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## Democratization of Technology

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**Abstract** We are living in a technological culture and technology has brought us great progress. The proliferation of digital and communication technologies is beginning to have profound impacts on democratic societies. Evidence of democratization can be seen in every technology today. The democratization of technology implies wider access to specialized knowledge without the need for extensive training. It may be regarded as easy access to technology without being a technical expert. It is regarded as an alternative modernity to the dominant understanding of technology which is perceived as determined by special bodies of expert professionals who enjoy a monopoly over knowledge. This paper provides a brief introduction to democratization of technology.

**Keywords** democratized technology, democratization of technology

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### Introduction

Our society relies heavily on technology. Technology provides us with the means to stay warm in cold weather, to communicate with a loved one a thousand miles away, to prevent or cure sickness, to care for those in need, to improve the quality of life, to increase happiness in many ways, to improve living standards and reduce poverty, and to be connected globally. Technology has become part and parcel of our lives and we no longer imagine life without it. It impacts customers, organizations, employees, business partners, society, and government. We are living in an age where technology allows us to shop at the comfort of our home, while businesses deliver the things we order. We have witnessed how technology is transforming our systems of commerce toward a future where money transfers are free and trustworthy. If you decide to remain a legacy company, your days are numbered since digital-native companies (such as Uber, Amazon, etc.) are taking over and doing a better job [1].

Scholars often cite the invention of the printing press by Johannes Gutenberg in the early 1400s as a major invention that changed the course of history. It had ability to get information to more people by way of mass production. The Internet is the modern-day counterpart of the printing machine. The Internet enables people all over the world to communicate and share ideas easily and instantly with the click of a button. It is the main reason behind democratization of technology and democratization of knowledge [2]. The spread of the Internet and other related technologies (such as AI, cloud computing, software robotics, smartphones, entertainment apps, and mobile games) has increased global connectivity, increase communication, and democratization in the distribution of knowledge and access to technology. Technology is non-neutral; it is two-edged in its impact. Technological tools can be used for good and bad. Figure 1 shows the three D's of technology evolution [3].

In the past, developers would put a patent on their new technology so that nobody could make exactly the same thing without being sued. Today, ideas are being shared in order to push technology forward at a faster rate without paying for its usage. One can make a slightly different product, with a different method. Technology belongs to big corporations and military as well as to its users. Instead of keeping the knowledge to ourselves as



experts and maintaining corporate hierarchy (which is often harmful to progress), technology inspires a culture of sharing [4]. We are now witnessing something termed the democratization of technology. This phenomenon had led to an open source culture which means that any product can be freely distributed without license restrictions. It also promotes the development of the production corporate culture, which is based on the exchange of opinions, knowledge, and innovative ideas [5].



Figure 1: The three D's of technology evolution [3]

### What is Democratization of Technology?

Democracy is a form of government where all people are represented. Similarly, democratizing technology means making it accessible for everyone who needs it. Technology is created by people, to be used by people, and to improve people's lives. Democratization of technology (DT) refers to the process by which access to technology becomes more accessible to more people. This means that more people than ever have access to technology. The widespread access to technology is critical to the transition to the new economy. Democratizing technology allows the expansion of technological design to include alternative interests and values. This can be a tool for increasing inclusiveness [6].

The era of globalization has been characterized by the democratization of technology, democratization of knowledge, democratization of finance, and democratization of information. Democratization has been occurring across several industries, from media and publishing, to technology and software development. Democratization of technology is a socioeconomic and sociopolitical phenomenon. Figure 2 illustrates waves of democratization [7].

