

There is still a research gap in the field of innovation studies in the public sector in transnational studies in countries of different cultural and institutional contexts, such as Brazil and Switzerland. Moreover, the strategy in both countries of developing and adopting technological innovation at the national level makes it relevant to understand these experiences. In Switzerland, the number of cases filed completely in electronic format is still very small, but in 2016, the cantonal and federal courts initiated a joint project called Justitia 4.0 “to introduce electronic communication between judicial authorities and parties/lawyers through a platform (Justitia.Swiss).”¹⁴ There is no information available in the last CEPEJ report about the percentage of cases processed in electronic proceedings. There is a question asking about the possibility of electronic submission of a case to the courts, so in 2018, the deployment rate of these tools in Switzerland was 50-99% in civil cases, 50-99% in criminal cases and 10-49% in administrative cases.¹⁵

The main innovations developed and adopted in courts in Brazil are related to ICTs; notably, one of the most remembered in the labor courts is the electronic judicial process.¹⁶ In 2021, the Brazilian justice had, in the first degree, 97,2% and in the second degree, 95,3% of the new lawsuits filed by electronic means.¹⁷

Therefore, the results of a comparative study could provide relevant information: (i) for developers of innovation; (ii) for decision makers; (iii) for the formulation of public policies; (iv) filling a research gap in public sector innovation with a cross-national study linking different traditions of governance and national culture;¹⁸ and, (v) contribute to scientific knowledge regarding the field of court management and more specifically to court innovation.

Given this overview and that, in general, there are still few empirical and theoretical studies in the context of the Swiss judiciary,¹⁹ this study tries to answer the following question: What are the main antecedents, i.e. drivers and hinders in the adoption of e-justice in Switzerland and Brazil? For the present publication, the focus is on innovation in its technological dimension, more precisely the information and communication technologies developed and adopted by the courts. To answer the research question, the objective of the paper is to explore the experiences and strategies used to adopt the innovation and compare the similarities and differences between Switzerland and Brazil, specifically, discuss the relevant antecedents of the adoption of innovation and identify the expected outcomes and impacts with the adoption of e-justice.

14 J. Bühler, Caseflow Management – CEPEJ and Swiss Federal Supreme Court’s Experiences, in A. Lienhard and D. Kettiger (eds.), *Innovations on European Caseflow Management in Courts*, 2018, p. 25.

15 CEPEJ, *Evaluation of the Judicial Systems (2018–2020): Switzerland* (2020), available at <https://rm.coe.int/en-switzerland-2018/16809fe2db>.

16 M. Machado et al., Innovation in Judicial Services: A Study of Innovation Models in Labor Courts, *Innovation and Management Review*, 15(2), pp. 155–173.

17 CNJ, *Justiça Em Números 2021* (2021), available at <https://www.cnj.jus.br/wp-content/uploads/2021/09/relatorio-justica-em-numeros2021-12.pdf>.

18 H. Vries, V. Bekkers and L. Tummers, Innovation in the Public Sector: A Systematic Review and Future Research Agenda, *Public Administration*, 94(1), pp. 146–166.

19 Lienhard and Kettiger, *supra* note 2.

We believe that the results may be useful not only for the Brazilian or Swiss context, but may have implications for other countries that adopt innovations at the national level.²⁰

2. THEORETICAL BACKGROUND: INNOVATION IN THE PUBLIC SECTOR

In the public sector, the development, adoption and evaluation of innovations is complex; however, it has received attention in recent years by the creation of research programs and awards. In Europe, we can mention the European Public Sector Award (EPSA), PUBLIN, the European Union's public innovation research program and the MEPIN (Measuring innovation in the public sector in the Nordic countries). Specifically, in the context of the European judiciary, there is the Crystal Scales of Justice Prize "aimed at discovering and highlighting innovative and efficient practices concerning the functioning of justice, judicial procedures or the organisation of courts."²¹ In Brazil there is the innovation award of the foundation National School of Public Administration (ENAP) – Innovative Competition in Federal Public Administration and INNOVARE award, the first with the focus on the federal public sector as a whole and the second specifically the judiciary.

Innovation "is an idea, practice, or object that is perceived as new by an individual or other unit of adoption."²² The diffusion of innovations is understood as "acceptance over time, of some specific item – an idea or practice, by individuals, groups or other adopting units, linked to specific channels of communication, to a social structure, and to a given system of values, or culture."²³ The decision-making process of innovation adoption and diffusion comprises five steps: (i) knowledge, i.e. the exposure and understanding of innovation; (ii) persuasion – formation of positive or negative attitudes in relation to innovation; (iii) decision – choosing for adoption or rejection; (iv) implementation, the effective use of innovation; and, (v) confirmation, which is the reinforcement of adoption in use.²⁴

Rogers²⁵ mapped out five characteristics that would influence the adoption and the adoption rate of an innovation: (i) relative advantage – the adoption is advantageous to the extent that the innovation presents evident benefits in relation to the product, service or current behavior; (ii) compatibility with systems and values – the more the innovation is compatible with the pre-existing situation, the greater the chances and the rate of its adoption; (iii) complexity – ease of transition – the more complex the changes involved in innovation reduce the chances and the rate of adoption; (iv) possibility of testing – testing an innovation before making a definitive decision increases the chances and the rate of its adoption; and, (v) visibility of change and its benefits – the more self-evident the advantages of an innovation, the more likely and fast it is to be adopted. These characteristics are pointed out as the main antecedents

20 The results of the Swiss part of the survey have been partly published in the Swiss Richterzeitung, see M. M. Sousa, eJustice in der Schweiz, *Justice – Justiz – Giustizia*, 2020/4.

21 CEPEJ, *Crystal Scales of Justice Prize*, 2019.

22 E. M. Rogers, *Diffusion of Innovations*, 5th ed., 2003, p. 11.

23 El. Katz, M. L. Levin and H. Hamilton, Traditions of Research on the Diffusion of Innovation', *American Sociological Review*, 28(2), p. 237.

