INNOVATION AND LOCAL GOVERNANCE:

THE GOVERNMENT-AS-A-PLATFORM APPROACH

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1. INTRODUCTION

The impact of the novel Coronavirus (COVID-19) outbreak changed the way in which cities and territories are to be administrated. In times of digital revolution and complex societies, local governments require innovative administration processes crossed by three main components: information and communication technologies integration (digitalization); analytical tools that convert data into usable information (informatization); and organizational structures promoting collaboration and smart governance (open government and innovation).[2]

As recently observed, the digital transformation of the public sector became essential for the guarantee of the "right to good administration" declared by the Charter of Fundamental Rights of the European Union, Art. 41.[3] Nevertheless, it shall be remarked that the digital transition of local government administrations requires a deep re-engineering of organizational structures and governance models, since the mere adaptation from analogical to digital tools does not guarantee, *per se*, good administration. Nowadays, the growing pluralistic outline of local communities increased the complexity in managing local governments' activities, which cannot further be understood as separate functions and services but need, instead, a holistic and integrated governance approach.[4]

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[2] L. FOLLIOT – LALLIOT, P. MCKEEN, *Procurement and Smart Cities: Exploring examples on both sides of the Atlantic*, in *Ius Publicum Network review,* vol. 2, 2019, 1 ff.

[3] See D. U. GALETTA, *Digitalizzazione e diritto ad una buona amministrazione (il procedimento amministrativo tra diritto UE e tecnologie ICT),* in *Il diritto dell'amministrazione pubblica digitale* (R. CAVALLO PERIN, D.U. GALETTA eds.), Turin, Giappichelli, 2020, 85 ff.

[4] M. RAZAGHI, M. FINGER, *Smart Governance for Smart Cities*, in *Proceedings of the IEEE,* vol. 106, no. 4, 2018, 682.

In the most cases, the traditional local government administration structure organized on a territorial and functional basis is not suitable anymore for the efficient pursuit of its functions.[5] The new governance model requires involvement of private citizens, nongovernmental organisations as well as networks of public organisations, and marks the shift of the role of public administration from 'governing' to solving public problems in collaboration with others.[6] Smart cities provide an ideal opportunity for exploring new digital technologies and their impact on citizens participation for the adoption of e-participation influences policy design and policymaking, leading to smart solutions.[7] This leads to an important transformation in the way cities and territories are governed and introduces new challenges to the traditional local governance models.

2. THE ROLE OF DIGITAL PLATFORMS IN LOCAL PUBLIC ADMINISTRATIONS

In governance structure legitimacy is required not only of the governing system, local authorities or public organisations; but also of other participants, including citizens.[8] The complexity of problems within the local administration context has reached a point where digitalization and collaboration among a large number of stakeholders are essential,

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[5] On this topic see R. CAVALLO PERIN, G.M. RACCA, *Smart cities for an intelligent meeting of social needs,* in *Le futur du droit administratif – The future of administrative,* (J.B. AUBY ed.), Lexis Nexis, 2019, 431-437.

[6] S. SECINARO et al., *Does Citizen Involvement Feed on Digital Platforms?,* in *International Journal of Public Administration,* 2021, 2.

[7] A. VISVIZI at al., *Irregular migratory flows: Towards an ICTs' enabled integrated framework for resilient urban systems. Journal of Science and Technology Policy Management,* 8/2, 2017, 227-242.

[8] L. HÄIKIÖ, *From Innovation to Convention: Legitimate Citizen Participation in Local Governance,* in *Local Government Studies*, 38/4, 2012, 415-435.

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since no single actor can have the adequate knowledge and resources to tackle them alone.[9] This increased the need of empowering horizontal-based governance models focused on collaboration with non-state actors and aimed at of co-defining how the public interest, which is to be pursued in different fields.[10] The roles and functions undertaken by citizens in smart city governance models are dynamic and evolve over time. This highlights how smart city initiatives have differentiated outcomes and how the mode of governance in a societal and institutional context plays an important role in shaping patterns of citizen participation.[11] Some public spheres of the city are now governed through the collective actions of different stakeholders rather than through activities exercised by the public administration alone.[12] This emerges more and more rapidly in the fields of online services that local authorities are required to guarantee to their citizens and enterprises.[13] The European strategy geared toward

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[9] M. RAZAGHI, M. FINGER, *Smart Governance for Smart Cities*, cit., 681; C. NUNES SILVA, *Global Trends in Local Governance,* in ID. (eds) *Contemporary Trends in Local Governance. Local and Urban Governance.* Springer, Cham, 2020, 1-19.

[10] C.M. COLOMBO, *New forms of local government and the transformation of Administrative Law,* in *European Public Law,* vol. 24, no.3, 2018, 575; R. E. LEVITT, W. HENISZ et al.*, Governance challenges of infrastructure delivery: The case for socioeconomic governance approaches*, in *Proc. Construct. Res. Congr.,* 2010, vol. 2, 757-767; N. TEWARI, G. DATT, *Towards FoT (Fog-of-Things) enabled Architecture in Governance: Transforming e-Governance to Smart Governance*, 2020 International Conference on Intelligent Engineering and Management (ICIEM*)*, 2020, 223-229; M. DAS AUNDHE, R. NARASIMHAN, *Public Private Partnership (PPP) Outcomes in E-Government: A Social Capital Explanation,* in *International Journal of Public Sector Management* 2016, vol. 29, no. 7, 638-658.

[11] Cf. E. PRZEYBILOVICZ et al.*, Citizen participation in the smart city: findings from an international comparative study,* in *Local Government Studies*, 48/1, 2022, 23-47.

[12] To stress the importance of enhancing citizens' participation, the Organization for Economic Co-operation and Development (OECD) has praised metropolitan authorities for being 'local agents of change', as they can easily identify the best opportunities for change and innovation and collaborate with the private sector and civil society to experiment with new solutions.

[13] S. RANCHORDÁS, *Citizens as Consumers in the Data Economy: The Case of Smart Cities*, in *EuCML 4*, (2018), 155 et seq. (157).

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the realization of the Digital Single Market (DSM)[14] has progressively evolved with the ambitious goal of shaping the digital future of Europe by considering digital technologies as an enabler for the improvement of citizens' quality of life, to provide new opportunities for businesses, and also to combat climate change in combination with the Europe's green transition[15]. The Digital Europe Programme (DEP)[16], presented by the European Commission in June 2018 and launched in early 2021, represents the consolidation of these strategies and provide strategic funding to answer these challenges. The Italian Digital Administration Code[17] recognizes the centrality of citizens' rights in the use of digital public administration services while emphasizing the need to implement the principles of accessibility, high usability and availability, completeness of information, high interoperability[18] of the local administrations' data. Beside of that, the EU Regulation n.1724/2018 establishing the Single Digital Gateway (SDG)[19] indicates mandatory quality parameters that websites of Member States' public administrations shall comply with to enable overall higher quality of

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[14] See European Commission (2015a), *Digital Single Market Strategy*, COM(2015) 192 final and European Commission (2015d), *Single Market Strategy,* COM(2015) 550 final.

[15] See A. SIKORA, *European Green Deal – legal and financial challenges of the climate change,* in *ERA Forum* vol. 21, 2021, 681-697.

[16] Online: The Digital Europe Programme | Shaping Europe's digital future (europa.eu), accessed 19 November 2021.

[17] Legislative decree of 7th March 2005, n. 82.

[18] The concept of interoperability recalls the possibility of wider and easier circulation of information and data in the public sector. See G. CARULLO, *Government in the Digital Era: Can We Do More with Less?* in *Information and Communication Technologies Challenging Public Law, beyond Data Protection. Atti del 12° congresso annuale della Societas Iuris Public Europaei* (SIPE), Milano, 25-27 maggio 2017, (J. ZILLER E D. U. GALETTA eds.), Baden, Nomos Verlagsgesellschaft, 2018, 143-152.

[19] Regulation EU 2018/1724 of 2 October 2018 establishing a single digital gateway to provide access to information, to procedures and to assistance and problem-solving services and amending Regulation (EU) No 1024/2012 - hereinafter SDG Regulation.

information on the Single Market and accessibility of administrative procedures for cross-border users.[20] The aim is to put the citizen in the centre by eliminating the burdens in access to public services by means of reorganised and innovative internal processes, as well as strengthened cooperation between public bodies. Specifically, the SDG is a portal designed to guide citizens and businesses to find information on European and national rules, rights and procedures with links to the sites where these can be done online, with the goal of bringing 21 administrative procedures online by 2023, making fully transnationally accessible national online services.[21] To that extent, the development of digital administrative networks between Member States and Union administrations plays a key role not only for the fostering of the European Single Market, but also for the rapid digital transformation of local governments.[22] Since the advent of the second digital revolution, local governments are forced to seek ways for their cities to become more ethical, inclusive, intelligent, and sustainable in order to address the challenges of the digital society (such as information sharing, citizen engagement, transparency and openness). The smart-city concept is indeed mostly considered from a technology-orientated perspective that stresses the use of information and communication technologies (ICTs) and big data; and the same goes for smart governance. This latter is regarded as basis for developing smart governance through the application of emergent ICTs that improve decision-making processes and collaboration

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[20] See R. BHATTARAI, I. PAPPEL, et al., *The Impact of the Single Digital Gateway Regulation from the Citizens' Perspective,* in *Procedia Computer Science,* vol.164, 2019, 159-167.

[21] H. GRAUX, *The Single Digital Gateway Regulation as an Enabler and Constraint of Once-Only in Europe,* in *The Once-only Principle* (R. KRIMMER et al. eds), Cham, Springer, 2021, 83 ff. (86-89).

[22] The Single Digital Gateway (SDG) has been established to promote mobility for citizens and businesses within the Union through the consolidation of so-called "dialogue system" capable to facilitate and improve online access to up-to-date information, administrative procedures, and assistance services. Therefore, the SDG Regulation is based on the once-only principle and is aimed at streamlining interactions between citizens, enterprises, and competent administrative authorities by reducing the amount of administrative burden. See C. SCHMIDT, R. KRIMMER, T. LAMPOLTSHAMMER, "*When need becomes necessity*" - *The Single Digital Gateway Regulation and the Once-Only Principle from a European Point of View,* in *Open Identity Summit 2021* (H. ROßNAGEL eds.), Bonn, Gesellschaft für Informatik e.V., 2021, 223-228.

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among governments, citizens, and other stakeholders.[23] This implies not only the exploitation of the advantages offered by new technologies, but also – and above all – the capability to overcome organizational as well as legal challenges by means of new prototypal solutions.[24]

To empower digitalization-driven local governance models, digital platforms begun to be applied to the city context. This is the case of the emerging "platform urbanism[25]" aimed at addressing various urbanization problems with the assistance of open data, participatory innovation opportunity, and collective knowledge to support local governance efforts in the development of smarter cities.[26] Platforms are revolutionizing every dimension of our society by providing potential for a new kind of value creation and allowing organizations to create entire ecosystems that leverage the expertise of a diverse pool of external complementors, resulting in an unprecedented scope of innovation[27].

As known, the most critical determinant of any platform's success is its ability to attract participants to join and contribute to it, since on its own a platform cannot create value. Contemporary models of public governance advocate the creation of public value through articulated initiatives involving governments and society, where the opening up of data and

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[23] G. VIALE PEREIRA, et al., *Smart Governance in the Context of Smart Cities: A Literature Review,* in *Information Polity*, vol. 23, no. 2, 2018, 143-162.

