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## **How SME Watkins Steel Transformed from Traditional Steel Fabrication to Digital Service Provision**

*There are many digital transformation success stories involving large enterprises, but few small and medium-sized enterprises (SMEs) have explored and initiated their digital transformations. This article describes the large-scale digital transformation journey of Watkins Steel, an Australian medium-sized steel fabricator, to become a leading digital services provider. The case offers unique insights into how SMEs can apply two strategic digital transformation concepts—augmentation and adjacency—to reimagine their businesses, capitalizing on rich yet underexplored opportunities while not departing from their existing core business.<sup>1,2</sup>*

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### **Lack of Digital Transformation Guidance for Small and Medium-Sized Enterprises**

*"Back [then], I thought innovation was just another buzzword. [Our business] is steel fabrication. You cut steel, and you weld steel. You cannot innovate it. It is a traditional industry. But, I reckon, no matter what industry you are in, there would be a better way of doing it. So, it is just the creation and delivery of new customer value. ... We went from the bottom of the food chain. We were just moving our way up. Then, all of a sudden, we are running the [construction] site." CEO, Watkins Steel*

Digital transformation has been defined as "a process that aims to improve an entity by triggering significant changes to its properties through combinations of ... [digital] technologies."<sup>3</sup> This process is a continuous and complex endeavor<sup>4</sup> that can impact an organization at three different levels: technological (i.e., the emergence of new digital technologies), organizational (i.e., changes in business processes and business model) and



<sup>1</sup> Varun Grover is the accepting senior editor for this article.

<sup>2</sup> We would like to thank Watkins Steel for its support and help with this research. We especially acknowledge the continuous support of Dee Watkins, director of Watkins Steel.

<sup>3</sup> Vial, G. "Understanding Digital Transformation: A review and a Research Agenda," *Journal of Strategic Information Systems* (28:2), June 2019, pp. 118-144.

<sup>4</sup> Matt, C., Hess T. and Benlian, A. "Digital Transformation Strategies," *Business and Information Systems Engineering* (57:5), September 2015, pp. 339-343.

social (i.e., affecting all aspects of human life).<sup>5</sup> This digital technology-induced change can be either incremental ("evolutionary") or disruptive ("big bang").<sup>6</sup> How organizations implement digital transformation depends on the individual organization and what best fits its (digital) strategy and management. However, gaining value from digital transformation involving the introduction of new digital technology usually requires changes in the company's business model.<sup>7</sup> At the same time, the existing business model may constrain the choice of digital technologies and the way they are deployed.<sup>8</sup>

Regardless of their history, position in the supply chain or industry, businesses face the challenge of incorporating ever-evolving digital technologies. Constantly challenging the status quo and innovating has become the only alternative to avoid becoming yet another company that has missed its digital transformation opportunities. Against this backdrop, companies need to explore ways to use digital technologies within or beyond their current business models. Practitioners and academics have regularly reported on how digital-native startups and major market players such as Audi<sup>9</sup>, Adidas<sup>10</sup> and LEGO<sup>11</sup> have navigated their digital transformations, but small and medium-sized enterprises (SMEs) have remained

in the shadows in terms of their ability to become beacons of digitalization.<sup>12</sup>

Running daily operations can be an all-consuming task for SME executives, leaving them with little time to focus on identifying digital transformation opportunities.<sup>13</sup> This is particularly the case with SMEs whose core business is not technology driven; they risk delaying their digital transformation until their potentially outdated industry standards become a competitive disadvantage. Additionally, various SME-specific constraints result in organizational inertia that can hinder the initiation of digital transformation. As digital technologies continue to rapidly advance, the ability of SMEs to remain successful without undergoing major transformation is fading. In general, SMEs remain unaware of the potential of digital technologies to enable new ways of doing business.

A major reason for the digitalization potential in SMEs remaining underexplored is the lack of academic and practice-oriented literature that can provide guidance for their digital transformation journeys. In particular, there are few blueprints and SME success stories that can pave the way for digital transformation outside the corporate and startup worlds. The lack of guidance, inspiration and lessons learned inhibits SMEs' latent ability to replicate and navigate the type of digital transformation that goes beyond process optimization and overturns industry paradigms.

The purpose of our research was therefore to explore SMEs' latent potential for initiating digital transformation and overcoming the organizational inertia that results from their resource constraints—for example, a lack of digital skills and limited financial resources. We investigated a million-dollar<sup>14</sup> digital transformation carried out by Watkins Steel, a medium-sized traditional steel fabricator based in Brisbane, Australia, and report our findings in

5 Reis, J., Amorim, M., Melao, N. and Matos, P. "Digital Transformation: A Literature Review and Guidelines for Future Research," in Rocha, A., Adeli, H., Reis, L. P. and Costanzo S. (eds.) *Trends and Advances in Information Systems and Technologies*, Springer, 2018, pp. 411-421.

6 See, for instance, Goerzig, D. and Bauernhansl, T. "Enterprise Architectures for the Digital Transformation in Small and Medium-sized Enterprises," *Procedia CIRP* (67), January 2018, pp. 540-545.

7 See Zott, C., Amit R. and Massa. L. "The Business Model: Recent Developments and Future Research," *Journal of Management* (37:4), February 2011, pp. 1019-1042.

8 See Chesbrough, H. "Business Model Innovation: Opportunities and Barriers," *Long Range Planning* (43:2-3), April 2010, pp. 354-363.

9 Dremel, C., Wulf, J., Herterich, M. M., Waizmann, J.-C. and Brenner, W. "How AUDI AG Established Big Data Analytics in Its Digital Transformation," *MIS Quarterly Executive* (16:2), June 2017, pp. 81-100.

10 Aubert, B. A., Saunders, C., Wiener, M., Denk, R. and Wölfermann, T. "How Adidas Realized Benefits from a Contrary IT Multisourcing Strategy," *MIS Quarterly Executive* (15:3), September 2016, pp. 179-194.

11 El Sawy, O. A., Kraemmergaard, P., Amsinck, H. and Vinther, A. L. "How LEGO Built the Foundation and Enterprise Capabilities for Digital Leadership," *MIS Quarterly Executive* (15:2), June 2016, pp. 143-166.

12 Barann, B., Hermann, A., Cordes, A.-K., Chasin, F. and Becker, J. "Supporting Digital Transformation in Small and Medium-sized Enterprises: A Procedure Model Involving Publicly Funded Support Units," *Proceedings of the 52nd Hawaii International Conference on System Sciences*, January 2019, pp. 4977-4986.

13 See, for instance, Heck, J., Al-Falou, K., Steinert, M. and Meboldt, M. "Iterative Creation and Analysis of Generic Ideation Spaces for SMEs," *Proceedings of NordDesign*, Espoo, Finland, August 2014, pp. 173-182.

14 All amounts, unless specified otherwise, are expressed in Australian dollars; as of March 2022, 1 Australian dollar = 0.74 U.S. dollar.

this article. Our comprehensive, in-depth study of Watkins Steel is based on external data and face-to-face interviews with nine representatives of the company (see the Appendix for more details).

After many years of focusing on sustaining and improving its traditional steel fabrication, Watkins Steel began to question and reimagine its role in the supply chain, and in 2015 embarked on a digital transformation journey. To date, the company has established digital offerings around its 3D-scanning, modeling and visualization capabilities, and now lists digital services as one of its three core services. Its digital capabilities have provided an entirely new revenue source, and it has become an industry leader in providing value-adding IT services.

The Watkins Steel study case provides unique insights into the digitalization opportunities available to SMEs and highlights ways to capitalize on these opportunities. Based on the lessons learned, we have derived general strategies for setting a direction for digital transformation in SMEs and highlight the success factors. These strategies are built around two novel digital transformation strategic concepts—*augmentation* and *adjacency*—that enable SMEs to leverage their flexibility, compared to large enterprises, to build a manageable pathway toward digital transformation. *Adjacency* is concerned with aligning innovation initiatives with what previously made an SME's traditional business successful. Unlike the extant academic literature, which describes digital transformation as leading to a new organizational identity,<sup>15</sup> the augmentation and adjacency strategic concepts lead to a hybrid type of transformation, which can be positioned between the “reinforced” old and the “new” organizational identities.

By using a combination of augmentation and adjacency as the central focus of their strategic (re)orientation, SMEs can use their existing organizational assets to follow a customer value-focused digital transformation path. When considering the multitude of transformation opportunities, this approach will enable SMEs to digitally enrich their value propositions for their customers, aligning the individual innovation

initiatives with what previously made their traditional business successful.

The contribution of this article is fourfold. Below, we first describe the adjacency and augmentation strategic concepts that can help SMEs navigate their digital transformation journeys. Next, we identify the digital transformation challenges that SMEs face and the advantages they have compared to large enterprises. Then, we describe the Watkins Steel case and the lessons learned, which provide a blueprint for digital transformation in SMEs, thereby offering inspiration for SMEs facing related challenges. Finally, we provide an “adjacent augmentation canvas,” as a guiding instrument for kick-starting the advocated type of digital transformation.