24 Rogers, *supra* note 22.

25 *Ibid.*

in innovation studies in the public sector,²⁶ not necessarily that an innovation is desirable²⁷ or that result only in expected results, or that there may still be a rejection of the innovation.

Innovation is a relevant subject in the research field of the administration of justice,²⁸ and in the technological dimension, the development and adoption of ICTs in the courts stand out;²⁹ however, few countries have actually succeeded with integrated and automated judicial litigation systems.³⁰ Initially, the ICTs were not seen as ways to improve the internal management of the courts but viewed with much criticism.³¹

Courts and judges have been under pressure for better performance in recent years, so judicial performance has gained importance.³² Accordingly, simplification and digitisation strategies have been used by several countries in judicial reforms to address bottlenecks in court performance.³³ Online access to justice, especially in less complex cases, contributes to cost and time savings by solving cases faster, easier and better.³⁴

Investment in technology is, in this context, necessary for the development and adoption of new technologies, but not sufficient to improve the performance of the courts. On the one hand, there is a direct and positive effect between the investment in ICT and the productivity of the courts, as Gomes et al.³⁵ found for the state and federal courts in Brazil. On the other hand, regarding the speed and duration of a lawsuit, the use of ICTs alone is not enough to shorten the duration of judicial proceedings, as Procopiuck's³⁶ findings revealed in the Brazilian context. Procopiuck also notes that in addition to management and technology, legislation also corresponds to an important factor that has impact on judicial performance.³⁷

Naturally, speed and productivity are not the only measures of performance and effectiveness in the use of ICTs in courts. As stated in Article 6 of the European Convention on Human Rights, everyone has the right to a "[...] fair and public hearing

26 Vries, Bekkers and Tummers, *supra* note 19.

27 Rogers, *supra* note 22.

28 Guimaraes, Gomes and Guarido Filho, *supra* note 3.

29 Sousa and Guimaraes, *supra* note 9.

30 M. Greenwood and G. Bockweg, Insights to Building a Successful E-Filing Case Management Service: U.S. Federal Court Experience, *International Journal for Court Administration*, 4(2), pp. 2–10.

31 F. Staechel , Les Technologies de l'information Au Service de La Modernisation Du Service Public de La Justice En France, in M. Fabri and P. Langbroek (eds.), *The Challenge of Change for Judicial Systems: Developing a Public Administration Perspective*, 2000.

32 A. Lienhard, Performance Assessment in Courts – The Swiss Case – Constitutional Appraisal and Thoughts as to Its Organization, *International Journal for Court Administration*, 6(2), pp. 26–42.

33 F. Van Dijk and H. Dumbrava, Judiciary in Times of Scarcity: Retrenchment and Reform, *International Journal for Court Administration*, 5(1), pp. 1–10.

34 J. J. Prescott, Improving Access to Justice in State Courts with Platform Technology, 70 *Vanderbilt Law Review*, 70(6), pp. 1993–2050.

35 A Gomes et al. Effects of investment in information and communication technologies on productivity of courts in Brazil, *Government Information Quarterly*, 35(3), pp. 480–490.

36 M. Procopiuck, Information technology and time of judgment in specialized courts: What is the impact of changing from physical to electronic processing?, *Government Information Quarterly*, 35(3), pp. 491–501.

37 *Ibid.*

within a reasonable time by an independent and impartial tribunal established by law.”³⁸ Judicial quality also includes technological tools and databases.³⁹ With the increased use of ICTs, courts can improve access, transparency, fairness and equality but also face the risk of a dehumanised justice system.⁴⁰

Several technologies have contributed to better assist the parties involved in the judicial process, allowing us to improve the effectiveness and legitimacy of the judiciary. In this respect, the relevance of meeting the needs of external users in day-to-day technologies is highlighted, for example, the use of mobile phones to obtain and send information and files, including evidence in court, videoconferences, including parties and lawyers, scheduling hearings at the parties’ convenience, and online dispute resolution,⁴¹ among others.

The literature has shown the importance of emergent ICTs applied to the judiciary: videoconference in remote hearings in French courts;⁴² online dispute resolution in Brazil;⁴³ bringing the courts closer to citizens through the use of trials live web-streaming⁴⁴ and social networks such as blog, Twitter, Facebook,⁴⁵ YouTube; LinkedIn.⁴⁶ These new technologies can contribute to increase confidence in the judiciary.⁴⁷

Specifically, studies related to this subject have recently been published with a variety of topics and contexts: adoption and implementation of the electronic judicial process in the State Court of the Federal District, Brazil, from the perspective of lawyers;⁴⁸ development and adoption of the electronic judicial process in the federal labour courts in Brazil from the perspectives of judges and court managers;⁴⁹ antecedents and outcomes of the adoption of the electronic processing system in the Brazilian

38 CoE, European Convention on Human Rights, 2013, p. 9.

39 Bühler, *supra* note 15.

40 D. Reiling, Technology in Courts in Europe: Opinions, Practices and Innovations, *International Journal for Court Administration*, 4–20(2), p. 11.

41 J. M. Greacen, Eighteen Ways Courts Should Use Technology to Better Serve Their Customer, *Family Court Review*, 57(4), pp. 515–538.

42 L. Dumoulin and C. Licoppe, Videoconferencing, New Public Management, and Organizational Reform in the Judiciary, *Policy and Internet*, 8(3), pp. 133–333.

43 R. V. C. Fernandes et al., The Expansion of Online Dispute Resolution in Brazil, *International Journal for Court Administration*, 9(2), pp. 20–30.

44 It is important to emphasise that according to presentations at the online conference “The COVID-19 crisis – Lessons for the Courts” on 3 September 2020, organised by the EGPA Permanent Study Group XVIII “Justice and Court Administration”, the disease Covid-19 crisis fostered the live-streaming of court meetings and hearings. See examples in United States of America <J. Baldwin, J. Eassey, and E. Brooke, Court Operations during the COVID-19 Pandemic, *American Journal of Criminal Justice* 45(4), pp. 743–758 >, and, in England and Wales <P. Brennan, Responses Taken to Mitigate COVID-19 in Prison in England and Wales, *Victims & Offenders*, pp. 1–19>.