[24] S. MAMROT, K. RZYSZCZAK, *Implementation of the OOP in Europe,* in *The Once-only Principle* (R. KRIMMER et al. eds)*, cit., 12.

[25] S. VAN DER GRAAF, P. BALLON*, Navigating platform urbanism*, in *Technol. Forecast. Soc. Chang.,* 2019, vol. 142, 364-372.

[26] P. REPETTE et al., *The Evolution of City-as-a-Platform: Smart Urban Development Governance with Collective Knowledge-Based Platform Urbanism,* in *Land* 2021, vol. 10, no. 1, 2021, 33 ff. See also M. DEMICHELIS, *Innovazioni nell'uso degli spazi pubblici post-pandemia: il caso italiano nel contesto europeo*, in *DPCE online*, issue 2, 2020, 2481 ff.; J. MORISON, J. COBBE, *Understanding the Smart City: Framing the challenges for law and good governance,* in (J.B. AUBY ed.), *Le futur du droit administratif*, cit., 375 ff.

[27] S. REPONEN, *Government-as-a-platform: enabling participation in a government service innovation ecosystem,* Johtamisen laitos, 2017*, passim.*

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the mobilization of collective knowledge is becoming essential to enable the co-creation of samrt solutions for local administrations.[28] Therefore, new platform-based approaches are emerging, which are associated with the local government's application of digital technologies to expand the possibilities of co-production of public services.[29] The ongoing "platformization" of public administrations' activities can thus be conceptualized as a model of sociotechnical governance supported by digital architecture technologies with open and modular standards that guarantee the connection between government and society while increasing public value.[30] This also marks the transition from centralized management to so-called "representative governance"[31] aimed at promoting the community participation in the construction of their own cities.[32]

Whereas the concept of platform government emerged long ago, supporting technologies and infrastructures are now being installed and implemented with highly integrative technologies such as Cloud computing, big data analytics, social media, Internet

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[28] T. ZHUANG et al., *The role of stakeholders and their participation network in decision-making of urban renewal in China: The case of Chongqing,* in *Cities*, issue 92, 2019, 47-58.

[29] See D. BOLLIER, *The City as Platform: How Digital Networks Are Changing Urban Life and Governance,* The Aspen Institute, Washington DC, 2016; A.G. GABRIEL, *Transparency and accountability in local government: Levels of commitment of municipal councilors in Bongabon in the Philippines,* in *Asia Pac. J. Public Adm.*, issue 39, 2017, 217-223; E. BELLIARDO, *Innovation and sustainability in public procurement,* at ICON-S Mundo, The future of public law, (online, 9 luglio 2021). The Smart City Challenges: procurement and innovation.

[30] P. REPETTE et al., *The Evolution of City-as-a-Platform,* cit., 38; see also A. LOVARI, G. DUCCI, *The challenges of public sector communication in the face of the pandemic crisis: professional roles, competencies and platformization,* in *Sociologia della comunicazione,* vol. 61, issue 1, 2021, 9-19.

[31] For an interesting analysis on this topic see: A RAHMADANY, M. ACHMAD, *The Implementation E-Government to Increase Democratic Participation: The Use of Mobile Government,* in *Jurnal Studi Sosial Dan Politik*, 2021, vol. 5, no. 1, 22-34.

[32] J.R. GIL-GARCIA, *Conceptualizing smartness in government: An integrative and multi-dimensional view*, in *Gov. Inf. Q.,* 2016, issue 33, 524-534.

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of Things, and Artificial Intelligence[33], which open up real opportunities by facing realistic challenges for public management.[34] Within this framework, the pressure for government innovations, such as algorithmic bureaucracy[35] and collaborative value creation, is increasing and changes the nature of work in government while the decision-making processes are re-institutionalized.[36]

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[33] To recall some of the more outstanding voices at international level: L.A. BYGRAVE, *Minding the Machine: Article 15 of the EC Data Protection Directive and Automated Profiling,* in *Computer Law and Security Review*, 17, 1, 2001, 16 ff.; D.R. DESAI, J.A. KROLL*, Trust But Verify: A Guide to Algorithms and the Law*, in *Harvard Journal of Law & Technology,* 31, 1, 2017, 1-64; N.M., RICHARDS, J.H. KIN, *Big Data Ethics,* in *Wake Forest Law Review,* 49, 2014, 393; P. SCHWARTZ, *Data Processing and Government Administration: The Failure of the American Legal Response to the Computer,* in *Hastings Law Journal*, 43, 1992, 1321 ff.; G. DE MINICO, *Towards an "Algorithm Constitutional by Design",* in *BioLaw Journal –Rivista di BioDiritto,* vol. 1, 2021, 381 ff. In the Italian literature see, *inter alia,* R. CAVALLO PERIN, D.U. GALETTA (eds.), *Il diritto dell'Amministrazione Pubblica digitale*, 2020, cit.; F. LAVIOLA, A*lgoritmico, troppo algoritmico: decisioni amministrative automatizzate, protezione dei dati personali e tutela delle libertà dei cittadini alla luce della più recente giurisprudenza amministrativa,* in *BioLaw Journal –Rivista di BioDiritto,* 3, 2020, 389-440, S. ROSSA, *Contributo allo studio delle funzioni amministrative digitali,* CEDAM, Milan, 2021; L. PARONA, *Government by algorithm: un contributo allo studio al ricorso dell'intelligenza artificiale nell'esercizio di funzioni amministrative,* in *Giorn. Dir. Amm.,* 1/2021, 10 ff.; G. ORSONI, E. D'ORLANDO., *Nuove prospettive nell'amministrazione digitale: Open Data e algoritmi,* in *Istit. fed.,* 3/2019, 593 ff.; L. MUSSELLI, *La decisione amministrativa nell'età degli algoritmi*, in *Media Laws – Riv. dir. media,* n. 1/2020, 18 ff.; D.U. GALETTA, *Algoritmi, procedimento amministrativo e garanzie: brevi riflessioni, anche alla luce degli ultimi arresti giurisprudenziali in materia,* in *Riv. it. dir. pubbl. comunit.,* 3/2020, 501 ff.; E. CARLONI, *Algoritmi su carta. Politiche di digitalizzazione e trasformazione digitale delle amministrazioni,* in *Dir. pubbl.,* 2/2019, 363 ff.;

[34] See J. CHEVALLIER, *Vers l'État-plateforme ?,* in *Revue française d'administration publique,* vol. 167, no. 3, 2018, 627-637.

[35] B. LEPRI et al., *Fair, Transparent, and Accountable Algorithmic Decision-Making Processes?,* in *Philosophy and Technology,* vol. 31, 2018, 611-612; I. ALBERTI, *Artificial intelligence in the public sector: opportunities and challenges*, in *Eurojus,* Special Issue, vol.3, 2019, 149-163; T. M. VOGL et al., *Smart Technology and the Emergence of Algorithmic Bureaucracy: Artificial Intelligence in UK Local Authorities,* in *Public Administration review,* vol. 80, issue 6, November/December 2020, 946-961.

[36] S. KIM et al., *Platform Government in the Era of Smart Technology,* in *Public Administration Review,* 2021, 1-7. See also I. MARTIN DELGADO, *Una panorámica general del impacto de la nueva Ley de Procedimiento Administrativo Común en las relaciones de los ciudadanos con la Administración Pública,* in Id. (ed.), *El Procedimiento administrativo y el régimen jurídico de la administración pública desde la perspectiva de la innovación tecnológica,* Innap Investiga, 2017, 159 ff. (173-193); G. CARULLO, *Decisione amministrativa e Intelligenza Artificiale,* in *Diritto dell'informazione e dell'informatica,* issue 3, 2021, p. 431-461; G. PINOTTI, *Amministrazione digitale algoritmica e garanzie procedimentali,* in *Labour & Law Issues,* 7/2021, 77-.95.

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3. DIGITAL E-GOVERNMENT PLATFORMS

Digital E-Government structures have been developed to provide public information dissemination, accept electronic document submissions, manage them via e-protocol and support the processing phases with appropriate electronic structure characterized by easy communication among the organization's departments.[37] This includes tools serving communicational and informative governmental functions through a user-friendly, interoperable and distributed web-based architecture.[38] As mentioned before, public services need to not only be delivered through E-Government platforms, but also to be coproduced with the engagement of social players (citizens and other main stakeholders). In this regard such platforms act as digital commons, where the society and public agents interact and collaborate.[39] Moreover, E-Government platforms constitute an extensive area of knowledge, principles, and policies wherein services are designed from the perspective of the end-user.[40] This implies considering the requirements, priorities, and preferences of each type of user.

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[37] A. DRIGAS, L. KOUKIANAKIS, *Government Online: An E-Government Platform to Improve Public Administration Operations and Services Delivery to the Citizen,* in *Visioning and Engineering the Knowledge Society. A Web Science Perspective. WSKS 2009. Lecture Notes in Computer Science* (M.D. LYTRAS et al. eds.), Springer, Berlin 2009, 530 ff.

[38] See L. HASSAN et al., *Gameful civic engagement: A review of literature on gamification of e-participation,* in *Government Inf. Q.,* vol. 37, no. 3, 2020, 1 et seq.; A. KALIONTZOGLOU, *A secure e-Government platform architecture for small to medium sized public organizations*, in *Electronic Commerce Research and Applications,* vol. 4, issue 2, 2005, 174-186; D. ROZHKOVA, N. ROZHKOVA, U. BLINOVA, *Development of the e-Government in the Context of the 2020 Pandemics,* in *Advances in Digital Science. ICADS 2021. Advances in Intelligent Systems and Computing* (T. ANTIPOVA, et al. eds.)*,* vol. 1352, Springer, Cham, 465-476.

[39] M.J. RIBEIRO ROTTA et al., *Digital Commons and Citizen Coproduction in Smart Cities: Assessment of Brazilian Municipal E-Government Platforms,* in *Energies* 2019, vol.12, no.14, 2813.

[40] See P.G. NIXON et al. (eds.), *Understanding E-Government in Europe: Issues and challenges,* Routledge, London, New York, 2010; K MOSSBERGER, C. TOLBERT, *The effects of E-Government on trust and confidence in government*, in *Pub. Adm. Rev.*, 2003, 66 ff.; L. AL-HAKIMCHE, *Global E-Government: Theory, Applications and Benchmarking, Hershey*, 2007.

