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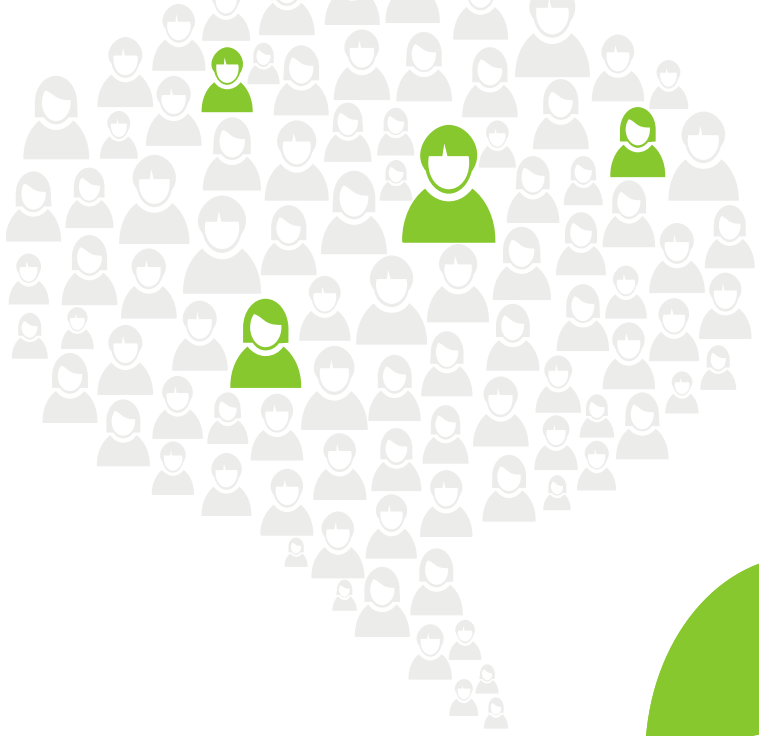
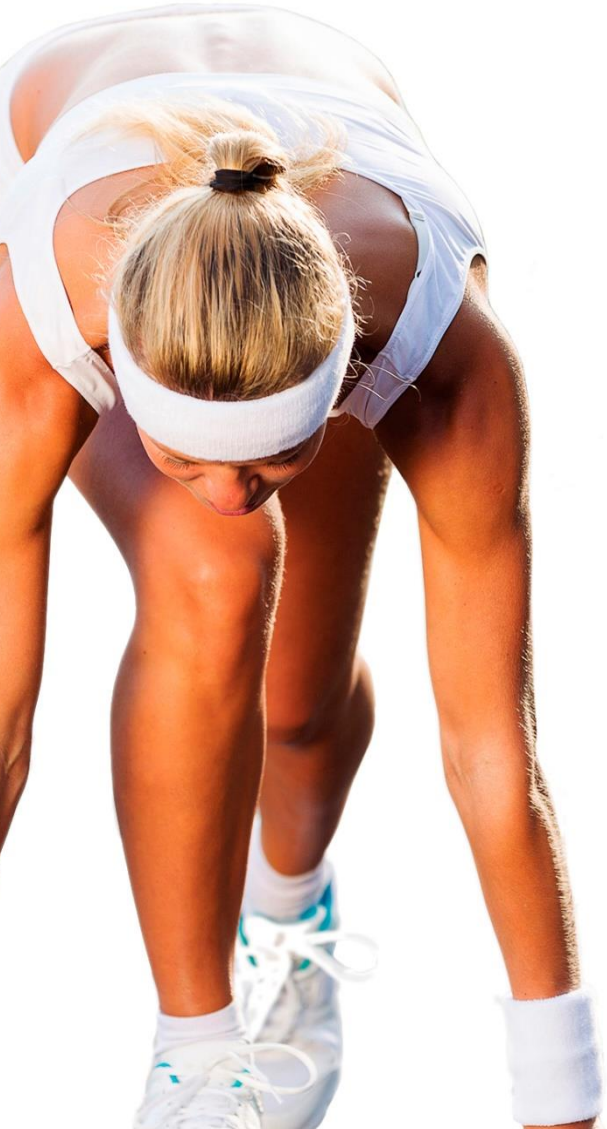


THE STRUGGLE FOR BOOSTING
THE FEMALE ENTREPRENEURSHIP

WOMEN AND TECHNOLOGY

SERIE INNOVATION TRENDS



01

Women's long-haul journey to enter the world of technology

February 2015. Four people get together to have a few beers in Madrid, and they decide to set up Mujeres Tech. One month later, three women decide to create Girls in Tech in Granada while having breakfast together. Two independent organizations in pursuit of the same goal: to encourage the presence of women in the world of technology.

