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Swedish construction MSEs: simply renovators or renovation service innovators?

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ABSTRACT
To address the renovation needs of detached house stock in Sweden, micro and small-sized enterprises (MSEs), a subgroup of small and medium-sized enterprises, are expected to introduce more comprehensive house renovation solutions. One-stop-shop (OSS) is an innovative Product-Service System model that can enable MSEs to offer comprehensive renovation packages instead of existing fragmented solutions. We have applied a conceptual framework for innovation adoption in organizations and conducted an interview of 21 construction MSEs in three different geographical areas in Sweden to examine their perceptions and preparedness to adopt the OSS business concept. Findings showed that the examined MSEs are positive towards OSS as it could address the needs for the comprehensive renovation of detached houses. However, presently, are not prepared to take the coordinator’s role in such a concept mainly due to the perceived business risks, the lack of flexibility to organizational restructuring, and lack of resources and management competency to coordinate multiple tasks and actors. Those organizations lacked awareness of existing policy support and access to funding mechanisms to try new business models. As a solution, they proposed an external coordinator to be the provider of OSS, on the trial phase, whose role and characteristics need to be further examined.

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Innovation adoption; construction MSEs; one-stop-shop; organizational innovation; business model; detached houses

Introduction

One and two-family houses (from here onward referred to as ‘detached houses’) account for more than 50% of the total building stock in Sweden and are responsible for 12% of the total energy consumption (Swedish Energy Agency, 2017). About 80% of those houses are more than 30 years old and in need of renovation (Boverket, 2015). This provides a unique opportunity for micro and small-sized construction companies (MSEs) to implement energy efficiency measures during the renovation. The MSEs are a subset of SMEs (small and medium enterprises) according to the criteria of the European Commission. A small enterprise has less than 50 employees and an annual turnover of up to €10 million, while micro enterprises have less than 10 employees and an annual turnover of up to €10 million (European Commission, 2018). Following the classification of number of employees, 99% and 92% of the construction companies in different segments of the Swedish construction sector are micro and small enterprises, respectively (Table 1). The MSEs typically offer fragmented services in their area of expertise, e.g. plumbing, carpentry, replace windows, insulation, roof, etc. A similar situation exists in other Nordic countries and several European countries (Mlecnik, Straub, & Haavik, 2019).

An EU-wide definition for the term ‘energy renovation’ does not exist. It is widely accepted though that energy renovation includes the adoption of all those measures that create long-lived reduction in energy use, after the intervention work is carried out, and which are not dependent on human behaviour (Clark, Gibson, Barth, & Bonato, 2019). In order to realize the business opportunities of energy renovation and to develop further in the market, the construction MSEs are required to address multiple renovation needs of the house owners and offer them more complete and advanced renovation solutions. For this to happen, the MSEs are expected to partner with other actors in the market (Rødsjø, Prendergast, Mlecnik, Haavik, & Parker, 2010) and form collaborative business models for the services they provide (Mlecnik, 2013). The attractiveness and importance of those new business models is highlighted by various researchers (Abuzeinab, Arif, Quadri, & Kulonda, 2018; Aho, 2013; Artola, Rademaekers, Williams, & Yearwood, 2016).

A product-service systems (PSS) business concept has been proposed for the construction MSEs to better satisfy
customer needs, increase efficiency, minimize general expenses, and maximize the profit margin (Tukker & Tischner, 2017). Product-service system (PSS) is an emerging business concept, which provides for cohesive delivery of products and services with the aim of pro-environmental outcomes. To adopt such a PSS, the MSEs are expected to change their existing structures and routines, and engage in a joint effort with other companies and with their customers under a common goal of delivering a functional service (Mont, 2002). The one-stop-shop business model for house renovations (Boo, Dallamaggiore, Dunphy, & Morrissey, 2016) is one such PSS concept. In this model, a single actor will coordinate or collaborate with other actors to offer comprehensive renovation packages on energy-efficient renovation. The benefit of this model is that it offers the house owners a unique contact point for all the services involving an energy renovation project, and that participating actors can join together, redefine their activities, and increase their resource efficiency (Mlecnik et al., 2019). It provides a holistic approach, simplifies the planning process, and offers advice on the most appropriate technical solutions and financial schemes. Furthermore, a one-stop-shop (OSS) organization may

Table 1. Structure of construction-related companies in Sweden.

<table>
<thead>
<tr>
<th>No. of employees</th>
<th>Building projects developer</th>
<th>Contractors for new building construction</th>
<th>Demolition and site preparation contractors</th>
<th>Contractors for electrical, plumbing and other construction installation activities</th>
<th>Contractors for building completion and finishing</th>
<th>Contractors for other specialised construction activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>74</td>
<td>55</td>
<td>58</td>
<td>46</td>
<td>60</td>
<td>55</td>
</tr>
<tr>
<td>1–4</td>
<td>22</td>
<td>32</td>
<td>30</td>
<td>37</td>
<td>30</td>
<td>29</td>
</tr>
<tr>
<td>5–9</td>
<td>2</td>
<td>6</td>
<td>6</td>
<td>9</td>
<td>5</td>
<td>8</td>
</tr>
<tr>
<td>10–19</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td>5</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>20–49</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>50–99</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>100–199</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>200–499</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>500+</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>


Figure 1. Notional OSS business model.
carry out its services and receive a pre-agreed price depending on the scope of the contract (Boo et al., 2016). Figure 1 offers an illustration of a notional OSS concept for house renovation.

