Asia-Pacific
Economic Cooperation

What comes after SME Digital Transformation? – Measuring Effectiveness of Public Policy and Identifying Trends for the Post-Digital Era

APEC Small and Medium Enterprises Working Group

TABLE OF CONTENTS

TABLE OF CONTENTS

TABLE OF CONTENTS

ACRONYMS AND ABBREVIATIONS

ABS	Australian Bureau of Statistics
ACSC	Australian Cyber Security Center
AI	Artificial Intelligence
APEC	Asia-Pacific Economic Cooperation
API	Application Programming Interface
ASELA	Association of Entrepreneurs of Latin America
ASEP	Association of Entrepreneurs of Peru
ASME	Association of Small and Medium Enterprises
ATO	Australian Taxation Office
AUD	Australian Dollar
B2B	Business-to-Business
BDDB	Better Data Driven Business
CLP	Chilean Peso
CORFO	Chilean Economic Development Agency
CRM	Customer Relationship Management
DAI	Digital Acceleration Index
DYSME	Digitalize your SME
ESG	Enterprise Singapore
FAST	Future and Social Adoption of Technology Unit
GDP	Gross Domestic Product
GNI	Gross National Income
HRMS	Human Resource Management System
ICT	Information and Communication Technology
IMDA	Infocomm Media Development Authority
IDB	Inter-American Development Bank
IDP	Industry Digital Plan
IT	Information Technology
ITE	Institute of Technical Education
ITM	Industry Transformation Map
LLC	Limited Liability Company
MBIE	Ministry of Business, Innovation and Employment
MNC	Multinational Company
MPI	Ministry of Planning and Investment
MSME	Micro, Small and Medium Enterprise
OECD	Organization for Economic Co-operation and Development
PER	Peruvian Sol
PDPA	Personal Data Protection Act
PPP	Purchasing Power Parity
NZL	New Zealand Dollar
NGO	Non-Governmental Organization
SERCOTEC	Technical Cooperation Service
SCC	Santiago Chamber of Commerce
SDO	SG Digital Office
SGP	Singapore Dollar

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SGP	Singapore Dollar
SMART	Specific, Measurable, Attainable, Relevant, Time-bound
SME	Small and Medium Enterprise
STEM	Science, Technology, Engineering, and Math
STP	Single Touch Payroll
UF	Chilean Unit of Account
UNDP	United Nations Development Program
USD	American Dollar
VND	Vietnamese Dong

EXECUTIVE SUMMARY

Digital transformation is one of the most relevant transformation processes for businesses: It can generate cost-saving opportunities, increase sales and productivity, and generate new business opportunities.

Moreover, the COVID-19 crisis has brought about impressive changes in markets and consumers, such as a drastic increase in delivery services, e-commerce and telecommuting, which are all phenomena that force businesses to digitalize in order to survive.

Unfortunately, SMEs seem unable to respond to new challenges in the same manner as large companies do.

More than 5,800 small businesses in the United States were surveyed between March 28 and April 4, 2020. Nearly 43% of SMEs temporarily closed due to the pandemic and reduced their active employment on average by 39%.[1] Several other studies and surveys find similar results on the vulnerability of SMEs in the pandemic given their low level of digitalization.[1] [3]

The following report takes account of SMEs digital transformation policies in the APEC region, developing recommendations for measuring the effectiveness and impact of such policies, whilst delivering policy recommendations for the design of public policies on supporting SMEs.

The report complements the efforts of APEC and other economies and organizations endeavored to understand digital processes, examining, for example, aspects of e-commerce or the regulatory environment for data management.[2] [3] [4]

In addition, it presents a digital transformation framework. A framework is vital to the success of digital transformation policies, as it provides a common reference point for their creation, implementation, and monitoring. A framework also acts as a roadmap that can evolve as the needs of individuals and businesses change.

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[1] Bartik, Alexander W., Marianne Bertrand, Zoe Cullen, Edward L. Glaeser, Michael Luca, and Christopher Stanton. 2020. The impact of COVID-19 on small business outcomes and expectations. Proceedings of the National Academy of Sciences, 117 (30) 17656-17666.

[2] March 28 and April 4, 2020

[3] Newpoff, L. (n.d.). Survey Results Indicate Digital Transformation is at the Heart of Small Firms' Business Model Changes. Sandy Spring Bank. Retrieved August 24, 2022, from https://www.sandyspringbank.com/news/survey-results-indicate-digital-transformation-heart-small-firms-business-model-changes

[4] Asia-Pacific Economic Cooperation. (2020, December). Assessment of Capacity Building Needs to Support WTO Negotiation on Trade-Related Aspects of E-commerce. https://www.apec.org/Publications/2020/12/Assessment-of-Capacity-Building-Needs-to-Support-WTO-Negotiation

[5] Asia-Pacific Economic Cooperation. (2019, July). Fostering an Enabling Policy and Regulatory Environment in APEC for Data-Utilizing Businesses. https://www.apec.org/Publications/2019/07/Fostering-an-Enabling-Policy-and-Regulatory-Environment-in-APEC-for-Data-Utilizing-Businesses

[6] Asia-Pacific Economic Cooperation. (2017, November). Promoting E-commerce to Globalize MSMEs. https://www.apec.org/Publications/2017/11/Promoting-E-commerce-to-Globalize-MSMEs

The contribution in this report is based on the analysis of six APEC economies in terms of digital transformation policies, and its main findings are:

1. To ensure success, digital transformation policies must have continuity.

2. Digital transformation policies must be understandable for businesses, so they realize the benefits and actively engage with them.

3. Digital transformation policies must consider all dimensions, including changing processes, technological solutions and human capital.

4. Digital transformation policies must be differentiated according to the needs and realities of the productive sectors in which each SME is in.

5. Digital transformation policies must be closely monitored, and their impact should be measured to track progress and adjust accordingly.

6. Self-assessment tools may not be ideal to measure an SMEs digitalization state, as these depend on SMEs intentions to assess themselves.

    a. The latter idea resonates strongly with OECD recommendations, which propose nine actions to improve the ability to measure digital transformation and its impacts: 1. Make digital transformation visible in economic statistics; 2. Understand the economic impact of digital transformation; 3. Measure well-being in the digital age; 4. Design new approaches to data collection; 5. Monitor transformative technologies such as the Internet of Things, AI and blockchain; 6. Make sense of data and data flows; 7. Define and measure the skills needed in the digital age; 8. Measure trust in online environments; and 9. Assess the digital strengths of the public sector.[5]

7. Digital transformation training programs must be designed according to entrepreneurs' time availability.

8. Participation can be incentivized by tying the successful completion of training programs.

The main recommendations that can be drawn from this report can be summarized as follows:

1. Institutions responsible for digital transformation policies should move towards making decisions based on administrative data. This could be achieved by transferring data between different public sector agencies or by creating mechanisms for companies to disclose their data anonymously.

[5] OECD (2019). "Measuring the Digital Transformation: A Roadmap for the Future" https://www.oecd-ilibrary.org/sites/1e75c7a1-en/index.html?itemId=/content/component/1e75c7a1-en

2. The design of training courses aimed at promoting digital transformation must continually evolve, as needs and knowledge about digitalization change among SMEs.

3. Digital transformation programs should be designed to incorporate impact evaluation with statistical and economic techniques.

4. Any initiative aimed at fostering digital transformation must also create precise recommendations on which digital solutions are most suitable for each SME.

5. Digital transformation policies have to incorporate modules teaching SMEs about the benefits of adopting digital tools in a tangible and intuitive way.

THEORETICAL FRAMEWORK

Introduction

Currently, digital transformation is one of the most relevant transformation processes for businesses, as it generates cost-saving opportunities, increases sales and productivity, and produces new business opportunities. Moreover, the COVID-19 crisis brought about impressive changes in markets and consumers, such as a drastic increase in delivery services, e-commerce and telecommuting, which are phenomena that force businesses to digitalize to survive.

Small businesses must adapt quickly in such an environment. Unfortunately, SMEs seem to be unable to respond to new challenges in the same way as large companies. A survey of over 5,800 small businesses revealed that nearly 43% of SMEs temporarily closed due to the pandemic, and, on average, reduced their active employment by 39%.[6]

Low percentages raise concerns, since SMEs play a critical role in the growth and dynamism of an economy. According to the World Bank, SMEs are relevant contributors to employment creation, representing 50% of employment worldwide and generating 7 out of 10 jobs in emerging markets. SMEs also account for most businesses worldwide, representing about 90% of them.[7]

Thus, initiatives that encourage SME adaptation and modernization through digital transformation, benefit the economy. This report assesses SMEs digital transformation policies in the APEC region and offers recommendations for: measuring the effectiveness and impact of such policies and delivering policy recommendations for the design of public policies to support SMEs.

The aim of this report is to provide a conceptual framework on emerging trends in the post-digital era which can be used for policy development, whilst also summarizing key findings of the study. This conceptual framework can be used to measure the effectiveness of SMEs digital transformation policies, and to identify the emerging trends which serve as a foundation for the development of next generation public policies in the context of digital transformation.

Our analysis starts with the review of state of the art regarding digital transformation policies and initiatives.

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[6] Bartik, Alexander W., Marianne Bertrand, Zoe Cullen, Edward L. Glaeser, Michael Luca, and Christopher Stanton. 2020. The impact of COVID-19 on small business outcomes and expectations. Proceedings of the National Academy of Sciences, 117 (30) 17656-17666.

[7] https://www.worldbank.org/en/topic/smefinance

Conceptualization and measurement of digital transformation

The design and creation of digital transformation requires developing guidelines and definitions about it. Digital transformation is a multidimensional and highly dynamic phenomenon. Moreover, depending on the state of digital development, digital transformation can be understood differently.

Thus, the challenge of defining digital transformation is complex and of interest for many, including researchers and policymakers alike. The latter are interested in the definitions, because the policies to be implemented depend on it. Likewise, in academia the concern for a comprehensive understanding of digital transformation and its implications is of great interest given its evident impact on numerous socioeconomic variables.

Notwithstanding the great interest in digital transformation, there is still no consensus on what it is and how to measure it. Henceforth, this section will first summarize the research findings on digital transformation from two publications that perform a meta-analysis of the extensive specialized literature on this topic: Reis et al. (2018),[8] and Vial (2019).[9] The following discussion is based on their work.

At least four major concepts can be identified to refer to and/or define and measure the phenomenon of digital transformation, all of which are interrelated: “Digital Transformation”, “Digital Economy”, “Digital Ecosystem” and “Digitalization”. These concepts suggest one of characteristics of digital transformation: it is a broad and general phenomenon that encompasses several trends and phenomena.

However, the ability to synthesize digital transformation with a small number of key areas does not imply that defining the concept of digital transformation is simple. Reis et al. (2018) analyze the content of 206 articles published in English in the Web of Science (ISI/WOS) databases that include the term “Digital Transformation” in the title, abstract or keywords. Results show that definitions of this concept in academic literature can be classified into three dimensions: i) “technological”, based on the use of new digital technologies; ii) “organizational”, which requires organizational changes or the creation of new business models, and iii) “social”, which affects all aspects of human life. As a result of this analysis, the authors define digital transformation as “the use of new digital technologies that enables significant business improvements and influences all aspects of customers’ lives” (Reis et al., 2018). This finding confirms that digital transformation is a broad process involving multiple dimensions.

Similarly, Vial (2019) analyzes 282 papers from three databases (AIS Library, Business Source Complete, and ScienceDirect) to conclude that digital transformation is “a process that aims to improve an entity by activating significant changes in its properties through combinations of information technology, computing, communication and connectivity”. This definition has three important characteristics: i) digital transformation does not focus on business organization; ii) although improvement is acknowledged as an expected result of digital transformation, it does not guarantee its success; and, as a consequence, obligates entities committed to this process,

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[8] Reis, J., Amorim, M., Melao, N. & Matos, P. (2018). Digital Transformation: A Literature Review and Guidelines for Future Research. WorldCIST’18, AISC 745, 411–421. https://doi.org/10.1007/978-3-319-77703-0_41

[9] Vial, G. (2019). Understanding digital transformation: A review and research agenda. Journal of Strategic Information Systems, 28, 118–144. https://doi.org/10.1016/j.jsis.2019.01.003

to continuously measure and monitor its results to achieve the expected objectives, and; iii) the concept takes into account that digital technologies may change over time.

Consequently, the analysis of articles in which the term "digital transformation" is most frequently cited, suggests that digital transformation encompasses a large number of changes and decisions in processes and operations of businesses, which are relevant to management. However, it is also cautioned that management changes are contingent on employee qualification, and whose training must consider inherent challenges in digital transformation (Reis et al., 2018). In other words, changes are necessary both on the management level, as well as on the organizational culture and the daily operation of the business.

Despite the lack of agreement on what digital transformation is, there seems to be consensus that its benefits are multiple and considerable. Although digital transformation requires greater use of digital technologies which can be costly, it enables organizations to modify their value creation pathways or to redefine their business models to remain competitive and survive.

The literature suggests that digital transformation can create greater value for businesses through at least four mechanisms:

i) offer more innovative services and solutions based on consumer data collection.

ii) eliminate intermediaries and enable direct dealing with customers (Hansen & Sia, 2015[10]), coordinate exchanges within a supply chain (Klotzer & Pflaum, 2017[11]) and engage customers (Lucas Jr. et al., 2013[12]).

(iii) use social networks to change sale channels, product distribution and/or use predictive algorithms to coordinate activities within the organization.

(iv) adapt with agility to increasingly changing environmental conditions and make better use of existing resources (Vial, 2019, pp. 125-127).

Although digital transformation has multiple benefits, it is difficult to measure consistently, as schemes are not flexible enough to accurately capture all its dimensions. So far, the approach to measure digital transformation and its effects has been through self-assessment instruments. The information gathered through self-assessment tools is used in the development of indicators. These are structured around various dimensions or sub-indices which, in turn, depend on a greater number of specific indicators. The number of dimensions or sub-indices depend on the chosen instrument, but they can easily number in the hundreds. Thus, the main difficulty in understanding and evaluating digital information is its multidimensionality, which gives rise to a multiplicity of definitions and an extensive number of indicators to measure it.

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[10] Hansen, R., and Sia, S. K. 2015. "Hummel's digital transformation toward omnichannel retailing: Key lessons learned," MIS Quarterly Executive (14:2), pp. 51-66.

[11] Klötzer, C., and Pflaum, A. 2017. "Toward the development of a maturity model for digitalization within the manufacturing industry's supply chain," Hawaii International Conference on System Sciences, Waikoloa Beach, HI, pp. 4210- 4219.

[12] Lucas Jr, H. C., Agarwal, R., Clemons, E. K., El Sawy, O. A., and Weber, B. 2013. "Impactful research on transformational information technology: An opportunity to inform new audiences," MIS Quarterly (37:2), pp. 371-382.

To design policies aimed at increasing digital transformation, identifying the difficulties in measuring digital transformation are relevant; as a policy planner must first understand the motivations and benefits that lead businesses to adopt digital tools. In turn, to understand the motivations and benefits that lead businesses to adopt digital tools, a policy planner has to consider the state of digital transformation in the population of businesses benefiting from any related public initiatives. Different economies try to measure the status of the digital transformation process in different ways. The most common instruments are self-assessment tools that vary in the content and length of their questions. Likewise, some organizations and agencies conduct surveys that, to some extent, are similar to self-assessment tools. However, economies such as New Zealand are going a step beyond, as surveys conducted by public sector statistical agencies incorporate digital economy measurements in a formal manner.

There is little knowledge on how to consistently measure the benefits and motivations behind digital transformation. As aforementioned, the main difficulty in understanding and evaluating digital information relates to its multidimensionality, which gives rise to a multiplicity of definitions and an extensive set of indicators to measure it.

However, without a conceptual framework outlining relevant dimensions of a multidimensional phenomenon, it is difficult to advance in policies that favor it. Producing such a definition and indicators can be complex, as these ideally should be consistent, i.e., comparable over time and across businesses; whilst also “communicating” the benefits of digital transformation. Hence, to develop policies that boost digital transformation, it is necessary to: first, establish a framework for designing, evaluating, and thinking about digital transformation; and second, to create measurable indicators to track the progress and effects of digital transformation

Similarly, the OECD stresses the importance of establishing a common scheme for measuring digital transformation on a global level. Several organizations have created a wide variety of approaches and indicators to cover the multiple aspects of digital transformation, which can be confusing[13] . Naturally, if it is already difficult to reach a single local definition, it will be more complex to reach a global one.

Whilst developing the present study, the same issue emerged: several APEC economies attempted advancing their own frameworks to understand digital transformation through definitions and indicators particular to the aims of designed and sponsored programs and policies. Likewise, the measurement of indicators is usually done using self-assessment tools, aiming to measure a set of indicators that reflect the current state of digital adoption and practices among SMEs.

[13] Organisation for Economic Co-operation and Development (OECD). A Roadmap Toward a Common Framework for Measuring the Digital Economy. Report for the G20 Digital Economy Task Force, Saudi Arabia. http://www.oecd.org/sti/roadmap-toward-a-common-framework-for-measuring-the-digital-economy.pdf

The existence of multiple digital transformation definitions reflects that it is a broad phenomenon encompassing multiple dimensions or perspectives, and different programs address digital transformation from differing angles. Each program must focus on the key aspects it intends to cover, which requires a definition that enables assessing the achievement of the planned aims. Still, such a large offer of programs intertwined with the fact that digital transformation is a broad phenomenon may lead to information overload and misallocation of SMEs into programs or lower levels of take-up.

As previously mentioned, the main approach to measuring digital transformation is the use of self-assessment tools, which has its advantages and disadvantages: On the one hand, it is easily adaptable, thus it considers different digital transformation definitions in a cost-effective way. On the other hand, measurement through self-assessment tools is not ideal, as the collected data is self-reported and therefore may not be accurate. Most importantly, the success of self-assessment tools measuring digital transformation depends on the willingness of SMEs to self-assess, which is not always the case.

Another issue with self-assessment tools is that results may not be comparable, as they depend on the developers' and evaluators' understanding of what a high and low level of digital transformation is. This does not imply that self-assessment instruments should be completely discarded, but rather that they should be improved. For example, self-assessment questions should be standardized and made mandatory for participants in digital transformation support programs, to avoid relying on the evaluator's willingness to collect information. Also, measurements to ensure the accuracy of responses should be incorporated. For instance, profits reported in the self-assessment instrument should be cross-checked with profits reported to tax authorities.

In addition, the problems experienced with self-assessment instruments echo issues with grant or training programs, which are partially related. The inability to accurately measure digital transformation needs can result in training that is not optimally designed in content and format and, consequently, cannot not benefit people who really need it. This is particularly relevant given that lackluster digital skills are one of the main constraints of SMEs regarding both digitization and digital transformation.

An alternative to self-assessment tools and to which economies could aspire, is the approach adopted in New Zealand: the creation of a formal measurement framework through public sector statistical agencies. This approach is in development and its effectiveness has not been assessed yet.

As argued above, much remains to be done to understand the phenomenon of digital transformation, but its importance has been recognized and efforts are made to advance towards a better understanding of it.

To conclude this section, we present a list of structural changes identified in the literature. It should be noted that implementing these changes does not ensure the success of digital transformation initiatives, but rather increases the chances of achieving it.

a) The organizational structure must be adapted to emphasize cross-functional collaboration as a central element of digital transformation. One way to achieve this goal is creating a separate unit that maintains a degree of independence from the rest of the organization (Maedche, 2016;[14] Sia et al., 2016[15]).

b) Digital transformation also requires changing the organizational culture. A common theme throughout studies is that businesses must cultivate a willingness to take risks and experiment (Fehér & Varga, 2017[16]) with digital technologies on a small scale before adapting them to the rest of the organization (Dremel et al., 2017[17]).

c) In the context of digital transformation, organizational leaders must ensure that their organizations develop a "digital mindset" and respond to the shocks associated with the use of digital technologies (Benlian & Haffke, 2016[18] ; Hansen et al., 2011[19]). To achieve this goal, the creation of new leadership roles is highlighted (Haffke et al., 2016[20] ; Horlacher et al., 2016 [21]). For example, the position of "Chief Digital Officer" ensures the appropriate use of digital technologies in accordance to the organization's objectives (Horlacher et al., 2016; Singh & Hess, 2017[22]).

d) Changes in organizational structure and culture lead collaborators to assume roles that are outside their traditional functions. As digital technologies enable new forms of automation (Neumeier et al., 2017[23]) and decision-making processes (Dremel et al., 2017; Hess et al., 2016[24]), the need to develop new skills in existing workers as well as in the future "digital workforce" (Colbert et al., 2016[25]) becomes increasingly relevant (Watson, 2017[26]).

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[14] Maedche, A. 2016. "Interview with Michael Nilles on "What Makes Leaders Successful in the Age of the Digital Transformation?"," Business & Information Systems Engineering (58:4), pp. 287-289.

[15] Sia, S. K., Soh, C., and Weill, P. 2016. "How DBS Bank pursued a digital business strategy," MIS Quarterly Executive (15:2), pp. 105-121.

[16] Fehér, P., and Varga, K. 2017. "Using design thinking to identify banking digitization opportunities - Snapshot of the Hungarian banking system," Bled eConference, Bled, Slovenia, pp. 151-168.

[17] Dremel, C., Wulf, J., Herterich, M. M., Waizmann, J.-C., and Brenner, W. 2017. "How AUDI AG established big data analytics in its digital transformation," MIS Quarterly Executive (16:2), pp. 81-100.

[18] Benlian, A., and Haffke, I. 2016. "Does mutuality matter? Examining the bilateral nature and effects of CEO-CIO mutual understanding," Journal of Strategic Information Systems (25:2), pp. 104-126.

[19] Hansen, A. M., Kraemmergaard, P., and Mathiassen, L. 2011. "Rapid adaptation in digital transformation: A participatory process for engaging IS and business leaders," MIS Quarterly Executive (10:4), pp. 175-185.

[20] Haffke, I., Kalgovas, B. J., and Benlian, A. 2016. "The role of the CIO and the CDO in an organization's digital transformation," International Conference of Information Systems, Dublin, Ireland.

[21] Horlacher, A., Klarner, P., and Hess, T. 2016. "Crossing boundaries: Organization design parameters surrounding CDOs and their digital transformation activities," Americas Conference of Information Systems, San Diego, CA.

[22] Singh, Anna and Hess, Thomas (2017) "How Chief Digital Officers Promote the Digital Transformation of their Companies," MIS Quarterly Executive: Vol. 16: Iss. 1, Article 5. Available at: https://aisel.aisnet.org/misqe/vol16/iss1/5

[23] Neumeier, A., Wolf, T., and Oesterle, S. 2017. "The manifold fruits of digitalization - Determining the literal value behind," Wirtschaftsinformatik Conference, St. Gallen, Switzerland: AIS Electronic Library, pp. 484-498.

[24] Hess, T., Matt, C., Benlian, A., and Wiesboeck, F. 2016. "Options for formulating a digital transformation strategy," MIS Quarterly Executive (15:2), pp. 123-139.

[25] Colbert, A., Yee, N., and George, G. 2016. "The digital workforce and the workplace of the future," Academy of Management Journal (59:3), pp. 731-739.

[26] Watson, H. J. 2017. "Preparing for the cognitive generation of decision support," MIS Quarterly Executive (16:3), pp. 153-169.

Implementing changes on a structural level may not be sufficient to ensure success. The literature compels to overcome barriers associated with inertia and resistance within organizations. For instance, established businesses rooted in existing relationships with customers and suppliers and have well-established production, are often rigid (Andriole, 2017[27]) and rely on resources that cannot be easily reconfigured (Kohli & Johnson, 2011; Woodard et al., 2012[29]). Thus, the problem of resilience within the organization raises important questions regarding the ways and pace at which digital technologies are introduced. Some resilience problems are, for instance, “innovation fatigue” (Fitzgerald et al., 2014[30]) and the role that the Chief Digital Officer should play in ensuring that digital technologies are used in a way that is consistent with the organizational culture to which employees are accustomed to and accept (Singh & Hess, 2017). Svahn et al. (2017)[31] show that resistance can also be explained by the “lack of visibility of the potential benefits of digital technologies’’. Hence, workshops involving stakeholders affected by digital transformation can help prevent resistance and improve cross-functional collaboration.

METHODOLOGY

This report has been prepared following a multiple, comprehensive, and systematic methodology to ensure an exhaustive and useful data collection to guide public policy development.

The findings are the result of: 1) a bibliographic review of academic documents and reports, such as the ones prepared for the APEC Policy Support Unit and APEC Policy Support Unit Policy Briefs, as well as newspaper and journal articles, 2) a review of public and private agencies' published content, 3) semi-structured interviews with public and private sector agents, and 4) a telematic workshop in which the preliminary findings of this report where shown, discussed and improved upon by attendees.

The literature review serves as a framework for this report's structure. It also identifies key areas in the digitization process of economies. It also identifies digitalization policies implemented by some economies, their evolution over time and impact (if measurement studies exist).

Content published by public and private agencies was reviewed regarding availability, implementation and monitoring of policies aimed at the digitalizing businesses. Also, an updated overview of ongoing or recently implemented programs was created, and, if available, data on their progress was collected.

The semi-structured interviews ascertained the opinion of key actors in the economies digital transformation process, while calibrating and/or clarifying information gathered by third party sources. It also enabled evaluating how to meet the digital needs of different businesses, as well as taking into account the approaches used to close the gaps. With this data, the main future concerns regarding digital transformation were identified. The fact that both public and private stakeholders were interviewed, contributes a nuanced perspective of societal visions and opinions.

The following economies constitute the cases of this study: Chile, Australia, New Zealand, Viet Nam, Peru and Singapore. They are a selection of a much broader research process in which at least 13 economies were contacted. The cases were not predefined, as the selection depended on their intention to participate in the sample. Also, cases were selected if sufficient content was to describe key elements and to extract valuable experiences for policymakers. In order to achieve the latter, public and private sectors' opinions were also obtained. In addition, the cases are from different economies as heterogeneity and diversity of experiences was sought. Unfortunately, it was not possible to conduct one or both interviews in several of the contacted economies, thus they were not included in this study. Detailed information on the interviewees in each of the contacted economies can be found in the Appendix 1.

