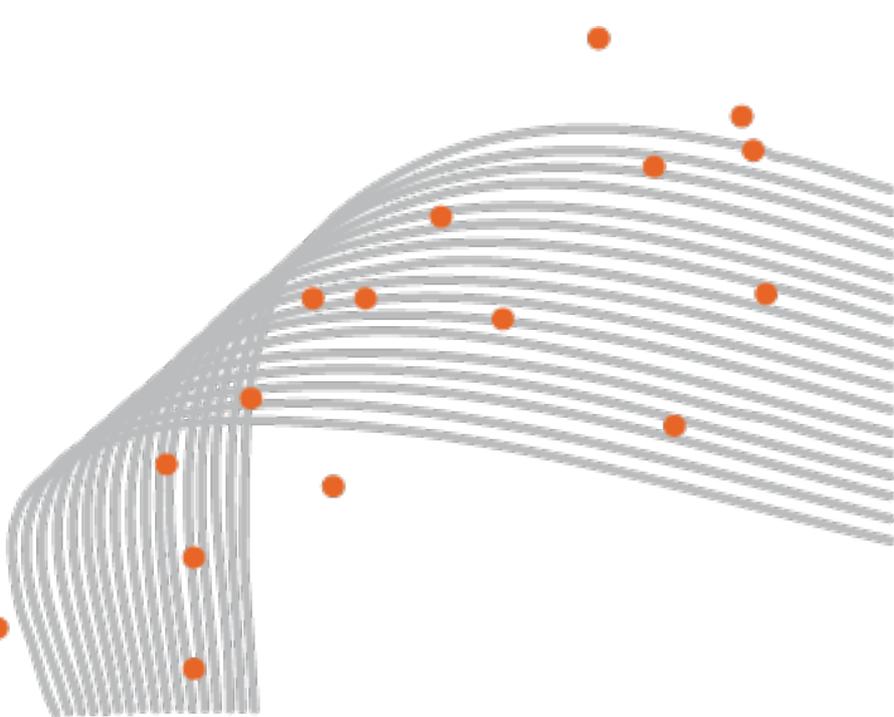


DINNOCAP

Increasing SME awareness of digitalization – Challenges and methods

A report on experiences from the BSR-region

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Introduction

Supporting the digitalization of small and medium sized enterprises (SMEs) is high on the agenda within the EU and the Baltic State Region (BSR) due to the fact that SME digitalization is key for sustained industrial competitiveness, and, subsequently, national growth and prosperity.

The last decades it has become clear that the digital economy will bring opportunities for *those who are aware* and prepared to embrace the digital evolution. When it comes to SME digitalization, one important barrier to digitalization is related to the low levels of awareness among SMEs about opportunities related to digital technologies and their needs in relationship to digitalization. To this background, it is not surprising that there have been – and still are – many activities within the BSR region that – in different ways – aim to get digitalization going within SMEs by increasing their awareness about digital technologies and thereby accelerating digitalization.

This report presents results from a study done within the DINNOCAP-project, in which we have collected experiences and extracted good practices used by stakeholders from six countries (Denmark, Estonia, Finland, Lithuania, Norway, and Sweden) in the BSR-region to increase SME awareness related to digitalization.

The guiding assumption behind this report is that there is no single best method for raising awareness about digitalization. Within the DINNOCAP partnership, there are extensive experiences from supporting SME digitalization, and many different tools and methods have been developed and used. The simple idea with this report is to collect experiences and presenting good-practice, and thereby provide recommendations for how to think about and support awareness creation.

The report provides insights for actors within the SME support system based on providing answers to the following two questions:

- What can we learn on a general level about *the challenges* in relation to increased awareness?
- What *mechanisms and methods* to increase awareness have been deployed in support activities?

The report is structured as follows. First, we provide a more elaborated argument for why “awareness” is important for SME digitalization. Second, we present the method used in this study. Third, we present the results of our study in two sections. The first summarizes seven challenges related to increasing SME awareness, and the second provides an overview of good practices (mechanisms and methods) to increase awareness. Third, we present two general perspectives from which awareness creation can be understood: Organizational change, and Organizational learning. The report is concluded with a discussion and implications for actors aiming to increase SME awareness about digitalization.

On the importance of “awareness¹” in SME digitalization

As already noted, a barrier to SME digitalization is the lack of awareness among firms about the opportunities related to digital technologies. This means that lack of awareness is a initial barrier to *get digitalization going* in SMEs. However, experiences for support activities (such as the Swedish national programme Kickstart Digitalization) also show that increased levels of awareness are important to *accelerate digitalization*. From this follows that attention to awareness is not only a matter of early-stage digitalization. If we are to get full effect of digitalization among SMEs, we need to assure that firms continuously increase their level of awareness, for example about different types of digital technologies.