45 M. Warren, Open Justice in the Technological Age, *Monarch University Law Review*, 40(2), pp. 45–58.

46 N. H. Meyer Jr., Social Media and the Courts: Innovative Tools or Dangerous Fad? A Practical Guide for Court Administrators, *International Journal for Court Administration*, 6(1), pp. 22–28.

47 Warren, *supra* note 45.

48 J. A. Teixeira and M. C. B. Rêgo, Inovação No Sistema Judiciário Com a Adoção Do Processo Judicial Eletrônico Em Um Tribunal de Justiça Brasileiro, *Journal of Administrative Sciences*, 23(3), pp. 369–384.

49 Sousa and Guimaraes, *supra* note 13.

Superior Court of Justice;⁵⁰ evaluation of the impact of the electronic lawsuit on federal courts in Brazil and Argentina;⁵¹ description of the electronic evidence management system in the international criminal court in The Hague, Netherlands;⁵² electronic case analysis and resolution in appellate courts;⁵³ implementation of the E-Codex – European Payment Order project in European countries;⁵⁴ discussion of risk factor associated with the design, development and implementation in e-justice systems in Singapore, Brazil, Belgium, Portugal and Cape Verde;⁵⁵ discussion of the e-discovery in North American state and federal courts;⁵⁶ adoption in two courts and two prosecutor's office in Italy of an electronic case management.⁵⁷

Thus, this study is in dialogue with studies on the adoption of ICTs and e-government, more specifically e-justice strategies in the context of the judiciary. The next section addresses the methodological aspects used to achieve the results.

3. METHODOLOGY

The research was descriptive, with a qualitative approach. The object is the e-justice technological innovations developed and adopted by the Swiss and Brazilian courts. The research aims to compare the similarities and differences in the adoption of e-justice innovations in both countries. In Switzerland, the object evaluated was the adoption of the Justitia 4.0 project, which covers all courts of the country.⁵⁸ It justifies researching Justitia 4.0 because it is a project that is still in development and implementation and will cover all the justice courts of Switzerland. In Brazil, the object analyzed was the electronic judicial process – PJE (*Processo Judicial Eletrônico*), the main e-justice system used by Brazilian courts.

To obtain a sample that represents the population of the courts: (i) seven Cantons were chosen in Switzerland, with priority for the first Cantons that had signed the

50 C. S. Freitas and J. J. Medeiros, Organizational Impacts of the Electronic Processing System of the Brazilian Superior Court of Justice, *Journal of Information Systems and Technology Management*, 12(2), pp. 317–332.

51 M. I. Arias and A. C. G. Maçada Judiciaries' modernisation through electronic lawsuits: Employees' perceptions from the Brazil and Argentina federal justice services." *Information Development*, 36(1), pp. 1–44.

52 M. Dillon and D. Beresford, Electronic Courts and the Challenges in Managing Evidence: A View from inside the International Criminal Court, *International Journal for Court Administration*, 6(1), pp. 29–36.

53 E. J. Magnuson and S. A. Thumma, Prospects and Problems Associated with Technological Change in Appellate Courts: Envisioning the Appeal of the Future, *The Journal of Appellate Practice and Process*, 15(1), pp. 111–138.

54 G. Pangalos, I. Salmatizidis and I. Pagkalos, Using IT to Provide Easier Access to Cross-Border Legal Procedures for Citizens and Legal Professionals – Implementation of a European Payment Order E-Codex Pilot, *International Journal for Court Administration*, 6(2), pp. 43–52.

55 J. Rosa, C. Teixeira and J. S. Pinto, Risk Factors in E-Justice Information Systems, *Government Information Quarterly*, 30(3), pp. 241–256.

56 S. A. Carlson, EDiscovery: A New Approach to Discovery in Federal and State Courts, *Illinois Bar Journal*, 9(95), pp. 184–209.

57 F. Contini, Reinventing the Docket, Discovering the Database: The Divergent Adoption of Information Technology in the Italian Judicial Offices, in M. Fabri and P. Langbroek (eds.), *The Challenge of Change for Judicial Systems: Developing a Public Administration Perspective*, 2000.

58 Warren, *supra* note 45.

public-law cooperation agreement with the Swiss Confederation, represented by the Swiss Federal Supreme Court and subjects who were involved in the project;⁵⁹ (ii) seven states and the federal level were chosen in Brazil, primarily in courts that have adopted or are in the process of implementing the e-justice system.

The *Swiss sample* consisted of twenty-two interviews: 9 judges, 5 information technology managers and 8 judicial managers.⁶⁰ One interviewee was a woman and 21 men. The average age of the interviewees was 51 years, with a standard deviation of 9.5 years; they had an average working time in court of approximately 15 years, with a standard deviation of approximately 12 years.

The *Brazilian sample* was composed of 25 interviews: 7 judges, 10 information technology managers and 8 judicial managers. Nine interviewees were women and sixteen were men. The average age of the interviewees was forty-two years, with a standard deviation of 7,3 years; they also had an average working time in court of approximately 15 years, with a standard deviation of approximately 6 years.

The interview lasted an average of 40 minutes. **Table 1** shows the cantons, states and federal courts of the first and second instances that were searched in both countries.

COUNTRY	CANTON/STATE	COURT
Switzerland	Zurich	Supreme Court of the Canton of Zurich**
	Bern	Government of Justice of the Canton of Bern
		Administrative Court of the Canton of Bern**
	Lucerne	Cantonal Court of the Canton of Luzern**
		Regional Civil Court of the Canton of Luzern*
	Thurgau	Supreme Court of the Canton of Thurgau**
	Neuchâtel	Cantonal Court of the Canton of Neuchâtel**
	Basel-Landschaft	Cantonal Court of the Canton of Basel-Landschaft**
	Vaud	Cantonal Court of the Canton of Vaud**
District Court of Lausanne*		
Federal level	Swiss Federal Supreme Court	
Brazil	Goías	State Court of Goías
	Pernanbuco	State Court of Pernanbuco
	Minas Gerais	State Court of Minas Gerais
	Roraima	State Court of Roraima
	Paraíba	State Court of Paraíba
	Paraná	State Court of Paraná
	Federal District	State Court of the Federal District and Territories
	Federal level	Regional Federal Court of the First Region

Table 1 Cantons/States and Courts of the research. Source: Research data. * Courts of first instance; ** Cantonal high courts.