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27 Andriole, S. J. 2017. "Five myths about digital transformation," MIT Sloan Management Review (58:3), pp. 20-22.

28 Kohli, R., and Johnson, S. 2011. "Digital transformation in latecomer industries: CIO and CEO leadership lessons from Encana Oil & Gas (USA) Inc.," MIS Quarterly Executive (10:4), pp. 141-156.

29 Woodard, C., Ramasubbu, N., Tschang, F. T., and Sambamurthy, V. 2012. "Design capital and design moves: The logic of digital business strategy," MIS Quarterly (37:2), pp. 537-564.

30 Fitzgerald, M. 2014. "How digital acceleration teams are influencing Nestle's 2000 brands," MIT Sloan Management Review (55:2), pp. 1-5.

31 Svahn, F., Mathiassen, L., and Lindgren, R. 2017. "Embracing digital innovation in incumbent firms: How Volvo Cars managed competing concerns," MIS Quarterly (41:1), pp. 239-253.

32 APEC (2020). "Overview of the SME Sector in the APEC Region: Key Issues on Market Access and Internationalization". https://www.apec.org/publications/2020/04/overview-of-the-sme-sector-in-the-apec-region

Lastly, the preliminary findings of this report were presented in a teleconference attended by members of different representatives of APEC member economies public and private sectors. The conference included a panel discussion including representatives of the public sectors of Australia, Chile and Singapore as well as a participant from the Chilean private sector. After the discussion a workshop began in which attendees could discuss and give their impressions regarding a set of broad and open-ended questions. This feedback was used to analyze the validity of the report's findings, which were almost completely corroborated by the participants.

Throughout the process many difficulties were encountered, and the most significant was the lack of systematic information on digitalization issues. There is an understanding that digital transformation is important and there are several different programs, however this does not translate into systematic methods of policy design and follow-up. This gap highlights the importance of this report, as it can help create policy design frameworks to ensure the success and fulfillment of the sought objectives.

Based on the experiences of each case study, the literature review and the workshop, several key findings on current practices in digital transformation programs are recognized. Based on this input, areas for improvement are identified and recommendations on how to achieve these improvements are discussed.

KEY FINDINGS ON POST-DIGITAL STAGE/ERA PRACTICES AND APPROACHES

As a result of this study, key aspects of policies aimed at fostering digital transformation were identified. These aspects are considered “good practices” but to successfully boost digital transformation, particular conditions must be considered in advance. It is important to mention that the following “good practices” are not a magic recipe that ensures the success of a digital transformation program.

1. Policies must have continuity

One aspect highlighted in the semi-structured interviews to policy stakeholders, was the need for maintaining SME support policies over time.

Continuity is important for several reasons. First, digitalization is a continuous process and SMEs need support and accompaniment throughout their journey towards the digitalization of their operations. Hence, the continuity of programs is essential to ensure that SMEs make sustained progress towards digitalization. However, continuity should not be understood exclusively in the sense of maintaining a single program over a period. Rather, continuity is understood as a gradual process. For example, a program may remain unchanged for several years, but it will not be successful because the digitalization needs of SMEs will change over time. Consequently, a program must be maintained over time and adapt to the SMEs’ changing needs. This can be observed in digitalization strategies of economies such as Chile, Singapore, or New Zealand, which are constantly being updated and modernized.

Second, information about available programs and opportunities spreads slowly. As a result, it can take time to become fully effective and achieve the desired scope and scale. Thus, a program should be maintained, even if it does not exhibit satisfactory usage indicators. The continuity of programs also helps SMEs to understand the importance of digitalization, since many are unaware of its relevance in the long term. Australia’s Digital Skills Finder is a program that intends to seek continuity. It has funding until June 2022, but alternatives are being sought in order to develop a sustainable funding model and continue to operate in the long term.

Another interesting case illustrating the importance of continuity, is Australia’s Small Business Digital Champions. This program is no longer active, it ran from April 2019 to March 2020, and again from April 2020 to April 2021. The first extension reflects the importance of maintaining an active program to achieve the desired impact. The extension also shows that continuity entails analyzing priorities. Continuity is valuable only to the extent that priorities remain the same.

2. Policies must be simple and easy to understand

Excessively complex policies may not achieve the goal of moving towards SME digitalization. This is because SME owners have limited time to review the conditions, to apply, and to participate in digitalization programs. Excessive complexity may lead to desisting from participating altogether. For instance, the New Zealand private sector is fundamental for moving forward in creating more successful digital transformation efforts.

Simplicity is also important for another relevant reason: to understand the importance and added value of the program and digitalization. For an entrepreneur to decide to participate

in a digitalization program, he must understand the consequences and the positive impact it will bring to his business. This requires, however, that the program is easy to understand. The question of how valuable it really is for an SME to go digital, is one of the great barriers to digital transformation policies today. Therefore, key factors to achieve greater success are: communication channels, incentives, dissemination (marketing look) and program design (to make them attractive over time), and added value.

This last point is relevant because embarking on the digital transformation is a costly process, especially for many SMEs that are just trying to stay afloat. This diagnosis was readily apparent during the workshop, that is: profits in the short term are the main driver for SME decision making, so it is important to circumvent the possible loss of profits by showing them the benefits associated with the digital transformation.

Simplicity is related to the menu of digital tool options offered by the programs. Too many tools end up confusing SMEs, and when they are not able to discern which one is appropriate, they give up on adopting them. A good alternative that was observed in some programs, was to offer a set of tools which had been already tested in other SMEs, as well as creating direct recommendations to choose the appropriate tool according to the state of digitalization of the SME. This was seen as the second major concern in the workshop; information overload leads to uncertainty, and uncertainty leads to inaction. This has been addressed by different public sectors, for example, New Zealand has a “Digital Boost Directory”, in which SMEs can search for tools and find ratings and feedback on their usefulness.

Finally, simplicity is also related to the number of institutions in charge of promoting digitalization programs. It is common for different ministries to manage their programs independently. This is, however, counterproductive, because it makes it difficult for SMEs to learn about the breadth of programs available to them. It would be best to administer programs through a single agency, or if tools compiled all available support in one place.

For example, in Chile the Ministry of Economy, the Chilean Economic Development Agency (CORFO), the Ministry of Social Development, Ministry of Women’s Affairs, Technical Cooperation Service (SERCOTEC), and others, are continuously promoting offers. An SME has to seek information from each of these agencies separately, but it could be simplified through a website that unifies all programs into one and filters through application requirements. Ideally, this website should also offer a single application form. For an SME, it makes no difference who the program manager is. In other words, it should aim for a “one-stop shop”.

3. Policies must be concerned with investing in technological solutions and human capital

Several of the identified policies are either designed to encourage the acquisition or use of digital tools, or to train SMEs in digitalization. It should be noted that these policies are not independent of each other and, ideally, should be intertwined.

For example, a program encouraging investment in digital tools should be accompanied by training, both in the area supported by the tool, and in the use of the tool itself: the adoption of an accounting tool should be accompanied by accounting classes and tutorials on how to use the chosen tool.

This is key, participants in the workshop vastly agreed that skills are one of three major concerns regarding the process of digital transformation for SME. Both owners and employees have knowledge gaps that hold them from utilizing digital tools to their fullest potential, so training is one of the most relevant issues to be addressed, especially in developing economies.

However, training could advance further. Since many of today's digital tools can be integrated within each other, training should also introduce the benefits of integration with other tools. In the workshop, it was commented that interoperability and full utilization of the different tools was the new frontier to incorporate in SME training.

The importance of training in handling new technologies, manipulating and interpreting data and not making decisions based on intuition, must be fundamental pillars of the digital transformation.

SMEs have to know why it is necessary to transform digitally, but they must also be able to adopt digital tools. To achieve the latter, human capital has to be trained in new ways of working.

The cases of Peru and Viet Nam can illustrate this last idea. In Peru, surveys indicate that talent is one of the main barriers to the growth of the innovation economy. This is corroborated by the private sector's experience, which suggests that education in the use of technologies must start at the most basic levels of schooling to improve human capital and, ultimately, increase the economy's welfare.

Similarly, Viet Nam's private sector points out that regardless of the digital transformation objectives of SMEs, the need for human capital is a basic and cross-cutting issue, as not many SMEs are able to cope with digital transformation.

Singapore's "Digital Leaders Program" supports businesses in building a core digital team to develop and execute their digitalization strategy, and connect businesses with tech partners to develop new digital products and services.

During the workshop the case of the cross-fertilization system implemented in Malaysia was commented on by attendees. Under these programs, SME workers/owners participate in internships in large companies in their productive sectors to attain different skills.

4. Policies must be differentiated according to the needs and realities of the productive sectors in which each SME is in

Most SMEs have different needs and priorities. This is probably one of the highest priority points regarding digital transformation initiatives. In fact, it is one of the key ideas highlighted by one of the technical roundtables of the "Roadmap of Digital Transformation for Economic Recovery", an initiative fostered in Chile by Microsoft Chile and the Centro de Innovación UC Anacleto Angelini.[33]

[33] https://centrodeinnovacion.uc.cl//wpcontent/uploads/2022/05/HR_TRANSFORMACION_DIGITAL_INGLES_.pdf

Most of the studied programs tend to recognize this fact and try to incorporate it in its design. One of the most common ways of recognizing that all SMEs are different, is to conduct a self-assessment from which recommendations are obtained, and which are generally linked to SMEs' level of digital development.

Albeit it is a good starting point, it may be insufficient. In fact, a simpler and more effective way to address the problem would be to consider the productive sector in which SMEs are involved.

In principle, digitalization should help all SMEs, but different digital tools have different returns for different SMEs, depending on the impact on operations. For example, an SME in the service sector that digitizes its supply chain management platform, is likely to see a greater effect than if it adopts a human resources management tool.

Digitalization should be understood as a gradual and incremental process. Given the opportunity costs, the areas that have the greatest influence on the operation of SMEs should be prioritized first. This can be observed indirectly by comparing the different types of programs implemented by economies at different stages of their digital development.

Some examples of programs that take into account differences in productive sectors, digital state and the size of SMEs are: The Digital Transformation Roadmap for Leaders of Peruvian Food Markets program, specially designed for SMEs participating in food markets; the sector-specific Industry Digital Plans (IDPs) in Singapore aligned to the respective Industry Transformation Maps (ITMs), which provides a step-by-step guide on the digital solutions for companies to adopt and relevant training for their employees at different stages of their growth; and the Viet Nam digital packages initiative: Digital Start Package (targeting newly established SMEs or those just starting their digitalization process), Digital Growth Package (targeting medium-sized enterprises), and Go Digital - Go Global Package (targeting enterprises wanting to globalize their operations).

5. Policies must be closely monitored, and their impact should be measured

One of the areas in which most of the reviewed economies have great room for improvement, is how the state of SMEs' digitalization is measured, as well as impact measurement and progress monitoring of implemented digitalization policies.

In terms of measuring the impact of policies, when these measurements are published, they generally focus on highlighting the number of benefited SMEs or the progress of budget execution. However, the relevant measurements for the evaluation of digitalization programs are whether they help the operation, survival and growth of SMEs. Thus, SMEs benefiting from digitalization programs should be tracked over time to follow their evolution in terms of growth in sales and employment.

Occasionally, as in the case of New Zealand's Digital Boost, it can be observed that programs are first implemented through pilot studies that provide the necessary feedback to identify areas where the initial design needs to be improved for maximum impact. With this evidence, programs are then scaled up.

In addition, the most relevant programs should be evaluated using experiments or formal econometric techniques. For instance, randomly selecting participants in programs where this is possible, or implementing program designs that enable applying statistical methods, such as regression discontinuity design. The latter approach can be employed in any program in which businesses need a “score” to be selected. Suppose that the score required to participate in a program is 100. The regression discontinuity design is based on the assumption that the businesses with 99 and 101 points are very similar to each other and the only difference between them is that one participates in the program and the other doesn’t. Thus, the effect of the program can be calculated by comparing the results of the 101-point (selected) business with the 99-point (non-selected) business.

Narrowing the impact measurements of the most relevant programs is justified, based on cost-complexity. An example of public policy evaluation through the use of formal econometric techniques, is the evaluation of PROGRESA in Mexico (although this is not a digital transformation program). In this sense, the importance of partnerships with other organizations, public, private, academic or NGOs (such as J-Pal) can also be highlighted, where data sharing for research purposes can be a way to obtain this kind of evaluation.

Another aspect that should be understood is that any impact measurement should be careful to compare SMEs in the same productive sector with the same development of digitalization and use of similar digital tools at the beginning of the intervention of the programs. This point should be considered from the design stage onwards and was highlighted by the private sector in Peru.

In most of the examined cases there is an interest in measuring the impact of digitalization programs, as well as recognizing the importance of measuring. But it is also acknowledged that it is a complex task and, given the abruptness of the pandemic, there has not been sufficient time and resources to implement impact measurement frameworks.

Despite these difficulties, there are efforts to move towards this direction. For instance, Australia’s Digital Solutions is being independently evaluated to measure the program’s effects on the businesses that have benefited from it. An independent evaluation also avoid incentives to positively evaluate what has been implemented. In other words, impartiality is ensured.

However, if SME digitalization support programs are to be sustained over time, progress must be made on these mechanisms. Impact studies not only provide information on whether or not a program had the expected effect, but also serve to redesign programs or design new ones with a greater impact.

Impact evaluations help to design programs with greater impact, as well as lower-cost programs. This is because an impact evaluation also identifies areas that can be eliminated. Hence, while impact evaluations can be costly, they can also help reduce costs in the long term.

6. In their current state, self-assessment tools might not be ideal to measure an SME's digitalization state

Across different economies, several digitalization programs use self-assessment tools to gauge the state SMEs' digital development. These tools are informative but suffer from several problems that must be corrected to guide public policy in a useful manner.

First, self-assessments can provide a misleading picture about the state of digitalization, since respondents may not be entirely truthful in their answers.

Second, most assessments are voluntary. This is a problem because it means that SMEs have no need to answer them. Therefore, any collected statistics are not representative of the business population they are intended to help.

Despite these difficulties, self-assessment tools are not an obsolete tool. Measures can be put in place to ensure the accuracy of responses, either with the cooperation of public institutions, such as cross-checking responses with data from the tax authority, or by allowing respondents to attach documents to support their answers.

Self-assessment tools can also be made mandatory for SMEs that wish to participate in a digital transformation program. However, this can also become a problem if businesses do not understand in a tangible way the benefits they will receive in return, as they may choose not to answer the survey and lose the option of accessing the training program.

SMEs want concrete benefits. They often do not value training because they cannot visualize its benefits. In this sense, programs that offer digitalization toolkits or economic resources to access them may be more attractive.

Finally, the relationship between the number of questions included in the self-assessment and their difficulty, as well as the information needed for public policy development must be carefully evaluated. A tool that is too long and complicated will be difficult for SMEs, and as a result, they will quit before completing it. A tool that is too simple will not create an accurate picture of the state of digitalization. Therefore, the self-assessment tool (or its alternative) should be understood as an integral part of digitalization programs and therefore should be carefully designed.

7. Entrepreneurs' time availability must be considered in the design of training programs

Most programs aimed at increasing SME digitalization are developed with the assumption that all SMEs will participate without any problems or that they will adapt to the program's characteristics.

For example, digitalization programs may include training sessions that generally take place at specific time schedules. However, these usually extend beyond the schedule and SME owners do not have enough time to participate.

The New Zealand private sector mentions entrepreneurs' lack of time as a very important problem. In addition, they point out that digital transformation should also be valued in this sense: the digitalization of processes helps to free up time and improve well-being.
Another issue is the location or format in which the training is delivered. For instance, it is common for training to be conducted through a proven partner, and to take place at the offices of the training provider. This can be counterproductive if the offices are far from the location of the SMEs.

Because of the pandemic, online training has alleviated this problem, but it still persists if SMEs do not have a stable internet connection, computer equipment, or a quiet and suitable place to participate in training. These are also areas that enable cooperation between different public sector policies and agencies that go beyond the digital transformation itself. For example, solving connectivity issues requires telecommunications policies.

Another format that has become more relevant within the pandemic are the on-demand courses with a series of educational videos that SMEs can access at any time. These are a good alternative, but also have some problems. For instance, SMEs may need human support during their digitalization journey or have doubts about concepts which are not explained in the tutorials.

One example of training through online videos is "WhatsApp Friday" in Peru, aimed at training more than two thousand businesses and entrepreneurs in the use of WhatsApp Business. Through the online training program of "WhatsApp Fridays", SMEs had the opportunity to learn more about the tools and best practices for the use of the app and to improve their competitiveness and business communication.

The New Zealand Digital Boost Training and Support, which focuses specifically on small businesses and tour operators, also offers a series of free online courses on how to become a digital business. Another similar initiative is Australia's Digital Skills Finder Platform.

8. Participation can be incremented by tying the successful completion of training programs to incentives

A significant number of SMEs may stop participating in the training halfway through. This can occur for many reasons. SMEs may become discouraged, or unforeseen events may arise. But perhaps training desertion is related to the fact that the cost of abandoning a training process halfway through is low. This can be remedied if the successful completion of training programs makes SMEs eligible for benefits of other digitalization programs.

The latter idea involves the definition of what is considered a satisfactory program fulfillment. In the case of online tutorials, completion could be watching all available videos. But this can be achieved by simply letting the video play while doing other things. Thus, satisfactory completion should include testing the level of knowledge acquisition.

Cases with approaches to solving the problem of program fulfillment are scarce, but they do exist. One example is Chile's Digital Route program. Participants are required to take part in various learning courses. They are eligible to receive a digital "kit", a grant for the purchase of business management equipment and tools, if they successfully complete them.

SMEs drop out of programs partially because they are unable to quantify their real value, and therefore stop participating instead of spending their time on them. Their opportunity cost assessment is biased towards understanding the short-, medium- and long-term benefits of training, coupled with a narrow focus on economic immediacy. The latter issue may relate to the fact that SME owners and their families are completely dependent on their businesses. Thus, incentive mechanisms used to increment the short-term value of training may have a large impact on program engagement.

KEY FINDINGS ON DIGITAL TRANSFORMATION MEASURING PRACTICES

Most of the reviewed initiatives in this report include the use of pilot studies, independent evaluations, and self-assessment tools of the digital maturity level of SMEs. Most of the researched economies rely on self-assessment tools to collect information on the digital maturity level and only a few examples of pilot studies and independent evaluations were identified.

Examples of impact assessment through pilot studies or formal evaluation frameworks include New Zealand's Digital Boost, which was first implemented through pilots that provided necessary feedback to identify areas where the initial design needed improvement. Meanwhile, Australia's Digital Solutions is evaluated in an independent manner, to measure the effects of the program on the businesses that have benefited from it.

The scarcity of pilot studies and formal evaluation frameworks relates to a lack of resources, including the hiring of experts, as well as the urgency with which many of the programs were created to respond to the challenges brought on by the pandemic. This urgency was mentioned by actors from economies such as Chile and Viet Nam. It is possible that, as digital transformation programs become more permanent, options such as piloting will become part of the very design of public policies.

Considering that both piloting and an impact assessment tool are not alternatives, for the reasons stated above, the current evaluation is mainly based on self-assessment.

Self-assessment tools are relatively easy and inexpensive to apply, which makes them favorable. They also have the potential to uncover relevant trends. However, the way in which these are generally implemented, suffers from several problems. The first issue is that these tools generally take the form of voluntary self-assessments. This means that the businesses that choose to respond may differ significantly from the economy's SME universe. Therefore, conclusions drawn from statistics collected through this kind of tool may not be extrapolated and, more importantly, may not be useful for revealing the real impact of interventions aimed at improving digitalization, or for designing or improving policy programs.

A second issue refers to the design of the tool itself. There must be a balance between the detail of the data to be collected, and the time it takes to answer the questions included in the self-assessment tool. This is because an overly detailed tool may take too long to answer, and the participating businesses may give up before completing their assessment. But if the detail and number of questions is too little, the collected statistics may be uninformative. Consider, for example, the diagnostic tool of "Digitalize your SME", an initiative developed by the Ministry of Economy of Chile. This self-assessment tool is excessively detailed and includes over 100 questions, which has been an obstacle for organizations that want to use it.

In other words, a balance must be struck between the duration, the approach to collecting information, and the incentives to respond. These elements must be weighed against the actual use that will be made of the collected information. In some cases, these tools collect more details that can be evaluated and even interfere in the improvement of digitalization. In other cases, they collect very little data. One should analyze what one really needs to know and not "get carried away" with collecting too many details.

Given that the knowledge about the current state of digitalization is essential for the success of digital transformation programs, a good practice would be to “experiment” with different versions of the self-assessment tool and choose the one that has the best response rate. This can be done with pilot studies, as is done with some digital transformation programs. An example of this is the Digital Transformation Roadmap for Leaders of Peruvian Food Markets carried out in 2021, a pilot training plan with the participation of 140 domestic markets.

Similarly, to increase response rates, small incentives can be offered to businesses that complete their self-assessment. We are not aware that such initiatives have been adopted, but Digital Route in Chile provides funding opportunities to participants that complete an e-learning training series.

Another important aspect is that mechanisms should be created to allow businesses to respond to the same tool at different points in time, to be able to track the effect of digitalization programs and change them if necessary. For example, evaluations can be done in stages, where the higher the level of maturity of the program, the more detailed information can be collected. This can be implemented through modules that are activated according to certain responses and level of digitalization. In this way it would be possible to track how knowledge (HR capabilities), digital work culture, technologies and organizational characteristics that facilitate and complement the digitization of processes react to digital transformation programs.

It is generally believed that businesses should respond to these self-assessment tools simply because it helps them and that should be enough to motivate them. However, this disregards the fact that many businesses are not aware of the benefits of digitalization, which prevents them from seeing how useful it would be to participate in these programs.

The improvement of this type of tools is a first step, and it is very important considering that the lack of mechanisms to evaluate success/impact seems to be a transversal issue in the design of digital transformation policies. Ideally, policy design should include evaluation tools.

POLICY RECOMMENDATIONS

Digital transformation is a topic on which various economies have been making progress for several years. However, the pandemic brought forward the level of maturity required to address the challenges of digital disruption. In other words, the pandemic pushed economies to accelerate the implementation of actions to address the new reality. It was a very sudden change of scenario, where some economies were caught better prepared than others.

This report reviews efforts in digital transformation developed before the pandemic and digital transformation efforts that seek to address the problems posed by the crises of the Covid-19 pandemic. In addition, some programs and organizations have also started to look to the challenges of the future.

Given the diversity of the analyzed economies, it is possible to identify different ways of addressing the needs of SMEs, so the recommendations described here are based on a cross-case analysis, understanding the different contexts of each examined case.

Thus, this section describes some of the recommendations that emerge from the experiences and lessons learned from each case and seek to contribute to a better design, implementation, and evaluation of SMEs' digitalization policies, as a step towards their digital transformation.

Improved assessment tools

One of the main requirements for designing effective digitalization programs is to understand the needs of SMEs. Across most of the studied cases, self-assessment tools are the go-to option. However, as described in the previous section, these tools are not sufficient and have several problems. Public sector institutions should move towards more robust measures based on administrative data. This could be achieved through the transfer of data between different public sector agencies or by creating mechanisms for SMEs to disclose their data accurately and in a timely manner. Using this type of source would help in the Discover and Design phases of digital transformation policies at a limited cost. This is because administrative data reveals the current state of SMEs. Certainly, administrative data will not be available for informal SMEs, but information from them could be obtained from other sources such as self-assessment tools or cooperation with financial institutions that manage their accounts.

However, the above criticisms apply to the current state of self-assessment tools. In other words, they can be modified to improve their usefulness. For example, measures can be put in place to increase response rates and ensure the accuracy of responses, either with the cooperation of public institutions (such as cross-checking responses with data from the tax authority) or by allowing respondents to attach documents to support their responses.

In addition, the use of self-assessment tools can be extended to identify the state of digital maturity of SMEs, but also to offer the best possible digital solutions according to the realities and needs of the evaluated SMEs.

Self-assessment tools can also be used to evaluate digital transformation policies making the previously mentioned corresponding adjustments. This can mean assessing businesses at different points in time with slightly differentiated questions. Examples depicting businesses at different points in time can then be used to infer the effects of policy efforts.

Improved continuity and simplicity

Cases such as the Digital Skills Finder in Australia (aiming to find a sustainable model to continue on the long term); or the Digital Boost Directory - The Right Tool in New Zealand, reflect how continuity and simplification of the process to find digital solutions can be fundamental. In fact, New Zealand's private sector recognizes that most SME owners find it very difficult to understand all the options available in the market.

Thus, it is necessary for digital transformation programs to have a long-term plan, either through secured public funding or by exploring the possibility of transforming into a self-sustainable project (Australia's Digital Skills Finder case).

Similarly, the creation of marketplaces for training, financing, and digital transformation tools with filters that allow SMEs to identify those that meet their needs, can be a game changer in the digital transformation process (New Zealand's Digital Boost Directory case).
As was previously discussed, information overload and SME short sightedness are two of the main constraints that disincentivize SME adoption of digital technology, thus, they halt the digital transformation process altogether. Reducing uncertainty in such a manner that SME are able to grasp the full benefits of digital transformation is key.

Improved training

Several of the programs aimed at boosting the adoption of digital tools among SMEs have training modules on the different dimensions in which digital transformation can be addressed. These training programs need to be improved and adapted to include the changes in digitalization experienced by SMEs in recent years, as well as learning outcomes in the last years. Hence, training must be designed to respond to the needs of businesses, but also to their reality. This involves several aspects, especially as digital transformation needs, technologies, and realities change over time, sometimes even in the very short term.

For example, the design and mechanism of training should not be static and should be continuously evolving as the needs and knowledge about digitalization change among SMEs. This also means that there should be variations in training programs (rather than one-size-fits-all training) that consider the particular needs of certain groups of SMEs. SMEs have very important and varied challenges depending on their situation, particularly if they belong to different productive sectors. In other words, there is no single way to digitalize SMEs; each sector and subsector has differences that lead to different needs. This also occurs in relation to the size of the SME, or whether it is B2B or B2C.