Despite the great efforts to support SME digitalization, we can still observe that many firms struggle to start their digitalization. One reason for this can be that the early stage of digitalization is often overlooked in existing support activities. Methods to measure digitalization maturity are common and a good approach to understand on what level individual firms are. But based on what we know from research on SME digitalization maturity, we know that it is important to recognize the existence of a *Level 0* as a critical stage in SME digitalization, and, that this stage might be longer and more difficult for firms than what we might expect (Mittal et al., 2018).

Mittal et al. (2018) noted that “A maturity model for SMEs should have a distinctly defined “level 0” (to focus on fundamental needs, e.g., computerization of core business processes and connectivity at shop-floor), which may better explain the state of many SMEs regarding their current digital [...] capabilities.” A level 0 should therefore reflect the realities of many SMEs thereby helping us to distinguish their needs from those of the larger corporations (Mittal et al., 2018, p. 212).

Furthermore, Mittal et al. (2018) notes that the transition from “level 0” to “level 1” may include a drastic change in the organizational culture of a company as it involves adopting new technologies, organizational culture, and learning skills, etc. Hence, the shift may take longer time, require more resources, and involve more unforeseen problems compared to, e.g., the shift from “level 1” to “level 2”” (Mittal et al., 2018, p. 212). This mirrors the now widely diffused notion that digitalization is not only about technology; it is also about new ways of (1) thinking and (2) doing.

Method and approach

The first step of this study was to identify organizations in the BSR-region with relevant experiences, and individuals to interview. This was done by means of e-mails to partners within the Dinnocap-project, in which partners were asked to inform us about relevant actors and their contact information. Thereafter, e-mail invitations were sent to contact persons with an interview request.

In the second step, interviews were made to collect the experiences of respondents. In all, 11 interview were conducted using a semi-structure interview guide.

¹ A note on the differences between “awareness” and “knowledge”: *Awareness* is here understood as a cognitive predisposition (openness and ability to see opportunities with digital technologies), while *knowledge* is related to the capability of the firm to act on digitalization opportunities.

The following organizations and respondents were interviewed.

1. Enterprise Estonia – Kersti Kuusksalu
2. Tallin Science Park Technopol - Kadi Villers
3. BDA Estonia – Marikai Karilaid
4. Estonian Association of Information Technology and Telecommunications (ITL) – Doris Pöld
5. Lithuanian Innovation Centre – Vilma Vilutyte
6. University of Tartu – Anastasiia Shevchenko
7. Kaunas University – Mindaugas Bulota
8. TalTech – Reet Pärasmäe
9. Mita – Erika Tauraite-Kvai
10. DIMECC – Risto Lehtinen
11. Digital Norway – Annita Fjuk

The third step was to make an initial analysis of the data. Here we mainly searched for patterns in how respondents described challenges in relationship to increasing SME digitalization awareness.

To validate our findings, two workshops were conducted as a fourth step. In the workshops, the initial analysis was presented and discussed with knowledgeable actors (all respondents were invited). This gave us valuable additional perspectives and insights that were used to advance our analysis and conclusions as presented in this report.

Presentation of results

In the following, the result of our study is presented in two sections. The first summarizes six challenges related to increasing SME awareness, and the second provides an overview of mechanisms and methods to increase awareness.

Six challenges related to creating awareness

Challenge 1: Digitalization is a fuzzy landscape for SMEs to navigate

From a policy perspective, digitalization is rather easy and straightforward, and there is a tendency from policy actors to describe digitalization and related strategies using fancy words, sometimes with links to for example EU-policies. It is clear from our interviews that experiences show that digitalization as a knowledge domain is new to many SMEs and that terms, concepts and theories are sometimes difficult to understand. To get digitalization going, support actors need to structure the support system as to ensure that it meets the contexts of the SMEs. Hence, when working to increase SME digitalization awareness, facilitators should search to avoid “fancy words” and too theoretical approaches as this risk to alienate SMEs.

Instead, the aim should be to make SMEs comfortable and relax the expectations on what early-stage digitalization is about. One way to achieve this is to put digitalization into the context of the firm, for example by showcasing good practices that are not based on advanced digital technologies (such as AI or use of advanced sensor technologies). If possible, such examples should be tied to the needs of the individual firm as to show opportunities that are perceived as apparent by the firm. By so doing, the motivation of the firm to start experimenting and taking actions can be increased.

Relaxation, in terms of the expectations on the firm, can increase the firm's ability to spot and act on emerging opportunities. It will enable the firm to identify their basic needs, to start learning more about the digitalization knowledge domain, and, subsequently, operate in a larger action space. Hence, a solution to the challenge related to digitalization as a fuzzy landscape for SMEs to navigate is to ensure relaxation and contextualization as means to increase awareness about digitalization opportunities. In short, relaxation can be an important means to prepare for a broader and more rapid awareness creation within SMEs.

Challenge 2: Firms' needs are an important source of increased awareness, but identifying SME needs are often difficult

As digitalization is an action space that can be perceived as fuzzy and hard to navigate, contextualization of digitalization opportunities is important. The needs of the firm should therefore be used to put digitalization into the context of the firm. From the interviews, however, it becomes clear that spotting firm needs can be more difficult than perhaps expected. Initially, some firms need active support to fully understand their needs, and to put their challenges and problems into context.

