

How Has Digital Transformation Affected the Fundamental Right to Privacy Within the Context of Personal Data Protection?

Wilson Engelmann, Dilça C. de Jesus, Hérica C. P. Nascimento, Valéria C. G. Cabral, Vithor A. Sousa
(Professional Master's Program of Corporate Law and Business, University of Vale do Rio dos Sinos – UNISINOS, Brazil)

Abstract: With a view toward the preservation of fundamental rights, in particular, privacy in the current legal and social scenario, this study aims to analyze Technology and its constant transformations in cyberspace while allied with the General Law for the Protection of Privacy (*Lei Geral de Proteção de Dados -LGPD*). Historically, the systemic and globalized rise in the standard of living and well-being of society, and the advent of the Fourth Industrial Revolution, have required us to understand human values. The ones incorporated into new technologies to improve the common good, environmental management, and human dignity. Our theoretical analysis, supported by an observation of the worldwide social scenario, indicates that the digital transformation of modern times requires an active posture that aligns with the fundamental guarantees of individuals and the preservation of their human condition, even in a digital environment. We use a dialectic and monographic method, together with the technique of bibliographic research.

Key words: digital transformations; data protection; fundamental rights

JEL codes: K2, O3

1. Introduction

As society strides forward, the path taken further shapes its sociability.

Communication is how society creates nexuses of exchange and knowledge to evolve and transform itself. Consequently, it achieves better conditions for intersubjective relationships that are more effective and sociable.

We dare to say that the digital age and cyberspace have been great challenges for reading or re-reading a new society with new dimensions to fundamental values.

In this digital world, time and distance have been crucial elements for making human desires possible and

Wilson Engelmann, Ph.D. in Law, Professor, University of Vale do Rio dos Sinos; research areas: nanotechnology; artificial intelligence; fundamental rights; Economic Analysis of Law; Corporate Law; Business Law. E-mail: wengelmann@unisinos.br.

Dilça Cabral de Jesus, Master, Server at the University of Rio Verde; Student of the Professional Master's Program of Corporate Law and Business, University of Vale do Rio dos Sinos; research areas: law, data protection. E-mail: dilcac@gmail.com.

Hérica Cristina Paes Nascimento, Master, Lawyer and Server at the University of Rio Verde; Student of the Professional Master's Program of Corporate Law and Business at University of Vale do Rio dos Sinos; research areas: taxation of new technologies; fundamental rights; economic analysis of law; corporate law; business law; data protection. E-mail: hericacpnascimento@gmail.com.

Kárita Barboza Gouveia, Master; Lawyer and Server at the University of Rio Verde; Student of the Professional Master's Program of Corporate Law and Business, University of Vale do Rio dos Sinos; research areas: mediation, digital mediation, conflict resolution, artificial intelligence. E-mail: karitabgadv@gmail.com.

Vithor Assunção Sousa, Master, Lawyer and Server at the University of Rio Verde; Student of the Professional Master's Program of Corporate Law and Business, University of Vale do Rio dos Sinos; research areas: business law and internationalization. E-mail: vithorassuncao13@gmail.com.

accessible in a globalized age. Geographical space has changed!

Cyberspace (the virtual environment) is also social, and where there is society human precariousness and the legal universe are bound to be part of it. Fundamental human rights are apparent on this virtual and accessible horizon, awaiting those who take ownership of new creations.

Alongside these ideas concerning the digital age and cyberspace, we intend to briefly analyze how digital transformation has affected the fundamental right to privacy, within the context of the General Law for the Protection of Privacy (LGPD). With these provisional concepts, we intended to seek an answer to the following question: how has digital transformation affected the fundamental right to privacy, within the context of the protection of personal data?

Would it be too much to think that the regulation of that right may be affected by the fragility and risk of the fundamental guarantee of privacy? The governance of cyberspace has long been discussed and, concerning the right to privacy enforced by the General Data Protection Regulation, reflection on these outlines and their cultural individualities is paramount, even within a globalized universe.

Our research method consisted of dialectical and monographic analysis and the technique of bibliographic research. We observed historical references such as the Fourth Industrial Revolution (which is considered an exponential evolution), and its speed, breadth, and systemic impact on the new dimensions of the digital universe, while harmonizing with the General Data Protection Regulation.