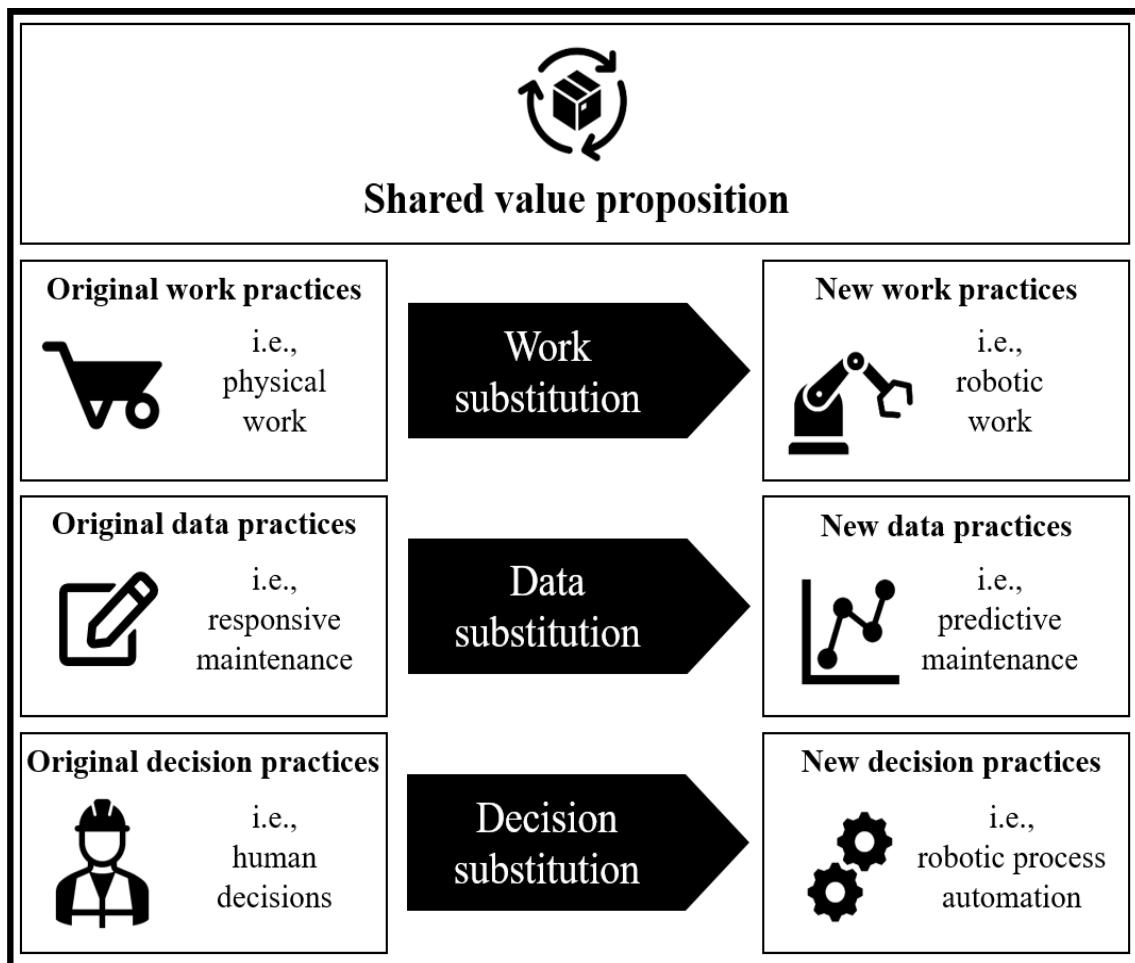
## The Digital Augmentation and Adjacency Strategic Concepts

### Digital Augmentation

Digital transformation in an organization, especially in traditional industries like manufacturing and construction, is often associated with improving the way that business has been done in the past. Initially, industries like these interpret digital transformation as *substituting* machinery or manual physical work with digital solutions like robotics (see Figure 1). The Internet of Things represents a further enabler for substituting, for example, traditional machine maintenance with remote and predictive alternatives to prevent or reduce machine downtimes.

Most success stories of digital transformation in SMEs are usually about digital substitution. However, this should not be the end point of an SME's digital transformation journey. Instead, new digitally enabled products and services can be added to the business model to augment the company's value propositions. Thus, *digital augmentation* not only replaces machinery or physical work with digital substitutes, but adds new elements to the company's value proposition based on the shared practices made possible by digital substitution (see Figure 2).

<sup>15</sup> See, for instance, Wessel, L., Baiyere, A., Ologeanu-Taddei, R., Cha, J. and Blegind Jensen, T. “Unpacking the Difference Between Digital Transformation and IT-Enabled Organizational Transformation,” *Journal of the Association for Information Systems* (22:1), March 2020, pp. 102-129.

**Figure 1: Digital Substitution**

More specifically, and analogous to "augmenting human intellect,"<sup>16</sup> digitally augmenting a business increases its capability to address complex customer needs, gain comprehension to suit a customer's particular needs and derive new value propositions. The increased capabilities comprise a mixture of new work practices, new data practices and new decision practices (see Figure 2), leading to new opportunities for value propositions that previously seemed impossible.

### Digital Adjacency

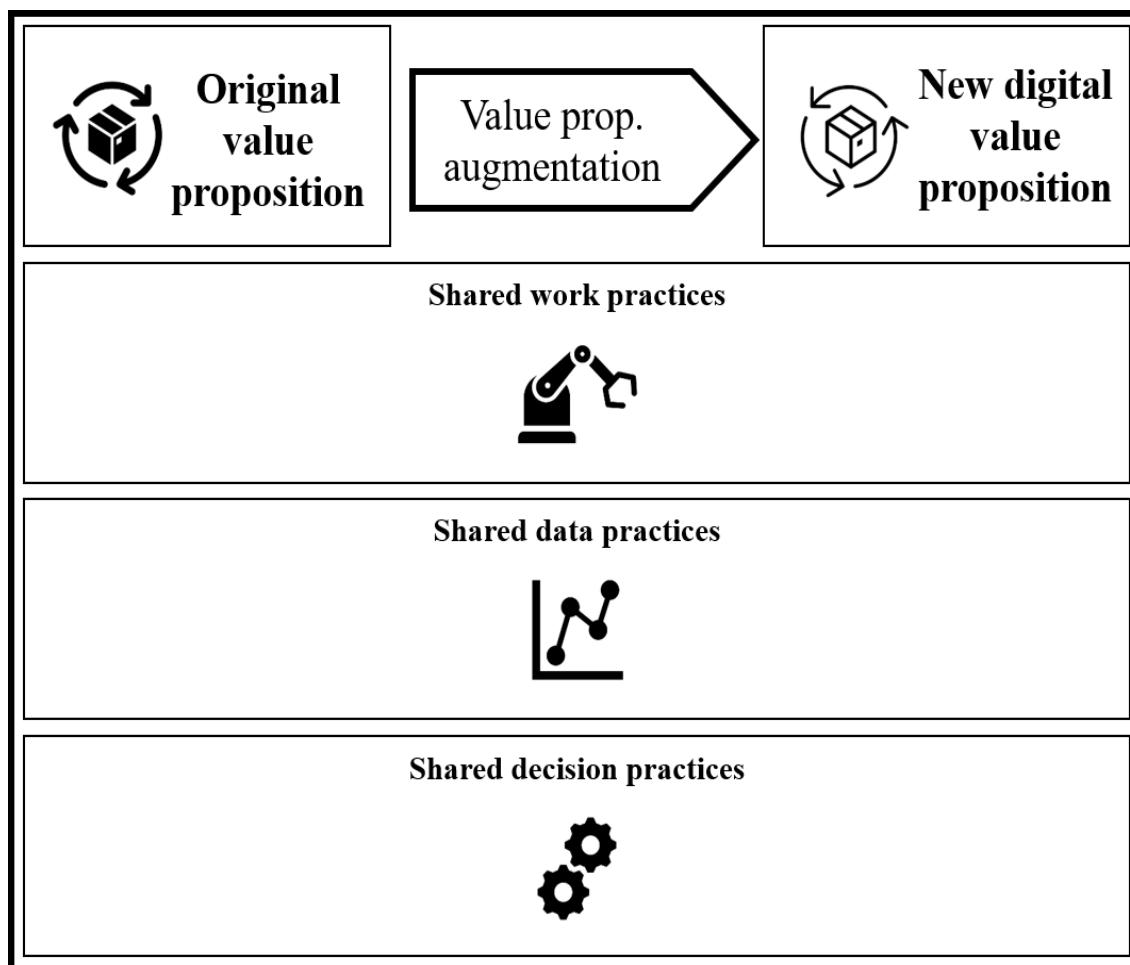
The innovation literature is rich in success stories of businesses that have explored new

markets and invented new business models in new industries for new clients. For established SMEs, such explorations of uncharted business territories can appear too distant, if not detached, from their perceived business reality. Such a radical shift can manifest itself, for instance, in the organization abandoning its traditional business and becoming a platform provider.

However, reorientation and greater distance from the original value creation leads to increased risks—for instance, in terms of unknown customers, legal requirements and unknown market mechanisms. To create new value propositions, however, SMEs do not need to enter uncharted business territories. Instead, the underexplored potential lies in the areas that are adjacent to their business (see Figure 3).

