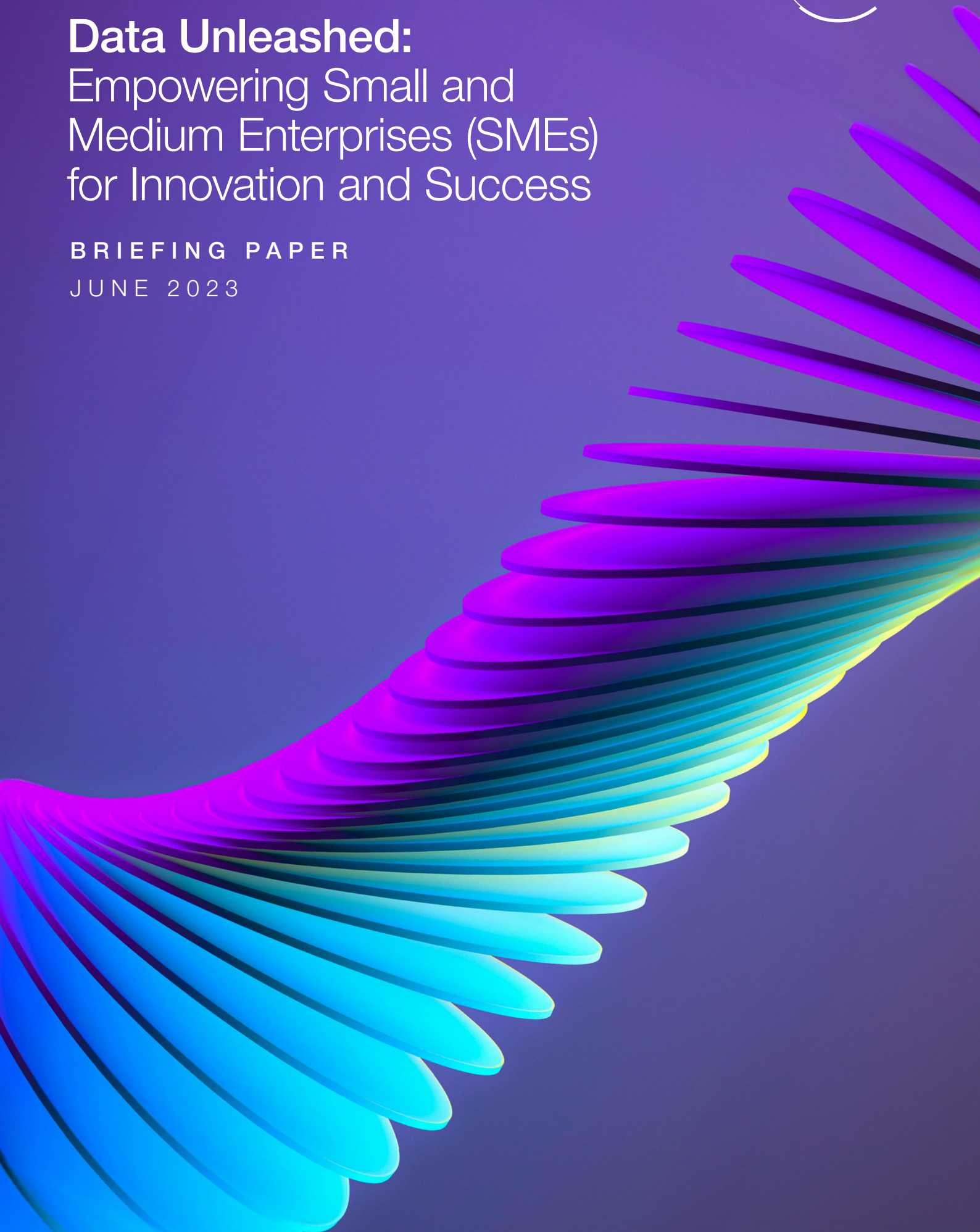


Data Unleashed: Empowering Small and Medium Enterprises (SMEs) for Innovation and Success

BRIEFING PAPER

JUNE 2023



Contents

Introduction	3
1 Key findings: challenges faced by SMEs	4
1.1 Lack of data policies and clarity on specific roles and responsibilities	4
1.2 Obstacles to extracting value from the data	6
1.3 Limited information technology (IT) infrastructure	7
1.4 Barriers to accessing global markets	8
1.5 Insufficient monitoring and reporting of sustainability data	10
2 Recommendations for SMEs	12
2.1 Taking stock of available IT infrastructure and prioritizing data needs	12
2.2 Advancing proactive data governance	13
2.3 Providing company-wide technical and data capacity-building	13
2.4 Building resilient IT infrastructure to facilitate scaling and going global	14
2.5 Promoting environmental responsibility and resource efficiency	14
3 Call to action	15
Conclusion	16
Contributors	17
Endnotes	19

Disclaimer

This document is published by the World Economic Forum as a contribution to a project, insight area or interaction. The findings, interpretations and conclusions expressed herein are a result of a collaborative process facilitated and endorsed by the World Economic Forum but whose results do not necessarily represent the views of the World Economic Forum, nor the entirety of its Members, Partners or other stakeholders.

© 2023 World Economic Forum. All rights reserved. No part of this publication may be reproduced or transmitted in any form or by any means, including photocopying and recording, or by any information storage and retrieval system.

Introduction

Small and medium-sized enterprises (SMEs) are the foundation of the global economy, representing 90% of all businesses and accounting for nearly 70% of global jobs and GDP.¹ These businesses power the supply and distribution chains of key industries.² SMEs also play a central role in society, helping to strengthen economic inclusion, supplying goods and services to poor and underserved markets and providing employment to many women entrepreneurs.³ These companies are also key drivers of innovation, offering fresh ideas and new products, being able to adopt change more quickly than large companies and having high growth potential.⁴

However, many of these companies are struggling to embrace the Fourth Industrial Revolution and face associated challenges, such as a scarcity of skilled employees or lack of access to capital.⁵ These limitations hamper SMEs' capacity to effectively manage and unlock the true value of their data resources and make well-informed and data-driven strategic decisions, which can significantly affect their opportunities for survival, prosperity and resilience in an ever-evolving business environment.

Recognizing the vital role of SMEs for the economy and job creation, as well as the data to drive the growth and expansion of these businesses,⁶ the World Economic Forum's Centre for the Fourth

Industrial Revolution conducted a survey from February-May 2023 to explore the key challenges and opportunities that SMEs face regarding data readiness (see Box 1). Based on the survey results and complementary analysis of secondary resources, the present publication provides recommendations to support SMEs to effectively use and manage data to achieve their business goals, advance their digital transformation, innovate, expand into new markets and strengthen their green growth and resilience for the future.⁷

The purpose of this publication is to highlight that data management needs are present within SMEs, irrespective of their size, location or sector. It aims to offer tangible recommendations that inspire and motivate these companies to advance in their journey towards becoming data-ready. It does not intend to generalize challenges faced by all SMEs or offer an all-encompassing list of recommendations. Every SME is unique, and recognizing and addressing its specific data needs is not only important but an indispensable strategic move to succeed in using data effectively, drive its operational efficiency and unlock untapped growth potential. SMEs are therefore encouraged to carefully review and adapt the recommendations in this paper, tailoring them to their individual business priorities and resources.

BOX 1

Research methodology

This publication defines "data readiness" as a company's state of preparedness to collect, process and analyse data to create organizationally valued outcomes.⁸ "SMEs" are defined as companies with fewer than 250 employees.⁹

This paper provides recommendations, based primarily on the analysis of survey responses collected between February and May 2023. A total of 111 individual responses were received from SMEs from 42 countries and 21 sectors.¹⁰ The survey was developed using Qualtrics, and included Likert-scale, multiple choice and open-ended questions. The survey was distributed

online through World Economic Forum channels and social media. The results presented in this work were obtained through a descriptive statistical analysis of the responses collected.

The main topics covered in the survey are data management and use, data protection and privacy, cybersecurity, information technology, cross-border data flows, and sustainability monitoring and reporting. The review of secondary sources helped design and select the questionnaire topics, as well as contextualize the analysis of the survey responses. The secondary sources used to develop this publication are cited throughout the text.

1

Key findings: challenges faced by SMEs

Many obstacles and constraints hinder SMEs' ability to fully realize their potential and drive robust growth.

Through extensive analysis of the survey results, five significant challenges have been identified. The identified challenges will be discussed in detail in the following sections. Please note that these challenges are listed in no particular hierarchical order.

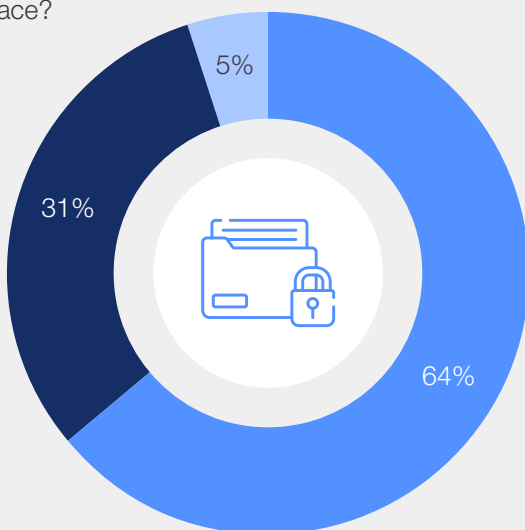
1.1 Lack of data policies and clarity on specific roles and responsibilities

Regardless of size or industry, every interaction, transaction and customer engagement of an SME generates valuable data points; for example, inventory records or sales figures, to name a couple. As SMEs accumulate this information, it becomes crucial for them to address privacy and security concerns, aligning their strategies with their unique priorities and resources.

