

EXPLORING STRATEGIC WAYS TO ENCOURAGE PERUVIAN WOMEN TO GET INVOLVED IN TECH CAREERS/ PROGRAMS

Author: Chiara Garrido

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ABSTRACT

This research project investigates the gender gap in the tech field, specifically in Private Universities in Lima- Peru, and the challenges that female students encounter in these programs. All results paved the way to explore short-, medium- and long-term strategies to potentially reduce this disparity.

Both secondary and primary research were used to gain an initial understanding of the selected issue. The secondary research involved reviewing articles, research papers, books, case studies, and news outlets. Primary research focused on conducting one-on-one interviews with experts in gender and inclusivity experts, "Women in Tech" Experts, and Tech Professionals to gain insights into the tech and gender landscape in Peru and understand the latter's group experiences as undergraduate students.

The collected data and information shed light on a potential solution: a comprehensive 30-year strategy divided into decade-long plans with various activities aimed at reducing gender disparity. These initiatives primarily address key issues identified during our discovery phase, including creating safe spaces, promoting inclusivity, fostering diversity, enhancing representation, building communities, instilling a sense of belonging, and driving behavioural change within the private university ecosystem. The final solution places the private universities in the middle of an ecosystem to provoke change not only within their institution but in High Schools and Private Sectors (potential work spaces) to increase attraction and retention of female students.

Key Words: Peru, Lima, Technology, Private Universities, Gender Gap, Gender Disparities, Equity, Inclusivity, Female Students, Strategy.

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PART 1:

BEFORE WE GET STARTED

INTRODUCTION

As a Peruvian Woman myself, I found much interest in making my research project based on my home country, as a way to contribute with some knowledge in one of the biggest social issues that has been exacerbated in the past years: Gender equity, specifically equity towards self-identifying Peruvian women.

I was deeply interested in further exploring this problem, specifically in the private education system (Universities) in the capital city of Lima- Peru.

A trend that is part of our lives and will continue to be of extreme relevance in the short and long-term future is technology. The problem that has been identified by not only numerous studies but has gathered political or state interest is that of a shortage of tech professionals in a context where demand is increasing. The underlying issue is that in STEM, specifically in this study Technology careers or programs, are highly masculine. This means that fewer women than men are enrolled in this education, and as a result, there are more men in the Peruvian Tech field. Due to this, many women struggle to find a voice in these spaces and often find themselves struggling with harassment and mistreatment by their male peers, professors, and TAs.

My study focused on exploratory research, with no hypotheses or assumptions in mind but with an open interest to further understand the root cause of this problem, why this happens, how it affects self-identifying women and men, and the repercussions in society.

The moral motivation behind this is to give equal opportunities to Peruvian women regarding their field of interest of studies, as well as understand how to promote better spaces for tech students, and ultimately explore ways that the number of professionals can increase and meet the demand of this field.

As this problem encompasses social and deeply rooted issues, it is hard to think that change will happen quickly. Using foresight thinking is important to understand how to build resilient solutions to see change in the long, medium, and short-term future.

For my research, I first showcase a further understanding of what gender equity is, where gender stereotypes come from, and how this specifically manifests or is found in the Peruvian

context. Information on the Tech field as well as Higher education tech programs is offered. As a result of primary research interviews with tech professionals, human-centred design methodologies have been used to further understand the problem from the standpoint of self-identifying female students and male students. Expert interview results are offered to give further information not only on the context and problem but also to shine a light on what are the crucial initiatives or features that need to be considered.

Foresight methodologies are then used to build a resilient long-term solution, considering that systemic and social change takes time.

The results are considered in short-, medium-, and long-term strategies and initiatives that private universities in Peru can apply to attract, retain, and protect female students within inclusive and more resilient educational spaces.

POSITIONALITY STATEMENT

I acknowledge my privileged position as an educated, white- Latina, cis-gendered Peruvian woman who can complete this research for a postgraduate program in an International setting: Toronto Canada.

My position might have influenced my research project as a Peruvian woman who has experienced sexism at different levels and spaces in my home country.

PART 2:

PROBLEM AND RESEARCH

METHODOLOGY

IDENTIFIED PROBLEM

Despite the rising demand for tech professionals in Peru, which has surged by 60% due to the pandemic (PageGroup, as cited in Chávez Quispe, 2021), and an international job growth prediction of 13% by 2030 (U.S. Bureau of Labor Statistics, as cited by Ascott, 2022), there is a significant deficit of professionals in STEM and tech careers, with a shortfall of 17,000 professionals according to Cisco's 2022 report (Cisco, 2022, as cited by Castillo, 2022).

While women in Peru constitute 56.6% of university graduates (INEI, 2015), the gender disparity in the tech industry remains stark. Only 29.2% of students enrolled in Science, Technology, and Innovation (STI) programs are women (SUNEDU, 2016, as cited by Sime, 2019), less than 10% of women work in the tech sector, and a mere 8% express interest in studying computing-related careers (INEI, 2017, as cited by RPP, 2021).

The data demonstrates a lack of professionals in tech that can meet the demand in the Peruvian market, as well as that most of the people enrolled in these careers are men. One way of achieving higher numbers is to attract that population that is less involved: women.

RESEARCH QUESTION

Main Research Question:

- How can foresight and inclusive design methodologies contribute to meeting the demand for tech professionals in Peru?
- How can we increase interest and retain more women in tech careers through Peruvian Private Universities?

Sub-Questions:

1. How do existing structures and practices in Peruvian universities impact female participation in tech-related programs?
2. What motivations and barriers affect women's decisions to pursue tech careers in Peru? (based on past and present experiences)
3. What lessons can be learned from successful international initiatives aiming to increase female participation in tech education?
4. How do proposed strategies align with or differ from the current approaches to gender inclusivity in Peruvian private universities?
5. What potential challenges and opportunities might arise in implementing these strategies, and how can they be addressed?

RESEARCH APPROACH

For this study, secondary as well as primary research was conducted to get a better understanding not only of the context where the problem is found, but also to have a deeper understanding of the core issues. The following were used:

a. Secondary Research:

Books, theses, research papers, data articles, and informative articles were used to learn and understand the problem's background, context, and data that shines light into the problem on both a smaller and larger scale. International Case studies were used as well

to learn from places that have managed to solve this problem, as a source of inspiration.

b. Primary Research:

This was conducted through 45-minute to one-hour-long semi-structured interviews with 3 different groups of people/ profiles:

i. Interviews with Tech Professionals:

The aim was to understand their journey and pains as self-identified female and male tech students in tech programs in Peru. The conversation focused on early-age decisions and exposure to tech programs, their trajectory as students in undergrad, and what the tech field looks like for them as professionals (after graduation). The research intent was to understand how gender disparity manifests in the tech field, especially in Lima's private universities.

The aim was to learn from both groups of students, with more focus on the self-identified female student's experience.

ii. Interviews with Gender and Inclusivity Experts:

The aim was to learn in-depth about Gender equity and inclusivity in Peru under the observation and study of experts in the field. This learning is not only focused on the broader Peruvian context but with focus on its importance in academic, tech, and highly masculine spaces. Their opinion and expertise on possible introductions or ideas that could benefit women in tech spaces is explored as well.

iii. Interviews with "Women in Tech" Experts:

The aim was to explore the importance of women's presence in the tech field, learn about different tools, initiatives, programs, or NGOs that exist internationally and in Peru that currently work on promoting more women in Tech, and ultimately discuss what are key initiatives and solutions to increase the number of women in Tech.

c. Primary Research/ Study Limitations:

This research study did not ask for participants' identity, race, ethnicity, sexuality, disability, socioeconomic group, nationality, immigration or citizenship status, or other identifiers.

As stated in Iris Bohnet's book "What Works. Gender Equality By Design ", there is

something called “double jeopardy”, where it is assumed or understood that people with “subordinate identities” are subject to more prejudice than those with one (Bohnet, 2016). This means that people who are part of minority or discriminated groups will have fewer benefits in society, for example, there would be a difference not only between women and men as a whole, but white women and African women for example regarding who has more privilege, and so on (Bohnet, 2016). This has been confirmed through interviews with gender and inclusivity experts.

This study can be further explored or validated by making screening more strict within its outlines to capture a more diverse pool of self-identifying women regarding their specific backgrounds or identities.

This research explores gender/ sex within the binary (male and female), taking into consideration folks who also self-identify within this. As a researcher, I acknowledge that gender is a spectrum and that it is beyond binary. However Peruvian society's expectations and norms are heavily binary due to traditional, conservative, and religious factors. Therefore, this research had to be conducted and framed in such a way to respond (as an initial approach) to this reality.

Moreover, this study also interviewed tech professionals, recalling their experiences when they were studying in their bachelor's program. Some of their retelling might be unfit as experiences on current reality, as current students compared to participants interviewed whose undergrad experiences might have changed throughout these years.

Finally, I used OpenAI/ Chat GPT and Grammarly as supportive tools in certain sections of my report for **only** syntax, coherence, spelling, and grammar purposes. The reason behind this is that english is my second language, and in certain moments I found myself in need of help on how to better my narration or correct any errors I was making throughout my MRP.

PART 3:

UNDERSTANDING OUR PROBLEM'S

CONTEXT

ABOUT GENDER

It is important to define certain terminologies to have a better understanding of this MRP's content, addressed problem, and context.

WHAT IS GENDER?

The World Health Organization (WHO) defines it as “the characteristics of women, men, girls and boys that are socially constructed. This includes norms, behaviours and roles associated with being a woman, man, girl or boy, as well as relationships with each other. As a social construct, gender varies from society to society and can change over time” (WHO, n.d.).

WHAT IS GENDER EQUITY AND INCLUSIVITY?

As defined by the Government of British Columbia, Gender Equity is “about removing barriers that stop people from reaching their full potential. Too often, women and gender-diverse people experience unfairness. This is especially true when they also struggle with injustices like poverty, racism, ableism, transphobia and/or homophobia” (Government of British Columbia, n.d.).

Interviewed experts in gender and inclusivity stated that it is about being able to offer the same starting point for everyone, and being aware that not everyone has the same starting point. If we are talking specifically of women compared to men, is there a significant breach between them? So the main question is how can we enable women to start at the same starting line as men, and how can we give equal opportunities to men and women? In this specific case, equity implies giving more tools or opportunities to those falling behind the starting line, to give them a chance to access the same opportunities. This will add variations in the population as a whole when we recognize that socioeconomic positions, race, ethnicity, sexual orientation, gender, disabilities, and other issues also come into play as main variables.

The experts also stated that the idea of diversity is that we are surrounded by people with different experiences and identities, while inclusivity is one step ahead as it touches on how we can make different people feel part of a space. And this is where the topic of belonging comes into play.

WHAT IS GENDER INEQUITY?

The European Institute of Gender Equality states that Gender Inequity is a “Legal, social and cultural situation in which sex and/or gender determine different rights and dignity for women and men, which are reflected in their unequal access to or enjoyment of rights, as well as the assumption of stereotyped social and cultural roles” (EIGE, n.d.)

The WHO states that gender inequality intersects with other forms of discrimination like ethnicity, socioeconomic status, disability, age, location, gender identity, and sexual orientation, forming what's known as intersectionality (WHO, n.d.).

Interviewed experts on this subject stated that this is manifested in different ways, and identified through different gender gaps such as the salary gap, street safety (for example, being catcalled), access to job opportunities, maternity and paternity leave, calorie intake between boys and girls, societal expectations, gender roles, and other issues.

ABOUT THE PERUVIAN CONTEXT

UNDERSTANDING PERU'S ECONOMY

In 2019, articles noted that Peru "is among the world's fastest-growing economies" (Omondi, 2019). This is attributed not only to the abundant and diverse resources the country possesses and capitalizes on but also to the "free trade agreement between Peru and the USA (...) that has resulted in further economic growth in the country" (Omondi, 2019).

Understanding the driving forces behind this economic progress is of great importance. Therefore, it's crucial to delve into the country's primary industries, which include **Mining, Agriculture, Fishing, Tourism, and Manufacturing**. This highlights Peru's extractive economy, alongside its manufacturing and service sectors, and emphasizes its heavy reliance on these activities.

Mining Industry:

Estimates show that the metal and mining sector "accounts for 8.3% of the GDP, while mineral exports represent about 64% of the country's total exports" (García, 2024)

Agriculture:

"In 2022, the share of agriculture in Peru's gross domestic product was 7.83 percent" (O'Neill, 2024)

Fishing:

Peruvian fish fishing provides 10% of the world's fish consumption (Omondi, 2019).

Tourism:

This sector contributes "3.9% of Peru's GDP, and generates 1.4 million jobs (direct and indirect), representing 7.9% of the economically active population" (OECD iLibrary, nd).

Manufacturing:

Contributes 20% of the country's GDP (Omondi, 2019).

UNDERSTANDING PERU'S TECH INDUSTRY

Peru and its vast Tech Opportunities:

Despite international perceptions of Peru as having limited access to technology, the reality is quite different. Peruvians have increasingly been adopting technology, particularly during the Covid-19 pandemic (Estrada, 2024). Evidence of this can be found in statistics such as household smartphone ownership (91.9% have at least one), the number of Peruvian Facebook users (24 million), and the addition of over 3.7 million mobile phone lines between 2020 and 2021 (Estrada, 2024).

According to Peru's Ministry of Production, technology items ranked as the 8th most purchased item by the population in 2023, coming after essential purchases (Estrada, 2024). Key segments driving Peru's technology market include software, hardware, telecommunications, and digital services (Estrada, 2024). E-commerce, in particular, experienced significant growth, with a 30% increase in 2023, reaching a turnover of US\$12.1 billion by the end of 2022, as reported by the Peruvian Chamber of Electronic Commerce (Capece) (Estrada, 2024).

Peru's extensive middle-class growth has come to a situation where their multiple and different needs are being unmet by both the traditional private and public sectors, giving opportunities for multiple tech startups to address and bring solutions to their demands (Lazarte, 2019).

Because of this, Peruvian startups have seen potential in the agriculture field (as it is one of the main industries in Peru), and financial services (as standard financial products don't respond to Peruvians' different needs) with "biotech, agtech, foodtech and fintech as the leading sectors" (Lazarte, 2019).

In the past years, Peru has seen an increase in the number of startups such as Fintechs, as well as growth in the Software and Saas (Software as a service) sector (Estrada, 2024).

Examples of different successful Peruvian Fintechs are (Estrada, 2024):

- **B89**, a 100% digital banking platform,
- **Kambista and Rextie**, are both digital platforms for currency exchange
- **Rebaja Tus Cuentas** and **Prestamype**, which allows you to finance projects
- **Yape** and **Plin**, which allow users to make payments from their cell phones, and has the interoperability function with other banks.

Both Peru's public and private sectors have stimulated technological development. Both sectors "bet on investment, research, training, and dissemination of Science, Technology, and Innovation (STI) (Estrada, 2024). Entities such as the National Council for Science, Technology and Technological Innovation (CONCYTEC), a governing body of the National System of Science, are betting on tech development through policies and different actions (Estrada, 2024).

Furthermore, In 2021 the law that "establishes the National System of Science, Technology and Innovation (Sinacti) was enacted" (UTECH, 2022). The objective of this was to "define a national science policy, implement it through STI programs and ensure its execution by universities, public research institutes, private companies, etc" (UTECH, 2022).

At the beginning of 2022, "Peru secured a new loan from the World Bank (WB) for USD 100 million to strengthen Sinacti. This investment will prioritize research, development and innovation in three key areas for the country: climate change, health and digital economy" (UTECH, 2022).

All of this context and sets of laws and policies would ensure that Peru has ample space to innovate and create using technology. However, this is a more complex situation that needs further understanding.

Peru's Problem with Technology:

Even though Peru offers great opportunities for different technologies and innovations to take place and be developed, there are many obstacles and problems along the way.

Back in 2003, a government bill stated "that Peru does not have a scientific and technological tradition, nor does it give priority to scientific research as part of its development model. This is reflected in a low level of investment in GDP, very much below average in Latin America" (Chamorro Balvin, 2003). Even though this was written more than 20 years ago, this is still true to Peru's current context as "data from the World Bank, where (Peru) is one of the countries in the region that invests the least in this, comparable to Bolivia, Paraguay and Venezuela" (Jones Pérez, 2022).

Peru's technology industry lacks or has low investment, where "today it only represents 0.13% of

the gross domestic product (GDP) when most developed countries allocate more than 2%. In countries like South Korea or Israel, the figure can be up to 4%" (UTECH, 2022).

The issue of lack of culture related to investment in technology from the public sector is seen as well in the private sector, where "according to the 2021 World Ranking of Digital Competitiveness - prepared by the Institute for Management Development (IMD) - only 20% or 30% of Peruvian companies invest in digital technologies (T21, 2023).

Despite ample opportunities for technological advancement in Peru, the scarcity of skilled professionals and insufficient investment pose significant challenges. Even before the COVID-19 pandemic, Peru faced a shortage of 17,000 Information and Communication Technologies (ICT) professionals (Bartra, 2023). The nation's lack of tradition in technology and science, worsened by political neglect of investment, aggravates the issue.

Even though research and innovation efforts are present, they are undervalued by Peruvian society, resulting in a disconnect from Peru's population needs (Cámara Santos, 2019). This threatens the interest of young Peruvians in pursuing technology careers, as the absence of a scientific culture makes it difficult for young Peruvians to navigate career paths in science and technology (Cámara Santos, 2019).

This shortage of skilled professionals not only impacts Peru's population but also risks its ability to adapt to advancing technologies like AI or machine learning. As a consequence, initiatives for technology development may lag due to a deficit of technology professionals.

FUTURE TRENDS IN TECHNOLOGY

Technology is an ever-changing and fast-developing industry. We have seen the impact of technology in our lives, starting with how we communicate with each other through a smartphone, to small floor-cleaning robots, to even making space tourism a possibility in the short term future.

So, what will this look like going forward? As of now, the new trend is **AI** or **Machine learning**, which it "is the technology that enables computers and machines to simulate human intelligence and problem-solving capabilities" (IBM, n.d.). This is fairly new to the general public, as now people can access AI through different platforms.

But, how will this impact Peru and what will it look like in the future?

The following information is extracted from different articles that discuss present technology trends and how they will shape our future, or future technology trends and how they will impact by 2050:

- **Generative AI and AI Machine Learning**

Emeritus mentions that AI has emerged as a transformative trend in 2024, using machine learning to create diverse content such as images, music, and code. This will revolutionize creative industries and will facilitate the creation of personalized content on a large scale. This technology is set to augment human creativity and provide tools for collaborative design and innovation (Chugh, 2023).

Moreover, it states that AI and Machine learning will transcend to impact profoundly sectors from healthcare to finance. Using data analytics teams will be able to unlock previous inaccessible insights. AI is expected to evolve towards autonomous decision-making, fostering gains across industries. AI will also have more personalized interactions, offering more tailored experiences (Chugh, 2023).

Future Business Tech states that by 2050 major tech companies will have initiated the world's first Artificial General Intelligence (AGI) which is currently close to becoming a reality. Billions of dollars will be invested in employing large teams full-time. These projects will aim to model complex initiatives such as intentional creativity, emotions, and consciousness. These are expected to be completed within 10-20 years. The main goal is to create a self-aware AI capable of solving previously deemed impossible problems.

The next trend would be to make copies of AI to humanoid robots for real-world applications. However, it also raises concerns about the potential emergence of a superintelligent AI by the end of the century, surpassing human intelligence by trillions of times (Future Business Tech, 2022).

- **Extended Reality**

Extended Reality (XR) in 2024 consists of virtual, augmented, and mixed reality. This pushes the boundaries of digital experiences. This trend further blurs the distinction between physical and virtual realms. This impacts retail, real estate, and education. XR enhances learning and purchasing through immersive experiences. This trend is expected to play a key role in remote assistance and telepresence solutions (Chugh,

2023).

By 2050, it is expected that cities will be transformed into Augmented Reality (AR) zones (AR is a technology inside the XR umbrella), accessible through AR glasses, lenses, or other devices. Both corporations and individuals create location-specific AR overlays, saturating urban landscapes with diverse information. Virtual price tags in stores, digital menus in restaurants, and virtual schedules at transportation stops will become common. AR will also be utilized for navigation, accessing nearby institution reviews, and viewing 3D animations and videos of past events at specific locations (Future Business Tech, 2022).

- **Robotic Arms and Automation**

The robotic arms industry has been increasing in the past years, with ample ways of utilizing them, different types to execute different types of work, and applied in different industries as well. This technology promotes industrial **automation**, brings with it cost efficiency, and technology advancements, offers safety, and can be often used in healthcare and medical applications (Kaur, 2023).

The following can be anticipated from robotic arms in the future (Kaur, 2023):

- **Robotic arms** are diversifying into new industries like agriculture, construction, and hospitality due to their increased versatility and affordability.
- **Mobile robotic arms** and drones equipped with arms will enhance mobility, offering opportunities in logistics, search and rescue, and surveillance.
- **Ongoing miniaturization of robotic arms** enables precise tasks in tight spaces, broadening their usefulness.
- **Integration of robotic arms with human limbs** can enhance physical abilities, benefiting healthcare and industry.
- Robotic arms are vital for **improving efficiency** and reducing waste in manufacturing, aligning with sustainability objectives

The future trend that is seen with this technology is that they can be used as cobots (Collaborative robots) to work alongside humans, to be integrated with AI and Machine learning for adaptive and autonomous decision-making, 3D printing and additive manufacturing to allow the production of intricate and customized parts/ pieces, for remote operation and telepresence where people can perform activities or work remotely

through the use of a robotic arm, and for customization and modular design where more robotic arms will be tailored to specific industry needs (Kaur, 2023).