⁵⁹ *Ibid.*

⁶⁰ *Ibid.*

The data were collected in the period from 2019 to 2020 in two stages. The first consisted of a bibliographic study to build the theoretical background and the state of the art of the theme. In the second stage, in-depth interviews were conducted with the help of semi-structured scripts.

The interview scripts, based on Sousa and Guimaraes,⁶¹ were structured in such a way as to contemplate the specificities of court innovation, identify the dynamics of planning and the adoption of innovation, and identify the antecedents, i.e., aspects that contributed to and hindered the adoption of innovation, and, assessed the expected outcomes and impacts.

The information collected through the interviews was recorded, transcribed, returned to the interviewees for confirmation and validation of the data, and analyzed using the content analysis technique proposed by Bardin⁶² in three steps: pre-analysis, exploratory reading, construction of the *corpus*; exploitation of the material, with the construction of a database, associating excerpts from the interviews with the defined categories and with the variables, and treatment and interpretation of the results according to the aims and categories of analysis.

The categories of analysis were defined as antecedents of innovation, i.e. aspects that contribute and aspects that hinder the adoption of the innovations studied; outcomes and impacts. The antecedents were classified at the level of analysis, as suggested by Vries et al.,⁶³ in environmental, organizational, innovation and individual aspects. The categories were presented in tables with the results by group of interviewees and by frequency of responses.

4. RESULTS AND DISCUSSION

Switzerland is a Confederation with the Cantons as member states.⁶⁴ The Swiss justice is structured on two main levels: (i) cantonal level, by civil, criminal, administrative and special courts; (ii) federal level: Federal Supreme Court, Federal Administrative Court, Federal Criminal Court, Federal Patent Court, and Military Courts.⁶⁵

On Swiss justice: the civil and criminal courts have first and second instance in the cantons; the code of civil and criminal procedure was harmonized in 2011 but the administrative code still varies between the cantons; the size of the cantons has an important impact on the size and number of judges acting.⁶⁶ In this line, the cantonal

⁶¹ Sousa and Guimaraes, *supra* note 13.

⁶² L. Bardin, *Análise de Conteúdo* (2011).

⁶³ Vries, Bekkers and Tummers, *supra* note 19.

⁶⁴ Patrick M. Müller, 'Swiss Experiences: Caseload Management at Lucerne Cantonal Court', in Andreas Lienhard and Daniel Kettiger (eds.), *Innovation on European Caseload Management in Courts* (2018).

⁶⁵ BUNDESGERICHT, *The Paths to the Swiss Federal Supreme Court. An Outline of Switzerland's Judiciary Structure*, 2013, available at https://www.bger.ch/files/live/sites/bger/files/pdf/de/wege_zum_bundesgericht_e.pdf.

⁶⁶ Andreas Lienhard, Daniel Kettiger and Daniela Winkler, 'Status of Court Management in Switzerland', 4 *International Journal for Court Administration* (2012) 1.

and the confederation (federal) level the courts have their own autonomy to organize the structure of their judicial system, so there is heterogeneity between cantons.⁶⁷

In Switzerland, the project “Justitia 4.0”, which has one of its functional objectives to be the “one-stop-shop” portal of the Swiss justice system⁶⁸ is under way, is currently at the concept stage and is expected to be fully implemented by 2026. A review of the Swiss codes of civil and criminal procedure is also being carried out in order to achieve the project.⁶⁹ Regarding investments in information technology, in 2018, around 2.78% of the Swiss justice implemented budget was allocated for court computerization.⁷⁰

The name of the project Justitia 4.0 is derived from the term industry 4.0, and this definition is associated with a stage of the industrial revolution and was introduced in 2011 at the fair in Hanover by the German government.⁷¹ So, this definition brought industry 4.0 constituents of the technological revolution: “big data, autonomous robots, augmented reality, additive manufacturing, cloud computing, cyber security, internet of things, system integration and simulation.”⁷² It is important to highlight that the project is placed in the judicial context, a government branch that presents strong barriers to innovation, such as conservative structure, deviation from performance objectives and risk aversion.⁷³

The judiciary is structured in Brazil through the following organizations: Supreme Federal Court; National Council of Justice (CNJ); Superior Justice Court; Superior Labor Court; Federal Regional Courts and Federal Judges; Labor Courts and Judges; Electoral Courts and Judges; Military Courts and Judges; Courts and Judges of the States and of the Federal District and Territories.⁷⁴

There are currently several adoptions of ICTs in Brazil related to e-justice systems. In the case of judicial electronic processes (PJE – electronic judicial process, PROJUDI – digital judicial process, and – e-SAJ – judicial automated system), 2.09% of the expenses of the Brazilian judiciary budget in 2020 were allocated to court computerization.⁷⁵

In Brazil, 96.9% of all new cases are in electronic format, there are some courts with a high percentage of digitalization; in labor justice, 99.9% of the cases are in electronic format, and in federal justice, 99.5%.⁷⁶ In the case of state justice, there was a strong evolution in the electronic format, from 4.2% in 2009, 82.6% in 2018 to 95.5% in

67 Peter Bieri, ‘Law Clerks in Switzerland – A Solution to Cope with the Caseload’, 7 *International Journal for Court Administration* (2016) 29Lienhard, Kettiger and Winkler, *supra* note 66.

68 HIS-PROGRAMM, *Vision Und Zielsetzungen Justitia 4.0*, 2018, available at <https://www.his-programm.ch/de/Projekte/Justitia-40/Ziele>.