For this reason, the spreading out of digital E-Government platforms includes the restructuring and reengineering of organizations and their services through user-centric exploitation of ICTs and Internet of Things.[41] On the contrary, platforms that only broker different groups of users are not capable of achieving co-participated governance and develop Internet-based services to ensure that citizens have access to essential public data. Research findings demonstrate that a platform that is open, flexible, transparent and accessible attracts participation.[42] E-Government platforms are thus required to encompass social elements (participation of stakeholders in the development of services and public policies that generate value to society) and technical elements (existence of an infrastructure information and communication technology with open, evolving, and adaptable standards architecture).[43]

Another main challenge of evolving E-Government platforms regards the accomplishment of full ICT-integration with high security standards within the several public administration processes.[44] To that purpose, an indispensable prerequisite is the development

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[41] The OECD defines digital government as "the use of digital technologies, as an integrated part of governments' modernisation strategies, to create public value" and that it "relies on a digital government ecosystem comprised of government actors, non-governmental organisations, businesses, citizens' associations, and individuals which supports the production of and access to data, services and content through interactions with the government. The OECD's definition of e-government is similar: "the use by the governments of information and communication technologies (ICTs), and particularly the Internet, as a tool to achieve better government." OECD (2014), *Recommendation of the Council on Digital Government Strategies,* online: http://www.oecd.org/gov/digital-government/Recommendation-digital-government-strategies.pdf, accessed 19 November 2021; J. ORTIZ-BEJAR, *Design and Implementation of Digital Platform for e-Government,* in *2021 IEEE URUCON*, 2021, 547-551; A. DRIGAS, L. KOUKIANAKIS, *Government Online: An E-Government Platform to Improve Public Administration Operations and Services Delivery to the Citizen*, in *Proceedings of the WSKS 2009,* Chania, Crete, Greece, 2009, 523-532.

[42] S. REPONEN, *Government-as-a-platform: enabling participation in a government service innovation ecosystem,* cit., 32 ff.

[43] M. DE REUVER et al*., The digital platform: A research agenda,* in *J. Inf. Technol.*, 2017, issue 33, 124-135.

[44] On this topic see L. SIDERIS et al. (eds.), *E-Democracy, Security, Privacy and Trust in Digital World*, Springer International Publishing, Switzerland, 2014; K. ANDREASSON (ed.), *Cybersecurity. Public Sector Threats and Responses*, CRC Press, Broken Sound Parkway, 2012; I. HOFFMAN, K. B. CSEH, *E-administration, cybersecurity*

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of an electronic infrastructure, which support e-protocol, e-applications/e-petitions and internal organizational function of the public organization.[45] E-Government systems influence almost all aspects of the life of a society, therefore they are the largest software systems ever used.[46] This shows that the escalation of the E-Government services begins with easy access to governmental information and passes through the e-transactions between citizens and the public organization reaching the electronic (direct) delivery of the requested document.[47] This is also related with the characteristics of E-Government data, which are often sensitive (personal, secret, business, etc.) and scattered over various components. Whenever the needed data should not be directly accessible for the querying people, the solution can be based on service-oriented architecture. To do that, the data can be used by applications producing the information, provided that the application's outputs (*i.e.,* the information) is controlled by a trusted body.[48]

In city administration, government and society partnership is sought through the configuration of an ecosystem that combines technological infrastructure made available by the platform owner (government) with a wide range of external participants (citizens and enterprises, society), who will have the opportunity to participate and complement the platform with innovative services and applications.[49] Governance and institutions play a

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and municipalities – the challenges of cybersecurity issues for the municipalities, in *Cybersecurity and Law,* vol. 2, 2020.

[45] A. DRIGAS, L. KOUKIANAKIS, *Government Online*, cit., 532.

[46] J. KRAL, *e-Government: Challenges and Lost Opportunities,* in *Visioning and Engineering the Knowledge Society. A Web Science Perspective. WSKS 2009. Lecture Notes in Computer Science* (M.D. LYTRAS et al. eds), Springer, Berlin, 2009, 484.

[47] A. DRIGAS, L. KOUKIANAKIS, *Government Online: An E-Government Platform to Improve Public Administration Operations and Services Delivery to the Citizen,* ibid*.,* 523.

[48] See J. KRAL, *e-Government: Challenges and Lost Opportunities,* cit., 486 seq.

[49] P. REPETTE et al., *The Evolution of City-as-a-Platform,* cit., 44.

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crucial role for the structuring of platform ecosystems[50] (which can be declined as private platform ecosystems, government platform ecosystems and decentralized platform ecosystems)[51].

Unlike the private sector, the motivating reasons for the adoption of platforms by the government focus on how to serve citizens efficiently in the era of rapid technological, social, and economical changes.[52] It is a matter of articulating new competences in order to guarantee the definition of public policies meeting citizen's needs.[53] All these considerations stress out how digital E-Government platforms within platform-based governance models can have a disruptive impact on local governance: they foster fluid and synergistic interaction among public administrations, institutions and citizen by means of four basic city assets, *i.e.* people, data, infrastructure and technology.[54] This represents an important step toward innovative smart governance implementation, wherein digital platforms represent an essential tool for enabling open and participatory models.

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[50] Different kinds of e-governmental services have taken into use in several countries all over the world. The transition is often driven by the seen benefits in, e.g., efficiency, money savings as well as empowerment of citizens. Nonetheless, the current models often fail to take a citizen into account enough. Therefore, it is essential to approach this topic by using an ecosystem viewpoint to define and explain this phenomenon and presents the concept of `e-government ecosystem', which finds its roots on basis of a philosophical foundation on citizenship. See further M. M. RANTANEN, J. KOSKINEN, S. HYRYNSALMI, *E-Government Ecosystem: A new view to explain complex phenomenon,* in *42nd International Convention on Information and Communication Technology, Electronics and Microelectronics (MIPRO),* IEEE, 2019, 1408-1413.

[51] See further M. KITSING., J. VALLISTU, *Future of Governance for Digital Platform Ecosystems,* in *Proceedings of Fifth International Congress on Information and Communication Technology. Advances in Intelligent Systems and Computing,* (X.S. YANG et al. eds), Springer, Singapore, 2021, 334-341.

[52] P. REPETTE et al., *The Evolution of City-as-a-Platform,* cit., 45.

[53] *Ibid.*

[54] D. BOLLIER, *The City as Platform,* cit., 45 ff.

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4. THE GOVERNMENT-AS-A-PLATFORM (GAAP) APPROACH

A city can be defined "smart" when it "invests in its human and social capital in conjunction with the communication and information infrastructure to fuel sustainable economic growth and improve the population's quality of life".[55] This means that technology – despite being increasingly disseminated and accessible to the population – does not replace human responsibility in the governance process, but shall rather represent an integrated means to solve complex problems by providing greater interactivity, quality, and efficiency of public administrations.[56] To that extent, institutional openness can be regarded as the use of purposive inflows and outflows of knowledge, data and information to foster innovation.[57] Open innovation constitutes a fundamental paradigm to reach digital public administrations and enable smart governance models where governments take advantage of the experience

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[55] A. CARAGLIU, C. DEL BO et al., *Smart cities in Europe,* in *Proceedings of the 3rd Central European Conference in Regional Science*, Kosice, Slovakia, 7–9 October 2009, 50. As the authors stress out, the main characteristics of smart cities are: (a) Infrastructure network, which allows good connectivity; (b) Strategic vision, to develop the city's competitiveness through new technologies and the involvement of multiple actors, and; (c) Adoption of a sustainable and inclusive urban development approach that emphasizes social capital in urban development. See also V. FERNANDEZ-ANEZ, *Stakeholders Approach to Smart Cities: A Survey on Smart City Definitions,* in *Smart Cities. Lecture Notes in Computer Science,* (E. ALBA et al. eds) 2016, Springer, Cham, 157-167.

[56] P. REPETTE et al., *The Evolution of City-as-a-Platform,* cit., 39; C. I. VELASCO RICO, *Smart Cities for all: Usability and Disability Bias,* in *European review of Digital Administration and Law,* vol. 2, issue 1, 2021, 157 et seq; D.U. GALETTA, *Public Administration in the Era of Database and Information Exchange Networks: Empowering Administrative Power or Just Better Serving the Citizens?,* in *European Public Law,* vol. 25, issue 2, 2019, 171 et seq.

[57] H.W. CHESBROUGH et al., *Open Innovation: Researching a New Paradigm*. Oxford, Oxford University Press, 2006, *passim;* L. SARTORI, *Open Government; What Else?,* in *Istituzioni del federalismo*, issue 3-4, 2013, 753 ff.; J. VON LUCKE, K. GROSSE, *Open Government Collaboration. Opportunities and Challenges of Open Collaborating With and Within Government,* in *Open Government. Opportunities and Challenges for Public Governance*, (M. GASCÒ-HERNANDEZ ed.), New York, 2014, 189 ff.

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of the citizens to develop "smart" digital services.[58] Nonetheless, digital technologies require consensual, transparent, effective and inclusive governance to promote open spaces for collaboration.[59] In the scope of governance, digital platforms enhance local government innovation by means of outside-in, inside-out and coupled streams of data and information that open up the innovation process.[60] That's why the concept of City-as-a-Platform (CaaP)[61] is spreading up as technological and political infrastructure that allows local society to play a direct role in the government of the Smart Cities.

Digital platforms enable the creation of a network of services (ecosystems) for local governments. Such ecosystems are built upon data and services in the frame of platforms that process big data with distributed autonomic and intelligent systems. The existence of different ecosystems is unavoidable because the digital architecture of informatized local administrations includes different domains such as healthcare, transportation, education etc. Each ecosystem has different characteristics and requires different boundary resources, which evolve as result of the activity of orchestration of the data production and are used to address and constrain the generativity of ecosystems.[62] Within this context, the concept of

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[58] N. KOMNINOS, *Intelligent cities: Towards interactive and global innovation environments,* in *Int. J. Innov. Reg. Dev.*, 2009, issue 1, 337-355; K.A. PASKALEVA, *The smart city: A nexus for open innovation?*, in *Intell. Build. Int.*, 2011, issue 3, 153-171; S. SECINARO et al., *Does Citizen Involvement Feed on Digital Platforms?*, cit.,1-19.

[59] A.J MEIJER, M.P. BOLÍVAR, *Governing the smart city: A review of the literature on smart urban governance*, in *Int. Rev. Adm. Sci.,* 2016, issue 82, 392-408. For a critical overview on the role of openness and transparency in e-Government Strategies see F. BANNISTER, R. CONNOLLY, *The Trouble with Transparency: A Critical Review of Openness in e-Government,* in *Policy and Internet,* 3/2011, 1 ff.

[60] O. GASSMAN et al., *The future of open innovation,* in *R&D Management,* vol. 40, issue3, 2010, 213-22.

[61] See D. BOLLIER, *The City as Platform,* cit.,48.

[62] A. GHAZAWNEH, O. HENFRIDSSON, *Balancing platform control and external contribution in third-party development: The boundary resources model,* in *Information Systems Journal*, 2012, vol. 23, no. 2, 174.

Government-as-a-Platform (GaaP)[63] envisages a new coordination structure among all administrative levels from closed relationships into open, flat, and unstructured relationship by means of shared software and data that open the service production processes to actors who traditionally play an external role to public administration.[64] Such model relies on a new way of building digital public services using a collaborative development model by a community of partners, providers and citizens to share and enhance digital public processes and capabilities, or to extend them for the benefit of society. As a result, the GaaP can be defined as a government service innovation ecosystem, which empowers a revolutionary solution for improving public administrations' structures and processes[65].Within this model, local government becomes a convener and an enabler[66]: it acts as an intermediary facilitating collaboration. Open platforms play therefore a primary role for the implementation of GaaP solutions at local level.[67] Important prerogatives concern, on the one hand, the autonomy by which participants can produce new content without additional help from the platform's original creators; on the other hand, the participatory design of platforms' infrastructure with clear rules and interoperable systems architecture. The EULF Blueprint Recommendation on

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[63] In its seminal work *Government as a platform,* O'Reilly outlines the key factors that make the platform organization in the public sector more efficient than other organizational configurations. See T. O'REILLY, *Government as a platform,* in *Innovations: Technology, Governance, Globalization*, 2011, vol. 6, no. 1, 13-40. See also D. LINDERS, *From E-government to we-government: Defining a typology for citizen coproduction in the age of social media*, in *Government Information Quarterly*, 2012, vol. 29, no.4, 446-454.