For better development of the theme, this scientific article was structured in such a way that the influences of the Fourth Industrial Revolution and the Protection of Personal Data and Fundamental Rights will be addressed first. This will be followed by an analysis of the digital transformation and the Protection of Personal Data, including some thoughts concerning Law no. 13.709, of August 14, 2018. This is known as the General Law for the Protection of Privacy (LGPD) in Brazil and it regulates the processing of personal data, even in digital media, to protect the fundamental rights of freedom and privacy, as well as the free development of the personality of the natural person. Finally, the feasibility of Big Data viability in this scenario will be addressed, and the possible implementation of governance and data quality management processes.

As this study proceeded, we found that digital transformation has produced a new and great challenge for cyberspace while it coexists with what we know as fundamental human rights and their processes of legitimation.

2. Literature Review

2.1 The Influence of the Fourth Industrial Revolution

Castells (2002, p. 73), highlights that “technological innovation is not an isolated occurrence”. It reflects a certain moment of knowledge and economic mentality, an institutional environment, or a specific industrial period in which costs and benefits are weighed.

Throughout the history of humanity, revolutions have had a prominent place since their developments impact society and reverberate to the present day. Increases in technological applications transformed the production process, gave rise to mass production and the creation of new products, and culminated in a greater quantity of products on the market, influencing the birth of globalization.

The emergence of industries has been characterized as one of the most important milestones in the evolution of humanity, expanding man’s capacity to carry out actions and transform a society that adapts to his contemporary reality.

How Has Digital Transformation Affected the Fundamental Right to Privacy Within the Context of Personal Data Protection?

Industrial revolutions can be explained by their characteristic inventions or discoveries, which are shown in Table 1.

Table 1 The History of Industrial Revolutions

| Moment | Period | Characteristic features |
|---------------------------------------|---|--|
| 1 st Industrial Revolution | The second half of the XVIII century, with England as its birthplace | <ul style="list-style-type: none"> - Industrial mechanization: mass production; - Large-scale industrial production for the market; - Steam power; - Coal and iron; - A transition from commercial capitalism to industrial capitalism. |
| 2 nd Industrial Revolution | From the middle of the XIX century to the beginning of the XX century. | <ul style="list-style-type: none"> - The era of electricity and steel; - Chemistry and electrical industry research laboratories that advanced science; - Progress in communication and petroleum use; - New industrial sectors and new sources of energy. |
| 3 rd Industrial Revolution | From the beginning of the 1970s. | <ul style="list-style-type: none"> - Advancements in information technology, robotics, telecommunication, biotechnology, microelectronics, semiconductors, mainframe computers (the 1960s), personal computers (the 1970s and 1980s), and the internet (the 1990s). - The use of robots in industries; - New technologies, unemployment and new ways of organizing work unfold as the more visible consequences of Globalization. |
| 4 th Industrial Revolution | From the beginning of the turn of the XX century, anchored by the digital revolution. | <ul style="list-style-type: none"> - More mobile and ubiquitous internet; - Cheaper, minimal, and more powerful sensor processing; - Neurotechnology, robots, Artificial Intelligence, biotechnology, 3D printers, Quantum Computing, drones, Big Data, and other innovations. - Technology fusions and integrations among the physical, digital, and biological domains. |

Source: Schwab, 2016 and Castells, 1999.

Society has been experiencing a new technological revolution unlike any previous ones, the so-called Fourth Industrial Revolution. It has a wide and varied scope, from genetic sequencing to nanotechnology, from renewable energies to quantum computing, to intelligent and connected systems that have transformed all humanity in different segments (Schwab, 2016).

The Fourth Industrial Revolution, as presented by Schwab (2016), has specific characteristics with an exponential evolution, as well as speed, amplitude, and systemic impact. The diffusion of these new digital technologies has caused changes in the pillars and structures of society, insofar as it has altered production formats, transformed business models and processes, and influenced the scope of work and new forms of working.