69 Bühler, *supra* note 15.

70 CEPEJ, *supra* note 16.

71 H. Ç. Bal and Ç. Erkan, ‘Industry 4.0 and Competitiveness’, 158 *Procedia Computer Science*, 158, pp. 625–631.

72 *Ibid.*, at 626.

73 D. Baxter, M. Schoeman and K. Goffin, *Innovation in Justice. New Delivery Models and Better Outcomes*, 2011.

74 Brasil, *Constituição Da República Federativa Do Brasil*, 1988.

75 CNJ, *supra* note 18.

76 CNJ, *Justiça Em Números 2019* (2019), available at https://www.cnj.jus.br/wp-content/uploads/conteudo/arquivo/2019/08/justica_em_numeros20190919.pdf.

2020.⁷⁷ The PJE was developed by the Federal Regional Court of the Fifth Region and began in 2004 with the name CRETA. Since 2010, with a technical cooperation agreement between the National Council of Justice (CNJ – *Conselho Nacional de Justiça*) and fourteen state courts, it was renamed to PJE.⁷⁸ In May 2022, the PJE was implemented in fourteen Brazilian states and the Federal Regional Court of the First Region.⁷⁹

It is important to mention that there are important differences in the stage of adoption, geographic, historical, political, economic and social terms; however, Switzerland and Brazil have in common a federative state structure and the legal tradition of civil law.⁸⁰ In any case, there is still a gap in cross-national innovation studies in different traditions of governance and culture,⁸¹ and the purpose is not to detect whether there is a better or a worse country’s strategies in terms of innovation adoption but to compare the similarities and differences in the light of the literature.

ANTECEDENTS

Tables 2 and 3 present the main innovation antecedents classified by level of analysis, according to the subjects interviewed. The more “+” this antecedent received, the more often it was mentioned by the subjects.

Table 2 Antecedents of the Swiss research.⁸²
Source: Research data.
Notes: ++++ Stands for antecedent mentioned by at least two thirds of the interviewees; +++ Mentioned by at least half of the interviewees; ++ Mentioned by at least a quarter of the interviewees; + Mentioned by at least once; / Antecedent not mentioned. The antecedent perceived only in Switzerland has been put in bold.

LEVEL	DRIVERS/HINDERS	JUDGES (N = 9)	IT MANAGERS (N = 5)	JUDICIAL MANAGERS (N = 8)	SUM (N = 22)
Environmental	Access to justice/information	+++	++	++++	++++
	Legislation	++	+++	+++	+++
	Federalism	+	+++	++++	+++
	Independency	+	/	++	+
	Different languages	/	+	/	+
	Integration with other e-gov systems	+	/	+	+
Organizational	Long adoption	++	+	++++	+++
	Update and adaptation of previous systems	++	++	+++	++
	Communication/Training	+	+	++++	++
	Concrete results	++	/	+++	++

(Contd.)

77 CNJ, *supra* note 18, *supra* note 76.

78 CNJ, *Processo Judicial Eletrônico: Histórico*, 2020, available at <<https://www.cnj.jus.br/programas-e-acoos/processo-judicial-eletronico-pje/historico/>> [Accessed: 25 July 2020].

79 TRF, *Dashboard – Implantação PJe*, 2022, available at <https://app.powerbi.com/view?r=eyJrIjoiNjQzNjAzYjktYTZkMy00YzI5LW1wNjUtYTQyZDMwZDk2ZjExIiwidCI6IjIjMzgzOWY2LWUxYTMtNDkxYy1hMWVhLTUwOTZmOTE0Y2Y0YiJ9>.

80 John Henry Merryman and Rogelio Pérez-Perdomo, *The Civil Law Tradition: An Introduction to the Legal Systems of Europe and Latin America*, 2007.

81 Vries, Bekkers and Tummers, *supra* note 19.

82 First publishes by Sousa, *supra* note 1.

LEVEL	DRIVERS/HINDERS	JUDGES (N = 9)	IT MANAGERS (N = 5)	JUDICIAL MANAGERS (N = 8)	SUM (N = 22)
	Clear focus and targets	/	+++	+++	++
	Participation/collaboration	+	+	++	+
	Support	++	+	/	+
	Interdisciplinary team	+	+	+	+
	Amount of people involved	/	+++	/	+
	Use of hybrid systems	+	/	+	+
	Leadership	/	/	++	+
	Overlapping the projects	/	+	/	+
	Dedicated staff	/	+	/	+
Innovation features	Usability	++	+	++++	+++
	Sandboxes	+	+	/	+
	Security/Privacy	/	++	+++	++
Individual	Resistance	++++	+	+++	+++
	Age	+++	++++	/	++
	Previous familiarity in using e-gov and other electronic tools	/	+++	+	+

LEVEL	DRIVERS/HINDERS	JUDGES (N = 7)	IT MANAGERS (N = 10)	JUDICIAL MANAGERS (N = 8)	SUM (N = 25)
Environmental	Centralization	++	+++	+++	+++
	Infrastructure	++++	++	+++	+++
	Access to justice/information	++++	+	+++	++
	Integration with other e-gov systems	++	+++	++	++
	Standardisation	++	++	++	++
	Legislation	+	/	/	/
Organizational	Communication/Training	++	++	++++	+++
	Update and adaptation of previous systems	++++	++	+	++
	Participation/collaboration	+	++	++	++
	Support	/	++	++	++
	Use of hybrid systems	++	/	++	+
Innovation features	Level of maturity	++	++	++	++
	Security/Privacy	++	++	+	++
	Usability	/	/	+	+

(Contd.)

