**Assignment**: To produce a short (2-4 page) biography of a key software engineer, discussing the work and impact of the individual.

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# Kim Polese: Engineer, Entrepreneur and Innovator

Audacity and persistence is necessary to innovate. Born to immigrant parents in the United States, Kim Polese learned the importance of hard work and the ability to stand out at an early age. So it's no surprise that she later grew up with a critical mind, an entrepreneurial mindset and a deep understanding how innovation can make or break any company.

Polese, in one word, is a revolutionary. She is the chairwoman of CrowdSmart Inc., a seed stage investment company for technology startups, and of ClearStreet Inc., a company that makes tools to employers and their employees reduce the amount of money they spend on healthcare. Being a chair of an investment firm, she sees what the present lacks and pushes boundaries to fulfil what the future needs. Her ability to handle many types of roles in the male-dominated technology industry is one of the things that makes her inspiring to girls and boys alike.

## Sun Microsystems

She attained a degree in biophysics from the University of California, Berkley, and in computer science from the University of Washington. She is also a fellow at Carnegie Mellon University's Center for Engineered Innovation. Her educational background served as a strong foundation for her career as an engineer and manager. For several years, she was a product manager of what was initially a small team at Sun Microsystems that was building an ambitious product called "Oak". What fuelled this project is the team's vision of a future infrastructure that will hold most of the world's financial transactions, communication and entertainment. In other words, they wanted to build software that works with the internet, way before the internet even became mainstream. They aimed to build a tool that will make a program work the way it is intended regardless of the type of machine it is running on. In the later stages of this project, Polese influenced to change its name from "Oak" to "Java".

As we all know today, Java has been one of the most used and recognisable programming languages all over the world. To know that a woman, like me, was the product manager of the team that built Java encourages my passion for creating software. Considering that only less than half of the people in technology are women, it becomes difficult for me to see myself succeed in the industry in the future. And it's not due to the lack of a positive outlook, but to the fact that when researching for this assignment, most of the public figures in technology on the search results are men. It is almost an immediate reaction to feel like an underdog in a field when your gender, ethnicity and whatever makes you who you are, is underrepresented.

## Women in STEM

Kim Polese is an advocate for women in Science, Technology, Engineering and Mathematics (STEM). In a TED talk she gave a few years back, she noted that although most of the world's first ever programmers were women, only a quarter of women are in technology today. Around high school (secondary school), most girls tend to lose their interest in the engineering because it becomes a field that is for boys. She also shared how she got into computing at a young age by interacting with ELIZA, a natural language processing program from MIT that worked like a therapist. It sparked her interest in computer science, which ultimately became her career.

## Reform in Higher Education

She also believes that computer science is more than just coding, which I personally think is remarkable. Even as a current computer science undergrad, I find it quite difficult to see the area as something more than simply programming. We are given a heavy load of assignments and group projects that mostly focuses on the finish product itself rather than the process involved towards building it. And so most of our attention is poured into the quantity of code and 'making the assignment work' instead of balancing it among technical skills, creativity, computational thinking and abstract thinking. This way of assessment not only encourages bad engineering habits but also cheating. Students getting working solutions from other students just to submit. The goal of a computer science undergrad today has shifted from actual learning to simply not failing the year.

A college degree is expensive and inaccessible to many people. However even with a high price tag, a degree will not usually guarantee to prepare a person enough for an actual job. Polese outlined in a talk she gave that less than half of undergraduates felt like they would be ready for the workforce by the time they graduate. She pushes for reform in higher education, to lower its cost and make it available to everyone. It is no surprise that her talent to spot problems, like the issues of higher education, and her drive to solve them translated well into entrepreneurship. She knows how to keep up and adapt with the constant growth of technology.

## Entrepreneurship

In a talk she gave at the University of Oxford, she mentioned the time when the first web browser Mosaic was released by the University of Illinois. It was text-based and had no interactive capabilities. And so eventually, Sun Microsystems released HotJava, their own version of an extensible web browser that supported Java applets. Unlike Mosaic, it did more than displaying text on a screen. It allowed for interaction and images. During the talk, Polese mentions that one thing that was created and supported by HotJava was an MRI scanner type of application where a user can drag a window on the screen to see a scan of a body. Interaction is a feature we take for granted now, but back then, it was considered impressive and innovative. However despite Sun Microsystems' initial success as a new company, it failed to stay on top years later.

Polese uses Sun Microsystems' pitfall from hyper-growth as an example of the dangers of not being able to continue innovation since the beginning. She believes in the importance of audacity and persistence to be innovative, however she also adds that to stay successful, these are not enough. A company needs to keep growing in order to compete with the new and ambitious startups being founded everywhere, every day.

To prove that Polese practises what she preaches, she co-founded Marimba, an Internet-based software management pioneer, and served as a CEO which led the company to profitability. Marimba provided a product that used the World Wide Web in a different way. They developed the Castanet Tuner, a program separate from a web browser that lets users have "channels". Each channel can display real-time data like the weather or stocks. The content of a channel can be a website, a Java application or applet. The software can also be programmed to request data periodically so that it is available in the hard disk without downloading webpages again and again. Considering this was developed pre-2000s when web browsers were text-based and the internet was slow, this was, in a way, a peek to the future of the internet.

## The Arts

It is easy to forget the importance of the arts when working in engineering. The problems we are solving need valuable high technical skills. However, Polese believes that to be 'fluent in the 21st century', we need the skills we learn from the arts such as innovation, flexibility and collaboration. She trained in dance herself, which taught her how to see the big picture, break a problem in small pieces, reverse engineering and being in front of an audience.

She also believes that the jobs of this century will exist in the edges and intersections where disciplines meet, such as the combination of biology and computing, and design and robotics. And so to prepare for this jobs, we must have the ability to learn and unlearn, to keep expanding our knowledge and skills, and to accept that, in this day and age, some skills will become obsolete.

## Conclusion

Being a woman working towards a computer science degree, I am inspired by Kim Polese, her wide set of skills and her view of the technology industry. Her contributions motivates me to reassess what my priorities in my studies are. And her work and its impact encourages me to believe in my own skills and the possibility that, in the future, I might contribute something crucial towards the growth of technology and the development of society just like her.

**References**

- Wikipedia: Kim Polese, https://en.wikipedia.org/wiki/Kim_Polese
- TechTarget: Marima, https://searchmicroservices.techtarget.com/definition/Marimba
- Kim Polese at TEDxBerkeley, https://www.youtube.com/watch?v=M6Q0nkRjD80
- KIM POLESE - The Journey of an Entrepreneur - Silicon Valley comes to Oxford 2013, https://www.youtube.com/watch?v=ZOBgvg2nzUc