



# ChatGPT Application vis-a-vis Open Government Data (OGD): Capabilities, Public Values, Issues and a Research Agenda

Euripidis Loukis<sup>1</sup> , Stuti Saxena<sup>2</sup> , Nina Rizun<sup>3</sup> , Maria Ioanna Maratsi<sup>4</sup> ,  
Mohsan Ali<sup>4</sup> , and Charalampos Alexopoulos<sup>4</sup> ✉

<sup>1</sup> University of the Aegean, 83200 Samos, Greece  
eloukis@aegean.gr

<sup>2</sup> Graphic Era University, Uttarakhand 248002, India

<sup>3</sup> Gdansk University of Technology, 80-233 Gdańsk, Poland  
nina.rizun@pg.edu.pl

<sup>4</sup> University of the Aegean, 83200 Samos, Greece  
{ioanna.m,mohsan,alexop}@aegean.gr

**Abstract.** As a novel Artificial Intelligence (AI) application, ChatGPT holds pertinence not only for the academic, medicine, law, computing or other sectors, but also for the public sector-case in point being the Open Government Data (OGD) initiative. However, though there has been some limited (as this topic is quite new) research concerning the capabilities ChatGPT in these sectors, there has been no research about the capabilities it can provide to government concerning its wide range of functions and activities. This paper contributes to filling this gap by investigating the capabilities that the ChatGPT can provide concerning one of most recently initiated and novel, and at the same time most promising, activities of government that aims to fuel the emerging data economy and society: the opening of large amounts of government data; furthermore, we investigate the public values that can be promoted through the use of ChatGPT in the area of OGD by both the data publishers as well as their users. At the same time, we investigate the issues that the use of ChatGPT in the area of OGD can pose, which can reduce the capabilities identified as aforesaid as well as the benefits and public values that can be generated from them. For these purposes interviews with 12 experts have been conducted and their responses have been analyzed. Finally, based on our findings we have developed a research agenda concerning the exploitation of ChatGPT application in the OGD domain.

**Keywords:** Artificial Intelligence · ChatGPT · Open Government Data · Public Values · Research Agenda

## 1 Introduction

As a major breakthrough in the Artificial Intelligence (AI) landscape, the roll-out of ChatGPT (Chat Generative Pre-Trained Transformer) in November, 2022 [1], was acknowledged with different reactions across academic circles, social media and electronic media

[2–7]. In its fundamental form, ChatGPT is “...a variant of the GPT (Generative Pre-trained Transformer) architecture, a neural network trained using a large dataset to generate natural language text suitable for conversational contexts, such as responding to user input in a chatbot or virtual assistant application... (and) it has been trained on a massive text dataset, including various sources, allowing it to generate grammatically correct, contextually appropriate, and coherent text” [8: 1]. Some first limited research (as it is a quite new topic) on the implications of ChatGPT has revealed that it can provide significant and highly beneficial capabilities in diverse sectors like academics, law, medicine, media and computing (software development) to name a few with some concomitant caveats too [9–15].

However, the implications of ChatGPT for the public sector have not been underscored so far. There has been no research about the capabilities it can provide to government concerning its wide range of functions and activities. So, it is necessary to investigate the capabilities that the ChatGPT can provide concerning both the ‘traditional’ government functions and activities, and also the more recent and novel ones. Our study contributes to filling this gap focusing on one of the most recently initiated and novel, and at the same time one of the most promising, activities of government that aims to fuel the emerging data economy and society: the opening of large amounts of government data to be used by citizens, firms and the society in general [16–19]. Whilst the applications of ChatGPT in the digital government may be a research pointer in itself, the present study seeks to provide an overview regarding the possible research avenues of the ChatGPT applications in the context of Open Government Data (OGD) initiative-the still-evolving digital government innovation across the globe [18]. Given that the success of the OGD initiatives relies on the usability by a range of stakeholders (user side) and the proactiveness of the government agencies (provider side) [20], the present study seeks to provide research pointers across these two broad rubrics; to investigate the implications of ChatGPT for OGD users and providers. Furthermore, we proceed to a deeper investigation of the capabilities that the ChatGPT can provide in the area of OGD from a public values perspective [21].

In particular, this paper contributes to filling this above-mentioned research gap concerning the implications of the ChatGPT for the public sector; our main research questions are:

- i) Which capabilities are provided by the ChatGPT in the area of ODG to OGD users and publishers?
- ii) What are the public values that can be promoted through the use of ChatGPT by OGD users and publishers exploiting these capabilities?
- iii) Which are the issues (e.g., problems, risks) posed the use of ChatGPT in the area of OGD, which can reduce the above capabilities as well as the benefits and public values that can be generated from them?
- iv) What should be the future research agenda concerning the exploitation of ChatGPT application in the OGD domain?