Some firms are aware of different digitalization terms and concepts, but they are not aware of how to put them into practice. This means that awareness can be superficial, and firms might be aware on an "clinical" knowledge level but what is needed is "experience based" knowledge that put their understanding into the context of the firm.

When it comes to high-tech firms (not necessarily digital technology firms), such firms are often unaware of being ignorant when it comes to digitalization. Being high-tech firms, they sometimes think that they are working with the unknown, and, therefore, that they are good in dealing with other unknowns, such as digitalization. But this is not always the case. In this kind of situation, awareness is about helping firms to understand what they do not know. Using for example an innovation audit approach can be a way to make firms aware of their ignorance, and thereby open to learning about their needs and related digitalization opportunities.

Another observation is that some SMEs do not want to have some outsider to tell them how to do their development and digitalization. They want to decide on their own, based on their own needs. Hence, in such cases, the approach should not be; "Now I come to teach you...", but rather; "Hey, now I want to understand your needs and help you resolve them". This emphasize the need of support actors to be critical friends, and the importance of trust in awareness creation situations. If we are to help firms to understand their needs, we need to make them willing and motivated to reveal their ignorance and to take advice from outsiders.

One common approach as to support firms in spotting and understanding their needs is to use benchmarks and good practices that are relevant to the specific firm, by providing examples of what other firms have done. By so doing, experiences show that firms can mirror such examples in their own operations, thereby becoming aware of and stimulated about what they can and should do.

Another solution to the challenge of spotting SME needs can be found in explicit frustrations and pains of the firm. If such pains can be identified, they can be a powerful source of pinpointing needs that can be resolved by digitalization. On a very general level, in initial digitalization, it is relevant to look for pains related to the need of lowering firm costs (e.g.,

in connection to unnecessary administrative activities) or related to the need of increased sales. Typically, firms will have an easy time identifying such pains.

Challenge 3: When to start Big or Small

When it comes to early-stage digitalization, as actors in the support system can be tempting to provide firms with an understanding of the digitalization “big picture” and a related roadmap to follow as to increase their awareness about digitalization. This could be done by making digital maturity assessments or by providing best practices of, for example, Industry 4.0. In some cases, this is an efficient way to increase awareness, as it provides an understanding of the big picture that firms can use to understand where they are going, and what is their starting point.

It is clear from our interviews that starting big can be a way to present a long-term vision of digitalization as well as a pathway for firms to follow. But experiences suggest that a related risk is that this alienate SMEs from digitalization, as the big picture and related visions of digitalization can be hard to grasp, and, perhaps, even a bit intimidating.

The alternative approach, on the other end of the spectrum, would be to increase SME awareness by “starting small” using specific and demarcated needs of individual firms as a enable firms to identify opportunities related to digitalization and to start taking action. This makes digitalization concrete and clearly related to what the firm needs to obtain short term gains. On the other hand, however, but this risks to simplify digitalization and make firms fail to see what digitalization can be about and related opportunities. Additionally, starting small also fails to provide firms with a path to follow, and, hence, leave them without a way forward from initial small digitalization efforts.

Of course, starting big or starting small are not mutually exclusive. There is a middle ground. If there is a risk that firms are intimidated/alienated by the bigger picture, support actors should avoid emphasizing visions of digitalization (e.g., based on advance use of digitalization) and instead only briefly (flash/blink) showing firms the bigger picture and turn to creating awareness based on helping firms to start small. This can be done by providing relevant examples of firms that have come far in their digitalization efforts, and by deconstructing their path towards increased digitalization, ending with an elaboration of how to start and where to begin. When a firm has come beyond initial digitalization actions, has more experience, and hence a better understanding of its own needs and opportunities of digitalization, support actors can make more in-depth depictions of the bigger picture.

Challenge 4: When to use a whip and when to use a carrot

On a policy level, the need of SME digitalization is often deemed as urgent, for good reasons. If we are to sustain European competitiveness, our SMEs need to keep up with the digitalization of their competitors. This sense of urgency might lead actors supporting SME digitalization to clearly state the risks of not digitalizing.

Using “a whip” and a push-logic to create awareness can provide firms with a sense of urgency, and, hence, incentivise them to start acting. However, not all firms are sensitive and responsive to calls like “The wolf is coming!”. As mentioned previously, some SMEs do not want to have some outsider to tell them how to do their development and digitalization. They want to decide on their own, based on their own needs, and, in such cases, the

approach should not be to push out solutions with a whip, but rather to help firms to understand how to make use of digitalization based on their needs.

SMEs tend to be driven by their challenges, and we need to tie to these challenges. Most people do not like others to tell them what to do. We should therefore be "kind experts". This also pinpoints trust as a mediator of awareness creation. In order for awareness to increase, some level of trust between the support actor and the firm need to exist or be established.