One year later, one of the founders of Mujeres Tech – Cristina Aranda, the marketing and communications director at Intelygenz– says: "We don't want to sell tech, we want to make it". And she goes on: "There are very few women programmers today, and this situation has to change. The average profile of women programmers at Twitter, Facebook and other companies is 15%, and in **the startup ecosystems there are very few female founders or co-founders".**

Aranda wants "more women in the digital sector". Elena Cruz, a telecommunications engineer and co- founder of Girls in Tech, agrees. "The Girls in Tech organization started in 2007 in San Francisco as a meeting point for women interested in technology. We thought it would be interesting to create a movement of this type in Spain, and we started up last year", she says.

From left to right: Molly Sears-Piccavey, Pilar Calvo Acuña, Marina Serrano Montes and Elena Cruz Martín.

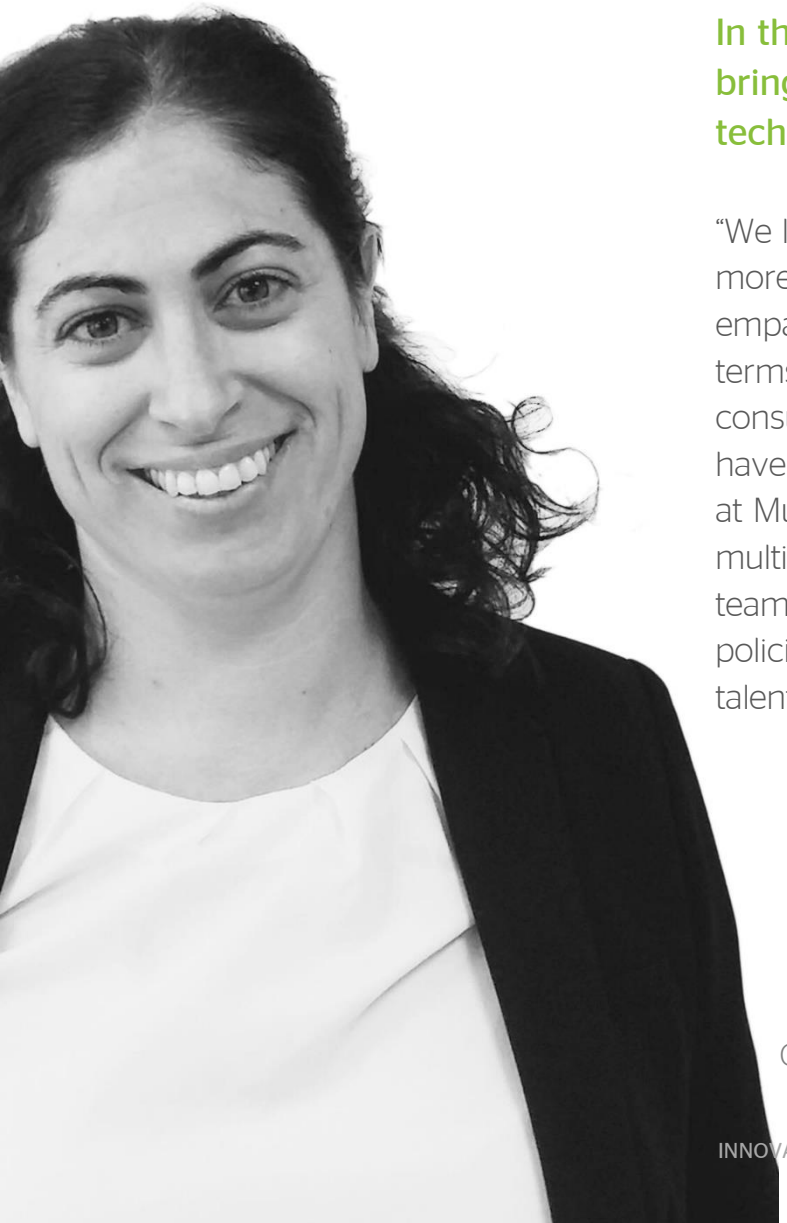
Why do women lose interest in technology as the years go by?

Both Aranda and Cruz agree about the cause: “a biased outlook”. “Little girls don't see role models they can identify with. **They see very biased views** in comics and videogames. Roles for boys and girls are highly segregated and that means they lose interest when they reach adolescence”, says Cruz.