[64]A. CORDELLA, A. PALETTI, *Government as a platform, orchestration, and public value creation: The Italian case,* in *Government Information Quarterly,* vol. 36, Issue 4, 2019, 101 f.

[65] S. REPONEN, *Government-as-a-platform: enabling participation in a government service innovation ecosystem,* Johtamisen laitos, 2017, 61 ff.

[66] T. O'REILLY, *Government as a Platform,* cit., 14.

[67] See M. ALHAWAWSHA, T. PANCHENKO, *Open Data Platform Architecture and Its Advantages for an Open E-Government,* in *Advances in Computer Science for Engineering and Education III. Advances in Intelligent Systems and Computing* (Z. HU et al. eds.), Springer, Cham, 2021, 631-639.

Standardisation and Reuse[68] provides that public administrations should consider adopting GaaP approaches to share components, service designs, platforms, data and hosting across public authorities, enabling data and services to be reused as effectively and widely as possible. With this regard, standardization, modularity, and component reuse constitute crucial features that facilitate new applications and allow developers to add value to the governmental platform's ecosystems. Nevertheless, the real benefits will only occur if local government move from the compartmental logic to horizontal structures toward central platforms that centralize common data in a strategic, homogeneous, and interoperable way, according to the GaaP model.

4.1. The implementation of GaaP in Germany

The digital transformation of the German public sector is embedded in a large-scale reform focused on digitalization and de-bureaucratization of public services, which represents an important step towards making local service delivery more citizen-centered and user-oriented.[69] The GaaP implementation is currently divided into two large-scale projects, *i.e.,* the digitalization programs[70] and the *Portalverbund* (National portal network)*[71]*. The

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[68] Recommendation 10: *Adopt a common architecture to develop digital government solutions, facilitating the integration of geospatial requirements,* in R. BOGUSLAWSKI et al., *European Union Location Framework Blueprint, JRC Technical Report*, European Commission, 2020, 54-57. Available online: https://publications.jrc.ec.europa.eu/repository/bitstream/JRC117551/jrc117551_eulf_blueprint_v4.0.pdf, accessed 19 November 2021.

[69] See S. KUHLMANN et al., *The Digitalisation of Local Public Services. Evidence from the German Case,* in *The Future of Local Self-Government* (T. BERGSTRÖM et al. eds), Palgrave Macmillan, Cham, 2021, 101-113.

[70] Precisely the *Digitalisierungsprogramm Bund* and the *Digitalisierungsprogramm Föderal*.

[71] Online: https://www.bmi.bund.de/DE/themen/moderneverwaltung/verwaltungsmodernisierung/portalverbund/portalverbund-node.html, accessed 19 November 2021.

German Online Access Act (*Onlinezugangsgesetz*-OZG)[72] adopted in 2017 thus foresees that Federal government, states, and municipalities shall deliver 575 public services online through the National portal network by the end of 2022.[73] Therefore, the joint digital portal-structure represent the heart of GaaP implementation in Germany and takes the form of the *Portalverbund*, which provides the technical linkages to the sixteen *Länder* administrative portals and their municipalities, and ensures interoperability between all administrative levels. It creates a network of portals serving as an informational signpost directing citizens to whichever authority carries out the services, regardless of which landing page they access through. The sharing of data in a decentralized manner is ensured by requiring all administrative portals to provide similar search and pay components as well as user accounts and mailing function.[74]

This has been regarded as an ambitious attempt to promote the digital transformation of the multi-level German administration while harmonizing and integrating a highly fragmented digital landscape.[75] Nevertheless, Germany has been ranked in the low- to mid-

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[72] *Gesetz zur Verbesserung des Onlinezugangs zu Verwaltungsleistungen (Onlinezugangsgesetz - OZG)* of 14th August 2017 (BGBl. I S. 3122, 3138), online: http://www.gesetze-im-internet.de/ozg/BJNR313800017.html, accessed 19 November 2021.

[73] In the OZG Implementation Catalogue, the 575 services that are to be provided online are broken down into 14 categories, according to the user's perspective. The Federation is responsible for putting a total of 115 into digital form while the different federal states and local governments' responsibility concerns 460 services. Cf. S. HALSBENNING, *Digitalisierung öffentlicher Dienstleistungen*, in *HMD Praxis der Wirtschaftsinformatik*, vol. 58, 2021, 103-1053.

[74] For an in-depth analysis on this topic see T. SIEGEL, *Auf dem Weg zum Portalverbund - Das neue Onlinezugangsgesetz (OZG)*, in *Die Öffentliche Verwaltung,* 2018, 185-192; C. K. PETERSEN, *Die Kommunen und der Portalverbund*, in *Deutsches Verwaltungsblatt (DVBl),* 2018, 1534 ff.

[75] I. MERGEL, *Digitale Transformation als Reformvorhaben der deutschen öffentlichen Verwaltung*, in *Der moderne Staat – Zeitschrift für Public Policy, Recht und Management* 2019, 12/1, 162-171,

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field of digital government rankings[76] and public's use of existing digital services has been steadily declining during the past few years even though large-scale investments in IT spending have been made.[77] This all-encompassing reform represents a holistic approach to foster the implementation of digital services and the adoption of open-source software to guarantee interoperability. Furthermore, because of the German federal structure and its so-called "three columns system" comprising the General Administrative Procedures Act[78], tax procedure law and social law, several administrative procedures cannot be uniformly digitalized.[79] This particularly affects local administrations[80], as they have the most points of contact with citizens, but have at the same time a very heterogeneous level of digitalization.[81]

To unlock the full potential of ICT-related public sector innovation and digital transformation, governments must embrace collaborative working structures and network-based approaches to governance.[82] For this reason, a crucial part of the policy design related to the German Online Access Act has been put into a novel arrangement in the German

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[76] See DESI (2019). *The Digital Economy and Society Index (DESI) Ranking*. Retrieved November 2, 2019, online: https://ec.europa.eu/digital-single-market/desi, accessed 19 November 2021.

[77] See I. MERGEL, *Digital Transformation of the German State*, in *Public Administration in Germany. Governance and Public Management* (S. KUHLMANN et al. eds.) Cham, 2021, 331-355.

[78] *Verwaltungsverfahrensgesetz* (VwVfG) of 25.5.1976, BGBl., I, 1976, 102.

[79] C. FRAENKEL-HAEBERLE, *Fully Digitalized Administrative Procedures in the German Legal System,* in *European Review of Digital Administration & Law – Erdal* vol. 1, issue 1-2, 2020, 105-111.

[80] For an in-depth analysis of the complexity in integrating the German municipalities into the portal network see C.K. PETERSEN, *Die Kommunen und der Portalverbund,* in *Deutsches Verwaltungsblatt*, vol. 133, issue 23, 2018, 1534-1542.

[81] S. HALSBENNING, *Digitalisierung öffentlicher Dienstleistungen*, cit., 1038.

[82] Ibid. On this topic see also C. DJEFFAL *Normative Leitlinien Für Künstliche Intelligenz in Regierung und Verwaltung*, in *(Un)Berechenbar? Algorithmen und Automatisierung in Staat und Gesellschaft, Kompetenzzentrum Öffentliche IT (ÖFIT), Fraunhofer-Institut für Offene Kommunikationssysteme FOKUS,* (R. KAR MOHABBAT et al. eds.), Berlin, 2018, 493 ff.;

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administrative system, which led to the creation of digitalization labs for designing digital services by bringing together Federal government, state, and local authorities, end-users and private-sector actors.[83]

4.2. The implementation of GaaP in the U.K.

From the late 1990s onwards, the UK Government invested on the development of common platform components and cross-Government infrastructure aimed at insulating the delivery channels for accessing public services from the complexity of Government's existing back office.[84] Since 2010 the Government Digital Service[85] focused more on open participation and accessibility for citizens to provide them with a single government portal for accessing services and policy guidance *i.e.,* GOV.UK[86]. Once the portal has been implemented, the emphasis has shifted to the creation of common building blocks that departments can reuse to build services such as common payment solution and automated text notifications systems.[87] The importance of open technical standards emerges about the GaaP implementation that could link existing systems to a wide range of access channel technologies. GOV.UK, as well as the German portal network, provides citizens and businesses with a government portal for accessing digital services. Still, while the German

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[83] J. FLEISCHER et al., *Policy labs as arenas for boundary spanning: inside the digital transformation in Germany,* in *Public Management Review,* 2021, online: https://doi.org/10.1080/14719037.2021.1893803.

[84] A. BROWN et al., *Appraising the impact and role of platform models and Government as a Platform (GaaP) in UK Government public service reform: Towards a Platform Assessment Framework (PAF),* in *Government Information Quarterly,* vol. 34, issue 2, 2017, 167-182.

[85] Government Digital Service was created in 2012 by the Cabinet Office to lead digital transformation across government and pioneered the concept of GaaP.

[86] Online: https://www.gov.uk, accessed 19 November 2021.

[87] See SHADBOLT et al. *Linked open government data: lessons from Data.gov.uk.* in *IEEE Intelligent Systems*, 2012, vol. 27, no. 3, 16-24.

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platform solution looks more like a network of several data-sources, the UK version can be seen as a single source of data for digital public services.[88] Another important difference lies in the way these platforms use common building blocks and basic services. In the UK, for example, the GOV.UK pay solution can be directly reused in the creation of services, whereas in Germany, the focus is more on sharing reliable data, while the technical functions can still differ across portals at federal, state, and local levels.[89]

To empower the digital transition process, local authorities in UK begun to adopt a variety of "smart" technological changes such as artificial intelligence and predictive analytics to rethink the structure of public administration.[90] Nevertheless, there is an opportunity missed to use GOV.UK as part of a broad participatory process related to GaaP: while some Government processes have been redesigned through the use of technology, many of them still mimic the previous paper processes and failed to take advantage of technology to fundamentally rethink processes around the service outcomes.[91]

4.3. The implementation of GaaP in Estonia

Estonia is considered the first Country to realize GaaP to efficiently manage data-driven administration in the public sector. Its digital transformation process started in 1994

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[88] For an in-depth analysis on this topic see A. BROWN, *Appraising the impact and role of platform models and Government as a Platform (GaaP) in UK Government public service reform: Towards a Platform Assessment Framework (PAF),* in *Government Information Quarterly*, 2017, vol. 34, no. 2, 167-182.

[89] See H. MARGETTS, A. NAUMANN, *Government as a Platform: what can Estonia show the world?,* online: https://www.ospi.es/export/sites/ospi/documents/documentos/Government-as-a-platform_Estonia.pdf.

[90] T. M. VOGL et al., *Smart Technology and the Emergence of Algorithmic Bureaucracy: Artificial Intelligence in UK Local Authorities,* in *Public Administration Review,* 2020.

[91] A. BROWN et al., *Appraising the impact and role of platform models and Government as a Platform (GaaP) in UK Government public service reform,* cit., 180.

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with the first draft of the 'Principles of Estonian Information Policy'[92] as basis for an action plan for establishing an information society.