For addressing the above research questions interviews with 12 experts have been conducted and their responses have been analyzed; experts’ perspectives were synthesized and filtered in alignment with the research objectives.

The theoretical foundation of our study is ‘affordances theory’, which, though initially developed and used in the ecological psychology domain, is increasingly used in the information systems domain [27]. An affordance is defined as ‘the potential for behavior associated with achieving an immediate concrete outcome and arising from the relation between an artifact and a goal-oriented actor or actors’ [23]: it constitutes a relationship between an actor and an artefact and concerns the action possibilities provided to the actor, towards achieving his/her goals, by the artefact; however, we might have not only ‘positive affordances’ but also ‘negative affordances’ as well [23]. So, in this study we investigate the positive and the negative affordances of ChatGPT concerning the OGD (for both their users and publishers).

Our study makes a contribution to the extant OGD-focused literature across two streams: a) it adds to the OGD-AI linkage literature, which has been limited so far, dealing with the generation of more value from OGD using the ‘classical AI’ (mainly Machine Learning) [24] it also makes a contribution towards the evolving ChatGPT-related literature.

This paper consists of six sections: In the following Sect. 2 the background of our study is outlined, and then in Sect. 3 our research methodology is described. Next the results are presented in Sects. 4 and 5, while in the final Sect. 6 conclusions are summarized and future research directions are proposed.

## **2 Background**

### **2.1 Public Values**

The ‘public value’ theory was developed by Moore [21], and elaborated by other researchers [24, 25], in order to provide a new public management paradigm to be used both for activities and resources allocation planning as well as for the evaluation of public sector organizations, which addresses the weaknesses of the two previous dominant public management paradigms: the ‘bureaucratic’ and the ‘new public management’ ones. According to the public value theory government has a wide range of objectives, that concern a wide range of collective needs, desires, aspirations and preferences of the citizens, which are associated with values regarded by them as important: efficiency in the use of public sector resources, quality of services, fairness, equal treatment of all citizens, trust, legitimacy, social cohesion, cultural development, transparency, public participation and collaboration, etc. Therefore, public resources should be used by government agencies in order to generate the above types of public value, in a way which is analogous to the generation of private value within private firms.

There has been considerable research concerning the relationship between digital governance and public values [26, 27]. One of its most interesting conclusions was that public value theory constitutes a sound and comprehensive basis for the strategic planning, the evaluation, and in general the analysis, of digital government, as well as specific kinds of information systems and applications for the public sector, which is not limited to the ‘traditional’ efficiency and cost reduction related objectives, but includes additional political and social objectives concerning the promotion of a wide range of public values, such as the above mentioned ones. An interesting stream of this research concerning the relationship between digital governance and public values is dealing with

the identification of specific public values, or categories of public values, that can be substantially promoted through the use of ICT in government. The most representative and widely used of these studies is the one of [27], which identifies four main categories of public values that can be promoted through e-government systems and applications:

- Efficiency-related values: productivity, performance, efficient use of public resources cost reduction, and value for money.
- Service-related values: public services quality, accessibility and utility, as well as citizen centricity.
- Professionalism-related: independent, robust and consistent administration, governed by a rule system based on law (legality), public record, which is the basis for accountability, transparency and equal treatment of citizens (equity).
- Engagement-related: citizens' participation, engagement with the civil society to articulate the public good and facilitate policy development in accordance with liberal democratic principles, deliberation, and 'deeper' democracy.

This framework developed by [27] concerning the public values that can be promoted through e-government has been used for the analysis and evaluation of different kinds of e-government systems and applications, including the application of AI in government [28, 29]. So, in this study we examine the use of ChatGPT in the area of OGD from this public value perspective, by investigating which of the above values (efficiency, services, professionalism and engagement) can be promoted by the use of ChatGPT by OGD users and publishers exploiting the capabilities offered by the former.

## 2.2 Public Values vis-a-vis OGD

Economic as well as social and political value derivation and innovation via OGD usage is the prime *raison d'être* for the implementation of OGD initiatives [16, 17]. As such, public value creation frame encapsulates technical characteristics of OGD initiatives, i.e. system planning and system implementation, as well as people characteristics, i.e. socio-economic status, skills and political development, with the concomitant challenges of citizen familiarity and engagement with the OGD initiatives and the associated legal stipulations [30] as well as the complexity or poor OGD quality, lack of a OGD-supportive management culture or cultural bottlenecks [31].