Aranda points out that at this “difficult time for teenagers, when peer pressure is very strong, several studies highlight the negative Pygmalion effect of the gender bias which holds that boys are good at science, and are encouraged to steer their course towards science, whereas girls tend towards careers with social impact: medicine, nursing –if they're on the science track–, and always in the humanities if they're good at expressing themselves”.

The co-founder of Girls in Tech urges them not to lose their motivation. “We want to publicize stories of women promoted by women”. According to Aranda, “our commitment here at Mujeres Tech is to create actions with social impact that steer girls and young women towards technology, and focus on technology as something that's fun and attractive”. And she points out **the importance of visibility:** “If you have no role models, like they do for example in the United States –look at Megan Smith, Obama's CTO–, and if you don't see female programmers or scientists in the media, the going is going to be hard. Both Aranda and Cruz agree (although they were interviewed separately –Aranda in Madrid, and Cruz by phone from Granada) that this is a long-haul journey.

Megan J. Smith



In this race, what do women bring to the world of technology and business ?

"We listen more, we go into more detail, we're more empathetic, we think more in terms of the product, the consumer and the impact. We have a more holistic view. Here at Mujeres Tech we champion multidisciplinary multi-gender teams. We want to promote policies for recruiting female talent within companies. I'm surprised there are no diversity departments inside companies, or diversity policies. What talent recruitment policies do companies really have? Do they operate like American companies where there has to be at least one woman candidate for every job? The female vision is very important in companies –just like the male approach– but it's different. We tend to think more in the long term", concludes Aranda.

Cristina Aranda

Cruz points out that the most significant finding when they run workshops with young people is how creative teenage girls are. “They surprise us, rather than the other way around. Their creativity when they present their projects is incredible”. And in the professional sphere, “they ask more questions before they launch projects and they tend to have to do with social issues”.

Mujeres Tech aims to have a headquarters where “both men and women can come to enjoy technology, and so we can continue fostering the spirit of enterprise in girls from a very young age. We women can be adventurous”. Girls in Tech wants to drive technology in women whatever their age. These are two organizations that work passionately to achieve their goal.

They want to change a world in which “‘companies do not allow women to be leaders or men to be fathers’. And it’s true”, concludes Aranda recalling the words of Margarita Alonso, chairman of the IE Foundation, in one of her inspirational talks.

02/ INTERVIEW

Leticia Gasca: “Entrepreneurs identify problems and offer solutions”

Leticia Gasca is a guru who wants to tell the more adventurous the truths about the entrepreneurship scene. It's not all about smiles, closed deals and instant income, and this is why she founded Fuckup Nights, a movement that encourages entrepreneurs to talk about their failures. Gasca is one of the 33 innovators featured in the ebook Hablan los protagonistas (The key players speak).

What is Fuckup Nights?

It is the most active entrepreneur movement in the world. We have events that take place in 150 cities in over 50 countries and it emerged in Mexico just over three years ago. We also have the Failure Institute, the only research center in the world focused on studying failure in business.

What is your motivation?

It all started as a hobby: one night I was having drinks with four friends in Mexico City, all of us entrepreneurs, and we realized that we had all failed in business and we had never talked about this, even though we were good friends. The conversation got so interesting that we decided to repeat the experience with more friends two weeks later. That's when we invented the model that is used around the world, which involves getting hundreds of people together so three or four of them tell us in public how they failed in business, using ten images and in seven minutes.

This method generates a kind of informal education that can even help those who know nothing about business so they can learn something practical. We then realized that with this activity we could do research that had been impossible to do until recently.

Can you tell us about the books you've published?

The book of failure is a work by the founders of Fuckup Nights, writers and entrepreneurs. research on the five most frequent reasons why entrepreneurial businesses fail in Mexico. It also includes personal reflections and failure stories, including Enrique Jacob's, the current chairman of the National Entrepreneurs' Institute; it's very interesting to see that, before he became a government official, he was an entrepreneur and he didn't succeed, and this explains why he understands the reality of this ecosystem so well.

In addition, I wrote the book **Surviving Failure**, with no relation to Fuckup Nights. I wanted it to be useful for people who run businesses with problems, thinking about how to prevent a situation that may jeopardize the company.

How do you define the DNA of the Mexican entrepreneur?

It's not somebody who goes through life looking for ideas that haven't occurred to anybody else before. It's someone who **identifies problems and offers solutions** through business models. And I think that the ones who have a better chance of success are those seeking to solve social and environmental problems. Because we've discovered that it's more effective to solve these problems through businesses than through philanthropy or donations, because a solution sustainable in the long term is created.