Another element to be considered in the design of training programs is the format of the training itself. In general, SME owners and their workers are immersed in solving various urgent problems and, therefore, a lack of time or availability to participate in training programs. Consequently, training programs must be accessible, either through digital formats or must be delivered at times and locations that maximize the likelihood that SMEs can be present.

Finally, training should not only focus on learning how to use a software or web page. It should also involve training the business's human capital in new ways of working through digital technologies. In the cases in which certain tools are selected to be trained at, they the program should highlight the benefits of software/platform interoperability and should aim for SME to be able to maximize its use.

Improved program evaluation

A number of statistical techniques are now available to assess the impact of programs on various performance variables relevant to the target population. Many public programs even consider budgets for experimenting with different design alternatives to choose the one that has the greatest impact.

In the cases that were studied, we could not find any initiative aimed at measuring the impact of programs on variables relevant to SMEs. This evidence is very important, as digital transformation is not an end, but a tool to help businesses thrive and grow. Given the relevance of the digital transformation in the development of businesses, and the impact that SMEs have on the economy of the economies, it becomes key to separate resources to ensure the correct design and implementation of the different programs, along with defining from the beginning the periodicity of monitoring and evaluation of the different programs. The latter action is fundamental to identify whether the programs are producing the expected results. Without this information it's very difficult to make the necessary adjustments to ensure results in digital transformation and, therefore, in the growth of SMEs needed to positively impact the economy's economy.

Offer of improved solutions

Another problem detected in this study is the large number of available programs that depend on multiple public- and private institutions, as well as NGOs. In the face of uncertainty about which of all the solutions is the most appropriate, this enormous offer frequently overwhelms and frustrates SMEs, which finally decide to not move forward in the adoption of digital tools.

Any initiative aimed at increasing the use of digital tools should also create narrow recommendations on which one is right for each SME. Therefore, it is necessary to organize and prioritize the varied offer of programs and build guidelines that clearly define the "digital journey" that SMEs should take, depending on their specific needs. An effort in this direction can be seen in "Chile Digital Checkup", which was reformulated in 2021 to create personalized recommendations for SMEs.

Improved understanding of the need to go digital

One finding of this study is the widespread understanding that SMEs are not aware of the importance of adopting digital tools. Private sector stakeholders in both Chile and New Zealand argue that SMEs believe that their way of doing business is sufficiently successful and that they do not need to go digital, even though it can have a positive impact on their ability to generate profit; or, alternatively, that not going digital may lead to their disappearance.

SME's short-sighted vision sometimes slips through the opportunity cost analysis that they make: to dedicate themselves to sell more in a traditional manner, versus dedicating time and resources towards digitalization. Their analysis is biased since it does not consider the medium- and long-term possibility of disappearing as a business. Thus, it is important to consider that many SMEs are skeptical about their potential and that most of them are born out of necessity and have no ambitions to grow. The latter is a very important point raised by the private sectors of Viet Nam and New Zealand. The implementation of guidance and support programs, in which SMEs can be motivated through existing digitalization cases can make a fundamental difference. The Digital Boost Spotlight Series of New Zealand is a program that attempts to do just this: it showcases the experience of small businesses which recently went through digital transformation.

A better understanding of digitalization also implies a better dissemination of these programs, considering the way SMEs think about the reasons for not taking the path of digitalization. Marketing should be an area to explore.

Program design can also incorporate incentives to increase SME participation. SMEs may value more monetary resources for implementing technology than for training on how to become a digital enterprise, although both are relevant. Therefore, the programs must have a balance between the areas to be covered to be sufficiently attractive.

Improved SME ambitions

Another point raised by several of the interviewed economies is that programs should be differentiated depending on the ambitions of SME owners. There is a large percentage that sees their business as a way to make ends meet and, therefore, do not consider the need to go digital. These SMEs must be encouraged to conceive their businesses as opportunities with growth potential. The New Zealand private sector proposes that digital transformation policies should differentiate the SME owner who wants to grow their operations from the SME owner who seeks to thrive. This suggestion is based on a study conducted by Xero, which explores the reasons for SMEs' reluctance to adopt digitalization.

To some extent, the differentiated approach could also include attempts to move the SME owner who wants to thrive, to a type of SME that wants to grow. After all, it is possible that these types of SMEs benefit society more. Consequently, the approach requires making digital transformation programs more visible, as well as the positive impacts they can have on SMEs. For instance, the message to the SME owner seeking to thrive can emphasize that without the technological tools, their survival is threatened. To SME owners looking to expand, the impact on sales and employment can be highlighted.

However, the benefits of digitalization go beyond increased sales or productivity. Some effects can have an impact on everyone. One example was raised by the New Zealand private sector: Digital transformation also enables better decision making and provides more time. With more free time, SMEs can devote themselves to other value-added activities or spend more time with their families. Consequently, it is important to understand that digitalization is not only necessary to increase the return of enterprises but also to improve the quality of life of SME owners.

POLICY DESIGN AND IMPLEMENTATION FRAMEWORK

The need to increase digitalization and to start a path towards digital transformation has accelerated dramatically due to the challenges imposed by new scenarios or contexts, such as the pandemic. Businesses were forced to deploy new solutions for which they may not have been prepared, but otherwise risked falling behind the competition. These harsh conditions prompted authorities to act quickly in order to alleviate the impact of a new business reality, which meant that the design time of public policies that support digital transformation was shortened, and that they adjusted the programs as they went along. It was, without a doubt, a race against time.

Initially, this strategy made sense. It was necessary to drive digital transformation quickly to solve urgent business problems. But this is no longer the case. Digital transformation policies must now be well designed, and issue focalized and coordinated efforts. This is not an easy task, given the breadth of the concept of digital transformation, which is why it is necessary to provide solid guidelines to decision-makers.

In this context, a policy framework is a useful guide that provides a common reference point that evolves as the needs of individuals and businesses change. The framework enables the strategy and roadmap that allows policymakers to design policies that make possible the evolution and success of businesses in today's rapidly changing market conditions.

Moreover, a digital transformation framework is a blueprint for policy- and decision makers for the design and implementation of digital transformation policies and initiatives. It provides clear indications on the key steps that any digital transformation policy should have, while leaving enough space and flexibility to include case-specific specifications.

However, before engaging with the design of a support initiative, policymakers must develop a vision of the future of digital transformation by exploring the current and future needs of businesses, especially considering the desired level of competitiveness. This is because it is not enough for a business to digitally transform as a result of a policy. Beneficiary businesses have to understand why they need to embark on digital transformation. Otherwise, the process will fail once the policy is finalized.

Once this vision has been defined, it is important to consider the guidelines that a policy framework can provide to the policy maker.

Based on the above literature review and the case studies discussed in the previous sections, a framework for the design and evaluation of digital transformation policies is proposed. This framework should be understood as a series of steps to be taken into account when designing, improving or evaluating a digital transformation policy. Each step is accompanied by its own issues and challenges.

Stage 1: Assess and prioritize issues

Every successful public policy begins with an assessment of the current situation to identify problems and constraints. In this sense, digital transformation policies should not deviate from the norm.

The assessment can be conducted through a qualitative and quantitative baseline study, or it can be based on self-reported SME assessments. If time and resources are available to choose between the two, the former approach is more appropriate. Baseline studies are more conducive to well-designed policies, as they can reduce biases normally associated with self-assessments tools, as evidenced in the key findings of the case studies.

Since digital transformation is a broad topic, as discussed at length in the previous section, it is reasonable for the assessment to cover a large number of feasible issues and upgrades, especially for SMEs. This implies that it is critical to prioritize issues, while the goal is to address problems one at a time or in clusters.

The most effective way in which prioritization can be achieved is by understanding the sequential nature that exists in digital transformation, especially in its digitalization aspect. Many times, in order to be implemented a technology needs prior conceptual or technical knowledge, such as familiarity with accounting terms or with the use of certain software. In that sense, a thorough understanding of the links between the stages of digital transformation is key.

It is also relevant considering that conducting a complete assessment involves understanding the intricacies of the issue in question and being able to zoom in on the differences that affect them. In that sense, assessment results are very different according to spheres, size, development level, age of the business and/or geographical areas. Thus, digital transformation policies should be diverse because they consider these aspects. This last idea relates to the key findings in the case studies: policies must be differentiated according to the heterogeneity of SMEs.

Moreover, the assessment should not only focus on the potential beneficiaries of the policy. Technology watch is essential when analyzing the digital transformation responses for SMEs.

Knowing which practices and technologies constitute the state of the art in different sectors and the value chains is of utmost importance when it comes to understanding and assessing issues.

Following these guidelines makes it possible to assess thoroughly where SMEs are at, in terms of digital transformation, and will also make it possible to determine the gaps to focus on; which, in turn, enables defining specific and prioritized issues.

To guide the assessment design, it is recommended to include some variables in the assessment stage. They must be taken into account in the stage of defining objectives of the public policy of digital transformation, since the scope and feasibility of the aims will depend on the characteristics of the economy’s business environment.

The variables that should be considered are: the population's schooling level; gender differences in topics as, for instance, entrepreneurship, education and employment, in order to understand gender gaps and considering possible focus; the internet connection level of SMEs as a enabling factor; the age of leaders or owners of SMEs, as an indicator of digitalization culture; the economic sector; size distribution of SMEs; and financial access and whether the company sells a product or services, given that each can be a proxy of the type of needs the main SMEs of the economy have. All of these aspects are relevant for defining the desired goals, as well as for the type and depth of the activities considered in different programs.

Stage 2: Setting SMART objectives

Once the issues related to SME digital transformation are fully understood, defined and prioritized, the next step is to set clear and defined objectives to resolve the issues through the program. Well defined objectives draw the line between being overly ambitious and unmotivating, between being easily attainable and out of reach, and so forth. In order to define the limits of objectives, we resort to the widely used SMART criteria:

a. **Specific:** objectives should be concrete, precise and, if the policy has multiple goals, prioritized. This allows clear and concrete measures to be taken.

b **Measurable:** compliance with the objectives must be verifiable, so objective quantitative measures of compliance must be established. It is strongly recommended that policies have intermediate and final objective measures.

c **Attainable:** objectives must be realistic; they must be met taking into account the staff and resources that will be available for the program.

d **Relevant:** objectives should also be relevant and ambitious; reaching them is what motivates participants and the workers implementing them.

e **Time-bound:** objectives should be achieved within clearly defined time periods, although different objectives can have different time frames (on a short, medium and long-term). This allows people to work efficiently and does not allow programs to continue indefinitely without changes being made if needed.

Stage 3: Policy design and implementation strategy

Once the objectives are clear and meet the SMART criteria, the intervention has to be designed. First and foremost, the implementation strategy and its design must be aligned with the objectives which are the guiding principles of the program. The implementation strategy is the bridge between assessment and objectives; it is the means by which the diagnosed issues and constraints are corrected, in order to achieve the previously defined goals.

The framework has to be flexible and guide policy considering time-varying and global factors, especially because policy makers have different skills and resources, each context is different, and technology is changing rapidly. Therefore, in order to be successful, the framework must include the minimum design requirements that a digital transformation policy must have.

Any policy design and strategy for policy implementation must be comprehensive; it should encompass the SME as a whole and not only one business department. Digital transformation is a business-level phenomenon and therefore is not intrinsic to exclusively one component of the organization. In that sense, the strategy must account for all the different branches of the businesses' core areas: people, customers, processes, products and technology. Consequently, a digital transformation policy must also ensure that the business' culture evolves and adapts to change. If this is not feasible, especially in the early stages of digital transformation, policy makers should support areas which are most relevant to the business model of companies, rather than taking a more holistic view.

The design of digital policies and strategies needs to consider timeframes based on the objectives associated with different levels of digital maturity. Roadmaps can be useful for this purpose, as the fulfillment of a set of objectives implies moving forward in the digital transformation "journey". In order to achieve it, it is important to define mechanisms that ensure full compliance with the objectives which are required to move to the next stage of digital maturity. This is directly linked to the metrics selected to test whether the objectives are being met. In many of the cases of the study, roadmaps do not exist or, if they do, they are merely a guide and do not include mechanism of measurement.

Lastly, the design of digital policy and strategy must be shaped in a way that businesses understand why digital transformation is relevant to them; why each step is important, why different actions are taken, among other things. An effective strategy must be simple, so that SME owners with time constraints understand and see how the digital transformation policy will improve their productivity, reduce costs or impact in a way in which value can be added. Ultimately, it cannot be stressed enough that the policy needs SME owners to be on board.

These last points are relevant and were highlighted prominently in the case studies and interviews. Their importance leads us to a key finding of the report: SME owners may struggle to measure the future benefits of digital transformation. If their time constraints are also taken into account, it is easy to understand why a significant number of SME owners have trouble with embarking on digital transformation policies. Moreover, it is important to emphasize the positive impact of digital transformation while engaging SME owners in the most direct, efficient and least time-consuming way possible.

Another aspect that must be considered at this stage in order to have a successful implementation and execution of the designed programs, is defining the institution responsible for the design, execution and evaluation of the policies.

It is common for policies to address a multifactorial problem or deficiency with different public institutions which display differing perspectives, but also share similar final objectives. Therefore, a clear definition of who is responsible for each part of the policy is essential for effective coordination, in order to reduce the chances of duplication and inefficiencies.

Stage 4: Policy limplementation and calibration of steps 1-3

There are a large number of factors that can negatively influence policy implementation, many of which cannot be known and/or measured accurately in advance. Even after conducting a high-quality assessment, setting SMART objectives and designing a comprehensive and straightforward policy with a clear value-generating proposition for the SME, policymakers can encounter unpredictable challenges and difficulties.

Consequently, when the program starts its implementation, policy makers should be attentive to how implementation in the field relates to the initial assessment, and then examine whether this new information demands recalibrating the objectives (possible dimensions: time frame, the objectives themselves, measures, etc.). If there are changes in the objectives, there will surely be changes in the policy design.

Calibration should lose sight of the initial problems and limitations. Hence, this step may result in the update of the original design of the digital transformation policy, based on real-life experience and data. However, this update should not be understood as an opportunity to change the program in 180 degrees.

Stage 5: Policy evaluation and analysis of the completion of objectives

Policies should be evaluated when they have ended, but they also should be evaluated throughout their implementation. This is one of the advantages of setting SMART objectives, as policymakers can take stock of their digital transformation policies whilst they are being implemented. Continuous assessment of the degree to which targets are being met is key, because it allows policymakers to change the policy design immediately, maximizing its likelihood of success. This idea is reinforced in the case studies and especially in the interviews, which highlighted the importance of policy continuity over time and as a continuous evolution based on technological advances and the changing needs of SMEs.

When analyzing the degree to which objectives were met, it is important to understand the mechanism by which objectives were and were not met, since having a thorough understanding of what worked and what did not, helps to guide the design of future policies.

What happens if a program has a poor evaluation? Only decision-makers can provide an answer to that question, which is why it is relevant to have an in-depth understanding of what did and did not work, and the reasons behind it. These programs can last for years and have different phases of implementation, hence evaluating throughout the process is essential to continuously optimize the programs.

In addition, it is also important to evaluate policies beyond the objective completion, but also in other relevant areas, such as budgetary execution and cost effectiveness.

PROFILE OF THE RESPONDENTS AND RESULTS OF THE SURVEY

In the following section, details of the case studies and semi-structured interviews are presented. Key findings and recommendations presented in the previous section are based on this data. Although the results and recommendations compile the key information from the cases, it is valuable to study the cases individually, as it enables the reader to elaborate their own insights. In addition, other APEC economies may have contexts that share more similarities with one economy than another, thus delving into case studies can be useful and inspiring.

Australia

1. Introduction

Australia is the sixth largest economy in the world, with a population of over 25 million people. [34] Like most developed economies, the Australian population is aging as a result of sustained low fertility and longer life expectancy. This has resulted in proportionately fewer children (under 15 years of age) and a higher proportion of people aged 65 years and above. According to data as of June 30, 2019, between 1999 and 2019, the proportion of children decreased from 20.9% to 18.7% of the total population. Meanwhile, the population between 15 and 64 years of age reached 65.4%, and between 1999 and 2019, the proportion of the population ages 65 and above increased from 12.3% to 15.9%.[35]

In terms of labor force statistics, in March 2022, Australia had a participation rate of 66.4% and an unemployment rate of 4.0%.[36]

In 2020, Australia's GDP reached AUD 1.981 trillion (USD 1.328 trillion), which is equivalent to a GDP per capita of AUD 77,115.383 (USD 51,692.843).[37] The economy's main economic sectors, according to their share of GDP, are health and education (13.2%), mining (11.5%), finance (8.0%), construction (7.4%) and manufacturing (6.0%).[38] Table A.1. summarizes several other economic and social statistics of Australia.

The economic impact of the COVID-19 pandemic in Australia was severe and was centered in the southeastern part of the economy, where most of the most labor-intensive industries are located. Economic activity slowed sharply in the third quarter of 2021 due to the effect of health restrictions on private consumption and investment. However, with vaccination rates increasing and restrictions on activity easing, the economy has begun to recover rapidly. GDP

is expected to grow at around 5.5% in 2022 and around 2.5% in 2023, a pace similar to pre-pandemic averages.[39]

Table 1: Australia Profile

Australia	1990	2000	2010	2020
Population, total (millions)	17,07	19.15	22,03	25.69
Population density (people per sq. km of land area)	2,2	2,5	2,9	3,3
Poverty headcount ratio at national poverty lines (% of population)				
GNI per capita, PPP (current international $)	16.720	25.560	37.770	50.540
Life expectancy at birth, total (years)	77	79	82	83
School enrollment, primary (% gross)	106.4	100.7	105.6	99.7
School enrollment, secondary (% gross)	134	153		141
Average years of total schooling male population 15-64	11,524	11,348	12,465	
Average years of total schooling female population 15-64	11,36	11	12,49	
Urban population growth (annual %)	1,4	1	1,7	1,4
GDP (current US$) (billions)	310,8	415,2	1.146,1	1.330,9
GDP growth (annual %)	3,6	3,9	2,1	-0.3
Inflation, GDP deflator (annual %)	6,1	2,6	1,2	2
Agriculture, forestry, and fishing, value added (% of GDP)	4	3	2	2
Industry (including construction), value added (% of GDP)	29	25	25	26
Exports of goods and services (% of GDP)	15	19	20	24
Imports of goods and services (% of GDP)	17	22	21	20
Time required to start a business (days)		3	3	2
Domestic credit provided by financial sector (% of GDP)				
Tax revenue (% of GDP)	22,5	23,1	20,5	23,3
Mobile cellular subscriptions (per 100 people)	1,1	45.1	101.6	107.7
Individuals using the Internet (% of population)	0.6	46.8	76	86.5
High-technology exports (% of manufactured exports)			17	22

Source: World Development Indicators; Barro, Robert and Jong-Wha Lee, 2013. “A New Data Set of Educational Attainment in the World, 1950-2010.” Journal of Development Economics, vol 104, pp.184-198.

Figures in green refer to periods other than those specified.

2. SMEs in Australia

SMEs are an important part of the Australian economy. The contribution of small-sized businesses to the Australian Gross Domestic Product (GDP) was almost AUD 418 billion in 2018-2019, and medium-sized businesses contributed AUD 287 billion during the same period. Those values are equivalent to 32% and 22% of the economy, respectively. In terms of employment, SMEs employ over 4.7 million people, which is 41% of the business workforce.[40]

[39] Reserve Bank of Australia (2021). “Statement on Monetary Policy November 2021” https://www.rba.gov.au/publications/smp/2021/nov/pdf/statement-on-monetary-policy-2021-11.pdf

[40] https://www.asbfeo.gov.au/sites/default/files/ASBFEO%20Small%20Business%20Counts%20Dec%202020%20v2.pdf

The Australian Bureau of Statistics (ABS) defines SMEs by the number of employees. Small-sized businesses are active trading businesses with up to 19 employees, medium-sized businesses are active trading businesses with 20-199 employees, and large businesses are active trading businesses with 200 or more employees. Micro-sized businesses are small businesses with up to four employees.

Meanwhile, the Australian Taxation Office (ATO) defines small-sized businesses as those with a turnover of less than AUD 10 million.[42]

The use of two different definitions by two different public sector agencies means that statistics on SME characteristics may vary slightly depending on the agency behind the data. For example, using the ABS definition (based on the number of employees in a business), Australia has 2,314,647 small-sized businesses and 56,835 medium-sized businesses, amounting to 97.4% and 2.4% of all businesses in the economy. On the other hand, if turnover is used to categorize businesses (ATO definition), there are 2,338,289 small-sized businesses, which is 98.4% of all businesses. The following tables present the number of businesses by size based on the definitions prior to June 2019.

Table 2: Number of businesses by size according to the number of employees.

Number of employees	Number of businesses	%
Up to 19 (Small)	2,314,647	97.4
20 to 199 (Medium)	56,835	2.4
200 or more (Large)	4,271	0.2

Source: ASBFEO Small Business Counts Dec. 2020.

Table 3: Number of businesses by size according to turnover.

Turnover (AUD)	Number of businesses	%
Up to $50k	592,896	25.0
$50k to under $200k	810,470	34.1
$200k to under $2m	806,248	33.9
$2m to under $5m	95,032	4.0
$5m to under $10m	33,643	1.4
$10m or more	37,464	1.6
Total	**2,375,753**	**100.0**

Source: ASBFEO Small Business Counts Dec. 2020.

[41] Department of Industry, Innovation, Science, Research and Tertiary Education (2012). "Australian Small Business Key Statistics and Analysis" https://treasury.gov.au/sites/default/files/2019-03/AustralianSmallBusinessKeyStatisticsAndAnalysis.docx

[42] https://www.ato.gov.au/business/small-business-entity-concessions/eligibility/

3. Barriers to Digitalization

Australian SMEs still have a long way to go when it comes to digitalization. In 2018, the "Small Business Digital Taskforce Report" stated that "many Australian small businesses are delaying, ignoring or simply unaware of digital opportunities, and do not realize the economic and lifestyle advantages that digital tools clearly offer." (p.3).[43] The challenges of digitalization for SMEs are varied. However, the "Small Business Digital Taskforce Report" identified structural factors as some of the challenges, such as Internet connectivity, cybersecurity issues and customer demands.

4. SMEs Digital Transformation Policies

The pandemic highlighted the role of digitalization in supporting and enhancing business operations across all sectors of the Australian economy. The potential benefits of digitalization have been estimated at up to AUD 315 billion over the next decade, with the potential to create up to a quarter of a million new jobs by 2025.[44]

The "Digital Economy Strategy" lays out how Australia will secure its future as a digital economy and society. The Strategy recognizes that the public sector plays an enabling role and that it is Australian businesses and individuals who will determine the success of digitalization.

The 2021-22 budget supports the Digital Economy Strategy through AUD 1.2 billion in strategic investments to unlock the value of data, drive investment and adoption of emerging technologies, build the skills needed for a modern economy, and improve public service delivery.

The Australian authorities has developed several initiatives to promote digitalization. One of the main ones is "Digital Solutions", which is also the only one focused exclusively on SMEs. Other initiatives address aspects of digital transformation and benefit SMEs, but also include workers and businesses of all sizes.

4.1. Digital Solutions

This program is expected to run from July 2018 to September 2022 and is administered by the Treasury Department. The program targets small businesses with fewer than 20 employees and has a budget of AUD 45 million.

The aim of the program is: "to help small businesses access high-quality, low-cost independent advice to digitize their business and take advantage of the opportunities it can offer, regardless of their location." To date, approximately 30,000 small businesses have benefited from the program.

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[43] The Treasury (2018). "Small Business Digital Taskforce Report to Government March 2018" https://www.industry.gov.au/data-and-publications/small-business-digital-taskforce-report-to-government

[44] https://digitaleconomy.pmc.gov.au/strategy/executive-summary

The program works with three nonprofit small business advisory service providers, who receive grants to offer digital solutions to these businesses. For AUD 44, a business can access a 7-hour consulting package, which includes one-on-one consultations, group workshops and webinars. Due to the exceptional conditions created by the pandemic, the program also offers business counseling in areas other than digitalization.

Participants must undergo a Digital Needs Assessment (DNA), to evaluate their digital capability and place them in one of three support streams based on their needs. Then, each company works one-on-one with a consultant to develop a Digital Action Plan (DAP).

The Australian public sector has conducted various market surveys to measure the attitudes of people who have interacted with the Digital Solutions program. The results have been positive, with users stating that they like the webinars and having the support of someone to help them on their digitalization journey.

Users have also stated that they have a positive perception of the effects of the program on their business. However, perceptions do not always correlate with the effects of a program. For this reason, an independent impact evaluation is also being conducted, which attempts to measure the effects of the program on businesses that have benefited from it.

4.2. Cybersecurity Assessment Tool

Cybersecurity is an issue in businesses of all sizes and has been addressed by the Australian public sector at a strategic level through the 2020 Cyber Security Strategy. The Cyber Security Assessment Tool is one of the initiatives to strengthen cyber security in Australian businesses. Other initiatives include the creation of the Australian Cyber Security Center, and the Cyber Security Business Connect and Protect Program.

The aim of the Cybersecurity Assessment Tool is to “help improve cyber security skills among Australian small and medium businesses, and to help businesses identify their business’ cyber security strengths and areas for improvement with advice from the Australian Cyber Security Center (ACSC).” Businesses undertaking the assessment can determine the current maturity level of their cybersecurity and receive a list of recommendations and practical actions for the business to improve. This program, run by the Department of Industry, Science, Energy and Resources, is an online platform that offers free access to more than 2,000 courses from the world’s leading technology companies. The training courses offer support in subjects such as computer fundamentals, cloud computing, coding and data analysis.

The aim of the program is to increase the digital capability of Australian small businesses and Australian workers; and to increase the global competitiveness and financial resilience of Australian businesses in the post-COVID economy.

Since its launch in January 2021, more than 55,000 people have enrolled in Skill Finder. The program has an allocated budget of AUD 2.5 million, and will run until June 2022, but there are hopes that the initiative can develop a sustainable funding model and continue to operate.