Given the provisioning of OGD across a range of socio-economic sectors, it is anticipated that the diverse stakeholders, inclusive of the professionals and lay citizens, shall derive value by re-using and harnessing OGD as per their needs and purposes (both social-political and economic) [32]. This is also suggestive of the involvement of a diverse set of stakeholders in the processes of social and economic value co-creation from OGD [33] thereby making this value creation processes more democratic in nature and scope [34]-case in point being the co-engagement of the public and private sector professionals in the OGD value derivation pursuits [35]. Moreover, the lynchpin of such value derivation endeavors lies in the conducive factors pertaining to the linking of granular OGD with congruent as well as non-congruent OGD belonging to the other socio-economic sector, for that matter [36].



### 2.3 OGD Research Agenda

Since OGD is a relatively recent and novel government activity, and at the same time quite ambitious and promising, aiming to make a strong government contribution to the development of data economy and society, extensive research is required in order to improve its efficiency, effectiveness and in general its maturity, and finally the increase the social and economic value generated from the large amounts of OGD that have been published (which has required a considerable investment). So, there have been several studies aiming to develop a future research agenda for the OGD domain, which are shown in Table 1.

We can see that most of them aim to develop a research agenda concerning OGD in general, while there are some studies aim to develop a more specific research agenda concerning some specific aspects of OGD: its impact on democratic processes [37] and also OGD services quality [19]. Our study aims to contribute to this latter direction: to develop a specific research agenda concerning the exploitation of the ChatGPT application in the OGD domain.

## 3 Research Methodology

Since our research objective is to investigate a novel research question (for which there is no previous research and knowledge), concerning the positive affordances (capabilities) as well as the negative affordances (issues, e.g. problems, risks, etc.) of ChatGPT in the area of OGD (for both users and publishers of them), we adopted a qualitative approach based on structured interviews with experts [41]. Expert opinion is considered as a viable research methodology in cases where the perspectives of experts are warranted for understanding the possibilities of an under-researched or neglected research theme; thus, the experts engage in deliberation and discussion over an issue and their perspectives serve as “intellectual bins” for further filtering and analyses. In particular structured interviews were conducted with 12 experts from Universities the authors belonged to or had research collaborations with in the area of OGD (University of the Aegean, Erasmus University, Gdansk University of Technology) from the domains of management, information systems and business analytics, who had knowledge about OGD on one hand and AI as well as ChatGPT on the other. We believe that such University experts would be a better source of insight concerning the capabilities that the ChatGPT can provide in the area of OGD, as well as relevant problems and risks, than government practitioners in the opening of government data, as the latter might currently have not sufficient knowledge about ChatGPT.

For the present study, the experts were contacted personally via email, which included a brief description of the objectives of our research, explaining that we wanted to elicit their views regarding these research objectives; for the ones who accepted (12 out of 15) to participate in our research an electronic meeting/interview was arranged via skype; all these electronic meetings/interviews were conducted in February 2023. Table 2 summarizes the profiles of the interviewees. The following six questions were posed to the experts which concerned the positive affordances (capabilities) of ChatGPT in the area of OGD for their users and publishers (questions A, B, D, E) as well as relevant negative affordances (e.g. possible problems and risks) (questions C and F):

**Table 1.** Studies for developing OGD-research agenda.

Authors/year	Emphasis	Major pointers for further research
[38]	Development of a taxonomy of OGD research areas and topics	Four main OGD research areas are identified: OGD management and policies, OGD infrastructures, OGD interoperability and OGD usage and value
[37]	Impact of OGD on democratic processes	Systematic literature review with a focus on the impact of OGD initiative across monitorial, deliberative and participatory aspects vis-a-vis government
[39]	Knowledge areas and themes of OGD research are identifies using a co-word analysis and then relevant future research directions are proposed	What opportunities for innovation do open data offer? What business models can be developed through open data? What financial impact do open data have on businesses, and how can this impact be measured? How can open data be applied to improve managerial information systems? How can new educational arenas be developed through open data? How can students develop applications or tools through open data?
[18]	Traces the evolutionary trajectory of OGD research and proposes relevant future research directions	It identities future OGD research directions concerning purpose and benefits of OGD, use of artificial intelligence for creating smartness in OGD, innovation with OGD, theory development - an integral approach of OGD and sustainable OGD initiatives