LEVEL	DRIVERS/HINDERS	JUDGES (N = 7)	IT MANAGERS (N = 10)	JUDICIAL MANAGERS (N = 8)	SUM (N = 25)
Individual	Age	+++	+++	+++	+++
	Resistance	++	+++	++	++
	Previous familiarity in using e-gov and other electronic tools	+	/	/	/

ANTECEDENT SIMILARITIES

Access was one of the most relevant antecedents according to respondents at the environmental level. Access was understood in two ways: easier access to information by the parties involved in the legal proceedings and access to the judiciary by citizens. As one respondent mentions, “the information system will allow you to access information everywhere, search and compare information, focus on the most important information and share instantly them with other parties,” and from a broader perspective in the sense of access to justice, “I think it will make it easier for the people to access to the courts, and this is a very important issue on the democratic level because access to the court is fundamental to the functioning of the democracy.” This antecedent was also found by Freitas and Medeiros⁸³ in the Brazilian Superior Court of Justice; in the study of Teixeira and Rêgo⁸⁴ in the State Court of the Federal District in Brazil; and in the US Federal Courts.⁸⁵

The legislation was an important aspect emphasized by all types of respondents in Switzerland in two ways: first, at the federal level, which makes electronic communication mandatory for courts and attorneys at law, as one respondent says “we need new laws, if we choose the electronic way everybody has to use electronic, we have to leave the paper files, so we need laws that say that is mandatory”; and, at the cantonal level, which defines the budget needed for implementation. Typically, an ICT-related innovation in the courts also needs to include legislation and administrative procedures to be implemented.⁸⁶ Although mandatory adoption was considered a hindrance in a previous study,⁸⁷ Swiss subjects considered that in the Swiss case, this legislation would be an important driver. In Brazil, this antecedent was mentioned only by a small number of judges relating to the implementation deadlines. The emphasis on this antecedent in the Swiss context may have occurred because the Justitia 4.0 project is still at an early stage, and therefore, regulation is a very relevant issue for the institutionalization of this innovation.

Lastly, common to both countries at the environmental level, the need for integration among other government systems was also highlighted. In the Brazilian context, as an example, it was mentioned that the development of other innovations integrated with the use of the e-justice system was possible “a new application called e-letter [e-cartas] of the post office that already distributes [documents to be sent by

Table 3 Antecedents of Brazilian research.

Source: Research data.

Notes: ++++ Stands for antecedent mentioned by at least two thirds of the interviewees; +++ Mentioned by at least half of the interviewees; ++ Mentioned by at least a quarter of the interviewees; + Mentioned by at least once; / Antecedent not mentioned. The antecedent perceived only in Brazil has been put in bold.

⁸³ Freitas and Medeiros 2015.

⁸⁴ Teixeira and Rêgo 2017.

⁸⁵ Greenwood and Bockweg, *supra* note 30.

⁸⁶ T. Weers, Case Flow Management Net-Project – The Practical Value for Civil Justice in the Netherlands, *International Journal for Court Administration*, 8(1), pp. 31–42.

⁸⁷ Sousa and Guimaraes, *supra* note 13.

post], so there is a new format of development of the process, where it was only possible with the arrival of the electronic format.” Systems integration can do much to improve services; for example, in Canada, the criminal justice case management system is integrated to collect data from the police and other government agencies.⁸⁸ Interoperability with other government systems was also considered an important antecedent in other studies.⁸⁹

At the organizational level, one concern stressed by all categories of respondents in both countries was the systems currently or previously in use by the courts. In Switzerland, they are aware of updating the systems currently in use and adapting them to the Justitia 4.0 project. As a manager mentioned, “we are satisfied with [the currently system], today is perfect, but [it] has to improve also in the future, and we are not sure today that they are in position to improve the software, it is one of our preoccupations today.” In Brazil, the issue is the comparison of the PJE with previous systems, considered better due to the freedom of adaptation by the court and the functionalities that the PJE does not yet have: “it [PJE] does not give the same freedom that the [previous electronic process] gives of working freely, it defines tasks in sequence, something that the [previous electronic process] does not do, the PJE does not have a range of functionalities that the [previous electronic process] has.” Related to this antecedent was also mentioned the use of hybrid systems, that is, initially having to use two systems to release the same data, or still having to operate in electronic and physical systems at the same time, previous studies indicate that this may negatively impact judicial performance and cause rework.⁹⁰

Given the complexity and scope of the e-justice, respondents of both countries reinforced the importance of communication in relation to all stages as well as organizational training activities. In Brazil, the training activities were not considered sufficient and need improvement, as a judicial manager states, “the training was very bad for us and it’s still not a good training today, even after so many years”. Well-structured training activity and implementation manuals are considered essential for the adoption of an innovation in the court.⁹¹ From this organizational perspective, the importance of participation and collaboration of those involved were also mentioned and contributed, as one Brazilian IT manager asserts, “[to] foster cooperation between courts, the conduct of proceedings, and a unification of the judiciary.”

At the innovation and features level, the respondents from both countries have indicated the relevance of data security and privacy issues, as two managers state “in Switzerland security is a higher value than access. People want to keep their data private”, “[...] we need security, we need to trust [in the system].” In Brazil, it has been reported that there are no more lost or missing processes, which occurred previously when the process was not digitalized, as an IT manager is quoted as saying “process security in relation to the physical process as losing, disappearing with the process, what does not occur with the virtual process, with the digital one does not occur.” The potential for security violations is a strong barrier to the adoption of ICTs in courts,⁹²

⁸⁸ J. Borkowski, *Court Technology in Canada*, *Willian & Mary Bill of Rights Journal*, 12(3), pp. 681–686.

⁸⁹ Freitas and Medeiros, *supra* note 49. Sousa and Guimaraes, *supra* note 13.

⁹⁰ Sousa and Guimaraes, *supra* note 13.

⁹¹ *Ibid.* Greenwood and Bockweg, *supra* note 30.