In this regard, 64% of survey respondents claim to have a data privacy policy and 50% have a cybersecurity policy (see Figure 1). The lack of awareness and implementation of essential policies may pose significant risks, as it hinders data security and protection from unethical use.¹¹ This was reinforced by 74% and 58% of respondents, respectively (see Figure 2).

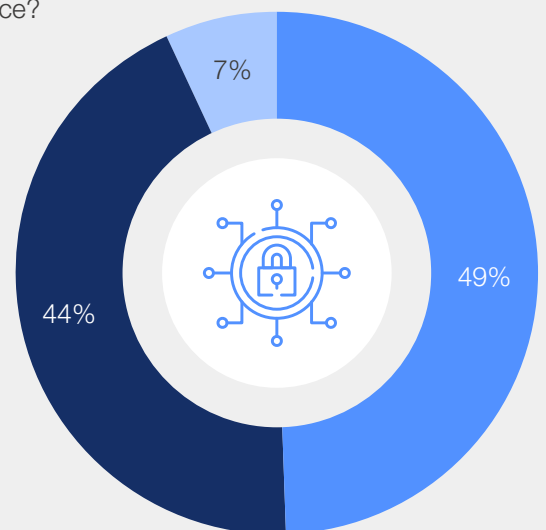
FIGURE 1 Existence of privacy and cybersecurity policies

Does your company have a data privacy policy in place?



Yes No Not sure

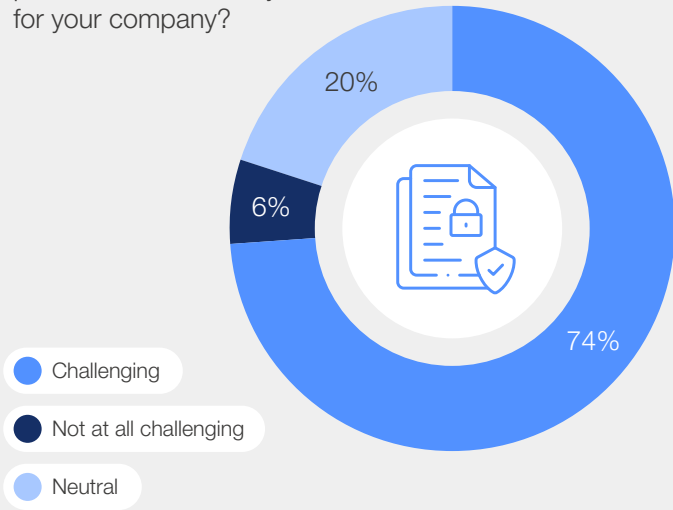
Does your company have a cybersecurity policy in place?



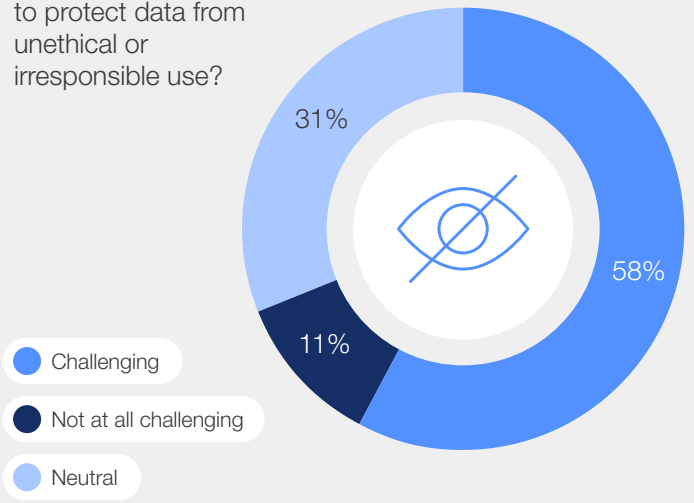
Yes No Not sure

FIGURE 2 | Challenges around data protection, security and ethical use of data

How challenging is data protection and security for your company?



How challenging is it for your company to protect data from unethical or irresponsible use?

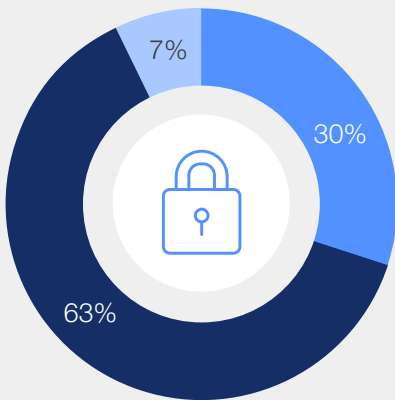


Furthermore, many SMEs have not appointed specific roles to design and implement data management strategies. Of the respondents, 63% reported not having a chief privacy officer (CPO). Similarly, 60% reported absence of the chief data officer (CDO) role and 60% of a chief information

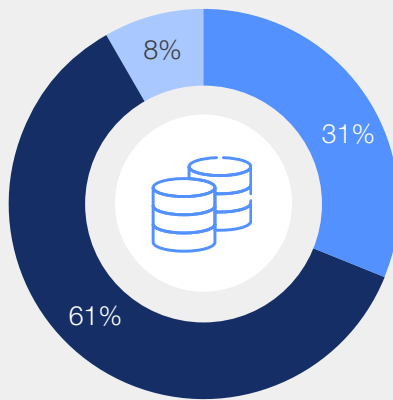
security officer (CISO) (see Figure 3). The lack of dedicated personnel for data management could be due to budget constraints,¹² lack of trained professionals in these fields,¹³ or these functions may already fall under other roles (as SMEs' employees tend to fulfil multiple roles).¹⁴

FIGURE 3 | Existence of personnel designated to perform data-related functions

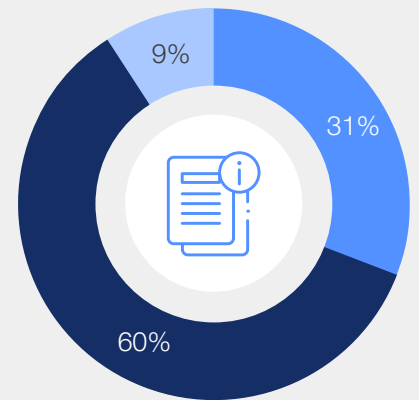
Does your company have a chief privacy officer, or equivalent?



Does your company have a chief data officer, or equivalent?



Does your company have a chief information security officer, or equivalent?



Yes No Not sure

While the technological infrastructure is necessary for SMEs' data readiness, it is important to note that technological solutions should be led by comprehensive data management strategies, and expert staff should be designated to coordinate their implementation and ensure compliance with current regulations.¹⁵ In fact, some regulations may require the creation of this role.¹⁶

SMEs need to be aware of the importance of having designated personnel and training staff in data management, for responsible data use, to minimize vulnerability to cyberattacks and to decrease unauthorized use or sharing of sensitive information, as these ultimately impact the reputation of the company and the experience and trust of consumers.¹⁷

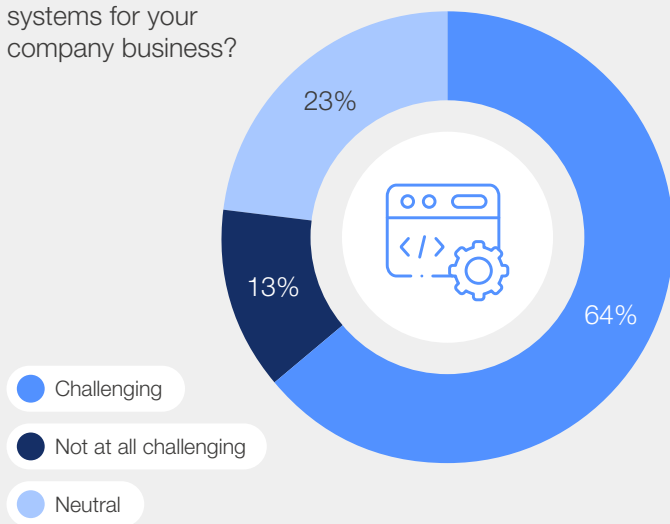
1.2 Obstacles to extracting value from the data

The true value of data lies in its use and the information that can be obtained from it, for example, to better understand customers and design marketing strategies. The advent of big data and other emerging technological developments (e.g. internet of things (IoT), artificial intelligence (AI), cloud computing, blockchain) create opportunities for businesses to innovate, compete and increase their productivity.¹⁸ However, based on our survey, 64% of SMEs find it challenging to effectively use the data from their systems and 74% struggle to maximize the value of their company's data