The Estonian Government focused on developing three main 'layers' of the platform concept. Those encompass: a system of registries and data exchange that allow departments and agencies to share data (X-Road[93]); a system of digital and mobile identification (eID[94]); and a service layer accessed through various portals (the largest of which is the official state portal, eesti.ee.[95]).[96] The digital services available on these layers are used for interacting and

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[92] The publication has been compiled by Estonian Information Centre and PHARE Public Administration Development Program. Online: https://ega.ee/wp-content/uploads/2020/01/Eesti-infopoliitika-p-hialused.pdf, accessed 19 November 2021.

[93] X-Road is a system of registries whereby each has an authorized owner of the data, responsible for its maintenance and security. The system relies on a unique 16-digit personal identifier (similar to the UK National Insurance Number, but with which every citizen is issued at birth) for every person which can be used to retrieve personal data from any registry, as well as a number of other identifiers for businesses, properties, vehicles and so on. The result is like a peer-to-peer network, where any data in flight (that is, in transit) is encrypted. Every X-Road environment is managed by a competent organization (centre) that defines the applied security policy and manages the information of its ecosystem members. Web: https://e-estonia.com/solutions/interoperability-services/x-road/, accessed 19 November 2021.

[94] The electronic ID (eID) infrastructure, based on PKI-based authentication and digital signatures was introduced in 2002 with the addition of a mobile ID in 2007. An electronic identity card is used as a container for the certificates. This secure system of identification and authentication means that every user of Estonian government may identify themselves to the system (through digital signatures), enabling them to access services from both public and private sectors. The eID can be used for various purposes including banking, internal applications of a company or public portals, and for signing encrypted emails. See E-GOVERNANCE ACADEMY, *e-Estonia: eGovernance in Practice,* 2016, 15. Available at: http://ega.ee/wpcontent/uploads/2016/06/e-Estonia-e-Governance-in-Practice.pdf, accessed 19 November 2021.

[95] The service layer, accessed through platform eesti.ee, the official Estonian State eServices portal since 2003, and other service portals. Citizens can access more than 800 services, most of which use X-Road. Any citizen interacting with the service layer can see who has accessed data that relates to them when they log on, as there is an audit trail of all accesses and changes to the data.

[96] H. MARGETTS, A. NAUMANN, *Government as a Platform: what can Estonia show the world*?, cit., 2.

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transacting with both public and private sectors.[97] With the introduction of X-Road, most of state services begun to be delivered online, including e-Police, e-Business that links to a data registry of all legal entities registered in Estonia, e-Health, e-School, etc.[98] X-Road constitutes a technical and organizational environment enabling secure data exchange between various information systems, where public and private sector institutions can connect their de-centrally organized information systems with the central component.[99] It can be considered as a federation with the capability to provide secure Internet-based data exchange across different ecosystems. The Government's boost towards digitalization also led to the creation of innovative e-Procurement environment an information portal of public procurement.[100]

After the 2007 cyber-attacks the Government reacted with the ambition of securing the infrastructure platforms through block-chain systems and became one of the leading nations in cyber security.[101] Although when the GaaP concept was first introduced the necessary ICT infrastructures were not sufficiently developed, the recent digital innovations have transformed the previous electronic government – which was system and architecture-

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[97] For an interesting analysis on the recent development of Estonian e-government see D. RENDULIĆ et al., *E-government innovation: the case of Estonia and implications for entrepreneurship and public sector in south-east Europe*, in *Contemporary economic and business issues,* (D. BODUL et al. eds.), University of Rijeka, Faculty of Economics and Business, 2021, 125 ff.

[98] See H. SEO et al., *The Priority of Factors of Building Government as a Platform with Analytic Hierarchy Process Analysis*, in *Sustainability*, vol. 12, 2020, 5615.

[99] See further M. A. WIMMER, *Once-Only Principle Good Practices in Europe,* in *The Once-only Principle* (R. KRIMMER et al. eds), cit., 71 f.

[100] See M. A. SIMOVART, M. BORODINA, *A qualitative step from e-communication to e-procurement: the Estonian e-procurement model*, in *Ius Publicum Network review,* vol. 2, 2017, 1 et seq.

[101] R. OTTIS, *Analysis of the 2007 cyber-attacks against Estonia from the information warfare perspective,* in *Proceedings of the 7th European Conference on Information Warfare and Security*, Plymouth, 2008, 163-168

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oriented – to a real network of services linked by platforms.[102] Even though GaaP has never been an explicit model in the development of Estonian digital government, the application of interoperable structures based on central control and coordination has revealed the importance of the principles of openness, simplicity, participation, and leading by example.[103]

5. CRITICAL ISSUES ON THE DIGITAL TRANSFORMATION OF LOCAL PUBLIC ADMINISTRATIONS: THE CASE OF ITALY

E-Government platforms in Italy (called "enabling platforms") constitute GaaP solutions that offer transversal and reusable functionalities for local governments by reducing times and costs. There are so-called "process services platforms" that digitally carry out a complete process (for example E-procurement[104]) and so-called "task service platforms", which

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[102] H. SEO et al., *The Priority of Factors of Building Government as a Platform with Analytic Hierarchy Process Analysis,* cit., 5615.

[103] H. MARGETTS, A. NAUMANN, *Government as a Platform: what can Estonia show the world*?, cit., 30.

[104] The digitalization of the procurement processes of Assets and services of public administrations (electronic public procurement) is one of the main drivers of the policies of the European Commission; the aim, in the medium term, is to digitize the entire procurement process of public administrations in the two phases of pre- and post-award, ie from the publication of calls for tenders until the payment (end-to-end electronic procurement).The pre-awarding involves the dematerialization and the regulation of public tenders by means of telematic tenders. In implementation of the European directives, the completion of the telematic tenders involves the obligation of electronic communications and specifically the use of: e-notification: electronic publication of calls for tenders; e-access: electronic access to tender documents; e-submission: electronic submission of offers; ESPD: single European tender document; e-Certis: the information system that allows the identification of certificates and certificates most frequently requested in procurement procedures. The project eNEIDE (eNotification and ESPD Integration for Developing E-procurement) aims at building an ICT architecture designed to be modular and compliant with EU regulations and best practices, in order to ensure wide cross-border interoperability. As regards the evolution of Italian contract register National Database of Public Contracts (BDNCP), the integration with the European TED (Tenders Electronic Daily) platform will allow the national infrastructure to complete automatically the ePublication process at the end of the pre-award phase. See further G.M. RACCA, *Le innovazioni necessarie per la trasformazione digitale e sostenibile dei contratti pubblici,* in *Contratti Pubblici e Innovazioni per l'Attuazione della legge delega* (R. CAVALLO PERIN, M. LIPARI, G.M. RACCA eds.), Neaples, Jovene, 2022, 9-32.; R. CAVALLO PERIN, *La*

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implement individual functions across the digital administrative procedures (for example user authentication through the Public Digital Identity System – SPID[105]).[106] Eventually, there are "data service platforms", which ensure access to validated data sources that local administrations need for carrying out their institutional functions (such as the Electronic HealthFile - FSE[107]).[108]

As known, cross-functional collaboration works at best when access to a 'single source of truth' is provided.[109] This means that the main obstacle to reach efficient coordination and integration for Italian local administrations doesn't concern primarily skill base or technology, but rather interoperability, accessing and integrating local government's

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digitalizzazione e l'analisi dei dati, Ibid., 119-126; V. CERULLI IRELLI, *Le innovazioni normative e i contratti pubblici*, Ibid., 45-63.

[105] SPID is the Public Digital Identity System that guarantees all citizens and businesses a single, secure and protected access to the digital services of the Public Administration.

[106] Art. 64-bis of the Italian Administration Code represents the legal basis of "Telematic Access to Services of Public Administration". SPID is regulated also by D.P.C.M. of October 24th, 2014. See R. TITOMANLIO, *Considerazioni introduttive sul Sistema Pubblico per la Gestione dell'Identità Digitale (SPID)*, in *GiustAmm.it,* vol. 3, 2015.

[107] The FSE is a key element of the Italian digital healthcare strategy, which is aimed at improving healthcare services, limiting waste and inefficiencies, improving the cost-quality ratio of healthcare services and reducing the differences among regions. For a critical analysis of this topic see: L. FERRARO, *Il Regolamento UE 2016/679 tra Fascicolo Sanitario Elettronico e Cartella Clinica Elettronica: il trattamento dei dati di salute e l'autodeterminazione informativa della persona,* in *BioLaw* 4/2021, 91-115; A. PIOGGIA, *La sanità italiana di fronte alla pandemia. Un banco di prova che offre una lezione per il futuro,* in *Diritto pubblico,* 2/2020, 385-403; G. SDANGANELLI, *La gestione del rischio clinico e delle connesse responsabilità per l'effettività del diritto alla salute,* in *federalismi.it.,* 5/2022, 214- 235.

[108] D. PEPE, *Intelligenza artificiale per la PA: i benefici, le sfide e il giusto approccio,* in *Agenda Digitale*, 12 April 2018.

[109] P. UNGUREANU et al., *Multiplex boundary work in innovation projects: the role of collaborative spaces for cross-functional and open innovation*, in *European Journal of Innovation Management,* vol. 24, no. 3, 2021, 984-1010; E. FIDELIS, *Exploring the Impact of Cross-Functional Collaboration on Organizational Mission Alignment* (April 30, 2019), available at SSRN: https://ssrn.com/abstract=3396876 or http://dx.doi.org/10.2139/ssrn.3396876, Accessed 19 November 2021.

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data that are trapped in functional silos.[110]Furthermore, to define the technical rules of interoperability it is necessary to predefine exactly what interactions will be allowed between two or more systems, thereby identifying and structuring the related data that will have to be exchanged. The realization of an interoperable system therefore implies a case-by-case assessment and normally involves a far greater degree of complexity than the creation of an isolated system, and this complexity gradually increases with the quantity and variety of information to be exchanged, and the systems to be interconnected.[111]

Cloud Computing is part of the solution: it guarantees reduced costs, instant scalability and agility, but also (and above all) data quality and unity from multiple sources.[112] However, defining and implementing effective interoperability standards for local administrations' data remains a crucial challenge to "break down data silos": to achieve real interoperability, data needs to be approached "outside the silo". Still, many Italian local government organizations are rigid and many of their systems are quite old. As result, governments find particularly complex to make cloud adoption decisions.

IT integration is challenging to analyze due to the dual role of technological issues and organizational factors that makes its adoption complex to manage.[113] This shows how the digital revolution impacts at local administrations' organizational level by paving the way to new models, where digital platforms are directly linked to a network of actors and services

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[110] O. ALI, V. OSMANAJ, *The role of government regulations in the adoption of cloud computing: A case study of local government,* in *Computer Law & Security Review,* vol. 36, April 2020, 1 ff.

[111] G. CARULLO, *Government in the Digital Era: Can We Do More with Less?* in *Information and Communication Technologies Challenging Public Law, beyond Data Protection,* cit., 145 et seq.

[112] See *infra,* § 5.2.

[113] O. ALI *et al.*, *Assessment of Complexity in Cloud Computing Adoption: a Case Study of Local Governments in Australia*, in *Inf Syst Front* (2021).