Other trends can be seen and will be seen in genomics, datafication, quantum computing, blockchain technology, 3D printing, and sustainable tech (Chugh, 2023).

What Will the Future Hold for All These Technologies?

The development of these new technologies brings immense advancements to industries and countries. However, these might pose a threat to developing countries such as Peru, as their economy relies heavily on the production and manufacturing of raw materials, which employs thousands of Peruvians for labour.

Will the use of AI, robotic arms, and other technology advancements pose a threat to the replacement of many people's jobs? Or will they enhance a better future for them?

How will Tech impact Future Careers and the Job Market?

With new technologies coming up every day, it is easy to understand why the world has changed so rapidly since one year ago and might give us an idea of the expected advancements and how different the world will look not only in one year, but five, or even ten years from now.

It is not hard to understand then why "experts estimate that 65% of kids in the next generation will have jobs that are not even created yet" (Dawyne, 2022). It is expected that many current jobs will be replaced by new technology such as cashiers, factory workers, warehouse workers, and many more (Dawyne, 2022).

A McKinsey article states that **automation** will have a "far-reaching impact on the global workforce" (Manyika et al., 2017), where technical automation will replace **50%** of current work activities that are technically automatable by adapting new technologies, and where 6-10 current occupations have over **30%** of activities that can be automatized (Manyika et al., 2017).

Estimation by 2030:

- Adoption of new technologies will impact **15% of workers** (Full-time Equivalent or FTEs), which is approximately 400 million people (Manyika et al., 2017).
- **3% of workers** will need to adapt and change occupational categories, which is approximately 75 million people (Manyika et al., 2017).

Jobs such as manufacturing, finance and business, education and training methods, creative industries, and others **will be affected by new technologies (for example: AI and automation)** (Tomorrow.Bio, 2023). These jobs will be either replaced by upcoming technologies, or people will adapt and embrace these changes to work collaboratively with them and enhance their work (Tomorrow.Bio, 2023).

As automation takes over repetitive tasks, the demand for **critical thinking** and **complex problem-solving** skills becomes crucial to staying relevant in future jobs (Tomorrow.Bio, 2023). Moreover, **emotional intelligence** and **empathy**, already significant in today's job market, will become even more essential, as **effective communication, conflict resolution, and relationship-building** skills will be highly sought after (Tomorrow.Bio, 2023). Additionally, **lifelong learning** and **continuous improvement** will be vital, as success will be closely tied to adaptability and the willingness to learn and adapt to new circumstances and technologies (Tomorrow.Bio, 2023).

Deakin University and Ford (Australia) published a study called "100 Jobs of the Future", where they give thorough and detailed information on relevant jobs of the future. They state that drivers or megatrends that will impact the future of work have to do with "**globalization, technological progress, and demographic change**" (OECD, 2017, p.2, as cited by Tytler et al., 2019).

For more information on future tech careers, please refer to Appendix A.

How can AI or Machine Learning affect Developing Countries such as Peru?

AI raises concerns about **job loss, data privacy, regulations, and environmental effects**. Risks involve **biases, deepfakes, and super-intelligence** (Thomas, n.d.).

To give further explanation, the use of AI poses threats to replacing jobs, internet regulation in general, risking identity being utilized in content against someone's will, regulating content or data being created by AI, or even learning biases that are harmful in general to society.

How will AI shape the future in general?

An IBM report from 2023 shows (Newswire, 2023):

- **Over 40%** of enterprise-scale companies state that they have **actively deployed** AI in their business
- Another **40%** is currently **experimenting** or looking into AI but have not deployed any
- Some **barriers** exist preventing AI implementation, and these include "**limited AI skills** (33%), data complexity (25%), and ethical concerns (23%)" (Newswire, 2023).

Yet, AI offers upsides like **efficiency, automation, and quicker decision-making**. It will shake up industries like manufacturing, healthcare, finance, education, media, customer service, and transportation (Thomas, n.d.).

How will this look for developing countries such as Peru?

Let's start with the positive aspects:

- **Education:**
New technologies, like automation, hold promise for improving education accessibility in Peru, both geographically and economically (Maskey, 2018). This could mean better education overall for Peru, with more people able to access high-quality learning. Building bridges between academic institutions and the private sector could help foster skill development in a more informal manner (Adhikari; Tesfachew, 2022).
- **Smart Agriculture:**
This will help farmers monitor their crops and make precise predictions for planting, weeding, and harvesting (Maskey, 2018). This will increase their overall work and resource efficiency.
- **Healthcare Accessibility:**
AI holds promise for improving healthcare accessibility, particularly in remote areas.

Rwanda's use of drones has already transformed supply transportation and provided timely assistance to remote regions (Maskey, 2018).

However, some **downsides or threats** exist by introducing AI to Developing Countries/ Less Developed Countries (LDC):

- **Job Loss:**

Increasing automation in Peru's manufacturing and production sectors threatens the economy by potentially replacing jobs and contributing to income inequality (Alonso et al., 2020).

- **Technology Infrastructure Challenges:**

Developing countries face significant challenges in technology infrastructure, with a substantial portion of the population (52.8% of LDC) lacking access to electricity (Adhikari; Tesfachew, 2022). This lack of basic infrastructure obstructs the creation and implementation of new technologies in these contexts (Adhikari; Tesfachew, 2022).

- **Low Investment in Technology:**

Due to cultural and political reasons, there is low investment in Peru's technology development. If this continues, it will not be able to adapt to an AI or automated future.

- **Tech Skill Shortage:**

With a shortage of skilled tech professionals in Peru, the adoption and implementation of new technologies may be limited, aggravating the technology and potential economic gap in the future.

- **Widening Disparity:**

This could further widen the disparity between developed and developing countries.

All of these factors affect how Peru or other Developing countries will be impacted by the 4th Industrial Revolution (4IR).

ABOUT PRIVATE UNIVERSITIES IN LIMA- PERU

ORGANIZATIONAL STRUCTURES OF LIMA'S PRIVATE UNIVERSITIES

Organizational structures within Lima's universities display considerable variation.

The following comments and conclusions have been drawn from interviews or conversations with Tech Professionals, as well as gathering insights from organizational frameworks from different universities and science faculties from Lima.

To find the organizational charts from different Universities, Science faculties, and Tech programs from Lima, please refer to Appendix B.

Observations and opinions given by professionals in Tech regarding their universities:

The following data has been gathered and synthesized from interviews conducted with five professionals who are graduates from undergrad tech programs and careers from different private universities in Lima. We will refer to this group as "students" from now on.

- **About their programs/ curriculums:**

Most students agreed that their universities gave them good and solid theoretical knowledge and background, but would have liked to learn more practical or applicable learnings in the real world. They stated that this would have elevated their learnings and would have impacted them positively at the beginning of their professional lives after graduation.

Professionals reflected on their university experiences, recalling a high demand and priority on studying and memorization. They mentioned that professors often portrayed tech programs as challenging and emphasized the necessity of persistent dedication to academic endeavours. Moreover, they highlighted the strict grading practices and how sometimes they found themselves repeating courses multiple times, a common practice they perceived in their faculty. Many expressed concerns regarding instructors' apparent detachment from current and future technology trends, which they felt constrained their professional development, as they knew the tech field demands are being constantly updated as development is fast.

Reflecting on their experiences, professionals unanimously acknowledge the intensity of their undergrad experience and the lack of emphasis on social or soft skills development. They expressed how this environment often impeded their ability to connect with others or cultivate skills such as teamwork and empathy, which they deem crucial in their professional development and performance. Consequently, many found themselves overly fixated on their studies, leaving little room for community-building activities. They observed the impact of this isolation on their social interactions and noted the contrast with faculties like arts, design, or social sciences, which fostered a more social atmosphere that they felt excluded from.

- **About University structures:**

Most students had an idea of how their faculties were structured, and how things worked within their universities. However, when asked if they were able to find any support if something happened, such as harassment or isolated incidents, they were unable to respond. Some of them even stated that they were unaware that such an office or academic body existed within their institution, and they had never heard from other peers about it.

- **Diversity, Equity, Inclusion (DEI):**

Universities such as Pontifical Catholic University of Peru (PUCP), University of Engineering and Technology (UTEC), and Technological University of Peru (UTP) do mention on their websites DEI academic bodies, offices, or initiatives. However, there is little to no information (in some cases, no access) to outsiders.

PUCP is the only university with publicly available information about its Office for Gender Equity (OIGD), established in 2022 (PUCP, n.d.). This office operates under the Academic Vice-rector's Office and aims to promote gender equality and diversity within the university community (PUCP, n.d.). Their strategic objectives include designing policies, developing programs, and executing projects to advance gender equality at PUCP (PUCP, n.d.). They collaborate with various university units to integrate gender perspectives into ongoing initiatives and provide technical support as necessary (PUCP, n.d.).

THE FUTURE OF EDUCATION

Deloitte in 2021 released a study where they discussed the future of higher education, and what are the related driving trends. These insights were collected from a Webinar that took place in Portugal in 2021.

They identified the higher education **drivers** as follows:

- **New Markets and Business Models:**

COVID-19 pushed us into distance learning mode really quickly, making us rethink how we teach and work. It's opened up new markets and opportunities for mixing traditional and digital learning. Offering different kinds of education can draw in students from all walks of life and give them the chance for specialized lifelong learning (Eiras Antunes; Gidro, 2021).

- **Student Experience:**

Universities are extending their partnerships, especially with businesses, leading to more practical training and improved employability. This collaboration also fosters increased applied research, with faculty providing services to the community. (Eiras Antunes; Gidro, 2021).

To boost student retention and graduation rates in higher education, it's crucial to encourage open campus dialogue, prioritize student needs, and make the most of local resources (Tutak; Ludgate, 2019). For example, the University of North Carolina at Greensboro introduced training programs to link students with available resources, while others have adopted technology to simplify administrative tasks. These initiatives, though part of a broader transformation, provide cost-effective support for students in reaching their educational objectives (Tutak; Ludgate, 2019).

- **Ecosystem Role:**

Within the education ecosystem, partnerships between universities and businesses have expanded, enhancing training and as a result increasing employability. This collaboration makes practical training possible and increases the chances of future job opportunities. It also fosters applied research within the faculty, which benefits the community through innovative services (Eiras Antunes; Gidro, 2021).

- **Teaching Contents:**

In order to adapt teaching methods, adjusting content to keep students engaged and

motivated is required. This will enhance their technical and social skills. Universities constantly face the ongoing challenge of developing and presenting cutting-edge knowledge in order to meet evolving educational needs (Eiras Antunes; Gidro, 2021).

- **The New Professor:**

These days, teaching is challenging for professors, especially when they have to juggle both digital and traditional classrooms. They have to learn and adopt different teaching styles, personalize lessons, and still make sure students do well in this ever-changing environment (Eiras Antunes; Gidro, 2021).

- **Technological and Physical Infrastructure:**

Due to Covid-19, rapid adjustments in university technology and infrastructure to facilitate the shift from in-person to online learning were needed, and quickly. Most universities prioritized enhancing technological capacity, communication systems, and digital security to support distance education. This focus on technology is expected to persist in the future, where it will require ongoing advancements in service quality and cybersecurity measures (Eiras Antunes; Gidro, 2021).

What are the implications or technologies to consider in this ongoing adaptation?

- **Artificial Intelligence (AI)** is driving innovation in education technology (EdTech) with four key applications gaining traction in recent years (Antunes; Gidro, 2021):
 - Improved research efficiency
 - Classroom insights
 - Personalized learning
 - AI integrated with AR/VR

- **Digital Reality- Augmented Reality/ Virtual Reality (AR/VR) integration with the Internet of Things (IoT) and other immersive technologies.**

Potential applications in educational spaces are (Eiras Antunes; Gidro, 2021):

- Digital classrooms
 - AI integration
 - Smart campuses
- **Blockchaining Technology and API Economy**
To read more on these, please refer to Appendix C.

These trends are either emerging, in the initial stages of implementation or are already in place. It's crucial to consider how technology will reshape education in the future, gaining insight into what lies ahead and developing solutions accordingly.

PART 4:

ANALYSIS AND SYNTHESIS

ANALYZING THE PROBLEM: EXPERT'S POINT OF VIEW

Throughout this section (except “Analyzing The Peruvian Context in Gender Equity”), analysis and key takeaways from conversations with both **Gender and Inclusivity experts**, and **“Women in Tech” experts** will be addressed. From now on, when we refer to experts, we are referring to these two mentioned groups.

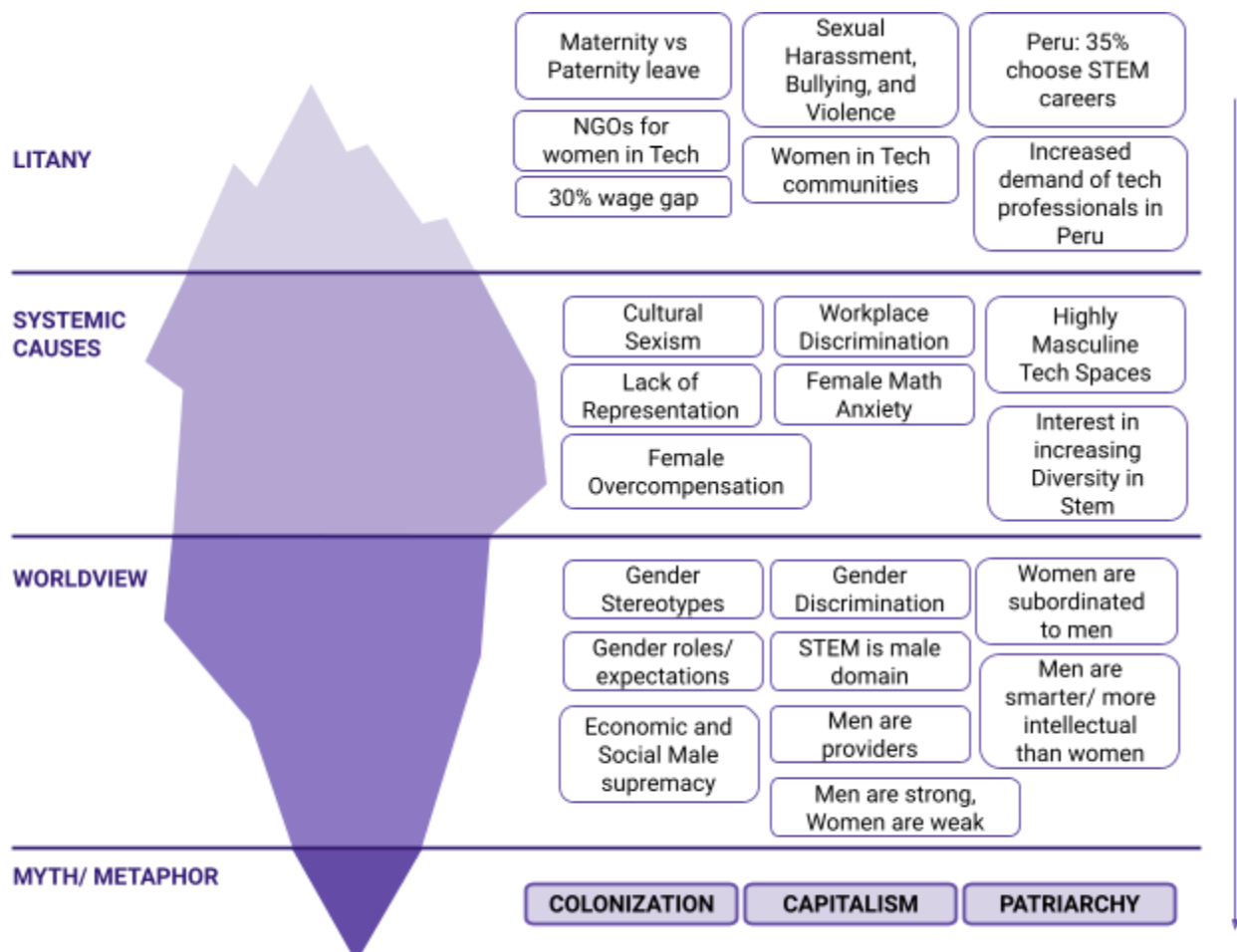
ANALYZING THE PERUVIAN CONTEXT IN GENDER EQUITY

Before addressing the main insights from conversations with experts, it is important to first analyze in depth the context.

As mentioned earlier, Peru still struggles with gender equity as a society, and the outlook for change is not promising. So, why is it tough to make progress on this issue in Peru? What factors contribute to the difficulty of achieving or advocating for gender equity in the Peruvian context?

To get to the bottom of this ongoing issue, the project used **Causal Layered Analysis (CLA)**, a tool that offers a four-layered approach for sensemaking and understanding underlying assumptions (UN Global Pulse, n.d.). Since the problem involves deep-rooted cultural and systemic issues, we can not expect quick fixes. Instead, we need to focus on building robust, long-lasting solutions for the future (UN Global Pulse, n.d.).

What did we discover through Causal Layered Analysis (CLA)?



[Fig 1]: CLA

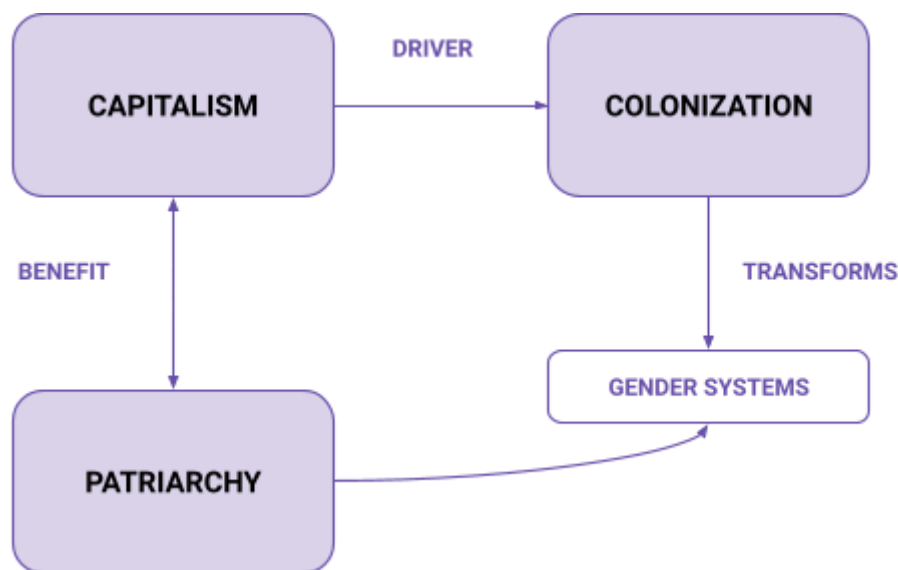
A thorough analysis with the CLA tool was done, starting with an overview of recent events, news, and developments in Peru concerning women in tech, female students in tech, and broader gender disparities (**Litany**). From there, we delved into the **Systemic Causes** underlying these issues, then explored the **Worldviews** associated with them, finishing off with an exploration of **Myths/ Metaphors**, which represent the deepest layer of the CLA. Within this last layer, we identified the following three root causes:

- **Capitalism**
- **Patriarchy**
- **Colonialism/ Colonization**

These three operate on their own, and at the same time are heavily interrelated.

To begin with, we need to understand that Peru was colonized by Spain (European colonization) from the 1500s to the 1800s. Spanish colonizers imposed gender norms onto colonized cultures, which were often different from those in Europe (Ballestín, 2018). Colonized cultures might have had a different outlook on gender, but binary and gender roles are believed to have stemmed from the imposition of European views and beliefs on this matter (Ballestín, 2018). Capitalism, intertwined with colonialism, further perpetuated these gender systems, using them for the benefit of reproductive labour (caregiving and domestic housework) (Ballestín, 2018). Patriarchy, a social structure where men hold power, is deeply ingrained in societal norms and perpetuates unequal gender relations, gender-based violence, and gender stereotypes as a means of control. While patriarchy predates capitalism, the two systems reinforce each other. Patriarchy devalues a woman's value and role in society, and capitalism takes advantage of this, leading to unpaid domestic labour, widening the salary gap, professional segregation, and regression in women's status (Allan, 2021).

To read more on this matter, please refer to Appendix D.



[Fig 2]: Relationship between Capitalism, Colonization, and Patriarchy.

The above figure further explains how these 3 concepts are related. Capitalism is the main driver of colonization, and in turn colonization transforms Gender systems in colonized areas. At the same time, Capitalism and Patriarchy both benefit from each other, as one takes advantage of low-cost labour and the other helps impose more control of men over women. In

the meantime, Patriarchy takes an important role in those (binary) Gender Systems mentioned previously.

GENDER ROLES AND STEREOTYPES: EXPERT'S POINT OF VIEW

Gender roles and stereotypes are deeply rooted in a society's culture, history, and societal rules. As part of the process of this research, experts were interviewed to gain a deeper understanding of where these come from, what they are, what they mean, and their impact in society. The following statements or conclusions stem from these conversations.

Where do Gender Roles and Stereotypes come from?

Experts agree on the following to be the root of gender roles and stereotypes in Peruvian society:

- **Cultural upbringing:**

Culture in general might have ancestral behaviours, or behaviours that came to exist due to necessity back in time. This has been kept, and this in many places in Peru has not evolved with modern societies and how things might work nowadays. Some might be seen as a trait in their culture, and something hard to let go of or even question. In this case, many gendered structures come into play as well as stereotypes.