There has been emerging examples of OSS business models for detached houses in the Nordic counties (Mahapatra et al., 2013) and in Europe (Boza-Kiss & Bertoldi, 2018). In Sweden, this is best illustrated by the concept of ‘totalentreprenad’, i.e. turnkey contract. Such a concept is typically offered by large or medium-size companies, which possess the capability to offer construction management (CM) services as they have internally project management competence that can oversee the planning, design and construction of a project, from its beginning to its end. MSEs in the majority of cases work either as subcontractors to a turnkey contractor or diffuse their manpower in individual small scale projects. According to Swedish Project Management Forum (2019) they have low ability to manage projects.

In Sweden, the application of the turnkey contract concept is known in the construction or renovation of multifamily residential buildings and construction of new detached houses, but not for renovation of detached houses. OSS model is still in its infancy and there is no known company that currently offers such a service. There has been though theoretical studies on OSS business model development (Haavik et al., 2012; Mahapatra et al., 2013; Mahapatra & Gustavsson, 2011; Mlecnik et al., 2019; Vanhoutteghem et al., 2011) and studies about attitudes and perceptions among house owners (Bjorneboe, Svendsen, & Heller, 2018; Bravo, Pardalis, Mahapatra, & Mainali, 2019). Most of these studies highlight the need of OSS to enable scaling up the comprehensive renovation. However, there is a lack of studies on how the MSEs perceive the OSS concept and are prepared to adopt it, especially in the Swedish context. Hence, the aim of this paper is to examine the perceptions and level of preparedness of Swedish construction MSEs regarding their adoption of innovations in general and OSS in particular. From this we will first gain a better understanding of how these firms see their position in the market of house renovations, and secondly, to what extent they believe that the adoption of an innovative business concept will improve their current business practice and benefit them, and thirdly, make an overall evaluation of the proposed concept based on their current organizational state.

Though this is a case study of Swedish construction MSEs, the results can be applicable to the broader context with similar market conditions. This is because construction MSEs in Europe appear to have a set of common characteristics such as limited information and awareness about new technological trends and opportunities, lack of management expertise as they mostly consisted of one person (owner) or a small group of people (family), and lack of financial resources to invest in innovations (Sexton & Barrett, 2003). Moreover, the European Commission through the ‘Smart financing for smart buildings’ initiative and through the ‘new’ Energy Performance of Buildings Directive (EPBD) has advocated OSS (Boza-Kiss & Bertoldi, 2018). According to the directive, ‘Member States are required to facilitate access to appropriate mechanisms for accessible and transparent advisory tools, such as OSS for consumers and energy advisory services, on relevant energy renovations and financing instruments.’ Since OSS models in the EU are in the initial phase of market development and the future is rather unknown (Boza-Kiss & Bertoldi, 2018), empirical analyses are needed to the overall understanding of the OSS market.

**Literature review**

Innovation is considered as the introduction of new products, processes or services (Dodgson & Gann, 2018; Drucker, 2014; Kahn, 2018). Innovations are classified as ‘incremental’ or ‘radical’ depending on whether the innovation is an improvement of an existing technology or a totally new technology (Ringberg, Reihlen, & Rydén, 2019). Innovations have also been classified as radical, incremental, modular, architectural and system innovations (Slaughter, 1998). Goverse, Hekkert, Groenewegen, Worrell, and Smits (2001) classified innovations into six different types based on various combinations of two dimensions of innovation, namely technical radicality and organizational complexity. Garcia and Calantone (2002) also applied similar criteria, which they term technological and/or marketing discontinuities at the micro (firm or customer) and/or macro (market, industry or world) level to classify innovation into radical, really new, and incremental innovations.

Applying this latter typology of Garcia and Calantone (2002), OSS for detached house renovations can be classified as a ‘really new innovation’, due to marketing discontinuity at macro level (European level). Marketing discontinuity includes lack of services, risk perceptions, business models, etc. There is no technological discontinuity as technology for energy renovation exists.

**Innovation in the construction industry**

The construction industry in general is traditional (Bennett, 2013) and suffers from lack of innovation (Iranmanesh & Kamal, 2015). Innovation is key for the success of firms regardless of their size (Kyrgidou & Spyropoulou,
2013; Turk, 2016; Zubizarreta, Cuadrado, Iradi, Garcia, & Orbe, 2017). Past research indicates that the adoption of new technologies and practices by the construction firms leads to improved firm performance (Russell, Tawiah, & Zoysa, 2006), increased range of capabilities, sustainable market share (El-Mashaleh, O’Brien, & Minchin Jr, 2006), and organizational competitive advantage (Salunke, Weerawardena, & McColl-Kennedy, 2011). However, compared to large construction firms, SMEs (and therefore MSEs) experience different barriers preventing them to innovate (Reichstein, Salter, & Gann, 2008). They lack the capacity to invest in R&D initiatives (Jung & Andrew, 2014) or in the improvement of their processes. They usually operate in a highly competitive environment, which makes it difficult for them to keep on investing and succeed to innovate over time, especially when their resources for such activities are limited (Iliescu & Ciocan, 2017). That inevitably drives those small firms to try achieve innovation based on their existing financial resources and organizational capabilities, in order to remain competitive. The success of this though remains unclear (Xue, Zhang, Wang, Skitmore, & Wang, 2018).