⁹² Freitas and Medeiros, *supra* note 50.

and security, integrity and confidentiality of data and information are essential elements in this regard.⁹³

Usability was associated with user-friendliness, as two Swiss respondents mentioned. One highlighted the ease of use, “important is that we have a simple system, not too complicated for the people to work,” and the other stressed the perception of usefulness “[...] it will change the manner of the job and it will be easier I think, because paper is not very friendly when you are researching things.” In Brazil, where the innovation is already in use, it was mentioned by an IT manager that the system needs improvements “[there is a] gap between what we want and what the system offers, the PJE [...] is not a friendly system, it is difficult.” The ease of use and perceived usefulness were also found to be relevant antecedents in the literature.⁹⁴

At the individual level, three antecedents have been identified in both countries, but with different degrees of importance: resistance, age and previous familiarity in using online services. Resistance to change is an important antecedent that acts as a hindrance to innovation, and it can be understood as opposition against a technology or practice related to a particular technology assessed as adverse and, in addition, can promote uncoordinated activities and conflict.⁹⁵ But the need to change is imperative for some subjects, as one Swiss interviewee mentions: “We are at the very beginning but so far it is very nice to see that I think all over Switzerland there is really all the people they think there must be something be done. We are a bit behind. We should get ahead, because we are behind with e-government so it is really necessary to get in to this digitalization process in the courts. So, it is a good feeling to see that people really want to get there”. This antecedent is also found in the literature as a hindrance.⁹⁶

Age was perceived by respondents in the same meaning as already described in the literature in court administration as a generation gap, in the sense that older professionals would have more resistance in adopting innovations and more difficulties in access and use these news technologies.⁹⁷ It has also been perceived that several other services are being offered electronically in recent years, and this familiarity with these electronic services may be a factor that would facilitate the adoption of ICTs in the context of the courts.

ANTECEDENT DIFFERENCES

Specifically, according to the research respondents in the Swiss context, the following antecedents were identified: (i) at the environmental level, federalism, independence

⁹³ Rosa, Teixeira and Pinto, *supra* note 55.

⁹⁴ F. D. Davis, User Acceptance of Information Technology: System Characteristics, User Perceptions and Behavioral Impacts, *International Journal of Man-Machine Studies*, 38(3), pp. 475–487. F. D. Davis, R. P. Bagozzi and P. R. Warshaw, User Acceptance of Computer Technology: A Comparison of Two Theoretical Models, *Management Science*, 35(8), pp. 982–1003. Sousa and Guimaraes, *supra* note 13.

⁹⁵ V. Kaptelinin and B. A. Nardi, *Acting with Technology: Activity Theory and Interaction Design*, 2006.

⁹⁶ Teixeira and Rêgo, *supra* note 47. A. Andrade and L. A. Joia, Organizational Structure and ICT Strategies in the Brazilian Judiciary System, *Government Information Quarterly*, 29(S1), pp. S32–S42. Sousa and Guimaraes, *supra* note 13.

⁹⁷ M. G. Morris and V. Venkatesh, Age Differences in Technology Adoption Decisions: Implications for a Changing Work Force, *Personnel Psychology*, 53(2), pp. 375–403. Sousa and Guimaraes, *supra* note 13. Freitas and Medeiros, *supra* note 49.

of the judiciary and the different official languages used by the country were identified; (ii) at the organizational level, long adoption, concrete results, clear focus and targets, interdisciplinary team, number of people involved, leadership and the overlapping of the projects were identified; and, (iii) at the innovation features level, only the use of the sandboxes was identified.

An antecedent often mentioned in Switzerland was Federalism. And this is a specific aspect of the Swiss context, as two of the managers mentions “the federalism hinder, we have 26 Cantons and all the opinion leaders and that is not easy to have the same understanding, the same targets, the same opinions on each of these aspects;” and, “the problem in Switzerland is that there are 26 different Cantons with their own justice system.” The federalism of the country associated with the autonomy of the Cantons and the democratic characteristic brings complexity to the development and implementation of innovations on a large scale, as illustrated by two managers: “ambitious project, very complex because of the number of stakeholders [...] in Switzerland;” “We try to reach the consensus, we look them to make decisions if we have not to reach a solid consensus it is difficult.” In the same country-specific line, it was mentioned only by IT managers that language, since Switzerland has four official languages (German, French, Italian and Roman), can be a hindrance.

The institutional independence of the judiciary was considered by the judges and judicial managers as an antecedent, and this is also a provision stated in Article 191c of the Federal Constitution of the Swiss Confederation in which it states that the judicial authorities are independent in the use of their judicial functions and are solely subject to the law.⁹⁸ Respondents were concerned about possible excesses in transparency and increased pressure by statistics and performance measurements.

The time period was a point raised at the organizational level, but there was no unanimity in this aspect. While some feel it is a long period of development and deployment “[...] we started in 2018 and we are looking forward to 2026, and I am not too sure we are going have it in 2026, maybe in 2030 as well, you see, that is a long time. And when you think about technical innovation in this period of time, it maybe that is a completely different technic in 2030 than we have nowadays”, others think it will be important for a smooth adoption of the new technology and a careful change planning to avoid risks “it is long but I am sure that we are going to have a good solution, it takes long time;” “there will be a long phase for people to adjust and for process inside the courts to adjust” and; “I do not recommend a ‘big bang’ approach because the risk of failure is high. A step-by-step introduction that will allow people to gradually adapt their way of working.”

Related specifically to the implementation of the project, respondents considered that some elements could contribute to lowering barriers in adoption: (i) to provide those involved with concrete results of the advantages of the innovation; (ii) that clear focus and targets were set; (iii) interdisciplinary team, the Justitia 4.0 project has created expert groups with participants from various fields and from various courts, this strategy is also found in previous studies;⁹⁹ (iv) as in the literature, leadership was

⁹⁸ Switzerland, *Federal Constitution of the Swiss Confederation*, 1999, The Portal of the Swiss Government, available at <<https://www.admin.ch/opc/en/classified-compilation/19995395/index.html#a191c>> [Accessed: 5 May 2020].

⁹⁹ Sousa and Guimaraes, *supra* note 13. Greenwood and Bockweg, *supra* note 30.

considered an important antecedent in all phases of the innovation process;¹⁰⁰ (v) specifically, IT managers believe that there are many people involved in the project on one hand, and on the other hand, there is a very limited number of dedicated personnel working full time on the project; and, (vi) only IT managers think there is overlap of some of the subprojects.