- **Educational System:**

The education system in Peru has not evolved or improved in the past. It is not a priority for any government, where it suffers and its exchange affects the current young population, as well as the future older population. Having a precarious education system with no support or investment proves a poor education and thus high ignorance, especially in topics such as gender equity.

- **Catholic Religion:**

Peru is a non-religious state. Yet, in reality, the Catholic Church holds significant political and societal influence. This institution holds traditional and conservative views in Peru, emphasizing limitations, the binary, and strict gender roles. According to these beliefs, women are expected to prioritize family over career, adopt a submissive character, and remain primarily in the home; while men occupy public roles, hold jobs, and hold power in society. Additionally, the Catholic Church's involvement in politics and social movements

often extends beyond its spiritual domain, revealing a pattern of control of non-religious concerns.

- **Historic background:**

The historical context of a society influences its current perception of women. Reva Rubin's theory suggests that women were often regarded as highly valuable possessions in the past, leading to practices such as exchanging goods for daughters. This association between "object" and "women" persists in modern times.

Gender Roles: The Public vs Private Spheres in Peru

Experts mentioned how the idea of public and private roles in society persist and are highly linked to the binary and allocate women and men in different spheres.

What are the Public and Private roles?

- **Public Role:**

The role involves activities conducted outside the home that are typically paid, often associated with being the economic provider and closely linked to wealth. In society, men are often assigned this role, as it is perceived as their natural place and function in society, leading to a predominance of men in associated positions.

- **Private Role:**

The role includes activities conducted within the home, typically unpaid, such as housekeeping, taking care of children, and caregiving for family members. These tasks are often associated with women, reflecting societal stereotypes linking women to motherhood and caregiving roles, rooted in cultural and historical contexts.

We can understand societal divisions on what women and men "should" do based on their sex or gender. An expert stated that the fact that "most women are obliged to settle to work at home, be a nurturing figure, often working unequal amount of hours compared to their male counterparts and that this work is unpaid only exacerbates stereotypes, widens the gender gap, and makes living conditions for women more violent or complex".

Working long hours at home and taking care of a family makes the "provider's" role easier as they don't have to work on these activities after their workday. However, the fact that these

activities in the private sphere are unpaid is often looked at poorly by society, it belittles a “housewife’s” work. Unpaid work and societal constraints of women having to be responsible for the private sphere often put them in a vulnerable position, as they do not have economic independence.

This conversation isn't limited to heteronormative families or couples; it also extends to young students. An expert also stated that “not only can they face pressures as young mothers, but as women within family dynamics (as daughters or sisters), they're often expected to fulfill these traditional roles”. This can significantly impact **the time** they have available for their studies, affecting their academic performance and overall development.

Experts suggest that when household responsibilities are unevenly distributed based on gender, it **reinforces stereotypes** about who should be responsible for what. In societies with more equal distribution of household and public responsibilities between genders, **gender discrimination issues are less prevalent** or even absent, as both men and women are expected to share responsibilities in both spheres.

Experts also noted that due to the prevalent gender role structure in Peruvian society, as women increasingly occupy more space in the private sphere over time, there is often pushback from their male counterparts. This pushback may manifest as acts of harassment, bullying, or even violence, occurring in different contexts.

This reaction could be interpreted as men feeling that their traditional space or “natural role” in society is being intruded upon, which may lead to feelings of vulnerability and a defensive response, such as rejection or hostility, from them as they perceive their rightful space being seized.

Gender Stereotypes in Peru

Experts mostly mentioned or pointed out the following as the main gender stereotypes in Peru:

- **Maternity:**

In Peru, stereotypes mainly revolve around the idea that women should prioritize motherhood above all else. They are expected to handle childcare and household chores while their male counterparts focus on providing financially. This belief leads to unequal parental leave policies, with women getting much more time off than men. As Dr. Hideg stated in an e-mail, “longer maternity leaves perpetuate and reinforce the stereotype that women are homemakers and carers of children, and they don’t have strong career ambitions” (Hansen, 2019). Some companies are trying to change this by offering longer paternity leave, but stereotypes still hold women back in the workplace. Universities also struggle to support pregnant or parenting students, often causing them to drop out. These stereotypes ultimately limit women's opportunities and perpetuate gender inequality.

To read more on this subject, please refer to Appendix E.

- **Social construct vs Biology:**

Experts debate whether traits are inherent or learned, known as “Social construct vs Biology or Nature”. While acknowledging biological differences, they argue that behaviours and preferences are largely shaped by societal norms. One expert also mentioned that “it is impossible to separate ourselves from a social construct, because we are part of it”, further evidencing the difficulty for many to separate what is nature from a social construct.

Children are assigned gender-based expectations early on, blurring the line between innate traits and learned behaviours. Despite evidence of societal influence, conservative contexts resist this concept.

The idea of the “motherhood instinct” heavily influences perceptions of women's roles. In children’s playtime, young girls are encouraged to embrace nurturing and domestic activities; while boys are directed towards problem-solving and construction game-play. This discriminates against both girls and boys, influencing which skills they will develop as adults. This early division influences career paths, where it results in women often

choosing careers such as psychology, and men choosing careers such as engineering. These deep-seated stereotypes perpetuate over time.

To read more on this subject, please refer to Appendix F.

- **Weakness and intellectual rigour/ capacity:**

The idea that women are less intelligent or capable than men has been disproven by research, yet traces of these stereotypes persist in Peruvian society. Similarly, the notion of women being the "weaker" sex, emotionally and physically, continues to influence perceptions of women's abilities. Data shows that female students outperform males in school and are more likely to attend university, yet studies state that the perception of females as intellectually inferior persists among both adults and children (Davis, 2018). These outdated beliefs still impact how women are viewed and treated in Peru.

- **Feminine vs Masculine energies:**

Experts discussed feminine and masculine energies, clarifying that they're not exclusive to women or men. One of the interviewed experts mentioned how "society often expects men to embody masculine traits and women to embrace feminine traits, leading to exclusion or judgment for those who don't conform". This dynamic affects various settings, like school and work, where certain roles are assigned based on gender norms. In STEM fields, students may face isolation or bullying if they deviate from these expectations.

THE IMPORTANCE OF GENDER EQUITY

Interview results showcase that this can be summarized in 3 different categories:

- **Moral:**

Experts expressed that pursuing gender equity in any space is deemed the right thing to do in society. Discrimination persists in many shapes and forms, and this is no stranger to gender, and this is ultimately wrong.

Specifically talking about injustice towards women, one interviewed expert mentioned that "this population not having access to, for example, education, career choices, spaces, etc. in this day and age is absurd".

As mentioned previously, women do much of the invisible work in our society, and this is a persistent injustice in our current society that needs to be changed.

- **Social:**

Disparities in society hit everyone, but women often take the hardest hit. Men also suffer emotionally and mentally from societal pressures to conform to toxic masculine norms. Toxic masculinity “refers to the dominant form of masculinity wherein men use dominance, violence, and control to assert their power and superiority” (Green Hill, n.d.). This leads to psychological pressure and inhibits their ability to express themselves freely. This has a plethora of results such as being not only on the receiving end of isolation, bullying, and harassment; but also becoming a perpetrator.

In an ideal world, everyone would have the same shot at jobs, healthcare, and education. But women often get stuck with more chores and family responsibilities, leaving them less time for other things (such as their studies).

Some societies still say certain jobs are only for men or women. This in turn shuts down many voices that need to be heard, for example when developing new technologies. It means we're missing out on solutions that could help and be adequate for everyone.

Household chores do not get the respect they deserve, especially when it is women doing them, further associating this invisible job with “not doing anything”.

Fixing gender issues is not just the responsibility of women. We all need to pitch in to make society fairer for everyone, and that means changing how businesses and workplaces operate to fit everyone's reality and lives.

- **Business:**

Experts emphasize the importance of managing diversity and equity within organizations. Numerous studies show that diverse teams lead to increased innovation and productivity, giving companies a competitive edge. Embracing diversity not only improves performance but also enhances the company's image, making it more attractive to potential employees. An expert also added that “multidisciplinary and diverse teams have richer and more innovative contributions, with different points of

view. This is favourable to companies because it foresees things that could happen". To achieve this, businesses need to create inclusive environments where everyone feels comfortable sharing their perspectives, especially women in male-dominated spaces, and establish diversity allies to support initiatives promoting inclusivity.

Additional Helpful tools to help bring diversity in these spaces:

- Having male allies significantly enhances gender equity strategies.
- Inclusive design considers various factors such as gender, race, disability, and ethnicity.
- Creating equitable starting points for all individuals in a business fosters inclusivity.
- When business leaders, like CEOs, champion these changes, implementation becomes smoother.
- Flexible labour days or schedules accommodate diverse life realities effectively.

UNDERLYING ISSUES FOR WOMEN IN TECH

Experts emphasized a series of underlying issues or problems in academic spaces. These are some of the ones that were discussed the most:

- **Highly Masculine spaces and its effects on students**
 - **Toxic masculinity** thrives and reinforces imaginary harmful stereotypes that men come with.
 - Female students tend to adapt to these environments, feeling unable to express themselves freely and sometimes engaging in toxic behaviours to fit in.
 - When women are outnumbered by men, they struggle to be heard and often face gender violence and discouragement from their professors and peers.
 - Lack of diversity limits innovation and perpetuates traditional gender roles.
 - Important skills like empathy and collaboration are associated with femininity and are overlooked in masculine spaces.
 - Anyone who does not conform to traditional masculinity faces aggression and exclusion.

- **Gender Gap Effects in Academic Spaces**

- Women now outnumber men in university enrollment and graduation, but there's still a significant gap in the career paths they choose.
- People still tend to stick to traditional career paths based on gender stereotypes. This pattern persists despite efforts to break it.
- Despite progress, there are still overarching issues that need attention, like examining the quality of higher education for men versus women.
- In academic settings, female students often deal with violence and sexual harassment from their professors and peers. This can drive them to drop out, and switch majors. It even discourages some from pursuing these careers altogether.
- The concept of time needs to be addressed. Women often juggle their studies with family duties, impacting the time they can dedicate to their education.
- Universities lack support systems for students dealing with family responsibilities or starting their journey into parenthood. Professors often adhere strictly to rules and policies, offering little assistance to students in such situations.
- The absence of role models in classrooms and staff can discourage students, especially women, from pursuing certain careers. Widening the gender gap in those fields.

ANALYZING THE PROBLEM: UNDERSTANDING FROM A PROFESSIONAL'S POINT OF VIEW

To gain deeper insights into the Tech career programs at private universities in Lima, Peru, interviews were conducted with **tech professionals**. These interviews aimed to explore their journey and experiences from childhood through university to their current professional life. The goal was to understand their challenges and successes before, during, and after their studies, with a particular focus on how gender disparities impacted them. A total of three women and two men were interviewed for this study.

*Any reference to **students** in this section is based on interviewed **tech professionals** recalling their experience in undergraduate programs.*

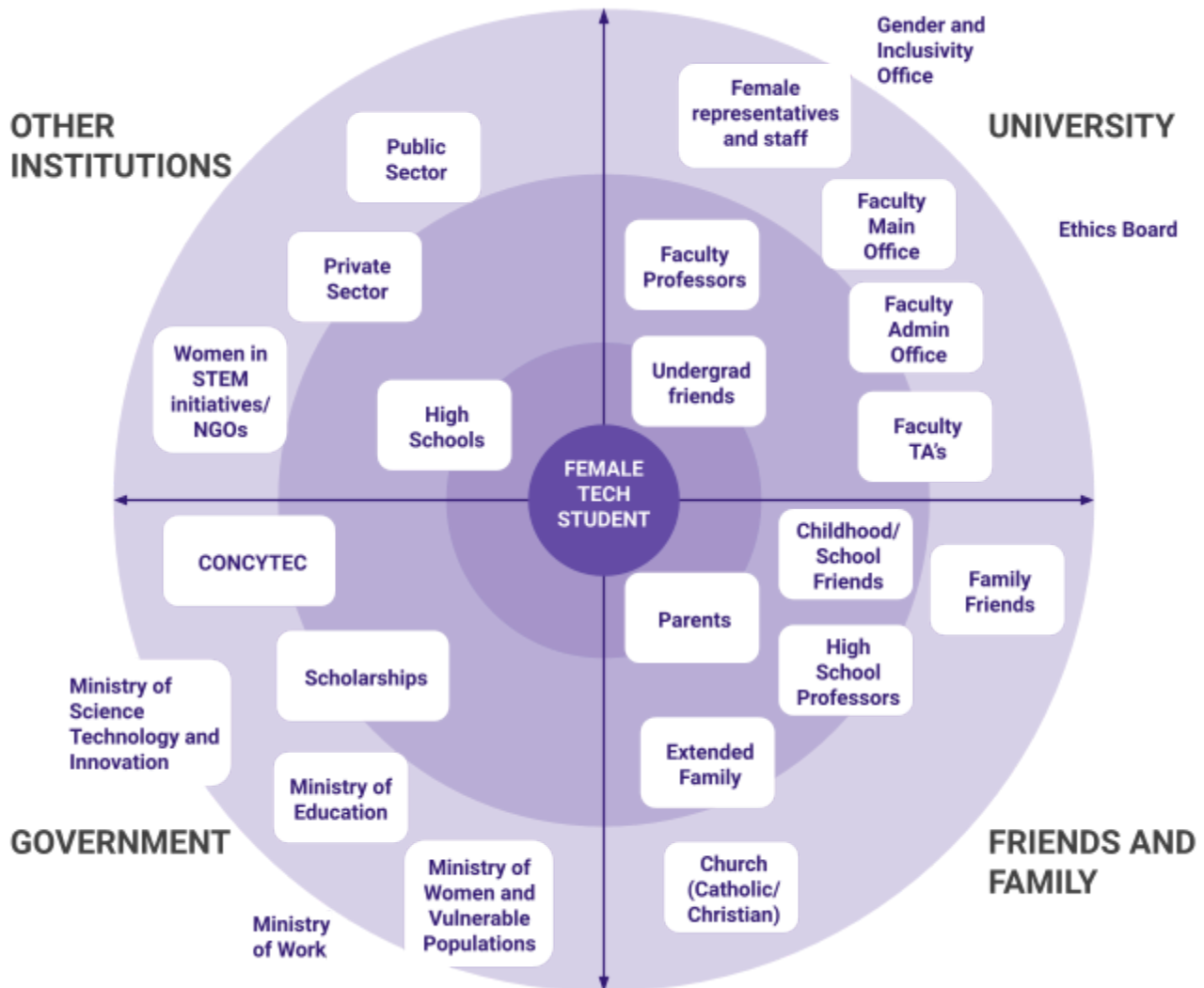
UNDERSTANDING USERS

What was the experience like for a self-identifying female student at a private university in Lima?

Various tools were used to analyze and gain a deeper understanding of these students' experiences during their studies.

The following tools were used to obtain key findings and qualitative results.

Actors Map: About the Student's Ecosystem



[Fig 3]: Actors Map of Female Tech Students. The arrows represent influence on the main user, where inner circles represent "most influence" and outer circles represent "lesser influence".

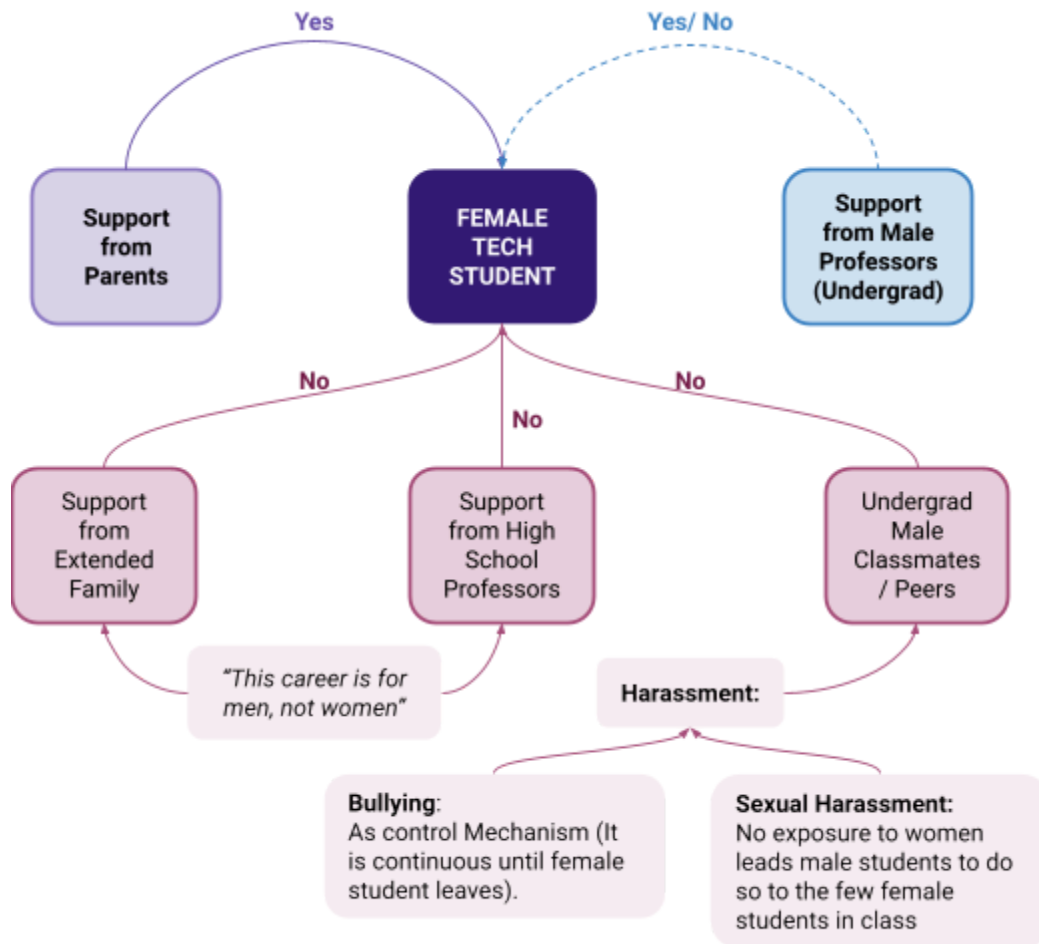
(Jones; Van Ael, 2022)

The actor's map provides us with information not only on female tech students' ecosystem while they are studying. It also gives us a better idea of who is closer to them in their circle of influence, which in turn can affect their decision-making processes and emotional/ mental state.

In this sense, we can understand that their own closer social group, such as their family, childhood friends, and high school staff have been the closest. This is also followed by the University sphere, where their undergrad friends, as well as staff faculty such as professors, have proximity to their circle of influence.

Having said that, we can understand how these relationships and their proximity to these students might have affected them.

Starting with their closest circle:



[Fig 4]: Diagram showing the influence on Female Tech Students from their closest circle.

Initially, the assumption we sought to validate was whether parents or those closest to students, influenced by stereotypes, may have discouraged their daughters from pursuing careers in tech or science. However, our findings revealed that in most cases, parents were highly supportive of their daughters pursuing a tech career. It is widely recognized that professions like engineering offer substantial professional and economic opportunities.

From an early age, some parents encouraged their daughters to excel in math or science, prioritizing paths that promised economic stability in their future.

STEM/Tech careers are often seen as indicators of intelligence and academic achievement, bringing pride and academic status not only to the child but also to the parents.

In other cases, parents did not fully understand the career path their child was choosing, leading to initial resistance. However, once the child was introduced to the field, the rejection faded away, and they became more accepting.

More stereotypes were found towards art or design careers, as they are seen as professional paths that would not bring economic safety.

Encouragement at an early stage is highly important for students. Some mentioned they found it through their parents (due to career preference or influence), as they would give them enough space for exploration; or by having teachers that saw talent in them and supported them to further develop their skills at a young age.

Discouragement was often outside their nuclear family (such as aunts and uncles), from their high school teachers, their undergrad professors, and their peers in their undergrad classes. In this case, they faced stereotypical comments such as “these are careers for men, not women”, “these are not careers for women who will eventually become mothers”, “You will be taking space for another man in this profession which is not fair”, and others. In a university setting, this came often with harassment and bullying.

In this sense, interviewed participants stated that they were able to surpass these events, but were aware that other women might have been discouraged from pursuing their career in tech, and some offered examples of women they knew that left the program or did not apply for these reasons.

Journey and Empathy Map: The Female Student's Undergrad Experience

The journey map gave an understanding of the female students' experience as a whole, from deciding what to study in high school, through their undergrad years, to their current professional lives. As a result of this exercise, we concluded with an **empathy map** and **pain points in their experience**.

The **empathy map** then explored the issue more deeply helping with categorizing and understanding the students' feelings during their undergrad journey.

To review the Empathy map, please refer to Appendix G.

The most valuable findings for this research were the **experienced pains** throughout their educational journey:

- **Lack of representation:**

There is no (or little) female representation nearby for students, such as:

- Alumni
- Professors
- Teaching Assistants
- There is a lack of support to showcase women in the field to new students in tech programs

- **Small Community:**

- In highly masculine educational spaces, female students are unable to find a community or are part of a small one (less than 30%)
- This isolates them and restricts their personal and professional development, as they are forced to shut down their feminine side
- This makes them try to "blend" in with men, often accepting and validating toxic masculine traits
- Women often struggle to identify and address aggression like harassment or bullying because they feel isolated and lack the support to discuss their experiences. This can lead to the normalization of such behaviours and feelings of isolation.