<sup>16</sup> For more information about the concept of augmenting human intellect, see Engelbart, D. C. *Augmenting Human Intellect: A Conceptual Framework*, Stanford Research Institute, 1962.

**Figure 2: Digital Augmentation Builds on Digital Substitution**



*Digital adjacency* involves establishing new business activities that are adjacent to the company's original business and leveraging its five organizational assets: customer, physical, data, human resources and cultural. Elements of all five asset groups remain adjacent to the digitally substituted and augmented businesses. In other words, adjacent augmentation in SMEs means that organizational practices leverage the existing organizational assets as the basis to provide a new digital value proposition and, at the same time, are constrained by these assets.

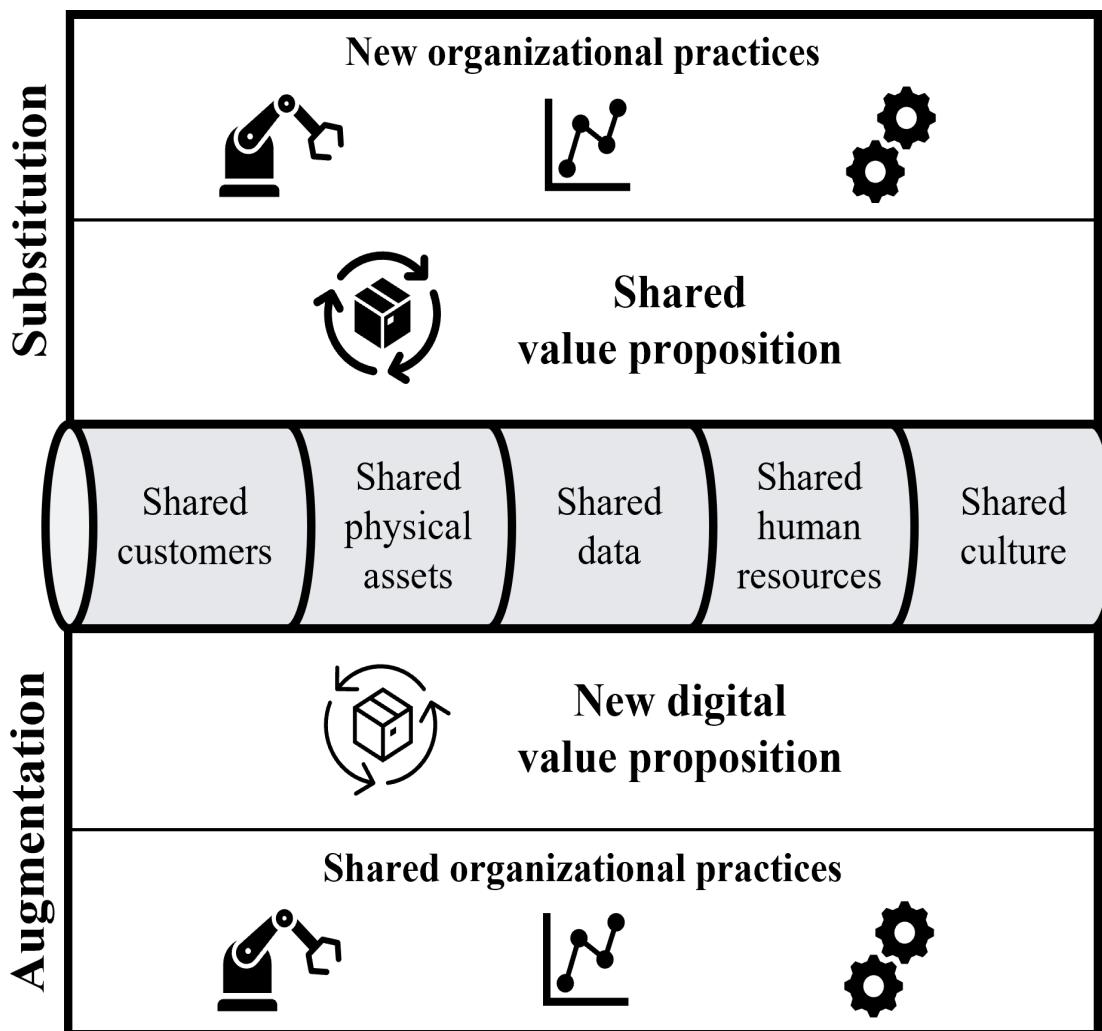
### Interplay Between Augmentation and Adjacency

The interplay of the *augmentation* and *adjacency* strategies is a key element of exploiting organizational opportunities in the

digital space to unfold a company's *augmented* business. Figure 3 in the following page depicts this interplay as a hinge, with the five groups of existing organizational assets representing the adjacency axis along which a new digital value proposition can be *augmented* (unfolded) as a complement to the substituted business. Hence, the *substituted* and *augmented* businesses can be seen as two *adjacent* plates of a hinge.

By digitally augmenting value creation adjacent to the substituted business, SMEs are able to digitally transform their businesses without having to abandon their traditional identity. The five groups of existing assets—customer, physical, data, human resources and cultural—can be leveraged to maximize synergies. The closer an SME remains to the adjacency axis, the more promising is the

Figure 3: Digital Adjacency Enables New Value Propositions



digital augmentation of the business model. The proximity of the value propositions to the existing assets facilitates successful digital transformation in SMEs by positioning the new *augmented* identity *adjacent* to the *substituted* (and reinforced) old one. The aim of digital transformation in SMEs is therefore to retain the substituted business, which is now done better and differently, while also creating an augmented business that provides new digital products and services that are adjacent to the existing organizational resources.

## Small and Medium-Sized Enterprises' Digital Transformation Challenges and Advantages

The definition of SMEs differs across national legal environments and can even vary depending on the local governing authority. In general, however, they are defined by staying within specified limits for their annual revenue and number of employees. SMEs are also subjected to specific regulations—for instance, for

bookkeeping and taxation.<sup>17</sup> SMEs account for a large share of individual countries' economies. For instance, in 2018 about 25 million SMEs accounted for two thirds of all employment in the European Union.<sup>18</sup> Similarly in the U.S., about 30 million SMEs represented about half of all jobs in 2015.<sup>19</sup> And in Australia, which is the geopolitical context for this study, 99% of businesses were SMEs in 2018, accounting for about 55% of the country's gross domestic product, mostly from the agriculture, real estate and construction industries. The Australian Bureau of Statistics distinguishes microbusinesses (four employees or less), small businesses (between five and 19 employees) and medium-sized enterprises (20 up to 199 employees).<sup>20</sup>

Because of their specific characteristics, SMEs have both limitations and benefits in terms of digital transformation.<sup>21</sup> Commonly identified challenges include limited financial resources and digital skills.<sup>22</sup> Compared to large enterprises, SMEs have limited physical, human, intellectual and financial resources. When digital transformation requires physical resources to be leveraged, SMEs will need to invest in additional resources, whereas large enterprises may have underused resources they can deploy. Similarly, for human resources: employees in SMEs often fulfill multiple roles in different departments or carry out additional roles needed to comply with regulations (e.g., data protection officer), while large enterprises usually have someone dedicated to these roles.

As a consequence, SMEs suffer from organizational inertia and often focus on

maintaining the status quo rather than innovating their business models.<sup>23</sup> Organizational inertia, however, is not limited to SMEs; large enterprises can also exhibit inertia but for other reasons, such as the complexity of their value creation constraining business model innovation. Though SMEs can innovate their business models more easily than large enterprises, they may not see this as a priority, preferring instead to focus on sustaining (rather than growing) their local competitive environments. The seemingly smaller opportunity for digital transformation in SMEs is reflected in initiatives by public institutions to support SMEs in their digital transformation<sup>24</sup> with a focus on securing funding (e.g., "Empowering Business to Go Digital"<sup>25</sup>) or digital skills and mentoring (e.g., "Small Business Digital Champions"<sup>26</sup>).

However, compared to large enterprises, SMEs have advantages in terms of a high degree of flexibility in their organizational structures, business processes and business models.<sup>27</sup> Their flat hierarchies facilitate fast and efficient horizontal communication between departments and vertical communication between management levels. SMEs also benefit from faster decision-making<sup>28</sup> because their stakeholder networks are more limited than large enterprises. Authorized personnel can make and execute faster budget decisions. SMEs can establish new partnerships with fewer additional administrative overheads, and business processes can be performed and adjusted on an ad hoc basis. They can switch employees, especially

23 See, for instance, Huang, H.-C., Lai, M.-C., Lin, L.-H. and Chen, C.-T. "Overcoming Organizational Inertia to Strengthen Business Model Innovation: An Open Innovation Perspective," *Journal of Organizational Change Management* (26:6), October 2013, pp. 977-1002.

24 See, for instance, Issa, A., Lucke, D. and Bauernhansl, T. "Mobilizing SMEs towards Industrie 4.0-enabled Smart Products," *Procedia CIRP* (63), 2017, pp. 670-674.

25 For more information, see *Establish a Business to Increase Digital Awareness*, business.gov.au, available at <https://www.business.gov.au/Grants-and-Programs/Empowering-Business-to-go-Digital>.

