

Regionally Based Socio-Economic Ecosystems: Case Studies from Argentina

Research paper

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Institutions:



UCL founded in 1826 in the heart of London, UCL is London's leading multidisciplinary university, with more than 16,000 staff and 50,000 students from over 150 different countries. UCL is consistently ranked as one of the top ten universities in the world (QS World University Rankings 2010-2022) and is No.2 in the UK for research power (Research Excellence Framework).



Universidad Siglo 21, with more than 67,000 students and 23,000 graduates is the largest private university in Argentina. Created in 1995, it offers a hybrid education covering 23 Argentine provinces with 300 learning centers, presential, face-to-face, mixed and full online proposals.



Universidad Tecnológica Nacional (UTN) is an Argentine public university with a federal organization, focusing on Engineering degrees. UTN is the largest Argentine engineering university with a strong presence in the working sector of society.



Universidad Nacional del Sur is a public university situated in Bahía Blanca, Argentina. Founded in 1956 and with more than 30,000 students, UNS is among the 10 best universities in Argentina and among the 50 best universities in Latin America.

ABSTRACT

In recent years, growth in digital transformation has increased exponentially, but in some regions, only slow growth has been achieved, as in Argentina. This represents a remarkable Argentine deficit of skills and a shortage of talent for the development of industry 4.0/5.0. The conclusion reached at an International Engineering Workshop which took place in Cordoba, Argentina confirmed this. Documentation derived from a collaboration with the UCL Global Engagement Strategy was considered, and projects and start-ups in London and Glasgow associated with digitalization, as well as lessons learned, were included. Finally, during 2023 a survey of digital maturity was carried out with Argentine companies. In addition, a field observation of direct data collection from Argentine companies as well as interviews with experts were conducted. Furthermore, 51 Argentine job banks were consulted, looking for digital transformation-related skills. Beyond the business world, 500 academic programs of study within Argentine university degree programs were examined to detect digital transformation-oriented content.

Even considering the particularities of the country, some patterns were detected including the urgent necessity of improving education as a guarantee of growth to promote a better Argentine digital transformation. Indeed, based on the diagnosis and including key points of the Social Ecosystem Model, a set of recommendations oriented towards aligning professional skills covered by university degrees in Argentinian academia with market needs was formulated. These focus on the Vocational Education and

Training framework as a basis for collaboration between employers and academic VET providers, to involve the active participation of all actors in the transformation of the Argentine university curricula, focused on engineering and applied Sciences programs and oriented toward a competencies model.

INTRODUCTION AND MOTIVATION

Currently, inducing inclusive digital transformation is a key factor in ensuring the well-being and balanced socio-economic growth of a society or region. Indeed, digital transformation has increased exponentially (Zaoui and Souissi, 2020). However, in some regions, only slow growth has been achieved, as in the case of Argentina (Vélez, G., 2022). In this context, this work reports on an extensive correlational study carried on in Argentina oriented towards collecting rich qualitative and quantitative data, identifying a remarkable deficit of skills in the face of Industry 4.0/5.0. Based on the study, based on recommendations coming from the Social Ecosystem Model (SEM) (Grainger and Spours, 2018) as a highly valued direction to follow, some policies aligned with the Vocational Education and Training (VET) viewpoint are

»Very low level of digital transformation even for large-sized Argentine enterprises.«

proposed, to deal with the observed talent gap, with an emphasis in the urgency to achieve agreed synergies between local enterprises, academia and all social actors involved.

The rest of this article is organized as follows. The next section discusses all the parameters of the study. Some policies aimed at improving what was observed are outlined. Following this, related works are compared with current contributions. Finally, conclusions and future work are presented, designed to interpret the problem described as a fundamental opportunity for growth and empowerment of the Argentine region towards the benefits of inclusive digital transformation.

SITUATIONAL ANALYSIS: TOWARDS A SOCIAL ECOSYSTEM MODEL FOR THE ARGENTINE REGION

In March 2019 the International Engineering Workshop "Understanding of Skills Systems: How to Involve Employers and Educators Applying Agile Methods" was held in the central Argentinian city Cordoba, organized by Universidad Tecnológica Nacional. Young entrepreneurs who develop their IT-based businesses or who were expanding their enterprises toward new digital business and customer niches were invited together with companies such as McAfee - Córdoba, PluralIT and so on, all of them recognized by government institutions as leaders of regional and national digital transformation. As a result, the talent gap caused by the strong discordance between market requirements and the academic training available was pointed out as one of the most pressing factors. In response to the conference conclusions, the importance of adopting

policies based on a VET viewpoint was highlighted, and some preliminary recommendations for academia were sketched. After this meeting, and largely due to the consequences of the COVID-19 pandemic, it is evident that in all regions of the world, the digitalization transformation processes accelerated and became one of the main keys to socio-economic survival. Consequently, what was concluded in the mentioned workshop became relevant, meriting being considered again in much more detail.