Factors affecting innovation in organizations

Innovation adoption helps organizations to become more effective and competitive (Damanpour & Wischnevsky, 2006), gain new perspectives and knowledge on existing problems they face (Pérez-Luño, Wiklund, & Cabrera, 2011), and adapt to new situations. However, innovation patterns for the large construction industry are not necessarily appropriate for SMEs and vice versa (Barrett & Sexton, 2006). Studies have shown that many of those SMEs are unfamiliar with existing renovation processes within their sector, and that they face difficulties when required to work together with other similar companies on whole building solutions (Mlecnik et al., 2019).

There exists a vast literature on factors influencing adoption of innovation in organizations in general (Anderson, Potočnik, & Zhou, 2014; Arpaci, Yardimci, Ozkan, & Turetken, 2012; Damanpour & Schneider, 2006; Frambach & Schillewaert, 2002; Gumusluoglu & Ilsev, 2009) and in specific sectors, e.g. health sector (Adler-Milstein, Kvedar, & Bates, 2014; Hamilton et al., 2014; Wisdom, Chor, Hoagwood, & Horwitz, 2014), automotive (Zailani, Govindan, Iranmanesh, Shahrudin, & Chong, 2015), lodging (Nieves, Quintana, & Osorio, 2014), and construction (Bygballe & Ingemanson, 2014; Martin & Perry, 2019).

Figure 2 presents a conceptual framework for innovation adoption, i.e. the OSS concept in this paper. This framework combines different variables found in the innovation adoption models of Rogers (2005) and Frambach and Schillewaert (2002). These models describe and incorporate the two types of organizational adoption decision that can be identified, i.e. the decision made by an organization and the decision made by an individual within the organization (in our case the construction MSEs owners). The organization’s level of preparedness i.e. the degree to which an entity is quicker to take an adoption decision (Rogers, 2005) is an outcome of different parameters related to the nature of innovation itself, the organizational capability, and external factors, which, to a certain extent, affecting the organization’s capability to innovate.

Nature of innovation

The nature or characteristics of an innovation as perceived and evaluated by an organization influence the inclination to adopt it (Anderson et al., 2014; Rogers, 2005). Such characteristics are related to the relative advantage (improvement of what already exists in the market), compatibility (consistency with existing organizational values), complexity (how easy innovation is to be understood and used), observability (visibility of results to others) and trialability (existence of an experimenting phase) of innovations (Rogers, 2005). Since deep renovation is complex in nature, including multidisciplinary tasks requiring huge capital investment and time, perceived risk behind trailing innovation in deep renovation by MSEs seems high. Furthermore, perceived risks, like for example market uncertainties and customers’ reactions can create a less safe environment for innovation adoption (Freel, 2005). Moreover, the perceived cost-effectiveness from adopting an innovation compared to the current practice provides organizations with an advantage that makes them more likely to adopt it (Damanpour & Schneider, 2006; Graham & Logan, 2004). The perceived innovation characteristics can be considered as subjective indicators reflected in an attitude towards the innovation (Le Bon & Merunka, 1998).

Organizational capability

In many studies, the effect of organizational capability in the preparedness of organizations to innovate has been controverted (Kannebley Jr, Porto, & Pazello, 2005; Rahmouni, Ayadi, & Yıldızoğlu, 2010). A variety of studies have examined relationships between organizations’ size, age, structure, business culture and vision, and their inclination to innovate. Some studies found a significant positive relationship between the size of the organizations and its willingness to innovate (Ganotakis & Love, 2010), while some other found this relationship
to be weak (Heimonen, 2012). Smaller organizations are considered more flexible and thus it is more probable for them to innovate. However, the size of an organization might be correlated to other variables, such as structure, vision and culture (Bock, Opsahl, George, & Gann, 2012). Smaller organizations usually have a simple structure and therefore are more willing to initiate an adoption decision (Anderson et al., 2014), but they are less prepared to implement an innovation. Regarding culture, organizations with an open mind towards new ideas will be positively influenced to adopt an innovation (Auernhammer & Hall, 2014). As far as it concerns the business vision of organizations, it is important to examine their general attitude regardless of their size (Goffee & Scase, 2015). The need to renew the way they do business and their willingness to enter new markets, positively influence the adoption of innovations. Huergo and Jaumandreu (2004) found a positive relationship between the age of the company and innovativeness, but Coad, Segarra, and Teruel (2013) dispute this relationship. When it comes to SMEs, inclination towards innovations are heavily influenced by the owners, as they can be those initiating innovation activities in the firm (Teirlinck & Spithoven, 2013). Their work experience and broader professional competency facilitate efficient management of the change that the innovation brings within the firm. Moreover, their personality and willingness to take business risks influence the decision for innovation adoption (Gronum, Verreynne, & Kastelle, 2012; Kickul & Gundry, 2002).

In general, organizations go through several stages of development during their life-cycle. Organizations that are at an early stage of their life-cycle are able to grow and become more mature by being innovative, while older firms that are more reluctant towards innovation may experience a period of stagnation or even a decline over time (Hansen, 2009). Nevertheless, older organizations that review the way they operate and remain innovative continue to have an exceptional market performance (Huergo & Jaumandreu, 2004).