What are the main challenges facing entrepreneurs / innovators in Mexico?

The main barrier is that **many think that failure is very uncommon**. In other words, when you look at business magazines, go to events or even consider university education in the area, it is very much based on success stories. So it's quite natural to enter this world thinking about the high chance of getting it right, when reality, according to the figures, is very different, because eight out of ten companies fail during the first two years, in other words, there are more failures than successes. In my opinion, that idea is a barrier that needs to be torn down and we have to promote the idea that failure can occur, but it's not the end of the world and with each attempt an entrepreneur has more chances of succeeding.

In pragmatic terms, the main causes of failure in Mexican entrepreneurship have to do with **bad financial planning**. In fact, the main cause is insufficient income to survive. This means that entrepreneurs, who are usually optimistic, imagine that after six months they will have enough money to pay themselves a salary. In practice, this rarely happens. And because entrepreneurs have to continue to pay for their rent, transportation, food, etc., they abandon their project and look for a job. Most businesses in Mexico are closing for this reason.

What are the areas of opportunity for entrepreneurs / innovators in Mexico?

Mexico is in a strategic position to have **innovators with better chances of success**. Having two coastlines and a large number of free trade treaties are opportunities that have not been leveraged by entrepreneurs. We also have the innovation influence from the United States and we are in Latin America, a region with many challenges to overcome, which can motivate us to be more creative and help the community.

What trends do you see in the ecosystem?

We see more and more entrepreneurs committed to social and environmental issues. I think this sector will grow significantly in a few years, especially because there are specialized funds the provide capital for this kind of companies. We also have **everything related to health**. In fact, Jorge Soto, who is one of the rockstars of Mexican entrepreneurship, is creating a technological solution to detect cancer at a very early stage.

Lastly, we have **financial inclusion** through technology, because Mexico still has a huge population not covered by banking services and there are very innovative ways of integrating them into banking by leveraging technology.

What skills do entrepreneurs need?

They need to be highly resilient: the ability to recover after adverse circumstances is very important, because this is going to happen many times, things are not going to work out the way you want, and entrepreneurs can't waste their time. So you have to **maintain mental clarity to make decisions and press on.**

Another essential aspect is to have a good relationship with your partners. We commonly hear in Fuckup Nights about people who are going to tell the story of the company that closed down, not because it wasn't a good business or because the market didn't demand that product or service, but because the partners fell out.

What advice would you give to someone who wants to become an entrepreneur?

If you know nothing about finance, learn something. Enroll in a course, no matter how basic, on accounting for non-accountants, you have to understand the essential accounting aspects of your business. You also need a real accountant, because otherwise your project is doomed to failure, since you'll never know how much money you're making, how much you're spending, whether you're really making a profit or not.

Because it's also important to be willing to "pivot". Sometimes a business model doesn't work, but that doesn't mean it's the end. You can always explore other possibilities.

The values that Leticia Gasca sets out as essential principles for entrepreneurs may not be the typical precepts for making a project competitive on the market, but proposing paradigms is a very effective way to reveal new paths for all those people unsatisfied with reality who want to change the world.

The event held on January 21 was an opportunity to hear the players featured in this ebook. Click here if you'd like to download the full eBook Hablan los protagonistas: 33 innovadores mexicanos (The key players speak: 33 Mexican innovators).

03

Fighting the technology gap between men and women in Latin America

Although we are gradually beginning to see progress today in Latin America, the difference between the number of men and women who work in the field of technology and innovation is still evident. For this reason new initiatives and collectives that are seeking to increase the presence of women in areas such as software development, programming and entrepreneurship are gaining strength each day.

Here are some of the initiatives that they are working on for Latin America to have a more inclusive technological development that is more fairly distributed and has more women in a field that has been dominated by men up until now:

Epic Queen

This is a Mexican organization, which also operates in Colombia. It started as a blog and now works as a collective that seeks to involve more girls and women in different areas and functions of the technology sector. To achieve their objective, they perform four types of actions:

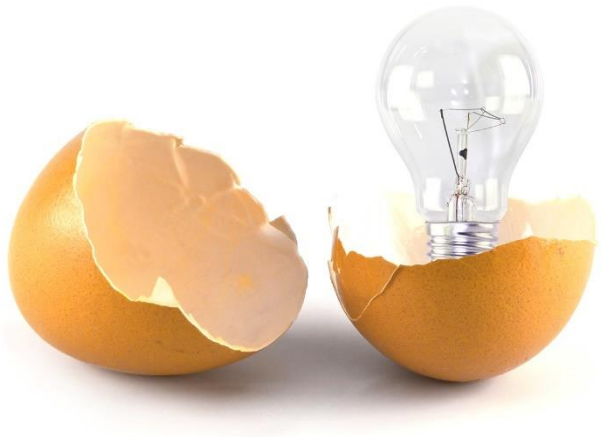
- They maintain a blog where they share content related to technology, feminism, entrepreneurship, science and inclusion politics.