All of these factors have triggered a paradigm shift with the use of emerging technologies that are typical of digital transformation. This was brought about by this historic era, that demonstrated an accelerated impulse with the advent of the pandemic that arose in 2020. Technologies such as Artificial Intelligence and Big Data have focused on healthcare worldwide and promoted profound changes in the doctor-patient relationship. Several studies have revealed their great potential in improving the diagnosis of diseases, due to their capacities to process and quickly analyze a large and varied volume of data, and to provide support for clinical decision making with greater security and agility (Silva, Nogaroli, 2021).

In this scenario, areas such as biotechnology, 3D printers, quantum computing, drone development, Big Data, and Artificial Intelligence have provided new reflections and challenges for society (Silva & Engelmann, 2020).

Thus, it is essential that all stakeholders in the global society, governments, universities, and civil society get involved in this discussion, to better understand current trends and develop alternatives that shape advances in

technology. This is to ensure that their potential is used for the social and cultural progress of Humanity (Schwab, 2016).

Technologies have played a crucial role in raising the standard of living and well-being around the world. However, for better integration between society and the potential provided by the Fourth Industrial Revolution, we must understand where human values incorporate into new technologies to improve the common good, environmental management, and human dignity.

2.2 The Protection of Personal Data and Fundamental Rights

The current technological era resulted from a gradual historical process. The Fourth Industrial Revolution has demonstrated digital acceleration and its interaction with fundamental rights must be analysed, as well as how the Brazilian legal system addresses the issue of personal data protection.

Despite the recent sanction of the Brazilian General Data Protection Regulation (Brazil, 2018), the issues of privacy and personal data protection had already been the subject of other laws in the Brazilian legal system, such as the Consumer Protection Code, Law no. 8,078, of September 11, 1990, and the Marco Civil da Internet, Law nº. 12,965, of April 23, 2014. These already had their own rules concerning the inviolability of intimacy and private life, either by guaranteeing the right of access to consumer information or protecting the collection, use, storage, and processing of an individual's data, respectively.

Said laws were sanctioned to establish, within the scope of their scopes, the founding protection of the inviolability of intimacy and private life, and the honor and image of people. This is stated in item X, of article 5, in the Brazilian Federal Constitution (Brazil, 1988).

Furthermore, in addition to the Brazilian legal system, the right to privacy stands out at the international level and is recognized in the Universal Declaration of Human Rights (1948); the European Convention for the Protection of Human Rights and Fundamental Freedoms (1950); and the American Convention on Human Rights (1969)" (Ritt & Sarlet, 2020, pp. 422-423).

Thus, although data protection (notably in a digital environment) is not explicitly expressed in the Brazilian constitutional text, it is a consequence of the considerable risks that automated data processing poses to the protection of the personality and dignity of the human person, as well as the protection of privacy and private life (Doneda, 2011).

In this regard, given the possibility that Big Data may reach the private life and the intimacy of users through the creation of a database and massive analysis of these data, and cause total exposure of user personality, the protection of personal data gains a prominent position in the fundamental principles that uphold the dignity of the human person.

The term Big Data refers to "situations in which digital technologies are used to deal with large and diverse amounts of data and the various possibilities for combining, evaluating and processing such data by private and public authorities in different contexts". It is used to "(...) control individual and collective behaviors, to register development trends, and allow new types of production and distribution, as well as State tasks, but also new forms of illegality, especially cybercrime" (Hoffmann-Riem, 2021, pp. 2, 16).

Fundamentals such as the protection of the dignity of the human person, and the principles of equality, freedom of communication, protection of personality, professional freedom, freedom of religion, and the guarantee of property are not limited. Nor are they empty of meaning and importance when confronted with/questioned in the face of technology use. This is because, at the very least, "Human rights and civil liberties

are also specifically applicable to the generation, analysis, and use of data, especially in the form of Big Data” (Hoffmann-Riem, 2021, p. 42). They guarantee respect for the dignity of the human person during current technological changes and those that are yet to come.

2.3 Digital Transformation and Personal Data Protection

Created in the 1970s, information technology is the product of scientific knowledge that takes care in making things in such a way that they can be reproduced. Among them are the whole set of technologies in microelectronics, telecommunications and radio broadcasting, computing, optoelectronics, and genetic engineering. They make up the so-called information technologies as they have promoted, since the end of the twentieth century to the present day, exponentially increasing technological advances, mainly in medicine, nanotechnology, energy sources, production techniques, and transport technology, among others. This culminated in the creation of a digital language, common to all, through which information is produced, stored, recovered, processed, and propagated. The world has transformed and became digital (Castells, 1999).