26 For more information, see *The Digital Champion Project*, The Small Business Association of Australia, available at <https://www.smallbusinessassociation.com.au/the-digital-champion-project/>.

27 See Lewin, A. Y. and Massini, S. "Knowledge Creation and Organizational Capabilities of Innovating and Imitating Firms," in Tsoukas, H. and Mylonopoulos, N. (eds.), *Organizations as Knowledge Systems: Knowledge, Learning and Dynamic Capabilities*, Palgrave Macmillan, 2004, pp. 209-237.

28 See, for instance, Vossen, R. W. "Relative Strengths and Weaknesses of Small Firms in Innovation," *International Small Business Journal: Researching Entrepreneurship* (16:3), April 1998, pp. 88-94.

**Table 1: Key Characteristics of Watkins Steel (2018)**

<b>Founded</b>	1968
<b>Employees</b>	75-80
<b>Factory Site</b>	3,500 m <sup>2</sup>
<b>Monthly Steel Processing</b>	200 tons
<b>Annual Revenue</b>	17 million dollars

those with multiple roles, between departments to accommodate short-term needs. Moreover, they can obtain missing skills and knowledge via internal working groups or by learning with or from other organizations.<sup>29</sup>

As a consequence, digitalization initiatives in SMEs may be less formalized than in large enterprises and less constrained by “path dependencies” (e.g., difficulties in breaking away from the existing value network),<sup>30</sup> potentially leading not only to incremental changes but also enabling radical business model change.<sup>31</sup> Furthermore, an SME’s CEO is the sole pace-setter of digital transformation and can therefore initiate and drive digital transformation with fewer constraints in terms of authority or justification.<sup>32</sup> These characteristics of SMEs can enable them to unlock the latent potential for digital transformation.

However, when SMEs decide to embark on a digital transformation journey, they face difficulties in identifying and prioritizing possible digitalization endeavors.<sup>33</sup> Because of the constraints they face, SMEs have to select their digitalization projects carefully, taking into account their limited resources, whether physical,

human, intellectual or financial. Moreover, SMEs tend to be risk averse when choosing digitalization projects, preferring “quick wins” that are easy to implement and have a high return on investment, rather than long-term business transformations.<sup>34</sup>

Below, we describe how Watkins Steel, an SME in the steel industry, capitalized on digital technologies by combining the *augmentation* and *adjacency* digital transformation strategies.

## Overview of Watkins Steel

Watkins Steel Pty Ltd<sup>35</sup> offers metalwork and structural steel fabrication as core services. At the time of our study (2018), it had over 75 employees who estimated, measured, drafted, fabricated and installed steel-related products. The SME processes about 200 tons of steel each month at its approximately 3,500 m<sup>2</sup> factory and serves local and overseas clients (see Table 1).

The SME-specific, opportunity-related and constraint-related attributes that influenced Watkins Steel’s digital transformation are depicted in Figure 4, along with the consequences of those attributes—fast knowledge transfer and decision-making (opportunity view in Figure 4) and organizational inertia (constraint view). Fast decision-making resulted from the loose allocation of human resources and less complex value creation compared to large enterprises. On the constraint side, limited digital skills and financial resources, and a focus on sustaining rather than growing its competitive position through innovation, resulted in organizational

29 See, for instance, Glückler, J. “Knowledge, Networks and Space: Connectivity and the Problem of Non-Interactive Learning,” *Regional Studies* (47), June 2013, pp. 880-894.

30 See Kesting, P. and Günzel-Jensen, F. “SMEs and New Ventures Need Business Model Sophistication,” *Business Horizons* (58:3), February 2015, pp. 285-293.

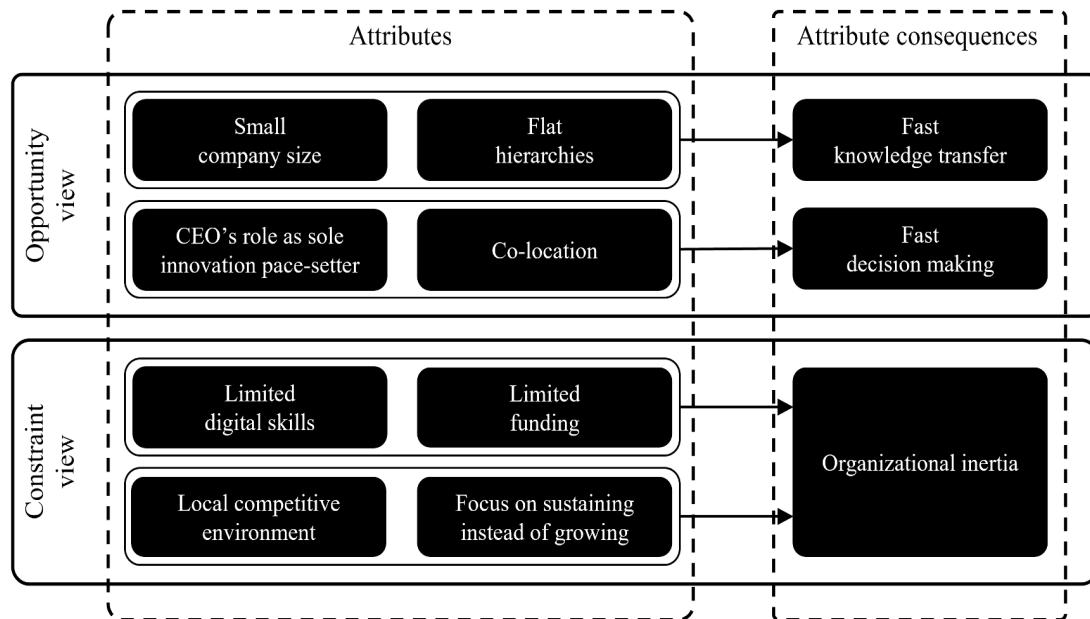
31 See Brunswicker, S. and Ehrenmann, F. “Managing Open Innovation in SMEs: A Good Practice Example of a German Software Firm,” *International Journal of Industrial Engineering and Management* (4:1), January 2013, pp. 33-41.

32 See, for instance, Abdul Hameed, M. and Counsell, S. “Assessing the Influence of Environmental and CEO Characteristics for Adoption of Information Technology in Organizations,” *Journal of Technology Management & Innovation* (7:1), March 2012, pp. 64-84.

33 See Heberle, A., Lowe, W., Gustafsson, A. and Vorrei, O. “Digitalization Canvas: Towards Identifying Digitalization Use Cases and Projects,” *Journal of Universal Computer Science* (23:11), January 2017, pp. 1070-1097.

34 See, for instance, *The Next Steps in Digital Transformation: How Small and Midsize Companies Are Applying Technology to Meet Key Business Goals*, IDC InfoBrief, sponsored by SAP, January 2017, available at <https://cofficient.co.uk/wp-content/uploads/2018/11/IDC-Infobrief-The-Next-Steps-in-Digital-Transformation.pdf>.

35 For information about Watkins Steel, see <https://www.watkins-steel.com.au/>.

**Figure 4: Watkins Steel's SME Attributes**

inertia. As described below, Watkins Steel was able to overcome the constraints during its digital transformation journey.

Before the digital transformation, Watkins Steel faced three types of operational challenges—*information-, communication- and labor-related*. Although these challenges were not the trigger for the company's rather opportunity-driven digital transformation journey, they are described below because they provide insight into the case's business context.

*Information-related challenges* arose from errors occurring when transferring information between various types of media, such as pen and paper, cameras and modeling software, and from information losses. For instance, there was often a disconnect between an architect's model (blueprint) and the reality on construction sites. Common causes for reality deviating from plans were physical constraints that were missing in the models or the inappropriate choice of the model's abstraction level. A Watkins Steel draftsman emphasized that "I can input and export the architect's [model. But] I don't want to because none of it is right."

*Communication-related challenges* were caused, for example, by excessive coordination

efforts and on-site meetings, and interfered with value creation. The presentation and clarification of product- or service-related specifications to multiple business partners at a construction site represented costly overhead, especially when digital technologies did not facilitate this communication. Watkins Steel's CEO said: "Traditionally, [employees] might have gone to a site with a notepad, a pen and a camera and taken a heap of notes."

*Labor-related challenges*, such as construction or production errors and unnecessary process steps, disrupted value creation and caused issues through, for example, malfunctions or delays. Together, these three types of operational challenges often led to "chest-beating" and the avoidance of responsibility, as recalled by a Watkins Steel draftsman: "You could spend weeks disputing this kind of thing with a client."

Despite the importance of these operational challenges, the primary aim of Watkins Steel's digital transformation journey was to reorientate toward opportunity-driven business development. As mentioned in the quote from Watkins Steel's CEO at the start of this article, prior to the transformation (digital) innovation was regarded as "just another buzzword" and

"steel fabrication ... [as something that] you cannot innovate." However, the CEO reported that there was a major shift in perception after "[we participated] in a design innovation course ... [about] identifying and recognizing new customer value." As a consequence, the company began to realign its value creation along strictly customer-oriented lines and began to search for and maximize opportunities to address customers' pain points, regardless of whether they were within or outside the traditional scope of a steel fabricator.