- Events or chapters are held on a monthly basis in different cities in which participants have the opportunity to share with leading women in the field of technology, share experiences and get inspired.

- They developed programs such as Code Party focused on awakening the interest of girls between 6 and 12 years old through code and programming languages.

- STEM Girls, a program that guides young women to make a good decision when developing in fields related to science, technology, engineering and mathematics.

- **Boolean Girl**, in which a group of girls travel to Washington to participate in programming activities and developingsoftware.



Geek Girls

This group seeks to **inspire and empower women in using technology as a change agent.** Its activities include holding meetings and creating communities, training sessions in different areas of technology, creating coworking networks and generating debates and reflection related to women, society and technology.

Women who code

This is a global organization dedicated to putting women into contact with each other who share the same vision: “The world of technology is much better if there are women in it”. Its fields of action focus on free training in programming languages, creating networks of effective contacts and consulting for companies that want to achieve a more balanced and inclusive work culture. In Latin America WWC has chapters in Brazil, Chile and Colombia.

Girls in tech

This **organization was created in San Francisco**, United States, but has chapters in Asia, the Middle East, Africa and South America. Its aim is to maximize the potential for success of **women working in the fields of technology, innovation and entrepreneurship**. Its programs include:

- Catalyst Conference: This is a three-day event in which outstanding women leaders share their knowledge on issues relating to technology and entrepreneurship. - Boot Camp: These are workshops for developing skills in areas such as programming and design.

- Hackathon: These are multidisciplinary meetings that bring together programmers, designers, science students and educators to work on projects creating software and applications.

- Pitch competition: these are days in which women entrepreneurs present their projects or products to a group of entrepreneurs and investors who are looking for new business opportunities.

In Latin America, Girls in Tech has a presence in Argentina, Brazil, Chile, Dominican Republic, Ecuador and Uruguay.

Rail Girls

This is a tour of events that focuses on creating a community that serves to provide and exchange tools for women to develop their technology-based ideas. Its activities are related to the **development of sketches, prototyping, web application development and programming.**

Girls4Code

This Colombian initiative is aimed at stimulating the talent of girls aged between 12 and 17 years old, interested in technology and developing software and applications. The training of Girls4Code consists in a **4-month program** in which the girls are trained in tools and programming languages applied to a project developed under the guidance of a tutor. At the end, participants present their projects and the best come to be part of an immersion cycle guided by expert advisors in the technology sector.

Codies

This is a community of women dedicated to developing software. It also works as a network for exchanging knowledge about technological inclusion projects, a meeting point for networking and developing joint projects led by women. Its website has a blog, a forum and a podcasts section where issues are raised on analysis and debate about the role of women in the area of software development.

Chicas poderosas

This community raised the challenge of making Latin American women lead editorial news rooms in the region, from the empowerment and the use of digital tools and content creation and innovative strategies for the practice of journalism. In its meetings, Chicas Poderosas gathers experts on data, narratives, technology and design in one place that work for media such as The Guardian and The New York Times and the universities of Columbia and Stanford. The Chicas Poderosas group is made up of journalists from Argentina, Brazil, Chile, Colombia, Mexico, El Salvador and Peru.

04

Ada Lovelace: history of the "Enchantress of Numbers"