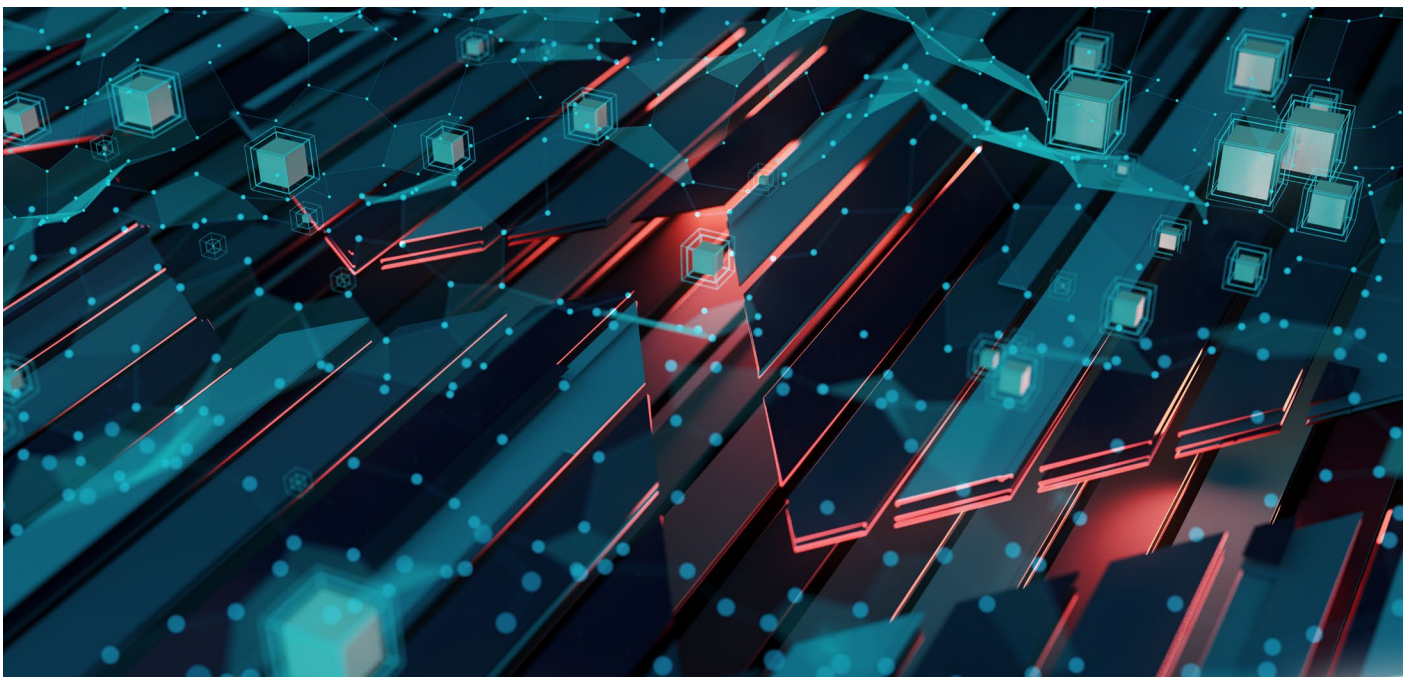
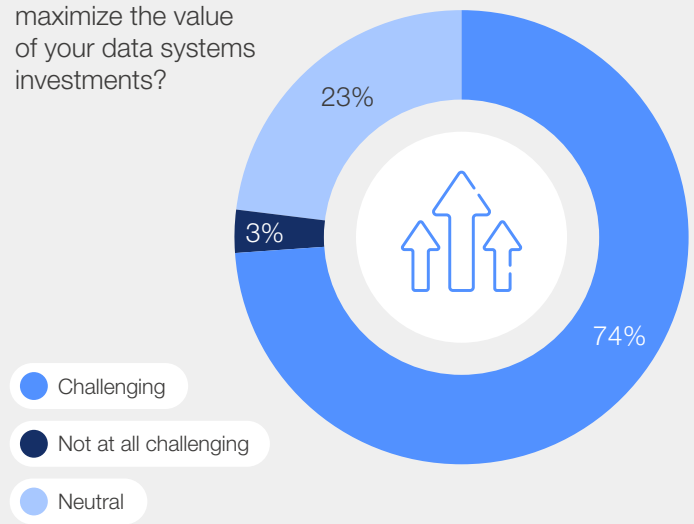
investments (see Figure 4). SMEs need to use data more efficiently and effectively, as the current challenges (such as the lack of a clear data strategy, coordinated IT systems, staff designed to oversee data operations and data literacy among employees) can lead to inadequate data use.¹⁹ Also, the prevalence of silos (i.e. the data remains scattered across multiple systems and departments within the company) not only hampers the timely retrieval and accessibility of pertinent data but also obstructs a holistic and interconnected understanding of the data insights.²⁰

FIGURE 4 Limitations in utilizing and maximizing the value of data systems

How challenging is using data from your systems for your company business?



How challenging is it for your company to maximize the value of your data systems investments?



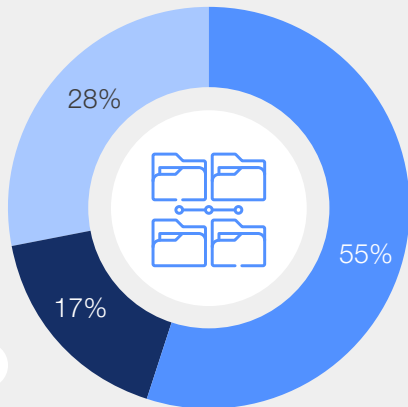
1.3 Limited information technology (IT) infrastructure

In today's business landscape, IT capabilities, including efficient data management and analytics, have become indispensable for supporting operations and achieving business objectives across all companies. However, the survey findings revealed that SMEs often face challenges in integrating and

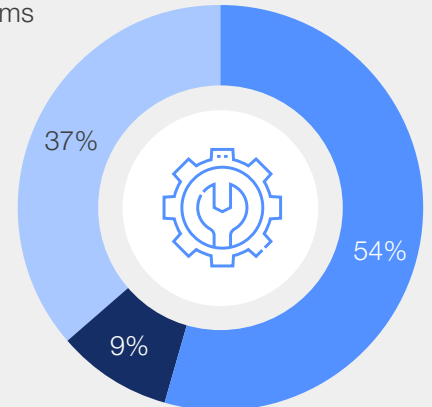
streamlining their IT systems: 55% reported difficulties in locating data, and 54% struggled to maintain data within their company's systems (see Figure 5). Several factors contribute to these challenges, including inadequate or fragmented data systems, limited IT infrastructure and a lack of data literacy within SMEs.

FIGURE 5 Limitations in utilizing and maximizing the value of data systems

How challenging is finding data within your systems for your company?



How challenging is maintaining data systems for your company?



SMEs may rely on a combination of in-house and outsourced IT solutions. For example, 53% of surveyed SMEs rely on both internal and external IT support, while 43% store their data in both the on-premises data centre and in the cloud (see Figures 6 and 7). While this combination offers some flexibility in terms of cost, security and accessibility, without

proper IT strategies and systems in place, SMEs may encounter issues such as security vulnerabilities, lack of interoperability and limitations to scale the business, which can affect their expansion into international markets and hinder effective vendor management. Prioritizing the development of robust IT capabilities is essential to address these challenges.

FIGURE 6 Where do SMEs source their IT support?

Does your company have in-house or outsourced business IT support to assist with technology needs, including data management and analysis?

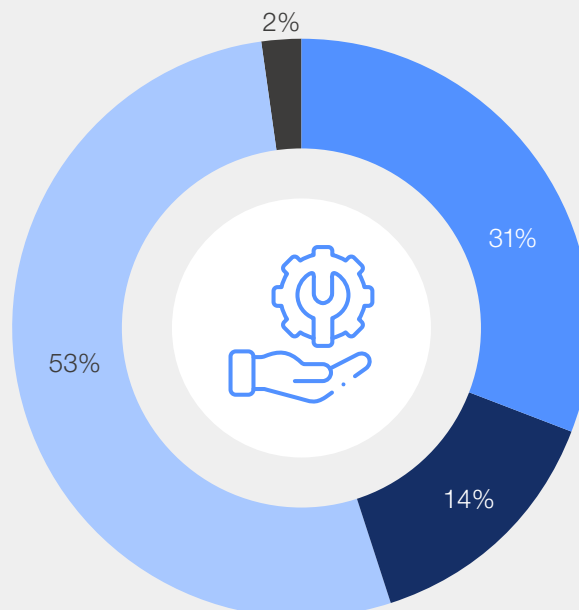
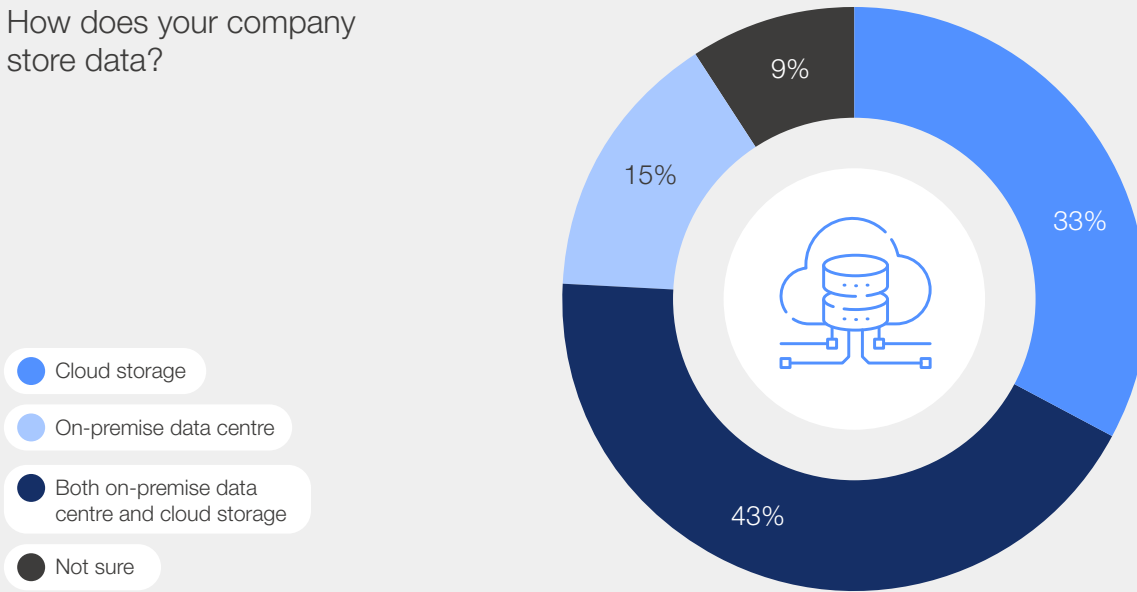