*(continued)*

**Table 1.** (continued)

Authors/year	Emphasis	Major pointers for further research
[40]	Systematic literature review of OGD empirical research that identifies six clusters; viz., general/conceptual development (OGD theory); drivers/barriers (OGD antecedents); adoption/usage/implementation (OGD decisions); success/performance/value (OGD outcomes); acceptance/satisfaction/trust in government (OGD impacts), and policies/regulation/law (OGD governance)	Based on the identified research clusters the following future research directions are identified: role of digital intermediaries for closing the OGD demand-supply gap; impact of government activities; status and prospects for economic OGD; specific roles of socio-economic, demographic and cultural characteristics of the economy that spur or hinder OGD implementation; causal linkage between OGD access barriers and the contribution of the digital economy in providing data-based public services; relationship between user-centric OGD initiatives and the customer-centric business models of the intermediaries
[19]	OGD services quality	Dimensions of OGD e-services quality; impact on users' satisfaction, OGD e-services re-use and e-trust; influences of culture; challenges for achieving high OGD e-services quality

- A. How do you perceive the efficacy of ChatGPT for Open Government Data (OGD) initiatives?
- B. What are the drivers for users' interfacing with ChatGPT with regard to OGD usage?
- C. What are the hindrances for users to tap ChatGPT vis-a-vis OGD initiatives?
- D. Can ChatGPT help in value creation via OGD? If so, how?
- E. How can the government use ChatGPT for OGD publishing?
- F. Will ChatGPT be a danger for user privacy while interacting with OGD portals and datasets?

All these electronic meetings/interviews were tape-recorded (with the permission of the interviewees), transcribed and then coded manually by two of the authors separately, using an open coding approach [41]; results were then compared and differences were resolved. Then each of the identified capabilities that ChatGPT can provide in the area of OGD was classified into one of the four categories of public values that can be promoted through the use of ICT in government proposed by the relevant framework of [27] (efficiency-related values, service-related values, professionalism-related and engagement-related). Finally, based on the identified capabilities as well as issues (e.g. problems, risks, etc.) a future research agenda was developed concerning the exploitation of ChatGPT application in the OGD domain.

**Table 2.** Experts profile/background.

Field of study	Country	Specialty
Information Systems Engineering	Greece	Cybersecurity, Data privacy, Digital forensics, Gamification strategies, Open and linked data ecosystems
Information Systems Engineering	Greece	Data mining, Computer security and reliability, Artificial Intelligence
Business-Society Management	Netherlands	Policy and governance, Planning and decision-making in China, Transport infrastructures, Sustainable urban development
Business Analytics	Poland	Big Data, Computational and Linguistic Analytics, Smart Sustainable Cities

## 4 Results

Broadly speaking, the experts shared with us their quite interesting perspectives across the capabilities, on the one hand, and the possible downside, on the other hand, vis-a-vis the ChatGPT application in the OGD ecosystem.

### 4.1 Capabilities

a) The experts pointed out that user engagement with OGD shall be furthered on account of the “open” and easy accessibility of ChatGPT, which can provide to the users substantial assistance in finding the datasets they need (with data about the topic they are interested in), to process them (especially if they are not familiar with data processing tools, as ChatGPT can provide data processing), to draw conclusions from them and in general exploit them either for business purposes (e.g. for developing value added e-services by combining various kinds of open government data and possibly private data as well, for making various business innovations) or for political purposes (for gaining a better and data-based understanding of government actions as well as spending, increasing transparency). Thus, a range of stakeholders, viz., common citizens, private sector entities, journalists, professionals, academia, software developers, and the like, stand to gain from the harnessing of ChatGPT for value derivation and innovation pursuits.

b) Furthermore, the ChatGPT (as it can generate software as well) can provide substantial assistance to programmers for the development of useful applications that are based on OGD, contributing to the generation of more economic and social value from them.

c) Apart from furthering user engagement, OGD awareness may be further bolstered among the potential users-case in point being the essays churned out by the ChatGPT applications with reference to the tutorials, documents, discussion forums, user feedback, data requests, case studies, success stories of value derivation as well as the manner in which OGD might be put to use and even retrieved from the OGD portals. It is anticipated

that such essays are more conducive towards developing a more nuanced, comprehensive and enjoyable understanding of the objectives, purposes, applications and utility of OGD per se as well as the technical dimensions related thereto, viz., technical terminology, visualization tools and techniques, searching and discovering OGD, utilizing OGD portal via linkage and/or interoperability, preparation, filtering, analyzing, contributing OGD, for instance.