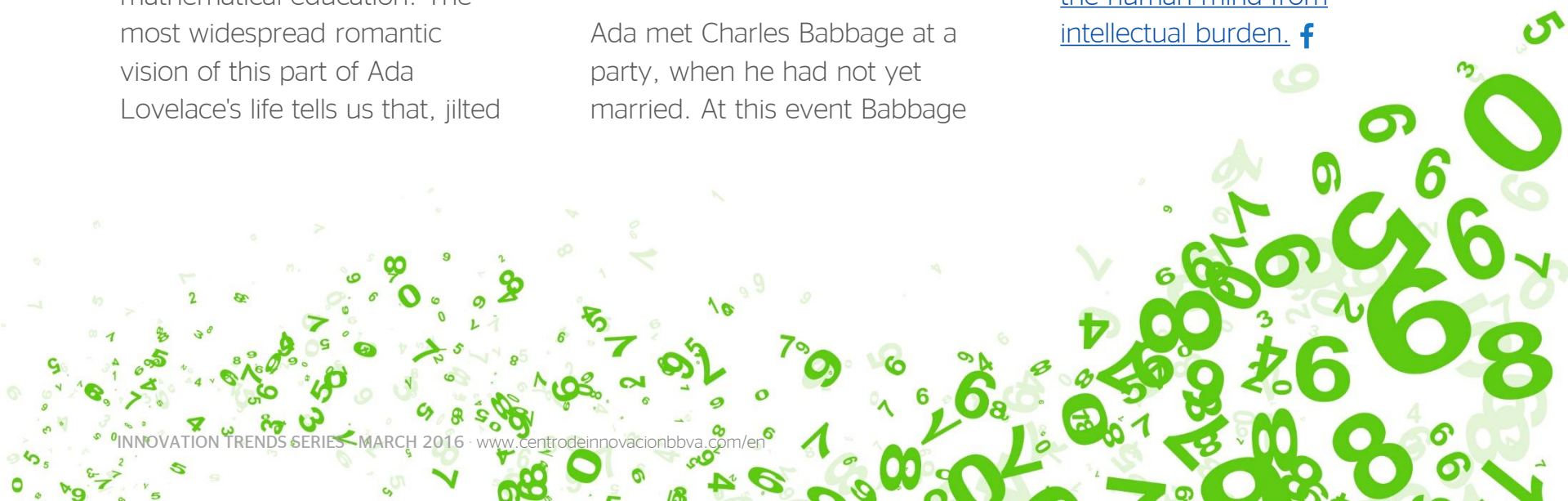
In December 2015 Augusta Ada Byron, the only legitimate daughter of the poet Lord Byron, would have been 200 years old. A symposium at the University of Oxford reviewed this figure and revealed new interesting information to better understand the role played by this Victorian woman in the birth of computer science.

The history

When the philhellene Lord Byron died of fever in **Greece**, fighting for a romantic ideal, his **only legitimate daughter** was 8 years old. This was approximately the same number of years since she had seen her father. Her mother, whom Lord Byron affectionately called "the princess of parallelograms", made sure that she received a solid mathematical education. The most widespread romantic vision of this part of Ada Lovelace's life tells us that, jilted by the womanizer that Lord Byron was, her mother tried to bury the passions of letters under grids of numbers and formulas.

However, Augusta Ada Byron, who would become Countess of Lovelace after she married William King, ended up managing to merge the apparently antagonistic currents that flowed through her predecessors.

Ada met Charles Babbage at a party, when he had not yet married. At this event Babbage presented his first model of the Analytical Engine to Ada Byron and her mother. This was an embryonic computer project that could never be carried out. However, the "Enchantress of Numbers" (nickname that Babbage gave Ada Lovelace during their long history of correspondence) is known as the first programmer precisely because of her contributions made in the theoretical creation of a computer that could free the human mind from intellectual burden.



The impact

After talks given by Babbage in Turin, Luigi Menabrea, engineer and mathematician who would later become the **Italian Prime Minister**, published an article in French that Ada Lovelace translated into English. It was Babbage himself, amazed she had not written something original about a subject she knew firsthand, suggested she make notes in the essay with her own ideas. Lovelace's notes ended up being longer than Menabrea's essay, and constituted the first public document in which the programming of a computer was exhaustively debated. And it stayed that way for **over a century.**

This is what led the celebrated figure of Ada Lovelace to be called the **first programme**r. Although it has recently been discovered that some of Babbage's writings prior to the publication of Lovelace's work contemplated her ideas, Ada Lovelace is still considered the first programmer, the visionary who established that "The Analytical Engine weaves algebraical patterns just as the Jacquard-loom weaves flowers and leaves", a simile that has its roots in the punch cards that were used to program these early machines, but also in the difference between the Analytical Engine and the previous **Difference Engine.**