The Digital Skills Finder has significant private sector involvement, as it is managed by Balance Internet, a Melbourne-based web company. In addition, 27 corporate partners have signed up to provide course content or promote the initiative to their clients.

The Department of Industry, Science, Energy and Resources of Australia is responsible for the Cybersecurity Assessment Tool, which was launched in April 2021. The budget allocated to this program is AUD 66,000 which includes a contract with a cybersecurity consulting services provider.

4.3. Digital Skills Finder Platform

This program, run by the Department of Industry, Science, Energy and Resources, is an online platform that offers free access to more than 2,000 courses from the world's leading technology companies. The training courses offer support in subjects such as computer fundamentals, cloud computing, coding and data analysis.

The aim of the program is to increase the digital skills of Australian small businesses and Australian workers; and to increase the global competitiveness and financial resilience of Australian businesses in the post-COVID economy.

Since its launch in January 2021, more than 55,000 people have enrolled in Skill Finder. The program has an allocated budget of AUD 2.5 million, and will run until June 2022, but it is hoped that the initiative can develop a sustainable funding model and continue to operate.

The Digital Skills Finder has significant private sector involvement, as it is managed by Balance Internet, a Melbourne-based web company. In addition, 27 corporate partners have signed up to provide course content or promote the initiative to their clients.

4.4. Empowering Business to Go Digital: Navii

Navii is committed to helping small business owners take advantage of the opportunities that new technologies bring in the fastest and most cost-effective way. It is an independent community, supported by the Australian public sector, through the Empowering Business to Go Digital program, and made up of small business owners and industry and digital experts who help businesses use digital tools and systems to operate more efficiently.

The Empowering Business to Go Digital program provides a grant of up to AUD 3 million to non-public sector organizations to build and improve the digital skills of small businesses and to address the issues raised in the Small Business Digital Taskforce report.

Navii formally launched its services in November 2020 and offers resources, training and advice to guide small and medium-sized businesses on their digital journey. The courses are available to anyone, from anywhere, so that any business can access them, regardless of location.

4.5. Small Business Digital Champions

This program is no longer active. It ran from April 2019 to March 2020, and again from April 2020 to April 2021. The Department of Treasury and the Department of Industry, Science, Energy and Resources were in charge of this program. It was targeted to Australian small-sized businesses with fewer than 20 employees and had an allocated budget of AUD 8.9 millions.

The aim of this initiative was to support small business owners across Australia to understand the opportunities that can be maximized through digital technology. 100 small-sized businesses were selected to receive digital transformation assistance, which included goods and services such as hardware, software, and digital training valued at up to AUD 18,500. In turn, fifteen of these 100 businesses were selected as digital champions, and were paired with high-profile Australian innovators to mentor and guide them on their journey.

5. Public Sector's View

Australia currently has its Digital Economy Strategy, which encompasses a large number of variables and aims to transform the economy into a digital world leader by 2030. The plan incorporates a cohesive roadmap with a series of initiatives for Australia to advance its digital journey.

The plan not only incorporates measures to help businesses, but also areas in which the public sector can digitize its interaction with businesses and citizens. One of the goals is that all businesses will be born digital by 2030 and that 95% of SMEs will have an online presence or use digital tools of some kind.

There are always risks that administrative changes could lead to changes in public sector priorities. However, the pandemic brought greater visibility to the importance of digital transformation. Thus, even if there were to be changes in public sector priorities, Australia would be in a good position to continue to develop digitally.

The strategy was not created in a deliberate way or based on studies and an initial plan, but it is still very useful. Sometimes it can be good to offer a large number of options to businesses and let them choose the most useful ones, since it is difficult to capture all the needs at once.

There have been measures that have boosted digital adoption, such as reporting laws to the Tax Office. These regulations have driven the adoption of accounting software. But businesses are not using them to their full potential; they are merely using them to meet reporting obligations.

Barriers that may impede the adoption or hinder the use of digital tools include lack of time to investigate the possibilities, lack of skills and confidence in the effects of digitalization and, of course, cost. In this regard, the role of mentors is very important, as they help guide and clarify the impact of first source digital tools. Given limited resources, the public sector intends to focus its efforts on areas where the market is not delivering adequate solutions. To this end, progress is being made in measuring the digital economy, since having data is key to making accurate assessments.

6. Private Sector's View

In Australia, the public sector has long been an open supporter of digitalization policies. Perhaps one of the public sector moves that most benefited the digitalization of SMEs was the introduction of the Goods and Services Tax in the 2000s. This tax incentivized the adoption of business-to-business accounting software for at least three reasons. First, the software simplified the lives of business owners by simplifying the reporting needed under the new Goods and Services Tax. Second, the public sector supported the adoption of such software because simplifying reporting also ensured the collection of the tax. Third, the increased demand for this type of software allowed developers to take advantage of economies of scale and prices dropped considerably.

In recent years, new regulatory changes have continued to deepen the need for digitalization among businesses. For example, the Single Touch Payroll (STP), an Australian public sector initiative to reduce the reporting burden from employers to public sector agencies, requires businesses to submit their payroll information digitally. Soon, the same will be true for the reporting of social security payments and contributions.

Generally speaking, all businesses in Australia need digitalization and have it built into them in one way or another. All businesses must use a point-of-sale system to process electronic sales and payments. If this were not the case, businesses would have little chance of survival.

Cybersecurity is not a fundamental problem. However, there are many organizations, both public and private, giving out too much information about it, which tends to create confusion. The right way forward should be for software vendors to include cybersecurity tools, as they have done so far.

Despite all the public sector efforts in Australia, digitalization would not have happened without the private sector. It is the private sector that has created the software solutions and platforms that have made digitalization possible.

Looking ahead, digitalization requires the private and public sector to work together to create the tools required by businesses. Ideally, the public sector should define an agenda of areas where digitalization is needed and then sit down with the private sector to fund the development of those solutions.

7. Concluding Remarks

a. The Australian case is very interesting, as one of the measures that most benefited the digitalization of SMEs was the introduction of the Goods and Services Tax in the 2000s, which encouraged the adoption of accounting software. In other words, it was a regulatory change that forced the adoption and familiarization with digital tools.

b. In recent years, new regulatory changes have continued to deepen the need for digitalization of businesses. For example, Single Touch Payroll (STP), an Australian public sector initiative to reduce the reporting burden from employers to public sector agencies, requires businesses to submit their payroll information digitally. The same will soon apply for reporting social security payments and contributions. This, as a whole, means that businesses will be able to see the benefits of digitalization and thus continue their progress in terms of digital transformation.

c. Because of the above, all businesses in Australia need digitalization and have it built into them in one form or another. All businesses must use a point-of-sale system to process electronic sales and payments. If this were not the case, businesses would have little chance of survival. However, this also means that these “basic” tools no longer provide a competitive advantage (as they all do). Thus, it highlights the importance of digital transformation as a continuous transformation process.

Chile

1. Introduction

Chile is located in the south-west of South America. It covers an area of 756,096 square kilometers (291,930 sq mi), and shares borders with Argentina to the east, Peru to the north, and Bolivia to the northeast. According to the last Census of 2017, Chile has a population of 17,574,003, wherein 48.9% is male and 51.1% is female. 11.4% of the total population is of 65 years and above, 68.6% between 15 to 64 years of age, and 20.1% is up to 14 years of age. [45]

In 2019, the labor force rate was 59.4%, the employment rate was 55.2%, and the unemployment rate was 7.0%.[46] In 2019, the GDP per capita was USD 24,968. According to data from the Central Bank of Chile, the main economic activities are those related to the Service sector, which represents approximately 58% of the economy's GDP. Other relevant economic activities are mining (9,1% of GDP), where copper production accounts for approximately 50% of the economy's exports, manufactured products (10,1% of GDP), and agricultural activities (3% of GDP).

The following table shows some of the economy's main indicators and those that specifically relate to the digitalization and digital transformation of businesses.

[45] Instituto Nacional de Estadísticas. (2017). Presentación Resultados Definitivos Censo 2017. http://www.censo2017.cl/wp-content/uploads/2017/12/Presentacion_Resultados_Definitivos_Censo2017.pdf

[46] Instituto Nacional de Estadísticas. (2020, enero). Separata Técnica Anual. https://www.ine.cl/docs/default-source/ocupacion-y-desocupacion/publicaciones-y-anuarios/separatas/anuales/separata 2019.pdf?sfvrsn=4a7591c2_4

Table 4: Chile Profile

Chile	1990	2000	2010	2020
Population, total (millions)	13.27	15.34	17,6	19,12
Population density (people per sq. km of land area)	17,9	20,6	22,9	25,7
Poverty headcount ratio at national poverty lines (% of population)	--	36	22,2	10,8
GNI per capita, PPP (current international $)	4,270	9.220	16,880	25,190
Life expectancy at birth, total (years)	74	76	79	80
School enrollment, primary (% gross)	102.6	103	103.8	102.4
School enrollment, secondary (% gross)	74	86	90	104
Average years of total schooling male population 15-64	8,58	9,479	10,31	
Average years of total schooling female population 15-64	8,59	9,333	10,39	
Urban population growth (annual %)	1,8	1,5	1,1	1
GDP (current US$) (billions)	33.11	77.86	218.54	252.94
GDP growth (annual %)	3,3	5,3	5,8	-5.8
Inflation, GDP deflator (annual %)	22,5	4,3	9	8,4
Agriculture, forestry, and fishing, value added (% of GDP)	8	5	4	4
Industry (including construction), value added (% of GDP)	39	31	36	31
Exports of goods and services (% of GDP)	32	31	38	32
Imports of goods and services (% of GDP)	29	29	31	26
Time required to start a business (days)		42	37	4
Domestic credit provided by financial sector (% of GDP)		83.7	104.5	147.7
Tax revenue (% of GDP)	13,3	16,2	17,4	17,8
Mobile cellular subscriptions (per 100 people)	0.1	22,2	116.3	131.1
Individuals using the Internet (% of population)	0	16,6	45	82.3
High-technology exports (% of manufactured exports)			7	8

World Development Indicators; Barro, Robert and Jong-Wha Lee, 2013. "A New Data Set of Educational Attainment in the World, 1950-2010." Journal of Development Economics, vol 104, pp.184-198.

Figures in green refer to periods other than those specified.

2. SMEs in Chile

There are two main ways of defining SMEs in Chile; either by the number of employees, or the annual amount of sales or revenue. However, the latter is the predominant way of defining these types of businesses and for considering digitalization initiatives. It is worth noting that in Chile, the concept of SMEs is used as an umbrella term that also includes micro enterprises.

47 APEC (2020). "Overview of the SME Sector in the APEC Region: Key Issues on Market Access and Internationalization" https://www.apec.org/docs/default-source/publications/2020/4/overview-of-the-sme-sector-in-the-apec-region---key-issues-on-market-access-and-internationalization/220_psu_sme-market-access-and-internalization.pdf?sfvrsn=2758bd1_1

48 The "Unidad de Fomento" (UF) is a unit of account used in Chile, adjusted for inflation with respect to the Chilean peso. It is an index calculated and authorized by the Central Bank of Chile,for money lending operations in local currency carried out by banking businesses, savings and credit cooperatives. (See more information in: https://si3.bcentral.cl/estadisticas/Principal1/Metodologias/EMF/UF.pdf). On December 30th, 2021, UF was equivalent to 30,986.76 Chilean Pesos.

49 On December 30th, 2021, the amount equivalent to 2400UF was USD 87,466. The amount equivalent to 25000UF was USD 911,107. The amount equivalent to 100,000UF was USD 3,644,429.

According to the Chilean Income Tax System, the classification of the size of the business is made by income expressed in the Chilean unit of account "Unidad de Fomento" (UF). Micro-sized businesses do not exceed an annual sales revenue of 2,400 UF. Small-sized businesses are those with annual sales revenue between 2,400 UF and 25,000 UF. Medium-sized businesses have annual sales revenues between 25,000 UF and 100,000 UF. Furthermore, SMEs are classified for labor purposes according to the number of business employees. Small-sized businesses have between 10 and 49 employees, medium-sized businesses have between 50 and 199 employees.

The following table presents the number of Chilean businesses by size measured by sales, according to 2021 data of the Income Tax System.

Table 5: Number of businesses by annual sales

Annual sales	Number of firms	% of total firms
0 to 25,000 UF (Micro and Small)	2,314,647	97.4
25,000.01 UF to 100.000 UF (Medium)	56,835	2.4
100,000.01 UF and more (Large)	4,271	0.2
Total	**467,876**	**100.0%**

Source: Income Tax System, 2021

According to the latest data from the Chilean Income Tax System, Micro, small and medium-sized businesses (MSMEs) are an important part of the Chilean economy, representing more than 97% of total enterprises in the economy. According to the Ministry of Economy of Chile, these businesses represented at least 50.8% of Chilean formal employment in 2019.[52] In terms of industries, in 2017, the largest proportion of the total number of MSMEs was in Trade (34.7%), Real estate, business and rental activities (12.7%), and Transport, storage and communications (9.7%).[53]
Chilean MSMEs, like many of their counterparts around the world, face several challenges in order to survive and grow. Some of these difficulties have been identified as having low sales levels, facing late payments, bureaucracy, and loneliness, which in sum, translate in entrepreneurs needing accompaniment and support in their business management.[54] Given that these types of businesses are an engine for the member's economic growth in terms of employment and sales, the public sector should support them in different aspects to increase their productivity.

50 Biblioteca del Congreso Nacional. (s. f.). Estatuto de las Pymes. BCN. Retrieved August 22, 2022, from https://www.bcn.cl/leyfacil/recurso/estatuto-de-las-pymes

51 Servicio de Impuestos Internos. (2021). Infografía a las Pymes. https://www.sii.cl/sobre_el_sii/info_empresas_pyme.pdf

52 Ministerio de Economía, Fomento y Turismo. (2020). Cuenta Pública Sectorial Ministerio de Economía, Fomento y Turismo. https://www.economia.gob.cl/wp-content/uploads/2020/05/Resumen-Ejecutivo-Cuenta-Pu%CC%81blica-2019-27mayo.pdf

53 APEC (2020). "Overview of the SME Sector in the APEC Region: Key Issues on Market Access and Internationalization" https://www.apec.org/docs/default-source/publications/2020/4/overview-of-the-sme-sector-in-the-apec-region---key-issues-on-market-access-and-internationalization/220_psu_sme-market-access-and-internalization.pdf?sfvrsn=2758bd1_1

54 Ministerio de Economía, Fomento y Turismo, & Commentz, F. (2019, mayo). Presentación a la Cepal sobre Digitaliza tu Pyme. https://www.cepal.org/sites/default/files/presentations/felipe_commentz.pdf

3. Barriers to Digitalization

The emergence of new digital technologies has, in one way or another, generated the need for all enterprises to adapt in different areas of business operation, such as purchasing, sales, or task automation. The latest available Longitudinal Business Survey (2019) which presents data from 2017, shows results on the use of e-commerce tools by MSMEs. According to this data, 80% of micro businesses, 74% of small businesses, and 68% of medium-sized businesses do not use these technologies.[55]

Internet access is a relevant dimension to consider in the process of digitalization. While internet coverage in Chile has grown steadily for the last decade (see Figure No.1), and SMEs have high connectivity rates, there are still barriers. The 2018 Survey on Access to and Use of Information and Communication Technology (ICT Survey) revealed that 91% of SMEs have broadband connection, and 69% reported having a mobile connection (taking into account once again that the survey does not include micro-enterprises). Despite these high percentages, the main barrier is related to the connection quality. Results from the same survey show that 23% of SMEs report speeds between 2 and 10 mbps, in contrast to 36% of large businesses. Only 9% of SMEs have connection speeds exceeding 100 mbps, as opposed to 19% of large businesses.[57] In addition, the geographic area is also a determinant in internet accessibility. According to data from the latest Internet Access and Uses survey (2017), 89.1% of households in urban areas had internet access, compared to 76.7% of households in rural areas.[58]

The 2018 ICT Survey in businesses presents other relevant information for SMEs (not including micro-enterprises) in other areas related to digitalization. Only 2 out of every 5 SMEs has a website, and only 24% of SMEs reported having social media presence. This indicates that in Chile, prior to the Covid-19 pandemic,[59] smaller businesses had certain shortcomings in the use of digital tools in areas such as inventory management, accounting administration and logistics.

The Covid-19 pandemic sped up the digitalization processes of thousands of businesses. For instance, according to the OECD, Chile is the member economy whose SMEs increased their use of digital technologies the most during the pandemic.[59] 62% of Chilean SMEs claim to have adopted new technologies. According to a Microsoft study, 88% of SMEs claim that the pandemic has digitized their businesses.

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55 Ministerio de Economía, Fomento y Turismo. (2019, enero). Boletín ELE-5: Principales resultados. https://www.economia.gob.cl/wp-content/uploads/2019/03/ELE-5-Principales_resultados.pdf

56 Dini, M., Gligo, N., & Patiño, A. (2021, agosto). Transformación digital de las mipymes: elementos para el diseño de políticas. CEPAL https://repositorio.cepal.org/bitstream/handle/11362/47183/S2100372_es.pdf?sequence=1&isAllowed=y

57 Ministerio de Economía, Fomento y Turismo. (2020b, julio). Informe General de Resultados: Encuesta de Acceso y Uso de Tecnología de Información y Comunicación (TIC) en Empresas. https://www.economia.gob.cl/wp-content/uploads/2020/07/Informe-de-Resultados-Encuesta-TIC.pdf

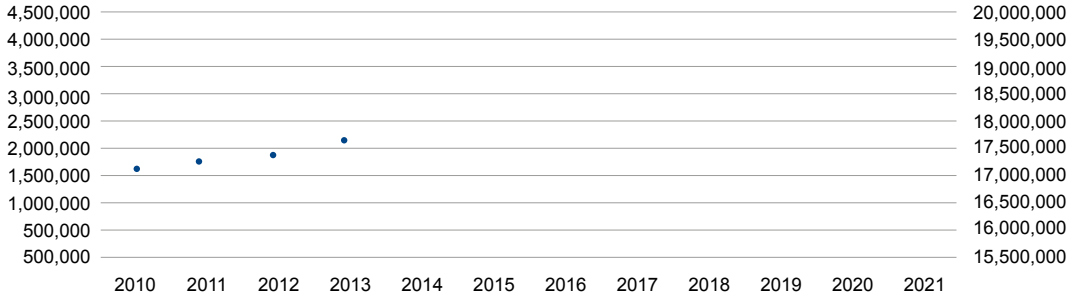
58 Brújula investigación y estrategia & Subsecretaría de Telecomunicaciones de Chile. (2017, diciembre). Informe Final-IX Encuesta de Acceso y Usos de Internet. https://www.subtel.gob.cl/wp-content/uploads/2018/07/Informe_Final_IX_Encuesta_Acceso_y_Usos_Internet_2017.pdf

59 Organización para la Cooperación y el Desarrollo Económicos. (2021). OECD SME and Entrepreneurship Outlook 2021, OECD Publishing, Paris, https://doi.org/10.1787/97a5bbfe-en

60 Microsoft. (2021). Readaptarse para Crecer: Los Secretos de las Pymes C hilenas a un Año de la Pandemia. News Center Latinoamérica. Retrieved from: https://news.microsoft.com/es-xl/a-un- ano-de-la-pandemia-pymes-chilenas-aceleraron-su-transformacion-digital/

Small-sized businesses accustomed to the physical sale of their products and services had to adapt their sales channels to online formats and delivery platforms. This was intensified due to the strict confinement measures that were extended for several months because of the pandemic. Nevertheless, the considerable increase in the use of digital sales channels does not necessarily mean that these businesses have gone digital in all areas, such as logistics, human resources, inventory, accounting, etc. In fact, only a few SMEs have a digital culture inherently embedded in the vision and management of their business, including possible transformations in processes and business model. In this sense, it is necessary to understand what 88% of SMEs are referring to, when they state that they have gone digital.

Figure 1: Evolution of the number of broadband connections in Chile, 2010-2021



*Connections: Average annual number of broadband connections. The year 2021 covers information from January to September. Source: Undersecretary of Telecommunications
*Population: projected values based on the latest 2017 Census. Source: National Institute of Statistics

One of the barriers in the digitalization process has been the characteristics of owners or managers of Chilean MSMEs, which should be taken into consideration when designing and implementing digitalization support tools. Business owners' age can influence the digitalization rates, as accepting and adopting technological solutions can be more difficult in some cases.

According to data from the latest micro-entrepreneurship survey (2019), 24.6% of micro-entrepreneurs' ages range between 55 and 64, and 17.5% are 65 years or older.[61] The difficulty to incorporate technological solutions may be associated with a weaker relationship with new technologies, lack of knowledge of their benefits, or the belief that they are not necessary for the management and growth of the business. Furthermore, due to the nature and way in which MSMEs operate and their needs, owners or managers must work several hours a day, focusing mainly on basic operation tasks. Thus, they do not always have additional time to attend or carry out training and coaching activities.

[61] Ministerio de Economía, Fomento y Turismo. (2019, diciembre). Informe Final - Sexta Encuesta de Microemprendimiento. https://www.economia.gob.cl/wp-content/uploads/2020/03/Informe-Final-EME-6.pdf

4. SMEs Digital Transformation Policies

Chile has promoted the economy's digital development for decades, and it is considered a pioneering economy in the region because it considered the importance of Information and Communication Technologies (ICT) for the economy's development, while incorporating them in digitalization strategies. Table 6 shows a summary of the main existing initiatives to support the digitalization of micro, small and medium-sized enterprises by the public sector, which are detailed below.

Table 6: Summary of initiatives for the Digitalization of MSMEs

Main initiative	Key instruments	Type of support
Business in a Day	Business in a day (2013)	Digitalization of the creation process of a business
	Business in a day (2013)	Digitalization of the operation procedures of a business
Digitalize your SME (2019)	Digital Checkup	Self-assessment of digital maturity level
	Digital Route	Training courses
	SMEs online	Training courses, including a subsidy businesses can apply for if they complete the process (digital kit).
	SME purchase	Virtual showcase
	Neighborhood SMEs	Virtual showcase

Source: Income Tax System, 2021

4.1. Domestic Digitalization Strategies

The first digitalization strategy dates back to 1999, when the National Information Infrastructure Commission, chaired by the Minister of Economy and comprising members from both the public and private sectors, created the report "Chile towards the Information Society" with the objective of "Generating a debate and proposing a path that leads to the full deployment of the economic and social potential of a technological revolution that is transforming the world".[63]

This first strategy was followed by several initiatives,[64] each covering different areas of digital development, such as the dissemination of the importance of ICTs, the promotion of greater connectivity, digital inclusion and the development of services.

[62] Digitalize your SME contains 17 programs. The five mentioned in the table above are the main programs. The total list of programs grouped in Digitalize your SME are: Digital Venture, Digitalize your SME Day, Digital Checkup, Digital Route, Business Centers, Digitalize your Warehouse, SMEs Online, Strengthen your SME Network, Amazon Host, MSME Take off, Digital Export, Tourism connect, Go Digital Kit, SMEs by SMEs, Neighbourhood SMEs, and SME Purchase.

[63] Comisión Presidencial Nuevas Tecnologías de Información y Comunicación. (1999, january). Informe al Presidente de la República - Chile: Hacia la sociedad de la información. https://www.economia.gob.cl/1540/articles-187090_recurso_1.pdf

[64] http://www.agendadigital.gob.cl/#/documentos/otras-agendas

Technological advances led the public sector to update its plans for digital development and to include them in the Digital Agenda of 2004-2006. This second digitalization strategy was led by the Undersecretary of Economy and had the support of public sector institutions, business organizations, academia and other public sector branches.

The Digital Agenda of 2004-2006 would later be updated to the "Digital Strategy 2007" and later to the "Imagina Chile Digital Agenda (2013-2020)". The first agenda was led by the Minister of Economy and the second by the Minister of Transport and Telecommunications.

The last Digital Agenda was published in 2020 and was developed by representatives of the ministries most directly related to Digital Development policies, led by the Minister Secretary General of the Presidency. This strategy was defined as "a roadmap to advance the economy's digital development in an inclusive and sustainable manner through information and communication technologies, making it possible to promote and ensure coherence, and to facilitate the monitoring progress and evaluation of the committed measures".[67]

The agenda focused on five strategic areas: Rights, Connectivity, Government, Economy and Competencies. "Transforming the company digitally" was proposed as a line of action within the Economy area.

4.2. Business in a day

"Business in a day" is one of the first public initiatives developed to support the digitalization of Chilean businesses. It was launched in 2013 by the Ministry of Economy and was part of the public sector's modernization efforts by enabling the creation of new businesses through an online platform.

In 2016, "Business in a day" was complemented with the launch of "Business Desktop", which introduced new features for entrepreneurs and the operation of their businesses, such as the realization of procedures related to the registration of trademarks, obtaining permits and patents, access to financial services, and applications for funds and benefits provided by the public sector. Today, "Business in a day" and "Business Desktop" are merged under the same platform, enabling entrepreneurs to access all its benefits in one place. It is worth mentioning that during the pandemic, the costs of implementing this policy were significantly reduced, dropping to practically zero (in the range of USD 2 - 2.5).[69]

The agencies responsible for these initiatives have changed over time, initially being CORFO, then the General Secretariat of Government, and currently the Ministry of Economy.

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65 Comité de Ministros de Desarrollo Digital. (2007, diciembre). Estrategia Digital 2007 - 2012. https://observatoriodigital.gob.cl/sites/default/files/estrategia_digital_2007-2012.pdf

66 Ministry General Secretariat of the Presidency, Ministry of the Interior and Public Security, Ministry of Finance, Ministry of Economy, Development and Tourism, Ministry of Education, Ministry of Health, and Ministry of Transportation and Telecommunications.