## Watkins Steel's Digital Transformation Journey

### Digital Substitution and Augmentation

Watkins Steel's digital transformation journey involved both the augmentation and adjacency strategies described above. But before taking these strategic steps, like its competitors, the company also made use of digital substitution. For instance, traditional steel cutting machines were continuously replaced by digitally enhanced alternatives that improved the quality and speed of steel cutting. Watkins Steel installed its first line of Voortman V808 robots in late 2014. Because the robot production line required more accurate information than could be provided by manual tape measuring, the company purchased its first laser scanner in early 2015. The robots

and laser scanner increased the manufacturing speed and precision of the steel fabrication products, which not only enabled Watkins Steel to overcome the challenges described above and minimize construction or production errors, but also increased the company's self-confidence. The latter was vividly expressed by the CEO: "Now [our products] just go through robotics, so we know it's going to fit."

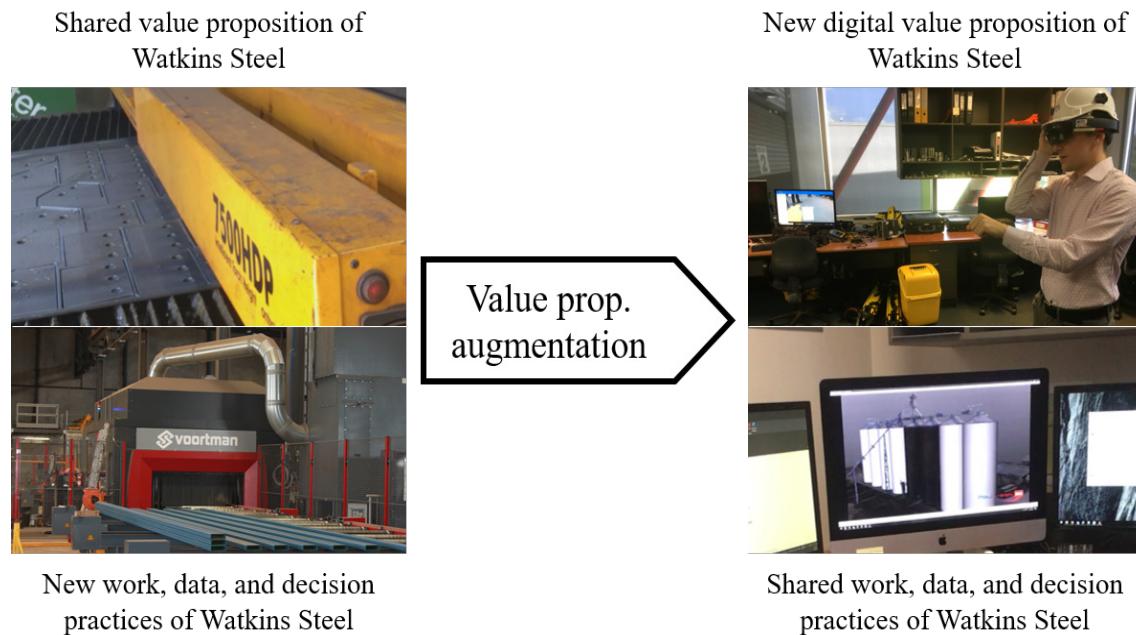
However, Watkins Steel wanted to go beyond digital substitution and began to augment its existing business model portfolio based on new digital technologies. As shown in Table 2, its IT investments included software solutions from RealWorks, EdgeWise and Tekla, and hardware such as smart glasses, portable 3D laser scanners and drones. Nevertheless, there was a degree of uncertainty about the technology's purpose, as acknowledged by the CEO: "[We] had an idea [for the new technology use]. But what we were going to use it for is completely different to how we are using it now."

These IT investments enabled Watkins Steel to augment its business model with new value propositions that could transcend the boundaries of the steel industry and the company's traditional steel fabrication business. Two examples demonstrate these new value propositions. First, by combining drones and 3D laser scanning, Watkins Steel carried out monthly measurements of sand deposits in

**Table 2: Watkins Steel's IT Investments**

Technology	Description
Vuzix	Visualization (augmented reality)
Microsoft HoloLens	Visualization (augmented reality)
Total Station	Scanning (measuring)
Drones	Scanning (assistance)
Trimble RealWorks	Modeling (detailing, e.g., coloring)
ClearEdge3D EdgeWise	Modeling (detailing, e.g., pipe modeling)
Trimble Tekla	Modeling (detailing, e.g., collision detection)
Microsoft Windows	General productivity
Microsoft Office	General productivity
Social Media (e.g., YouTube)	Marketing

**Figure 5: Digital Substitution and Digital Augmentation at Watkins Steel**



Substitution: Robotics for steel processing (left); Augmentation: Augmented reality construction exploration (upper right) and drone-based 3D laser construction site capturing (lower right)

the Port of Brisbane and reported the volume data as a service to a business partner. Second, the company used its measuring, modeling and visualization capabilities in an ambitious treehouse construction project. To enable the construction to be integrated into its environment, Watkins Steel provided 3D models and data for the fabrication of custom-shaped timber precuts so the treehouse could be built without having to cut any tree branches.

Digital augmentation not only provided new value propositions but also changed the role of Watkins Steel on construction sites. According to the CEO, “[We became the organization] that is ‘running the site’” by providing key information for the construction process that was previously very difficult to obtain. The company’s new capabilities based on augmented reality technology (smart glasses in combination with the increased precision of measuring and modeling) enabled it to visualize construction errors, create a shared understanding of building steps and clarify the overall progress of the construction process. Augmented reality also improved Watkins Steel’s communication

capabilities. Meetings with builders that were previously only possible on construction sites could now be held remotely and provided as a service even when the company was not involved in steel fabrication for the client.

The newly acquired capabilities also allowed Watkins Steel to easily identify apparent construction errors and treat these as opportunities instead of obstacles. According to a Watkins Steel draftsman, this allowed the company to “[prevent] souring any relation [with] the customer over the arguments. There’s no disputing it. [It is about] how [they are] going to fix [it].”

This is the point in Watkins Steel’s digital transformation journey when it moved beyond digital substitution to digital augmentation. The augmentation not only involved the introduction of new technologies (technological impact level), but also involved the implementation of organizational changes (organizational impact level) and the enhancement of the customer experience (social impact level).

At this stage of its transformation journey, the digital business of Watkins Steel thus

comprised its *substituted* business and *augmented* business. The former was digitally enhanced steel fabrication—i.e., using digital technology to create better or different ways of doing the original business. The augmented business, on the other hand, provided a new digitally enabled value proposition. The company was now doing new things that were outside the original business scope. Images that reflect this stage of Watkins Steel's digital transformation journey are shown in Figure 5.

### Digital Adjacency

As Watkins Steel progressed to the adjacency stage of its transformation journey, all five asset groups on the adjacency axis (see Figure 3) played significant roles.<sup>36</sup> The company stayed *adjacent* to these asset groups even when new value propositions were added to the business portfolio.

**Adjacency to Customer Assets.** Customer-centricity was a critical component of initiating Watkins Steel's digital transformation journey, which began when the company conducted the previously mentioned innovation workshop on delivering new customer values. Watkins Steel's traditional customers were construction companies that, according to the CEO, continually try to "win work" in a crowded competitive market for private and government tenders. To capitalize on its customer knowledge, the company therefore offered the majority of its new augmented digital services *adjacent* to its existing customer base. Though these new services had different value propositions, Watkins Steel largely kept its customer base for both the *substituted* and *augmented* businesses. Even special orders, such as artworks (e.g., sculptures), often came from long-term customers that trusted Watkins Steel because of their prior business relationships.

**Adjacency to Physical Assets.** Watkins Steel's major physical asset was its factory that housed all the machinery. There was also a separate "upstairs" office space for digital practices like 3D scanning and modeling that was adjacent to the "downstairs" fabrication hall. Employees could freely move between the downstairs

factory hall and the upstairs digital offices. As a result, the company not only kept communication and coordination costs low during the steel fabrication process but also increased the sense of belonging among employees.

**Adjacency to Data Assets.** All jobs, whether from Watkins Steel's digitally substituted or augmented business, generated and used data for value creation. The adjacency of the augmented business to data assets can be seen by the job-related data (e.g., measurements) used to initially improve the precision of steel fabrication now being used as the basis for new value creation. For instance, a complete 3D scan of a construction site served two adjacent purposes. On the one hand, it could be used for quality control in steel fabrication, where, in the words of the CEO, it was possible to "overlay the model to see if it's going to fit." On the other hand, said the CEO, "[the same model could be used for "running" the [construction] site," by providing business partners with information, for resolving conflicts and supervising the building process independent of any potential steel fabrication activities being run in the background. In the case of new services like visualization, data became the product itself with Watkins Steel monetizing the 3D models by selling the data.