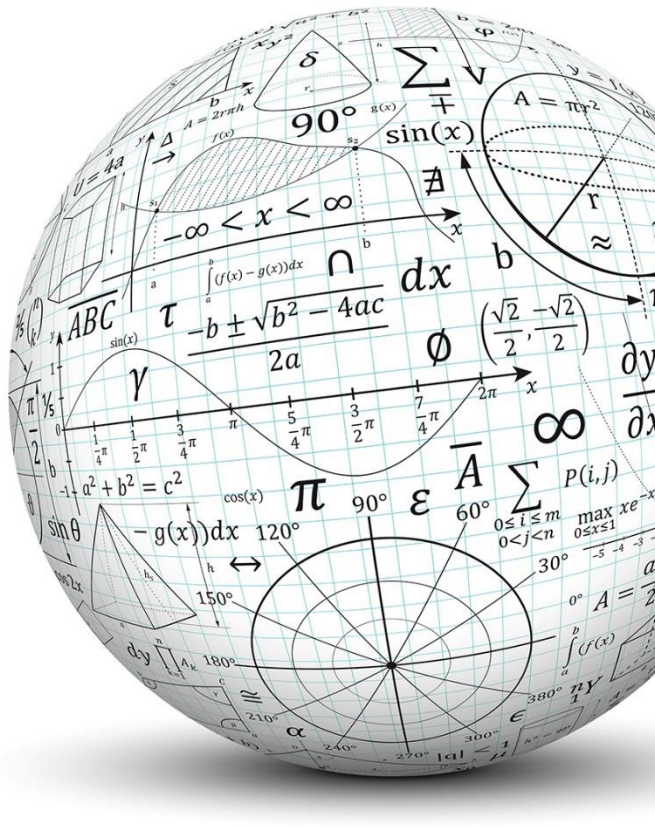
Ada Lovelace was considered, in her exchange of letters with Charles Babbage an "exhibitor" of the engineer's work. There is absolutely no argument about the work and the idea of the Analytical Engine. However, she advocated his **"great, general and metaphysical insight",** so she ended up suggesting to Babbage to take charge of everything around the machine so that he could focus "on performing the work". Babbage refused, but this led to a **friendship** that would last a lifetime.

Lovelace's algorithm for calculating **Bernoulli numbers** was not the first computer program ever conceived, but it is the best known. And Babbage's work that preceded it had **conceptual restrictions** such as the idea that the Analytical Engine could only work with numbers, while Lovelace thought it could also be done with symbols, among other things.

The legacy

The figure of Ada Lovelace was rescued from oblivion when, after the first third of the twentieth century, the work of Alan Turing merged mathematical logic with universal computing. Turing himself gave the name Lady Lovelace's Objection to his maxim that **Artificial Intelligence cannot generate anything**. An image of Ada Lovelace appeared in all certificates of authenticity for Windows 95, and today there are different initiatives bearing her name celebrating the advancement of women in the fields of mathematics, science and technology, including Ada Lovelace Day (October 11).

While in recent times deciding the identity of the first programmer in history has turned into a matter of **gender**, the important thing is to recognize the work performed by the woman who transgressed **the established limits** not only in the human mind, but also in Victorian society. An example for everyone, but also a reminder that technology and especially programming **are not unique skills of a particular sex.**



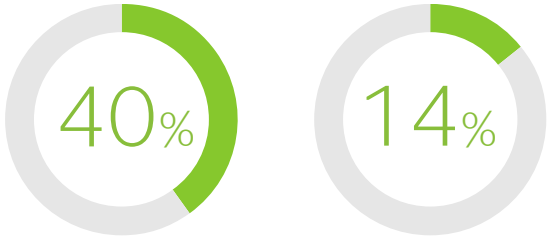
05/INFOGRAPHIC

Women and code

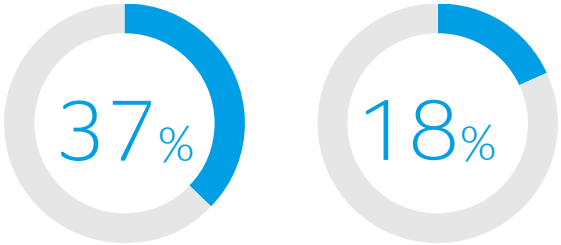
The presence of women in technology has been inversely proportional to its importance in the world we live in. Here we examine the situation of technology with no female representation and also pay homage to some famous women programmers.