67 Chile anuncia la creación de su División de Gobierno Digital. (s. f.). U-Gob. Retrieved August 22, 2022, from https://u-gob.com/chile-anuncia-la-creacion-de-su-division-de-gobierno-digital/

68 Ministerio de Economía, Fomento y Turismo. (s. f.-b). Registro de Empresas y Sociedades. Registro de empresas y sociedades. Retrieved August 22, 2022, from https://www.registrodeempresasysociedades.cl/

69 Ministerio de Economía, Fomento y Turismo. (s. f.). Creación de empresas alcanza cifra récord por Firma Electrónica Avanzada 100% online en medio de la pandemia. economia.gob.cl. Retrieved August 22, 2022, from https://www.economia.gob.cl/2020/08/18/lucas-palacios-creacion-de-empresas-alcanza-cifra-record-por-firma-electronica.htm

4.3 Digitalize your SME

Currently, the main public policy targeting the digitalization of SMEs is implemented through the "Digitalize your SME" program (hereinafter DYSME), launched in early 2019. This program combines all the previously existing initiatives and encompasses the largest number of instruments and tools to support businesses in this area. DYSME seeks to guide and support the digital transformation process of smaller businesses, offering a range of events, workshops, training, tools and a network of partner institutions to support the adoption of digital technologies.

In its early days, DYSME was originally conceived as an instance that generated and grouped various initiatives and instruments to support the digitalization of smaller businesses. The program grew stronger in 2020 due to the Covid-19 pandemic.

The Ministry of Economy is in charge of the program. It works through the Undersecretariat of Economy and Small Businesses and its function is to design, collect information, evaluate and coordinate the development of the instruments needed to solve the identified needs of SMEs, which are executed by other agencies.

DYSME consists of several initiatives, mainly carried out through two agencies: Chilean economic development agency (CORFO), and the Technical Cooperation Service (SERCOTEC). Both belong to the Ministry of Economy.

In 2021, the administrative structure of DYSME was significantly modified with the creation of the "Future and Social Adoption of Technology Unit" (FAST) of the Undersecretariat of Economy. FAST is responsible for consolidating the DYSME program and making improvements as they arise. Its mission is to "advance the exploration and application of new technologies for the post-pandemic economy". [71]

DYSME's intervention strategy for businesses is structured in three stages:
1. Business managers are encouraged to understand the benefits of digitalization.
2. They are instructed to learn about different tools, contents and processes.
3. They receive support in adopting digital technologies, so that they can effectively incorporate them into their businesses.

These three stages are based on the idea of making the DYSME program a digital transformation "journey" for SMEs: to "understand", to "learn" and to "adopt".

The initiatives within DYSME aim to support businesses with lower levels of digital maturity and which need more guidance. The more the digitalization level of a business increases, the more it increases its independence in the search for new solutions.

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[70] Ministerio de Economía, Fomento y Turismo. (s. f.-b). Digitaliza tu Pyme. Digitaliza tu Pyme. Retrieved August 22, 2022, from https://www.digitalizatupyme.cl/

[71] Ministerio de Economía, Fomento y Turismo. (s. f.-d). Subsecretario Julio Pertuzé anuncia creación de Unidad FAST: se enfocará en adopción social de la tecnología. Retrieved August 22, 2022, from https://www.economia.gob.cl/2021/05/31/subsecretario-julio-pertuze-anuncia-creacion-de-unidad-fast-se-enfocara-en-adopcion-social-de-la-tecnologia.htm

4.3.1 DYSME instruments and tools

4.3.1.1 Self-assessment tool

Businesses that join the DYSME program begin with an assessment of their digitalization status through the "Digital Checkup". This tool consists of an online self-assessment that measures the level of digital maturity of MSMEs, and provides them with personalized and actionable recommendations to advance on their path to digitalization. [72]

The Digital Checkup assesses the maturity of the business considering seven dimensions of digital transformation: Technology and Digital Skills; Culture and Leadership; People and Organization; Communications; Data and Analytics; Processes; and Strategy and Digital Transformation.

This assessment had a first redrafting stage which was carried out in 2021 through a direct survey with users. It generated several improvements, enabling the creation of personalized recommendations for businesses. In addition to promoting its use, it considerably increased in a few months the number of checked businesses. At the present, all businesses wishing to access DYSME benefits must first undergo a Digital Checkup. By the year 2021, approximately 8,800 checkups had been performed, and where more than 76% obtained low maturity level results.

4.3.1.2 Training

One of the main tools for implementing the initiative's intervention strategy is training. The DYSME program has a wide range of training courses, which are permanent and are categorized by topic and level of digital maturity. Given that these training courses are provided by different agencies (mainly private organizations), part of the Ministry's role is to ensure and coordinate that among the different agencies that provide the courses, these do not repeat, and that they meet the current and future needs of Chilean MSMEs. The main training courses offered are:

- **Digital Route:** an online platform of SERCOTEC, which seeks to provide tools that facilitate the use of technology in the business management of micro and small enterprises through an e-learning format. Each course of this Route presents basic and advanced levels of knowledge and includes five courses in the following subjects: Finance and Information Security, Marketing, Sales and Inventory, Management and Collaboration, and Tourism Marketing. After the Digital Checkup and depending on the results regarding the business' digital development status, a Digital Route is recommended. Upon completion of the training courses related to the Route and the required final tests, the business is eligible for the "digital kit", which is a subsidy for the purchase of equipment and business management tools. This subsidy is a benefit that can be applied to, it has application requirements and is especially aimed at businesses who have taken the courses and who present learning progress after the training sessions. Among the users of the Digital Route whose progress has been measured in regard to their initial situation, 92% improved their situation, 7.1% maintained it, and only 0.8% did not improve.

[72] The digital maturity scale used ranges from levels 1 to 5. Level 1 means that the business requires support and training to acquire the necessary skills and knowledge to begin its digitalization process. Level 5 means that the business has a digital culture that encourages the constant development of new technological instances and opportunities.

[73] Updated figures up to January 2021 show that more than 15,511 checkups have been performed.

- **SMEs online:** online platform of CORFO which seeks to make available training content to SMEs on issues such as e-commerce, social networks, e-commerce platforms, marketplace, payment methods, and digital marketing. This initiative includes audiovisual content produced by expert companies in each of the target areas, live virtual classes, forum participation and a virtual community.

These trainings are not mutually exclusive, and SMEs can participate in both. The main difference is the catalog of offered courses and the target audience. SERCOTEC is focused on businesses in their early stages, while CORFO also includes businesses that are more established.

4.3.1.3 Virtual showcases

The DYSME program has two virtual showcases for businesses:

- **SME purchase:** a virtual showcase with free registration that provides a digital presence to Chilean MSMEs, connecting people with the supply of local entrepreneurship. Visitors to the site can search for businesses by different categories/characteristics (e.g., industry or geographic location) to identify those that match what they are looking for. The business profiles contain contact information, location, opening hours, payment methods and links to their websites. The site also includes media campaigns on certain dates in order to encourage purchases from MSMEs and to provide greater visibility.

- **Neighborhood SMEs:** a platform that connects the needs of customers with services offered by neighborhood MSMEs through a virtual assistant that increases businesses' visibility, shows their products and their sales channels. SMEs participating in this initiative can access preferential prices for shipping and logistics services, thanks to an agreement between the Ministry of Economy and companies in these areas.

4.3.2. DYSME budget and scope

At present, the DYSME program is established within a budget line of the Ministry of Economy. Thus, the agencies in charge of its execution expect that the main initiatives within the program will be maintained over time, regardless of future changes of authorities.

Table 7 shows the evolution of the baseline budget provided to the DYSME program between 2019 and 2021. There is a relevant drop in 2021 which may be due to budget adjustments made by the public sector to address social demands during the pandemic.

Table 7: Budget allocated to the Digitalize your SME program

1019	2020	2021
CLP 237,705,000	CLP 248,974,000	CLP 172,652,000

Source: Ministry of Economy

Most of the businesses benefiting from the program are micro and small-sized businesses, followed by medium-sized ones. It should be noted that the DYSME program initiatives are transversal to any type of industry or economic sector, and do not have a specific gender focus with respect to the owners or managers of the businesses.

To date, more than 400,000 program benefits have been granted to nearly 52,000 businesses. This means that the same business has benefited more than once from the program, as they can take the same course or courses on different topics several times over time. The training courses of the Digital Route and SMEs online programs have delivered approximately 100,000 and 147,000 benefits, respectively, and within the Digital Route, the digital kit has been delivered to approximately 2,800 businesses. In addition, as part of the SME purchase virtual showcase, more than 45 training courses have been held, focusing on e-commerce and digital marketing, so that registered SMEs could make the most of their participation.

4.3.3 DYSME program evaluations

As a result of the pandemic DYSME had to respond quickly, delivering benefits in the shortest possible time. In that regard, the program grew strongly, but there was little time to carry out pilots, modifications or evaluations. Aware of the need for improvement, recently the program began its redesign by incorporating both quantitative and qualitative information based on feedback from users and interviews with SMEs.

Thus, during 2021 and early 2022, the Ministry of Economy conducted nearly 350 interviews with SMEs throughout the economy, as part of the “Lessons of Digitalization’’ initiative. The goal was to gather qualitative information to learn about the digitalization process of Chilean MSMEs during the Covid-19 pandemic. With the obtained information it has been possible to validate what the program does and support aspects of its design, especially regarding the use of training courses. The user feedback also helped to identify new SME needs that were not detected in the first stage of the program, and to evaluate the redesign or elimination of certain tools, such as old training courses that were no longer adequate for the current SMEs’ needs.

An important aspect that should be considered when analyzing program results that lead to an impact evaluation, is data accessibility. At the beginning of DYSME, various organizations implementing the different instruments managed their data internally and did not have protocols for transferring information amongst them, which made program monitoring difficult. This was addressed and resolved during the course of the program’s development, through the creation of formal agreements for the transfer of information.

Also related to the use of data within the program, the Ministry of Economy is working on an internal data infrastructure that will allow having all records in a single place. This will facilitate a better design of new initiatives and will also make the process of transferring information between agencies more efficient.

[74] On December 30th, 2021, CLP 237,705,000 was equivalent to USD 279,571; CLP 248,974,000 was USD 292,824; and CLP 172,652,000 was USD 203,060.

4.3.4 Complementary initiatives to DYSME

Currently, the Ministry of Economy is interested in developing several complementary and supporting initiatives to the already existing ones within the DYSME program. One of these initiatives is the creation of personalized route recommendations for each SME that performs the Digital Checkup (so far the recommendations only vary according to the level of digital maturity of the SMEs). The customization of the route is key to the business' correct development in the process towards digital transformation. Through the use of Artificial Intelligence (AI) and information on the performance of the business obtained from other sources, the eventual impact that training courses may have on performance aspects is expected to be included. Thus, it would be able to recommend to businesses the best route to digitalize.

Another initiative with development potential is a platform for SME recommendations called "SMEs by SMEs", which seeks to generate support networks and recommendations among SMEs. This program arises from the reality that owners of smaller businesses are generally isolated in the management of their businesses, they do not know the existing opportunities for growth and development or have certain fears in the incorporation of digital tools. In this regard, it was determined that obstacles like these are better addressed if businesses are integrated into an ecosystem of peers and generate networks that allow them to support each other and develop the necessary skills to manage their businesses.

Another initiative in the pipeline is to generate a Behavioral Economics study to encourage progress towards higher levels of digitalization. Although the necessary tools have been implemented in the initial stages of digitalization, the Ministry is aware of the need to increase support in terms of digitalization progress, to businesses that obtain a higher level of maturity in the digital checkup.

Finally, there are plans to work on a Digital Leaders program. This program seeks to promote the role of young people that strengthen digitalization within their communities. Given that younger generations are the ones who have internalized more the use of digital tools, they can be a great contribution to supporting MSMEs, both in their families and with close ones, as well as in their communities and neighborhoods, to follow the path of digitalization for their businesses.

5. Private Involvement in digitalization programs

Since its inception, the DYSME program has taken into account the importance of adding private partners. To this end, partnerships have been made with private companies to support certain budget shortfalls, and for activities such as virtual showcase platforms, preferential services to SMEs, or as sponsors of digitalization events.

The public-private relationship has evolved since the beginning of DYSME. Initially, there was no formal system for the selection of private actors to collaborate and provide services. Now however, there are guidelines for evaluating providers in terms of the various criteria they must meet, such as size, scope, or value of their services. At the beginning of 2022, the Ministry of Economy launched the “Go Digital kit” platform, which enables partner companies to offer their services to SMEs at preferential prices. The areas in which these services are offered are digital marketing, e-commerce, shipping, payment methods, Internet connection and cybersecurity.

Another type of relationship the Ministry of Economy has created has been with global organizations. One of the most important agreements is with the Inter-American Development Bank (IDB). Through technical cooperation, the IDB financed the “Digital Checkup” tool and also participated in redesign stages of the DYSME program. One of the great benefits of this type of partnership is that, for example, in this specific case, the IDB has exported the Digital Checkup to 14 other economies, which will eventually provide comparable data on the digitalization processes of SMEs in different economies.

The following can be highlighted within the variety of examples of public-private collaboration related to the field of digitalization in Chile:

1. **Fundación País Digital.** This organization, set up in 2001, has worked on various initiatives to support digitalization, such as the “Technology Adoption Workshops: Digital Solutions for SMEs’’, a project developed within the framework of the DYSME program, with support from CORFO.
2. **Santiago Chamber of Commerce (SCC).** Non-profit trade association that works on initiatives to support business development in the economy, such as: supporting the development of regulatory frameworks for collaborative economy initiatives; supporting women entrepreneurs to convert their work to e-commerce; and being the main promoter of the “cyber day”, the largest local event of business visualization and digital shopping, where SMEs also participate.

[75] Argentina, Chile, Ecuador, Panamá, Honduras, El Salvador, Costa Rica, Guatemala, República Dominicana, Perú, Bolivia and Paraguay.

[76] The average age of entrepreneurs is between 35 and 55 years old, where 87% of the businesses have 25 employees or less, and only 1% of SMEs have more than 200 employees.

In Chile it is also possible to find initiatives that are born entirely from the private sector and are focused on supporting the digitalization of SMEs. For instance, SME Value, launched by BCI Bank, is a collaborative platform that provides strategic partner solutions, tools and knowledge free of charge to small business owners, with the goal of supporting them in their operations and making them more competitive through digital knowledge and tools. This initiative also includes a self-assessment so that businesses can assess their level of digital maturity.[76]

To better comprehend the impact of this private initiative, between June and December 2020, more than 17,000 SMEs from more than 150 different industries, have carried out a self-assessment, where 89% of the businesses have a beginner level of digitalization.[76]

6.Territorial approach of digitalization initiatives

Chile is a geographically diverse economy, where 83% of the territory consists of rural areas, home to 25.5% of the economy's inhabitants. Although DYSME does not have initiatives classified by territory, this aspect has been considered nonetheless and support to SMEs has been adjusted to adapt to the geographical reality, with a significant territorial deployment throughout the economy. It has been of vital importance to include businesses in the most isolated areas of the economy, since they generally have less information about the available possibilities for learning and using the new emerging technologies.

One of the changes made to the DYSME program was to change the training format, in order to ensure that no entrepreneur is left behind due to territorial difficulties. Initially, training courses were held in person and online. Now, however, all training is online, which facilitates the participation of regional SMEs and those in areas with less connectivity.

A recent initiative with a territorial approach is CORFO's Strengthen SME Digital Assistance Network, with training, education and comprehensive support centers deployed in different regions, which promote the adoption and use of digital technologies in SMEs in their production, management and commercial processes. Although this initiative is not within the DYSME program, they are linked, as businesses must complete the Digital Checkup in order to participate. Another initiative is the SERCOTEC Business Centers, which aim to provide support services to small businesses in different areas of the economy so as to ensure that they achieve economic success. This initiative is the result of an agreement signed between Chile and the United States, through the Small Business Development Centers (SBDC). One of the challenges related to the territory is for SMEs in the most isolated areas of the economy to become more familiar with the existing programs.

7. Public Sector's View

Digitalization efforts should be part of long-term planning, so that they have continuity over time. So far, there is no formal commitment to maintain initiatives, programs or tools after a change of authorities beyond the budget item including spending on digitalization programs. However, the responsible agencies have sought, within the realms of possibility, to ensure continuity.

In a sense, the latter reflects a paradigm shift, in which gradually different initiatives on digitalization issues have attempted to organize themselves to be framed within a unified system. Prior to these attempts, the various initiatives were individual efforts without a framework of their own order.

The view to offer assistance to SMEs according to the needs of every single business has also become more widespread. In other words, there is a feeling that the "one program fits all" approach is not optimal, since all SMEs have their own realities.

In order to identify the needs of SMEs and design programs that satisfy their needs, appropriate assessments and impact evaluations are essential. However, solid evidence on the needs of SMEs in relation to digitalization is limited and the effects of digital transformation have only begun to emerge. Likewise, efforts have been made to create a legal and technological platform for data transfer and storage system among the different agencies in charge of developing policies to encourage the development of SMEs.

There are also a number of difficulties that still need to be addressed. A particularly important one is the lack of cooperation among public agencies, which on many occasions has threatened the design and execution of programs. There should be, in other words, a formal and organized commitment between the different Ministries or public services that, in one way or another, support digitalization processes.

It is evident to the public sector that cooperation with the private sector is relevant for the success of digitalization programs, as they can do things more efficiently. But cooperation must be built on agreements and projects that effectively benefit SMEs and not just serve as a showcase or marketing platform for private parties.

Finally, the public sector stresses that cooperation with global organizations can be incredibly beneficial, both in terms of knowledge and funding opportunities, which can be critical to ensure the success of any policy, especially in small economies with limited budgets such as Chile.

8.Private Sector's View

The private sector does not perceive a centralized and long-term sustainable policy to promote digitalization. On the contrary, it observes isolated policies.

Strong progress in the development of certain skills is needed, for which educational institutions must adapt their programs to the new business requirements. This is related to the need for knowledge about alternative tools to advance in digitalization, since many SMEs currently are unaware of the existence of these new options.

Significant cultural changes and a general lack of awareness of the real meaning of digital transformation and adoption of digital technologies in business are still lacking. Many SMEs think that having a website or joining an e-commerce platform means “going digital”. However, digitalization is something more complex and which must permeate the entire operation of businesses, including their culture, processes, interaction mechanisms with their customers, suppliers, etc.; as well as their business vision and digital mindset.

There is also the fear that advances in digitalization that have taken place during the crisis are only temporary. In short, SMEs have adopted digital tools to survive during this critical period, but there is no total conviction about their use. Hence, this perception could lead them to return to operating as they did before.

Finally, the private sector places a great emphasis on the large gender gap that exists in terms of digitalization in SMEs, which is seen as a structural problem that must be addressed urgently.

9. Concluding Remarks

a. In Chile, there is a great diversity among businesses in terms of digitalization and skill development level for a digital transformation that implies changes in the business model. These differences can also be observed among industries. In order to ensure greater reach and, therefore, impact on public policies to support digital transformation, it is essential to recognize these differences and the restrictions they impose and advance towards specialization by industry.

   Making this leap implies that the designed programs will respond to the challenges faced by businesses according to the differences that characterize them, avoiding that only the segment of businesses with an entry level of maturity receive the necessary support, but that those more advanced can also increase their impact on the economy through a faster digital transformation and not only depend on their self-management or on the private sector.

b. Chile is considered a pioneer in the region in including digital transformation in its development strategy. However, the scope of digital transformation support policies has yet to be extended to businesses with a high level of technological development. Digitalization and subsequent digital transformation is certainly necessary for SMEs to have sustainable growth in the medium to long term and not to perish along the way. This aspect is now being addressed by programs such as DYSME.

   However, it is also necessary to analyze the possible impact on the economy by providing support tools for digital transformation to more consolidated businesses or businesses with a developed scientific-technological base. This is the case of scale-ups, fast-growing businesses that in Chile created 40% of new jobs between 2015 and 2018 (Centro de Innovación UC, 2020). This rapid growth is mainly explained by their ability to innovate or by an external shock that generates a business opportunity. Thus, it is possible to imagine the positive and relevant impact on the development of the economy that would have to support the digital transformation of these types of businesses.

c. The economy's geography determines the productive structures of the different areas, for example, mining in the north, agriculture in the central region and aquaculture in the south. This reality creates different needs to advance in digital transformation. From this perspective, it is necessary to identify geographic characteristics that in some way hinder the digital transformation of businesses. In this context, public policies to support connectivity and telecommunications are essential for the transformational leap that businesses require in digital terms. Thus, effective coordination among all public institutions in charge of these policies is a fundamental step.

   Very specific programs can be designed for each industry, but if the basic conditions are not in place to increase and enable the necessary infrastructure, the outcome of these programs will be affected in terms of their impact.

   Based on the above argument, it is expected that the development of the fifth-generation mobile network infrastructure (5G) will generate opportunities for the production of goods and services, the development of new businesses, and the improvement of production processes in the main industries.

d. It is important to remember that Digital Transformation occurs at the business level, i.e., it moves beyond the digitalization of processes. Given the magnitude of what this change implies, organizational culture is a determining factor for the success of this challenge. In Chile's case, there is a significant absence of digital and integrated organizational culture on the different business levels, which makes the correct and efficient implementation of required changes possible.

   In this context, the training courses that are offered in different programs must play a central role in establishing and shaping the digital and transformational culture of businesses. These should not only provide knowledge about technical tools for business management, regardless of how popular these may be for users, but they should also push users to question their own cultural barriers that prevent the use of new technologies, such as risk aversion, lack of flexibility and speed in management and execution of different tasks, the low value given to evidence-based decision making, among others.

e. Given the importance of Digital Transformation in the productivity and competitiveness of businesses and the acceleration it suffered due to the pandemic, both public and private sectors in Chile reacted to the new scenario. They assumed an active role in the Digital Transformation of businesses and quickly delivered support tools for digitalization. In this context, the involvement of the private sector is noteworthy, as it has a positive perspective on the existing public initiatives, providing support to SMEs in different areas.

   The role played by the private sector in the digital transformation process of SMEs is fundamental, since it has the capacity to react more quickly to the arising needs of the economy. Consequently, it is expected that the private sector will continue to complement and support public sector policies. Notably, there is a need to strengthen the development of public-private alliances that enable a better complementarity of different efforts, addressing the different needs of SMEs in a more efficient and effective manner.

New Zealand

1. Introduction

New Zealand (Māori: Aotearoa) is an archipelago located in the Southwestern Pacific Ocean. The two main islands are North Island (Te Ika-a-Māui) and South Island (Te Waipounamu). With a population of 4.4 million, it is one of the most geographically isolated developed economies.

The economy is divided into 16 regions: Northland, Auckland, Waikato, Bay of Plenty, Gisborne, Hawke's Bay, Taranaki, Manawatu-Wanganui, Wellington, Tasman, Nelson, Marlborough, West Coast, Canterbury, Otago, and Southland.

New Zealand's main economic activities are agriculture and livestock, it has a GDP (PPP) per capita estimated between USD 27,420 and USD 29,352.

The following table shows some of the economy's main indicators and those that specifically relate to the digitalization and digital transformation of businesses.

Table 8: New Zealand Profile

New Zealand	1990	2000	2010	2020
Population, total (millions)	3,33	3,86	4,35	5,08
Population density (people per sq. km of land area)	12,6	14,7	16,5	19,3
Poverty headcount ratio at national poverty lines (% of population)	--	--	--	--
GNI per capita, PPP (current international $)	14,240	20,290	29,690	43,950
Life expectancy at birth, total (years)	75	79	81	82
School enrollment, primary (% gross)	104,7	99,5	101,1	101,7
School enrollment, secondary (% gross)	89	111	119	123
Average years of total schooling male population 15-64	11,861	12,281	10,99	--
Average years of total schooling female population 15-64	11,494	12,097	11,786	--
Urban population growth (annual %)	1.2	0,7	1	2,2
GDP (current US$) (billions)	45,5	52,62	146,52	210,89
GDP growth (annual %)	0,2	2,9	1,5	1
Inflation, GDP deflator (annual %)	2,4	2,8	3,1	-0,3
Agriculture, forestry, and fishing, value added (% of GDP)	6	8	7	6
Industry (including construction), value added (% of GDP)	27	24	21	20
Exports of goods and services (% of GDP)	27	36	30	27
Imports of goods and services (% of GDP)	26	33	28	27
Time required to start a business (days)	--	12	1	1
Domestic credit provided by financial sector (% of GDP)	--	--	--	167,9
Tax revenue (% of GDP)	32,7	28,6	26,2	28,2
Mobile cellular subscriptions (per 100 people)	1,6	40	107,8	134,9
Individuals using the Internet (% of population)	0	47,4	80,5	90,8
High-technology exports (% of manufactured exports)	--	--	10	10

Source: World Development Indicators; Barro, Robert and Jong-Wha Lee, 2013. "A New Data Set of Educational Attainment in the World, 1950-2010." Journal of Development Economics, vol 104, pp.184-198.

Figures in green refer to periods other than those specified.

2.SMEs in New Zealand

In New Zealand, SMEs are defined as businesses with fewer than 20 employees. They represent 97% of all businesses and make a significant contribution to the economy: SMEs employ 28% of the workforce and are responsible for 42% of value added.[77] Data from 2014 revealed that SMEs in New Zealand contributed 27.9% to the economy's GDP, which means that their importance has grown over time. [78]

The rewards of digitalization could be enormous for New Zealand. Xero and NZIER estimate that a 20% increase in cloud computing alone could generate an additional USD 6.2 billion in annual GDP, while Google estimates that annual GDP would increase by USD 46.6 billion if New Zealand were to take full advantage of digitalization by 2030.[79]

[77] Ministry of Business, Innovation, & Employment (2020). "Small Businesses in 2019" https://www.mbie.govt.nz/assets/small-business-factsheet-2020.pdf

[78] APEC (2020). "Overview of the SME Sector in the APEC Region: Key Issues on Market Access and Internationalization" https://www.apec.org/docs/default-source/publications/2020/4/overview-of-the-sme-sector-in-the-apec-region---key-issues-on-market-access-and- internationalization/220_psu_sme-market-access-and-internalization.pdf?sfvrsn=2758bd1_1

[79] Luey, M. (n.d.). How Digital Boost is uplifting and upskilling Kiwi small businesses. Kea. Retrieved August 23, 2022, from https://keanewzealand.com/digital-boost/

3. Barriers to Digitalization

The Better for Business Digital Index 2021 revealed that New Zealand businesses have made a digital leap in the last 12 months. However, they still have work to do. Adoption of internal and external tools has increased in 2021 compared to 2020. Most New Zealand businesses are now "visible" or "discoverable" online, but many have passive rather than active online presence and are not using digital tools or channels to promote themselves. The biggest barriers to digital enablement are concerns about security and fraud, difficulty in choosing the right tools, lack of skills and affordability of digital solutions.[80]

4. SMEs Digital Transformation Policies

4.1 Small Business Digital Support Package and Digital Boost

The Ministry of Business, Innovation and Employment (MBIE) launched the Digital Boost program for small businesses in late 2020. It was designed in collaboration with industry experts to ensure it meets the needs of New Zealand small business owners.