- **Harassment and Bullying:**

- Highly masculine spaces often validate toxic masculinity and gender stereotypes, creating a power imbalance where harassing and bullying women is normalized.
- This affects women in:
 - Their professional and personal development
 - How they dress
 - How they go about their studies
 - Their physical and mental health/ safety

- **Stereotypes and Toxic Masculinity:**

- In highly masculine spaces, echo chambers on gender stereotypes occur.
- Men often validate their idea of gender roles, and how women should be treated.
- This affects the mental and physical well being of female students.

- **Lack of Support from Universities:**

- Most universities lack strong policies of "zero tolerance" towards harassment of women.
- Most students do not know where to go if they are victims of harassment or bullying.
- Universities lack support through policies and channels for female students for them to report harassment safely.
- Mental health support is unknown to students
- Lack of training for professors/ TAs on this issue makes them potential perpetrators as well.

PRIVATE UNIVERSITIES' ROLE IN THIS ECOSYSTEM

Throughout interviews with either experts or tech professionals, conversations lead to the ideal roles of universities regarding this problem, as well as opportunities that they could take in their favour as well as for their student population.

Experts' opinion: The following responses to questions were drawn from expert interviews and are aggregated to express insights.

What are the opportunities and changes Private Universities can act upon?

- Universities are a good starting point to make a difference. Changes are seen when one is young and from their upbringing. But working from an earlier stage in a child's life will encounter rejection from their parents. Universities are key to promoting and establishing change, as they connect young adults who are interested in getting a bachelor's degree, as well as connect with multiple companies or entities from the private and public sectors. It is in a good position to have a positive influence regarding gender equity.
- Universities can increase the number of professionals in tech. This can be done through a series of initiatives such as career fairs, hiring more female professors (internationally if there aren't enough nationally), introducing events to showcase female students' work, a networking event for women in tech and students, leadership programs for female students, and protective policies that will care for them and prevent bullying and harassment.

What are student's expectations of their Higher Education?

- Safer spaces or educational environments for all, especially for female students. Have ways to protect themselves or feel protected by their university or faculty from harassment, bullying, or violence from their peers or professors.
- Courses to be more interactive, hands-on, and applicable to real-life scenarios or work.
- Having strong connections with other female students builds a community where they can express themselves and question behaviours that they deem normal due to the hostile environment they have been exposed to.

- Be noticed by their universities. If they are already professional women in tech, why aren't their universities contacting them to speak to students in their universities to give visibility to current students?
- More role models or visibility of them. They stated that having more professors who are women would have made them feel represented and more comfortable in class.

PROJECT INSIGHT

Based on the research findings, the following insight was developed to inform the project decision-making process:

Female students in tech programs are highly motivated in their career choices, but being forced into highly masculine spaces throughout their studies increases the impact of stereotypes, where they experience harassment, bullying, exclusion, and solitude. These issues often affect their mental and physical well-being, driving them away from the tech field in an early or late stage of their career.

PART 5:

STRATEGIC FORESIGHT METHODOLOGY

SUCCESSFUL CASE STUDIES

Many ideas for solutions to address this issue are derived from both secondary and primary research, particularly by gathering insights from experts and professionals in the field (as showcased previously).

Additionally, learning from universities that have effectively implemented initiatives and improved outcomes for women studying tech provided valuable insights for this project. This emphasizes the significance of exploring successful approaches and adapting them to different contexts.

Explored Universities for this project were:

- **Harvey Mudd College- USA**
- **University of Technology (UTS)- Australia**
- **University of Waterloo- Canada**
- **University of British Columbia (UBC)- Canada**

The main key takeaways regarding the success of their initiatives are as follows:

- Making careers such as computer science (CS) more attractive, approachable, and interesting by introducing **hands-on courses** to tackle problems through CS tools.
- **Building communities for women in tech.** For example, WiCS (Women in Computer Science) or Women in Engineering (WiE) at the University of Waterloo, offers access to events, support, and programs focused on women.
- **Creating spaces for communities** for female students where they can bond and connect.
- **Frameworks for Strategic Equity-** Help tackle sexist comments, harassment, or bullying which are gender-based.
- Have an **outreach to STEM careers beginning in High School-** Create introductory courses in tech careers that eventually can connect with classes in High Schools or offer workshops to them.
- Offer **Scholarships.**
- Offer **Mentorship programs.**
- Create a **Gender Equity Ambassador Program.**

- Increase **guidance and access** for female students to access **internships or different jobs in the tech field**.

Nevertheless, it's crucial to keep in mind that these initiatives cannot be replicated identically in private universities in Lima. This is due to the following issues:

- Peru poses a **challenging context** compared to Australia, Canada, and the USA as it is a far more **conservative, religious, and traditional** country. Proposing initiatives related to equity, let alone gender, face **significant opposition**.
- Some of these initiatives were successful as they have a smaller population of students. There is an ongoing conversation on how applicable these initiatives would be in higher educational spaces with a **much larger population of students**.

This ties back to the interviews conducted as part of this research. Many recommendations and ideal scenarios are outlined for women in tech programs directly aligned with these initiatives or similar characteristics. This provided a form of validation for the primary research findings.

As a result, the following clusters or ideas for **initiatives** were developed for consideration in the solution development process:

- **Strategies to Encourage Women in Tech: Collaborating with High Schools**

- Universities should work hand in hand with high schools in order to increase interest of women towards tech programs (i.e.: Harvey Mudd College).
- Career Fairs should feature female representatives from tech programs to inspire younger girls to envision themselves as successful professionals in the field.
- Organizing engaging high school programs can introduce young girls to tech career options (ex: extra curriculums, after class activities, etc.) (i.e.: UTS).

- **Building a Supportive Environment: Key Courses for Future Tech Professionals**

- Courses that will help develop respect, empathy, communication, and open discussions between men and women in these subjects will help reduce problems in the future (ex: harassment, stereotype bullying).
- Focus on Critical Thinking and teamwork to fit future demand of skills in tech professionals.

- **Strategies for Female Representation and Empowerment in Tech Education**

- Ideally, having at least 30% female professors or teaching assistants would ensure a more representative balance for students.
- Exposing female students to conferences featuring female professionals has proven beneficial (i.e.: Harvey Mudd College).
- Bringing tech professionals from abroad could be a solution if there's a shortage of female Peruvian professionals in the field.
- Leadership programs for female students (i.e.: all case studies supported this)

- **Creating Inclusive Educational Environments: Training Professors, TAs, and Faculty Staff**

- It's important to provide thorough training for professors, TAs, and administrative staff to ensure educational environments are safe and inclusive for all.
- Having advocates and allies will be important in this step to achieve success.
- Behavioural design is crucial here to have a successful implementation.
 - How can we make behavioural change without being too direct on it?
- Regularly conducting talks for both staff and students about this issue could be beneficial.

- **Safeguarding Female Students: Implementing Zero Tolerance Policies and Anonymous Reporting Channels**

- Strict policies regarding "zero tolerance on harassment" have to be implemented in order to protect female students.
- Establishing anonymous reporting channels can enhance student safety by providing a secure avenue for reporting instances of harassment.
- Therapy and mental health facilities can be offered to help female students.

- **Empowering Female Student Communities: Fostering Supportive Spaces for Connection and Validation**

- Provide spaces so female students can create their communities (i.e.: all case studies supported this).
- Community benefits: A safe space to share their experiences, not feel alone, as well as understanding what are unacceptable behaviours, what has been normalized, and validating their feelings.
 - They need to connect and build a strong community that cares for each other.

- **Bridging the Gap: Ensuring Safe Transitions from University to the Professional World**

- Training and creating inclusive spaces at universities serve no purpose if female students encounter discrimination and harassment in their professional lives.
- Partnering with companies interested in hiring female professionals to ensure safe internship and job environments is crucial (i.e.: Harvey Mudd College).
 - "I'll refer my students to you as long as you demonstrate that you meet these requirements for creating safe environments for them."
- Provide female students with engaging internships (i.e.: Harvey Mudd College).

BUILDING A STRATEGIC SOLUTION

Given the complexity of the studied problem, and the definitive conclusions drawn, it is clear that systemic change won't happen overnight. Solutions rooted in societal, cultural, and behavioral shifts take time. Therefore, using foresight methods made sense to create a realistic strategy to tackle this problem.

SCENARIOS

To start things off, insights gathered from both primary and secondary research were used first to craft scenarios for the year 2054, which is 30 years from now. This resulted in the following scenarios:

- **Positive Scenario: Transformational- Maximum Development**
- **Negative Scenario: Risks and Threats**

The idea behind having polar opposite scenarios was to be able to create our **north star** (where we want to get) to understand our **goals** and understand the **ideal state** we want to achieve. On the other hand, the negative scenario would give us light on **obstacles**, and things we need to be **aware** of and to understand what measures we need to take in case of these less ideal situations coming in the future.

Positive Scenario: Transformational- Maximum Development

To read the storytelling/ description of the scenario, please refer to Appendix H.

POLITICAL/ GOVERNMENT

- Government change- Anti-corruption laws passed to reduce corruption in the public sector.
- Peru increasingly has become more trustworthy for international investors.
- Increase in partnerships and alliances with other countries + global initiatives.
- The government allows and incentivizes diversity of thought and religious beliefs in government bodies, but attachments to religious organizations will not be allowed (sticking to being a non-religious state).
- Reprioritization of field investment (Economy): Tech becomes a priority for public sector investment and initiatives.
- Increased tech development has been allowed to increase in education for Peru's population (decentralization of education).
- Increased investment in the educational sector- Help from global experts to make this possible.
- Campaigns to increase interest in tech in Peruvians from a young age
- Fitting narratives and curriculum to discuss gender equity and professional development with different communities (ex: modern Peru, rural Peru, indigenous Peru, etc)
- Laws and alliances so the public and private sectors can work together to promote increased and sustainable growth of Peru's technology
- Increase in campaigns/ initiatives to attract more women to this sector
- Ministry of Women and Vulnerable Populations (MIMP): Increase and strengthen policies to protect women, and encourage women in educational spaces. Laws to promote tech gender gap reduction
- Education/ Training to those who will use their jobs due to automation- introduce them to the tech field to keep working in their sector but in another role.

TECH PRIVATE SECTOR: INDUSTRIES/ COMPANIES

- Increased investment in **tech departments/ companies/ initiatives/ startups/ Universities.**
- Increased interest in acquiring high-performing and valuable tech professionals for future developments.
- Collaborative work with the Public sector to **increase or enhance the tech sector in Peru.**
- Collaborative work with Private Universities (Initially) to attract young talent to their policies
- Laws implemented and stated as **MANDATORY** by private universities to protect their female students: Reporting channels (harassment, etc), inclusive/ gender equity mindset, and fair and equal treatment for all.
- Facility for internships, especially for young female students.
- Leadership and mentorship program for women: engage professionals and young students.
- Increased number of women- 50/50 of men and women distribution in this field.

PRIMARY/ SECONDARY EDUCATION

- Collaborative work with **Private Universities** to encourage women in the tech field:
 - Collaborative work in science/ tech courses/after-class activities.
 - University fairs.
 - Events.
 - Workshops/ Bootcamps.

PRIVATE UNIVERSITIES

- 50/50 gender distribution:
 - Professors
 - Students
- Curriculum changes:
 - Introduction to courses on soft skill development (ex: communication, community, empathy, inclusivity)
- Policy changes:
 - Zero tolerance towards harassment and bullying (ex: gender targeted)
- Female Empowerment:
 - Tech Women Communities in Tech/ Science faculties
 - Events/ talks to young female students
 - Mentorship programs
- Tech advancements:
 - Enforcement and application of policies through tech advancements
 - Enhancement and better academic distribution towards students through tech (inclusive towards disabilities, times, spaces, etc)

Negative Scenario: Risks and Threats

To read the storytelling/ description of the scenario, please refer to Appendix I.

POLITICAL/ GOVERNMENT

- **Government change- Unstable (Continuous corruption).**
- No measures were taken to join the technology race (4IR).
- Peru has become **more vulnerable to international exploitation.**
- Social and economic stress due to **increased unemployment** (replacement of humans by AI and Automation).
 - **Increased discontent and protests** in the population spread countrywide.
 - **Increased Violence** (including Gender Violence).
- **Low investment in scholarships.**
- Professionals in tech look elsewhere (internationally) to find a promising career, as Peru does not offer an opportunity for them.
 - Remote work.
- **Continuous rejection of gender equity** by traditional and conservative populations.

TECH PRIVATE SECTOR: INDUSTRIES/ COMPANIES

- Some initiatives to compete and invest in technology- not enough.
- **Low investment in scholarships.**
- Tech field:
 - **Highly masculine** spaces are increased.
 - **Less women are involved** in this profession.
 - **No visibility or representation** of women in this field.
- Workspaces are **not motivational or technologically advanced** enough to attract tech professionals to work for them.

PRIVATE UNIVERSITIES

- **Low adaptation to technology**
- **Decreased quality of education-** affects directly upcoming tech professionals, in turn affects future development of tech.
- Decreased possibility to reach population outside of Lima.
- **The educational gap is widened.**
- Opportunity to educate/ train the unemployed population has been lost (no suitable resources).
- No prioritization of gender equity.
 - Unconscious biases and toxic masculinities persist.
 - Echo chamber on toxic masculinities.
 - Aggressive educational spaces for women.
 - Enrolment of female students in tech declines- in turn fewer students opt for a tech career.
 - More women decide not to study or many abandon tech careers.
- The curriculum has **not prioritized skills needed for future tech professionals**, affecting their capacity to work in a new tech environment.

OVERTON WINDOW

Many of the proposed initiatives or goals so far might seem challenging, as to how a conservative setting will be able to accept directly these new ideas for equitable change. In this sense, exploring the Overton Window might shine some light on how we can insert them successfully by creating mindset change.

“The Overton window is a political theory that refers to the range (or window) of policies that the public will accept” (Statesman, 2015).

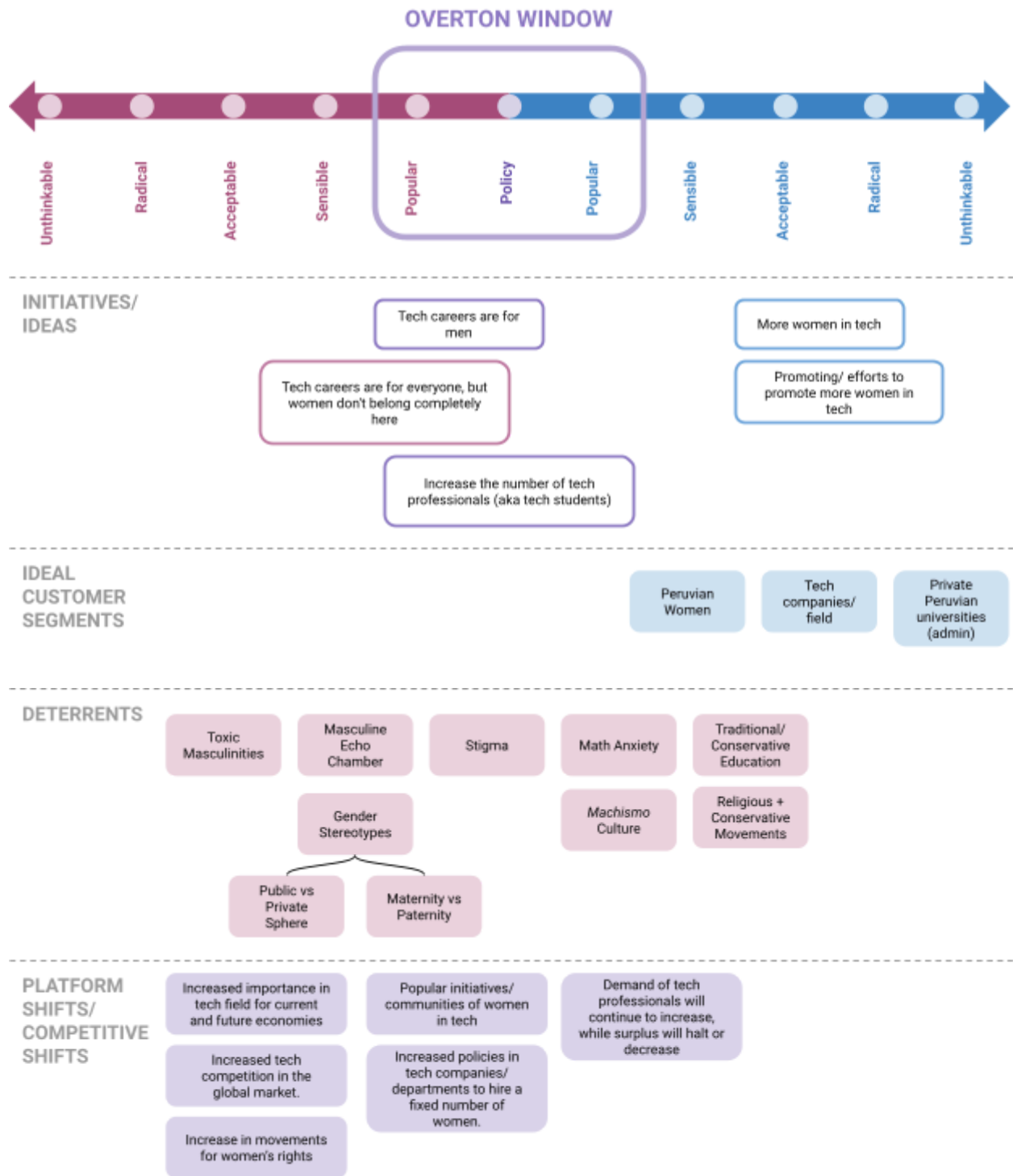
Any idea or policy, then, that lies outside of the Overton Window due to public opinion, current context, or political climate will cause less acceptance or more rejection from a group of people, community, population, etc. (Statesman, 2015). Then, certain formulations can take place to further push this window in our desired direction, to expand it, or make it wider (Statesman, 2015).



[Fig 5]: Overton Window Diagram (Waytowich, 2019).

Change does not happen in our comfort zone, or in this case, our assigned Overton Window.

Change, which is often disruptive, will occur outside of this window. In this specific case, changes for gender equity, in any aspect, lie outside our Overton Window.



[Fig 6]: Overton Window Diagram for Project Analysis.

By using the Overton Window (as shown in the above figure) we have a better idea of our landscape, our ideal customers, deterrents, and shifts that underlie different initiatives or ideas that are part of this project.

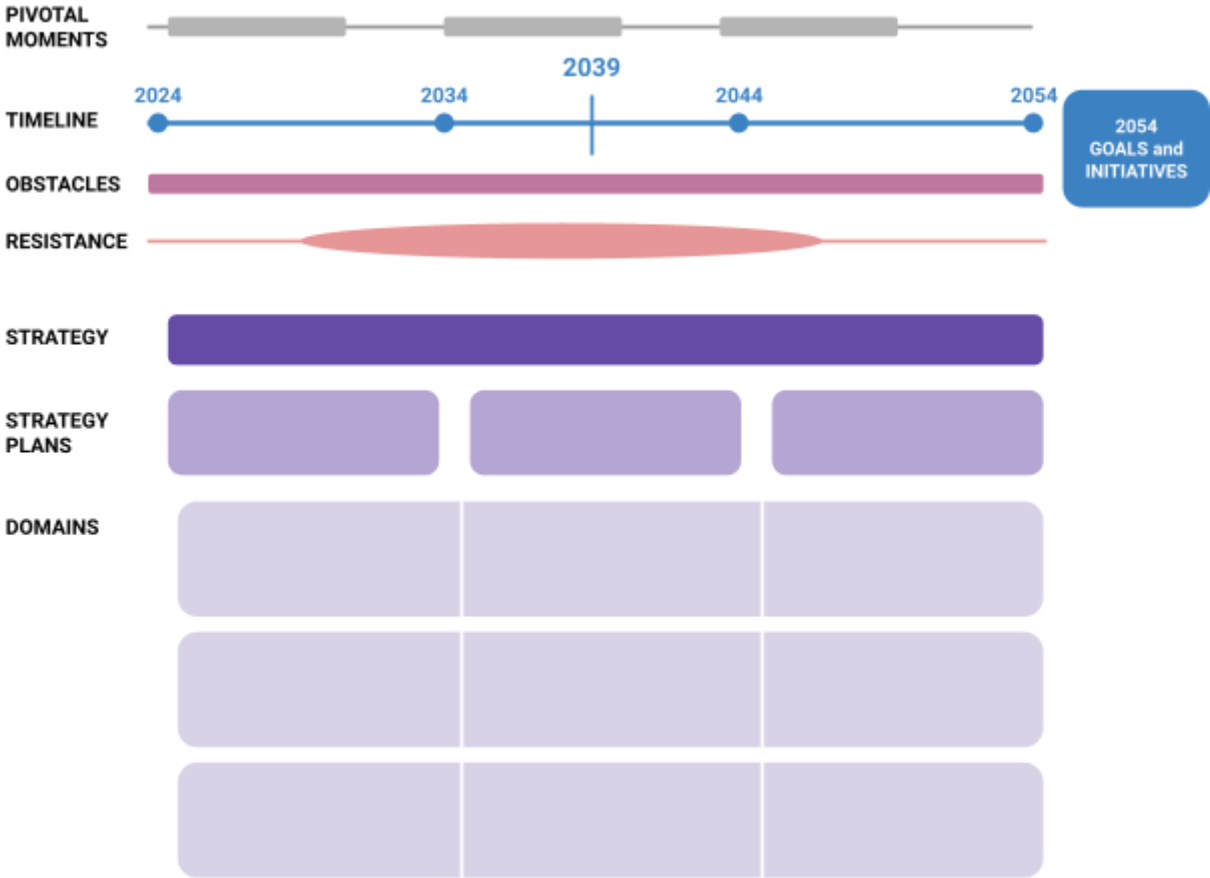
BACKCASTING METHODOLOGY

How can we achieve our ideal future scenario by 2054?