Additionally, some firms do not need to be pushed. They understand that something new is coming. Currently they feel that they do not need to do something right now, but most likely later. In such cases, using a carrot – based on the needs of the specific firm – can motivate the firm to act now rather later, when it might be too late. However, based on the experiences of our respondents, it seems clear that while carrots in awareness creation can motivate firms, some firms do need a push to start acting.

The solution is to ensure a sensibility to the predisposition of the specific firm; sometimes the whip will be effective, and for others the carrot is key. Both are needed, but we should use them with "fingerspitz gefühl".

Challenge 5: Awareness in relation to digital technologies is sometimes not enough

Digitalization is typically seen as a technological transformation. Although this of course is the case, an awareness about digital technologies and related opportunities is not enough. From our interviews, it seems clear that a big threshold for SME digitalization is also related to lack of awareness in relation to "soft" issues such as change management.

Digital technologies are of course a prerequisite and enabler for digital transformation but implementing digital technologies alone will not result in a successful digital transformation. The reason is that the success of digitalization is about restructuring companies so that they can effectively take advantage of data, create new values, and finally acquire some of the economic value that is created - often by increasing internal efficiency or changing and broadening existing business. This often requires new ways of leading, organizing and collaborating, and new ways of developing products and services as well as new supporting skills. Digitalization is simply more than digital technologies, as it will affect the entire company's value chain and several of its functions.

Hence, as an increased use of digital technologies will lead to organizational changes, firms also need to become aware of how digitalization might impact the firm from an organizational and management point of view.

The solution to this is to differentiate between *hard* awareness (technological) and *soft* awareness (e.g., awareness about the need of change management, leadership, employee behaviour, etc.). Additionally, we also need to make firms aware about and to support them in dealing with soft issues related to digitalization by giving them necessary tools and methods. In cases when digitalization activities do not accelerate and development activities are cancelled, it might be worthwhile considering if awareness relation to soft skills is needed.

Challenge 6: Awareness creation approach needs to be adapted to different types of firms

As already indicated, our interviews clearly point to the fact that there is no single best way to increase SME awareness. The basic message is that firms will react differently on attempts to increase their awareness about digitalization depending on key features of the firm.

In our interviews, many insights about different types of SMEs have been highlighted, all pointing to the fact that different types of firms will respond differently to different types of awareness creation mechanisms. In table 1 below, we provide a summary of different dimensions that have been used to express differences among SMEs.

Low tech firms	High tech firms
Firms located in rural areas	Firms that are located in big cities
Old firms	New/young firms
Traditional manufacturing firms	Firms that are digital from their inception
Firms that do not have services in their offer to the market	Firms that have services in their offer to the market
Firms with employed/external CEO	Firms with CEO as an owner
Firms that are not used to enrol external knowledge providers in their development activities	Firms that are used to enrol external knowledge providers in their development activities

Table 1. Different types of SMEs, relevant to understand challenges related to digitalization

On an overall level, firms having characteristics as depicted in the right column will respond easier to efforts to increase their awareness about digital technologies, while firms the characteristics in the left column will have greater challenges.

For example, low tech firms can be assumed to be less experienced in dealing with novel technologies than high tech firms. This means that attempts to increase awareness about digital technologies will have to start on a more basic level as to ensure that firms see a relevance with adopting such technologies. Another example is firms with an employed CEO that needs the owner’s approval to start investing in new digital technologies, while firms with a CEO which is also an owner of the firm can respond more rapidly.

In terms of solutions, there are two consequences of this observation. First, actors within the support system need to adopt and use multiple mechanisms and methods to increase SME awareness. Hence, we need deploy a multitude of approaches to reach as many firms as possible. Second, activities to support firms early-stage digitalization need to be adapted to the preconditions and situation of individual firm. Without such adaptation of activities to increase awareness risk to fall short.

Challenge 7: On the importance of progression in awareness creation

The last challenge is related to the observation that digitalization is not about firms taking “one step” (from non-digital → digitalized firm). Instead, SMEs need to walk a path to increased levels of awareness that will enable them to exploit opportunities that surfaces as the firm progresses. From our interviews, it seems valid to talk in terms of multiple levels of awareness. The more a firm works with digital technologies, the more it will understand its needs and opportunities with digital technologies, as well as how digitalization should be approached from a change management perspective.

In a sense there is a path that need to be followed. When it comes to early-stage digitalization, our results indicate that support actors should first help the firm to define initial needs that can be resolved with small efforts as to ensure a quick return on investment. Here, it is sometimes important to avoid jumping to big questions too early as this might alienate the firm from further digitalization. If initial problems/needs can be resolved, the company often starts to see other needs that they want to resolve, and a door to a new awareness “room” is therefore opened. Hence, there is a progression, and, as stated by one of the respondents: “Awareness needs constant communication over time”.

For progression to happen, continuous competence development and learning is needed. This is important partly to create awareness on a deeper level in relation to different aspects of digitalization, and partly as to assure awareness progression at different levels in the company (management and employees). A challenge, however, is that SMEs rarely have the resources to buy training and consulting assistance.