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and allow public administrations to perform their institutional functions by means of ICTs-integration in accordance with the GaaP approach.[114]

5.1. The GaaP implementation in Italy

The reforms that the Italian Government has undertaken to develop platform components following the GaaP approach started in 2015 with the Digital Growth Strategy[115]. Over the past years, the Italian Agency for Digitalization (*Agenzia per l'Italia Digitale* - AgID)[116] and the Italian Digital Transformation Team (*Team Per La Transformazione Digitale)[117]* adopted the 2017-2019 three-year Plan for ICTs in Public Administrations[118] and developed numerous actions aimed at fostering the use of digital services through the diffusion of enabling platforms[119]. The Italian Digital Transformation Team embarked on rebooting Italy's digital innovation footprint by understanding the digital transformation as socio-

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[114] See M. JANSSEN, E. ESTEVEZ, *Lean government and platform-based governance—Doing more with less* in *Government Information Quarterly,* issue 30, 2013, 1 et seq.

[115] Since the approval by the Council of Ministers of the Digital Growth and Ultra Broadband plans many projects and actions have been carried out, such as the e-invoicing, the creation of an open data portal of the Italian public administration and the National Resident Population Registry (ANPR).

[116] The main purpose of the Agency is to guarantee the achievement of the Italian digital agenda objectives and contribute to the diffusion of information and communication technologies, with the aim of fostering innovation and economic growth. AgID has the task of coordinating public administrations in the implementation of the Three-Year Plan for information technology in Public Administration and supports digital innovation and promotes the dissemination of digital skills, also in collaboration with international, national and local institutions and bodies.

[117] The Italian Team Digital is a temporary body the government constituted in 2016 to boost the development of Italian digital platforms.

[118] Piano Triennale per l'Informatica nella Pubblica Amministrazione 2019-2021, online: https://pianotriennale-ict.italia.it/piano, accessed 19 November 2021.

[119] See eGovernance Academy, *e-Estonia: eGovernance in Practice*, cit., 9.

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technical and socio-political solution.[120] One pillar of the current 2020-2022 Plan for ICTs in Public Administration [121] concerns the development of national platforms to provide core digital services (*e.g.,* identification payments to all public agencies at all levels of government procurement and artificial intelligence). Key components of such shared services are catalogues of private and public open data, which facilitates the collaboration among public agencies and the co-production of public services with external actors.[122] Another priority is related to the enhancement of general digital competencies and skills.[123] To that purpose, the European Union is promoting investments in technologies, infrastructures and digital processes in the Member States in order to bridge the deep digital disparity in infrastructures and culture, as shown by Italy's rankings by the Digital Economy and Society Index (DESI). Therefore, part of the National Strategy for Digital Skills[124] is aimed at increasing citizens' digital skills and competencies, by encouraging the use of digital public services to interact with public administrations through the involvement of young volunteers (digital

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[120] To that end, it developed the "io italia" app (https://io.italia.it/) that would consolidate several digital services on to a single platform and automatize all front-office-phases. P. DATTA, *Digital Transformation of the Italian Public Administration: A Case Study*, in *Communications of the Association for Information Systems,* issue 46, 2020, 253.

[121] Piano Triennale per l'Informatica nella Pubblica Amministrazione 2019-2021, online: https://www.agid.gov.it/it/agenzia/stampa-e-comunicazione/notizie/2020/08/12/il-piano-triennale-linformatica-nella-pa-2020-2022, accessed 19 November 2021.

[122] S. P. OSBORNE, *From public service-dominant logic to public service logic: are public service organizations capable of co-production and value co-creation?,* in *Public Management Review,* vol. 20, no. 2, 2018, 225-231.

[123] Cf. Piano Triennale per l'Informatica nella Pubblica Amministrazione 2020-2022, online: https://pianotriennale-ict.italia.it/piano, accessed 19 November 2021.

[124] *National Strategy for Digital Skills* approved by Ministerial Decree of the Minister for Technological Innovation and Digitalization, July 21, 2020. The Strategy has been drafted jointly with the help of Ministries, Regions, Provinces, municipalities, universities, research institutes and with the informal exchanges with the European Commission, under the direction of the Technical Steering Committee of "Repubblica Digitale", and the coordination of the Department for Digital Transformation - Presidency of the Council of Ministers on behalf of the Minister for Technological Innovation and Digitization. Available online: https://repubblicadigitale.innovazione.gov.it/assets/docs/national-strategy-for-digital-skills.pdf, accessed 19 November 2021.

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facilitators). The process of digital transformation of Italian Public Administrations is now fostered by the National Recovery and Resilience Plan (PNRR)[125], financed with funds from the European Recovery and Resilience Next Generation EU (NGEU)[126], which identifies, among its missions, the digital transition of the Italian public sector.

Focusing on local government's digitalization, local public administration's information systems solutions are often silo-based and barely coordinated, so that the organization tend to be fragmented, reflecting their autonomies.[127] This resulted in duplications of digital infrastructures and interoperability flaws. With this regard, AgiD platforms represent an important response to the fragmentation of the Italian local public administration, and to the inefficiency that the lack of coordination generated across the twenty Italian regions.[128] They were planned to avoid duplication of investments for similar services at the local level and to support the development of ecosystems, which can reduce the complexity of coordination axes.[129]

These platforms became the backbone of the Italian GaaP architecture, and the new 2020-2022 Plan for ICTs in Public Administration envisages the GaaP model of Italian local government as an adaptable "operating system". This relies on physical infrastructures – such

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[125] *The Recovery and Resilience Plan: Next Generation Italia*, approved by the Council of Ministers on 12 January 2021, available online: https://www.mef.gov.it/en/focus/documents/PNRR-NEXT-GENERATION-ITALIA_ENG_09022021.pdf, accessed 19 November 2021.

[126] *Regulation (EU) 2020/2094 of 14 December 2020 establishing a European Union Recovery Instrument to support the recovery in the aftermath of the COVID-19 crisis,* available online: https://eur-lex.europa.eu/eli/reg, accessed 19 November 2021.

[127] Cf. F. DANIELSEN, *Benefits and Challenges of Digitalization: An Expert Study on Norwegian Public Organizations,* in DG.O 2021: *The 22nd Annual International Conference on Digital Government Research, (June* 2021), 317-326.

[128] A. CORDELLA, A. PALETTI, *Government as a platform*, cit., 9.

[129] Ibid., 8.

as data centres, Cloud, and telecommunication infrastructures – and on intangible ones, *i.e.* all the data of public organizations and new platforms – *inter alia,* Public Digital Identity System (SPID[130]); Electronic management of payments to PA (PagoPa[131]); Electronic Identity Card (CIE); Electronic invoicing (FE); The mobile application (APP IO) to access from smartphones the services local and national digital public services, intended to be the tool through which all PAs make their services usable online to enable citizens to make self-certifications, submit applications and declarations, and make payments through PagoPa; National Register of Resident Population (ANPR[132]); Index of Public Administrations (IPA); Transmission of collection and payment orders between public administrations and treasurers (SIOPE+)[133].

5.2. *Main hindrances to the implementation of Cloud computing solutions*

The digitalization of the Italian public administration and its migration to Cloud solutions constitute some of the main objectives pursued by the National Recovery and Resilience Plan. Specifically, the empowerment of local administration through modern, interoperable, and secure infrastructure represents an essential prerogative to foster

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[130] SPID was imposed by law in 2014 in order to provide a single way to identify citizens for digital services and avoid duplication, inefficiencies, and redundancies a multitude of independent and incompatible identification systems had generated.

[131] PagoPA was required by article 5 of the CAD (*Codice dell'Amministrazione Digitale*) and by the law D.L. 179/2012 and it unifies all the digital payments across the entire Italian public administration and eliminates all the digital payment solutions individual national and local agencies had developed. SPID provides a national and cross-departmental identification solution.

[132] *Anagrafe Nazionale Popolazione Residente* - ANPR unifies all the registries single municipalities across the country had developed and autonomously managed.

[133] See Fig. 5. Structure of the Italian operating system, online: http://pianotriennale-ict.readthedocs.io/en/latest/doc/02_modello_strategico-di-evoluzione-dell-ict-della-pa.html, accessed 19 November 2021. See further online: https://www.agid.gov.it/en/platforms, accessed 19 November 2021.

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innovation and promote the deployment of digital platforms. In this context, the transition to Cloud computing is one of the most important challenges, as it works as technological substrate that enables the development of new technologies. Considering that Artificial Intelligence, Machine Learning, Big Data Analytics, and the Internet of Things require heavy computational power and storage space, Cloud computing came as a solution to integrate these technologies in local public administrations while improving the reliability and scalability of organizational systems[134]. However, despite being one of the most evolving developments in IT applications, Cloud adoption has not been a smooth ride for Italian local administrations.

Cloud computing is defined as a system of interconnected computers with dynamic provisioning of resources, "so that a consistent service-level agreement can be arranged between the service provider and its consumers".[135] It is a model for enabling network access to a shared pool of configurable computing resources that offers a means for digital government services to be delivered in a more agile, faster, and cheaper manner compared with traditional information technology infrastructure.[136] Nevertheless, local governments show a considerable resistance to Cloud computing. This depends on different reasons, such as the fact that their previous infrastructure investment may not have reached its "end of life" yet, or that staff capabilities may not be ready for a migration into a new system. Moreover, Cloud migration often includes redesigning database systems, instituting technical interoperability policies, developing Cloud governance mechanisms, and adjusting public

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[134] See C. MILLARD (ed.), *Cloud Computing Law,* Oxford, 2013.

[135] R. BUYYA et al., *Cloud computing and emerging IT platforms: Vision, hype, and reality for delivering computing as the 5th utility*, in *Future Generation Computer Systems,* 25/6, 2009, 599-616.

[136] D.C. MARINESCU, *Cloud computing: theory and practice*, Morgan Kaufmann, 2022, *passim*.

sector procurement policies.[137] Such transition thus imposes a radical local governance's change, which many local bodies are not capable to concrete yet. Another reason regards the lack of specificity among government regulations and the lack of support to local governments. Indeed, many aspects concerning this topic require closer scrutiny as, for example, privacy issues.[138] Also, at the present time, cybersecurity is not effective enough to ensure trust by organizations.[139] All those aspects therefore need greater analysis and appropriate solutions.

The PNRR provides that the development of a national Cloud storage will take place in parallel and in synergy with the GAIA-X European project.[140] The architecture of Gaia-X is based on the principle of decentralization, since it is the result of a multitude of individual platforms that follow a common standard that creates a networked system that

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[137] On this topic see F. GORGERINO, *Legal Basis and Regulatory Applications of the Once-Only Principle: The Italian Case,* in *The Once-only Principle* (R. KRIMMER et al. eds), cit., 104-125 (115 ff.).

[138] T. ABELL et al. (eds.), *Cloud Computing as a Key Enabler for Digital Government across Asia and the Pacific,* cit., 13 ff.

[139] See R. KRIMMER et al., *The Once-Only Principle: a matter of Trust,* in ID. et al. (eds), *The Once-only Principle*, cit., 1-8.