One way to know which steps we should take is by applying backcasting methodologies. By this, we refer to constructing scenarios, strategies, or initiatives starting in 2054 and steadily heading back in time until we approach the present time (2024).

In this specific case, backcasting was used to build or create resilient and sustainable strategies in 3 different decades: 2024-2034, 2035-2044, and 2045-2054.

The following format was used to develop strategies for the upcoming 30 years, with a strategic plan attached to each decade

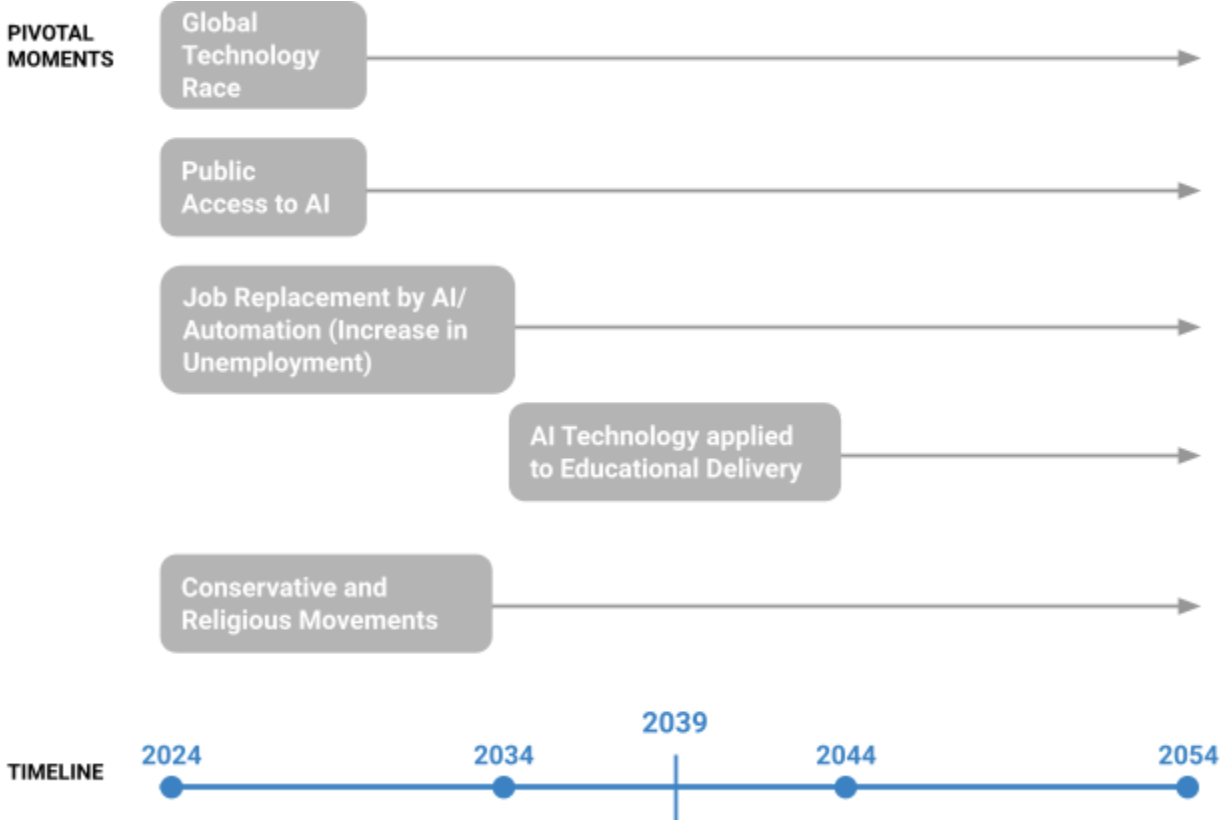


[Fig 7]: Backcasting Canvas/ Format

To further understand certain sections of this format, we will go one by one to give further explanation:

PIVOTAL MOMENTS

The following Pivotal moments were mapped and considered in our Backcasting Canvas:



[Fig 8]: Zoom in Pivotal Moments

2054 GOALS

These **Goals** were retrieved from our **Positive Scenario** and used as our Northern Star for our Backcasting, and they are specific to **Private Universities** in Peru. For each goal, we distributed our **initiatives** (Case Study Section) to those that would help achieve different Goals:

Enforcing Gender Equity in Academia: A Shift Towards Inclusive Educational Practices

GOAL DESCRIPTION:

- Universities make it mandatory that all faculties have programs that protect and promote gender equity
- Faculties have their own experts to promote gender equity, as well as allies within its educational grounds that help promote and educate others on this
- This is not thoroughly thought as before, it has become the norm and it is natural
- Tech makes it possible to enforce and pinpoint whether a problem has occurred, as well as providing channels to report anonymously

INITIATIVES:

Creating Inclusive Educational Environments: Training Professors, TAs, and Faculty Staff.

Safeguarding Female Students: Implementing Zero Tolerance Policies and Anonymous Reporting Channels.

Shaping the Future: Collaborative Efforts for Equity in Universities

GOAL DESCRIPTION:

- ONGs/ ORGs/ Independent Companies/ Communities
 - Present in the future of Universities as they helped set foundations for equity
- Private sector:
 - Worked together to promote hands on/ in practice learning
 - Offer internship and scholarships for women (norm)
 - % of women and men to hire in their businesses
 - Protection law of students: Universities work and evaluate the company's inclusivity and protection towards their students, especially towards women (inclusive and protected spaces)
- Public sector:
 - Programs catered towards people that have lost their jobs due to automation- increasing numbers of men and women in tech
 - Scholarships to promote women in tech is the norm

INITIATIVES:

Strategies to Encourage Women in Tech: Collaborating with High Schools

Bridging the Gap: Ensuring Safe Transitions from University to the Professional World

Revamping Curriculum: Transforming Education for Engaged Learning

GOAL DESCRIPTION:

- Courses are taught by levels
 - Courses are more ENGAGING with students
 - Introduction of new courses (the norm):
 - Soft skills
 - Critical Thinking
 - Inclusivity
- Hands on experiences (theory to practice)

INITIATIVE:

Building a Supportive Environment: Key Courses for Future Tech Professionals

Tech-Enabled Education: Embracing AI in Higher Learning

GOAL DESCRIPTION:

- AI in education is common and is widely used in higher education
- High tech provides flexibility to students to choose if they study in class, hybrid, async, or at the time is most convenient for them
- Tech provides
- AI professors

Equilibrium Achieved: Gender Balance in Tech Education and Faculty Roles

GOAL DESCRIPTION:

- C50/50 gender distribution:
 - Professors
 - Students
- Women in Tech is seen as normal/ people are already used to it
- No issues with student enrolment, retention, and graduate numbers

INITIATIVES:

Strategies for Female Representation and Empowerment in Tech Education

Empowering Female Student Communities: Fostering Supportive Spaces for Connection and Validation

OBSTACLES:

These risks/ obstacles were retrieved from the Negative Scenario and used as possibilities that we should be aware of in the future. Some of these obstacles/ risks are as follows:

- **Gender talk is a sensitive subject that will receive backlash or resistance if its introduced in an upfront and direct manner**

- **Keep in Mind:**
 - Introduce the subject in an indirect and non-forceful way, context is not prepared for this conversation.
- **What do Professors want?**
 - Support on how to deliver better education to their students (sensitive point).
- **For Professors:**
 - How can I enhance my educational delivery to my students? How can I keep my students highly interested and engaged in my class?

- **There's insufficient understanding or mechanisms to address gender-based harassment or bullying in highly masculine environments.**

- **Keep in Mind:**
 - Be careful when introducing means and ways to protect students, to avoid backlash. Think how this can be perceived by men and how we can positively engage them.
- **What do Female Students want?**
 - A safe space to study and engage with others, support and understanding from faculty or university when they struggle with inclusivity, harassment, or bullying.
- **For Students:**
 - How might we offer more inclusive and safer spaces to female students?

- **No Investment from the Private or Public Sector**

- **Keep in Mind:**
 - This is ultimately out of a university's hands. However, seek opportunities to engage and show value in what change will bring for private and public sectors.
- **What does the Public and Private Sector Want?**

- Prepared professionals in tech that will help elevate the field in Peru as well as deliver products that will bring them profit.
 - **For Universities:**
 - How can we engage both the public and private sectors in proactive change?
- **Persistent Gender Stereotypes in Educational Spaces**
 - **Keep in Mind:**
 - Having a direct conversation and training might bring awareness, as well as some rejection. Change will be seen in time, and subtle changes in education or spaces will better behavioural results.
 - **What do Students want?**
 - A safe space to not only study, but build a community, and engage with others with freedom of judgement.
 - **For Universities**
 - How can we eradicate Gender Stereotypes? How can we build educational spaces that are healthy for everyone?
- **Unemployment**
 - **Keep in Mind:**
 - This is somewhat out of the University's hands. In some sense, foresighting what could happen to Peru's economy could help with reinforcing or strengthening skills or career programs that will struggle less with unemployment in the future.
 - **What does the Unemployed Population want?**
 - An opportunity to get a job, to be trained, and to be hired again in order to sustain their lives and families.
 - **For Universities:**
 - How can I prepare my students with skills that will be of high value in the future? How can I take this opportunity to train or fast-track educate unemployed people due to AI/ Automation in the future? How can I bring education in tech to unemployed people to meet professional demands in this field?

STRATEGY AND STRATEGIC PLAN:

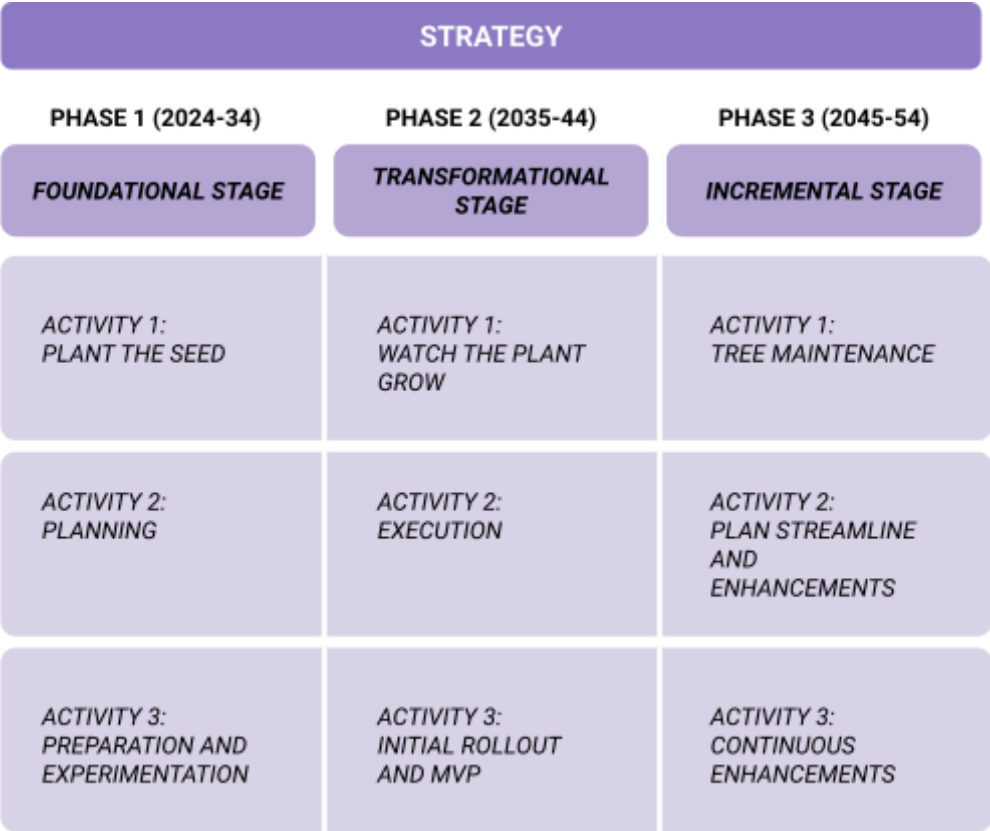
Once all the gathered information was organized within our format/canvas, marking a foundational milestone, the next step involved creating our final solution. This entailed crafting a **30-year strategy** along with **decade-wise strategy plans**, each comprising **three domains** housing various initiatives and activities.

PART 6:
STRATEGY

ABOUT THE PROPOSED SOLUTION

Based on the analysis, insights, learnings, and conclusions drawn from the preceding sections of this research project; a solution tailored to address the identified issues was created.

The proposed strategic solution is mapped out as follows:



[Fig 9]: Strategy Diagram.

As we can see in the above diagram, the strategy contains 3 different sections:

- Strategy:**

Where we have our larger purpose, our aspiration, where we play, our capabilities, and others.

- **Strategy Plans:**

Our strategy plans are structured into **three phases**, each representing a decade from 2024 to 2054. In order to move on to the next phase, the one before it has to be completed.

The phases mentioned initially can be further understood with the following contexts:

- **Phase 1:**

Initial focus has to be on setting ground to attract the minority group of students in tech who are women. Most initiatives and strategies start here, and subsequently will impact purposes and implementations in the upcoming two phases.

- **Phase 2:**

Intentions are not just about empowering women or altering university behavior (though that's necessary); the bigger goal is enhancing tech capabilities in Peru and increasing the number of overall tech professionals.

- **Phase 3:**

Men and women don't compete in the same areas; there's ample space for tech professionals due to the expanding economy and the increasing need for students and professors. This reflects ecosystem expansions over the last decade.

This approach allows for a comprehensive long-term strategy, considering the potential for initiatives to require systemic change, particularly in a university setting. Each stage is composed as well of **3 different strategy plans**, that have **3 different domains** with activities (In our diagram, this can be read per column).

- **Domains:**

In our diagram, our 3 categories are represented in 3 different rows below our strategy plan. All of them respond to every decade of our plan and offer a set of activities that intend to bring our Strategy Plan to reality in 30 years.

Most activities start in our first decade, and this continues to roll out, get implemented, or be enhanced throughout the next 2 decades.

The 3 categories are as follows:

- **Domain 1: Core/ Ground Level**

This stage will set the foundation for the other two stages. Without this one, the

other two will not be able to happen or be implemented successfully.

Understanding behavioral design and its methodologies is crucial for this domain and its impact in the overall strategy. Addressing systemic or social change requires subtle initiatives that prompt positive behavioral changes without stakeholders realizing it. This approach helps to mitigate resistance to the implementation of our strategy both initially and in the long term.

- **Domain 2: Training and Planning**

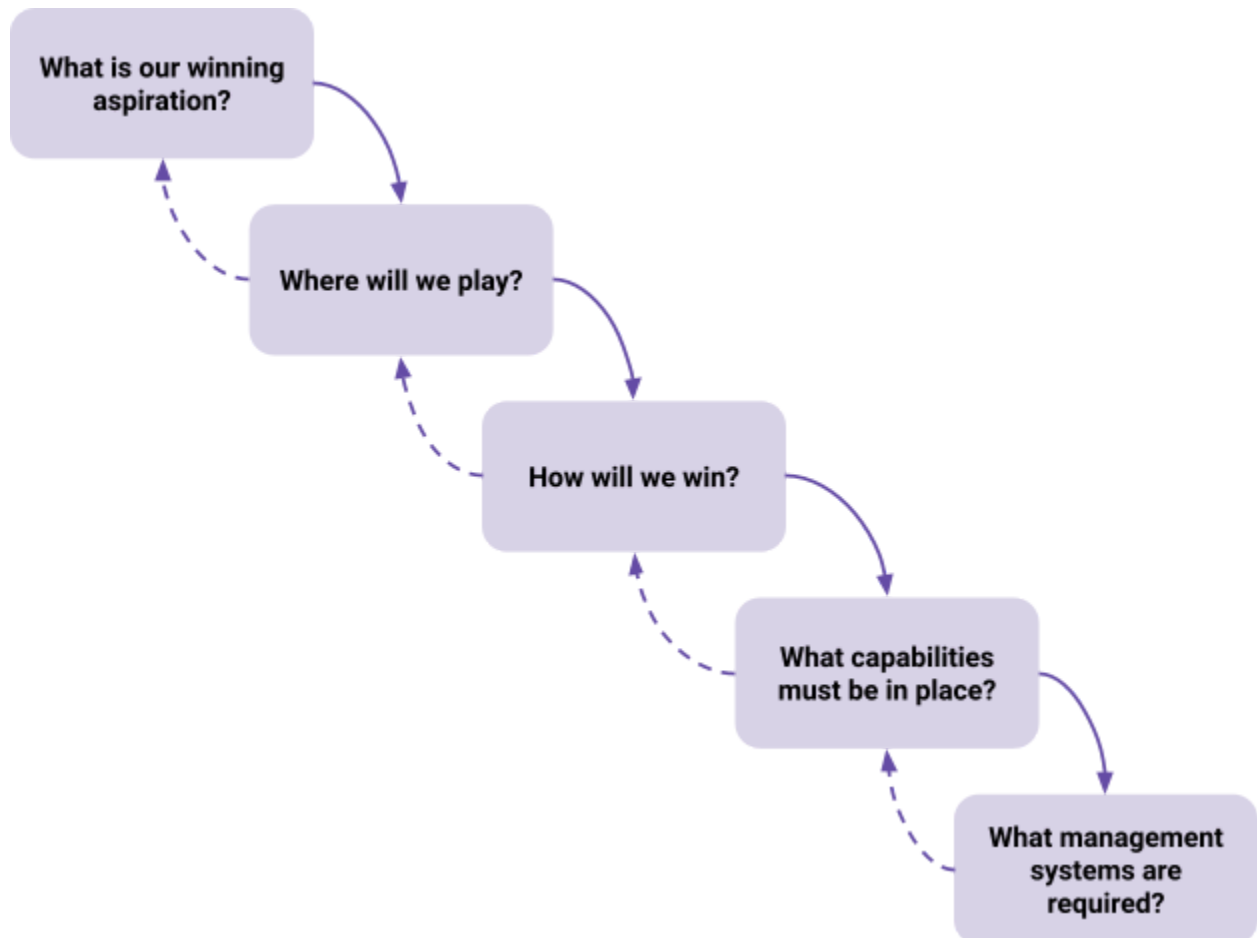
This stage follows to start implementing initiatives, strategies, or plans from Stage 1. Somewhat of an execution level, it prepares plans and actors to make initiatives successful.

- **Domain 3: Initiatives**

This section comprises all initiatives that can and should be implemented according to each decade. This responds directly to Stages 1 and 2's objectives, directions, and capacities.

STRATEGY

We utilized the "Integrated Cascade of Options" framework from the book "Playing to Win: How Strategy Really Works" to develop our overarching strategy.



[Fig 10]: Integrated Cascade of Choices (Lafley; Martin, 2013)

- **What is our Winning Aspiration?**

To Increase up to 50% the number of women enrolled in tech careers in Peruvian Private Universities, and maintain them in this field in their professional lives in the upcoming 30 years.

- **Where will we Play?**

- (Starting point): Private Universities in Lima- Peru
- Engagement with:
 - Private sector: Tech companies
 - Peruvian High Schools

- **How will we Win?**

Our strategy aims to build a dynamic ecosystem that fosters collaboration between universities, high schools, and the private sector to cultivate an environment that attracts and retains women in tech careers. Through a multifaceted approach centred on behavioural change, provision of safe spaces, and increased representation, we seek to empower women and create engaging programs starting from high school, and continuing throughout their student and professional life. By prioritizing diversity and meeting Peru's unmet demand for tech professionals, our strategy drives innovation and economic growth while promoting gender equality in the tech industry.

More information can be found in the upcoming section: Phase 1 (2024-34).