Subsequently, the authors involved themselves in some activities proposed by the UCL Global Engagement Strategy.¹ Under the guidelines of this initiative, the most relevant characteristics of socio-economical ecosystems that foster high levels of digital transformation were collated having in mind the differences between developed and emerging countries and regions. Besides this, projects between colleges and start-ups in London and Glasgow were analyzed to take advantage of the lessons learned. Again, the relevance of achieving an oriented VET model capable of dealing with the talent gap emerged. As a consequence, and framed in profound changes in political and social direction, the particular socio-economic environment associated with the Argentine digital transformation was once more put under the spotlight. Indeed, work in two complementary lines of investigation started.

On one hand, during 2023 a poll still in progress surveying digital maturity was carried out between representatives of Argentine companies to detect self-perception and key issues regarding digital transformation. Different regions of the

country were covered; and a mix of 100 small, middle, and big enterprises were contacted so far 30 have responded. The pool was developed bearing in mind the patterns proposed by (Mugge et al, 2020), but considering particular aspects of the Argentine region and the new scenario post-pandemic. Enterprises like Pan American Energy (energy provider, 200 employees), Toyota S.A. (car industry, 2000 employees), Cooperativa Obrera (supermarket, 5000 employees), MEGA Company (hydrocarbons, gas and petrochemicals sector, 10,000 employees), Bodgas Bianchi (wine sector, 1000 employees), Condor Estrella (passenger transport, 5000 employees), La Anomina (supermarket, 8000 employees), Acon Timber (export lumber sector, 2000 employees), Grupo Ledesma (agribusiness in the sugar sector, 6000 employees), Vista Oil & Gas (energy company, hydrocarbon export, petrochemical, 2500 employees), Barrick Gold Corporation (miner sector, gold, 4000 employees), Claro (telecommunications and TI sector, 10,000 employees) participated, among others.

»Results support the imperative necessity of change led by the SEM (Social Ecosystem Model) as a high-valued direction to follow.«

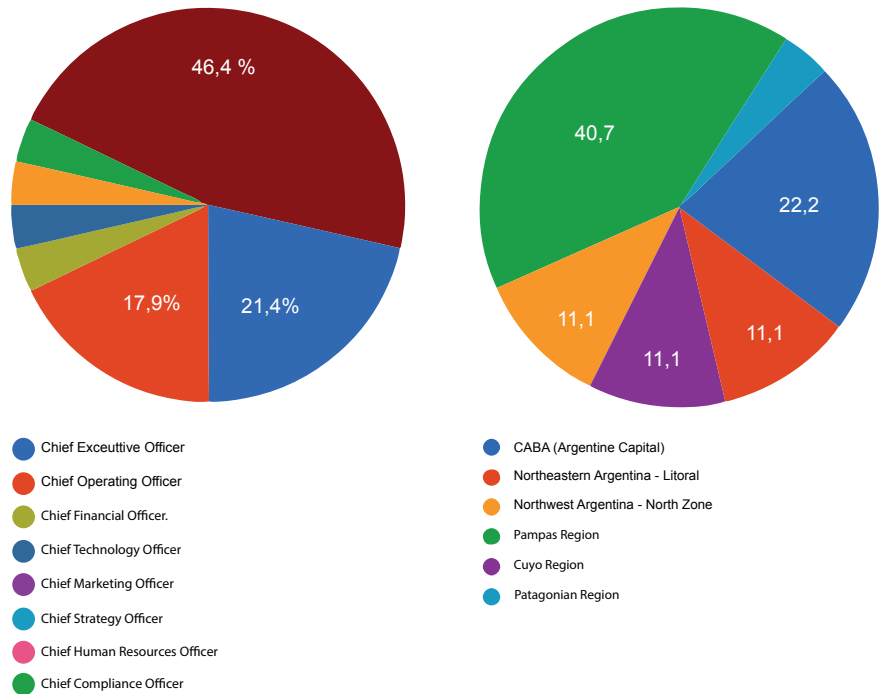


Figure 1: Role of person who represents the company (left) / Geographical distribution of surveyed companies (right)