Technological revolutions have been characterized by their ability to penetrate all domains of human activity. For that purpose they use information, and processing and communication to apply and develop pre-existing knowledge to reach a higher level, culminating in technological transformation. It is not just a matter of storing information, but also processing and applying it in a manner that encourages innovation and generates new knowledge in an upward and constant fashion. Information technologies are no longer just available to be processed continuously by users and creators who confuse themselves with the same object (Castells, 1999).

All this interaction between individuals and technologies has required greater storage and processing capacities, better communication, and decoding and programming systems, including behavioral and genetic ones. This is so they become extensions of a human mind - now assimilated into a digital environment - that expresses human will and thoughts in the form of goods, services, material production, and intellectual production, all offered in an almost imperceptible way to the critical analysis of the user.

This intertwined and ascending interaction affects the way society is conducted. Not only has the form of consumption changed, so have the forms of learning, assimilating, producing, and even self-determining. These take shape according to the directions suggested by statistical, probabilistic, and algorithmic analyses that anticipate and reveal human choices.

It can be inferred that the need to communicate at ever greater speeds, with the maximum delivery of information between communications, was what drove the creation and spread of the Internet around the world. It enabled the exponential development of digital data transmission. It similarly makes demands on technology companies and computer scientists to constantly innovate storage, processing, and data transmission, with ever-increasing quality and accessibility. This occurs within a progressively imperceptible space-and-time due to the speed of processing and transmission. As such “data transmission has become the predominant and universal form of communication” (Castells, 1999, p. 110).

Information technology has become capable of realizing a new social structure, as the numbers of subjects and organizations that accumulate and organize the data of network users broaden the range of information they can generate. Depending on the purpose for which it was generated, they can define the autonomy, identity, and even the freedom of the contemporary citizen (Doneda, 2011).

In this sense, the information obtained by correlating data from the same individual does not demonstrate purely quantitative results. It has the additional ability to draw economic, moral, social, political, and cultural

profiles of the network user, and to understand and capture their personality. If this is confused with the actual individual, there is ample legal protection capable of assisting the dignity of the human being, a basic and guiding principle of postmodern society.

The protection of the personal data of users through Brazilian law was more strongly established with the enactment of Law no. 13,709, of August 14, 2018. This is known as the General Law for the Protection of Privacy (LGPD) and it seeks to regulate the processing of personal data (including digital media) and protect the fundamental rights of freedom and privacy, as well as the free development of a natural person's personality. To this end, the subject of data is guaranteed the right to request reviews of decisions taken solely based on automated processing of personal data; decisions that affect their interests, including the ones aimed at defining their personal, professional, consumer, and credit profiles, or even aspects of their personality (art. 20).

It was thought that by protecting the data of an individual, the one holding the data would also be protected. This can be achieved and co-opted for various purposes, and be fostered and directed by capital and power, be it economic, cultural, or even political.

However, the expectation of massive data analysis through Big Data also permeates objectives that aim at minimizing cost, improving services of all kinds, and enhancing assertive decision making, among several other possibilities. These prospects present themselves for governments and companies, such as market intelligence, public security, and social research and analysis, all aimed at maximizing their results at ever lower costs, with ever-faster effectiveness (Buhl, Röglinger, Moser & Heidemann, 2013).

Decision-making based on automated information can reduce complexities and bureaucracy for individuals while allowing companies and governments to provide services in real-time and offer full support within a relationship, be it commercial or even between governments and citizens (Schwab, 2016). Thus, "Individual freedom and state sovereignty are today measured by the ability to access information" (Peck, p. 45).

On the other hand, when Buhl, Röglinger, Moser, and Heidemann (2013) discussed the feasibility of Big Data, they identified factors that hinder its full development, such as constant efforts to update data, media interruptions, and the problem of the volume, variety, and veracity of acquired data. These end up generating a quantity of data waste that could certainly be better recognized and managed by employees than by software. Moreover, they highlighted the enormity of different legal restrictions regarding privacy in different countries, an additional factor that affects the development of this tool.