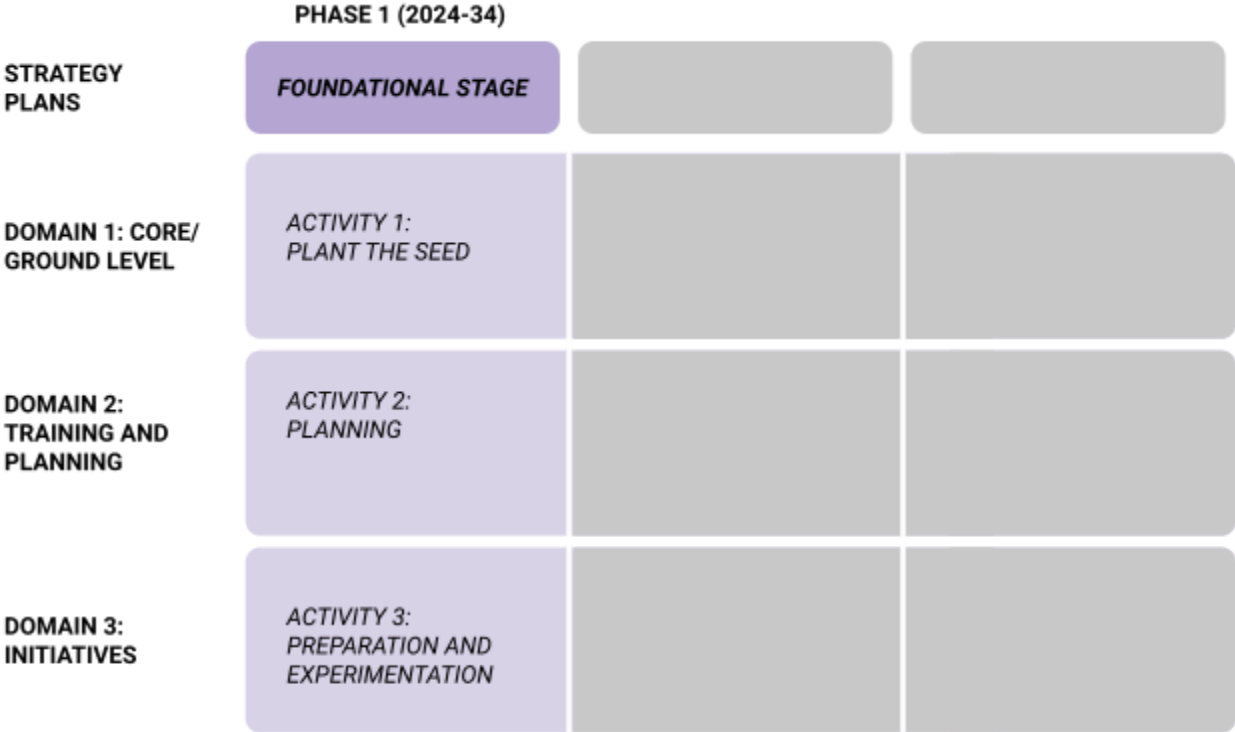
- **What Capabilities Must Be in Place?**

- Behavioural Design/ Economics Skills
- Community building
 - For female students
 - With other entities (for example: Organizations, International/ National Universities, private sector, public sector, etc.)
- Female representation in tech (alumni, professors, national or international, professionals).
- Training:
 - Gender and Inclusivity
 - New technology
 - HR (Equitable Hiring Processes)
- Acquisition and application of new technologies

● What Management Systems are Required?

- Initial focus on building allyships and relationships within the university
 - Dean
 - Head of Tech faculty
- Investment in training and capabilities listed in the previous point
- If skillsets are still new or non-existent: Hiring a third party to train or do the job
 - Gender and Inclusivity initiatives: Consultancies or labs specialized in this.
 - If there are no female professors in Peru, seeking internationally could become an option
- Data:
 - Measurement of the number of women involved in tech careers per year (application numbers vs admission numbers)
 - Measurement of the number of female professors and staff in tech programs per year
 - The number of reported cases over the years regarding gender equity issues.
- Investment in:
 - New technologies (to support students in their learning journey, and also enhance data collection and make processes more efficient)
 - HR training:
 - On Gender Equity
 - On Hiring processes that consider diversity

PHASE 1 (2024-2034)



[Fig 11]: Strategy Diagram- Phase 1

During this stage, most activities and initiatives will be initiated or conceptualized. The following two decades will focus on developing, implementing, or improving these initiatives to further support the overarching strategy.

STRATEGY PLAN: FOUNDATIONAL STAGE

EVALUATION AND AWARENESS

First decade. Opportunity to start setting foundations for and preparing the ground for what's to come in the future or second decade.

Initial efforts need to be consolidated with heads of universities and faculty regarding one focal purpose vision to contribute to Peru's present and future society and advance sustainable growth in tech (which if not taken seriously, might affect the future economy).

Efforts in allies development and community building are highly important in this stage to bring support in the second decade. Focus on building an ecosystem that will offer you support in the upcoming decade.

Purpose: Economic, capital opportunity, sustainable future for business,

Initiative owners: Head of University + Gender and Equity office/ committee

DOMAINS AND ACTIVITIES

Domain 1: CORE/ GROUND LEVEL

ACTIVITY 1: PLANT THE SEED

- The most important domain: set the purpose and keep allies close to you for this purpose.
- **Initial Owner(s):**
 - Gender and equity office
 - University dean/ head
- **Purpose (selling point):**
 - Market opportunity: there is an increase in demand for tech professionals, and we are not meeting it.
 - Potential for the university to develop more tech professionals than what we are currently doing.

- Plan strategies: One could be to address the minority group and how can we attract more of them (women).
 - We already have a strategy that attracts more men, efforts should be on attracting more women to increase these numbers
 - Focal point for new potential students to join our university = increased profits
 - Tech or papers or work by our faculty will be more accurate: Diversity brings more accurate solutions for 100% of the population and more innovation (Levine, 2020).
 - Foresight: The priority of the future is tech, and we help Peru be part of this race and ensure economy is not negatively affected in the future. (Public and Private sector concern)
- **Who to team up with/ Have this discussion with/ Most important allies:**
 - Head of University/ Dean
 - Head of Science/ Tech faculty
- **How to go about these meetings:**
 - Hear everyone's voice
 - Collaborative work- all work and contribute for the best strategy
- **Find support from (if needed):**
 - Tech subject matter experts
 - Gender + Equity experts
 - Local or international entities that are currently working on this (ex: Universities)
 - Consultancies
 - Behavioural economists/ designers
- **Establishing alliances and gaining leadership support is the crucial first step for progress to occur.**
- The initial strategy should incorporate **behavioural design**, possibly involving **experts**, as addressing inclusivity directly from the start may not be effective. Instead, it should aim to **prompt behavioural changes** and **challenge unconscious biases** without individuals realizing it, tailored to each specific situation or context.

DOMAIN 2: TRAINING AND PLANNING

ACTIVITY 2: PLANNING

Focus on: Behavioural Design/ Economics to build influential strategies and have positive results on behavioural change patterns.

- **Training for Tech Faculty:**
 - Flexible/ not mandatory (not imposed on them)
 - Topics:
 - Tools to increase engagement from students
 - Enhancing educational skills
 - Educational Delivery
 - Professors are seeking ways to improve and engage their students in their classes.
 - Subjects on equity, inclusivity, and gender can be added to content in an indirect manner (introductory)
 - Expect that this section will **take time to develop and create impact.**
- **Initial Talks/ Conversations**
 - Transparency: What is the vision for tech faculty and the importance of the future? (Collaborative work to achieve this/ Space to hear everyone's thoughts/ opinions).
 - Separate groups at first, eventually workshop or invite all together for this conversation
 - With Who?
 - Allies/ Partnerships
 - Private Sector/ Companies/ Startups
 - Faculty Members (Professors, Admin, Staff)
 - Female Alumni
 - ORGs, ONGs, Consultancies
 - With High Schools- Initial Conversations:
 - How can we increase interest in tech among female students?
 - Interest from high schools, co-creation on what this could look like

- University fairs continue and maintain- inviting female representatives for these career fairs
- Curriculum or tech activity opportunities
- Community female-in-tech activities + female students in HS interested

DOMAIN 3: EXPERIMENTATION AND IMPLEMENTATION

ACTIVITY 3: PREPARATION AND EXPERIMENTATION

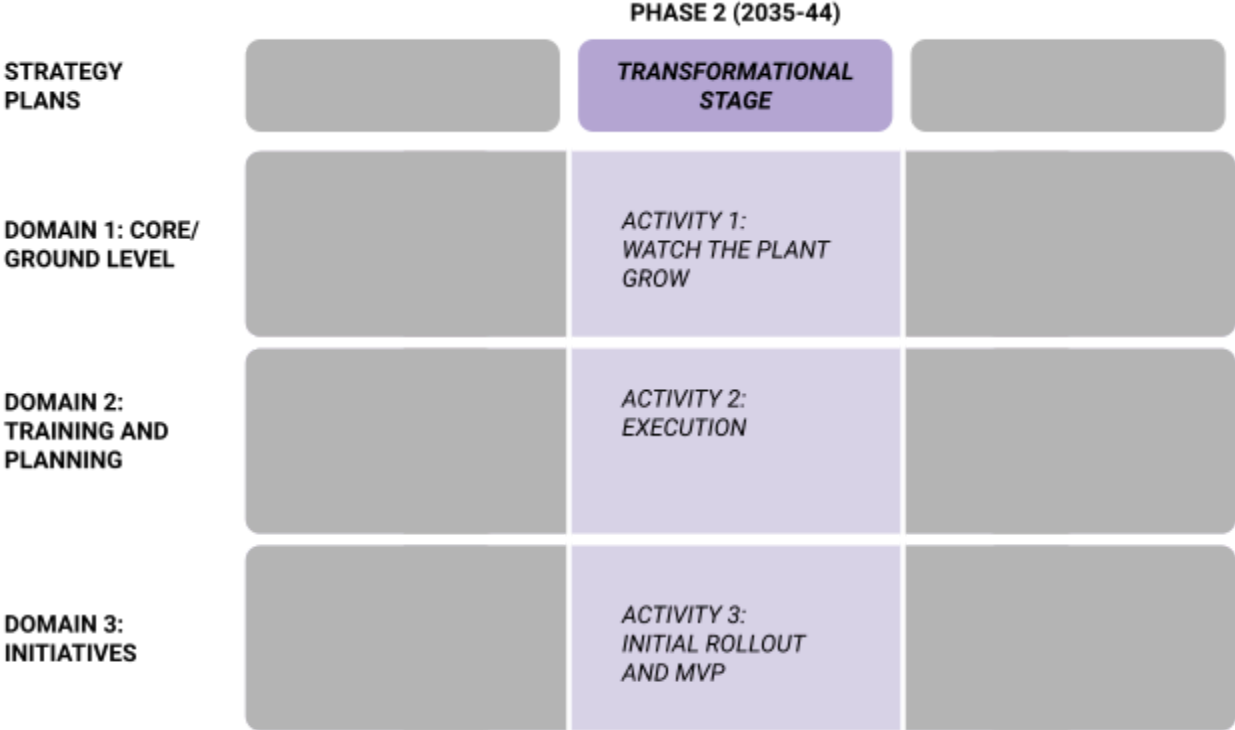
- **Evaluations + Initial Strategies for Change:**
 - With external help- ORGs, Consultancies (experts)
 - Some items can be evaluated by partnerships/ allies/ students
 - Items to evaluate:
 - Admission exams (Experimental/ Collaborative/ Co-creational stage)
 - Curriculum (Experimental/ Collaborative/ Cocreational stage)
 - Community building, empathy, communication, critical thinking- Initial conversations
 - The future of Tech: what skills are needed in the future with AI and automation in present and future horizons?
 - How to make classes more engaging/hands-on/ applied?
 - Professors education Delivery (Experimental/ Collaborative/ Co-creational stage)
 - Gender and Equity Indicators
 - Conduct and Evaluate Surveys
 - Staff and Students
 - Topics:
 - Perception of educational space
 - Experience
 - Hiring processes (of professors)
 - Flexibility to hire internationally (women)
 - Job Descriptions
 - How can we attract more female professors
 - Unconscious Biases

- Attracting the right people (with the right mindset- future allies)
 - Perception of career and marketing strategy:
 - How are we going to be perceived by the general public?
- **Seeking Potential Allies**
 - Start building a community and finding people who will support this new inclusive mindset and purpose
 - Staff
 - Administration
 - Students
 - Professors
 - Alumni
- **Community Building: Female Tech Students**
 - Foundational start for "Women in Tech faculty" Community
 - Build awareness of this groups
 - The foundational start could be with help from the gender + inclusivity office, alumni, and current students
 - Co-creational stage: What do we want out of this space?
 - Safe space for students to:
 - Share lived experiences
 - Point out positive and negatives
 - Connecting
 - Connecting with other communities/ organizations (ex: +Mujeres en UX, Laboratoria)
 - Understand their needs and wants
 - Foundational start to create events
 - Talks (nationwide) - Partnerships/ alumni
 - Access to events citywide/ Nationwide/ Internationally
 - Workshops
 - Funding (Partnerships)
 - For all initiatives
 - Investing in future staff/ professors as female representatives in faculty (this will increase the number of female professors and representation in the next decade)

- Initial sharing of content with peers in classrooms (Allies)
 - Foundation for Role Model/ Mentorship/ Representation (Allies/ Partnerships)
 - Leadership Classes (Extracurricular/ Seminar/ Activities)
 - High School connections
- **Drafting Initial Policies**
 - Flexible initial policies to be introduced
 - Inclusivity talks among students and Staff
 - Zero tolerance towards Bullying and Harassment
 - Advocate for others
 - Policies that will provide time and location flexibility of studies to students who are undergoing Maternity or Paternity
- **Awareness and Security Report Channels:**
 - Evaluate channels that can be inserted easily as Minimum Viable Products (MVPs)
 - Anonymous reports
 - Talks with students about changes and introducing new reporting channels for harassment
 - Foundational level: Support office for students who are suffering or struggle with Gender violence
 - Data collection for future changes or a better understanding of the situation
 - Initial awareness campaigns
 - Built by Female Students in the Tech community
 - Built with the help of ORGs Consultancies
- **Tech Adaptability and Acquisition Assessment:**
 - Evaluation of upcoming technologies to adapt in education
 - Examine capabilities to introduce them in the future
 - Funding
 - Tech for education + activities execution
 - Educational flexibility
 - Hiring processes (Automation + Educating AI with inclusivity)
- **Be aware of:**
 - Men's perception of loss impedes women's advancement.

- Resistance stems not from the need for equal treatment and representation of female teachers in all aspects, which is necessary and should not change, but rather from a reluctance to accept these changes.
- Shift of mindset has to occur from women “taking” their space, towards there is more than enough space for all of us to coexist.

PHASE 2 (2035-2044)



[Fig 12]: Strategy Diagram- Phase 2

During this decade, the focus of our strategy plans and domains will largely revolve around continuing the activities and initiatives initiated in the first decade. This may involve implementing, enhancing, or further developing existing strategies.

STRATEGY PLAN 2: TRANSFORMATIONAL STAGE

ROLL-OUT AND HIGH IMPACT

Second decade. Opportunity to execute and implement initiatives. Once your surrounding ecosystem has been prepared and is highly supportive of inclusivity and gender equity measures, retaliation or rejection will be easier to handle or manage.

Measures can be more upfront and mandatory compared to the previous decade. Losses or inevitable changes will be seen, and as a backup new professionals with equality mindsets will be able to jump into your new ecosystem.

This is likely to be the hardest decade as more rejection can be seen here. As mentioned previously, it is important to prepare the ground, partnerships, and allyships in the previous decade to make this stage flow with ease.

DOMAINS AND ACTIVITIES

DOMAIN 1: CORE/ GROUND LEVEL

ACTIVITY 1: WATCH THE PLANT GROW

Relationships or alliances have now transformed, and are now more consolidated and working collaboratively.

- **Goal:**
 - Ideal expected growth of pool of tech graduates: 10-20%
 - 30% of students are women, 30% of professors are women
- **What is happening?**
 - Continuous conversations and transparency about + results
 - Increased and refined results regarding gender equity/ inclusivity measures vs attraction/ retention/ NPS metrics
 - Iteration of decisions and strategy for the upcoming decade:
 - Preparation for policy and strategy rollout
 - What does this mean?
 - How do we handle rejection

- How do we connect better with + students
- **New Alliances in the Horizon:**
 - Nationwide Universities- Connected through one purpose
 - International Universities- Mentorship/ guidance, setting ground for future collaborations
 - Private Sector
 - Public Sector* (unstable)
- **Next Steps:**
 - Funding for new tech acquisitions:
 - Educational Plan
 - HR development Plan
 - Training
 - Reporting and safety channels
- **Focus on:**
 - Allies/ promoters of change
 - Working with other faculties that can help build more welcoming and inclusive spaces within the faculty (opportunity to network and involve students on building this + multidisciplinary training/ learning)
 - Responsible in different areas of execution for strong initiative rollout
- **Expect:**
 - Rejection or loss of faculty members (this should be controlled and prevented by measures in the first decade)

DOMAIN 2: TRAINING AND PLANNING

ACTIVITY 2: EXECUTION

Focus on executing plans designed and probed on the **previous decade**. **Take time to consolidate these plans.**

Continue with behavioural design/ economics initiatives.

- **Tech Faculty Staff Training:**

- Conversations around gender, equity, and inclusivity in education are now more upfront and direct. Expect reactions towards this, previous work should make this easier and with less retaliation.
 - Adequate training focused on targeting gender biases, stereotypes, etc
 - Help of Partnerships: Consultancies
 - More Upfront talks on Gender disparities, biases, etc.
 - Equity vs Equality
 - Diversity vs Inclusivity
- **Continuous Talks/ Conversations:**
 - During rollout keep promoting:
 - Transparency with all parties
 - Collaborative work
 - Invite Women in Tech communities to these conversations
 - Activities and roadmap enhancement/ changes to achieve the goal
 - Implement new policies- phase of adaptation from flexible to mandatory
- **With High Schools:**
 - Initial Goal: Expects to Increase Interest in Tech Careers
 - Next steps:
 - Extracurricular/after-class activities related to tech (hands-on-collaboratively done with universities)
 - Count as curriculum points for current 3rd/5th-year female students?
 - Discussions and experimentation:
 - Including tech subjects in science class.
 - Future opportunity:
 - Tech class as part of science course or side course (in hand with universities)
 - Focus on:
 - Co-creation/ Collaborative work
 - Rollout and MVP of Initiatives
 - Data gathering regarding interest

DOMAIN 3: INITIATIVES

ACTIVITY 3: INITIAL ROLLOUT AND MVP

In this domain, prioritize continuing the initiatives from the previous decade, along with implementing the following new initiatives:

- **Strategies for change/ Rollout**
 - With external help- ORGs, Consultancies (experts)
 - ORGs, Consultancies, Private Sector
 - Items to continue evaluating:
 - Admission exams
 - Changes made from evaluations + Gender Equity indicators (More inclusive in language)
 - Curriculum
 - Increased engagement in introductory courses (more in practice, less in theory)
 - Increased opportunities to work for women in tech
 - Collective effort: Consultancies, University policies for equity in place, agreements from Private sector
 - What does this mean? Standardized inclusive spaces have to be put in place for private sector companies to be given a "trustworthy" place to work with female students.
 - Introduction of younger and new staff (alumni)- Hiring Process
- **Ally Group/ Community Consolidation/ Formalization**
 - Group working together with Women in the Tech community to bring initiatives to reality
 - Indirect or informal training to staff about inclusivity in education
 - Increased numbers of allies- contingency point from regressive standpoints or rejection
- **Community Building: Outputs + Initiatives in Place**
 - Continued rollout of initiatives
 - Solid Community- extended towards other citywide then nationwide communities
 - Consolidated groups within the faculty for:
 - Mentorship for women

- Leadership courses for women
 - Increased exposure
 - Increased Networking Events
 - Formalizations of community through different initiatives such as:
 - Events
 - EXAMPLE: NATIONAL OR INTERNATIONAL COMPETITION ENROLMENT
 - Mentorship/ Leadership programs
 - Include Male student counterparts to engage in inclusive conversations (separate forum)
 - Introduction of younger and new staff (women alumni) as TAs, Professors, Staff
- **Drafting Initial Policies: Executing/ Trial stage for the introduction of new policies**
 - 30% of staff/ professors in tech faculty have to be women
 - Representation matters: Policies with initiatives and goals to promote representation in staff
 - With private sector/ companies: Making safety deals where the university promises to prepare the best professionals, where these companies will at least hire 30% of women from their internship programs.
 - Continuous enhancement and betterment of policy implementation for maternity and paternity leave (students and staff)
- **Awareness and Security Report Channels**
 - Report Channel MVP in place
 - Continuous iterations/ betterments to initiatives
 - Increased security for reporting channels
 - Increased education toward staff and students regarding awareness and reporting channels
 - Increased involvement with Faculty, Women in the Tech student community, Gender and Inclusivity Office
- **Tech Acquisition**
 - Increased

PHASE 3 (2045-2054)



[Fig 13]: Strategy Diagram- Phase 3

As mentioned in the second decade, focus on rolling out and enhancing strategies that started in decades 1 and 2.

STRATEGY PLAN 3: INCREMENTAL STAGE

EASE IMPLEMENTATION

2045-2054

Generational change in staff and professors can be seen.

The stage of normalization is almost reached. Formalization of communities, groups, policies, etc. is now seen and makes execution of it all easier.

Things that took great effort in previous years are now the norm or are helped to be constantly present in the ecosystem through new technologies.

Gears start to function on their own, things work naturally and with no extra effort.

Initiative owners: Head of Tech Faculty.

DOMAINS AND ACTIVITIES

DOMAIN 1: CORE/ GROUND LEVEL

ACTIVITY 1: TREE MAINTENANCE

- New and expected ecosystem in place, where Private universities are the major influence in creating inclusive spaces for all tech students and professionals, before, during, and after their studies.

For further details on the ecosystem map and new relationship descriptions, please refer to Appendix J.

- **Goal:**
 - Ideal expected growth of pool of graduates: 30-50%
 - 50% of students are women, 50% of professors are women
- **Owner:**
 - Tech Faculty
- **Right hand:**
 - Gender and Equity office
 - Head/ Dean of University

- **What is happening?**
 - Alliances and different parties consolidate in a
 - Sustainable Tech for Future University
 - Forum: Consisting of internal and external bodies to each university
 - Transparent and collaborative work continues
 - Metrics are ongoing
- **Part of Forum:**
 - Private Universities
 - Private Entities
 - Gender Equity Experts
 - Behavioural design/ economists
 - Female student in Tech Community
 - International Universities
- **Future Intentions:**
 - Connect with Govt initiatives
 - Connect with Public Universities
- **Expect:**
 - Things to be more structured, organized, and working on their force/ inertia. Efforts need to be continuous but there is space to tackle and address other inclusivity measures

DOMAIN 2: TRAINING AND PLANNING

ACTIVITY 2: PLAN STREAMLINE AND ENHANCEMENTS

Focus on continuous betterment and streamlined execution on what works + tackling new challenges (ex: beyond gender binary).