The figures in EE.UU

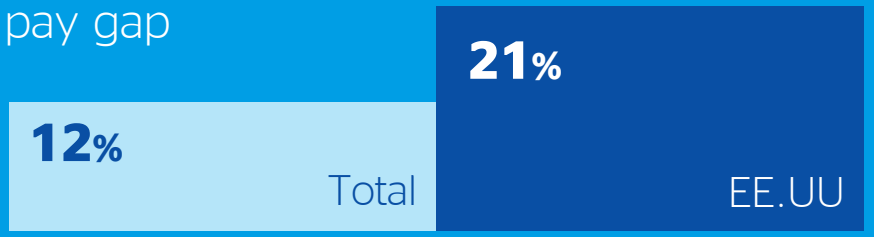
Women graduates in computer engineering



Sector jobs held by women



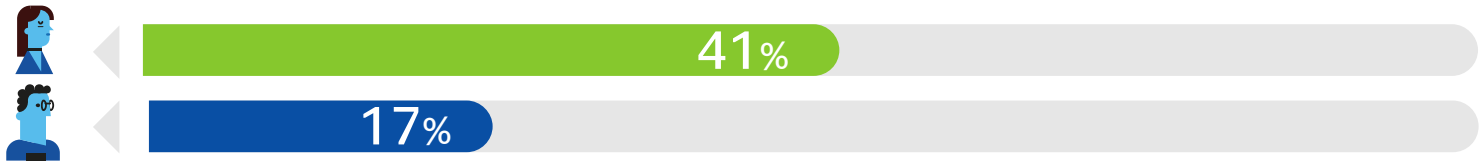
Gender pay gap



50% of women in the sector claim to have **been treated in a "hostile"**, contemptuous and "patronizing" way.

15% of women in **technical jobs** in the technology industry in 2015.

Possibilities of leaving the sector after more than 10 years.



Famous female programmers

1815-1852

ADA LOVELACE

The countess of Lovelace and daughter of Lord Byron wrote the first algorithm designed to be processed by a machine. The machine in question was Charles Babbage's Analytical Engine, which was never built. Computers were not invented until one century later, so for many she was the first woman programmer in history.

1815-1852

GRACE HOPPER

In the U.S. Army and during the Second World War and the subsequent Cold War, Hopper participated in the programming of the Harvard Mark I, programmed the first programming language compiler and gave birth to COBOL, the first programming language based on words instead of numbers.

1936

MARGARET HAMILTON

She ran the department that programmed the software for NASA's Apollo project. Her work foresaw and corrected a human error, making possible the safe landing of the Apollo 11 on the Moon. She later set up several technology companies and is attributed the coining of the term "software engineering".

1959

DANESE COOPER

Known as the "open source diva", Cooper is responsible for Sun Microsystems opening the code of Java, OpenOffice.org and Oracle Grid Engine, among others. She is a member of the board of the Drupal Association, the Open Source Hardware Association and Mozilla, and also belongs to the Apache Software Foundation. She has worked for companies such as PayPal, Wikimedia and Intel.

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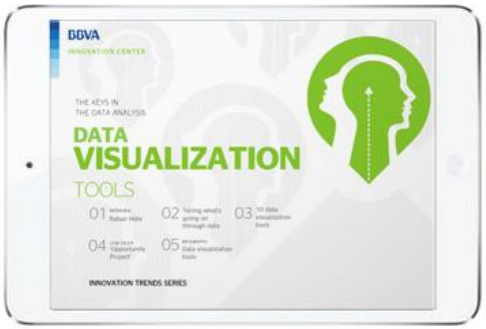
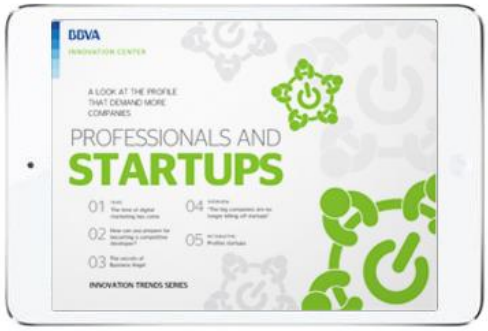
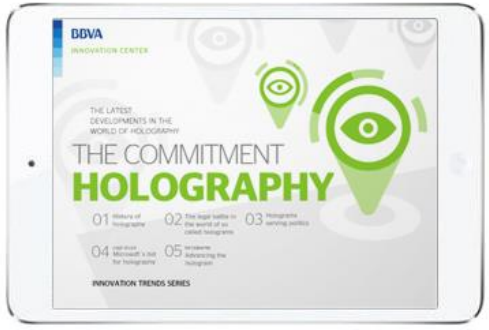


The keys in the data analysis



A look at the profile that demand more companies

Trends aspire to become the starts in the new year



The lastest developments in the world of holography

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