A solution to this is to build in training activities into initial development activities as to enable employees on different levels to develop their understanding of digitalization, both in terms of it is and can be, and how to make it happen. This can be done by exposing them to opportunities related to new technologies/tools to make them understand the next level based on what is initially done and in focus. This emphasizes the need of continuous coaching as an important means to SME digitalization.

From a support actor point of view, it can be suitable to think in terms of a progression of activities, where initial awareness about digitalization might be a doorway to other types of more in-depth activities, such as hackathons.

Not surprisingly, our study clearly shows that many different mechanisms and methods are used as to increase awareness of digitalization. Below we provide a brief overview of such mechanisms and methods.

Mechanisms and methods to increased awareness

- *Use-cases, benchmarks & best practice* to inspire firms to digitalize
It is common to deploy use-cases and benchmarks as showcases of best-practices. This can be done in a more passive way, by diffusing such use-cases via radio shows, Facebook, LinkedIn, YouTube and so on, or in a more active way by using them as an instrument in face-to-face discussions with firms as to identifying their needs.
- *Needs spotting* (multiple approaches) to create awareness of digitalization opportunities
A commonly used approach is to tie awareness creation to the needs of SMEs and specific firms. Many respondents argue that attempts to increase awareness should be

done based on helping SMEs to understand needs that can be resolved by digitalization. Often, identifying needs are done by reaching out to and talk with firms about their pains, challenges, and problems, and based on such discussions, digitalization opportunities can be spotted.

- *Seminars and lectures* to inspire and transfer knowledge about opportunities and applications of digital technologies

Some firms are hungry for knowledge and are eager to learn more about opportunities related to digitalization. Seminars and lectures fit such firms and they are therefore important mechanisms to increase awareness. A specific type of seminars that is used is connected to digitalization funding schemes, and such seminars are provided on a regular basis by many actors. As many firms lack funding for their digitalization efforts, they are actively search for funding opportunities, and that makes funding seminars an effective means to reach out to SMEs.

It is, however, worth noting that seminars should not be too theoretical as they might be perceived as too theoretically by SMEs.

- *Innovation audits* to create awareness about digitalization opportunities

Some actors offer innovation audits at site on the companies. One aim of this is to understand what a company is doing and what opportunities are available? Audits are reviewed by the experts, and in some cases, they are used as a qualifier for applying for national funding. One proposed advantage of audits is that they focus on and clarifies the processes of the firm, and if they are a mess, development and the use of digital tools will not be applicable.

Audits help to understand firm processes and value chains and help to tactically analyse them. This provides a deep understanding of the firm beyond what individual firm often can describe. As such, audits are a way to create an opportunity for a more transparent discussion on strengths and weaknesses of the firm, and related digitalization opportunities.

- *University courses and student programs* in which students actively works with SMEs

Using students to increase the awareness of SMEs is an often-used approach to bring in fresh eyes and new competencies into firms. This can be done in short courses, but there is also examples of longer programme (e.g., one year programmes), which allow the students to get to know the company and to do more than what can be done in shorter activities. This also creates an “adjustment period” because the one-year longevity makes firms and students more relaxed in terms of the expectations of short-term value.

Longer programmes also means that trust can be established between students and the firm, which makes it easier for the firm to open for input from external knowledge providers (such as students).

Seeing students resolving their problems is also an important part of awareness creation. Sometimes the students are employed and then the awareness creation continuous via the students as employees.

- *Hackathons* to resolve specific problems with digital technologies

Hackathons are an effective means to help SMEs to resolve specific needs. Typically, they are organized as to allow different types of actors to come together to resolve challenges of an individual firm. Hackathons are also an opportunity to make inspirational presentations including use-cases and short training activities/session on how to make use of digitalization to resolve the problems, thereby increasing firms' awareness.

From our interviews it can be observed that Hackathons have been used to stimulate awareness and action in SMEs in different stages of digitalization. Firms that have taken some steps can be supported towards further exploration and increased levels of awareness. There are examples when Hackathon mentors have sustained their dialogue with and support to the firm also after the Hackathon.

Firms at the beginning of their digitalization can be enrolled in Hackathons as to get initial insights that can guide further exploration of possible solutions to their problems and challenges.

Hackathons are also a good way for SMEs to find relevant and good future partners in their digitalization efforts, as hackathons enable firms to test out for example IT-firms for future collaboration. Startups have also been used in hackathons to resolve corporate challenges, which is a good way to boost SME digitalization and awareness, and to establish relations between SMEs and possible solution providers. In one case, a coordinating mentor was used to keep an eye on the process.

In short, hackathons are a useful approach to quickly explore solutions to SME needs, but demands skilled facilitators as well as an ability of the organizers to staff the event with appropriate participants as to ensure good results.