Digital Boost is a public sector-funded program that focuses on promoting and supporting small business owners and their workers to make greater use of digital tools. Digital Boost offers free access to self-paced training and tools for business owners to gain the skills to launch their business in the digital world. As of May 2021, more than 21,000 users were already registered in the program.

The main initiatives of the Digital Boost program are as follows.

Digital Boost Skills Training and Support. This initiative focuses specifically on small businesses and tour operators and offers a series of free online courses on how to become a digital business. It aims to develop the skills, confidence and security needed to help small business owners realize the benefits of digital tools. The training is available to any small business that has begun to explore the digital world and wants to know "what's cool." The MBIE partnered with private entities such as tech companies like The MindLab, K&J Growth and Indigo to offer this platform.

Digital Boost Spotlight Series. These videos feature a range of small business owners who have recently transformed their business by adopting digital tools and work methods. The businesses share their experiences to benefit other small business owners.

Digital Boost Directory - The Right Tool. The Right Tool is a marketplace of digital applications and services that brings together a range of digital tools, technologies, products and services in one centralized location so that small business owners can easily find what's right for their needs. Business owners can also find ratings and reviews of the various digital applications and tools.

[80] Better for Business (2021). "Understanding the digital capability of New Zealand businesses – A Digital Index Benchmark"https://www.betterforbusiness.govt.nz/assets/better-for-business-files/documents/the-digital-capability-of-new-zealand-businesses-in-2021.pdf

Digital Boost is part of the Small Business Digital Support Package, a NZD 20 million digital package announced in September 2021 to support small businesses and tour operators in their digital transition in the COVID-19 world. The initial NZD 20 million package included:

- NZD 10 million specifically for small businesses, announced in COVID-19 Recovery and Response Fund.

- NZD 10 million as part of the Tourism Recovery Package: NZD 5 million to boost digital skills in the broader tourism sector, and NZD 5 million for Qualmark to help its registered tour operators develop digital strategies and skills. The latter NZD 5 million was funded directly by Qualmark.

Initially, the support package had funding through June 30, 2021. Following the evaluation of the pilot program and its overwhelming success, the Digital Boost program was funded during Budget 2021 for an additional two years, through June 30, 2023. MBIE continues to work closely with small business owners and the private sector in the implementation of the program.

4.2 Digital Boost Alliance Aotearoa

This is an initiative launched in May 2021, in which more than 35 organizations, including banks, telecommunications companies, and local and global technology companies, have joined together to offer free or discounted products and services to help New Zealand businesses go digital. The Alliance members' commitments or offers fall into three main categories: business commitments, growth commitments and community commitments.

Some of the offers by private partners include the following:

The Mind Lab - 250 full "Digital Skills for the Workplace" scholarships - The Mind Lab is a learning institute that focuses on professional development and the development of digital skills and capabilities for small businesses to thrive in a changing world.

Zeald - Free e-commerce and lead generation websites: Zeald is a specialist in e-commerce and web development, helping more than 15,000 small and medium-sized businesses transform online. Zeald gives away an e-commerce and/or lead generation website to a small independent business every week. This includes free hosting for 12 months, and a reduced cost thereafter, as well as access to digital advice, training and support, to help with the ongoing digitalization of the business.

Xero - 50% discount on Xero for 6 months: Xero is a cloud-based accounting software platform where small business owners and their advisors have access to real-time financial data anytime, anywhere, on any device.

Salesforce - 50% off up to 10 Salesforce Essentials licenses for the first year: Salesforce is a software company and a global leader in customer relationship management (CRM) tools.

Rocketspark - 25% off your first business website: Rocketspark is a website builder that allows people with no programming knowledge to create websites without the need for coding.

4.3 Digital Council

Established in late 2019, the Digital Council provides independent advice to the New Zealand public sector on how to maximize the social benefit of digital and data-driven technologies.

Based on their work, the Digital Council has made the following recommendations for the public sector:

1. Fund community groups to run their own data projects.

2. Fund and support a public sector team to test and implement best practices in ADM.

3. Create a public sector data management center.

4. Work collaboratively to develop and implement private sector GAD standards and best practices.

5. Build ADM systems from a Te ao Māori perspective.

6. Build a diverse digital workforce.

7. Increase the digital skills and knowledge of public sector leaders.

Additionally, as a result of the challenges raised by the COVID-19 pandemic the Digital Council has identified four key areas that the public sector should prioritize when considering digital and data issues:

1. Social and digital inclusion: the Digital Council recommends, among other things, advancing affordable connectivity, device distribution, support for the newly connected, and greater infrastructure deployment, including increased fiber deployment, and a coordinated approach to 5G.

2. Leverage technology to empower businesses: the Digital Council recommends, among other things, developing options for SMEs to build a local e-commerce platform equivalent to Shopify, offer digital skills training to SMEs, or develop incentives to adopt cloud-based technologies.

3. Boost employment in the tech sector: the Digital Council recommends, among other things, investing heavily in digital education pathways into tech-related careers, with particular emphasis on members of communities traditionally underrepresented in the tech sector (this includes women, Māori, Pacific peoples and people with disabilities) and in areas where there is a skills shortage and a historical reliance on importing talent from overseas.

4. Privacy and trust: the Digital Council recommends, among other things, providing timely and thoughtful privacy advice.

4.4. New Zealand's Digital Transformation Measurement Plan

The economy is keenly aware that the ability to understand and respond to the impact of digital transformation depends on the availability of accurate and timely data.

As such, Stats NZ and the Ministry for Business, Innovation and Employment (MBIE) have developed the Digital Nation Domain Plan.[81] The plan aims to help improve the way information on digital industries is collected and will coordinate the entire data system. It will also provide a better understanding of how digital technologies influence social, cultural and economic well-being.

The plan discusses, among other things, what should be measured and how. It sets some strategic priorities for digital-related data and outlines four key areas of measurement: digital inclusion, digital sector definition and assessment, digital security, and digital technologies and their impact.

5. Public Sector's View

As the above-described initiatives reveal, New Zealand is focused on pursuing the goal of digitalization by means of public-private coordination through goodwill and joint objectives.

The public sector's view is that one of the keys to the success of public-private cooperation in New Zealand is the value proposition that the public sector offers to the private sector. The public sector has established, within the framework of Digital Boost, a recognized platform with a large, registered user base. Therefore, private businesses that join public sector initiatives gain visibility and access to a network of potential customers.

In terms of assessing the impact of the digital economy, the MBIE works closely with statistical agencies to create a series of reports on the subject. One area of particular interest is advancing mechanisms and methods to measure the impact of the digital economy in a timely and accurate manner.

In addition, the public sector declares that it will conduct independent evaluations of its programs on a regular basis in order to improve its digitalization efforts. In particular, one of the most recent objectives is the creation of a digital index for SMEs. This index will make it possible to track the evolution of SMEs in terms of digitalization and will be a key tool for small businesses to make a significant leap in their digital development.

[81] OECD (2019). "Measuring the Digital Transformation: A Roadmap for the Future" https://www.oecd-ilibrary.org/sites/1e75c7a1-en/index.html?itemId=/content/component/1e75c7a1-en

6. Private Sector's View

New Zealand launched Digital Boost with the aim of accelerating the adoption of digital platforms in SMEs. It is the view of the private sector that the program has brought about a significant positive change, but not on the scale they would have expected.

There are several reasons why the private sector believes that the progress and results of the digitalization efforts have not been as good as initial aspirations. According to the private sector, findings from several behavioral studies provide insightful answers.

A study by Xero identified the following "mental" barriers as some of the main reasons why SMEs are reluctant to embrace digitalization. These need to be considered if digital transformation is to reach all New Zealand SMEs. The mental barriers are the following:

1) SME owners tend to think that the way they run their business is good enough that they don't need digital tools.

2) Most SME owners tend to focus too much on the risks and costs of adopting new technologies, rather than on the long-term benefits.

3) It is very difficult for most SME owners to make sense of all the options in the marketplace.

Therefore, the private sector believes that it is the responsibility of political and economic leaders to take action to break down these barriers. Some of the proposed solutions are:

1) Motivate SMEs to take small steps on their way to digitalization instead of big leaps. When SMEs move forward in small steps, they have fewer concerns that the adoption of digital tools could fail.

2) Highlight and publicize examples of SMEs that have already adopted digital tools. In this way the digital adoption process becomes part of the "day-to-day" operations of SMEs.

3) Measure the benefits of digital adoption in a reliable way. In order to convince SMEs to take up digital adoption, they have to be sure of the benefits.

4) Understand SME owners' motivations. The approach for the SME owner who wants to grow his or her operations is very different from the approach for the SME owner who just wants to survive.

5) It is necessary to simplify the menu of digital tool options available. It is very complicated for SME owners to navigate the wide range of existing digital tools, and it could end up confusing and frightening them.

As the above suggests, New Zealand's private sector is characterized by making decisions based on empirical evidence and tends to commission and cooperate with research institutions on a continuous basis.

It is clear to the private sector that digitalization is not only important for SME owners and their families, but also for the whole economy. Joint research with the New Zealand Institute of Economic Research revealed the importance of the digital economy: A 20% increase in the adoption of cloud technology would produce a 2% increase in GDP.

In addition, the private sector stresses that digitalization should also be pursued because of its importance for welfare and productivity. Currently, SME owners work long hours, which impacts their ability to make good decisions and affects their well-being by, for example, preventing them from spending time with their families. The cost of poor decisions can be enormous.
Finally, the private sector is constantly monitoring the outcome or potential impact of its efforts. In this regard, they recognize that the public sector has understood the needs and has been open to cooperate to a large extent, but the role of the public sector must go a step further and move towards creating a vision for the digitalization of the economy and overseeing how everything progresses.

7. Concluding Remarks

a. There is a sense among the private sector that the public sector's digital transformation efforts have brought about significant positive change but could have had a greater impact. This highlights the need to understand what barriers SMEs face, as these can be very heterogeneous and affect the impact of policies.

b. New Zealand's private sector is extremely active in digital transformation efforts, conducting research and promoting initiatives. This highlights the importance of public-private cooperation.

c. New Zealand also recognizes that digital transformation should also be pursued because of its importance to the well-being of entrepreneurs. Currently, SME owners work long hours, which impacts their ability to make good decisions and affects their well-being by preventing them from spending time with their families. The use of digital tools frees up

Peru

1. Introduction

Peru is the third largest economy in South America, with 2,400 km of coastline on the South Pacific Ocean. The economies that share a border with Peru are Bolivia, Brazil, Chile, Colombia, and Ecuador. Peru stretches along the Andes, the longest exposed mountain range in the world, and has an area of 1,285,216 km².

The economy has a rich and varied cultural heritage that includes the ancient Inca capital of Cuzco and the lost city of Machu Picchu. The capital and largest city is Lima and the main languages are Spanish, Quechua and Aymara. According to official data from the National Institute of Statistics and Informatics of Peru in 2020, the total population of the economy exceeds 32.6 million inhabitants, of which 24.9% are up to 14 years of age, 66.1% are between 15 and 64 years old and 9.0% are 65 years old and above. In addition, data from the World Bank's World Development Indicators show that the labor force participation rate was 65.3% in 2020 and that the unemployment rate reached 7.4% in the same year.

Peru's landscape is divided into three main regions: the Coast, the narrow coastal plains between the ocean and the Andes; the Sierra, the Andes mountain range and the Andean plateau; and the Jungle, the vast plain to the east, on the other side of the Andes, covered by the Amazon rainforest.

2. SMEs in Peru

Data from the Ministry of Production [82] indicate that more than 1.7 million official MSMEs will operate in the Peruvian market by 2020. This business segment represents 99.5% of the total number of official businesses in the Peruvian economy: 95.2% are micro-sized, 4.1% are small-sized and 0.2% are medium-sized. Out of the official businesses, 85.2% are engaged in trade and services, and 14.8% in productive activities (manufacturing, construction, agriculture and livestock, mining and fishing).

MSMEs represent more than 90% of the economically active population employed in the private sector. Likewise, eight out of every 100 people of the economically active employed population are entrepreneurs of an official MSME. Between 2015-2020, the number of official businesses in this segment increased at an average annual rate of 1.1%, which slowed down due to the steep drop in 2020 (-25.1%). Official MSMEs participated with 31.0% of the member economy value added in 2020.

At the end of December 2020, around 841,343 MSMEs had some type of credit operation in the financial system, a figure more than six times higher than the recorded in 2019. There is also an inverse relationship between the financial inclusion ratio and the business size. Thus, while only 30.9% of microenterprises have some credit operation (26.9 p.p. more than in 2019), small, medium and large businesses show a financial inclusion ratio of 64.0% (+19.5 p.p.), 74.8% (+12.7 p.p.) and 80.9% (+8.9 p.p.), respectively.

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[82] Ministerio de la Producción. (n.d.). Estadística MIPYME. Perú Ministerio de la Producción. Retrieved August 23, 2022, from https://ogeiee.produce.gob.pe/index.php/en/shortcode/estadistica-oee/estadisticas mipyme#:~:text=M%C3%A1s%20de%201%2C7%20millones,peque%C3%B1a%20y%200.2%25%20mediana%E2%80%93

Table 9: Perú Profile

Perú	1990	2000	2010	2020
Population, total (millions)	22,07	26,46	29,03	32,97
Population density (people per sq. km of land area)	17,2	20,7	22,7	25,8
Poverty headcount ratio at national poverty lines (% of population)	--	--	30,8	30,1
GNI per capita, PPP (current international $)	3,150	4,930	9,020	11,520
Life expectancy at birth, total (years)	66	71	74	77
School enrollment, primary (% gross)	115	117,2	109,9	121
School enrollment, secondary (% gross)	67	81	92	111
Urban population growth (annual %)	2,7	2	1,1	1,7
GDP (current US$) (billions)	26,41	51,74	147,53	202,01
GDP growth (annual %)	-5	2,7	8,3	-11,1
Inflation, GDP deflator (annual %)	6,261,20	3,5	5,7	4,2
Agriculture, forestry, and fishing, value added (% of GDP)	8	8	7	8
Industry (including construction), value added (% of GDP)	26	29	36	30
Exports of goods and services (% of GDP)	16	17	28	22
Imports of goods and services (% of GDP)	14	19	24	21
Time required to start a business (days)	--	101	43	26
Domestic credit provided by financial sector (% of GDP)	20,1	26,8	18,9	--
Tax revenue (% of GDP)	10,7	12,6	15,5	14,5
Mobile cellular subscriptions (per 100 people)	0	4,8	100,3	133,4
Individuals using the Internet (% of population)	0	3,1	34,8	65,3
High-technology exports (% of manufactured exports)	--	--	7	5

Source: World Development Indicators; Barro, Robert and Jong-Wha Lee, 2013. “A New Data Set of Educational Attainment in the World, 1950-2010.” Journal of Development Economics, vol 104, pp.184-198.

Figures in green refer to periods other than those specified.

3. Barriers to Digitalization

The results of a BCG survey of 1,775 managers and executives in the ICT sector revealed that talent is one of the main barriers to the growth of the digital-driven innovation economy. According to the study, the quality of human capital is a key factor in improving the growth of the economy’s innovation ecosystem.

Data shows that the digital economy has been growing faster than the traditional economy for several years. The COVID-19 pandemic greatly accelerated this digital transition. For many SMEs, it has been “go digital or go dark”.

The research also notes that there are significant challenges regarding inadequate digital infrastructure and lagging SME adoption. For example, data from 2017, reveals that Peru has low internet usage compared to other economies in the region. Despite improvements in recent years, only 45% of Peruvians use the internet, and there is a wide inequality: in urban areas, 54% of the population uses the internet, while only 14% does so in rural areas.

4. SMEs Digital Transformation Policies

4.1. MyDigital SME

The Innóvate Perú program of the Ministry of Production launched the "Innovate to Reactivate" initiative in June 2020, a package of non-refundable funds to help enterprises seeking to reactivate their businesses through innovation. This, in order to contribute to the economic recovery after the health crisis caused by the pandemic.

The initiative included 11 contests for funds ranging from PER 12,000 to PER 1 million. These were open to micro, small, medium-sized and large businesses, as well as universities and other entities, for the co-financing of new value propositions and innovative business models, the implementation of technological and digital services, training and scholarships, among other needs.

MyDigital SME was part of this series of contests. It sought to encourage the projects aimed at identifying the main obstacles or opportunities in businesses that could be addressed through the implementation of digital technologies to improve their level of digital maturity. The initiative provided funding of up to PER 5,000 for the needs assessment and up to PER 50,000 (between 50% and 75% of the total value) for the implementation of solutions to the problems identified in the assessment stage.

4.2. Digital Route

Digital Route is an initiative that enables SMEs to accelerate the adoption and use of digital technologies, through a digital maturity assessment and a set of recommendations related to training resources, digital tools and instruments. As of April 2022, the program had more than 10,130 registered SMEs.

4.3. Digital Transformation Roadmap for Leaders of Peruvian Food Markets

In 2021, in coordination with the United Nations Development Program (UNDP), the Ministry of Production designed the "Digital Transformation Roadmap for Leaders of Peruvian Food Markets" program, which consists of two components: the theoretical and practical training program "Roadmap for Leaders" and the digital platform for Food Markets.

The program's objective is to modernize the economy's food markets through instruments that increase their competitiveness, thus facilitating their economic reactivation and promoting the digitalization of the sector. Among the beneficiaries are 90 leaders of 15 food markets. The e-commerce module of the market platform is expected to be launched in August of 2022. Meanwhile, in December 2022, the market platform's producer purchasing module is expected to be launched.

In 2021, a pilot training plan was carried out with the participation of 140 domestic markets. By the end of the first quarter of 2022, four training modules were completed in the central zone, comprising eight regions, and 52 markets were trained.

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83 BBVA Research (2017). "Perú Avances en digitalización" https://www.bbvaresearch.com/wp-content/uploads/2017/11/Peru_Avances-en-digitalizacion_nov-17I.pdf

4.4 Whatsapp Fridays

In October 2021, WhatsApp, the Association of Entrepreneurs of Peru (ASEP), the Association of Entrepreneurs of Latin America (ASELA) and the Secretary of Government and Digital Transformation of the Presidency of the Council of Ministers announced an alliance to train more than 2,000 businesses and entrepreneurs throughout the economy in the use of WhatsApp Business, the version of the messaging application specially designed for small businesses. This, with the aim of helping the economic recovery and boosting the digitalization of Peruvian MSMEs.

Through the online training program “WhatsApp Fridays”, SMEs had an opportunity to learn more about the tools and best practices for the use of the application and improve their competitiveness and business communication.

The training was part of a program covering different modules of basic and advanced content and are available on the microsite “WhatsApp Fridays”. According to public sector figures, more than 7,000 people have participated in the program.

5. Private Sector’s View

The private sector believes that the pandemic has accelerated the digital transformation process and that without it the economy would be much further behind in digitalization. They recognize that much has been done, but stress that much still remains to be done. Topics such as digital public sector or digital economy are concepts that have been talked about for some time, but nevertheless remain new and unknown.

Congressmen who make laws, rules and regulations, are not yet trained to fully understand what digital transformation means and that affects the development of policies. The feeling is that there is still a lot of room to help SMEs. Entrepreneurs know how to use their computers or cell phones, but they are unaware of how these tools can help generate new business models, or take advantage of omnichannel, for example.

Education is a fundamental issue in this respect. How to use technologies should be taught from the earliest school levels, in order to enhance human capital and ultimately increase the economy’s welfare. The new policies have helped in educational issues, but the perception is that more progress can be made. Further advances will probably require the cooperation of the public and private sectors, as well as academia.

One area of special interest is advancing STEM skills at all levels, which requires changing the teaching model in a more profound way. Educational programs must adapt to be fundamentally digital and also more immersive and interactive. This would help to break down some of the most important barriers to the advancement of digitalization, such as lack of knowledge of available digital tools. But there are other barriers that require investment. One of them is fiber optic coverage, which has not yet reached all of Peru.

There are also barriers that the public sector could help to break down, such as including universities in digitalization policies or increasing tax incentives for businesses that invest in new technologies. Gender parity in digitalization issues is also an area that needs to be addressed. The private sector

has implemented its own initiatives to help SMEs on their way to digitalization. Perhaps the most important is “Boost your SME”, which is part of a project called “Peru Worldwide”.

Boost your SME is a virtual business ecosystem with a local and global perspective that will be launched soon. This virtual platform aims to increase the visibility of SMEs and make it easier for them to bring their products to a wider audience through, for instance, participation in virtual fairs, or the creation of interactive websites.

The private sector has also been in contact with the public sector to create alliances to advance digitalization issues, for example, the attempt to create the first virtual Innovation and Technology Center in Peru. The advantage of these alliances is that the private sector is generally quicker and more efficient in implementing new trends. Nevertheless, it should also be noted that any initiative should aim to increase employment or sales, vital measures for any business.

Another area where the private sector can help is in unifying digitalization efforts and creating a “highway towards digitalization”. So far there are many fragmented efforts, which create confusion and difficulties for SMEs to have a smooth and seamless digitalization journey.

This is partly the spirit of Boost your SME, an initiative that in principle has the capacity to serve between 1,000 and 10,000 SMEs but will require public sector support to sustain itself over time. It is not yet clear what requirements the participants will have to meet, but the selection will be based on a software that will evaluate several key dimensions of businesses. The software will also help to identify the state of the business in terms of digitalization in order to be able to provide them with more individualized support according to their particular needs.

One of the program’s objectives is for 50% of the participants to be businesses with only local reach, to help them expand their markets. Several dimensions of the program are planned to be monitored on an ongoing basis, probably quarterly, with an annual schedule.

6. Public Sector's View

Following the OECD's 2016 Public Governance Report on Peru, the public sector established a roadmap to implement the recommendations, measures, and commitments derived from the report.

Probably one of the most relevant commitments was the creation of the Secretary of Digital Government, officially established on January 15, 2017. Less than a month after receiving the OECD report it highlighted the public sector's commitment to digital transformation. This Secretariat came to replace the National Office of Electronic Government Informatics, which due to the new technological needs of the economy no longer had the scope required to meet the future challenges in terms of digitalization.

The creation of the new Secretariat and the development of mechanisms to ensure compliance with the new roadmap involve three main areas:

1) Ensure funding for digitalization efforts: With this in mind, the public sector signed an agreement with the Inter-American Development Bank (IDB) to provide budget and both human and technological resources to the institutions that required them.

2) The creation of a governance framework: As the new institutional framework and objectives permeated every policy and sphere of public sector, successful implementation would require that all digitalization objectives set forth by the Secretary of Digital Government be accompanied by a full commitment of public entities. The objective of the governance framework is to ensure that commitment.

3) The binding participation of the private sector: The public sector recognized the importance of the private sector for the successful advancement of digital transformation in society. Therefore, the public sector included the private sector in the digitalization efforts in a binding manner, by establishing a laboratory and a local digital transformation ecosystem. Previously, the private sector only participated as an advisory board through the National Informatics System.

The first progress report on the targets set from the 2016 OECD report was published in mid-2019. Based on these results, new recommendations were made.

In this context, an emergency decree was approved creating the National Digital Transformation System, an ecosystem at the legal level that included both the private and public sector. The new Secretary of Government and Digital Transformation was also created, as the new vision for the digitalization of the economy involves both public bodies and members of the private sector.

In 2021, several decrees and regulations were created defining the role of the private sector in a long-term digital transformation framework, and a National e-Strategic Development Plan was devised. This plan is still in the process of approval and has a 90% digital transformation component.

The public sector aims to implement digital transformation with equity. Following this rationale, at least three initiatives have been carried out. The first objective is that the Secretary of Government and Digital Transformation is staffed by 60% women. The second objective is to influence public

universities so that their curricula formally incorporate gender equity dimensions. The last objective refers to the Digital Girls program, which is already active in several regions of Peru, and its purpose is to make girls fall in love with digital technology.

Along the way, the public sector has encountered several problems that it had to correct. Some problems were related to the lack of knowledge about the regulatory frameworks. For example, it was very common to find startups whose concept and operation violated basic rules on personal data protection or cybersecurity. For this reason, the public sector has taken steps to ensure that incubators can properly advise entrepreneurs on these areas.

Another effort in which the public sector is advancing to facilitate and encourage digitalization is to ensure interoperability between different public sector agencies so that the start-up costs for businesses are lower. As for measuring the progress of digitalization in the economy, the public sector is working on a digital maturity index.

The public sector also plans to create a set of reusable digital components that SMEs can incorporate into their digital platforms (e.g., snippets). It should also be noted that the public sector has a regional vision of digitalization needs. This is because the public sector is convinced that for digitalization to be successful, it must be developed based on the needs of the productive sectors and these vary

7. Concluding Remarks

a. MSMEs represent 99.5% of the total number of official businesses in the Peruvian economy. Of these, 85.2% are engaged in commerce and services, and the rest in a wide variety of productive activities: manufacturing, construction, agriculture and livestock, mining and fishing. For this reason, it is vital that digital transformation policies consider the productive diversity of businesses: they do not have the same needs and will not apply digital tools in the same way.

b. Talent is one of the main barriers to the growth of the digital-driven innovation economy. Therefore, education in the use of technologies must be provided from the most basic levels of school. This requires the cooperation of the public and private sectors and academia to design educational programs that meet the needs of the economy. Improving education is especially important, considering that eight out of every 100 people in the economically active working population are traditional MSME entrepreneurs.

c. Finally, one of the reflections submitted by the private sector that deserves attention, is that congressmen who draft laws, rules and regulations are not yet trained to fully understand what digital transformation means and this affects policy development. Working together with the private sector is therefore essential.