Construction MSEs operate in limited geographical areas. Their ability to recognize the value of an innovation, the assimilation of it, and its application to their way of conducting business is very much influenced by their individual internal characteristics. Those organizations usually have no specific goal towards the development of human resources, and strategic adoption of the required innovations. Furthermore, the adoption of an innovation is highly dependent on how individuals are able to acquire, understand and implement new knowledge (Kamal & Flanagan, 2014).

**External factors**

MSEs lack resources, which act as a barrier towards adopting innovations. Integration with other actors
within the limits of their network is important towards growing their organizational capability to innovate. The existence of networks gives the MSEs the opportunity to complement their own resources, and to mitigate the risks and costs of innovation adoption (Gronum et al., 2012). For effective use of networks, MSEs should be able to identify suitable partners, create and maintain collaborative relationships with them, and identify which elements of their collaborators required to implement successfully their set goals (Forsman, 2011).

Apart from network influences, the business environment affects the adoption of innovations in different ways (Baker, 2012). A potential adopter may gain an understanding of the potential risks associated with the adoption of the innovation from the fact that other partners within a business network have adopted the innovation in the past (Lee, Leong, Hew, & Ooi, 2013). It is more likely that an organization will adopt an innovation if a number of other linked organizations in the market environment have adopted the same or a similar innovation (Wu & Chiu, 2015), or due to the pressure of market competition (Aydalot & Keeble, 2018; Bossle, de Barcellos, Vieira, & Sauvée, 2016; Kirzner, 2015). However, the probability of a competitive disadvantage depends on the strategic importance of the innovation and its effect on the functioning of the organization. Local markets are rather competitive as well, since many MSEs operate in that space. Therefore, the adoption of innovation can become the vehicle for them to achieve the desired business growth (Andersson & Tell, 2009).

Another important external factor affecting innovation adoption is the existing policy environment. Especially for the pre-adoption stage, there are indications that external policies and regulations are positively related to innovation adoption, including specific application of policies, legislation and regulations that facilitate innovation adoption (Aarons, Hurlburt, & Horwitz, 2011; Rogers, 2005). In addition, Bossle et al. (2016) show that if there is a potential market that organizations could penetrate, and there are governmental incentives for companies to develop innovative products and services to address the needs of that market, then it becomes very attractive for many companies engage in innovation. Studies have shown that in organizational settings, characteristics of attitude components (e.g. owner’s characteristics and business vision) intervene the influence of external variables, like policy environment, on behavioural intention (Park, Song, Yoon, & Kim, 2014). Furthermore, attitude theory (Fishbein & Ajzen, 1977; Triandis, 1971) presumes that beliefs intercede the impact of external influences, such as persuasive communication and/or active participation on decisions.

### Research methods

This research is based on semi-structured interviews with owners of 21 SMEs, out of which 19 are micro and small (MSE) construction enterprises, form the three Swedish counties, namely Kronoberg, Västra Götaland and Kalmar. Interviews were used as a data collection tool with an aim to get detailed information from the interviewees on the subject of our research, which would not be possible with a questionnaire survey (Collis & Hussey, 2013). Data from the interviews were complemented by information collected from the web pages and brochures of the examined companies regarding their structure, the products and services they offer and any potential innovative initiatives they are involved in. For confidentiality purposes, any direct quotes from these brochures or websites are given in an interpretative way. The reason for choosing construction MSEs as an actor to examine are related to their importance in renovation projects. Those companies are expert in their field of work and the have the technical capacity to perform renovation related works. Furthermore, the nature of their operations brings them in direct contact with other professionals in the same field (e.g. suppliers, other small construction contractors, etc.) with whom they might have developed some sort of professional relationship. Moreover, since they interact with house owners, within the limits of their business, they have a better picture of customer needs.

The interviewed companies were randomly selected from online yellow pages based on their size and activities. The keywords used to identify them were ‘construction works’ (byggarbeten) and ‘renovation works’ (renoveringsarbeten). Out of the 65 companies approached via telephone calls, 21 agreed to be interviewed. All the 21 companies are or have been actively involved, according to information deriving from the examination of their websites and brochures advertising their services, in the detached house renovation market. No more companies were approached due to the fact that during data analysis similar information appeared from the interviewees. It was reasonable to feel assured that further data collection would yield similar results and would confirm the existing themes and conclusions (Faulkner & Trotter, 2017). Table 2 provides general information about the interviewed companies.

For the interviews, an exploratory approach was used as this places emphasis on examining participant interpretations and takes account of the research context (Bryman, 2008). The interviewer was not allowed to record the interviews electronically, so the proceedings of the interviews were captured through detailed notes.
including written comments from the interviewees. Those notes were examined thoroughly by the first author, who conducted all the interviews at the interviewees’ place of work. On an average, each interview lasted 95 min.

A funnel approach (Figure 3) was applied for the interviews (Roller & Lavrakas, 2015) with a goal to build trust, affinity, and questions were presented in a way to minimize biases from both the interviewer and interviewee (Hutchings, 2005). Stylistically, open-ended questions in simple language were used to get descriptive answers from the interviewees. Examining the perceptions of interviewees during all the stages of this funnel approach was important, as it provided the researcher with interviewees’ individual observations, understanding, interpretations, and evaluation of the discussed subjects (Bennett, 2016). Examining those perceptions allowed the interviewer to gain a clearer picture of those things that should be done for the development of the market of house renovations.