FIGURE 7 | Where do SMEs source their data storage?

How does your company store data?



1.4 Barriers to accessing global markets

For SMEs aiming to expand their operations into international markets or those already operating on a global scale, it is important not only to establish a robust and dependable IT infrastructure but also to comply with diverse trade and data exchange regulations, to ensure responsible and secure cross-border data flows as part of the global digital economy.²¹ Of the companies surveyed, 36%

operate in more than one regulatory jurisdiction (see Figure 8). Among those operating in more than one jurisdiction, conflicting, complex and unclear regulations, the frequent regulatory changes, and the added cost of keeping up with them were highlighted as some of the more prevalent barriers they have experienced while engaging in cross-border data flows (see Table 1).

FIGURE 8 | SMEs operating in more than one regulatory jurisdiction

Does your company operate in more than one regulatory jurisdiction?

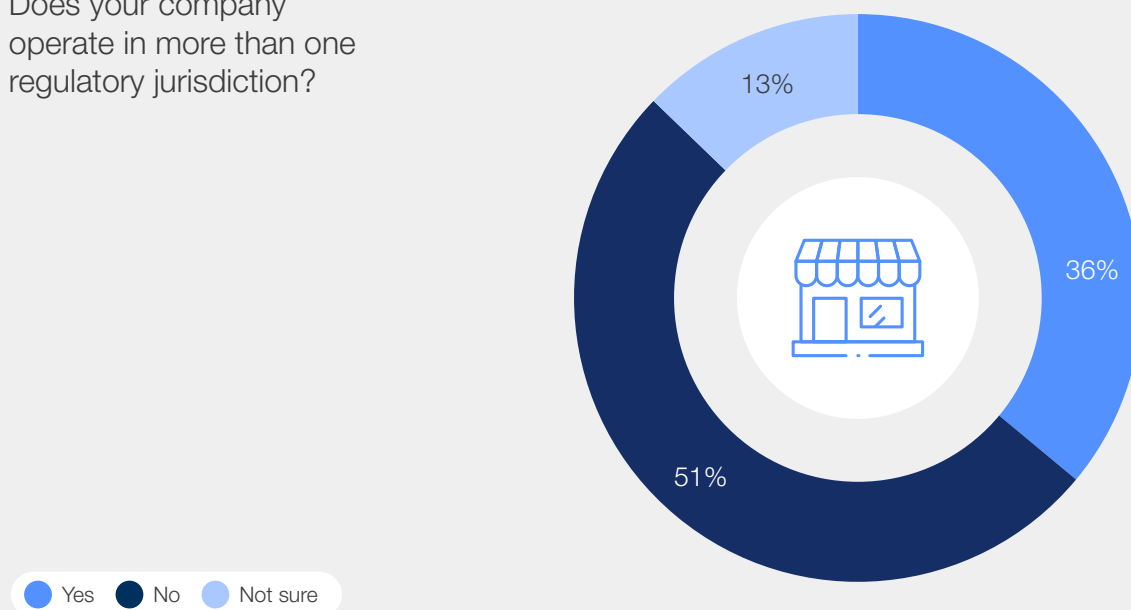


TABLE 1 | **Ranking of the main challenges related to cross-border data flows experienced by SMEs operating in more than one jurisdiction**

What are the major challenges your company faces with regards to cross-border data flows?

Ranking	Challenges
1	Complexity in legal requirements due to multiple layers of regulations leading to lack of transparency
2	Ambiguity in definitions such as “consent”, “personal data” and others
3	Conflicting regulations
4	Uncertainty in legal requirements due to frequent changes and additional research costs for companies
5	Technical barriers such as data security and privacy
6	Regulators’ limited understanding of the practical aspects of cross-border data flows
7	High costs involved in obtaining certifications for data handling
8	Other challenges

Note: The table above contains the responses to the question ordered from highest to lowest prevalence.

SMEs have immense untapped potential to position themselves as strategic players in the dynamic landscape of the digital age. In line with previously discussed challenges related to IT infrastructure and data storage, SMEs should understand how to securely store their data not only within their local jurisdiction but also in any

geographical location they operate. By adopting a comprehensive approach that encompasses a robust IT infrastructure, a deep understanding of cross-border regulations and proactive measures to safeguard data integrity, privacy and prevent cyber risks, SMEs can unlock opportunities for expansion into international markets.



1.5 | Insufficient monitoring and reporting of sustainability data

While SMEs individually have a relatively small environmental and carbon footprint, their combined contribution to greenhouse gas emissions is significant, accounting for at least 50% of the emissions from the business sector.²² SMEs play a major role in helping large companies implement and meet sustainability objectives throughout the value chain. To achieve this, these companies are required to strike a balance between increasing performance and meeting quality standards while reducing their impact on the environment.²³ This underscores the increasing importance for SMEs to embrace sustainability initiatives to combat the global climate crisis, optimize their operational efficiency and enhance their overall reputation.²⁴

However, the success of these initiatives hinges on the availability of high-quality data. When it comes to sustainability reporting systems, there are frameworks such as carbon disclosure.²⁵ Only 21% of respondents are aware of the benefits of carbon disclosure and actively track and report energy consumption and carbon emissions. Additionally,

only 25% of surveyed SMEs have some familiarity with this framework, but they are unsure of its business benefits (see Figure 9). The survey revealed that time, budget and other resources constraints (20%), as well as limited access to data from suppliers and customers (20%), among other factors, hinder the implementation of carbon disclosure reporting (see Figure 10). Technical training on carbon reporting (27%) and standardized guidelines or simplified frameworks for carbon reporting (20%) are conditions identified by surveyed SMEs that could improve their carbon disclosure practices (see Figure 11). Considering the broader challenges surrounding data maintenance, access and use, companies should ensure that current sustainability indicators reporting meets global or industry-wide standards.

Thus, by adopting transparent and rigorous sustainability reporting practices, SMEs cannot only help mitigate the climate crisis, but also unlock new business opportunities, strengthen their market position and meet changing stakeholder expectations.

FIGURE 9 | Awareness of carbon disclosure

Are you aware of the concept of carbon disclosure (tracking, measuring and reporting of greenhouse gas emissions and energy consumption) and the benefits for your company?