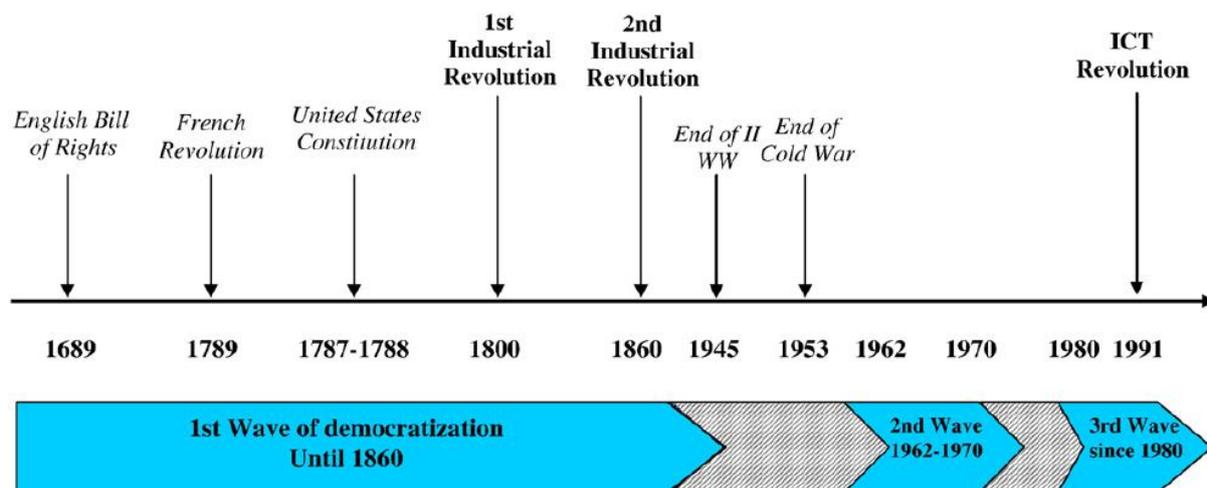


Figure 2: Waves of democratization antecedent to technological revolutions [7]

Today, there are leaps in democratization of many technologies such as artificial intelligence, nanotechnology, biotechnology, robotics, ICT, cloud computing, smartphones, open-source programming, and applied cognitive science. These are not only accelerating within their particular domains, but increasingly integrating in unpredictable ways. They have also fueled the democratization by lowering costs and improving access.

### Stages of Technology Democratization

There are five stages that technology goes through as it is being democratized. The stages can be identified by the groups of people, as illustrated in Figure 3 and explained as follows [8].

1. **Discipline Experts** — Tech professionals who are primarily masters of the core technology, independent of the domain in which it is applied. Often small tech-savvy startups are deploying sophisticated forms of technology.
2. **Domain Experts** — Tech professionals who master the technology in a particular domain, e.g., marketing technologists who build solutions within the marketing department.
3. **Power Users** — Non-tech professionals who develop advanced technical skills in leveraging the technology, e.g., tech-savvy marketing automation platform administrators.
4. **Users** — Non-tech professionals, people who are not experts in a particular discipline, can use tools to accomplish tasks in those disciplines. For example, new technological tools enable non-IT experts to build websites themselves.
5. **Ambient/Automatic** — Technology just works within the domain without users needing to explicitly manage/operate it, e.g., where automation or AI simply take over the work.