The data from the interviews were analysed following a mix of both a deductive and inductive approach in a sequential way. A deductive approach was applied to draw a list of factors (or codes) from the existing literature on the topic of innovation adoption (like e.g. trialability of innovation, business vision of the company, operational efficiency, etc.). The deductive approach assumes that certain substantial concepts are in the data based on knowledge gained after examining the existing literature on the topic (Bradley, Curry, & Devers, 2007; Thomas, 2006). Data were coded into categories using a start list. After developing clusters of data from the deductive analysis, an inductive analysis was conducted by engaging detailed readings of interviews’ data, not only to gain comprehensive understanding of what interviewees said (Gale, Heath, Cameron, Rashid, & Redwood, 2013), but also to make sure that all

<table>
<thead>
<tr>
<th>Company</th>
<th>Owner’s age group</th>
<th>Number of employees</th>
<th>Age of company</th>
<th>Area of operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>40–50</td>
<td>2</td>
<td>9</td>
<td>Roof and floor construction and renovation</td>
</tr>
<tr>
<td>2</td>
<td>40–50</td>
<td>8</td>
<td>10</td>
<td>Ventilation systems</td>
</tr>
<tr>
<td>3</td>
<td>60+</td>
<td>23</td>
<td>43</td>
<td>Heating systems</td>
</tr>
<tr>
<td>4</td>
<td>50–60</td>
<td>15</td>
<td>5</td>
<td>Solar panels</td>
</tr>
<tr>
<td>5</td>
<td>30–40</td>
<td>4</td>
<td>12</td>
<td>Carpentry</td>
</tr>
<tr>
<td>6</td>
<td>40–50</td>
<td>35</td>
<td>16</td>
<td>General house renovations</td>
</tr>
<tr>
<td>7</td>
<td>30–40</td>
<td>4</td>
<td>3</td>
<td>Heating systems installations</td>
</tr>
<tr>
<td>8</td>
<td>40–50</td>
<td>5</td>
<td>20</td>
<td>Plumbing and electricity services</td>
</tr>
<tr>
<td>9</td>
<td>30–40</td>
<td>10</td>
<td>5</td>
<td>Heating and ventilation systems</td>
</tr>
<tr>
<td>10</td>
<td>30–40</td>
<td>6</td>
<td>7</td>
<td>Carpentry</td>
</tr>
<tr>
<td>11</td>
<td>40–50</td>
<td>4</td>
<td>14</td>
<td>Architect</td>
</tr>
<tr>
<td>12</td>
<td>40–50</td>
<td>2</td>
<td>12</td>
<td>General house renovations</td>
</tr>
<tr>
<td>13</td>
<td>50–60</td>
<td>2</td>
<td>18</td>
<td>Roof and flooring</td>
</tr>
<tr>
<td>14</td>
<td>40–50</td>
<td>24</td>
<td>15</td>
<td>Heating systems installations</td>
</tr>
<tr>
<td>15</td>
<td>40–50</td>
<td>12</td>
<td>10</td>
<td>Total renovation services</td>
</tr>
<tr>
<td>16</td>
<td>50–60</td>
<td>68</td>
<td>27</td>
<td>Flooring and tiling</td>
</tr>
<tr>
<td>17</td>
<td>40–50</td>
<td>6</td>
<td>20</td>
<td>New construction, renovation services</td>
</tr>
<tr>
<td>18</td>
<td>30–40</td>
<td>52</td>
<td>13</td>
<td>Stairs, remodelling and façade services</td>
</tr>
<tr>
<td>19</td>
<td>40–50</td>
<td>18</td>
<td>16</td>
<td>Bathroom renovations</td>
</tr>
<tr>
<td>20</td>
<td>30–40</td>
<td>4</td>
<td>15</td>
<td>Heating systems installations</td>
</tr>
<tr>
<td>21</td>
<td>30–40</td>
<td>20</td>
<td>10</td>
<td></td>
</tr>
</tbody>
</table>
important aspects of data were captured. The authors after examining thoroughly the notes from interviews, assigned codes to paragraphs or segments of texts relevant to the parameters of the framework of organizational innovation adoption of Figure 2. Key concepts and themes were identified using those parameters as lenses. Deriving themes from the raw data using the inductive approach prevented the possibility authors to lead to subjective conclusions (Bradley et al., 2007). The sequential approach using deductive and inductive analysis resulted in two categories of data sets, which were reduced to manageable sizes by creating bigger categories including similar ones (e.g. the bigger category of owner’s characteristics includes the sub-categories business behaviour, management style, commitment, etc.). The preparation and organization of data and the stages of the analysis process can be seen in Figure 4.

The data collected in this research were validated with the employment of triangulation strategy (Flick, 2018), and more specifically the employment of multiple investigators from different disciplines (Merriam & Tisdell, 2015). Apart from the authors, two additional individuals from social science discipline analysed the same data, resulting in similar conclusions. Additionally, findings from the examined MSEs websites and brochures confirmed the testimonies of their owners in subjects like i.e. future vision, collaborative culture and so on. Moreover, as previously mentioned, during the analysis, similar information appeared from the interviewees, which indicates that our data is saturated, and thus more reliable.

