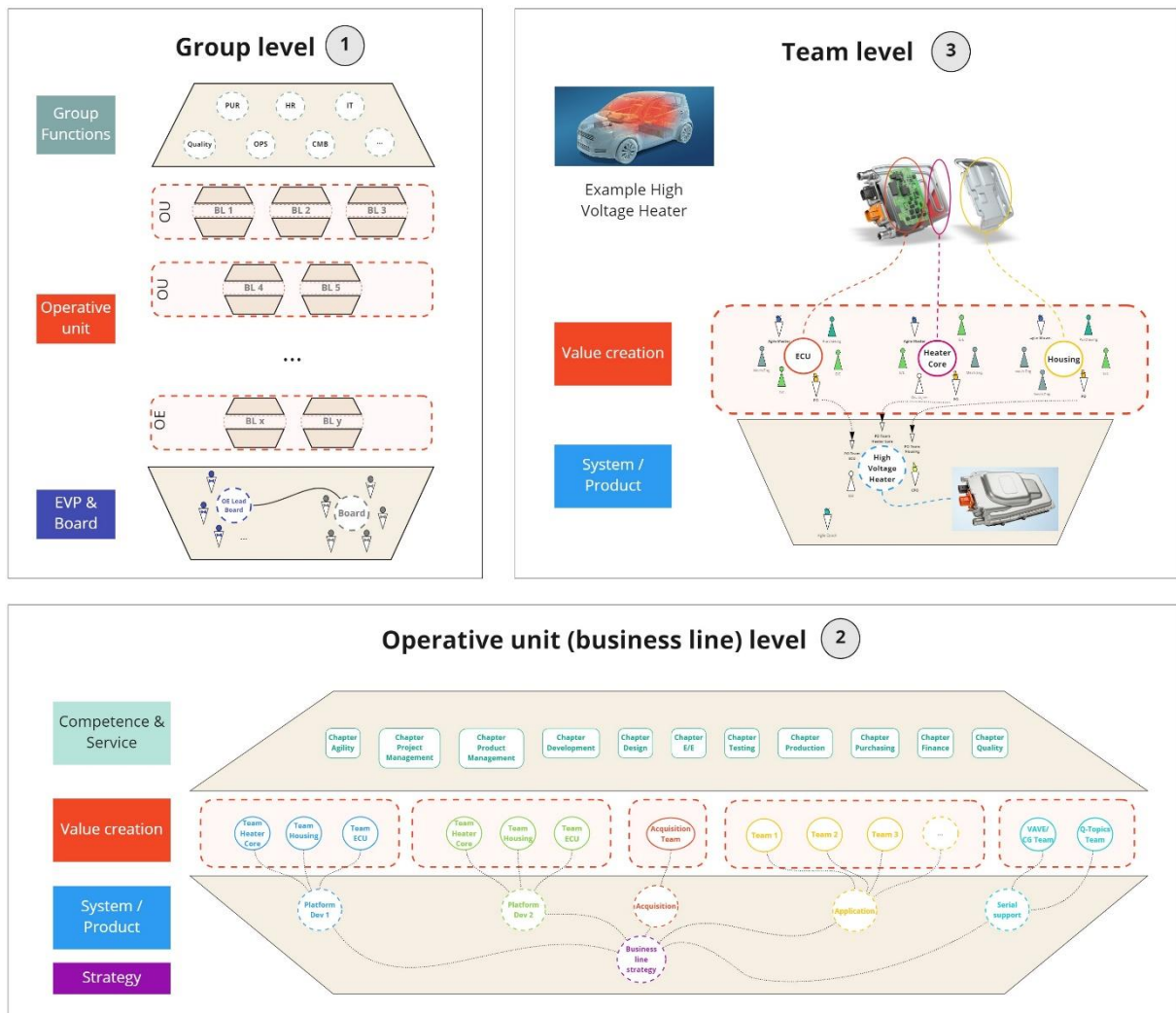


Figure 4. Scaling level "Webasto Group" with operative units (1, top left), Businessline HotDog with value stream (2, bottom), Scaled team setup within the Hotdog model (3, top right)

Let's focus here on the "product development" phase for the "high-voltage heater / platform development 1" example. Then, similar to scaling level two, the steering dimension is again sought for the tailoring of the teams. According to Conway's law, these teams should have a high degree of autonomy, i.e. relatively few dependencies on each other. So it will come down to the control dimension "product components" here. This results in one team each for the heater core, for the housing, and one for the electrical unit (ECU). Up to this point, the organizational dimension "organizational structure" has been highlighted in the respective three layers of the model using this concrete example. It is now used to illustrate the other two organizational dimensions.