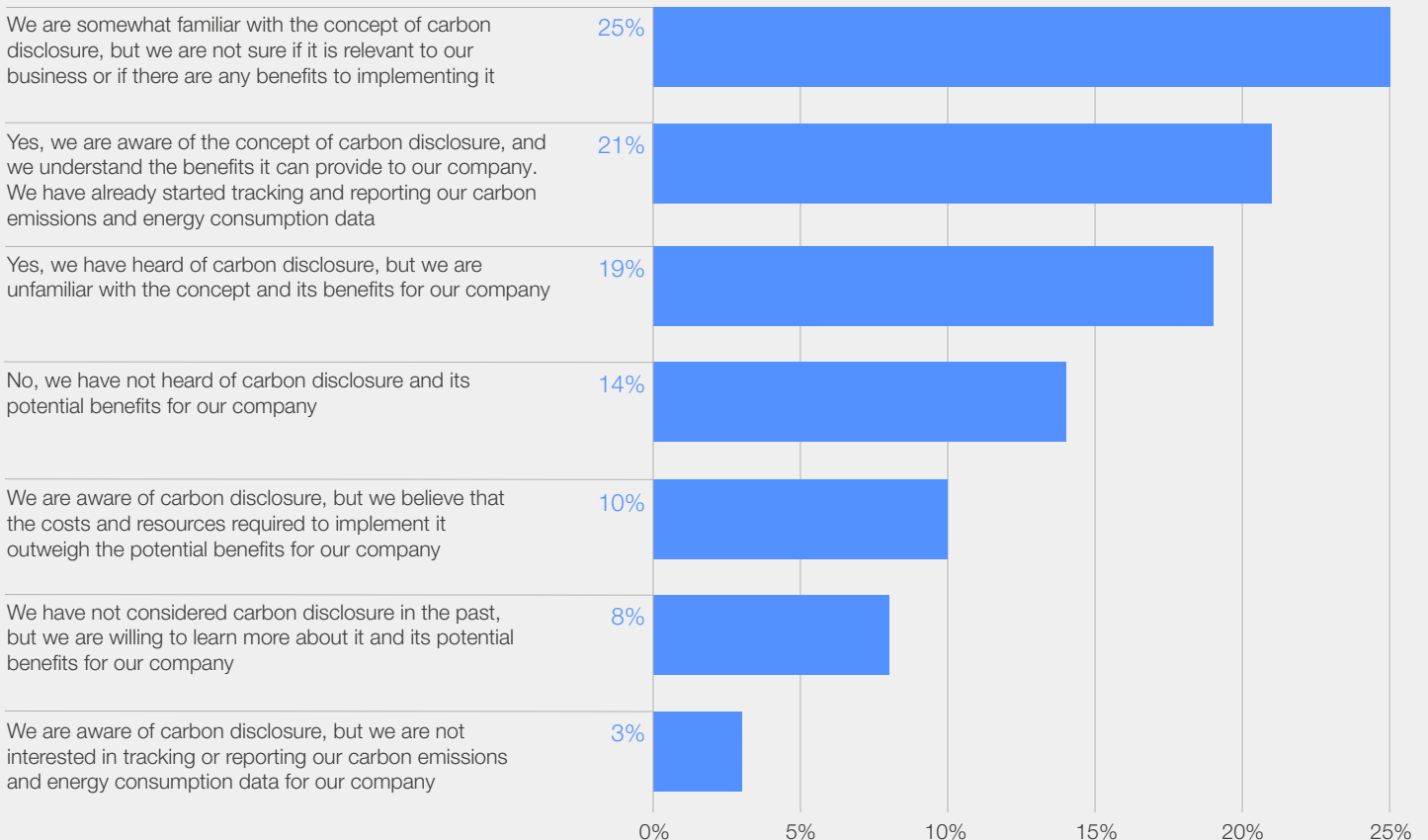


FIGURE 10 | Difficulties SMEs have encountered in collecting and reporting carbon disclosure

What difficulties have you encountered in collecting and reporting your carbon disclosure?

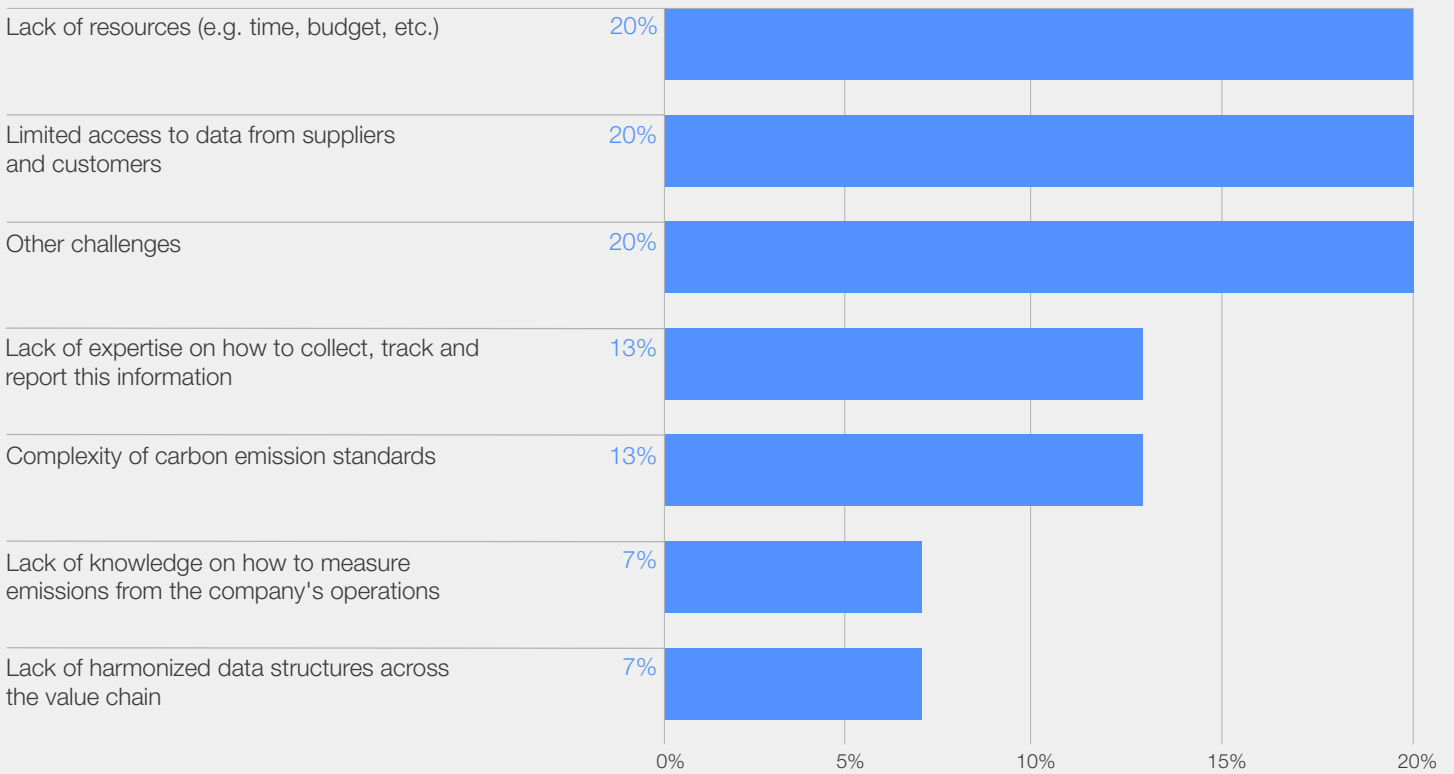
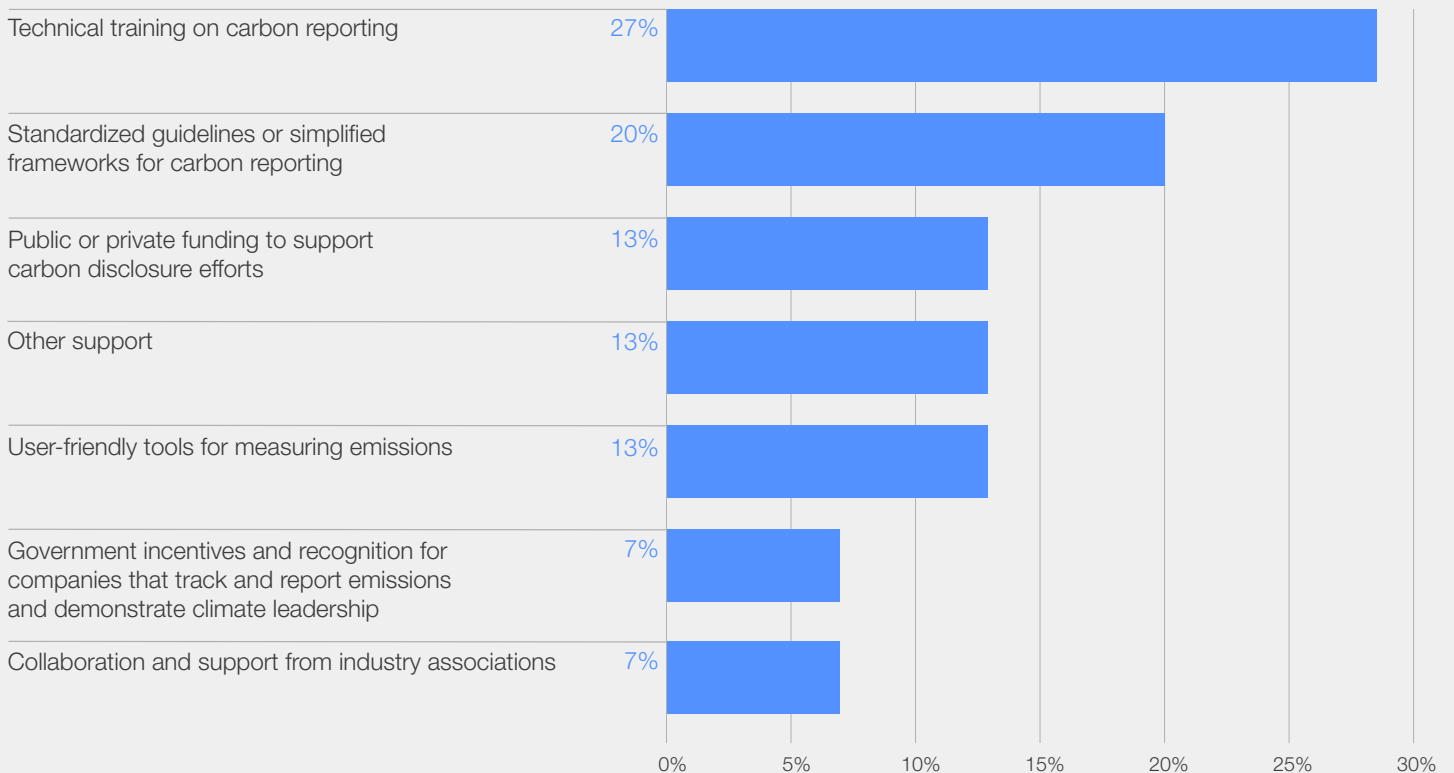


FIGURE 11 | Conditions or types of support that could help SMEs improve their carbon disclosure practices

What conditions or types of support could help your company improve carbon disclosure practices?