**Research findings**

**General perception on OSS**

Interviewees were asked to comment on the model presented in Figure 1, and share their opinion about the OSS concept as a whole. Their responses were largely homogeneous. The majority of the interviewees showed a keen interest in OSS. They claimed that it opens space for collaborations with professionals from other fields of business, which could provide a great opportunity to strengthen their position in the market and expand their networks. They firmly believed that they could learn a lot from their collaborators and improve the way they do business. Furthermore, learning from experts from different business segments would provide them with an opportunity to adopt a more extrovert business approach and possibly reach a new customer base. Some of the interviewees mentioned that a more simplified version of the concept exists in the market. They described that if a customer needs to perform more than one technical work in their house, then usually they sign a single contract with the company having the largest share of work, and the rest are employed as sub-contractors. They all agreed, that the concept given to them does not exist, to their knowledge, at the moment in their local markets.

According to the interviewees, the OSS concept seems to be compatible to their current way of delivering work, and its adoption would result in reaching a new market that potentially could increase their profit. A common response and conviction of all the respondents was that the one who
will bring such a holistic approach in house renovations would gain the ability to lead the market. But they claimed though that this would probably take some time, since at the moment the greatest focus is placed upon new constructions. As one of the interviewees pointed out:

… it is certain that an integrated service for house renovations would have been very attractive for the customers, and would definitely challenge us and the way we do business at present, setting an example for the future. Do not expect though this to happen immediately, especially when we talk about a local market. People are used to the current market situation and it will take time to accept something new …

External factors

While discussing the business environment in which they currently operate, all interviewees agreed that local markets are limited in terms of share for their business. For example, one interviewee quoted that:

If you consider how many companies can offer the same service as you, then you realize that your market share is limited and you need to offer your product in a more attractive way to choose you.

According to them, there is high competition in the local markets in which they operate, where every company tries to sell their own product or service to the same customer base, which in some cases leads to great conflicts of interest. ‘The market for heating systems is good, but at the same time it makes it more difficult for us to convince people to make changes in the façade of their house’ stated one of the interviewees. Another said:

Most of the smaller size companies have a craftsman that they know from previous collaborations, which they offer to the customers for additional renovation services for attractive prices. To deal with that I need to lower the cost for my services to remain competitive. You understand that this creates certain problems to me and my business

Despite the competition, they admit that, in general, companies respect each other and that no great volatility exists. Most of those companies are usually called to work together as sub-contractors to larger firms, which allows them to develop business relationships and to exchange knowledge in projects. Through those relationships, they admit, they gain access to more customers, as word of mouth is their main advertising strategy, and getting good references from past collaborators help them to work in new projects. Moreover, the vast majority of interviewees claimed that it is a common practice, when they are called to perform a technical work, the customer asks them for additional works that
could be performed to improve their house. For those extra works, usually they propose artisans within their network of collaborators.

Before installing a new heating system, I always propose to my customers to proceed to more changes, like for example windows or additional ceiling insulation. I have worked with a company delivering such services, and I know they can deliver good work at an affordable price. They also give reference to me to their clients,

Answered one of the interviewees, confirming that ‘word of mouth’ promotional practice for services for companies operating in the same geographical area. The same principle applies to a lesser or greater extent for the rest of the examined MSEs.

Policy environment, and especially the new Energy Performance of Buildings Directive from EU (Directive E.E., 2018), creates a fertile ground for more business according to all interviewees. Using different expressions, all came to the same conclusion that there are many houses across the country that are in definite need for some type of renovation, and that creates opportunities for them to sign more contracts and have an increased amount of job. Surprisingly, however, this market is not their present priority, since they are busy working in new construction, and have limited time and human resources to deploy in renovation projects. Some of the respondents argued that if there was a more favourable tax environment for small companies, they could recruit more staff, so they can take advantage of the business opportunities that the house renovation sector offers. Moreover, in the direction of opportunities to create new jobs, five of the respondents argued that they have knowledge of state funding opportunities for the development of small businesses and the development of new sustainability-related products and services. According to them, however, both they and most businesses in their sector do not know how to access these funds. In the case of construction MSEs in Sweden though, those favourable policies, even if they exist, they remain unreachable for those type of entrepreneurs. The end result is entrepreneurs preferring to continue with what they call ‘business as usual’, rather than investing resources to innovate.

**Organizational capability**

In the discussion regarding business culture and innovation, the interviewees had different perceptions on how they will achieve growth of their company. Those companies are owner-centred organizations, where the owner has in most of cases the final word for every decision related to organizational changes and innovation adoption. The common feature of those owners is that they consider themselves entrepreneurs and business persons, who want to be at the forefront of trends and developments in their field. All of them showed an open-minded attitude towards new ideas, which in combination with their entrepreneurial attitude, are aligned to the personality characteristics that can positively influence innovation adoption. However, they are somewhat conservative while implementing an innovation in their current practice.

MSEs operating in the market for longer time (up to 15 years) stated that it is their goal to grow their business and enter new markets in the near future.

There are still unexplored areas in the building industry, which we should consider exploring in the future ...

Claimed one of the respondents, while another stated that:

I have inherited this business from my father, and I believe that as a younger person I can see more ways to conduct business than he did.

Another interviewee took it a step further, claiming that:

At the moment we have the knowledge and networks that allow us to expand beyond the limits of our current area of operations.