Given this situation, and envisioning a higher quality of technological development that encourages effective data privacy, the aforementioned authors pointed out some criteria that should be met for the success of Big Data. They deserve to be highlighted and include the intelligent management of data use and selection, with clear rules regarding data quality; maintaining 99% of an individual's data, so that only 1% is inserted on demand; and maintaining high-quality data through constant updating that allows uniformity and consistency in meaning, content, time and the unique identification of user information.

This requires a clear implementation of governance and data quality management processes. Upon adopting them, it is vital to have a treatment policy in place to check the veracity of data. Without these, "all technological infrastructure advancements, analytic tools or business models are ultimately without value for data-driven business decisions". Thus, "Big Data requires innovative approaches which view privacy concerns and different international privacy standards not as hindering restrictions, but rather as a chance to develop a competitive advantage" (Buhl, Röglinger, Moser, & Heidemann, 2013, p. 2). The legal contours imposed on the treatment and sharing of personal data should serve as a stimulus for the creation of innovative solutions that respect individuals

as they follow the legal restrictions on data protection and privacy. At the same time, these answers should generate value for organizations, whether public or private.

Through an innovative governance system, transparency while treating data will certainly be one of the determining factors for more effective, moral, ethical, and professional Big Data, vis-à-vis the information society. Especially since the concerns of citizens, “as regards privacy and the establishment of commercial responsibility and legal structures...will require adjustments in the way of thinking, as well as guidelines for the use and prevention of the individual profile of people (profiling) and unforeseen consequences” (Schwab, 2016, p. 140).

This will not completely prevent the expropriation of human experience as processed and commercialized raw material in the form of behavioral data (a true “means of extracting behavioral surplus value” (Kerner, 2021, p. 1). Nevertheless, it does allow for a better calculation of responsibilities, or even the exclusion of responsibilities when harmful uses of information occur. Data analysis supported by reliable methodological standards for verification would generate quality data use and maintenance, and add value to organizations (even those that act exclusively in the digital sphere) that must excel in respecting fundamental rights. These include the privacy of personal data that results in the protection of the individual.

Participating in the digital transformation of modern times requires an active posture that aligns with the fundamental guarantees of the individual, and always keeps this basic objective in perspective to avoid the emptying of the human condition, even if it is expressed in the form of data arranged in a digital environment.

3. Conclusion

Society has been experiencing a new technological revolution unlike any previous one, the so-called Fourth Industrial Revolution. It has a wide and varied scope, from genetic sequencing to nanotechnology, from renewable energies to quantum computing, to intelligent and connected systems that have transformed all of humanity in different segments.

Together with this revolution, we have considered user privacy in digital networks. Privacy is considered a fundamental right that is inherent to every individual since it is constitutionally protected. However, with the digital age, new dimensions have appeared that often test this guarantee.

From the reflections we sought to perform, with historical references, we found that the protection of fundamental rights must be maximized through legal regulations that effectively bring support to the legal universe in the virtual context. Therefore, in addition to this legislative protection, we need to increase the number of digital tools that legitimize the protection of these rights and relentlessly pursue an ethical evolution in these universes.

We are faced with a new world that has long been foreshadowed. Now there are concerns regarding the daily lives of users that are on the stage of cyberspace, together with all of the life connections each individual makes. When we remember that few live outside this network and the current systemic way of life, we see the numerous, deep and elementary concerns.

We are facing a time when the synchrony provided by the digital age makes it possible to transform communication, social relationships, and the maintenance of rights.

Everything has changed. All individual perspectives have changed, such as the forms of consumption, social relations, communication, education, and information, among many other human dimensions.

Besides the challenges of creating new legislation to support, provide accountability and give direction to this

universe, it appears that the preservation of privacy as a fundamental guarantee involves numerous tools that enable the protection of the individual within these spaces. As an example, we have the criteria suggested by other similar thinkers for the success of Big Data. They deserve to be highlighted and include the intelligent management of data use and selection, with clear rules regarding the quality of this data; maintaining 99% of an individual's data, so that only 1% is inserted on demand; and maintaining high-quality data through constant updating, to allow uniformity and consistency concerning the meaning, content, time and unique identification of an individual's information.