The possibility of trying out or testing an innovation before a definitive decision is made increases the probabilities of it being adopted;¹⁰¹ in the same sense, the sandboxes were perceived as an important antecedent. In the perception of a manager, “What I then know, which I think is very good, they will realize this solution in sandboxes, in small solutions to taste any productive or pre-productive bills in pilots and then roll it out throughout the Cantons.” Sandboxes are part of the methodology of Project Justitia 4.0 and are pilot tests in certain cantons or courts or public prosecutors’ offices, allowing the user-friendliness, legal compliance, technical feasibility and administrative processes of future applications to be tested at an early phase, and in doing so, minimize the risks.¹⁰²

The following antecedents were found only in the Brazilian context: (i) at the environmental level, there was centralization, infrastructure and standardization, and (ii) at the innovation features level, the level of maturity of the e-justice system.

The CNJ is a control and governance body of the Brazilian judiciary.¹⁰³ CNJ Resolution 185 regulates and institutes the PJE to the Brazilian courts as a standardized computerized system of legal proceedings.¹⁰⁴ More recently, by CNJ resolution 335 of 2020, the PJE remains as the priority system.¹⁰⁵ With the adoption of the PJE, the courts lose their autonomy to develop and change the system locally, suggestions for change must be evaluated by the CNJ, and in a centralized top-down way, it is decided whether to change the system. If any change occurs, the update will be implemented for all courts that use the system. These points are highlighted, according to some statements: “in court it comes from the top down, then the court sets the rules, simply communicates and determines that from such a day on the system is as follows,” “is a closed tool, that the development of modules is centralized in the CNJ, perhaps this aspect is a little detrimental to the judiciary itself,” and “there are generally no adjustments allowed to the specific reality of each State.” This strategy is also found in labor courts in Brazil¹⁰⁶ and in the Brazilian Superior Court of Justice.¹⁰⁷

On the other hand, centralization may promote standardization in a nationwide e-justice system, as mentioned by the interviewees. This standardization can be of

¹⁰⁰ M. P. Castro and T. A. Guimaraes, *Dimensões Da Inovação Em Organizações Da Justiça: Proposição de Um Modelo Teórico-Metodológico*, *Cadernos EBAPE.BR*, 17(1), pp. 173-184. Baxter, Schoeman and Goffin, *supra* note 64.

¹⁰¹ Rogers, *supra* note 22.

¹⁰² HIS-PROGRAMM, *Que Signifie Bacs à Sable?*, 2020, available at <<https://www.justitia40.ch/fr/methodologie/>> [Accessed: 8 May 2020].

¹⁰³ Renato Máximo Sátiro, Jessica Vitorino Martins and Marcos de Moraes Sousa, ‘The Courts in the Face of the COVID-19 Crisis: An Analysis of the Measures Adopted by the Brazilian Judicial System’, 12 *International Journal for Court Administration* (2021) 1.

¹⁰⁴ CNJ, Resolução No 185, de 18 de Dezembro de 2013, 2013.

¹⁰⁵ CNJ, *supra* note 18.

¹⁰⁶ Sousa and Guimaraes, *supra* note 13.

¹⁰⁷ Freitas and Medeiros, *supra* note 50.

advantage to users: “they thought it best to adopt the PJE because it is a unified system, the courts are going for an adoption of an unified system for all courts, [...] it is easier for the user to know that it is the same system in all courts, [...] and for the lawyer, who works with several different courts, if we can standardize he will have a very similar environment”, but it can also slow down the evolution of the system “and since it has this tendency to be national, I think its evolution is much slower than regionalised initiatives, it is a bottleneck.”

Infrastructure was a frequently mentioned antecedent and was associated with problems in the supply of internet and electricity; supply of updated hardware, such as scanners and two monitors to facilitate reading; and equipment maintenance. Infrastructure challenges are reported in the adoption of e-justice in Brazil,¹⁰⁸ Singapore, Portugal and Cape Verde.¹⁰⁹

The level of maturity of the system was the most mentioned antecedent in the innovation features level in Brazil. All the courts researched already had an e-justice system in place at the time they adopted the PJE, and many respondents think that the PJE still needs to evolve and many also find the previous system better than the PJE, as mentioned in the following excerpts: “the PJE lacks maturity, it will take years to reach the point of maturity that the previous one already has”; “the system itself still lacks an adequate solution for providing more critical information and analysis reports”; “I want to make a warning, the PJE is not the best electronic process system, it is still in development.”

OUTCOMES AND IMPACTS

Tables 4 and 5 provide the expected outcomes and impacts in the Swiss and Brazilian courts of justice, according to the subjects interviewed. The more “+” this item received, the more often it was mentioned by the subjects.

OUTCOMES/ IMPACTS	JUDGES (N = 9)	IT MANAGERS (N = 5)	JUDICIAL MANAGERS (N = 8)	SUM (N = 22)
Speed	++++	++	+++	+++
Review-redesign process (routines)	++	++++	+++	+++
Simultaneously	+++	/	+++	++
Saving costs	/	++++	++	++
Repetitive work and double entry	/	+++	++	+
Transferring cases	+	+++	+	+
Access to justice/ information	+	+	++	+
Mobility	/	++	++	+

(Contd.)

Table 4 Expected outcomes and impacts of the Swiss research.¹¹⁰
Source: Research data.
Notes: ++++ Stands for outcomes/impacts mentioned by at least two-thirds of the interviewees; +++ Mentioned by at least half of the interviewees; ++ Mentioned by at least a quarter of the interviewees; + Mentioned by at least once; / Antecedent not mentioned. The outcomes and impacts perceived only in Switzerland have been put in bold.

¹⁰⁸ Sousa and Guimaraes, *supra* note 13. Rosa, Teixeira and Pinto, *supra* note 53. Freitas and Medeiros, *supra* note 49.

¹⁰⁹ Rosa, Teixeira and Pinto, *supra* note 55.

¹¹⁰ First publishes by Sousa, *supra* note 1.