It becomes evident from their answers that the age of the company cannot act as a motivating factor only by itself, but in combination with the personality and characteristics of the owner. For older companies in the market (operating for more than 15 years), the opportunity for business growth is not a strong motive to innovate. They act in a reserved way, and they are not willing to change the way they operate, feeling safer within the limits of their current operations. For them, exceptional market performance is connected with the offering of the latest technology within the area of their expertise. Characteristic of that attitude were the words of the owner of a MSE offering plumbing and electricity services who said:

I feel pleased with the amount of work I deal with at the moment. New construction is blooming and smaller projects are always on the run. I see no reason to try to swim in dark waters

While another stated:

I am focusing on offering to my clients the latest technology existing. That makes me differ from my competitors. People can find through me products that nobody in the area is able to offer.

When discussing potential changes in their organizational structure due to the adoption of an innovation,
the vast majority of the examined companies suggested that such an incident would be ‘bad for business’. The need of owners to have control of their organization, and potential changes in the way they have formed their business, or the way they deliver their services makes them feel insecure and not taking risks that could harm what they have achieved so far. Even if they understand that adopting an innovation could help them grow and require sacrifices, their personality and the lack of a risk-taking attitude act as a deterrent on their decision to innovate. Potential changes in organizational structure and way of delivering services can also lead to financial and time planning inefficiencies according to the interviewees. For example, one interviewee observed:

... changing organizational structure requires hiring new competent people to deliver. It is my company and I feel more secure when I can control how this company operates ... 

However, two MSE owners had a different opinion on this issue. According to them, taking risks and changing the organization structure is the driving force for growth, but before taking such risks, a careful and thorough investigation of all involved parameters is required. Moreover, in terms of having control of their own business, both of them stated:

I have no problem sharing control of the company’s activities. I would prefer though to do that with a person that we share common views.

All the interviewed MSE owners seem not convinced that the adoption of OSS would be a good decision for them. According to them, the size of their company does not leave space for complex business structures. They were worried that the adoption of such a model would cause a great disturbance to the balance they have managed to achieve in their business, and disappoint their employees, whose satisfaction is considered the key for companies’ success. They insisted that investing in changing their business model is valued less than investing in creating opportunities for an improved working environment and training of their personnel.

Construction SMEs as providers of OSS

In the last part of the interview, interviewees were asked to express their opinion regarding the probability of them offering OSS service for house renovation, as presented in Figure 1. All of them saw potential in the concept and had a general interest, but were hesitant to offer such a service due to certain concerns. They all recognized that offering such a service to customers will provide them with a definite relative advantage in the market. All of them actually perceived OSS as a

... certainly more efficient and complete way to offer an attractive renovation package ...

With one of them paralleling OSS with Walmart’s ‘pay less, live better’ concept. Concerns were raised regarding the complexity of the model with most of them referring to the risk factors. Perceived risks related to the adoption of an innovation have been found as a parameter that creates a negative decision environment for them. That applies to the case of the examined construction MSEs in this study, as they seem to feel worried of the impact that those risks can have in their current operations. This was expressed like:

‘... who will be responsible for what.’ ‘... it is important the contract to state clearly who is responsible for potential problems and malfunctions ...’ or ‘... signing a contract with a client is OK, but having to sign contracts with several technicians worries me as they would probably want to lower their risk ...’

The complexity factor also appeared in the concern for coordination of an OSS renovation project. The lack of project management competence among most of the MSEs owners makes them concerned for whether they would be able to deliver efficiently what would be promised to the customer. Furthermore, the interviewees connected efficient coordination with their ability to understand the work of each technician. The vast majority of MSE owners claimed that their work is ‘... rather specialized and unique in each project ...’, and that they were unable to ‘... fit in someone else’s working schedule, when having ongoing projects ...’. Additionally, they felt that the effort to coordinate different professionals and try to bridge the gaps between different working cultures would bother them.

Another important element that was raised was related to the uncertainties around OSS. All respondents stated that the market now is mostly oriented towards new buildings, and the taxation environment limits their opportunities to try something new, while they have to ensure adequate capital flow in their business. They were uncertain regarding the quality of the new service they might offer. Even though they can guarantee the quality of work performed by themselves, they feel unable to offer the same guarantees for the work delivered by other actors involved in the renovation. Even though they trust those actors, they have little knowledge of their expertise, and that may lead to a poor service and quality of renovation. Potential failures to deliver what they promise will harm their business and their reputation in the market. They were not against participating in such a business if someone else took the lead.
They have proposed that during a trial period of application of this OSS concept there should be an entrepreneur, who has knowledge of the building industry and managerial competence, could take the role of the project manager and coordinate all the different actors involved. The entrepreneur would ensure the quality of the final product to be delivered on promised time and agreed-upon cost. Taking into account the consultation of the interviewees on how OSS concept should be applied during the trial period of implementation, it would have a form as illustrated in Figure 5.

**Discussion and conclusions**

The main findings of the interview, when visualized in relation to the conceptual theoretical framework we used, would look like Figure 6. Different pattern lines indicate the positive, negative, or neutral influence of various variables on the organizational preparedness for OSS adoption.

This paper has analysed the perceptions of construction MSEs regarding OSS business model for the holistic renovation of detached houses, and has examined their level of preparedness to offer such a service. The results showed that the examined MSEs consider OSS concept as appealing with obvious future benefits for their business. Even if turnkey contractor concept exists in the market, OSS is might be more appropriate for construction MSEs to lead the market of detached house renovations. However, they are not yet ready to adopt the OSS, at least at present, mainly due to the perceived complexity of the model, the likely need to change the existing business structure, and the ensuing perceived business risks.