[140] The EU launched Gaia-X whose origin stems from the German Federal Government to create the next generation of data infrastructure for Europe, its companies, and its citizens. This infrastructure needs to meet the highest standards in terms of digital sovereignty and aims to foster innovation. The targeted infrastructure is regarded as the cradle of an ecosystem, where data and services can be made available, collated and shared in a trusted environment. The goal was to establish a more robust framework in 2020 and to launch the very first use cases by 2022. Gaia-X thus aims to create a European standardization forum to define the operating protocols of Cloud services, from the control of processed and stored data on the infrastructure. The project activity is divided into. two areas: i) analysis and requirements development of some use cases (about 40) belonging to 8 different domains (Industry 4.0, Healthcare, Finance, Public Sector, Smart Living, Energy, Mobility, Agriculture); ii) the reference architecture, the basic technical functionality of the data infrastructure and the technical implementation. GAIA-X claims to support the objectives of the European Data Strategy and uses current technologies (cloud, containers, APIs, etc.) and has the participation of seven EU countries and more than 300 organizations, joined by a nonprofit association of companies (French and German for now). Cf. A. BRAUD, G. FROMENTOUX, B. RADIER, O. LE GRAND, *The Road to European Digital Sovereignty with Gaia-X and IDSA*, in *IEEE Network*, vol. 35, no. 2, 2021, 4-5.

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links many Cloud services providers together.[141] Launched in July 2019 by the governments of Germany and France, the project aims to create the a federated data infrastructure for Europe based on the principles of security by design and privacy by design, capable of ensuring easy access to providers, nodes and services, through federated data catalogs, interoperability and portability of data and applications. But firstly, according to the Cloud First strategy, the adoption of Cloud services shall be implemented by means of the rationalization of Data Centers of the Central public administration and the reinforcement of the National Strategic Poles for digital infrastructures, which, at the central level, will be responsible for coordinating and managing them.[142] Aside of that, the migration of existing infrastructures and applications to the Cloud model[143] is envisaged and regulated by the AgiD Cloud Enablement Program[144]. It recognizes that the move toward Cloud solutions can be a gradual process and therefore different options are available, including private Cloud, hybrid Cloud, and public Cloud deployments.[145]

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[141] See more at https://www.data-infrastructure.eu/GAIAX/Navigation/EN/Home/home.html.

[142] The Public Administration's need for connectivity is expressed through four different lines: 1. the extension and adjustment of the administrations' connection capacity, including using virtual network infrastructures that allow for the development of a centralized routing paradigm and traffic processing; 2. the adjustment of connectivity to allow the offices of the public administrations to access the internet and Cloud services; 3. the adjustment of connectivity to inter-connect the National Strategic Poles (NSPs) and allow them to supply cloud services; 4. the adjustment of connectivity to allow citizens and businesses to use public services. Cf. Strategia Cloud Italia Documento sintetico di indirizzo strategico per l'implementazione e il controllo del Cloud della PA.

[143] AGID, *Il modello Cloud per la PA,* Piano Triennale per l'informatica nella Pubblica Amministrazione 2020-2022, online: https://docs.italia.it/italia/piano-triennale-ict/cloud-docs/it/stabile/index.html, accessed 19 November 2021.

[144] Online: https://docs.italia.it/italia/cloudenablementprogram/html, accessed 19 November 2021.

[145] See further T. ABELL et al. (eds.), *Cloud Computing as a Key Enabler for Digital Government across Asia and the Pacific,* Asian Development Bank Sustainable Development Working Paper No. 77, June 2021, 3 ff.

5.3. SaaS platforms' flaws

Cloud computing activities can be categorized into three types of services: Software-as-a-Service (SaaS), Infrastructure-as-a-Service (IaaS) and Platform-as-a-Service (PaaS).

In SaaS model, a Cloud provider hosts software applications and provides them on demand to customers (such as Google Apps, Dropbox, BigCommerce, and so on). In this case the user does not need to download any type of file, but the service can be used simply through Internet as end-user application. The applications are accessible from various client devices through either a thin client interface, such as a web browser (e.g., web-based email), or a program interface.[146]

In the IaaS option, third-party providers offer software and hardware tools that are conceived to develop Internet applications (as, for instance, Windows Azure). This Cloud service model supplies processing and other basic computing resources, where the users can install and run different software such as operating systems and other programs.[147] It thus encompasses the hardware infrastructure that underlies every Cloud service as raw computing resource.

Eventually, the PaaS consists of platforms for developing and deploying software applications. It can be seen as a bridge platform between applications (SaaS) and the

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[146] I. SON et al., *Assessing a new IT service model, cloud computing*, in *Proceedings of Pacific Asia Conference on Information Systems*, 2011, 1-11.

[147] See O. ALI et al., *Cloud computing technology adoption: Evaluation of key factors in local governments,* in *Information Technology and People* 2020, 1 et seq.

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infrastructure part (IaaS), where the service provider focuses on hardware infrastructure, while the user focuses on developing its application.[148]

From April 2019 Italian public administrations can only acquire IaaS, PaaS and SaaS services qualified by AgID and published in the Online Cloud Marketplace[149], where they can compare costs and main characteristics declared by the supplier.[150] To that extend, the Italian Central Purchase Body "Consip Spa"[151] has announced an open call for tenders for the conclusion of a Framework Agreement of 18 months concerning "Cloud services for public administrations".[152] SaaS and the Cloud can be used by local public administrations to digitalize their services and functions with many advantages, but they also have disadvantages.[153] Indeed, trough SaaS platforms, local governments can have many customized applications and data stored in proprietary databases.[154] On the one hand, this enhances differentiation among local administrations, but, on the other hand, it creates many

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[148] A.M. MOHAMMED, R.M ZEEBAREE, *Sufficient Comparison Among Cloud Computing Services: IaaS, PaaS, and SaaS: A Review*, in *International Journal of Science and Business, IJSAB International*, vol. 5, no. 2, 2021, 17-30.

[149] Online: https://catalogocloud.agid.gov.it, accessed 19 November 2021.

[150] Circolari AgID 2/2018 e 3/2018.

[151] Website: https://www.consip.it, accessed 19 November 2021.

[152] Cf. *Gara a procedura aperta per la conclusione di un Accordo Quadro avente ad oggetto l'affidamento di Servizi applicativi in ottica cloud e l'affidamento di servizi di PMO per le pubbliche amministrazioni,* Online: https://www.consip.it/bandi-di-gara/gare-e-avvisi/gara-servizi-applicativi-in-ottica-cloud-e-pmo, accessed 19 November 2021.

[153] S. FLOERECKE, F. LEHNER. *Meta-study of success-related factors of SaaS providers based on a cloud computing ecosystem perspective* in *Handbook on Digital Business Ecosystems* (S. BAUMAN ed.), Edward Elgar Publishing, 2022, 327-347.

[154] F. GIACOMINI, C. MUZZI. *Promoting digital innovation in the public sector: managerial and organisational insights from a case study,* in *International Journal of Public Sector Performance Management*, issue 8, vol. 3, 2021, 236-252.

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lock-in issues[155]. This is mostly related to the fact that when the public administration is only provided with the "closed" version of the program but doesn't own the source code, therefore local governments will have trouble in switching to a SaaS/Cloud platform without prejudice for the existent dataset.[156] Furthermore, the issue of free software becomes increasingly relevant with regard to the autonomy of the public administrations from the manufacturers and the awareness of how the software works, involving – by consequence – transparency problems.[157]

Another important profile is related to the indication of the rules on the basis of which the software must be programmed.[158] Applied research carried out in Piedmont Region (Italy) highlights that most SaaS qualified platforms are actually not suitable neither in terms of effectiveness nor in terms of best value for money. Most services merely dematerialize the administrative procedures without reaching a high level of digitalization. This is particularly remarkable by Single Point of Access for Enterprises (SUAP) domains.[159] Therefore, more

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[155] Cf. B. LUNDELL et al., *Addressing Lock-in Effects in the Public Sector : How Can Organisations Deploy a SaaS SolutionWhile Maintaining Control of Their Digital Assets?,* in *Proceedings of Ongoing Research, Practitioners, Posters, Workshops, and Projects at EGOV-CeDEM-ePart 2020 co-Located with the IFIP WG 8.5 International Conference EGOV-CeDEM-ePart 2020,* Linköping University, Sweden (Online), 31 August-2 September 2020, 289-296; G. CARULLO, *Principio di neutralità tecnologica e progettazione dei sistemi informatici della pubblica amministrazione,* in *Ciberspazio e diritto : rivista internazionale di informatica giuridica,* issue 21, vol.1, 2020, 33-48.

[156] M. CUSUMANO, *Cloud Computing and SaaS as New Computing Platforms,* in *Technology Strategy and Management*, April 2010, vol. 53, no. 4, 29.

[157] A. G. OROFINO, *The Implementation of the Transparency Principle in the Development of Electronic Administration,* in *European Review of Digital Administration & Law - Erdal* vol. 1, issue 1-2, 2020, 123-142 (131-138).

[158] Ibid., 134 ff.

[159] Cf. V. SOTTILI, *I risultati dell'indagine sull'operatività dei SUAP,* at *L'amministrazione Semplice per i Comuni e per le Imprese,* ANCI Piemonte Conference of 23rd November 2019, Turin.

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attention shall be paid to the integration of SaaS services, their standards, and their implication on e-government principles.

6. CONCLUSIONS

The global health emergency has led to a renewed centrality of the public sector, which aims at rebuilding relationships based on trust between institutions and citizens.[160] This also stressed out the pivotal role of the digital transformation towards the enforcement of European Open Governments,[161] where public administrations use the opportunities offered by the new digital environment to facilitate their interactions and ensure the right to access documents and proceedings, according to the principle of transparency.[162] On the other hand, the pandemic showed the importance in enhancing collaboration and solidarity for the implementation of innovative citizen-centric public administrations, which must be able to respond to the challenges of a multiform complexity of needs in the cities of tomorrow.[163] None of such challenges can be adequately addressed without a strengthened European

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[160] R. KRIMMER et al., *The Once-Only Principle: a matter of Trust,* in ID. et al. (eds), *The Once-only Principle*, cit., 5 et seq.

[161] See B. UBALDI, *Open Government Data: Towards Empirical Analysis of Open Government Data Initiatives,* OECD Working Papers on Public Governance, No. 22, OECD Publishing, Paris, 2013 (18 et seq.).

[162] G.M. RACCA, *La trasparenza e la qualità delle informazioni come forma diffusa di controllo sulle amministrazioni pubbliche*, Report for "Accademia per l'Autonomia", 5 maggio 2015; S. FOÀ, *La trasparenza amministrativa e i suoi limiti*, in *Scritti in onore di Franco Pizzetti* (C. BERTOLINO et al. eds.), Edizioni Scientifiche Italiane, Neaples, 2020, 497-525; F. GORGERINO, *L'accesso come diritto fondamentale e strumento di democrazia: prospettive per la riforma della trasparenza amministrativa*, in *federalismi.it*, 5/2022, 96-127.

[163] P. HALL, *Cities of tomorrow: An intellectual history of urban planning and design in the twentieth century,* Oxford, Blackwell Publishers, 1996; J-B. AUBY, *Droit de la ville: Du fonctionnement juridique des villes au droit à la Ville,* Paris, 2013; R. CAVALLO PERIN, *Beyond the Municipality: The City, its Rights and its Rites,* in *It. Journal of Public Law,* issue 2, 2013, 307 et seq.