Singapore

1. Introduction

Singapore is an archipelago located in Southeast Asia consisting of a main island and more than 60 smaller islands. According to SingStat, in 2021 the economy had a population of 5.45 million, of which 4 million were residents. In turn, of Singapore's residents, 0.8 million were under 20 years of age, 2.6 million were between 10 and 65 years of age, and 0.6 million were 65 years and above. [84]

As for labor force statistics, the employability rate among Singapore residents was 70.5% , with an unemployment rate of 3.5%. The economy's GDP was SGD 469.1 billion in 2020, which is equivalent to a GNI per capita of SGD 72,418. The member's main economic activities are manufacturing (21.5% of value added), wholesale and retail trade (16.8% of value added), and finance and insurance (15.7% of value added). [87]

[84] https://www.singstat.gov.sg/find-data/search-by-theme/population/population-and-population-structure/latest-data

[85] Ministry of Manpower. (2021, December 1). Summary Table: Labour Force. Manpower Research and Statistics Department. Retrieved August 24, 2022, from https://stats.mom.gov.sg/Pages/Labour-Force-Summary-Table.aspx

[86] Ministry of Manpower. (2022, July 29). Summary Table: Unemployment. Manpower Research and Statistics Department. Retrieved August 24, 2022, from https://stats.mom.gov.sg/Pages/Unemployment-Summary-Table.aspx

[87] Ministry of Trade and Industry. (2021, February). Economic Survey of Singapore 2020. https://www.mti.gov.sg/-/media/MTI/Resources/Economic-Survey-of-Singapore/2020/Economic-Survey-of-Singapore-2020/FullReport_AES2020.pdf

Table 10: Singapore Profile

Singapore	1990	2000	2010	2020
Population, total (millions)	3,05	4,03	5,08	5,69
Population density (people per sq. km of land area)	4,548	6,011,8	7,231,8	8,019,5
Poverty headcount ratio at national poverty lines (% of population)	--	--	--	--
GNI per capita, PPP (current international $)	23,58	43,57	74,48	86,45
Life expectancy at birth, total (years)	75	78	82	83
School enrollment, primary (% gross)	--	--	--	100,7
School enrollment, secondary (% gross)	--	--	--	105
Average years of total schooling male population 15-64	7,143	10,377	11,911	--
Average years of total schooling female population 15-64	6,734	9,625	11,338	--
Urban population growth (annual %)	3,9	1,7	1,8	-0,3
GDP (current US$) (billions)	36,14	96,07	239,81	340,00
GDP growth (annual %)	9,8	9,0	14,5	-5,4
Inflation, GDP deflator (annual %)	4,7	3,9	1,1	-2,9
Agriculture, forestry, and fishing, value added (% of GDP)	0	0	0	0
Industry (including construction), value added (% of GDP)	31	32	27	24
Exports of goods and services (% of GDP)	177	188	198	176
Imports of goods and services (% of GDP)	167	176	172	144
Time required to start a business (days)	--	8	3	2
Domestic credit provided by financial sector (% of GDP)	--	--	--	--
Tax revenue (% of GDP)	14,5	14,9	12,8	13,2
Mobile cellular subscriptions (per 100 people)	1,7	68,2	143,9	144,1
Individuals using the Internet (% of population)	0,0	36,0	71,0	75,9
High-technology exports (% of manufactured exports)	--		52	55

Source: World Development Indicators; Barro, Robert and Jong-Wha Lee, 2013. "A New Data Set of Educational Attainment in the World, 1950-2010." Journal of Development Economics, vol 104, pp.184-198.

Figures in green refer to periods other than those specified.

2. SMEs in Singapore

The Singapore Department of Statistics defines SMEs as businesses that have annual sales of less than SGD 100 million or have fewer than 200 employees. SMEs are a key part of Singapore's economy. In 2021, there were close to 290,000 SMEs (99% of the economy's total enterprises), accounting for 71% of the economy's total employment (3.4 million people) and 34% of nominal value added (SGD 484 billion).[93]

3. Barriers to Digitalization

A 2018 study by the Association of Small and Medium Enterprises (ASME) and Microsoft, revealed that 56% of SMEs in Singapore had digital transformation strategies in place and 57% had already heard of digital transformation.[89]

[88] Department of Statistics. (n.d.). Singapore Economy. Retrieved August 24, 2022, from https://www.singstat.gov.sg/modules/infographics/economy

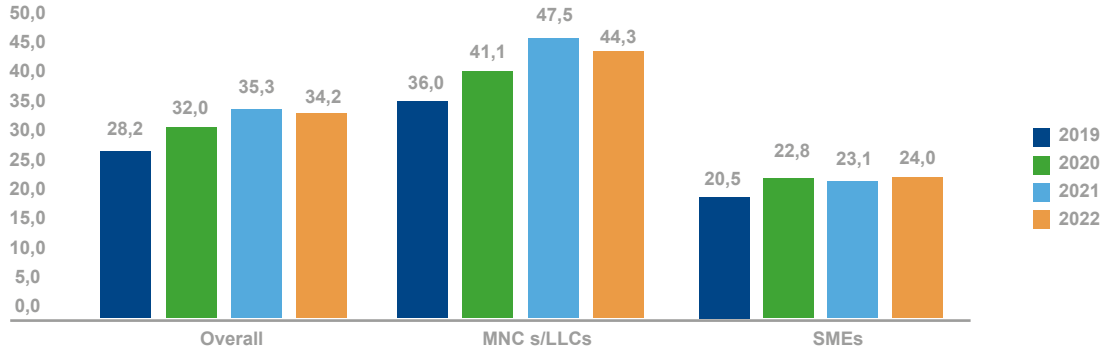
[89] Microsoft. (2018, October 23). Singapore SMEs who embrace digital transformation expect to see average revenue gains of 26%: ASME-Microsoft study. Singapore News Center. Retrieved August 24, 2022, from https://news.microsoft.com/en-sg/2018/10/23/singapore-smes-who-embrace-digital-transformation-expect-to-see-average-revenue-gains-of-26-asme-microsoft-study/

Only two years later, in 2020, the percentage of SMEs with digital transformation strategies in place increased significantly to 83%. Similarly, the percentage of businesses aware of the term digital transformation reached 80%. The data shows, in part, the significant progress in digital transformation awareness among entrepreneurs due to the economic disruption caused by the COVID-19 pandemic. This suggests that the level of digitalization of businesses had also increased in recent years.

However, this latest survey also suggests that the pandemic increased the challenges faced by SMEs and that a perception of low success of digitalization efforts exists. SMEs in Singapore had lagged behind large enterprises in the adoption of digital solutions.

Fortunately, according to the Digital Acceleration Index (DAI), by the Infocomm Media Development Authority (IMDA) and Boston Consulting Group (BCG), digital adoption among SMEs had been a growing trend in recent years, as seen from Figure 1.

Figure 1: Digital Acceleration Index (DAI) Scores by Enterprise Type, 2019-2022.
Base: DAI Survey respondents from 23 ITM sectors.

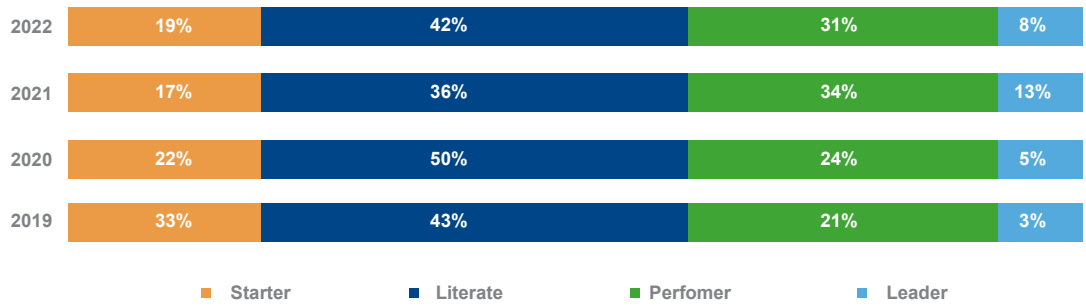


Source: IMDA Digital Acceleration Index (DAI) Survey 2019-2022.

Figure 2 shows the digital maturity of multinationals (MNCs) and limited liability companies (LLCs). Most of these large companies are at Literate and Performer levels. In contrast, the vast majority of SMEs are at a Starter level (see Figure 3).

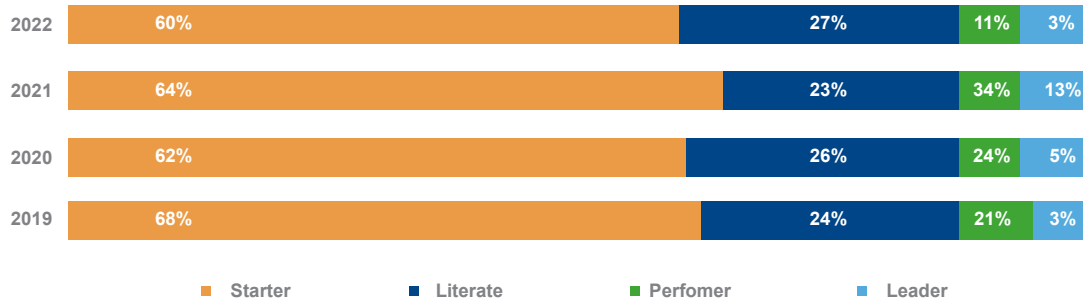
[90] Infocomm Media Development Authority. (2023, February 9). Enterprise. Retrieved February 9, 2023, from https://www.imda.gov.sg/About-IMDA/Research-and-Statistics/Enterprise

Figure 2: Digital Maturity of MNCs and LLCs, 2019-2022.



Base: DAI Survey respondents from 23 ITM sectors.
Source: IMDA Digital Acceleration Index (DAI) Survey 2019-2022.[91]

Figure 3: Digital Maturity of SMEs, 2019-2022.



Base: DAI Survey respondents from 23 ITM sectors.
Source: IMDA Digital Acceleration Index (DAI) Survey 2019-2022.[92]

The 2020 SME Digital Transformation Study produced jointly by Microsoft Singapore and ASME surveyed 400 business owners and key IT decision makers from Singapore SMEs across 15 industries, on the state of local SMEs' digital transformation. The study revealed that only 30% of SMEs indicated that they were forced to go digital due to COVID-19. The majority, however, reported delays in their digital transformation plans. Nevertheless, 54% of businesses indicated that the COVID-19 pandemic intensified barriers to digitalization, and also generated a delay in the globalization plans of several SMEs.

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[91] Infocomm Media Development Authority. (2023, February 9). Enterprise. Retrieved February 9, 2023, from https://www.imda.gov.sg/About-IMDA/Research-and-Statistics/Enterprise

[92] Infocomm Media Development Authority. (2023, February 9). Enterprise. Retrieved February 9, 2023, from https://www.imda.gov.sg/About-IMDA/Research-and-Statistics/Enterprise

[93] Microsoft. (2020, October 21). Over 80% of Singapore SMEs embrace digital transformation; more than half report slowdowns due to COVID-19: ASME-Microsoft study 2020. Singapore News Center. https://news.microsoft.com/en-sg/2020/10/22/over-80-of-singapore-smes-embrace-digital-transformation-more-than-half-report-slowdowns-due-to-covid-19-asme-microsoft-study-2020/

Regarding the barriers to digitalization faced by businesses, 56% of the interviewed SMEs stated that high implementation costs are a major barrier to digitalization, 40% mentioned the lack of skilled workforce, 35% economic uncertainty, 30% lack of awareness of public sector support policies, and 26% not having the right technology partners.

4.SMEs Digital Transformation Policies in Singapore

By the late 1970s, due to its small size and sparse population, Singapore recognized the importance of digitalization as a key to its economic development. The public sector realized that, in order to be competitive in the future, it had to focus on capital- and technology-intensive activities. In the early 1980s, the public sector of Singapore made efforts to advance digitalization, launching the National Computerisation Plan (1980-1985), which aimed to make Singapore a regional center for software development and services. In addition, the Plan also aimed to digitalize the public sector and create a skilled workforce to meet the needs of the information technology industry.

Other plans and strategies followed: the National IT Plan (1986-1991), IT2000 (1992-1999), Infocomm 21 (2000-2003), Connected Singapore (2003-2006) and Intelligent Nation (2006-2015). The National IT Plan created public sector-provided information exchange networks (e.g. TradeNet,[96] MediNet,[97] LawNet[98]). IT2000 laid the foundation for e-commerce regulations. Infocomm 21 achieved freeing the telecommunications market and increased global connectivity. Meanwhile, Connected Singapore extended the reach of telecommunications to encourage its use in key sectors in the Singapore economy, such as logistics, high-tech manufacturing, retail and healthcare.

In 2014, Singapore set itself the goal of becoming the world's first Smart Nation . To achieve this goal, the economy launched the Smart Nation Strategy in 2018. The Digital Economy Framework For Action[100] was also launched in the same year. In the following year, the latter was complemented by the Infocomm Media Plan 2025.

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94 William Hioe (2001). "National Infocomm Strategy and Policy: Singapore's Experience." ICA Information No. 74: General Issue https://www.unapcict.org/sites/default/files/2019- 01/National%20Infocomm%20Strategy%20and%20Policy%20-%20Singapores%20Experience.PDF

95 iN2015 (2005). "Innovation. Integration. Internationalisation. Report by the iN2015 Steering Committee." https://www.tech.gov.sg/files/media/corporate-publications/2015/01/01_iN2015_Main_Report.pdf

96 TradeNet is a single window for trade declaration.

97 MediNet is a nationwide network for the medical and healthcare community.

98 LawNet is a one-stop practice portal providing information and transactional solutions to the legal community.

99 Infocomm Media Masterplan Steering Committee. (2015, August). Infocomm Media 2025. https://www.imda.gov.sg/-/media/Imda/Files/About/Resources/InfocommMedia2025Report.pdf

100 Infocomm Media Development Authority. (n.d.). Digital Economy Framework for Action. https://www.imda.gov.sg/-/media/Imda/Files/SG-Digital/SGD-Framework-For-Action.pdf

101 Infocomm Media Development Authority (2018). "The future of Services and Digital Economy Technology Roadmap"https://www.imda.gov.sg/-/media/Imda/Files/Industry-Development/Infrastructure/Technology/Technology-Roadmap/SDE-TRM-Main-Report.pdf

In addition, IMDA has developed eight versions of the Technology Roadmap to date, the latest of which was launched in 2018.[101] The latest Technology Roadmap identifies nine key trends that will shape the development of digitalization in the upcoming years and highlights that the service sector is likely to be the most impacted. Among the nine trends are the pervasiveness of AI, greater collaboration between humans and machines, new technological interfaces (such as augmented reality), greater use of tools that do not require knowledge of how to write code, and the expanded use of blockchain and application programming interfaces (APIs).

Various initiatives, programs and tools have been part of Singapore's successive digitalization efforts. Singapore has adopted a business-centric approach to enable businesses to navigate and adapt to today's dynamic business environment. In this sense, a relevant aspect of this support is that by promoting digitalization, the public sector is aware that one size does not fit all and has taken into account aspects such as the business' growth stage, the sector in which it is located and other needs.

The Infocomm Media Development Authority (IMDA) is the main public institution responsible for the deployment of digitalization plans focused on SMEs. It is a statutory board of the Singapore public sector, whose mission is to "drive Singapore's digital transformation with infocomm media". IMDA works together with other public institutions in promoting and implementing digital transformation plans and programs. Some of these organizations are Enterprise Singapore (EnterpriseSG) and Singapore public sector agencies tasked with driving the development of specific industries.

It is worth noting that the digitalization plans implemented for SMEs in Singapore are gender agnostic. The main initiatives developed to support the digitalization and digital transformation of SMEs are explained below.

4.1 SMEs Go Digital

SMEs Go Digital is a local program, launched in April 2017 by IMDA. It aims to support SMEs in the use of digital technologies and the creation of stronger digital skills to take advantage of growth opportunities through the adoption of IT solutions, the acquisition of equipment, or consulting services. Details of each can be found on the program's website. To date, the following initiatives were implemented under the SMEs Go Digital program.

[102] Infocomm Media Development Authority (2018). "Empowering Possibilities With More Reasons to Smile" https://www.imda.gov.sg/-/media/Imda/Files/About/Resources/Corporate-Publications/Annual-Report/IMDA-FY17-AR-Approved.pdf

[103] Infocomm Media Development Authority. (2022, April 25). SMEs Go Digital. Retrieved August 24, 2022, from https://www.imda.gov.sg/programme-listing/smes-go-digital

[104] Infocomm Media Development Authority. (2023, February 10). SMEs Go Digital. Industry Digital Plans. Retrieved February 10, 2023, from https://www.imda.gov.sg/How-We-Can-Help/smes-go-digital/industry-digital-plans

[105] Ministry of Trade and Industry. (n.d.). Overview. Retrieved August 24, 2022, from https://www.mti.gov.sg/ITMs/Overview

[106] Infocomm Media Development Authority. (2023, February 10). SMEs Go Digital. Start Digital. Retrieved February 10, 2023, from https://www.imda.gov.sg/How-We-Can-Help/smes-go-digital/Start-Digital

4.1.1 Industry Digital Plans (IDP)[104]

Industry Digital Plans aims to provide SMEs with guidance on the digital solutions they should adopt, as well as training options for their employees at different growth stages. This initiative, developed in conjunction with industry players and leading agencies in the sector, is aligned with the Industry Transformation Maps (ITMs), which are roadmaps to drive transformation for 23 industry sectors in Singapore.

4.1.3 Start Digital[106]

This program was launched in 2019 by IMDA together with Enterprise Singapore (EnterpriseSG). It aims to provide newly incorporated SMEs, and those that have yet to digitalise with foundational and easy-to-deploy digital solutions, to help them start their digitalisation journeys. The solutions, or Start Digital Packs, are offered by partners like banks and telcos partners. The Start Digital program has helped more than 37,000 SMEs since its launch.

4.1.4 Grow Digital[108]

This initiative was officially launched in 2020 by IMDA, together with EnterpriseSG, as an effort to boost SME participation in business-to-business (B2B) and business-to-consumer (B2C) e-commerce platforms to sell internationally without a need for physical presence overseas. The platforms are offered by private partners, and pre-approved by IMDA and EnterpriseSG, due to their strong network with complementary service providers, good track record and experience in operating in multiple markets with regional or global reach. They also have proven track records of providing e-commerce and business support services to SMEs as well as for their strong commitment to help SMEs with accessing overseas markets via their platforms. Since its launch, more than 2,500 enterprises have connected to 13 cross-border digital platforms supported under Grow Digital and have gained access to international markets in 10 countries.

4.1.5 Chief Technology Officer-as-a-Service (CTOaaS)[109]

This is another IMDA-promoted effort. It helps SMEs that want to go digital yet may not be familiar with how to get started, by offering quick access to personalized recommendations on digital solutions and resources, through a one-stop web application. In this application, which can be accessed through the initiative's website, SMEs can assess their digital maturity and digitalization needs. CTOaaS has a self-assessment tool to diagnose the digital readiness of businesses and suggest next steps to boost digital efforts. The self-assessment tool contains questions to identify the profile of the businesses, whether the business has formal digitalization plans, whether it has employees with expertise in digitalization, whether they use digital solutions, whether they use data analysis to make strategic decisions, and whether they are aware of the importance of cybersecurity. SMEs in need of more in-depth digital advice can access a pool of qualified digital consultants to seek digital consulting services.

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[107] Subramaniam, V. (2022, July 28). Start Digital initiative for SMEs to be extended for 3 more years. Businesstimes.com.sg. Retrieved February 10, 2023, from https://www.businesstimes.com.sg/singapore/smes/start-digital-initiative-smes-be-extended-3-more-years

[108] Infocomm Media Development Authority. (2023, February 10). SMEs Go Digital. Grow Digital. Retrieved February 10, 2023, from https://www.imda.gov.sg/How-We-Can-Help/smes-go-digital/Grow-Digital

[109] gobusiness Singapore and Infocomm Media Development Authority. (n.d.). CTO-as-a-Service. Infocomm Media

Infocomm Media Development Authority. (2023, February 10). SMEs Go Digital. Advanced Digital Solutions.

[110] Retrieved February 10, 2023, from https://www.imda.gov.sg/How-We-Can-Help/smes-go-digital/Advanced-Digital-Solutions

4.1.6 Advanced Digital Solutions (ADS)[110]

To help enterprises deepen their digital capabilities, the Advanced Digital Solutions (ADS) was announced as part of the 2020 Resilience Budget as an initiative under the SMEs Go Digital program. ADS supports the adoption of advanced technologies (e.g. AI, Robotics, Blockchain and Internet of Things) and integrated solutions (e.g. B2B solutions that integrate inventory management, e-invoicing, and e-payments) that address common enterprise-level challenges at scale.

4.1.7 Budget and program scope

The public sector allocated over SGD 80 million to SMEs Go Digital at its launch in 2017. In the following years, the public sector continued to drive digitalization among SMEs in Singapore, especially following the increased digital adoption in the wake of the COVID-19 pandemic. For example, in 2020, more than SGD 500 million was allocated to support the digital transformation of Singapore's businesses, under the Fortitude Budget announced in 2020. The following Table 12 shows general information on the adoption of solutions of SMEs Go Digital program. This data shows the rapid pace of implementation that the program has had among SMEs, and the high rates of solutions that have been created in recent years.

Table 12: Adoption of SMEs Go Digital Program

	Digital solutions	Start Digital Packs	Pre-approved solutions
2019-2020 report	>20,000 SMEs	10,000 SMEs	>180 solutions
2020-2021 report	>70,000 SMEs	>30,000 SMEs	>300 solutions (+80 due to Covid-19)
2021-2022 report	>80,000 SMEs	>37,000 SMEs	> 450 solutions available on CTOaaS

Source: IMDA Annuals reports FY 2019-2020; FY 2020-2022[111]

[111] Infocomm Media Development Authority. (n.d.-a). Annual Reports. Retrieved August 24, 2022, from https://www.imda.gov.sg/Who-We-Are/corporate-publications/annual-reports

[112] Ministry of Trade and Industry. (2019, May 21). Digital Adoption Among Firms and Impact on Firm-Level Outcomes in Singapore. Retrieved August 24, 2022, from https://www.mti.gov.sg/Resources/feature-articles/2019/Digital-Adoption-Among-Firms-and-Impact-on-Firm-Level-Outcomes-in-Singapore

[113] SkillsFuture Singapore. (2023, February 10). Programmes and Initiatives. Enhanced Training Support for SMEs. Retrieved February 10, 2023, from https://www.ssg.gov.sg/programmes-and-initiatives/training/enhanced-training-support-for-smes.html

Digitalization programs are often reported and tracked based on take-up rates. Singapore's Ministry of Trade and Industry has conducted studies to assess the overall impact of digitalization programs. For example, a study developed in 2019 from data on the adoption rate of various digital tools among businesses in Singapore, found that the adoption of digital tools has a positive and statistically significant effect on the value added and productivity of businesses, including SMEs. Furthermore, the findings suggest that, especially in the case of SMEs, there is still room for further progress in their digitalization efforts using more advanced digital technologies. It is expected that studies such as these will continue to guide the public sector in the formulation of digitalization strategies, including the design of future digitalization programs.

4.2 SkillsFuture Singapore (SSG) Enhanced Training Support for SMEs

The Enhanced Training Support for SMEs (ETSS) addresses the challenges that SMEs may face in sending their employees for training by offering additional support for SMEs in the form of higher course fee subsidies.

4.3 SG Cyber Safe Program[114]

The SG Cyber Safe Program was launched by the Cyber Security Agency (CSA) to help SMEs better protect themselves in the digital domain and enhance their cybersecurity. It recognizes that every organization is unique, and thus its business needs and risk-level will vary. CSA has tailored cybersecurity toolkits to help SMEs take greater ownership of their cybersecurity. These toolkits provide information on cybersecurity issues and threats, enabling SMEs to adopt cybersecurity measures pertinent to their job roles and employees adopting tips to address the most common threats they face.

4.4 Digital Leaders Program

Jointly introduced by IMDA and EnterpriseSG, this initiative supports businesses ready to integrate digital technology into their core business strategy. Through the program, businesses can: i) obtain support for the creation of a core digital team composed of a leader and up to five digital talents to drive digital transformation initiatives; ii) obtain financial support for consulting services required for the development of a digital roadmap; and iii) obtain financial support for the development of new digital products and services. Participating businesses also have access to a curated network of ecosystem partners, such as systems integrators, technology companies, strategy consultants and talent search firms to deepen digital awareness and exposure, facilitate the recruitment of a digital team, and support the business' digitalization plans.

4.5 Better Data Driven Business Programme

The Better Data Driven Business (BDDB) program helps SMEs gain deeper consumer insights and expand their businesses through responsible use of data. Through this program, free resources are offered to help SMEs protect their customers' personal data and make a more effective use of data to remain competitive in the digital economy. The BDDB program aims to support two types of SMEs: those who just embarked on learning how to use data to generate insights, and those looking to apply and share data for more complex purposes.

[114] Cyber Security Agency Singapore. (2023, February 10). Programmes. SG Cyber Safe Programme. Retrieved February 10, 2023, from https://www.csa.gov.sg/Programmes/sgcybersafe

Through BDDB, SMEs learn how to collect the necessary data securely, how to combine data between systems with appropriate protections, and how to externally share data with partners and suppliers in a secure manner, in accordance with the requirements of Personal Data Protection Act (PDPA) obligations.

4.6 Heartlands Go Digital

Heartland enterprises are local businesses providing convenient and affordable goods and services. They play an important role in preserving local culture. These types of businesses need to evolve to keep up with retail, hence digitalization skills are crucial for them to remain competitive.

Launched by EnterpriseSG and supported by IMDA, Heartlands Go Digital aims to support businesses by accelerating the adoption of digital solutions by Heartlands businesses, and to help transform their business and reach new customers.