- **Tech Faculty Training:**
 - Frequent talk in class- Normalization stage- integrated into basic professor staff training/ follow up through AI/ AR courses + evaluations
- **Ongoing Conversations:**
 - Upkeep promoting collaborative work and transparent spaces for discussion
 - Streamlined process

- Hybrid execution
- High Schools
 - Contracts and partnerships in place
 - Continuous Rollout
 - Tech program/ class becomes initially an elective and later on a course in the science curriculum
 - Class summary built collaboratively with university professors + consultancies
 - Formalizes extracurricular classes in tech for students (hands-on)
 - Connected community with female tech students + representatives in universities (bigger forum containing multiple universities)
- Upkeep of contracts, relationships, and partnerships
 - *For further details on the ecosystem map and new relationship descriptions, please refer to Appendix J.*

DOMAIN 3: INITIATIVES

ACTIVITY 3: CONTINUOUS ENHANCEMENT

- **Strategies for change/ Rollout**
 - Collaborative work with external aid (such as consultants).
 - Admission exam/ processes:
 - Redesigned and ongoing- Streamlined to be more inclusive and to incentivize students rather than scare them away (increased number of potential applicants)
 - Curriculum
 - University, Private Sector, Gender experts Communities, and Female students in tech proposals are now set and running
 - Emphasis on hands-on learning
 - Real World Experience incorporated to the curriculum through course materials/ teachings

- Access to new technologies and understanding of current and future innovations/ tech/ changes
 - Access to national and international professors/ mentors
 - Courses with teachings in soft skills and critical thinking are of high importance (advancements in tech have left behind many tasks that used to be done by tech professionals are now done by AI or automation)
 - Professors education delivery is done in training that is already streamlined
- **Ally Group/ Community Consolidation/ Formalization**
 - Settled and streamlined
- **Community Building: Female Students in Tech Community**
 - Consolidated and formalized institution or community
 - Sub-communities belonging to different nationwide universities
 - Communities connected online and hybrid- bringing constant input and initiatives forward
 - Formalized platform of representation for HS students, current students, and professionals
 - Connected community with international university communities + forums

CLOSURE

HOW YOU CAN APPLY THESE LEARNINGS

The following next steps and recommendations are suggestions for anyone who considers to follow and implement this strategy:

- Research regarding your university population. It is important to keep in mind that inclusivity is not binary, and there is a wide mosaic of people that need to be engaged. In this case.
 - Not all women are the same, as some women might struggle more from discrimination than others based on their sexual orientation, how they identify themselves (gender), ethnicity, socio economic background, cultural background, etc.
 - All of these need to be considered in order to add and keep creating appropriate measures to help everyone and give accessibility and opportunities accordingly. The same would go for those who identify as men.
- This research, as mentioned previously, responds to the binary reality of Peru. However, we can not exclude a minority which is the LGBTQ+ community. Further studies, research, and designed initiatives and strategies to cater to the needs and opportunities for this population would be of great help to further bring diversity and inclusivity to all in the tech community.
- All parties need to be included in initial conversations. Collaborative work and transparency is key for the success of this project.
- Re-evaluate whether stakeholders mentioned here respond to the organizational reality of your university institution. Accommodating and finding key responsible stakeholders and owners within the university's reality is important, as not all universities work or operate in the same way.
- Bring awareness that inclusivity and focus on minority groups does not mean "preferences"; educate others that this effort is to promote equity and for the greater good of every student.
- Invest in learning and applying behavioural design/ economics. This practice and knowledge is key for the success of the strategy and proposed initiatives.

- Take time to make resilient and strong relationships with key stakeholders when getting started. This is extremely important, as it will determine the future success of the strategies.
- Probe/ test strategy and strategic plan with stakeholders, students, and professors. Gathering feedback is needed to understand if anything needs to be modified.

NEXT STEPS/ RECOMMENDATIONS

- Validate or test strategic plan with different users.
 - This could be done in triads or single interviews.
 - Groups of interest for validation, future co-creation and iteration of strategy :
 - Current Female Tech Students (test if initiatives are met)
 - Current Male Tech Students (Understand if they find benefit, if there is any rejection)
 - Professors and Staff (Understand their reaction of such plan to be implemented to gather information on what changes need to be applied to avoid rejection)
 - Heads of University (example: Dean)
 - Probe them to see if this is something that they find value, if not find a space for co creation.
- Build a space where future important or allies/ partnerships of interest can get involved in the creative iterative process of the strategy.
- Strategy **needs to be probed** as each university space and ecosystem works differently.

CONCLUSION

This research has provided valuable insights and findings regarding the complex ecosystem and problem regarding women in tech in private Peruvian universities. Even though this project tries to tackle a wicked problem, some solutions where we can get started were discovered and offer proper initial guidance on where we could move forward.

Firstly, this primary and secondary research has further evidenced that the problem of little participation of women in tech as university students responds to a reality in Peru, where society pushes its population towards gender roles and stereotypes, further finding support on its traditional, religious, and conservative background. Struggles of women who studied a tech career revolved around harassment, bullying, and demotivation by their own environment. Listening to both experts' opinion and students' experiences were of high value to further understand how these factors kept women away from studying or choosing these careers.

The reason why universities and undergrad students were chosen as a target of study is that they showed the most potential to trigger change. Even though it is evidenced that change regarding gender roles and stereotypes starts as soon as one is born, it is important to understand that the Peruvian reality would not allow it, making it harder to start change at such an early stage due to high rejection. Universities are a space for students, they are also connected to high schools as well as future employers, and in some sense with the public sector. The opportunity here is to teach young adults in order to reduce the gender gap, but also acknowledge universities' key position to implement change to their ecosystem by influence.

The strategy and strategic plan pose an initial solution which responds to Peru's, specifically Lima's, environment and reality when it comes to gender roles and highly masculine careers. Strategies need to first become resilient and strong, and the only way of doing so is by creating strong allyship and making main stakeholders that hold power understand why this is important for them and the institution. This is the most important point of all (relationship building), as with no help from those to make decisions it will negatively affect whether things will work out in the end.

Ensuring inclusivity at every stage is crucial, along with promoting initiatives that provide representation, role models, and a sense of belonging. It's essential to frame belonging and equity as benefits for all, not just a minority. Increasing awareness and implementing safety reporting channels are also important. Additionally, employing behavioural design and economics methodologies is vital. Each step or implementation should be carefully strategized to trigger behavioural change with minimal risk of resistance.

In conclusion, while it is hard to expect to make systemic and cultural change, efforts and initiatives can start tackling certain areas where the gender gap is extremely prevalent and present. Tackling such problems is hard, but with enough time and consistent effort this can be achieved.

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APPENDIX

APPENDIX A

Within their study, they have multiple groups with lists of careers. One of this groups is Technology, and these are one of the careers they present in their study:

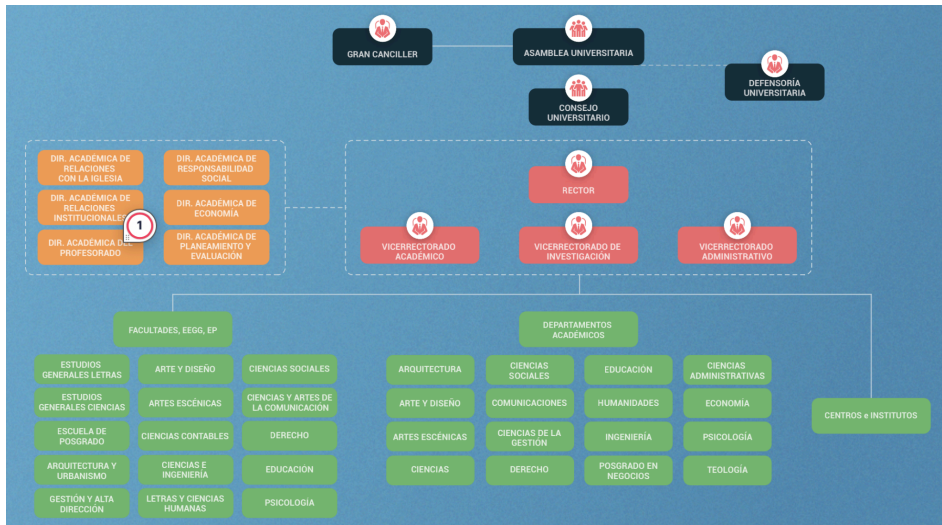
- Additive Manufacturing Engineer
- Automation Anomaly Analyst
- Biomimicry Innovator
- Bioprinting Engineer
- Child Assistant Bot Programmer
- Digital Augmentation Officer
- Digital Implant Designer
- DigiTech Troubleshooter
- Energy and Data System Installer
- Ethical Hacker

These are the first 10 careers in their list. All of these revolve in new necessities as future demands of more an new technology, on making efficient processes, revolving around health or the environment, and others.

APPENDIX B

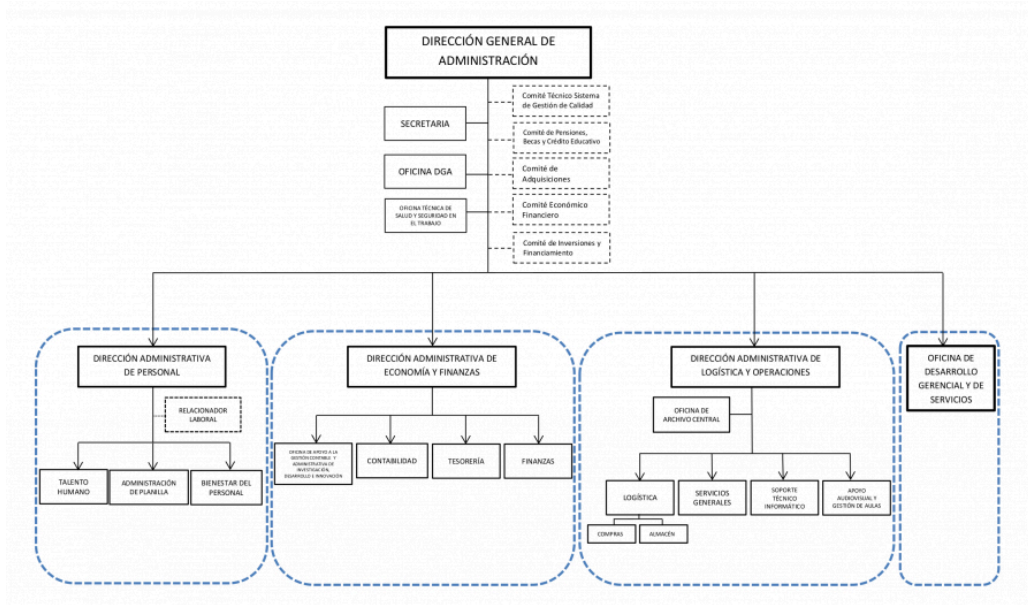
Organizational structures vary in different universities in Lima. We will be observing a few of them to further understand how they are structured as an organization, as well as how their Science faculties are organized. The following images show the organizational chart of 3 different private Peruvian universities in Lima:

- PUCP (*Pontifical University of Peru*)



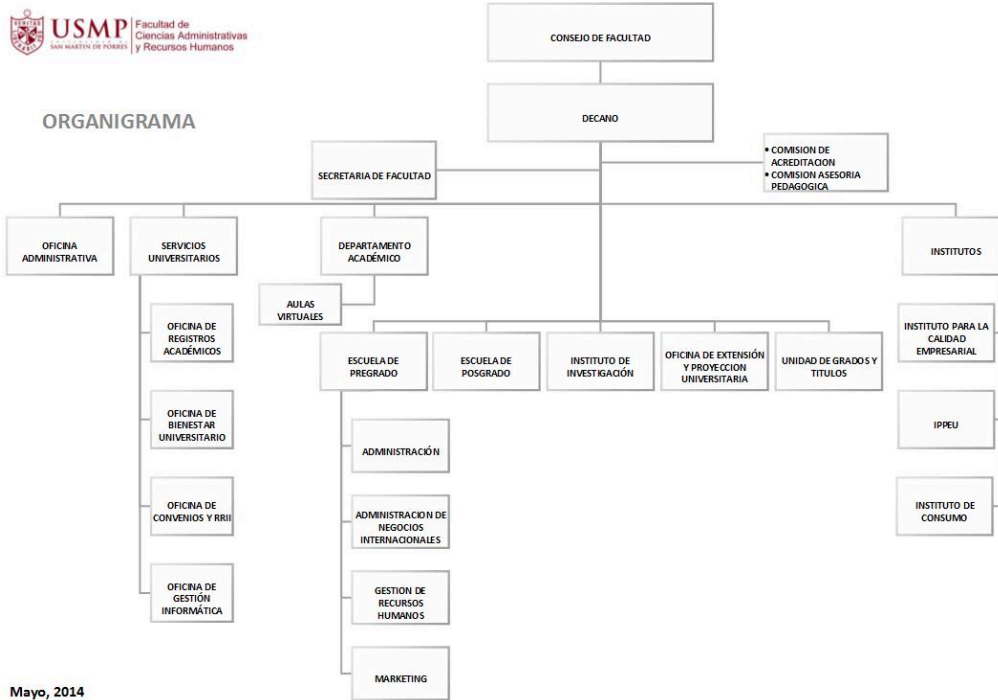
(PUCP, n.d.)

- UPCH (*Peruvian University Cayetano Heredia*)



(UPCH, n.d.)

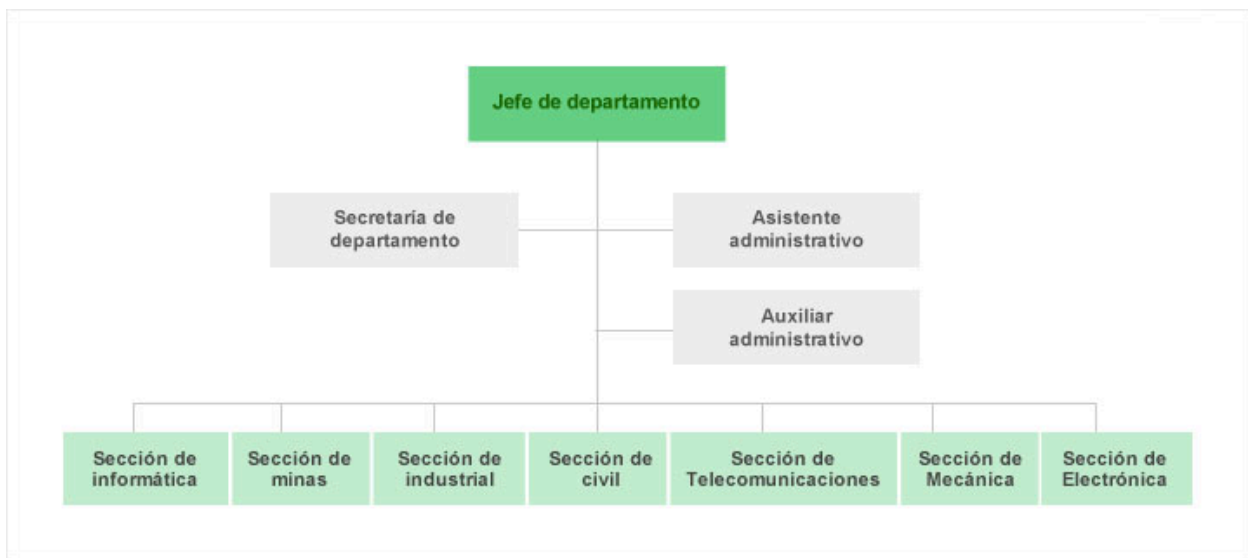
- USMP (San Martín de Porres University)



(USMP, 2014)

About Science/ Tech Faculties

We're now going to take a closer look into different science faculty's organizational structures. We will take PUCP (*Pontifical University of Peru*) as an example to further understand the faculty's hierarchy's.




(PUCP, n.d.)

About Tech Careers/ Programs

Career or program curriculums can vary depending on the person's career of choice. In order to have a better understanding or comparison between them, we will choose one career or similar ones in order to evaluate and bring further discussion on how they are structured. In this case, we will review curriculums for Computer science programs:

- UTP

	Curriculum de Ingeniería de Sistemas e Informática	Código: GCU – CU136
		Versión: 01-2023

Malla Curricular de Ingeniería de Sistemas e Informática

	CILO 1	CILO 2	CILO 3	CILO 4	CILO 5	CILO 6	CILO 7	CILO 8	CILO 9	CILO 10									
COMPRESIÓN Y REDACCIÓN DE TEXTOS I	4	CÁLCULO APLICADO A LA FÍSICA 1	4.78	CÁLCULO APLICADO A LA FÍSICA 2	4.78	ANÁLISIS Y DISEÑO DE ALGORITMOS	3	ALGORITMOS Y ESTRUCTURAS DE DATOS	3	ADMINISTRACIÓN Y ORGANIZACIÓN DE EMPRESAS	3	DESARROLLO WEB INTEGRADO	2	DISEÑO E IMPLEMENTACIÓN DE ARQUITECTURA EMPRESARIAL	3	CURSO INTEGRADOR II: SISTEMAS	3	ELECTIVO I	3
INDIVIDUO Y MEDIO AMBIENTE	2	LABORATORIO DE CÁLCULO APLICADO A LA FÍSICA 1	0.22	LABORATORIO DE CÁLCULO APLICADO A LA FÍSICA 2	0.22	BASE DE DATOS	3	BASE DE DATOS II	4	ANÁLISIS Y DISEÑO DE SISTEMAS DE INFORMACIÓN	4	DISEÑO DE PRODUCTOS Y SERVICIOS	3	GESTIÓN DEL SERVICIO TI	3	FORMACIÓN PARA LA INVESTIGACIÓN - SISTEMAS	4	ÉTICA PROFESIONAL	2
INGLÉS I	3	INGLÉS II	3	ESTADÍSTICA DESCRIPTIVA Y PROBABILIDADES	3	ESTADÍSTICA INFERENCIAL	4	DISEÑO DE PATRONES	2	CURSO INTEGRADOR I: SISTEMAS - SOFTWARE	3	HERRAMIENTAS DE DESARROLLO	3	HERRAMIENTAS DE PROTOTIPADO	3	GESTIÓN DEL CONOCIMIENTO	2	FORMACIÓN PARA LA EMPLEABILIDAD	3
INTRODUCCIÓN A LA MATEMÁTICA PARA INGENIERÍA	5	INTRODUCCIÓN A LAS TIC	2	INGLÉS III	3	INGLÉS IV	3	HERRAMIENTAS INFORMÁTICAS PARA LA TOMA DE DECISIONES	2	GESTIÓN DE PROYECTOS	3	LENGUAJES DE PROGRAMACIÓN	2	HERRAMIENTAS PARA LA COMUNICACIÓN EFECTIVA	3	INTERACCIÓN HOMBRE MAQUINA	3	INGENIERÍA ECONÓMICA	3
INTRODUCCIÓN A LA VIDA UNIVERSITARIA: INGENIERÍA DE T.Y TELECOMUNICACIONES	2	COMPRESIÓN Y REDACCIÓN DE TEXTOS II	4	CIDADANÍA Y REFLEXIÓN ÉTICA	3	INVESTIGACIÓN ACADÉMICA	4	REDES Y COMUNICACIÓN DE DATOS I	4	HOJAS DE ESTILO EN CASCADA (WIKIPEDIA)	2	LIDERAZGO Y GESTIÓN DE EQUIPOS	3	INNOVACIÓN Y TRANSFORMACIÓN DIGITAL	3	PLANEAMIENTO ESTRATÉGICO DE LAS TIC	4	NUevas TECNOLOGÍAS Y TENDENCIAS	2
PRINCIPIOS DE ALGORITMOS	2	MATEMÁTICA DISCRETA	2	MATEMÁTICA PARA INGENIEROS II	2	PROBLEMAS Y DESAFÍOS EN EL MUNDO ACTUAL	3	SISTEMAS ORIENTADOS A DATOS	3	JAVA SCRIPT AVANZADO	3	SEGURIDAD INFORMÁTICA	3	INTELIGENCIA DE NEGOCIOS	4	SISTEMA DE INFORMACIÓN EMPRESARIAL	3	SERVICIOS CLOUD	3
MATEMÁTICA PARA INGENIEROS I	4	TALLER DE PROGRAMACIÓN	4	TALLER DE PROGRAMACIÓN	3	PROGRAMACIÓN ORIENTADA A OBJETOS	3	TALLER DE PROGRAMACIÓN WEB	2	MARCOS DE DESARROLLO WEB	3	TEORÍA DE SISTEMAS	3	NEGOCIACIÓN Y NARRATIVA	2	TALLER DE INVESTIGACIÓN - SISTEMAS	4		4
	18	20	19	21	20	21	19	21	19	21	19	21	19	21	19	20			

FG	Formación General	11 Cursos	35 Créditos
FE	Formación Especializada	21 Cursos	105 Créditos
	TOTAL	32 Cursos	140 Créditos

(UTP, 2023)

- PUCP (*Pontifical University of Peru*):

Nivel 1	Nivel 2	Nivel 3	Nivel 4
Álgebra matricial y geometría analítica (4.5 créditos)	Cálculo diferencial (4.5 créditos)	Cálculo integral (4.5 créditos)	Cálculo aplicado (4.5 créditos)
Comunicación académica (3 créditos)	Ciencia y filosofía (3 créditos)	Cálculo en varias variables (4.5 créditos)	Física 3 (4.5 créditos)
Fundamentos de cálculo (4.5 créditos)	Dibujo en ingeniería (4.5 créditos)	Estructuras discretas (4.5 créditos)	Laboratorio de física 3 (0.5 créditos)
Fundamentos de física (3.5 créditos)	Física 1 (4.5 créditos)	Física 2 (4.5 créditos)	Técnicas de programación (5 créditos)
Química 1 (3.5 créditos)	Laboratorio de física 1 (0.5 créditos)	Laboratorio de física 2 (0.5 créditos)	Electivo de humanidades 2
Laboratorio de química 1 (0.75 créditos)	Trabajo académico (3 créditos)	Fundamentos de programación (3 créditos)	Electivo de Teología y religión
	Idioma extranjero (Nivel básico de inglés)		
	Electivo de humanidades 1		

(PUCP, n.d.)