2 Recommendations for SMEs

The unique qualities of SMEs offer them diverse opportunities to unlock their data potential and accelerate their growth.

When implementing the recommendations provided below, it is important to recognize the unique advantages that SMEs possess compared to large multinationals. These companies are more agile in adopting new practices, embracing innovation and making sustainable decisions.²⁶ Additionally,

SME employees tend to exhibit greater loyalty and cohesive teamwork. They also tend to be more empowered within the company as they are closely involved in management decision-making.²⁷ Making use of these qualities, SMEs can effectively advance their data preparedness.

2.1 Taking stock of available IT infrastructure and prioritizing data needs

To achieve data readiness, SMEs should understand the purpose of using data, create a data management plan and identify potential business benefits. Prioritizing data needs (see Figure 12) involves assessing available data, determining its relevance and quality and storing it in digital formats for accessibility, interoperability

and analysis. Integrating existing systems and data sources into business operations and governance while ensuring security and regulatory compliance is also crucial. When choosing IT solutions, SMEs should consider current and future needs, cost implications and long-term value for maximum return on investment.²⁸

FIGURE 12 Example of a framework for defining data priorities



2.2 Advancing proactive data governance

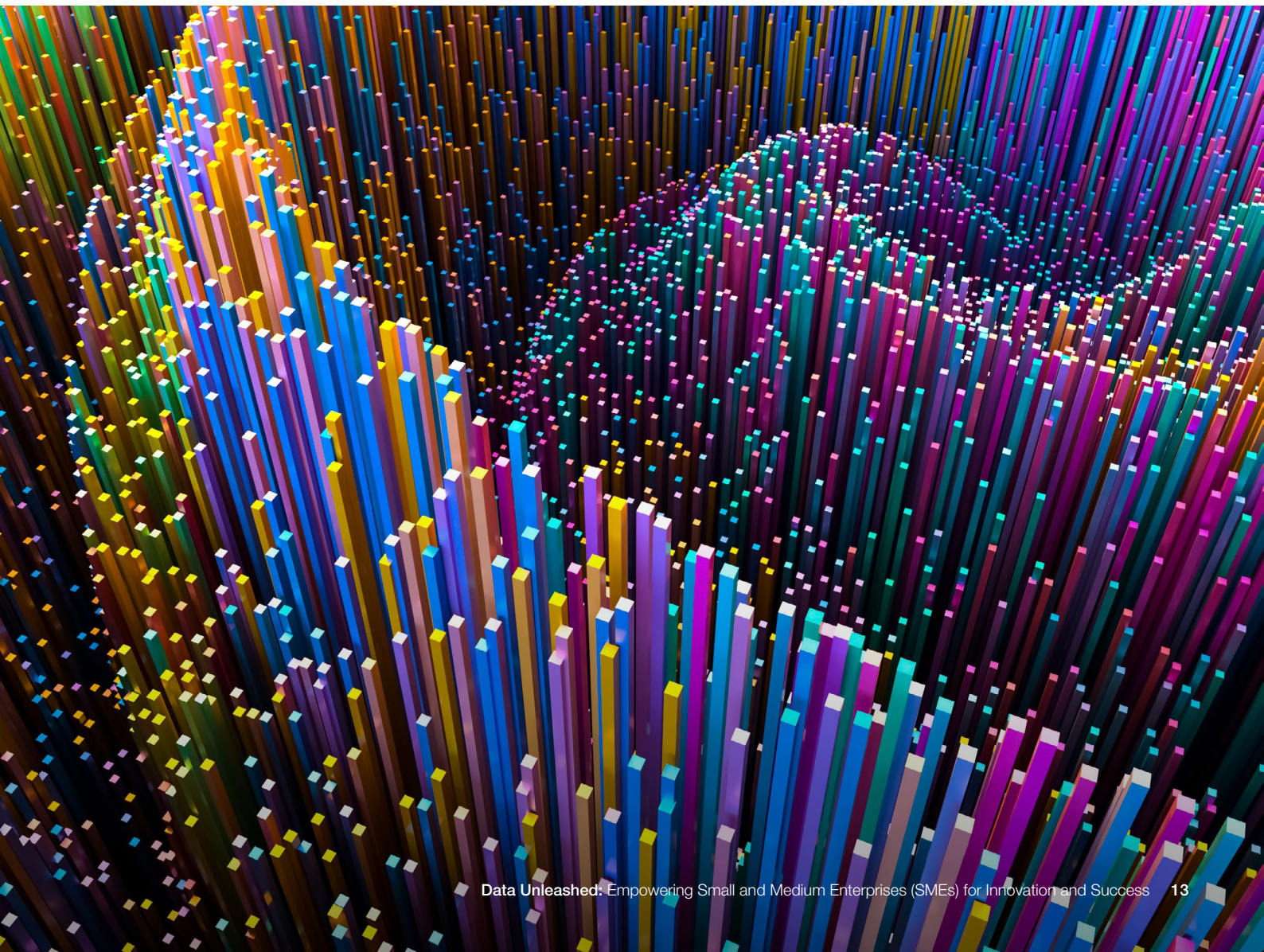
To navigate the growing risks of data privacy and regulatory complexities, SMEs should adopt a proactive approach. Developing data management, privacy and cybersecurity strategies and appointing dedicated and qualified professionals such as chief data officers will help to align long-term strategies with short-term business and operational needs, focusing on data governance to ensure compliance

with regulations through ethical, private and secure data use. SMEs may have budgetary constraints in creating and filling senior roles. So, even starting small and having just one appointed person on a full-time, part-time or consultancy basis, who is clear on the roles and responsibilities of a chief data officer and can advise the business accordingly, can have a significant impact on data readiness.

2.3 Providing company-wide technical and data capacity-building

In addition to establishing an adequate technology infrastructure, SMEs should encourage a data-driven culture among their employees and provide training on data-related issues, such as data analytics and visualization. This can enable staff to extract maximum value and insights from information. Capacity building on topics such as cybersecurity, privacy, data processing risks and limitations, and the roles and competencies of agents and teams

should also be provided. In addition, it is imperative that SMEs wishing to introduce AI-based solutions into their operations acquire the necessary skills to do so effectively and responsibly. This will help to ensure responsible handling of the information to reduce the likelihood of human-related errors³⁰ and to develop risk mitigation and timely response strategies. This type of training can be facilitated by public institutions, NGOs, academic institutions or peer-to-peer networks.³¹



2.4 Building resilient IT infrastructure to facilitate scaling and going global

Choosing the right IT infrastructure presents both SMEs and global enterprises with common dilemmas: IT decisions should be based on periodic assessments to align business needs, i.e. IT infrastructure as a means rather than an end. For SMEs outsourcing IT support, it is crucial to establish clear data security protocols (ensuring data integrity, confidentiality, availability, authenticity and non-repudiation), clear responsibilities, privacy-preserving mechanisms for regulatory compliance and budget for future IT needs and upgrades. Selecting technology providers with robust data protection systems, such as firewalls, intrusion detection applications, and data backup and

recovery systems, is also important to ensure that SMEs remain cyber resilient in complex regulatory environments.

For those companies wishing to expand and scale their operations abroad, having a robust and resilient IT infrastructure, as described previously, can offer many possibilities. Some of these are secure and responsible cross-border data flows, regardless of the physical location of the participants, more agility to scale operations and a more complete view of customer preferences and global market and industry trends to identify new business opportunities and promote industry-wide collaboration.



2.5 Promoting environmental responsibility and resource efficiency

In response to climate change concerns and growing green preferences among business stakeholders, SMEs should incorporate emission tracking and reporting into their operations.³² Using data from processes like energy consumption can enable SMEs to monitor carbon emissions, benchmark environmental performance, improve resource efficiency and achieve cost savings while

promoting sustainability. The implementation of carbon disclosure or similar tracking and reporting mechanisms can support corporate social responsibility (CSR) strategies, demonstrate accountability, enable real-time data sharing for supply chain optimization, enhance business reputation and build stakeholder trust.

3

Call to action

Proactive and forward-thinking leadership can drive SMEs to tap into data and have their business thrive in the digital world.

Data has the power to transform SMEs, but they will need leadership, vision, skills and infrastructure to plan and act effectively and responsibly. We encourage these companies to take as their guide the following four principles, which frame the various recommendations suggested in this publication.

Develop a data-driven culture

To use data efficiently and responsibly, SMEs need clear, long-term data management strategies, which should be periodically reviewed, and experts/dedicated personnel to implement these strategies to ensure compliance with regulations. These strategies should guide the adoption of IT solutions rather than the other way around.