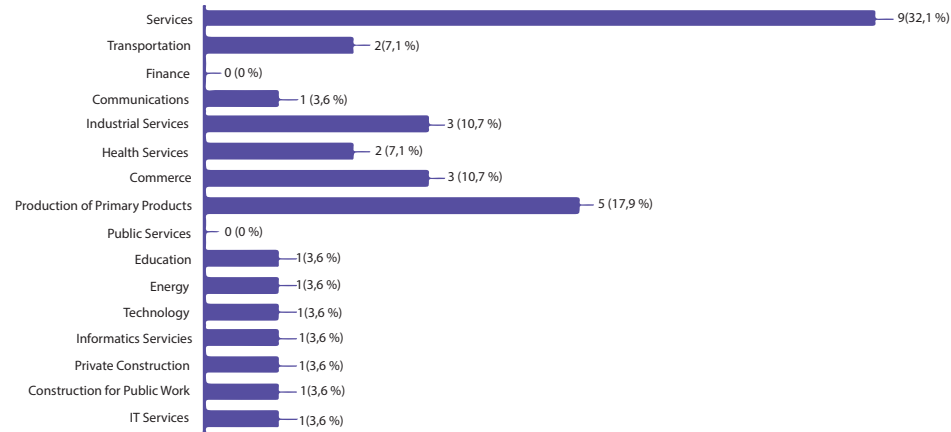


Figure 2: Surveyed economic sectors.

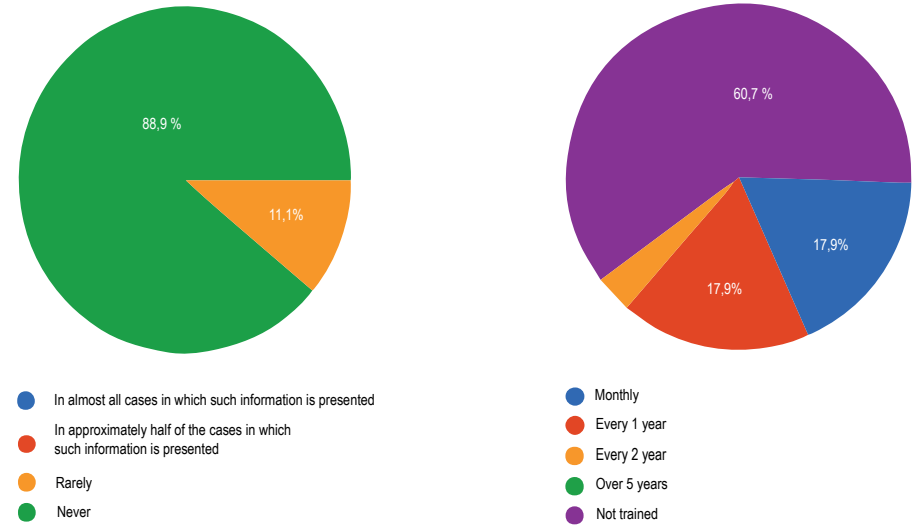


Figure 3: Cases on which Data Science Techniques or Tools are used to process available information (left) / Frequency of digital training (right)

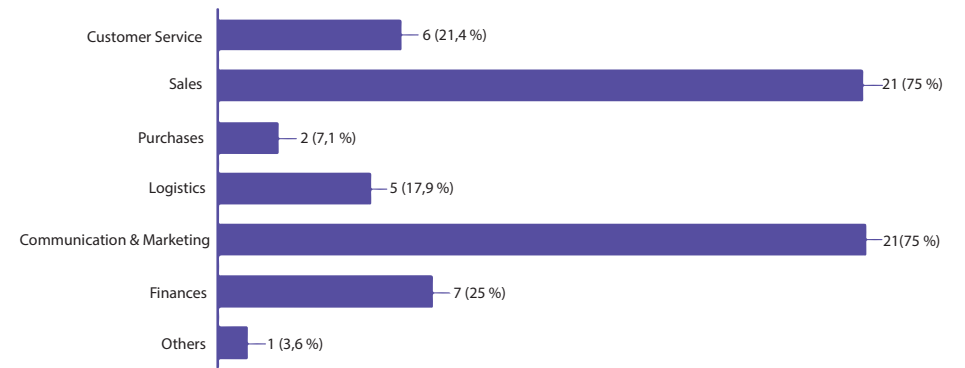


Figure 4: More relevant processes in the Company that suffer a digital transformation may be at 50% during the last 4 years.

Figures 1, 2, 3, and 4 summarize some obtained results. Despite the well-known importance of digital transformation, collected data reinforces the previous hypothesis supporting a very low level of digital

transformation even for large-sized Argentine enterprises. Besides, direct data collection from 10 Argentine companies was undertaken. A sample of small enterprises was considered and results fol-

»Policies supporting VET (Vocational Education and Training) viewpoint are suggested as a crucial strategy for improving the talent gap observed.«

lowed the tendency shown in the survey. Interviews with experts as a secondary collection method are in progress, with the ratification of what was observed.