- UTEC (*University of Engineering and Technology*)

300 DE LA COMPUTACIÓN

NIVELACIÓN

En UTEC sabemos lo importante que es empezar la etapa universitaria de la mejor manera. Por eso hemos diseñado un programa de nivelación que te permitirá reforzar tus conocimientos en las áreas de matemáticas, física, química y habilidades comunicativas. Participa de este programa y vive una excelente experiencia universitaria.

REAL - LIFE EXPERIENCE

A partir del cuarto año, te enfocaras en una experiencia externa y real de la elección (proyectos en empresas, programas de intercambio, trabajos de investigación, proyectos sociales, emprendimientos).

LA NUEVA INGENIERIA

Una Ingeniería más innovadora y más integral.

MALLA CURRICULAR

AÑO OBLIGATORIO	01 01/2020	02 /2020	02 03 /2020	04 /2020	03 05 /2020	06 /2020	04 07 /2020	08 /2020	05 09 /2020	10 /2020	
INICIACIÓN PARA LA VIDA UNIVERSITARIA	Programación I 4 Cálculo de una Variable 4 Matemáticas Discretas I 4	Programación II 4 Cálculo Vectorial 3 Álgebra Lineal 2 Óptica y Ondas 4 Matemáticas Discretas II 4	Ecuaciones Diferenciales 3 Estadística y Probabilidades I 4 Desarrollo Basado en Plataformas 4 Programación III 4 Base de Datos I 4	Métodos Numéricos 3 Algoritmos y Estructuras de Datos 4 Teoría de la Computación 4 Arquitectura de Computadores 4 Cloud Computing 3	Combinaciones 4 Análisis y Diseño de Algoritmos 4 Ingeniería de Software 4 Base de Datos II 3	Machine Learning 4 Estructura de Datos Avanzadas 4 Programación Competitiva 4 Sistemas Operativos 3	Computación Paralela y Distribuida 4 Computador Gráfico 4 Interacción Humano-Computador 4 Redes y Comunicaciones 3 Electivo Libre I 4	Investigación en Computación 3	Internet de las Cosas 4 Electivo de carrera I 4 Electivo libre II 4	Electivo de carrera II 4 Electivo de carrera III 4 Electivo libre III 4	CONCENTRACIÓN EN INGENIERÍA DE LA COMPUTACIÓN
INICIACIÓN A LAS CIENCIAS BÁSICAS (UNIVERSITARIAS)	Laboratorio de Comunicación I 3	Laboratorio de Comunicación I 3			Prac. Temas de la sociedad contemporánea 3	Economía, Gobierno y Relaciones de Poder 3		Arte y Tecnología 3	Arte y Tecnología 3		
INICIACIÓN A LA INGENIERÍA Y EMPRENDIMIENTO	Proyecto Interdisciplinario 3		Proyecto Interdisciplinario II 3	Empres y Comandante 3	Proyecto Interdisciplinario III 3	Finanzas Empresariales 3		Proyecto Profesional 8	Evaluación Funcional de Proyectos 3 Tesis I 4	Estrategia y Organizaciones 3 Tesis II 4	

*SUJETA A CAMBIO POR LAS EXIGENCIAS DEL MERCADO LABORAL Y DEL MODELO HOLÍSTICO Y GLOBAL DE LA UNIVERSIDAD. EL PLAN DE ESTUDIOS ES FLEXIBLE, PERMITIENDO QUE EL ESTUDIANTE PUEDA, SEGÚN LOS PRERREQUISITOS ACADÉMICOS, CURSAR ASIGNATURAS DE DIFERENTES CICLOS.

(UTEC, n.d.)

APPENDIX C

- **Blockchain technology** offers secure and permanent storage of information on a ledger, ensuring authenticity and preventing fraud. For education providers, blockchain applications include:
 - Curriculum design: Insights into curriculum performance and design.
 - Student prediction: Anticipating student outcomes for proactive support.
 - Tailored marketing: Using insights to enhance recruitment and retention efforts (Eiras Antunes; Gidro, 2021)
- **The API Economy** refers to the use and management of Application Programmer Interfaces (APIs) to facilitate data sharing and connection among various applications and systems. For education providers, potential applications include:
 - Enhanced partnerships: Collaborating with education and industry partners to share resources and create a seamless experience for students and researchers (Eiras Antunes; Gidro, 2021).

APPENDIX D

To give further context, Peru was a Spanish Colony from the 15 to 18 hundreds. With this in mind, we can now talk about gender as a colonial tool (Ballestín, 2018). European colonization included the extension of their gender systems onto the colonies or colonized cultures (Ballestín, 2018). In many colonized societies, gender norms might have varied differently to those of European countries, where it is researched where this “gender norm” actually stems, and how it was imposed to colonies by European colonizers (Ballestín, 2018). In this sense “Gender itself might be understood as a colonial object in as much as colonial gender norms were often vastly different before and after the colonial encounter and differed as a result of the “encounterer” between the colonizer’s gender system and whichever gender system existed in that culture previous to colonization” (Ballestín, 2018).

This then bridges to capitalism itself, as there is a connection between the expansionist behaviour in colonialism and capitalism (Ballestín, 2018). As capitalism imposes colonial gender systems to “the need of reproductive labour under capitalist systems” (Ballestín, 2018). With this, we can understand the following diagram, where capitalist behaviour is the driver for colonization, and colonization in turn transforms gender systems and in this sense, capitalism takes advantage of gender systems for its benefit.

In this sense, we can also discuss the connection and how much patriarchy and capitalism rely on each other to exist in this society.

In this sense, Patriarchy is a social order based on the holding of power and privileges by men. (Allan, 2021). In this socially constructed reality:

there are rules set on: who keeps or maintains power (which can be deeply rooted in culture and societal norms) (Allan, 2021).

Gender stereotypes, naturalization of unequal gender relations, sexual division of labour, gender-based violence, and gender norms privileging the male (Allan, 2021).

Other interrelations such as race, class, north-south, power structures, etc. need to be considered as well (Allan, 2021).

In this broader aspect, patriarchy pre exists capitalism. But in this sense, capitalism benefits by keeping patriarchy alive in our societies. In response, capitalism contributes to the institutionalization of the devaluation of women and their work, as capitalism comes to replace the

medieval feudal system and its own vision of women bringing the following to modern societies:

- Unpaid domestic work
- Housewife concept
- Professional segregation
- Regression in the status of women (Allan, 2021).

Capitalism and patriarchy constantly reinforce each other. Capitalism establishes unequal social relations and serves patriarchy by facilitating the oppression of women in society (Allan, 2021). In turn, patriarchy is useful to capitalism, as it provides a devalued population (women) where they can exploit and derive maximum benefit (Allan, 2021).

APPENDIX E

- **Maternity:**

In Peru, most stereotypes derive from the concept of maternity, and a woman's duty to become a mother.

As women are the ones who carry the baby, it is often assumed they are responsible for their upbringing, nurture, and care. It is often thought that women are made to be at home with children, cooking, cleaning, and doing other activities at home and that they have nothing else to contribute to their families or society. In this context, it is expected that every woman will get married, have a child and that they will dedicate their lives to them. Implying that if they have a job they will eventually have to drop it to become a mother. Therefore, any woman who has no desire or plans on becoming a mother is highly criticized, as it is assumed it goes against gender roles that are often assumed or deemed as "natural".

Maternity and paternity roles are filled with stereotypes. Unlike maternity, paternity is often associated with providing economic support for the family (public sphere), rather than being directly involved in childcare (private sphere). As a result, laws regarding parental leave vary significantly. In Peru, women are entitled to 45 days of maternity leave before and after birth, while men receive only 10-15 days of paternity leave. This drastic contrast in leave duration reinforces the notion that women are primarily responsible for childcare, while men are not (Ministerio de Trabajo y Promoción de Empleo, n.d.; Bartra, 2023).

In a more equitable scenario, both parents would have extended leave to collaborate in caring for their child, allowing the mother time to recover and the father to support their partner during this period. Some Peruvian private companies have begun to promote co-responsibility by extending paternity leave, aiming to gradually close the gender gap between paternity and maternity leave.

Other gender disparities, such as the wage gap and professional advancement gap, are exacerbated by this stereotype. Women approaching motherhood age often face rejection or are deemed unhireable, as potential maternity leave is seen as a risk factor

for companies. Additionally, women who choose to balance motherhood with their careers often experience stagnation in professional growth, while men continue to progress. Consequently, women may encounter delays in promotions and career development opportunities.

Peruvian universities lack adequate support for pregnant or parenting female students. These students often find themselves forced to pause their studies, experiencing financial losses from prepaid tuition, and receiving little flexibility with evaluation deadlines. Universities are unprepared to address the needs of this demographic, resulting in many female students leaving their studies permanently.

APPENDIX F

- **Social-Construct vs Biology**

Most experts mentioned the concept of “Social construct vs Biology or Nature”. This entails the ongoing debate about whether traits are inherent to one's sex or gender's biology, or if they are learned during early development or accepted as a result of societal constructs or norms.

Experts do agree that there are biological differences between the male and female sex, but behaviours, decisions, likes or dislikes, and others have been proven by studies to not be inherent to the sex one is born.

They point out that even before babies are born, they're already being labelled with expectations about their likes, behaviours, clothing, and activities based on their sex. These notions are ingrained in us from early on, making it hard to tell later what's truly natural and what's influenced by societal norms. While studies show these norms are taught by society, conservative contexts often push back against such ideas.

When it comes to women, there's a lot of talk about the "motherhood instinct." Young girls are often introduced to nurturing and household chores early on, through play and toys; while boys tend to get toys that encourage construction and problem-solving. This early division in play can impact the skills they develop later in life, leading to more women in fields such as psychology and more men in engineering. This cycle of gender stereotypes keeps getting reinforced.

APPENDIX G

Empathy Map Results:

Think and Feel

- Feeling unsafe in a highly masculine space
- Unfair to be constantly tested or prove my worth just because I'm a woman
- I don't know where to go if I am harassed/ bullied or if someone I know is harassed or bullied
- Feel insecure about participating or asking questions in fear of being judged
- Constantly judged harsher compared to male peers
- I feel objectified
- They only view me as someone who is organized and is only good at that
- I am tired of receiving comments that I'm not good enough because I'm a woman
- I feel under represented, I don't have female professors
- I have lost my self of identity
- I don't have freedom to grow and learn who I really am

See

- Too many male students
- Too many male professors/ TA
- Harassment + bullying to myself
- Harassment + bullying to other female students
- Crying from other students for being bullied

Say and Do

- I agree with male peers even I don't
- I am afraid to ask questions as I might be judged by my peers or professors
- Questions are not welcomed by my professors in this space
- I don't speak up as I'm the minority

- I don't report as I don't know that is even possible
- Sometimes I responde to professors that are disrespectful
- If I'm harassed I don't do anything out of fear or because I don't fully understand what is happening
- I wear large baggy clothes so that my classmates will avoid saying things to me

Hear

- That they are not enough
- That this is not my place to be
- That I'm taking space for other men
- Harrassment, bullying, and talking behind a female student's back
- Professors being agresive or harrassing me

Pains

- Being harrassed by classmates, professors, TAs, employers
- Not being hired because I'm a woman
- Not been taken serious because I'm a woman
- Not having a support system adequate for me
- Constant questioning if this career path is worth it
- Being told by relatives, friends, teachers, and professors that this career path is not for me, only for men
- Not having enough friends (especially women)
- Failing classes
- Not having female professors
- Not having who to go to report or speak with when getting harrassed
- Being told that I will leave my career because I will become a mother
- Not having enough representation of women in my class/ faculty/ university
- Being expected to demonstrate they are smarter to be taken as an equal
- Not having a community to speak with
- Having aggressive/ disrespectful professors
- Dealing with a highly masculine space
- Dealing with stereotypes towards women

Gains

- Status from being a woman in tech (few)
- Become a role model for other women (especially students)
- Support from my parents from an early stage
- STEM is a highly paid career with good reputation
- Tech will be a career that will last in the future
- Studying a challenging career

APPENDIX H

Positive Scenario: Transformational- Maximum Development

Peru in 2050 has joined the highly competitive technology race that is seen worldwide. Private as well as public entities saw 20 years ago the importance of investing in this field for the sustainable future development of the country. Ministries responsible for constructing new economies, innovation, and technology have shifted their focus to fully increase their investment and prioritization in this field.

In this aspect, the number of professionals in technology has increased as well as opportunities. This was given not only by increased investment in scholarships for women to have interest and access to technology programs in private universities, but technology also gave access to high-quality education from these universities to Peruvians across the country. Access to VX and AR classrooms, powered by AI to elevate educational delivery in hybrid settings has made this possible. Peru was able to join the technological race successfully, as tech professional numbers meet the demands of the increasing job market.

There has been an increase in the number of female students in universities, to the point where there are equal numbers of men and women enrolled, which has been possible after years of efforts from different Peruvian sectors, with International help. These equal numbers of female and male professors are also seen, giving equal opportunities to voice their opinions and ideas in an educational space.

Gender and inclusivity conversations around science faculties have become normal, thanks to the introduced strict university policies, training, and support systems for female students and professors. Gender disparity is an ongoing conversation, but it is no longer a problem. Curricula in tech careers have introduced courses that encourage soft skills, communication, community building, and critical thinking. This started with a main focus on female students, especially giving them leadership training, however, this is now mandatory for all tech students, as new technologies, such as automation and AI, now execute tasks that 30 years ago professionals would do. Focus on soft skills and critical thinking for collaborative and high

problem solving is in demand and highly valued by these professions nowadays, thus the importance of the inclusion of these different skills in their curriculum.

Female students have access to communities of women in tech, where they can voice and share their opinions freely. Access to female mentorship and role models is easy, either in Peru or technology has facilitated them to have access to other women in tech internationally. A community of alumni exists, where women in tech can connect.

Universities have also created and set policies for many years regarding respect and gender equity among their professors and students. Venues to provide help and support for those being victims of harassment have been established correctly, and they have been successful in aiding students as well as sanctioning people who might be perpetuating against other students. Zero tolerance towards gender violence or sexism is widely known and respected in these higher education systems.

Companies highly invest and partner with private universities, as they are in high need in of these professionals and by law require a 50/50 rate of hiring men and women. Universities work together with these companies, as well as have instilled for years now a series of policies to protect their female young professionals (as interns or graduates), where they have been told to invest in work culture and training regarding gender equality. This reinforcement has created a suitable space for women over the years, decreasing considerably the number of women leaving their profession after they graduate due to sexism or harassment.

Due to it being in the best interest of both, companies respect and follow through with this collaborative training to retain and have availability to hire highly skilled professionals who are in high demand.

The government has also partnered with these universities, as in their internships or once they graduate students/ professionals have been able to aid the threat of the technology gap in Peru regarding their highly manual or manufacturing industries that are the most important in their economy, potentially risking increased unemployment. They have been able to develop new technologies that have replaced labour work, but universities with new technologies have been able to recruit and enroll new students (previously in labour work) to learn about these new technologies, even at a technical level. This way, thousands of people who could've lost their

jobs in the 4th Industrial Revolution were kept up to date, trained, and engaged to use new technology or even be part of its creation.

APPENDIX I

Negative Scenario: Risks and Threats

By 2050, the Peruvians had not prioritized increasing investments in technology development. Political instability has been the culprit of these decisions, as well as feeling confident that their industries would not be impacted by the 4th industrial revolution. Even though there were some initiatives from the private sector to invest and increase these technological advancements, it was not enough for Peru to join the technological race. There is now a bigger gap between developed and developing countries regarding production and adoption of new technologies, making countries such as Peru more vulnerable to exploitation and low possibilities to continue developing.

This has deeply affected Peru, as international companies that invest and have their own companies (such as mining and fishing) decided to implement AI and automation to increase efficiency in their processes, laying off thousands of Peruvians from their jobs. This added more social and economic stress, preventing or making it difficult for Peru to join late towards technology investment. Due to these stress factors, protests and population discontent spread throughout the country, increasing violence including gender violence.

Due to the low investment in technology, people around Peru are still unable to have quality or any sort of higher education remotely, increasing the education breach. Even though there is an attempt to increase technology, due to low investment there was no incentive for professionals to join these careers, therefore the amount of professionals does not meet the demand of them in the job market. Even though there is an opportunity to train the unemployed population, the economy and lack of technology will make this virtually impossible for them to access it.

As gender violence increases, this continues to exacerbate in highly masculine spaces such as the technology field. Fewer women get enrolled, causing more constraints in this profession as there are fewer possibilities for this field or sector to grow in the medium or long term future. Less female representation and role models, or visibility of them for female students, increases behaviours such as harassment, mistreatment, and beliefs in gender roles or stereotypes.

Universities still don't prioritize this as a concern, and unconscious biases in highly masculine spaces are not challenged or corrected. Universities therefore don't believe there is a plan to be made to fix this problem or create great avenues or strategies for resilient change, which as a result causes fewer and fewer women to enroll in tech careers. Only superficial solutions are offered, but this does not impact the root cause of the problem.

This creates an "echo chamber" problem, where men continue to validate their ideas on gender roles and stereotypes, while forcibly excluding women from this field. Posing risks that tech produced in Peru will not address female issues or needs appropriately.

Professionals don't see a future in tech, and the ones who are studying or have graduated decide to look for opportunities internationally, as working remotely is possible. This means those professionals who are there to work on tech opportunities in Peru, are not motivated by the current situation on a professional or personal level and decide to work for companies that inspire them, and usually these are companies that are part of countries that have already invested in technology and are highly innovating.

Even though Universities and Companies in the private sector continue to work together, they do not prioritize any soft skills, empathy, critical thinking, or inclusivity. This highly isolates professionals on how to work in teams, limiting them on how to innovate and putting at risk women who are tech professionals. The increase in violence in this field makes the few women employed decide to shift their career paths, and if they are students change careers, posing more threats in any possibility to have technological advancements in Peru.

APPENDIX J

Ecosystem Map 2054



Private Universities

High Schools

- Strong new addition to educational curriculum regarding Tech, designed by high standard professionals in the field- hands on and in practice work.
- In Science class
- Extra curriculars
- With access to highly renowned tech professionals as teachers (50/50 f and m)
- Connection and access to Universities venues to explore tech faculties

Private Universities

High Schools

- Access to interest potential students in tech in their late years of studies
- Access to venue to teach and collaborate in tech education
- Access to venue for fairs and to offer talks of "Women in Tech" to inspire young female potential students in tech

Private Universities

Ex-Alumni

- Space to work as a professor with flexibility to their own time and lifestyle
- Space to be part of ever growing "Female students in tech" community, with access to international universities, mentors, representants, and possibility to be a mentor and speaker at events (connection + networking)
- Space to advocate and showcase their expertise to others

Private Universities

Ex-Alumni

- Expertise in the tech field as a professional and a woman
- Be part of the "Female students in tech" community as a mentor, representation, speaker, and organizer of events
- Knowledge onto what's happening now a days with Tech field
- Connection with current students
- International Universities connections (if they study abroad)

Private Universities

National/ International Universities



- Expertise exchange
- Collaborative work for betterment
- Constant feedback (Ex: Curriculum, hiring processes, exchange programs, etc)
- Exchange of professors (broaden international expertise)
- Access to resources that lack otherwise in their country (ex: female professors in tech)

Private Universities

Private Sector Entities



- High standard professionals
- Increased supply of professionals for their companies in the future
- Diverse population of professionals- Increased innovation and precision in results (more inclusive)
- Collaborative work for curriculum and experiences for future tech workers
- Top of line of recommendation for students to work in companies that comply with inclusivity and gender equity standards
- Connection with consultancies and professionals that will guide them through this

Private Universities

Private Sector Entities



- Curriculum input- content that will prepare for current and future tech field scenario needs
- Offer experiences (in field) as internships/ jobs to students
- Will promote and upkeep with inclusivity and gender equity policies within their work culture and structures
- Will hire 50/50 of female and male students.



- Gender + Inclusivity Continuous- Seamless system (upkeeping + Policy/ Norm)
 - Evaluation
 - Workshops
 - Training
 - Feedback
 - Execute strategies
 - Streamlining hiring processes (aid)
- Community/ connections/ representation- Ongoing and seamless team work
- Strategy and next step/ plans



- Expertise exchange
- Collaborative work for betterment
- Constant feedback (Ex: Curriculum, hiring processes, exchange programs, etc)
- Exchange of professors (broaden international expertise)
- Access to resources that lack otherwise in their country (ex: female professors in tech)



- Policy actors on inclusivity and gender equity within the tech faculty- help you on ground level
- Implement inclusivity from forefront
- Trustworthy community who will help spread the word and good practices to others in closer proximity (ex: as a friend, not from an imposing figure or manner)