Join the global data revolution

The data revolution is here to stay, and for SMEs, it is crucial to embrace and thrive in this rapidly evolving digital landscape. Instead of pondering “if”, the focus should shift to “when” and “how” SMEs can effectively harness data through digital innovation for sustainable growth. Irrespective of their size or industry, SMEs should adopt a proactive and forward-thinking strategy to use technology and data strategically, aligning their business objectives with global market demands and thus future-proofing resilient business operations. Regardless

of its magnitude, what truly matters is forging ahead on the path to data readiness, be it through a mighty stride or a humble step.

Take advantage of SME’s agility for transformation and innovation

Unlike large companies, SMEs are not subject to complex organizational structures and hierarchical decision-making processes. This flexibility enables them to respond quickly to market trends, customer demands and technological advances, which encourages innovation and the exploration of emerging opportunities.

Engage in multistakeholder collaboration

SMEs can build collaborative networks with other sectors to access skills and new technologies, share best practices, navigate the regulatory environment for data management both domestically and internationally, and ensure their data policies are compliant with industry standards. Cross-sector collaboration is essential, as SMEs play a critical role as partners and intermediaries within any supply chain. There are numerous opportunities for beneficial exchanges for these actors to drive mutual growth and collaboration and enable them to forge a path to success in an ever-evolving business ecosystem (see Table 2).

TABLE 2 **Some key actions for stakeholders to help SMEs overcome their challenges and thrive in their data readiness journey**

Other private sector actors (big companies, entrepreneurs)	<ul style="list-style-type: none"> – Share best practices and knowledge on quality management and data governance. – Share access to new technologies, tools, knowledge and training, e.g. through digital platforms. – IT service providers can offer tailored solutions for SMEs.
Public sector (governments and regulators) ³³	<ul style="list-style-type: none"> – Simplify regulatory frameworks and provide incentives (fiscal, grants, subsidies) to promote responsible and ethical data management and encourage sustainable practices. – Establish agreements, platforms and standards to promote open data, data sharing and interoperability. – Develop programmes to promote awareness and literacy in data regulation, in collaboration with NGOs and academia.
International organizations and civil society organizations ³⁴	<ul style="list-style-type: none"> – Promote data practices that comply with current regulations and safeguard privacy, inclusion and responsible use of data. – Provide open-source data tools and training resources for efficient and responsible data management at a low cost. – Industry organizations can provide guidance for understanding and complying with data regulations.
Academia (universities and institutions)	<ul style="list-style-type: none"> – Review existing data literacy curricula and training programmes for professionals based on business needs. – Develop collaborative research projects to identify internationally recognized frameworks, standards and guidance to accelerate the data-driven digital transformation of SMEs. – Develop incubators and entrepreneurship centres that offer mentoring, networking opportunities, access to financing and shared offices, etc.

Conclusion

Data holds tremendous potential to revolutionize SMEs, but its effective and responsible use requires forward-thinking leadership, proactive strategy, data-centric culture and robust IT infrastructure. With these goals in mind, this report aims to create significant impact by raising awareness of the utmost importance of data readiness in driving growth and prosperity for SMEs of all sizes, sectors and nationalities. It also sheds light on the critical barriers that hinder strategic data use while presenting practical steps for SMEs to overcome these challenges.

By catalysing the evolution of SMEs towards data-centric entities, it can lead to improved business processes, agile management, increased productivity and resilience, and generate remarkable opportunities for sustainable business growth, access to global markets, job creation and supply chain optimization.

The data-driven transformation of SMEs can set an inspiring precedent for other businesses and generate positive change that ripples throughout the global economy. By embracing data-centricity, SMEs can also make a substantial contribution to the dual transition of both a more sustainable world and a more digitized future.

Moving forward, this work is intended to develop a community of diverse stakeholders and continue championing SMEs' data readiness to promote global economic growth. Through collaboration and deeper analysis, the goal is to strengthen the understanding of data's transformative potential and empower SMEs on their journey towards becoming data-driven enterprises.

Contributors

This initiative is a multi-industry, multistakeholder endeavour. This paper is a combined effort based on numerous discussions between all stakeholders involved. However, the opinions expressed herein may not necessarily correspond with those of each individual involved with the project listed below.

Lead authors

Mohammed AlEidan

Lead, Data Management, Saudi Aramco;
Fellow, World Economic Forum

Karla Yee Amezaga

Lead, Data Policy, World Economic Forum

Co-authors

Kimmy Bettinger

Lead, Expert and Knowledge Communities,
World Economic Forum

Rashimah Binte Rajah

Lecturer, National University of Singapore
Business School

Soumyadeb Chowdhury

Head, The Center of Excellence in CSR and
Sustainable Development, TBS Education

Nino Letteriello

President, Italian Data Management Association

Supheakmungkol Sarin

Head, Data and Artificial Intelligence Ecosystems,
World Economic Forum

Olivier Woeffray

Practice Lead, Strategic Intelligence,
World Economic Forum

Acknowledgements

The authors would like to thank all SME respondents who participated in our online survey. They would also like to thank the people who provided comments to this publication (listed below).

Tunç Acarkan

Director, Technology Management, Centre for the
Fourth Industrial Revolution Turkey

Basmah Albuhairan

Managing Director, Centre for the Fourth Industrial
Revolution KSA

Ibrahim Alshunaifi

Search Associate Professor, Advanced
Manufacturing Technologies Institute, King
Abdulaziz City for Science and Technology (KACST)

Mara Balestrini

Digital Transformation Lead Specialist, IDB LAB,
Inter-American Development Bank (IDB)

Sebastian Buckup

Head, Network and Partnerships, Centre for
the Fourth Industrial Revolution; Member of the
Executive Committee, World Economic Forum

Carmen Cecilia Castro Blandon

Senior Specialist, IDB Lab, Inter-American
Development Bank (IDB)

Tenzin Chomphel

Project Coordinator, Data Policy,
World Economic Forum

Julia Devos

Head, New Champions Community,
World Economic Forum

Eduardo Gomez Restrepo

Lead, Data Policy, Centre for the Fourth Industrial
Revolution Colombia

Rebecca King

Engagement Lead, Centre for the Fourth Industrial
Revolution Network and Partnerships, World
Economic Forum

Cathy Li

Head, AI, Data and Metaverse; Centre for the
Fourth Industrial Revolution; Member of the
Executive Committee, World Economic Forum

Jeff Merritt

Head, Centre for Urban Transformation; Member of
the Executive Committee, World Economic Forum

Tomoaki Nakanishi

Executive Director, Japan External Trade
Organization (JETRO), San Francisco, USA;
Fellow, World Economic Forum

Loren Newman

Engagement Lead, Centre for the Fourth Industrial Revolution Network and Partnerships, World Economic Forum

Anna Pierobon

Specialist, Impact Monitoring and Evaluation, Impact Management, World Economic Forum

Saiful Salihudin

Curator, Centre for Urban Transformation, World Economic Forum

Allan Santos

Head, Data Policy, Centre for the Fourth Industrial Revolution Brazil

Stephanie Teeuwen

Early Careers Programme, Data Policy, World Economic Forum

Mishary Thani

Lead, Urban Transformation, Saudi Aramco; Fellow, World Economic Forum

Priya Vithani

Lead, Data Policy, World Economic Forum

Kyle Winters

Initiatives and Community Specialist, Advanced Manufacturing and Value Chains, World Economic Forum

Yan Xiao

Project Lead, Digital Trade, World Economic Forum

Quan Zhao

Trade Policy Adviser, Division for Market Development, International Trade Centre