The objectives of the program are operationalized through the following initiatives:

- PlugIn – Basic Digital Programme: Through this initiative, students from the Institute of Technical Education (ITE) teach SMEs about the importance of online presence.

- E-payment: Through this initiative, businesses can access preferential discounted rates when signing up with any of the designated electronic payment providers.

- Business productivity solutions: This initiative helps businesses to improve their productivity by automating their processes with tools such as human resources management systems, accounting, sales and inventory management systems, or integrated point-of-sale systems.

- Visual merchandising: As part of this initiative, Heartland businesses can obtain support from visual merchandising providers to revamp their product layout, design and display, acquire digital competencies in basic digital and visual merchandising, and create marketing and promotional materials.

- Digital Commerce: Eligible Heartland businesses can receive funding assistance to offset the costs of solutions to help them increase their participation in digital commerce.

[115] Raguraman, A. (2021, December 20). Over 13,000 heartland merchants adopt e-payment methods in digitalisation push. The Straits Times. Retrieved August 24, 2022, from https://www.straitstimes.com/singapore/consumer/over-13000-heartland-merchants-adopt-e-payment-methods-in-digitalisation-push

[116] Infocomm Media Development Authority. (n.d.-a). Annual Reports. Retrieved August 24, 2022, from https://www.imda.gov.sg/Who-We-Are/corporate-publications/annual-reports

By the end of 2021, more than 13,000 heartland enterprises have adopted electronic payment platforms, while more than 7,500 have adopted digital commerce solutions.

According to the IMDA Annual Report FY 2020 and 2021, three new programmes were announced in 2021, and which are explained in the next section.

4.7 Other Initiatives

An important dimension to take into account when designing digitalization initiatives, is to understand the needs of certain demographic groups in society, such as the elderly. In this regard, IMDA's SG Digital Office (SDO) was created to drive public sector initiatives to accelerate digital adoption in the community. The SDO designs initiatives to ensure that no one is left behind in Singapore's digitalization efforts. Its Seniors Go Digital and Hawkers Go Digital programs are initiatives that aim to educate and encourage senior citizens and food stall owners to go digital, through Digital Ambassadors who impart basic digital skills in one-on-one or small group settings.

5. Private Sector's View

The private sector representatives believe that Singapore is a great place for SMEs. Since 2006 there has been a public sector campaign to make Singapore a Smart Nation and an important part of this program is dedicated to advancing the digitalization of SMEs.

The public sector is dedicated to improving the skills and infrastructure needed for SMEs to successfully go digital, such as training and resources to acquire software or hardware. Simultaneously, Singapore's private sector is also focused on developing a legal framework and platforms to ensure cybersecurity and the correct and fair use of personal data.

One of the most unique dimensions of Singapore's efforts is the public sector's strong focus on fostering projects aimed at implementing AI-based solutions. However, there are also challenges. SME owners tend to have lower educational levels and are not necessarily fluent in English, which seriously impacts their ability to adopt digital tools.

Another problem holding back the progress of digitalization is that a non-negligible fraction of entrepreneurs live in a reality that prevents them from even thinking about digitalization. Many business owners have to work long hours in order to make minimal profits. For this reason, they agree with the approach of promoting intuitive, mass-produced and proven tools.

However, the private sector regrets that monitoring digitalization programs and the measurement of their impact is limited or almost non-existent. The private sector also points to efforts to focus programs on specific SMEs based on their profiles, built on information available in public sector records (e.g., tax records). These approaches may change over time and vary by program.

6. Concluding Remarks

a. SMEs are a key part of Singapore's economy. In 2021, they accounted for 99% of businesses and 71% of employment. More than 80% of SMEs have digital transformation strategies in place, but there is a perception of low success of digitalization efforts. This requires understanding why businesses are not able to benefit from digitalization efforts and correct the associated problems.

b. Despite the high level of digitalization of SMEs, they have lagged behind large companies in the adoption of digital solutions. This means that the digital transformation journey is an ongoing process and that there is still room for progress.

c. In the early 1980s, the Singapore public sector already began efforts to advance digitalization by launching the National Computerisation Plan (1980-1985). This initial plan has been followed up with other plans and strategies: the National IT Plan (1986-1991), IT2000 (1992-1999), Infocomm 21 (2000-2003), Connected Singapore (2003-2006) and Intelligent Nation (2006-2015). Their long-term strategy shows the importance of continuity in digital transformation efforts.

[117] Infocomm Media Development Authority. (n.d.-c). SG Digital Office. Retrieved August 24, 2022, from https://www.imda.gov.sg/infocomm-media-landscape/SG-Digital-Office

Viet Nam

1. Introduction

Viet Nam is located in the eastern part of the Indo-China peninsula. It is bordered by China to the north, Laos and Cambodia to the west, the East Sea to the east, and the Pacific Ocean to the east and south.

According to the World Bank's World Development Indicators, Viet Nam's population reached 97.3 million people in 2020. Of these, 25% were up to 14 years of age, 69% were between 15 and 64 years of age, and 8% were 65 years and above. As for the labor force, the participation rate in 2020 reached 68.6% and the year closed with an unemployment rate of 2.4%.

There are currently 54 different ethnic groups living in Viet Nam. The Kinh (Vietnamese) represent almost 90% of the economy's more than 97 million inhabitants, 65% of whom live in rural areas.

In 2020, Viet Nam's GDP reached VND 271.16 billion, of which the manufacturing sector accounted for 16.7%, services 41.6% and agriculture 14.9%. Some of Viet Nam main industries are infrastructure, manufacturing, retail, agriculture and food. In addition, Viet Nam's most important manufacturing sectors are textiles, garments, furniture, and electronics. Renowned global companies such as Samsung Electronics, Intel, and Siemens have already set up factories in the economy. To better compare the situation of the Vietnamese economy in the global context, Viet Nam's GNI per capita (PPP, current international US dollar) was 8,150 in 2020, while that of the United States was 64,610.

Table 13: Viet Nam profile

Viet Nam	1990	2000	2010	2020
Population, total (millions)	67,99	79,91	87,97	97,34
Population density (people per sq. km of land area)	208,9	256,9	283,7	313,9
Poverty headcount ratio at national poverty lines (% of population)	--	--	20,7	6,7
GNI per capita, PPP (current international $)	860	2,120	4,050	7,890
Life expectancy at birth, total (years)	71	73	75	75
School enrollment, primary (% gross)	105,2	109,5	105,7	117,2
School enrollment, secondary (% gross)	35	58	--	--
Average years of total schooling male population 15-64	2,572	9,099	7,512	--
Average years of total schooling female population 15-64	4,029	5,564	6,979	--
Urban population growth (annual %)	4	3,4	3,2	2,8
GDP (current US$) (billions)	6,47	31,17	115,93	271,16
GDP growth (annual %)	5,1	6,8	6,4	2,9
Inflation, GDP deflator (annual %)	42,1	3,4	12,1	1,3
Agriculture, forestry, and fishing, value added (% of GDP)	39	25	18	15
Industry (including construction), value added (% of GDP)	23	37	32	34
Exports of goods and services (% of GDP)	36	54	72	106
Imports of goods and services (% of GDP)	45	57	80	103
Time required to start a business (days)	--	61	36	16
Domestic credit provided by financial sector (% of GDP)	--	--	--	--
Tax revenue (% of GDP)	--	--	--	--
Mobile cellular subscriptions (per 100 people)	0	1	126,8	142,7
Individuals using the Internet (% of population)	0	0,3	30,7	70,3
High-technology exports (% of manufactured exports)	--	--	13	40

Source: World Development Indicators; Barro, Robert and Jong-Wha Lee, 2013. "A New Data Set of Educational Attainment in the World, 1950-2010." Journal of Development Economics, vol 104, pp.184-198.

Figures in green refer to periods other than those specified.

2. SMEs in Viet Nam

The legal definition of SMEs in Viet Nam follows the classification of the SME Support Law (Law 04/2017/QH14 dated June 12, 2017), which includes two criteria to define whether a business is an SME: the number of employees and the total revenue or total capital of the enterprise. In turn, the thresholds for each criteria are different for businesses in the agriculture, forestry and fishing, industry, and construction sectors; and for businesses in the trade and services sector.

Enterprises in the agriculture, forestry and fishing, industry, and construction sectors are considered micro-sized businesses if their total revenue is less than VND 3 billion, or if their total capital is less than VND 3 billion and they have 10 employees or less. They are considered small-sized businesses if their total revenue is less than VND 50 billion, or their total capital is less than VND 20 billion and they have between 11 and 100 employees. Finally, enterprises are considered medium-sized businesses if their total revenue is less than VND 300 billion , or their total capital is less than VND 100 billion and they have between 101 and 200 employees.

11 OECD (2021). SME and Entrepreneurship Policy in Viet Nam https://www.oecd-ilibrary.org/sites/1359290e-en/index.html?itemId=/content/component/1359290e-en

119 USD 132,479.70 at the 1/23/2022 exchange rate.

120 USD 2,207,995.00 at the 1/23/2022 exchange rate.

121 USD 883,392.00 at the 1/23/2022 exchange rate.

Businesses in the trade and service sectors are considered micro-sized businesses if their total revenue is less than VND 10 billion, or their total capital is less than VND 3 billion and they have 10 employees or less. They are considered small-sized businesses if their total revenue is less than VND 100 billion, or their total capital is less than VND 50 billion and they have between 11 and 50 employees. And finally, businesses in trade and service sectors are considered medium-sized businesses if their total revenue is less than VND 300 billion, or their total capital is less than VND 100 billion and they have between 51 and 100 employees. Table V.2. summarizes Viet Nam definition of SME's in a convenient format.

Table 14: Viet Nam's SMEs Definition.

	Digital solutions	
Size	Agriculture, forestry and fishing, industry, and construction	Trade and services
Micro	Total revenue is less than VND 3 billion or total capital is less than VND 3 billion and the number of employees is equal to or less than 10	Total revenue is less than VND 10 billion or total capital is less than VND 3 billion and the number of employees is equal to or less than 10
Small	Total revenue is less than VND 50 billion or total capital is less than VND 20 billion and the number of employees is between 11 and 100	Total revenue is less than VND 100 billion or total capital is less than VND 50 billion and the number of employees is between 11 and 50
Medium	Total revenue is less than VND 300 billion or total capital is less than VND 100 billion and the number of employees is between 101 and 200	Total revenue is less than VND 300 billion or total capital is less than VND 100 billion and the number of employees is between 51 and 100

Source: https://www.oecd-ilibrary.org/sites/1359290e-en/index.html?itemId=/content/component/1359290e-en

In January 2019, Viet Nam had 382,444 micro-sized businesses (62.6% of total businesses), 189,879 small-sized businesses (31.1% of total businesses) and 21,306 medium-sized businesses (3.39% of total businesses). However, only 54.1% of these SMEs were active or operating. Table V.3. presents the number and proportion of Vietnamese businesses by size.

Table 15: Number and Proportion of Vietnamese SMEs by Size.

Size	Number of businesses	Proportion of total busines-
Micro	382,444	62.6%
Small	189,879	31.1%
Medium	21,306	3.39%
Large	17,778	2.91%

Source: Own elaboration.

[122] USD 13,250,880.00 at the 1/23/2022 exchange rate.
[123] USD 4,416,960.00 at the 1/23/2022 exchange rate.
[124] USD 441,696.11 at the 1/23/2022 exchange rate.

In terms of their contribution to the economy, Viet Nam SMEs account for nearly 50% of total employment. In 2018, SMEs created 8.8 million jobs. On average, the SME sector created about 280,000 new jobs per year over the past decade. In addition, according to the Ministry of Planning and Investment, SMEs contributed 45% of GDP and 31% of total public sector budget revenues.

SMEs are heavily present in the service and commerce sectors, followed by manufacturing and construction. This trend is demonstrated by the number of new businesses registered in recent years. In 2019, 99.5 thousand new businesses were created in the services sector, accounting for 72% of all new businesses. However, despite the large number of businesses belonging to these sectors, we are not aware that the policies discussed below place particular emphasis on them.

2. Barriers to Digitalization

According to a recent report released by the Viet Nam Chamber of Commerce and Industry (VCCI), most businesses in Viet Nam face multiple barriers in digital transformation. First and foremost, businesses are unaware of the importance of digitalization. The report shows that although SMEs account for nearly 98% of Viet Nam enterprises, they have a low level of technology and innovation. This conclusion was confirmed by a recent survey by the Ministry of Industry and Trade, which revealed that more than 80% of businesses have just started to understand digital transformation. Indeed, many SMEs are still unable to apply concepts such as “digital economy” or “digital transformation”.

In addition, the report “Digital Economy and Digital Transformation in Viet Nam”, prepared with the support of the European Union, identifies several other barriers to Viet Nam digitalization. The three issues afflicting over 50% of the SME’s are the following:

i) High cost of investments in high technology applications: the principal barrier to embark on the digital transformation, afflicting 60,1% of surveyed SMEs. This directly relates to many of the challenges faced by SMEs mentioned throughout this report, specially, the direct need of funding a costs reductions needed for them to adopt digital tools.

ii) Difficulties in changing business habits: about 52,3% of SMEs report this barrier. As noted in this report, day-to-day inertia is a powerful force that is hard to contest for businesses, especially SMEs, given their profit and staying a float culture.

iii) Lack of internal human resources to apply digital technologies: 52,3% of businesses surveyed chose this option as a barrier.

125 Le Duy Binh & Tran Thi Phuong (2021). SME Sector and the EVFTA. A Reader Prepared for Roundtable Series on EVFTA, EVIPA and Post-Covid-19 Economic Recovery in Vietnam https://www.economica.vn/Content/files/PUBL%20%26%20REP/EVFTA%20and%20the%20SME%20Sector%20ENG.pdf

126 Le Duy Binh & Tran Thi Phuong (2021). Digital Economy and Digital Transformation in Vietnam. A Reader Prepared for Roundtable Series on EVFTA, EVIPA and Post-Covid-19 Economic Recovery in Vietnam https://www.economica.vn/Content/files/PUBL%20%26%20REP/EVFTA%20and%20Digital%20Economy%20in%20Vietnam%20ENG.pdf

3. SMEs Digital Transformation Policies

In January 2021, the Ministry of Planning and Investment (MPI) launched the Program on Supporting Enterprises' Digital Transformation Period 2021-2025. This is the first digital transformation initiative formally pursued by the Vietnamese public sector. Enterprises from all sectors are encouraged to participate in the Program. However, only SMEs are eligible for support from the public sector budget. Private entities may donate funds to the Program and may establish their own requirements for allocating their funds. Large businesses participate in the Program by sharing their knowledge and putting SMEs in contact with consultants or solution providers.

The Program will run through December 2025 and is sponsored by USAID's LinkSME. The private sector is strongly encouraged to participate in the Program, with special emphasis on solution providers.

SMEs participating in the Program have access to the following benefits:

i) Assessment of digital maturity: The Program includes a digital assessment tool available on the Program's website --- http://digital.business.gov.vn. The questionnaire used to assess the digital maturity status of Vietnamese businesses collects basic information about the them (e.g. name, sector, number of employees, etc.), and ranks businesses on their digitalization journey according to variables such as knowledge level of owners or managers regarding digitalization, the type of digital experience offered to customers, the use of digital tools to manage the supply chain, or the incorporation of digital tools into business processes, such as financial accounts or human resources management.

ii) Access to guidelines for digital transformation: The Program includes a solutions roadmap with recommendations and tips for businesses to develop and expand their digital skills.

iii) Technical assistance on digital transformation: The Program includes training, consulting sessions, and mentoring for businesses.

iv) Intensive one-on-one support to 100 businesses (focused on medium-sized manufacturing businesses): The Program sponsors consultants to support businesses in developing their digital transformation roadmap.

v) Networking and support to access digital services: The Program supports communication activities and business matching between SMEs and solution providers with favorable discounts/ policies (online and offline).

So far, more than 15,000 businesses have received some form of support, 350 businesses have responded to the digital assessment tool and 100 businesses have received customized support.

The objectives of the Program are: 1) to raise awareness of the importance of digital transformation, 2) to improve the competitiveness and productive capacity of businesses through digital transformation, and 3) to develop an ecosystem to support businesses in digital transformation. To meet its objectives, the Program aims to achieve the following:

1) At least 100 businesses will receive intensive support to become success stories, moving from “going digital” to “being digital”,

2) Businesses access the Program’s information and will improve their knowledge on digital transformation,

3) At least 100,000 businesses will receive support from the Program, including the use of tools to self-assess their readiness for digital transformation or receive training, advice or connecting solutions,

4) A network of at least 100 experts will provide technical support for digital transformation of businesses.

4.1 The Digital Packages Initiative

In addition to the program described above, the Ministry of Planning and Investment of Viet Nam (MPI) is working to expand the scope of digital transformation initiatives through a cooperation agreement with the Prime Minister’s Office. To this end, the MPI designed the Digital Packages Initiatives. The initiative contains three main different support packages to assist SMEs on their digital transformation path: the Start Digital Package, the Grow Digital Package, and the Go Digital - Go Global Package. Each package is designed for different types of businesses and offers different types of support to drive digital transformation according to the needs of the target companies.

The MPI plans to launch this initiative regardless of whether it obtains support from the Prime Minister’s Office. However, the Prime Minister’s support would mean a larger budget and scope for the initiative. Currently, the initiative is financially supported by LinkSME, the Vietnamese public sector, banks and other entities.

It should be noted that the dimension of the initiative, as well as the scope objectives, have not yet been defined, as it depends primarily on the reception and decisions of the higher bodies of the Vietnamese public sector.

4.2 Digital Start Package

The Digital Start Package is aimed at newly established SMEs or SMEs that have just started their digitalization process. It aims to help them choose the right solutions to successfully start their digitalization process. The package includes consulting and one-on-one training through public sector-approved private providers. It provides up to VND 20 million per year to micro-sized businesses, and up to VND 50 million per year to small-sized businesses.

The objective of the Digital Start Package is to help beneficiary SMEs implement database solutions and cybersecurity solutions; introduce human resources and payroll management systems and digital marketing tools; develop digital transaction solutions and digital transaction services through banks; adopt digital collaboration solutions; and implement accounting solutions.

4.3 Digital Growth Package

The Digital Growth Package targets medium-sized businesses and provides them with up to VND 100 million per year to accelerate their growth with digital solutions. Like the Digital Start Package, the Digital Growth Package also includes consulting, one-on-one training, and the implementation of database solutions and cybersecurity solutions.

But, unlike the Digital Start Package, the Digital Growth Package also supports the implementation of ERP solutions and the introduction of digital CRM solutions and Intelligent Reporting and Analytics solutions. In other words, the Digital Growth Package is focused on the use of information to guide business decisions.

4.4 Go Digital - Go Global Package

The Go Digital - Go Global Package offers a maximum of 50% or VND 50 million per year for up to two years for businesses to cover the membership fee for e-commerce platforms. The Package is specially designed for SMEs going global through B2B or B2C platforms or through direct export. The objective of the Package is to assist SMEs in successfully deploying digital and technology solutions and positioning their brand and products for a global reach. The main benefits for participating businesses are the possibility of expanding their customer base, access to cross-border electronic payment systems and the establishment of global transport networks.

Like the previous Packages, the Go Digital - Go Global Package also includes consulting and support, and one-on-one training. However, since this Package aims at the use of digital tools for globalization and improving the competitiveness of businesses, the main areas supported by this Package are the promotion of the use of e-commerce platforms and cross-border e-payments; the implementation of digital tools for market research and analytics based on Big Data and AI; and the use of digital content publishing tools and digital content dissemination tools for cross-border promotion.

4. Public Sector’s View

Public sector digitalization efforts are increasing every day to cope with the consequences of the pandemic. 98% of Viet Nam´s businesses are SMEs and the public sector is working hard to boost their growth and recovery. So much so that the public sector has formally declared that in the next five years business policy will focus on supporting SMEs.

However, public sector initiatives are not always perfect. This is understandable, as the challenges posed by the COVID-19 pandemic are unique and never seen before. What is relevant is that the public sector is thriving to ensure that SMEs can recover to pre-pandemic levels as quickly as possible. As a result, many policies are changing on a daily basis to improve on their initial shortcomings.

5. Private Sector's View

In general, SMEs welcome the public sector's efforts. However, SMEs sometimes encounter difficulties with administrative regulations. For example, there are payroll assistance programs, but to access them, SMEs have to complete paperwork. The policy is supposed to help businesses within a week, but in practice the regulations imply that the aid is disbursed between one to two months. The public sector is listening to the challenges and trying to improve.

Not all SMEs face the same challenges. Some need basic improvement in their technology, while others are looking for a total transformation. But regardless of the digital transformation goals of SMEs, they all face basic problems: Access to finance and the need for human capital. This means that not many SMEs are able to cope with digital transformation. Many SMEs are not familiar with computers or the Internet. Likewise, there are also regional difficulties. If SMEs are not located in specific areas, the likelihood of receiving support is low. Urban areas are in advantage because information on existing digital transformation programs is widely available. In contrast, gender is not a factor in access to digital transformation.

Finally, it should be noted that the public and the private sector work closely together to develop effective programs. The public sector is constantly partnering with various business associations to provide funding, specialists and human resources designed specifically for the needs of SMEs.

6. Concluding remarks

a. SMEs in Viet Nam account for nearly 98% of businesses and 50% of total employment, but they face multiple obstacles in digital transformation and seem to be unaware of the importance of digitalization, resulting in a low level of technology and innovation.

b. The lack of experts and the shortage of skilled labor is one of the main challenges in terms of digital transformation. Only 27% of IT workers meet the minimum skill requirements for their roles. Moreover, it is estimated that there is a shortage of more than half a million IT workers. With only about 50,000 IT students graduating from universities and IT training institutes across the economy, it is expected that this number can only grow. It is therefore important that transformation policies not only focus on the training of SME workers, but also on that of students.

c. The digital economy requires a solid infrastructure. Lack of funding and insufficient information are the main obstacles to improving infrastructure and deepening digitalization at the enterprise level in Viet Nam. Therefore, digital transformation policies should aim to clarify the economic benefits of technology adoption to increase the willingness to invest in digital transformation.

d. One of the challenges of digital transformation is the lack of coordination of different public sector agencies in the implementation of digital economy strategies. It requires the establishment of political leadership in the digital economy. Therefore, digital transformation policies must aspire to and have mechanisms in place to create an official endorsement and commitment from the highest levels of the public sector.

APPENDIX 1:
ECONOMIES CONTACTED AND SELECTED FOR THE STUDY

Total economies contacted:	13
Total economies selected:	6
Total economies not qualified:	7

A. Economies selected for the study

Australia
- Public Sector: Mr. Sean Macintyre; Director, Small Business Policy Council. Interviewed 11/11/2021.
- Private Sector: Mr Mattew Addison; Executive Director of the Institute of Bookeepers. Interviewed 23/11/2021.

Chile
- Public Sector: José Antonio Guridi; Head of Future and Social Adoption of Technology Unit (FAST) Ministry of Economy. Interviewed 08/11/2021
- Private Sector: Manuel Correa; Executive Director of Endeavor Chile. 19/11/2021 and George Lever; Research Manager of the Chilean Chamber of Commerce. Interviewed 12/11/2021.

Hong Kong, China
- Private Sector: Mr. Carlos González, President of the Chile Hong Kong Chamber of Commerce. Interviewed 11/11/2021.

Republic of Korea
- Public Sector: Mr. Andy Kim from Korea SMEs and Startups Agency (KOSME). Not willing to participate.
- Private Sector: No contact achieved.

México
- Public Sector: Ms. Ivana Fernández; Institutional Liaison Director. Interviewed 14/01/2022.
- Private Sector: Mr Luis Ortiz; Founding Partner and Member of the Board of Directors of ASEM and Founding Partner of the technology agency Zumi. Interviewed 22/12/2021.

New Zealand
- Public Sector: Ms. Robyn Henderson; Policy Director of Digital and Mr. Malcolm Luey; Director of Digital Boost. Ministry of Business, Innovation and Employment. Interviewed 03/12/2021.
- Private Sector: Ms. Anna Curzon; Chief Product Officer at Xero. Interviewed 17/03/2022.

Perú
- Public Sector: Ms. Marushka Chocobar; Secretary of Government and Digital Transformation of the Presidency of the Council of Ministers, Peru. Interviewed 19/03/2022
- Private Sector: Mr. Enrique Mesones President of the Peruvian Association of Software, Technology and Digital Economy. Interviewed 14/12/2021.

The Philippines
- Public Sector: Ms Bianca Asiñas-Aga, Officer in Charge; E-Commerce Division of the Department of Trade and Industry. No Interview granted.
- Private Sector: Eunice Decena; Executive Administrator Office of the Chairman EMS Group. Interviewed 22/12/2021.

The Russian Federation
- Public Sector: Ms Natalia Pedan; Deputy Head of Division, Department for Investment Policy and Business Development, Min. Ec. Development. No contact achieved.
- Private Sector: No contact achieved.

Singapore
- Public Sector: Ms. Agnes Lee; Assistant Business Partner | Corporate Planning, Enterprise Singapore. Sent questionnaire 19/12/2021.
- Private Sector: Mr. Edward Tay; Honorary Treasurer of SGTech Singapore Enterprise Chapter. Interviewed 09/11/2021.

United States
- Public Sector: Ms. Emily Desai; Deputy Director for International Affairs and Trade. CalOBSA
- Private Sector: Mr. Matías Alcalde; Executive Director; Chile California Council. No contact achieved

Viet Nam
- Public Sector: Ms. Nguyen Thi Le Quyen; Official at Agency for Enterprise Development, Ministry of Planning and Investment. Interviewed 23/11/2021
- Private Sector: Mr. Lan Hoang Nguyen; Assistant to the Chairman, VINASME I Trade Promotion - Business Development Services. Interviewed 08/12/2021

B. Economies contacted but whose information collected was not sufficient to elaborate the case.

Colombia
- Public Sector: Edwin Javier Ramírez; R&D Coordinator; Directorate of Innovation and Business Development. No contact achieved.
- Private Sector: No contact achieved.

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