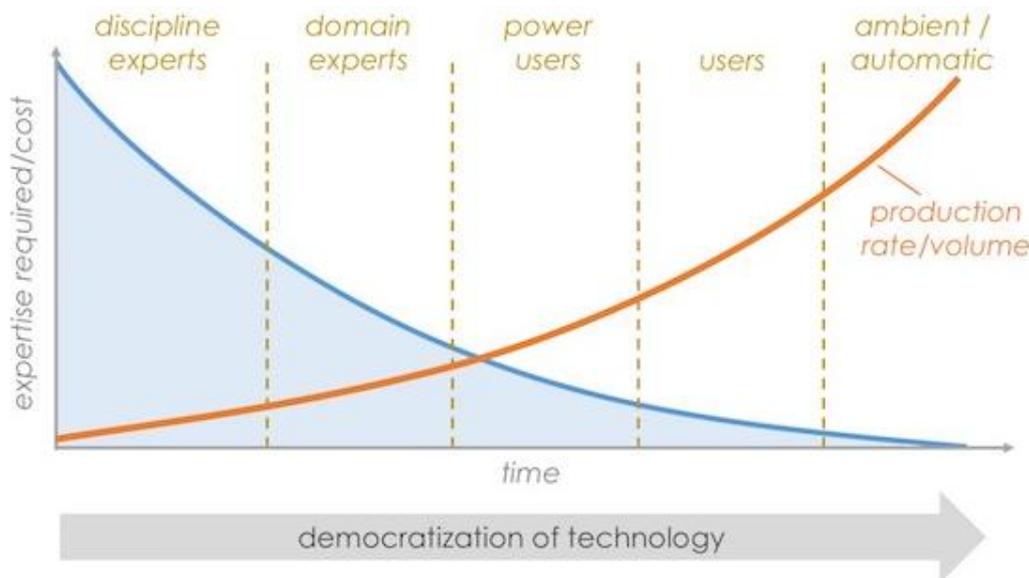


Figure 3: Five stages of technology democratization [8]

### Components of Democratization of Technology

Technology constitutes the cornerstone of the company's business. Industry innovation and user demand have produced more affordable, user-friendly products. The democratization of technology is often regarded as "mutual education," which includes: (1) identification of needs, (1) participation and inclusion of lay expertise, (3) implementation [9].

- **Identification of Needs:** Technology is always meant to solve a problem or meet some needs. Several tools can be used to identify the needs of the end-users. These include market surveys, personal interviews, focus groups, and data from published literature. Once the end-users need is identified, appropriate end-user groups can be selected. It is important to select a large end-user community to ensure that the identified needs are representative of the selected group.
- **Participation:** This is a major democratic components in the development of technology. This has helped stimulate wider public involvement, helped frame the issues, and influenced the overall policy debate. In response to customer demands, company can create various procedures for framing the issues, for defining the relevant expertise, and for channeling dissent. The inclusion of lay expertise in the design process ensures that real needs are identified and solutions are given priority.



- *Implementation:* This is also known as prototyping. It involves implementation of identified solution for the purpose of evaluation. The implementation is carried out under real world conditions. Results of implementation will then be brought back to the design group for reflection and possible suggestions for improvement.

### Benefits

The benefits of democratization of technology can be seen everywhere. Technologies have given more people and group of people access to information and the tools needed to increase productivity and communication than in the past. Democratization of technology will transform the very fabric of society. It has the potential to change people's lives, as it opens up new opportunities and possibilities. Dreams that were previously infeasible are now possible. Democratization of technology allows new ideas to be implemented within minutes and improved instantly. It has helped and strengthened the industry. It leads to rapid developments and innovations within the industry. It will help the entertainment industry move forward at a faster rate.

Democratization of technology will radically change the way we research. Access to technology allows us to collaborate better. The efficiency of technological tools makes life easy for consumers as well as businesses. Access to tools like these is revolutionizing creativity. Technology democratization allows the public to participate in political processes and ensuring transparency of government. It is a driving force for technological change; most free countries have a higher level of technology than less free and more autocratic countries. Policy makers should understand the positive correlation between democratization and technological innovation in order to support the modern economic growth and national progress [7]. Technology can enhance democracy in both developed and developing nations.

### Challenges

A major challenge of democracy in technology is the problem of democracy in its core. Can every citizen be rational, self-aware, and refrain from abusing it? How can we make all citizens act responsibly by avoiding excessive use of opportunities? Increasing democratization of technology poses substantial challenges to environmentalists, particularly in areas of security, data privacy, and data misuse. Greater connectivity increases opportunities for technical breakdowns and criminal hacking. It also increases global competition. Technologies often raise issues about the unintended harm they can cause, and about their misuse if they fall into the wrong hands.

Technology has the potential to do us both good and harm. The regulation of the Internet, social media, and 'smart' technologies is a global challenge [10]. The democratization of technology has been regarded as a threat by modern defense organizations.

### Conclusion

Technologies are changing the way people interact today. They have given more people access to information and the tools needed to increase communication and productivity than before. It is certainly an exciting time to be alive and witness rapid technological progress. Great things happen when a technology is democratized. There is virtually no limit as to what is achievable through the democratization of technology. Our time is the third wave of democracy incited by the access to the Internet. Democratization of technology is a good for the future. More information on democratization of technology can be found in the books in [11-14].

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