Production

Studio Miko**Laurence Denmark**

Creative Director

Sophie Ebbage

Designer

Martha Howlett

Editor

Oliver Turner

Designer

Endnotes

1. “The Power of Small: Unlocking The Potential of SMEs”, *International Labour Organization (ILO)*, 2019, <https://www.ilo.org/infostories/en-GB/Stories/Employment/SMEs#power-of-small>.
2. Mills, Karen G., Elisabeth B. Reynolds and Morgane Herculano, “Small Businesses Play a Big Role in Supply-Chain Resilience”, *Harvard Business Review*, 2022, <https://hbr.org/2022/12/small-businesses-play-a-big-role-in-supply-chain-resilience>.
3. “SME and Value Chain Solutions”, *International Finance Corporation (IFC)*, https://www.ifc.org/wps/wcm/connect/corp_ext_content/ifc_external_corporate_site/solutions/products+and+services/advisory/farmer+and+sme+training.
4. European Investment Bank Group, *Small and medium enterprises Overview*, 2022, https://www.eib.org/attachments/lucalli/smes_overview_2022_en.pdf.
5. World Economic Forum, *Future Readiness of SMEs: Mobilizing the SME Sector to Drive Widespread Sustainability and Prosperity*, 2021, <https://www.weforum.org/whitepapers/future-readiness-of-smes-mobilizing-the-sme-sector-to-drive-widespread-sustainability-and-prosperity/>.
6. Perdana, Arif, Hwee Hoon Lee, Desi Arisandi and SzeKee Koh, “Accelerating data analytics adoption in small and mid-size enterprises: A Singapore context”, *Technology in Society*, vol. 69, 2022, <https://www.sciencedirect.com/science/article/abs/pii/S0160791X22001075>.
7. This work is part of a broader World Economic Forum strategy focused on SMEs, including the Centre for the Fourth Industrial Revolution (C4IR), Strategic Intelligence, the Center for Urban Transformation, New Champions Community and the Center for Advanced Manufacturing and Supply Chains.
8. “What Is Data Readiness”, *Alibaba Cloud*, n.d., <https://www.alibabacloud.com/topic-center/tech/cq6knqrp64y9-what-is-data-readiness-alibaba-cloud>.
9. European Commission, *The new SME definition. User guide and model declaration*, 2003, <https://www.eusmeccentre.org/cn/wp-content/uploads/2022/12/SME-Definition.pdf>.
10. Respondents voluntarily chose to participate in the survey. Responses were received from the following 42 countries: Afghanistan, Australia, Austria, Cambodia, Canada, China, Colombia, Eswatini, France, The Gambia, Germany, Ghana, India, Indonesia, Ireland, Italy, Jordan, Kazakhstan, Kenya, Mexico, Namibia, Netherlands, Nigeria, Pakistan, Philippines, Republic of Korea, Rwanda, San Marino, Saudi Arabia, South Africa, Spain, Sri Lanka, Switzerland, Tanzania, Thailand, Trinidad and Tobago, Turkey, Uganda, United Arab Emirates, United Kingdom, United States, Zimbabwe. The survey asked for “industry”, offered the following industry options and allowed for multiple choice: Agriculture; Automotive; Digital/Information Technology; Education/Academia; Electronics; Entertainment and Publishing; Environment; Financial Services; Government; Healthcare; Manufacturing; Media; Non-profit; Other; Professional Services; Retail; Social Enterprise; Telecommunication; Travel and Transport; Utilities and Energy; Wholesale and Consumer Goods.
11. Organisation for Economic Co-operation and Development (OECD), *Digital Security and Data Protection in SMEs. How to ensure SMEs are less vulnerable for a post-COVID digital world?*, 2020, <https://www.oecd.org/digital/sme/D4SME%20Digital%20Security%20and%20Data%20Protection%20Webinar%20Summary%20Record.pdf>.
12. Bouzari, Parisa, Balázs Gyenge, Pejman Ebrahimi and Mária Fekete-Farkas, “Problem Solving and Budget Allocation of SMEs: Application of NCA Approach”, *Computation*, 2023, <https://www.mdpi.com/2079-3197/11/3/48>.
13. OECD, *OECD SME and Entrepreneurship Outlook 2019*, 2019, <https://www.oecd.org/industry/oecd-sme-and-entrepreneurship-outlook-2019-34907e9c-en.htm>.
14. Heidt, Margareta, Jin P. Gerlach and Peter Buxmann, “Investigating the Security Divide between SME and Large Companies: How SME Characteristics Influence Organizational IT Security Investments”, *Information Systems Frontiers*, vol. 21, 2019, <https://link.springer.com/article/10.1007/s10796-019-09959-1>.
15. Ibid.
16. General Data Protection Regulation (GDPR), *Art. 37: Designation of the data protection officer*, 2018, <https://gdpr-info.eu/art-37-gdpr/>.
17. “A privacy reset — from compliance to trust-building”, *PwC*, n.d., <https://www.pwc.com/us/en/services/consulting/cybersecurity-risk-regulatory/library/privacy-reset.html>.
18. OECD, *Data Analytics in SMEs. Trends and Policies*, 2019, <https://www.oecd-ilibrary.org/docserver/1de6c6a7-en.pdf?expires=1685724749&id=id&accname=guest&checksum=8FB31CC05DF8530DD754D6CB44AF1A31>.
19. Ibid.
20. “Breaking Down Data Silos Takes A Cultural Shift”, *Forbes*, 2021, <https://www.forbes.com/sites/forbestechcouncil/2021/04/16/breaking-down-data-silos-takes-a-cultural-shift/>.
21. World Economic Forum, *From Fragmentation to Coordination: The Case for an Institutional Mechanism for Cross-Border Data Flows*, 2023, <https://www.weforum.org/whitepapers/from-fragmentation-to-coordination-the-case-for-an-institutional-mechanism-for-cross-border-data-flows>.

22. Puppim de Oliveira, Jose A. and Charbel Jose Chiappetta Jabbour, "Environmental Management, Climate Change, CSR, and Governance in Clusters of Small Firms in Developing Countries: Toward an Integrated Analytical Framework", *Business & Society*, vol. 56, no. 1, 2017, <https://journals.sagepub.com/doi/10.1177/0007650315575470>; OECD, *Financing SMEs for sustainability*, 2022, <https://www.oecd.org/publications/financing-smes-for-sustainability-a5e94d92-en.htm>.
23. Metzger, Eliot, Evana Said and Daniel Baker, "Missing: Voices of Small and Medium Enterprise (SME) in Global Supply Chains", *World Resources Institute*, 2022, <https://www.wri.org/update/missing-voices-small-and-medium-enterprise-sme-global-supply-chains>.
24. Alam, Ashraf, Anna Min Du, Mahfuzur Rahman, Hassan Yazdifar and Kaleemullah Abbasi, "SMEs respond to climate change: Evidence from developing countries", *Technological Forecasting and Social Change*, vol. 185, 2022, <https://www.sciencedirect.com/science/article/pii/S0040162522006084#bbb0360>.
25. Carbon disclosure can be defined as the annual reports on greenhouse gas emissions derived from the company's activities; Bazhair, Ayman Hassan, Saleh F. A. Khatib, and Hamzeh Al Amosh, "Taking Stock of Carbon Disclosure Research While Looking to the Future: A Systematic Literature Review", *Sustainability* 14, 2022, <https://www.mdpi.com/2071-1050/14/20/13475>.
26. Gherghina, Ștefan Cristian, Mihai Alexandru Botezatu, Alexandra Hosszu and Liliana Nicoleta Simionescu, "Small and Medium-Sized Enterprises (SMEs): The Engine of Economic Growth through Investments and Innovation", *Sustainability*, vol. 12, no. 1, 2020, <https://www.mdpi.com/2071-1050/12/1/347>; Dambiski Gomes de Carvalho, Gustavo, Luis Mauricio Martins de Resende and Leozenir Mendes Betim, "Innovation and Management in MSMEs: A Literature Review of Highly Cited Papers", *Sage Journals*, 2021, <https://journals.sagepub.com/doi/full/10.1177/21582440211052555>.
27. Halbesleben, Katie L. and Charles M Tolbert, "Small, local, and loyal: How firm attributes affect workers' organizational commitment", *Local economy*, vol. 29, no. 8, 2014, pp. 795-809, <https://ideas.repec.org/a/sae/loceco/v29y2014i8p795-809.html>.
28. Dey, Prasanta Kumar, Soumyadeb Chowdhury, Amelie Abadie, Emilia Vann Yaroson and Sobhan Sarkar, "Artificial intelligence-driven supply chain resilience in Vietnamese manufacturing small-and medium-sized enterprises", *International Journal of Production Research*, 2023, pp.1-40, <https://www.tandfonline.com/doi/abs/10.1080/00207543.2023.2179859>.
29. International Organization for Standardization (ISO), *ISO/IEC 27001, Information security management systems*, 2022, <https://www.iso.org/standard/27001>.
30. Studies have shown that 95% of cybersecurity problems are caused by human error; World Economic Forum, *The Global Risks Report 2022. 17th Edition*, 2022, https://www3.weforum.org/docs/WEF_The_Global_Risks_Report_2022.pdf.
31. World Economic Forum, *Future Readiness of SMEs: Mobilizing the SME Sector to Drive Widespread Sustainability and Prosperity*, 2021, <https://www.weforum.org/whitepapers/future-readiness-of-smes-mobilizing-the-sme-sector-to-drive-widespread-sustainability-and-prosperity/>.
32. Business Wire, *Recent Study Reveals More Than a Third of Global Consumers Are Willing to Pay More for Sustainability as Demand Grows for Environmentally-Friendly Alternatives* [Press release], 14 October 2021, <https://www.businesswire.com/news/home/20211014005090/en/Recent-Study-Reveals-More-Than-a-Third-of-Global-Consumers-Are-Willing-to-Pay-More-for-Sustainability-as-Demand-Grows-for-Environmentally-Friendly-Alternatives>.
33. OECD, *The Digital Transformation of SMEs*, 2021, <https://www.oecd.org/industry/smes/PH-SME-Digitalisation-final.pdf>; "Digital Volunteers Programme, mentoring SMEs and NGOs in their digitalisation", *European Union*, 2022, <https://digital-skills-jobs.europa.eu/en/latest/news/digital-volunteers-programme-mentoring-smes-and-ngos-their-digitalisation>.
34. Lukonga, Inutu, *Harnessing Digital Technologies to Promote SMEs in the MENAP Region*, International Monetary Fund (IMF), 2020, <https://www.elibrary.imf.org/view/journals/001/2020/135/article-A001-en.xml>.



COMMITTED TO
IMPROVING THE STATE
OF THE WORLD

The World Economic Forum, committed to improving the state of the world, is the International Organization for Public-Private Cooperation.

The Forum engages the foremost political, business and other leaders of society to shape global, regional and industry agendas.

World Economic Forum
91–93 route de la Capite
CH-1223 Cologny/Geneva
Switzerland

Tel.: +41 (0) 22 869 1212
Fax: +41 (0) 22 786 2744
contact@weforum.org
www.weforum.org