**Adjacency to Human Resource Assets.** Adjacency with human resources was also evident in Watkins Steel's substituted and augmented businesses because organizational roles (e.g., a draftsman) were not rigidly assigned. Employees used the same digital skills, such as scanning, measuring, modeling and visualizing, both for original steel fabrication jobs and for industry-independent jobs. Many of the estimators and draftsmen had worked in non-IT jobs before joining the company. For instance, one draftsman told us "[I worked] as a boilermaker at another company." Adjacency in terms of human resources was, however, best demonstrated by the estimators and draftsmen who had previously worked in the downstairs fabrication hall before moving upstairs to the digital offices to learn the new skills.

**Adjacency to Cultural Assets.** The culture of Watkins Steel was characterized by a friendly, open-minded and trust-based working environment. Collaboration and idea-generation were proactively fostered by the CEO: "The

<sup>36</sup> In other contexts, additional asset groups such as "brands" might also be relevant for setting the direction for an SME's digital transformation.

culture of Watkins Steel is ... how can we do things differently?" This open-minded mentality spread across the entire company and facilitated the recruitment of people without previous experience using digital technologies and the movement of employees from traditional roles to new roles. This ensured that both the substituted and augmented businesses leveraged (and were therefore adjacent to) Watkins Steel's cultural assets. The increased passion for and affinity with IT and employees' willingness to learn new skills positively affected both the substituted and augmented businesses.

### The Interplay of Augmentation and Adjacency at Watkins Steel

The close interplay of augmentation and adjacency in digital transformation requires SMEs to plan their transformation efforts according to the goals they want to achieve. Augmentation implies new digital value propositions, but digital substitution-type investments might be necessary to realize that value. At Watkins Steel, aspects of its new services, such as producing steel components precisely shaped to site measurements, would not be possible without first substituting manual steel cutting with a robot production line. An interesting question is which comes first: Does an augmented business model create a need for some digital substitution in the original model, or does substitution enable the transition toward a new augmented digital business model? In the case of Watkins Steel, the latter was largely prevalent. But as the augmented business model is further developed, it will likely become the driver of change in the original model, rather than being a mere beneficiary of changes in the previous core side of the business. For example, it is possible that some of Watkins Steel's digital augmentation developments may require the steel fabrication production lines to be upgraded to enable new capabilities and provide new value propositions.

Adjustments to the five asset groups along the adjacency axis (see Figure 3) might also be required for augmentation to be possible. For example, the introduction of digital tools might require a more appropriate physical space—it is hard to imagine Watkins Steel's draftsmen being located right next to the steel cutting robots. As explained above, the adjacency axis at Watkins

Steel has remained mostly unchanged. In fact, adjacency to its existing customers, as well as physical, data, human resources and cultural assets was a key success factor for Watkins Steel's augmentation strategy. This implies that an SME embarking on a digital transformation journey should determine which aspects of the organization should remain relatively unchanged (i.e., its adjacent pathway) while the digitally augmented business model is developed. Adjustments (such as new types of physical spaces) might need to be made in response to the developing augmented business model, as the new requirements are potentially hard to predict. This is consistent with other types of responsive behavior in SMEs—for instance, moving to a larger site when the company outgrows its current site. As the CEO of Watkins Steel stated: "We have got to find a new factory."

Watkins Steel's digital transformation journey has enabled it to move away from the traditional steel fabrication value chain. Instead of just transforming its steel-related products into services, it augmented its business by adding entirely new digital services, which, however, remained adjacent to its core business. Although it initially used its steel-related products as a vehicle for digital service delivery, the importance of this approach diminished as its digital services began to be offered beyond the construction domain. Thus, the interplay between augmentation and adjacency at Watkins Steel enabled the company to ultimately establish what we refer to as a *hybrid* organizational identity that includes both digitally substituted business and new digitally augmented business.<sup>37</sup>

Compared to the traditional service-dominant logic,<sup>38</sup> digital services are associated with a plethora of benefits (e.g., scalability) but also pose the challenge of managing an additional and complex technological layer. Watkins Steel leveraged the strategic concepts of augmentation and adjacency to successfully tackle this additional complexity.

<sup>37</sup> As mentioned earlier, organizational identity can be either "reinforced" or "new." In the case of Watkins Steel, we observed a hybrid organizational identity that combines characteristics of both.

<sup>38</sup> For more details about service-dominant logic, see, for example, Vargo, S. L. and Lusch, R. F. "Institutions and Axioms: An Extension and Update of Service-Dominant Logic," *Journal of the Academy of Marketing Science* (44:1), July 2016, pp. 5-23.

In addition to augmenting the substituted business, Watkins Steel's digital transformation resulted in a new brand, Holovision,<sup>39</sup> for its non-steel-related digital services spinoff. This new brand coexists *adjacent* to Watkins Steel because Holovision operations are, for instance, based in the same factory halls and share employees. Thus, the transformation path followed by Watkins Steel not only grew the original business through digital substitution and augmentation, but also built up a second SME that had a strong symbiosis with the original substituted business. Large enterprises are capable of building up or even buying digital-native businesses for strategic reasons but may not need to align these businesses with their corporate portfolios. SMEs, however, may lack the capacity to take over other companies. But, as the Watkins Steel case shows, they have the latent potential to build up their own digital business adjacent to their original business. This type of digital transformation is not limited to SMEs in specific domains or with specific characteristics.<sup>40</sup>

## Lessons Learned from the Watkins Steel Case

The adjacent augmentation path followed by Watkins Steel led to success and enabled it to become a local leader in providing digital services at construction sites. As a consequence, the company's role in the supply chain was elevated from being just a provider of fabricated steel to coordinating and managing the construction process and thus becoming a crucial component in collaboration between contractors on construction sites. The continuing digital transformation transition at Watkins Steel (which began in 2015) provides a rich source of insights in the form of seven lessons learned, which are summarized in Table 3 and described below. The first five relate to the augmentation strategic concept and the last two to the adjacency strategic concept.

39 For information about Holovision, see <https://www.holovision.com.au/>.

40 One example is Lightweave, a Brisbane-based digital-native business providing augmented reality services. Lightweave augmented its business by building up a second brand, District, for its mobile app for runners, which makes extensive use of the augmented reality-related capabilities of the original business. For more information, see <https://www.lightweave.co> and <https://www.exploredistrict.com>.

Each lesson, either directly or indirectly, can help an SME perform a digital transformation similar to that of Watkins Steel's—i.e., augmenting the business through a digital service provision that is adjacent to the company's assets. Together, they show how the organizational inertia inherent in SMEs can be overcome.

## Lessons Relating to the Augmentation Strategic Concept

**1. Contagious Leadership and Pace-setting.** Digital transformation requires people from different organizational layers (e.g., operations and management) to be responsible for advocating, initiating and executing the transformation. Innovation cannot flourish in an environment characterized by caution and reservations; thus, following the adjacent augmentation path of an organization requires a degree of openness, flexibility and reinforcement. This can be especially challenging for an established organization that lacks a Silicon Valley-like innovation culture or a dedicated intermediary organizational layer that oversees digital transformation.

The Watkins Steel case shows that top management can effectively compensate for the lack of an innovation culture and kick-start the process of augmenting substituted business with a digital counterpart that is adjacent to the already used resources. A motivating and encouraging mindset in top management is contagious and will spread throughout the organization and reinforce a sense of responsibility, making employees proud of the digital augmentation they are jointly driving. According to Watkins Steel's CEO, when draftsmen talked about their work "their shoulders go back and their chests [go] out." The resulting self-confidence allows employees who worked and interacted with business partners to run the construction site since they have the advantage in terms of information and knowledge.

Thus, leadership that provides contagious employee motivation and encouragement is a prerequisite and the basis for successful digital augmentation. However, since the CEO in an SME is usually the sole pace-setter, digital transformation depends on the CEO being willing to engage in and having an affinity for

**Table 3: Strategic Roadmap for Mastering the Digital Commons Ecosystem Game**

No.	Lesson	Description	Watkins Steel Case
<b>Lessons Relating to Augmentation</b>			
1	<b>Contagious Leadership and Pace-setting</b>	Communicate excitement and optimism and provide top-down encouragement about the potential of digital transformation and drive the change	Draftsmen were able to communicate the excitement of Watkins Steel's CEO to business partners and clients on construction sites
2	<b>Embracing Constraints</b>	Use obstacles and mistakes as opportunities for digital augmentation	Construction errors were used, for instance, as part of a building's support structure
3	<b>Embracing Uncertainty</b>	Allow a degree of uncertainty in estimating the business value of digital technologies for emerging, unexpected opportunities	Participated in trade fairs within other industries and invested in new technologies without direct relation to value creation
4	<b>Unintended Technology (Re)combination</b>	Use and integrate existing technology to transcend the limits of IT solutions' intended purpose	Combined existing IT solutions for enhanced capabilities that benefited value creation
5	<b>Encouraging Experimentation</b>	Establish and encourage a culture of experimentation among employees to inspire digital augmentation	Created an environment of trust and allowed employees to purchase technologies they saw as promising
<b>Lessons Relating to Adjacency</b>			
6	<b>Customer-Driven Value Alignment</b>	Adopt a customer-centric mindset to identify and find solutions for customers' pain points and thus capitalize on the SME's strengths	Helped clients to win and retain contracts by providing them with a competitive advantage through advanced job visualizations
7	<b>Cultivating Your Own Digital Experts</b>	Focus on domain skills when recruiting and establish a learning environment for employees to become digital experts	Encouraged employees to educate themselves on a regular basis, for instance, by attending workshops

potential (digital) innovations. If the CEO lacks these characteristics, an SME should appoint another qualified management authority to be responsible for its digital transformation.