- *External experts and solution providers* to resolve specific problems with digital technologies

Using external experts and solutions providers are important to get SMEs to increase their awareness about the opportunities as well as limitations of digital technologies. Support actors commonly support SMEs in findings such experts. Typically support actors might get a call from a firm that has a certain need, and then they put the firm into contact with the right expert(s) that subsequently meet up in a one-to-one situation.

Such a matchmaking functionality can be critical to support firms in starting as well as accelerating their digitalization efforts. In order for support organizations to be able to take on such a role they need to ensure that they have good contacts to valid knowledge and solutions providers, as well as an ability to help SMEs to formulate and communicate their needs.

A threshold for deploying this kind of support to SMEs is that some firms have little or no experiences of enrolling external knowledge providers that can support their digitalization efforts. This points to the importance of building awareness about this as well, as a complement to an awareness of digital technologies.

- *Matchmaking platforms* as to get SMEs in contact with knowledge/solutions providers

Some firms have identified the need for new types of knowledge, e.g. AI, but have a hard time finding resources that can help them to develop capabilities. Hence, a threshold for SME digitalization is related to finding the right resource that can support the firm in resolving their needs. Matchmaking platforms can be a solution to this challenge. One

example of this is a partnership around getting more PhDs to SMEs, that aims to match PhDs with specific SMEs based on the needs of the firm and the skills of the PhD. The only thing the firm promises is to possibly hire the PhD after the period. This programme runs for 6 or 12 months, and, hence, allowing the firm to dive deeper into digital technologies as a solution to their needs.

Such platforms can also help to reduce uncertainties in connection to how SMEs should interact with external knowledge providers, as well as include project management functionalities as to support the firm in running digitalization projects more efficiently.

- *Training/competence development programs* for SME digitalization

An important vehicle for increased awareness is training and competence development. Deploying training programmes for SME digitalization is a solution to this. An example from our interviews is a three-month training and mentoring programme for manufacturing firms focusing on creating an digitalization action plan for the firm. After the end of the programme, the firm should have an action plan and have started at least one digitalization “project”. Mentors in the programme are independent expert that are handpicked to fit the needs of the firm.

The enrolled firms are firms that had already spotted a need to work more actively with digitalization. The programme is organized as to be very practical with little theory, and to address explicit and specific needs of the firm.

Such programmes enable firm to dive deeper into digitalization opportunities as well as broadening their understanding of digital technologies.

From this brief overview of used mechanisms and methods, it can be noted that awareness creation can and should be achieved using different often complementary approaches. Actors working to support SMEs should therefore search to create a toolbox of approaches that can be used in both a broad way as to reach out to many firms in an efficient way, and in a more tailored way as to support individual SME based on their specific needs.

Discussion and conclusions

In this concluding section, we will reflect on the results from our study from two different perspectives. First, we will elaborate on how we can understand SME digitalization and awareness from an organizational perspective. Second, we will explore digitalization and awareness from an organizational change perspective. The report is then concluded with conclusions and implications.

Digitalization and awareness from an organizational learning perspective

So, how should we understand awareness creation in relation to SME digitalization? A recurring observation from our interviews is that digitalization is a new knowledge domain that SMEs need to be understand, learn about, and apply, for digitalization to happen. This, together with an understanding of digitalization as a transformation process – or journey – rather than a step, opens for an organizational learning perspective. Simply put, often, when SMEs start this process towards increased levels of digitalization, the first step is to learn about digital technologies and how to apply them within their firm.

As digitalization typically is a new knowledge domain for SMEs, the firm starts without preconceptions, experiences, and existing knowledge, all being factors that inhibit SME digitalization.

Within research on organizational learning, one key distinction between different types of learning orientation is between what is called exploration and exploitation. According to Levinthal and March (1993), exploration involves “a pursuit of new knowledge,” whereas exploitation involves “the use and development of things already known” (p. 105). Expressed differently, exploitation is associated with building on the organization’s existing knowledge base. This means that if the firm persists within an existing technological trajectory and leverages its existing skills and capabilities, its operations are geared toward exploitation. Exploration, on the other hand, entails a shift away from an organization’s current knowledge base and skills (Lavie, Stettner and Tushman, 2010, p. 114).

If we understand digitalization as a new knowledge domain for many SMEs, we should treat early attempts at digitalization as acts of exploration. In most firms in general, and in SMEs specifically, the dominant learning orientation of most firms is directed towards exploitation. Such development activities provide the firm with short term gains without great risk taking, and, hence, is typically “the name of the game” when it comes to R&D within SMEs. Hence, from the firm perspective, when faced with digitalization as a new knowledge domain, it is a matter of choosing between allocating development resources that provides short-term competitive advantage by doing “more of the same” with low risks, or allocate resources exploring digitalization as a new potentially relevant area of development. The latter being related with greater risks in terms of return on investment.

This means that the firm needs to make a choice to engage in exploration or exploitation activities by making resource-allocation decisions. This leads them to face a trade-off between the expected consequences and gains of these two different types of development activities. If choosing to explore digitalization, the firm trades off short-term productivity for long-term innovation by supporting the search for new knowledge and prospective opportunities instead of leveraging currently available knowledge to address immediate needs (March, 1991).