The age of the companies affects their willingness to innovate as found by Aarons et al. (2011). MSEs that are at their initial stage, or are not fully mature, see a new innovative way to offer their services as a strategic step towards expanding their business. Such a step is considered as an opportunity to explore new business potentials and gain a better position in the market. They are a bit reserved though, fearing that the changes accompanying the introduction of an innovative service delivery in their current business practice, might harm their current operations. Any such eventual change is seen as a danger to their ability to deliver services, and a potential cause of further inconsistencies in their overall business operation. Therefore, even if they recognize the benefits from adoption such an innovation, and it was clear to them that this would help in the growth of the company, the risks and uncertainties prevail over the potential adoption. On the other hand, mature organizations, with longer experience in the market, consider that their position in the market will be enforced and maintained if they offer the latest technology within their area of expertise, and thus decline to adopt innovations in the way they deliver their services. The certainty with which the owners of those mature MSEs expressed this view, shows that we cannot talk about a period of stagnation towards innovation adoption for

![Figure 5. OSS concept for detached house renovation. Illustration developed after consultation of interviewees.](image-url)
them, as described by Hansen (2009), but an absolute decline. Moreover, for those MSEs exceptional market performance is not connected with a desire to remain innovative, contradicting the findings of Huergo and Jaumandreu (2004). Additionally, their small size and the controlling nature of their owners makes most of the examined MSEs less flexible and less probable to innovate, a finding that opposes that of Tolbert and Hall (2015).

The internal characteristics of the organizations such as their business vision and culture dictate that they should strive for future growth, thus be more inclined to innovate. OSS though, entails changes in organizational structure, which the examined firms did not support due to their size and limited flexibility. Moreover, the lack of managerial and coordination skills (in projects requiring the collaboration of different actors) of the examined MSE owners have a negative impact on organizations’ preparedness to innovate. External factors, such as existing business networks and trust relationships between the potential partners have a positive impact on the examined organizations’ preparedness to adopt OSS concept. This limits their scale of operations, and creates problems in their ability to expand their business in the field of detached house renovations, as they currently use all their resources to work in new constructions as sub-contractors to larger companies. Additionally, the examined construction MSEs feel that there is no competitive pressure regarding OSS, since it is a concept with no actual market application yet.

A positive policy environment supports the adoption of innovations (Aarons et al., 2011). Especially, policies that overcome business risks may promote a really new innovation. In Sweden, opportunities exist for the MSEs to avail capital incentives, which may overcome their concern for the risks of adopting new business concepts. The examined companies perceive such support mechanism as something appealing, but they lack knowledge on how and where to seek such opportunities. For the examined MSEs there is only a small point of disagreement with current policies that has to do with the taxation on small businesses, which, according to them, can be improved.

The MSEs consider their business environment as highly competitive, but they seem to work well together when working under the coordination of turnkey contractors. Additionally, owners of these MSEs perceived working with other professionals as a great opportunity to strengthen their competencies. Unlike turnkey contractors though, they lack competencies that will allow them to tackle potential conflicts of interest among involved actors, and mitigate the risks that a renovation project entails.

The perception that OSS is compatible with the MSEs’ current operations, the observability they will gain in the market, and the perceived economic advantage they will gain from OSS have a positive influence on their organizational preparedness. On the other hand, the risks related to OSS adoption and the uncertainty that an investment on OSS will pay back, negatively influences the MSEs. When it comes to offering OSS, that risk avoidance behaviour of MSEs, combined with the lack of managerial competencies, makes them hesitant to take-in charge. They have a clear view that a new type of actor should act as

Figure 6. Reasons for non-adoption of OSS concept.
an OSS entrepreneur and be responsible for the coordination of a renovation project, at least on the trial phase of the application of such a model. For them, such an entrepreneur has the role of a safety measure to notice how this concept works and which problems in their interaction with the other involved actors need to be addressed. Additionally, that external entrepreneur is thought to bridge the competency gap those MSEs have, and will allow them to understand better what they are missing internally, setting the framework for the smooth operation and further development of OSS for them in the future. Therefore, we can safely assume that such an entrepreneur is not affecting the level of preparedness of those MSEs to innovate.

The research has conducted in a specific geographical location, coverage of larger geographical regions and examining a larger sample of construction SMEs could have been better in capturing different perspectives. Furthermore, since the data was collected through a series of interviews there are limitations related to data collection approach. The researchers tried to keep a distance and to interpret the answers they received in a way that would ensure objectivity and scientific validity. However, that interpretation might not fully reflect the views expressed. Moreover, since the interviews were not allowed to be recorded electronically, some of the comments might not be noted.

Concluding, we can claim that the variables having negative influence are of greater importance for the organizational preparedness of the examined MSEs as they affect the core of how they conduct business. That results in low level of organizational preparedness, and consequently lack of inclination, to adopt the OSS concept, at least for nonce. Nevertheless, the examined MSEs are interested to be a part of the OSS concept, but not as coordinators of the whole house renovation process. The role of the coordinating, the examined MSEs owners suggest, should be undertaken by an external entrepreneur, during the trial phase of the OSS concept application. The role of that external entrepreneur needs to be further investigated to define accurately his role on the OSS model and the required competencies one must possess to successfully address the needs of that role. In overall, capacity building activities and studies are deemed necessary to support MSEs journey towards the OSS market development and identifying their roles within it.

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References