"Process organization": At this point, the product development process was adapted in such a way that it should be delivered more frequently and more quickly in iterations and increments by the three development teams in order to be absorbed by the environment as early as possible. As mentioned earlier, this organizational dimension is only found in the third scaling level "Team".

Let's move on to the "control and communication organization". This dimension can now again be found on all 3 scaling levels.

At the "Webasto Group" level, the importance of the "HS" operating unit is defined, for example, by the allocation of money, especially in contrast to the other operating units. The decision to invest in a particular technology can also be made at this level, which incidentally was the case with the new

heating and cooling system. At the second scaling level, the "HS" operating unit, the respective product developments, procurement activities and applications are controlled. For example, an SOP was defined for the heating and cooling system. On the third scaling level, the teams for the product development of the new heating and cooling system are then planned, divided into releases and sprints, and meetings are held within the teams and across teams so that these teams can think and act together in one direction.

This vivid explanation was used to explain how the AHEAD framework with the Hotdog model as a central guiding model is used to model one operative unit. In the end, it can be used to model an entire organization from Group down to Team level and thus, create an entire agile organization.

5 CONCLUSION

As it had been stated in chapter 2.2, the AHEAD framework is a *context-specific* one, as it had been designed for and within the context of a tier one supplier. Due to this, it is not meaningful to simply "copy" the framework and apply it to other contexts. This might seem obvious, however as [Atzberger \(2022\)](#) has pointed out, the blunt application of agile methods and methodologies across several contexts without a detailed investigation of the working mechanism of the methodologies and a plausibility check with respect to the specific context is inevitable.

Moreover, the framework has *not been rolled out in every scaling level* (operative unit and Group level) yet, thus it cannot be considered fully validated at all levels. However, as one has to start in dedicated pilot projects and successively extend towards new pilot projects, which is characteristic for large-scale transformations. In contrast, the Hotdog model can be considered mostly validated, as this is applied across several projects with different boundary conditions and it is still considered to be applicable in practice, with several additions and extensions, which have been added in the course of the transformation. Another important aspect is that the framework is *limited to the area of product development*. The model covers the entire value chain from ideation / advanced engineering, yet it doesn't consider the handover to production / other areas or is targeted towards a combination of such, like DevOps. This was not the focus of the framework design activities to date, yet this could be a potential future extension of the AHEAD framework.

Often an important fact is forgotten in the context of agile working methods, the *prevailing management paradigms*, which are not questioned and adapted, if necessary. It is believed that other ways of working on team level, such as Scrum, and scaling these across multiple teams are sufficient – however that is not the case. In this case, the framework was used as part of top-down scaling to question and precisely change these management paradigms. So, what is one of these management paradigms?

Create something exactly once and then use it n times. One could also call it efficiency, cost optimization or prevention of redundancy. This paradigm can be observed in the steady growth of group functions that create services in a central function for the operating units. This shifts the balance towards centrality away from decentralization. However, that also impairs the autonomy and thus the market proximity of the operating units, which, in turn, makes it more difficult to focus on customers. Among other things, this management paradigm and several others have been validated and adapted precisely using design principles in the context of top-down scaling across scaling levels.

Moreover, it does not describe the *underlying success factors* behind the implementation of such a framework. Several topics are essential for a transformation and thus, the introduction of a new way of working, to be successful: The commitment of top management to continuously advance with the transformation, as transformations take time. The training and education of the employees in agile ways of working and the new roles associated with it. The establishment of a modern leadership styles, shifting towards servant leadership, meaning that management is intended to serve its people, who are the ones generating the actual value, not vice versa. After all, for an agile organization to flourish, the entire environment has to be adapted within the enterprise. These aspects are not covered here, as it is not the scope of the work at hand, yet they are vital success factors for a prosperous implementation of such a framework.