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integration[164] aimed at consolidating the Digital Single Market for sustainable development[165], where data become a strategic resource for managing future Cities. Within this context, the GaaP approach is based on a digital foundation for governments to share data and services, which has been proposed as innovative model enabling a "ecosystem of participation".[166] It encloses a new way of building digital public services using a collaborative development model for the benefit of the society at various levels (city, regional, national).[167] Such approach applied to the emerging local government's models might play a pivotal role for the effective digitalization of local administrations and impacts on their traditional governance models. However, there remain several key blockers that local governments shall overcome as, for instance, the tackling of the technical, legal, and bureaucratic barriers to sharing data between local administrations' departments[168]. The use of open data and cross-government platforms represents a way to break down the data-silos, but, at the same time, governments need to invest in data security and Cloud solutions.

Eventually, local governments should prevent data duplication and ensure that the solutions are interoperable between departments and Member States' administrations.

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[164] R. CAVALLO PERIN, *L'organizzazione delle pubbliche amministrazioni e l'integrazione europea,* in *A 150 anni dall'unificazione amministrativa europea,* (L. FERRARA, D. SORACE eds.), vol. I, Firenze University Press, 2016, 3-36; G. M. RACCA, R. CAVALLO PERIN, *Plurality and diversity of Integration models: the Italian unification of 1865 and the European Union ongoing Integration process,* in *The Changing Administrative Law of an EU member state. The Italian case,* (D. SORACE, L. FERRARA eds.) Cham, Springer, 2021, 5-22.

[165] See E. LATOSZEK, *Fostering sustainable development through the European Digital Single Market*, in *Economics and Business Review*, vol. 7 (21), no. 1, 2021, 68-89.

[166] T. O'REILLY, *Government as a Platform,* cit., 37.

[167] H. MARGETTS, A. Naumann, *Government as a Platform: what can Estonia show the world?,* web: https://www.ospi.es/export/sites/ospi/documents/documentos/Government-as-a-platform_Estonia.pdf. See also E. Latoszek, *Fostering sustainable development through the European Digital Single Market*, cit., 69.

[168] Cf. G. CARULLO, *Government in the Digital Era: Can We Do More with Less?* in *Information and Communication Technologies Challenging Public Law, beyond Data Protection. Atti del 12° congresso annuale della Societas Iuris Public Europaei* (SIPE), cit., 146 ff.

Governments among Europe are evolving towards platform-like Single Point of Contacts, where citizens and businesses can complete most public administration procedures fully online.[169] The adoption of the Single Digital Gateway Regulation creates a horizontal, non-sector specific legal framework for the direct exchange of digital evidence between public administrations in different Member States by creating a shared legal basis and establishing trust.[170] For the full implementation of the Single Digital Gateway, local government shall thence fastener the integration of GaaP approach working firstly on the critical issues concerning the compliance of local administrations' current digital solutions with the once-only principle[171].

Without interoperable data elements that can move smoothly between different systems there's often no efficient way to exchange information and coordinate public administrations' data. To solve this problem, the European ISA² program (Interoperability Solutions for European Public Administrations) promotes and implements interoperability solutions between public administrations in the Union and finances technological infrastructures and opening source data analytics tools that can be used at European, national and regional level.[172] The 2020 Work Plan included 43 actions financed and managed directly

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[169] See T. O'REILLY, *Government as a Platform,* cit.

[170] On this topic see H. GRAUX, *The Single Digital Gateway Regulation as an Enabler and Constraint of Once-Only in Europe,* in *The Once-only Principle* (R. KRIMMER et al. eds), 83 ff.; D. U. GALETTA, *La Pubblica Amministrazione nell'era delle ICT: sportello digitale unico e intelligenza artificiale al servizio della trasparenza e dei cittadini?*, in *Ciberspazio e Diritto,* issue 3, 2018, 319-336.

[171] Until now many Member States and associated countries have started to implement the OOP at national level, but the cross-border implementation is still work in progress. For an overview based on the findings of the EU-funded "The Once-Only Principle Project (TOOP)" and mobile Cross-Border Government Services for Europe (mGov4EU) see C. SCHMIDT et al. *"When need becomes necessity" - The Single Digital Gateway Regulation and the Once-Only Principle from a European Point of View,* in *Open Identity Summit 2021*, (H. ROßNAGEL, et al. eds.), cit., 223-228.

[172] See ISA² - Interoperability solutions for public administrations, businesses and citizens, online:https://ec.europa.eu/isa2/home_en, accessed 19 November 2021.

by the European Union concerning, *inter alia,* interoperability tools, open data, geospatial solutions and eProcurement Analytics.[173] Furthermore, the Digital Europe Programme[174] foresees higher investments in the strategic capacities that allow to develop and use digital solutions at scale, and strives for interoperability in key digital infrastructures, such as extensive 5G (and future 6G) networks and deep tech. The aim is to implement a reinforced EU governments interoperability strategy to ensure common standards for the consolidation of borderless data flows and services in the public sector.[175]

The digital transformation is not limited to an organizational moment aimed at better achieving administrative goals through the application of ITCs and simplification actions. If adequately linked with innovation, this process deploys a creative impulse to new, "born-digital" administrative functions and public services.[176] To that extent, the challenge of adapting the purchase of goods, works and services for local administrations to such innovative perspective by integrating the use of ICTs, data analytics and networked organizational structures in public procurement takes on a propulsive role. Whenever municipalities procure goods and services, they carry out a public function of industrial policy, which cannot avoid innovation and digitalization to comply with the Constitutional principle of effectiveness and adequacy of public administrations' activities (art. 118 of the

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[173] See AgID, Interoperabilità PA europee: proposta AgID nel piano di lavoro 2020 del programma ISA², online: https://www.agid.gov.it/it/agenzia/stampa-e-comunicazione/notizie/2020/01/29/interoperabilita-pa-europee-proposta-agid-piano-lavoro-2020-del-programma-isa2. Accessed 19 November 2021.

[174] Online: https://digital-strategy.ec.europa.eu/en/activities/digital-programme, accessed 19 November 2021.

[175] Communication from the Commission to the Parliament, the Council, the European Economic and Social Committee of the Regions of 19th February 2020, *Shaping Europe's digital future* – COM (2020)67.

[176] On this topic see S. ROSSA, *The Digitalisation of Public Administration and Born-Digital Functions: a Modern "Janus Bifrons"?,* in *Research Monograph "Smart Governments, Regions and Cities", Proceedings of the International Scientific Conference Economics of Digital Transformation (*EDT) DIGITOMICS 2019, (S. DREZGIC et al. eds.), University of Rijeka Edition, Rijeka, 2020, 207-221.

Italian Constitution).[177] An interesting example of how the digitalization and the implementation of digital platforms can impact the efficiency of local public administrations and its governance models can be identified in the ongoing reform of Italian E-procurement system. On March 9, 2022, the Italian Parliament approved the bill-draft for the adoption of the legislative decree introducing the new discipline of public contracts.[178] The aim is to concrete the implementation of e-procurement native digital platforms that overcome the mere adaptation from analogical to digital tools[179] and acquire information from public administration databases can enable the verification, in real time, of the qualification of economic operators[180], as well as programming, design, selection and monitoring.[181] This is

[177] Cf. G.M. RACCA, S. PONZIO, *La scelta del contraente come funzione pubblica: i modelli organizzativi per l'aggregazione dei contratti pubblici*, in *Diritto Amministrativo,* issue 1, 2019, 33 et seq.

[178] Bill-draft No. 2330-A, *Delega al Governo in materia di contratti pubblici,* March 9, 2022. Online: https://www.senato.it/service/PDF/PDFServer/DF/368148.pdf, accessed 19 November 2021.

[179] See F. FRATTINI, *Introduzione*, in *Contratti Pubblici e Innovazioni per l'Attuazione della legge delega* (R. CAVALLO PERIN, M. LIPARI, G.M. RACCA eds.), cit., 1-6; G.M. RACCA, *The digitization of contractspublic contracts: adequacy of public administrations and qualification of companies*, in *Il diritto dell'amministrazione pubblica digitale* (R.CAVALLO PERIN, D.U. GALETTA eds.), cit., 321-341.

[180] COMMISSION EU, Expert Group on eProcurement (EXEP), *Interoperability in end-to-end eProcurement, Publications Office*, Brussels, 2020. In this perspective, the Italian Interoperable eProcurement - IIeP (action No. 2015-IT-IA-0108), represents an important project funded by the European Commission for the integration of the Italian centralized certification system - SIMOG with e-Certis and the e-Procurement Central Purchasing Bodies under the European standardization program. AgID coordinates a group of Italian public institutions and private partners, ANAC, Consip, Intercent-ER, InVerso which was awarded funding under the CEF Telecom call (CEF-TC-2015-1) for the implementation of the project. The main result expected from the project is the updating of the Italian SIMOG certification system for the exchange of information regarding the admission criteria, in compliance with the European directives on public procurement 2014/25/EU, 2014/24/EU and 2014/23/EU requiring Member States to gradually adopt e-procurement, with the objective of improving the opportunities for economic operators to participate in procurement procedures throughout the internal market. Online: https://www.agid.gov.it/sites/default/files/repository_files/modello_evolutivo_iiep.pdf, accessed the 19 November 2021.

[181] G.M. RACCA, *Le innovazioni necessarie per la trasformazione digitale e sostenibile dei contratti pubblici,* in *Contratti Pubblici e Innovazioni per l'Attuazione della legge delega* (R. CAVALLO PERIN, M. LIPARI, G.M. RACCA eds.), *cit.*, 23.

particularly correlated to the need of adequate digitalization of the whole procurement circle (above all in local public administrations).[182]

Nonetheless, these topics concern not only local public procurement, but more generally all the fields related to local public services and functions, which are characterized by the principles of decentralization and local autonomy that underlie the organization and the functioning of local public administrations. The recognition of local government's right to self-administrate to identify and implement the optimal solutions for solving specific problems on behalf of the local interests (which they represent) is emerging in a new, innovative declination. From this blueprint comes out that the capability to guide local government's autonomy throughout the main challenges of Smart Cities and digital transformation of public administrations implies finding a new balance between subsidiarity and differentiation – on the one hand – and simplification, interoperability, once-only and digital trust – on the other hand.

Abstract. Smart City-paradigm and the digital transformation of the public sector introduced new challenges for traditional local governance models, which need to understand, assimilate, and spread up innovation. This contribution aims to analyse how the implementation of the Government-as-a-Platform Approach (GaaP) impacts on local governance and innovation by focusing on a compared analysis of the ongoing "platformization" and on a critical perspective of the Italian GaaP implementation strategy.

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[182] G.M. RACCA, *La digitalizzazione necessaria dei contratti pubblici: per un'Amazon pubblica*, in *DPCE online*, 45, n. 4/2021, 4669-4706; P. MCKEEN, *The Pursuit of Streamlined Purchasing: Commercial Items, E-Portals, and Amazon*, in *Joint Public Procurement and Innovation. Lessons Across Borders* (G.M. RACCA, C.R. YUKINS eds.), cit., 373-387; C.R. YUKINS, *United States procurement and the COVID-19 pandemic*, in *Public Procurement Law Review*, n. 4/2020, 220-231; C.R. YUKINS, A. SUNDSTRAND, M. BOWSHER, *Tale of Three Regulatory Regimes - Dynamic, Distracted and acted and Dysfunctional: Sweden, the United Kingdom and the United States*, in *GWU Law School Public Law*, Research Paper no. 2018-08.