Countless discussions have shown that we must continue thinking about joint and continuous efforts to bring necessary and expected balance to the users of digital networks. The legitimization of fundamental rights in this new universe is a great paradigm for discovery, even with some horizons still partially unknown.

At the end of its trajectory, the main challenge of the digital age will have been to shield individuals from losing their fundamental guarantees in technological transformations.

References

- Brasil. *Constituição da República Federativa do Brasil de 1988*, access on 17 Feb. 2021, available online at: http://www.planalto.gov.br/ccivil_03/constituicao/ConstituicaoCompilado.htm.
- Brasil. *Lei 12.965, de 23 de abril de 2014 (MCI)*. Estabelece princípios, garantias, direitos e deveres para o uso da Internet no Brasil. Access on 17 Feb. 2021, available online at: http://www.planalto.gov.br/ccivil_03/_ato2011-2014/2014/lei/l12965.htm.
- Brasil. *Lei n. 8078, de 11 de setembro de 1990*. Dispõe sobre a proteção do consumidor e dá outras providências (CDC). Access on 17 Feb. 2021, available online at: http://www.planalto.gov.br/ccivil_03/leis/L8078compilado.htm.
- Brasil. *Lei n.º 13.709, de 14 de agosto de 2018*. Lei Geral de Proteção de Dados (LGPD), access on 17 Feb. 2021, available online at: http://www.planalto.gov.br/ccivil_03/_ato2015-2018/2018/lei/L13709.htm.
- Buhl H. U., Röglinger M., Moser F. et al. (2013). "Big data", *Bus Inf Syst Eng*, Vol. 5, pp. 65–69, access on 17 Feb. 2021, available online at: <https://doi.org/10.1007/s12599-013-0249-5>.
- Castells M. (1999). *A Sociedade em Rede*. Tradução: Roneide Venâncio Majer, atualização para 6ª edição. Jussara Simões. V. 1 – São Paulo: Paz e Terra.
- Doneda D. (2011). "A proteção dos dados pessoais como um direito fundamental", *Espaço Jurídico Journal of Law*, Vol. 12, No. 2, pp. 91-108, access on 17 Feb. 2021, available online at: <https://portalperiodicos.unoesc.edu.br/espacojuridico/article/view/1315>.
- Hoffmann-Riem W. (2021). *Teoria Geral do Direito Digital: Transformação Digital; Desafios Para o Direito*, Rio de Janeiro, Forense.
- Koerner A. (2021). "Capitalismo e vigilância digital na sociedade democrática", *Revista Brasileira de Ciências Sociais*, São Paulo, Vol. 36, No. 105, e3610514, accessed on 17 Feb. 2021, Epub Jan 15, 2021, <https://doi.org/10.1590/3610514/2020>, available online at: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0102-69092021000100702&lng=en&nrm=iso.
- Peck P. (2013). *Direito Digital* (5th ed.), São Paulo, Saraiva, p. 438.
- Ritt C. F. and Sarlet I. W. (2020). "A lei geral de proteção de dados e sua importância com relação ao direito fundamental à privacidade", in: Sarlet I. W., Barbosa J. F., Leal A. A. F., Siqueira A. B. (orgs.), *Direitos Fundamentais: Os Desafios da Igualdade e da Tecnologia num Mundo em Transformação*, Porto Alegre, RS: Editora Fundação Fênix, pp. 419-435, doi: <https://doi.org/10.36592/9786587424019-22>.
- Schwab K. (2016). *A Quarta Revolução Industrial*, São Paulo: Edipro, p. 176.
- Schwab K. and Nicholas D. (2019). *Aplicando a Quarta Revolução Industrial*, Prefácio de Satya Nadella, João Doria; tradução: Daniel Moreira Moreira, São Paulo: Edipro.
- Silva R. G. and Nogaroli R. (2021). "Inteligência artificial e big data no diagnóstico e tratamento de doenças: Novos desafios ao dever de informação e à proteção de dados sensíveis", *Proteção de Dados Pessoais na Sociedade da Informação Entre Dados e Danos*, pp. 357-380, Indaiatuba, São Paulo: Editora Foco.
- Silva R. P. and Engelmann W. (2020). *A Quarta Revolução Industrial (des)Emprego?* Curitiba: Appris.