**2. Embracing Constraints.** When SMEs digitally augment their substituted business, sources of inspiration for innovation are not limited to business opportunities. Sometimes, digital augmentation can be triggered by obstacles and deficiencies in business operations. Like all companies, SMEs are constrained by physical, economic, legal and social boundaries, all of which can create obstacles to doing business. Inevitably, there will be errors and

problems caused both by the SME and external parties. However, instead of working around a problem, SMEs can make it part of the value creation process. For instance, Watkins Steel draftsmen told us that instead of spending "weeks disputing [construction problems]," employees could instead focus on trying to find a way of exploiting the problem to create business value. The problem cited was "beams sticking out," which were then used as part of the supporting structure for a staircase. Through digital augmentation of its substituted business, Watkins Steel developed the ability to scan, detect and incorporate construction errors into its

designs and sell information about the errors as a service.

SMEs may also face nonphysical constraints (e.g., seemingly unnecessary process steps), which can also offer opportunities for new value creation. For instance, employees continuing to engage in work activities that management believes are unnecessary or undesirable could represent a good starting point for embedding these activities into new value creation, especially if they contribute to, or have the potential to contribute to, positive outcomes.

SMEs are well placed to overcome innovation constraints because of their quick decision-making and less complex value creation. This allows them to respond to what might initially seem to be errors in a context-sensitive and flexible manner. SMEs are less constrained by their corporate boundaries than large enterprises, which, for example, may need to collaborate with a specific partner on projects.

**3. Embracing Uncertainty.** As with every digital transformation endeavor, there will be a degree of uncertainty as SMEs pursue digital augmentation, especially if experimentation is involved. This uncertainty, however, can have a positive influence on digital augmentation with respect to personnel and investment. Hiring employees who are willing to learn is more important than finding employees with domain knowledge or who have already mastered specific digital technologies. Hence, digital augmentation can be supported by looking for potential IT-savvy employees, whether they are existing employees or new recruits, who will be comfortable with a high level of uncertainty in their roles.

Digital augmentation can also be supported by investing in new digital technologies without having any immediate plans for capitalizing on them. Ideas from other industries might foster digital augmentation by identifying solutions for problems that competitors do not yet face. For instance, Watkins Steel's CEO told us "[At trade fairs, we tried] finding out what other people are doing in [other domains] and adapting it to steel fabrication." However, the CEO said the company was uncertain about the purpose of the digital technologies it acquired: "[We] had an idea [for the new technology use]. But what we were going to use it for is completely different to how we are using it now."

Although SMEs are initially constrained by limited digital skills and financial resources, they can take advantage of fast knowledge transfer, enabled by their looser resource allocation. As in the Watkins Steel case, other SMEs can foster knowledge exchange either within or from outside the company to exploit digital technologies for value creation.

**4. Unintended Technology (Re)combination.** The combination and orchestration of different IT solutions is a primary source of digital augmentation. When organizations experiment with dedicated IT solutions, they unavoidably hit limits in terms of functionality. Experimenting with digital technologies is constrained by an IT solution's individual capabilities and thus reduces the chances of finding unexpected features that can address identified challenges. However, established interfaces and standards allow software and hardware to be combined (or recombined). Thus, new capabilities can be unlocked by integrating different IT solutions, whether this integration is intended (e.g., by using interfaces and standards) or, to a certain extent, enforced (e.g., software workarounds or, in the case of Watkins Steel, using duct tape to attach a camera to a drone).

IT solutions do not always have to be a perfect fit for the problem at hand. Often, a minimally viable product is enough to do the job. For example, Watkins Steel started to imagine use cases that had not been promoted by IT solution providers. The CEO told us that the company had combined "different software and different applications [and] found new applications that give ... benefit [in terms of value creation.] ... Even when we thought [we] would [need to] invest in some other software to get [the job done], ... [our employees] managed to do it with what they [already had.]"

SMEs' limited financial resources and the resulting perceived constraints in the acquisition of new technologies often lead to organizational inertia. However, their combination of fast knowledge transfer and fast decision-making provides fertile ground for value-adding technology (re)combinations without having to acquire new technologies, even if this is not apparent at first glance.

**5. Encouraging Experimentation.** Another source of inspiration for digital augmentation

is for an SME to advocate and support experimentation with digital technologies. Although top-down contagious leadership can foster digital augmentation innovation, employees must eventually implement and live with the changes. SMEs can therefore facilitate digital augmentation by encouraging employees to experiment and make independent decisions. Watkins Steel's CEO takes the idea of experimentation with digital technologies to a new level. Searching for a fitting metaphor, he stated: "The best resource I can give [my employees] is a credit card [so they can purchase technologies and start] playing around with [them]." His governing principle is: "If you want to get it, buy it" even if this meant the company was "still working out ways ... [it] can use [newly acquired digital technology]" as employees experimented with the technology to augment value creation.

Typically, SMEs do not have dedicated innovation units for experimentation beyond typical R&D activities within the organization. Because of their fast knowledge transfer enabled by, for example, rather flat hierarchies, SMEs should therefore conduct augmentation experiments adjacent to their existing value creation.

## Lessons Relating to the Adjacency Strategic Concept

### 6. Customer-Driven Value Alignment.

The adjacency concept implies that new digital services are provided to existing customers instead of addressing new customer segments. Creating new value propositions in mature and formalized relationships with business customers can be challenging and may require SMEs to look at customers in a different way. Similar to how organizations serving the consumer market aim to gain a deep understanding of their customers, an SME should aim at uncovering its business partners' needs and pain points, especially when, in the words of Watkins Steel's CEO, "[business customers do not even know] what their pain points [are]." Understanding their business customers helps SMEs to capitalize on their strengths and compensate for their weaknesses. By collaborating and cooperating with business customers, SMEs are explicitly seeing them as contributors to their own success.

Digital technologies enable SMEs to be flexible in finding solutions for business customers' needs and pain points. A vivid example is provided by the Watkins Steel case, where the company focused on its business customers' (i.e., builders) needs by addressing the question "How can we help builders win work," which was a significant pain point for builders. The company's digital service provision (e.g., visualization of construction errors) helped its business customers win more contracts. In turn, addressing this customer need ensured future collaboration with customers in both the substituted and the augmented businesses.

Regardless of whether SMEs operate in consumer or business markets, customer-driven value creation is a key factor for their success.<sup>41</sup> They can leverage their fast decision-making to align value creation adjacent to customers' needs and thus stay as close to their customers' success as possible.

### 7. Cultivating Your Own Digital Experts.

In the increasingly digitalized world, the way digitally enabled practices (e.g., 3D modeling) and digital techniques (e.g., data analysis) are applied is similar regardless of the industry in which they are applied. As a consequence, domain knowledge (rather than digital skills) has become a key factor when it comes to finding new employees. SMEs can constantly improve their value creation capabilities by proactively funding and cultivating the use of domain knowledge to exploit standardized digital technologies. According to Watkins Steel's CEO, a major driver of its success was to give employees with domain knowledge "freedom and [invest] in [their digital] training," and to encourage them to educate themselves by, for example, attending trade fairs, workshops and courses. A draftsman at Watkins Steel said: "[Independent of seniority], every day ... [employees are] learning something new."

Synergies with the digitally substituted business can help to create the budget for cultivating digital expertise. Watkins Steel's CEO told us that when the company started to digitalize its measuring processes, it "could

<sup>41</sup> Similar phenomena concerning "customer intimacy" have been discussed in the context of hidden champions. See, for instance, Rant, M. B. and Černe, S. K. "Becoming a Hidden Champion: From Selective use of Customer Intimacy and Product Leadership to Business Attractiveness," *The South East European Journal of Economics and Business* (12:1), April 2017, pp. 89-103.

self-fund ... [its] R&D because [the employees] would have had to go to the site ... to get the measurements anyway." This shows that SMEs can overcome the initial lack of digital skills without implementing dedicated training services or by sourcing external training services with a noticeable disconnect from value creation. SMEs' fast knowledge transfer enables them to cultivate their own digital experts close to their value creation without having to employ experts from the already scarce labor market.

## How to Apply the Lessons from the Watkins Steel Case

To help other SMEs apply the lessons from the Watkins Steel case, we have created an "adjacent augmentation canvas"<sup>42</sup> for capturing new digital augmentation ideas in a structured way (see Figure 6). This canvas synthesizes the essential elements of the digital augmentation and digital adjacency strategic concepts and can be used by SMEs as a guide for the creative process leading to adjacent augmentation, including identifying new organizational practices and new value propositions.

We recommend that the canvas is filled out during a workshop, following a five-step process.<sup>43</sup>

1. The first step is to capture the SME's existing value proposition. If several existing value propositions need to be considered, just one per canvas should be captured.
2. In the second step, core practices that support creating and delivering the existing value proposition should be sketched out on the canvas.
3. Adding the core practices to the canvas creates an opportunity in the third step to brainstorm opportunities for digital substitution—i.e., identifying new organizational practices that provide the same "shared" value proposition.
4. In the fourth step, the new organizational practices can be incrementally considered

<sup>42</sup> In management literature, an "idea canvas" is a diagram used to design the strategy needed to execute an idea.