From this perspective, some of the challenges related to increasing SME awareness can be understood. First, the reason for digitalization is often perceived fuzzy is because it brings new technologies into the firm, technologies that the firm knows little about. The often observed hesitation to act on proposed opportunities can be explained by the firm are facing a choice between allocating resources on exploiting existing technological trajectories and leveraging its existing skills and capabilities, or exploring digitalization and at least partly shifting away its current knowledge base and skills. Given the scarce development resources of SMEs, this is not an easy choice to make, and the choice to stick to “more of the same” is a rational one. Despite what actors within the support system might say...

To make this choice easier to make, early explorations into the area of digitalization should be done as to assure short term gains. By so doing, the firm can start to understand and experience the potential benefits of this novel knowledge domain. A focus on demarcated areas, perhaps oriented towards efficiency gains is a promising solution.

Additionally, the challenge related to awareness progression and the observed need of continuous competence development and learning can also be further understood from the perspective of organizational learning. In order for the firm to accelerate digitalization, they

need to develop and obtain new knowledge and skills over time. This means that support actors should aim to provide continuous support including opportunities for SMEs to learn both from their own investments in digitalization and from external knowledge and solution providers. Integrating training activities and focusing on learning in initial development activities can support employees on different levels to learn more about this new knowledge domain, and to develop their understanding of digitalization. By exposing to such learning opportunities give them the necessary knowledge base to understand the next level of digitalization.

As noted previously, however, a challenge is that SMEs rarely have the resources to buy training and consulting assistance. Therefore, financial support will be key as to make this explorative learning happen.

To this background, increasing SME awareness about digitalization should be done based on an understanding of digitalization as involving a choice to engage in exploration or exploitation activities. Digitalization being a novel knowledge domain necessitates an explorative learning orientation that many SMEs will have a hard time prioritizing due to rational reasons. To get the firm to explore digitalization, they need to be motivated to the search for new knowledge and prospective opportunities instead of focusing on leveraging currently available knowledge to address immediate needs. Here actors in the support system clearly have an important role to play.

Digitalization and awareness from an organizational change perspective

Another barrier to digitalization is that any related operational development and organizational changes that happen, happen in relation to existing operations and products/services that have been developing over time. From what we know about organizational change, it should therefore be expected that SME digitalization will be inhibited by what is called “organizational inertia”.

In the case of organizational changes, two different types of inertia can be identified in most organizations: *insight inertia* and *action inertia*.

In face of environmental change, there is something that can be called mental defense mechanisms in an organization, which is *insight inertia*. It can take time before an organization gains insight that changes, and adaptations need to take place to meet new demands and changes in society. Put differently, insight inertia appears where there is a time lag between important changes in the organizational environment – such as digitalization – and a firm’s awareness of those changes.

Action (or maneuverability) inertia means that an organization does not have time or ability to adapt to the changes that are taking place. Action inertia arises after managerial insight is gained from for example environmental scanning, but the response from the firm fails to materialize or is slow and the results of the change efforts do not appear in time to be beneficial. The reason for this is that an organization's routines and structures are a result of historical investments and actions, and therefore it becomes difficult for the firm to change. The reason for this is basically due to the path-dependent nature of most firms.

From our understanding of organizational change, we know that as a firm matures, inertia will follow, and the receptiveness/sensibility to novelties will decrease, as will its abilities to take action. Basically, organizational inertia is about the tendency of established

organizations (not only SMEs) to continue its current trajectory, and it is worth noting that this barrier to change is to be expected in most organizations.

Based on an understanding of that SME digitalization in many cases will face barriers in terms of organizational inertia, what can we learn from our study? Well, first it is worth noting that any attempt to increase awareness will most likely face both insight inertia and action inertia as a barrier. Insight inertia, should be expected as digitalization is a new knowledge domain that not directly and easily relates to the world views of SMEs. Hence, it is important to act appropriately as to overcome this type of inertia. In the results section above, we do discuss several possible solutions.

For example, insight inertia might partly stem from the fact that digitalization is a novel and fuzzy landscape for many SMEs leading firms to avoid delving into the area and its related opportunities (the where to start challenge). Therefore, relaxing expectations of what digitalization can mean to, and demand of, a SME is a way to overcome insights inertia. By avoiding diving deep into “the bigger picture of digitalization”, only briefly showcasing long term opportunities and visions, and instead focusing on demarcated areas of the vast digitalization landscape in connection to needs of the firm can help overcoming insight inertia. Using concrete examples explicitly connected to the firms need, the firm can start to gain insights into opportunities of digitalization, that can later be expanded upon as to broadening the awareness in relation to other digitalization aspects.