In the end, by having developed this HotDog model, the old problem of the conventional matrix organization, namely the *dichotomy between organizational structure and process organization* has been addressed. Back in the day, on the one hand, people used to have their "home" in the line organization, in which they were "paid and disciplined". On the other hand, people used to work in

and across several (customer) projects (for a certain period of time), guided by project management. Now, with the HotDog model, this dichotomy is broken down and the organizational structure and process organization have been harmonized.

The framework is checked against the five validation criteria once defined by Patzak (1982). *Empirical correctness* as a measure of correspondence between the framework and the actual procedure in the field is provided, as the framework has been developed within the specific context and the findings have been obtained by participative action research. Next, *formal correctness* describe how accurately the framework depicts reality. As the framework has been developed in close exchange with pilots, and is still approved by pilot colleagues, it can be considered formally correct as well, which was an important factor, as it was designed in a context-specific manner. The *purpose-relatedness* is provided as it represents a framework which covers all of the aspects listed in table 1 (scaling levels, organizational dimensions, context alignment), which was the aim. Its *operability* can be attributed by the continuous application by the pilot colleagues even after the pilot phase, as it has not been abandoned, but constantly adapted to their specific needs. In addition, the *simplicity* of the framework is given. By having the Hotdog analogy for the structural model and the russian puppet analogy for the scaling levels, it is perceived as a vivid by pilot candidates. For the sake of comprehensibility, an entire clickable framework has been created in Microsoft PowerApps, for everyone to understand and "click-through" how it actually works. This is another aid with respect to the knowledge transfer.

All in all, the framework with its Hotdog model can be considered a viable model for the context of a tier one automotive supplier which has been applied in practice successfully in several pilot projects. For the framework as well as the hotdog model to mature, an application in more pilot projects in different business units as well as in different regions is necessary, which the scope of the agile transformation in the next year. Especially the rollout on a global scale is of high importance, as other contextual factors and cultural boundary conditions come into play.

Moreover, to demonstrate its general applicability, its application at other companies in the same tier 1 automotive supplier context is meaningful.

REFERENCES

- Atzberger, A. (2022) A value model for describing the interdependencies of agile development in mechatronics. Dissertation. Universität der Bundeswehr München.
- Beer, S. (1994a) Decision and control: the meaning of operational research and management cybernetics. Chichester; New York: J. Wiley (The Stafford Beer classic library).
- Beer, S. (1994b) The heart of enterprise. Chichester; New York: John Wiley & Sons (The Managerial cybernetics of organization).
- Beer, S. (2007) Diagnosing the system for organizations. Chichester: Wiley (The managerial cybernetics of organization).
- Bradbury, H. et al. (2019) 'A call to Action Research for Transformations: The times demand it', Action Research, 17(1), pp. 3–10. Available at: <https://doi.org/10.1177/1476750319829633>.
- Conway, M. (1968) 'How do committees invent?', Datamation magazine, pp. 28–31.
- Dove, R. (1999) 'Knowledge management, response ability, and the agile enterprise', Journal of Knowledge Management, 3(1), pp. 18–35. Available at: <https://doi.org/10.1108/13673279910259367>.
- Gericke, K., Meißner, M. and Paetzold, K. (2013) 'Understanding the context of product development', in Proceedings of the International Conference on Engineering Design. Seoul, pp. 191–200.
- Leffingwell, D. (2011) Agile software requirements: lean requirements practices for teams, programs, and the enterprise. Upper Saddle River, NJ: Addison-Wesley (The Agile software development series).
- Michalides, M. et al. (2022) Agile Entwicklung physischer Produkte: Eine Studie zum aktuellen Stand in der industriellen Praxis. Universität der Bundeswehr München. Available at: https://doi.org/10.18726/2022_3.
- Nicklas, S.J. et al. (2021) 'Agile Entwicklung physischer Produkte: Eine Studie zum aktuellen Stand in der industriellen Praxis während der COVID-19-Pandemie'. Available at: https://doi.org/10.18726/2021_3.
- Patzak, G. (1982) Systemtechnik - Planung komplexer innovativer Systeme: Grundlagen, Methoden, Techniken, Springer Berlin, Heidelberg.
- Pfiffner, M. (2020) Die dritte Dimension des Organisierens: Steuerung und Kommunikation. Wiesbaden Heidelberg: Springer Gabler. Available at: <https://doi.org/10.1007/978-3-658-29247-8>.
- VersionOne (2020) 14th Annual State of Agile Report. Available at: stateofagile.com.