<sup>43</sup> We have successfully used this process in a workshop to fill out the canvas with the executive team of an Australian automobile association.

as shared organizational practices (i.e., moved to the bottom of the canvas).

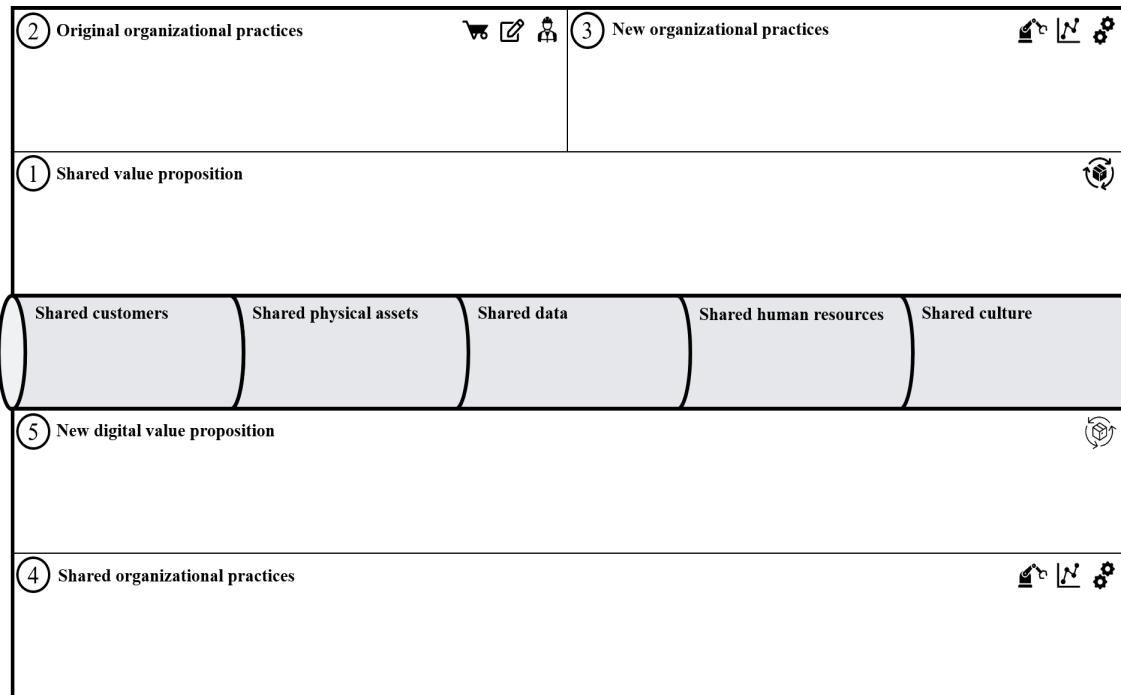
5. Finally, in the fifth step, the shared organizational practices should be discussed in terms of how they could be used to create new digital value propositions—i.e., augmenting the "shared" value proposition. During this step, the workshop moderator should regularly stress the difference between the top and bottom of the canvas, emphasizing that the top represents the old (substituted) business and the bottom the new digitally augmented business.

After completing the five-step process, we recommend that workshop participants discuss the shared organizational assets in terms of their adjacency, considering, for instance, whether the same customers, physical assets, data, human resources or culture will be used to create and deliver the new digital value proposition. A brief explanation of the outcomes of these considerations should be added to the canvas. These organizational assets form the basis for the adjacent augmentation approach. Each new idea for an adjacent augmentation requires filling out a new copy of the canvas so it can be mapped to the shared organizational assets and practices needed for the new digital value proposition.

As an example of how the canvas works in practice, Figure 7 shows the completed adjacent augmentation canvas for Watkins Steel's 3D laser-based measuring service.

## Concluding Comments

The time to embark on a digital transformation journey is when the business is thriving. However, even in an economic boom, companies tend to focus on their established value creation and hesitate to invest in digital transformation. In particular, the complexity of digital transformation and the resulting uncertainty often leads to inertia in SMEs. Watkins Steel, a traditional steel fabricator, demonstrated in an inspiring way how to overcome this inertia by using its business assets and economic circumstances to tackle the complexity of digital transformation while retaining its original "DNA." The insights from this case help to redress the lack of digital transformation guidance for SMEs in the literature.

**Figure 6: Adjacent Augmentation Canvas**

Watkins Steel went beyond simply substituting existing parts of the business with alternatives based on digital technologies and progressed by using digital augmentation and digital adjacency. Adjacent augmentation relies on an organization's general readiness to embark on the digital transformation journey before it becomes an existential necessity. In fact, Watkins Steel acted during a favorable economic situation for its digital augmentation and, as emphasized by the CEO, continued to "keep it going ... [and] pushing" to continuously augment its value creation adjacent to its original business.

The lessons learned from the Watkins Steel case, together with our "adjacent augmentation canvas," serve as a guiding instrument and a source of inspiration for SMEs that are looking for new opportunities to initiate digital transformation without disconnecting from their original industry and value creation. Other SMEs can extend their opportunity space for introducing new digital technologies by augmenting their substituted business with a new digital "hybrid identity" that is a mixture of both

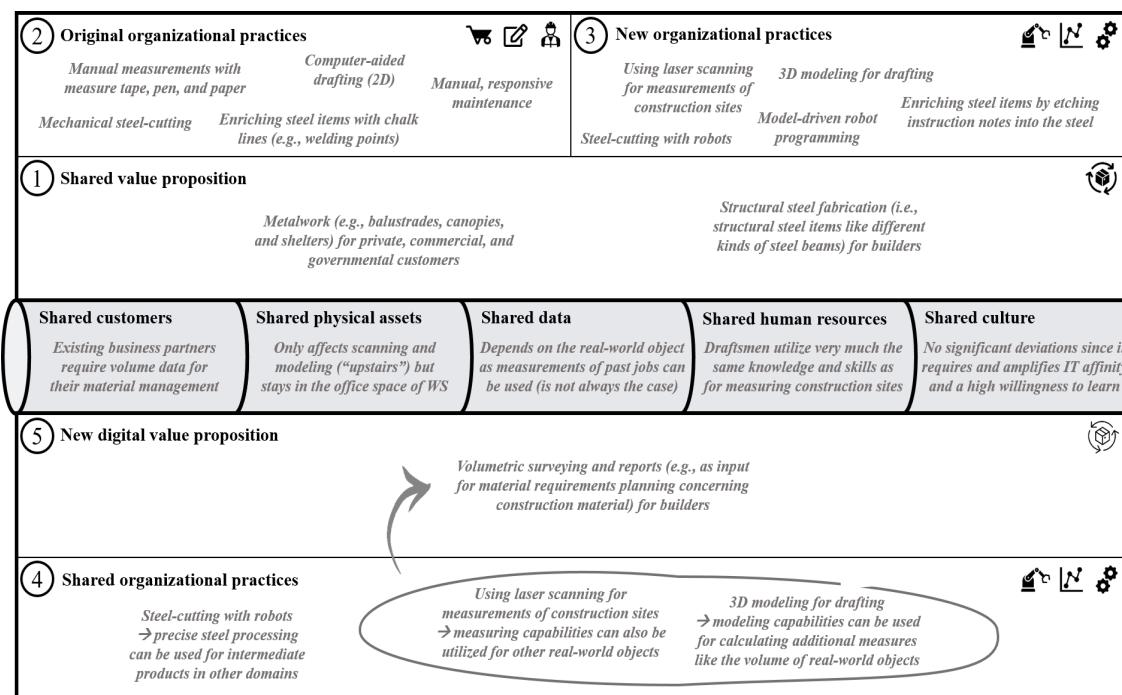
a new and the reinforced (i.e., substituted) old identity.

## Appendix: Research Approach

The insights presented in this article were derived from a comprehensive, single, in-depth case study of Watkins Steel, an SME providing steel fabrication services in Australia. The case study was a follow-up to one of the authors' extensive cooperation with Watkins Steel, which included joint conference appearances and site visits.

In addition to reviewing internal data sources, we conducted semistructured face-to-face interviews with nine representatives of the company (the CEO, a business development manager, a senior draftsman, four other draftsmen and two employees responsible for marketing and marketing and sales). The interviews, which were conducted on-site between mid-July and mid-September 2018, were transcribed and iteratively analyzed by three researchers following an open-coding approach that focused on the drivers, barriers, paths and impacts of the company's digital transformation.

**Figure 7: Adjacent Augmentation Canvas for Watkins Steel's Laser-Based Measuring Service**



The coding was informed by documentation produced from our factory tours (including photos taken) and external data, such as press releases, social media sites and conference presentations.

From the case study insights, and building on literature on digital transformation, the research team created a theoretical framework for analyzing the nature of Watkins Steel's digital transformation journey. In eight internal workshops, we conceptualized the digital transformation's success and derived lessons learned that could be applied by other SMEs in other industries or with different starting conditions.

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