Additionally, using real pains perceived by the firm is a way to make them aware of opportunities related to digitalization, and to make them motivated to take action. Finding pains that the firm has already invested efforts into solving can help pinpointing the entry point for digitalization, thereby overcoming action inertia. This also points to another important direction when it comes to who the support actor working to increase awareness should see as the main speaking partner within the firm. If the problem/need has no well defined organizational “location” and “owner” within the firm, inertia should be expected. On the other hand, if individuals within parts of the organization close to the perceived problem (Cyert and March, 1963) can be approached and discussed with, inertia should be less apparent (cf. Greve, 1998, p. 88). Hence, the aim should be to look for speaking partners within the firm that truly have pains that can be resolved by means of digitalization.

In some cases, using a friendly “whip” when communicating with the firm can also stimulate them to take action, especially in connection to activities when external actors (e.g., students or consultants) are used to help firm to digitalize.

In summary, any activity aiming to increase SME awareness should be aware of (sic!) the fact that insight inertia and action inertia need to be dealt with. From an organizational change perspective, the aim is to increase the receptiveness to digital technologies by overcoming insight inertia and then to lower the threshold to initial digitalization actions by helping firms to overcome action inertia. Within the Swedish national programme Kickstart Digitalization, two important mechanisms were to “raise the bar for thinking” and “lower the bar for doing”. From the perspective of organizational inertia these respond to insight inertia and action inertia, respectively. Perhaps this basic raising-and-lowering-the-bar logic can be a mantra that can guide many activities aiming at increasing awareness about digitalization among SMEs.

Conclusions and implications

In this report we aimed at providing insights on the challenges in relation to increased SME awareness about digitalization. Additionally, we have collected information about mechanisms and methods to increase awareness that have been deployed in support activities within the BSR-region.

In this study we have identified seven general challenges related to activities aiming to increase SME awareness. From these challenges follows several implications for actors within the support system that can improve the success of their support activities. In the following, we will pinpoint X such implications.

It is important to understand that digitalization is a fuzzy landscape to navigate, and attempts to increase SME awareness should therefore lowering the threshold for firms to start adopting digital technologies. The needs of the firm is an important motivator that will enable firms to start see opportunities of digital technologies, and firm needs should therefore be used as a driver in awareness creation. Our results also clearly indicate that identifying firm needs can be difficult. Support actors are therefore advised to spend time and effort to develop capabilities to help firms spot, identify and communicate their needs.

Another implication is related to the risks related to showcasing the big digitalization picture and related visions of the highly digitalized firm. Even if some firms might respond positively to such visions and pathways towards the future, some firms might be alienated from digitalization as such visions might become a big threshold for firms to start digitalizing. Hence, support actors should be sensitive to the predisposition of individual firms and adapt their awareness creation activities accordingly. The same logic applies to using a “whip” or a “carrot” to motivate firms. Some firms need a push to develop a sense of urgency, while others will react negatively while respond positively to the use of carrots as a motivator.

Yet another implication is that awareness in relation to digital technologies is sometimes not enough and needs to be complemented with what we have called “soft” awareness. As digitalization is only partly a technological transformation, firms also need to become aware of organizational and leadership issues that will impact successful implementation of digital technologies. For example, becoming aware of the need of change management as a precondition for successful digitalization is key for the needed long-term transformation. Hence, support actors should also ensure to increase SME awareness related to such “soft” issues.

Our results furthermore clearly show that support actors need to adapt their awareness creation approach to different types of firms. Perhaps an obvious observation, but if support actors are to be effective and reach out to as many firms as possible, they will need a broad toolbox of mechanisms and methods that they can use. Otherwise, the risk is that we will fail to reach all types of firms, as different firms will respond to different approaches. Awareness creation should be seen and deployed as a client-oriented service, and not something can be done using a general approach. Awareness creation support should be deployed based on an understanding of the specific needs and context of the firm.

The last implication is related to the observation that awareness should be understood as a progressive process, where many firms start from no or little awareness which inhibits their initial steps towards increased levels of digitalization. However, experiences from the BSR-region clearly indicates that firms need support also after the initial steps have been taken.

Hence, support actors should be prepared to sustain their awareness creation support towards individual firms as to support their long-term digitalization. This is basically because digitalization is a multifaceted knowledge area, that firms need help to become aware of.

Based on our short journey into the field of organizational learning and organizational change, and their relevance to understand awareness creation in relation to SME digitalization, our suggestion is that actors aiming to increase SME awareness should start to understand how organizations learn from direct experience, how organizations learn from the experience of others, and how organizations develop conceptual frameworks or paradigms for interpreting that experience (Levitt and March, 1988), and how organizational inertia impacts explorative learning. Based on such a conceptual understanding, appropriate actions as to increase awareness can be taken.

As a final note, it is worth noting that awareness is important not only to digitalization but also other transformation processes such as sustainability and circular economy. As such areas are also novel knowledge domains, SMEs will face similar challenges when exploring them. Hence, the results of this report can be used to understand how to facilitate other early-stage transformation processes in SMEs, e.g., in connection to areas such as circular economy.

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