In addition, 35 job banks managed by public and private Argentine universities plus 16 job banks related to the most relevant Professional Associations throughout the country were consulted. As a result, only 8% of the job applications belonging to the university job banks asked for some Artificial Intelligence or other advanced digital skills regarding digital transformation. In the case of job banks of Professional Associations, the percentage drops to 6.5% of cases.

On the other hand, 500 academic programs of subjects belonging to Argentine university degree careers in science were observed to detect the digital-oriented talent gap as one possible cause of the digital transformation slowdown in the region. If careers in Computer Science or Informatics, Data Science, and Technological Innovation are not considered, few references for competencies or skills regarding dig-

ital transformation could be determined (less than 5%). In all cases, competencies focus on specific traditional software usage more than in regarding industrial processes, in discussing changes in communications and monitoring possibilities, in Artificial Intelligent tools usage and possibilities, or in global comprehension of the novel business rules of the basic contracts underlying Argentine population moving from 4.0 to 5.0 economy.

After all the situational diagnoses were carried out, results support the imperative necessity of change led by the SEM as a highly valued direction to follow. Policies supporting the VET viewpoint are suggested as a crucial strategy for improving the talent gap observed. Achieving agreed synergies between local enterprises, academia and all social actors involved in Argentine digital transformation is not only a very harsh reality but also an opportunity for the entire Argentine society to fulfill more favorable living standards for all citizens. The Argentine Digital Agenda must be positioned at the center of the social and political scene, so that global agreements in the short and medium term can mitigate the slowdown in the adoption of a socio-economic inclusive digital culture, by best practices observed in other geographical regions.²

RELATED WORK

Digital transformation has been measured over the last years in different Argentine scenarios. For example, (Vadell, 2023) describes and analyses factors that show the degree of progress in digitization in Argentina. Unlike this work, the focus is on the process of the tax administration in the country. Another interesting study is pre-

sented in (Fernández et al, 2020), where digital transformation in the Argentine health system is sketched. In addition, in 2023 a recent form to measure the digital enterprise maturity of insurance Argentine companies was launched by the recognized non-governmental organization, the Argentine Chamber of the Software Industry, CESSI in collaboration with the Argentine Association of Insurance Companies.³ Similarly, the Argentinian government made available to the public a digital maturity self-diagnosis through INDTech 4.0, a public-private collaborative hub created for the digital transformation of small companies in which a comprehensive offer of solutions with Argentine technology is articulated.⁴ This reveals the importance that both the institutions and the government provide to the topic under discussion.

One more engaging work is shown in (Califano, 2024), where the author examines the public actions and interventions needed to address the digital inequalities that emerged and became a central issue on the public agenda during the Covid 19 pandemic in Argentina. Although the SEM frame is not mentioned, the author takes into account how digital transformations have disrupted traditional systems of work, education, domestic lives, and methods of communicating. The author explores the extent to which the public actions between 2020 and 2021 have helped to cope with the online activities of everyday life. Respecting the academic training, Martínez-Pérez and Rodríguez-Abitia (2021) discuss a roadmap for the digital transformation of Latin American universities. However, to the best of our knowledge, there are no similar studies as the one presented in this paper.

CONCLUSIONS AND FUTURE WORK

This article discusses Argentina's slowdown in digital and inclusive digital transformation. Starting from the detection of an imperative gap of talent and taking into consideration VEP viewpoint, other countries' strategies and lessons learned, and SEM best recommendations, a worrying lack of demand for skills associated with digital transformation was surveyed, added to a marked lack of university training that promotes an adequate 4.0 and 5.0 oriented professionals skills and competences.

In the short term, future work includes continuing to record the level of digital maturity of Argentine companies as well as other job banks, as more evidence is required. Besides, currently, Colombia is considering not only expanding the survey of business data and contrasting it with the Argentine one but also examining academic Colombian curricula in a similar way that was done for the Argentine case. In the medium term, synergies between the university and the business world must continue to strengthen. Work in all these directions is currently being pursued.

»Agreed synergies between local enterprises, academia and all social actors involved in Argentine digital transformation.«

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¹ See https://www.ucl.ac.uk/global/sites/global/files/ucl_global_engagement_strategy.pdf

² See <https://www.boletinoficial.gob.ar/pdf/aviso/primera/195154/20220824>

³ See <https://cessi.org.ar/2023/04/26/10-05-indice-de-maduracion-digital-de-companias-de-seguros/>

⁴ See <https://www.argentina.gob.ar/produccion/asistencia-digital-para-pymes/autodiagnostico-indtech>