d) Useful capabilities are provided by the ChatGPT not only to OGD users (or potential users) but also to OGD publishers, the most important of them being the government agencies who open/publish some of their data, in order to acquire valuable insight concerning the OGD needs and preferences of different groups of potential users, to understand better for what kinds and thematic categories of data there is a real demand by citizens and firms, and also to assess the level of awareness about and satisfaction with the data they have already opened. So, ChatGPT can immensely increase the probability of ascertaining the equilibrium between the “demand” and “supply” side of OGD initiatives, which has remained a knotty issue in many contexts. Thus, on the one hand, the ChatGPT application would be helpful in ascertaining the cases where the application has been successful and overwhelming in terms of being responsive to the user queries about OGD, and on the other hand, the negligible or absence of OGD or related information would be an indicator for improvisation of the grey areas by the OGD publishing agencies. Therefore, ChatGPT could assist in the development of better OGD strategies of government agencies, and a better-informed policy making, through a combination of machine and human-derived input.

e) Also, governments can use ChatGPT not only for the design and implementation of their OGD policies and strategies, but also can in their OGD provision portals introduce chatbots backed by the ChatGPT model, which can help with data discovery, recommendations, and better user engagement, as well as with data exploration such as data visualization, insights generation, and suggestions for future potential areas.

Therefore, we can conclude that ChatGPT can provide quite useful capabilities to both OGD users (and potential users) (the above mentioned capabilities a, b and c) and also to OGD publishers (government agencies publishing OGD) (the above mentioned capabilities d and e).

However, some of the experts made interesting remarks, that pertain to the robust technological infrastructures, viz., supervised machine learning and reinforcement learning, on which ChatGPT application rests itself, which are liable to be further improvised with technological breakthroughs in the near future, and, these features are likely to provide glitch-free inferential summaries to the users (as currently definitely there are some mistakes). This is also suggestive of the manner in which customized value-added goods/services might be the resultant of OGD linkage and/or interoperability pursuits. Thus, the stakeholders concerned may get engaged in such value derivation pursuits such that apart from the standalone benefits to be reaped by the ecosystemic entities horizontally and vertically, the collaborative attempts by the public, private and the voluntary sector entities across local, national and international levels are facilitated at the same time. Such inter- and intra- collaborative efforts shall be evidenced across the myriad social, economic, political and legal sectors, for instance.

## 4.2 Public Values

We then analyzed the above identified capabilities that ChatGPT can provide in the area of OGD from a public values perspective, and this led us to the conclusion that they can promote two out of the four types/categories of public values of the framework of [27]: service-related values and professionalism-related.

I) Service-related values: If we view OGD as a service provided by government to the citizens and firms, ChatGPT enables improving the quality of this service, by providing to government insight about the kinds and thematic categories of data that citizens and firms need, which is quite useful for defining their data opening priorities, opening datasets that are really useful, and avoiding wasting valuable financial resources for opening datasets for which there is limited interest and usefulness. One of the experts said: *“The ChatGPT will allow government agencies to identify special needs and preferences of users for data, so that the later can get in a quick and efficient manner the required datasets”*, while another expert mentioned: *“ChatGPT could assist in the prioritization of data categories to be published, as well as the temporal margin under which it is optimal (according to customized preferences) to publish certain data”*. Furthermore, ChatGPT enables improving the quality of this OGD provision service with respect to its wider accessibility and use by a much larger numbers of users; indicative for this is the following experts’ statement: *“ChatGPT can help with accessibility, efficiency, interactivity, and accuracy of open government data; by leveraging these drivers, ChatGPT can encourage more users to interact with OGD portals or services”*. At the same time ChatGPT will enable users of OGD to visualize and process them easily and rapidly, and draw useful conclusions from them, and finally create more economic value from them; indicative is the following experts’ statement: *“New products, services, businesses, jobs, and opportunities can be stimulated by the ChatGPT processing and recommendations concerning the highly valuable dataset”*.

II) Professionalism-related values: The use of ChatGPT in the area of OGD can increase the transparency of government activity and spending, as it enables a much larger number of citizens, journalists, politicians, etc. to find, access and analyze OGD datasets concerning government activity and spending, and draw conclusions from them, easily and rapidly, and this can lead to a higher trust in government; this can also contribute to having political debate of higher quality, with arguments based on real data/evidence (and not on stereotypes and pre-existing biases); indicative of these possible political impacts are the following experts’ statements: *“Increasing data understandability and accessibility through the use of ChatGPT can help improve transparency. And in return, trust and confidence in government and other organizations by providing greater visibility into their operations and decision-making processes will be increased”* and *“The accessibility of ChatGPT could be one of its most appealing traits to the user. The easy access to the retrieval of knowledge and real-time information of any nature, can be an attractive starting point for the user to also use ChatGPT in an OGD context”*.

### 4.3 Issues

i) With respect to possible privacy violation issues that might be posed by ChatGPT, its developers (OpenAI) claim that it doesn't use any type of private or personal data about individuals until and unless it is publicly available. In the case of OGD, these data usually undergo a strict and careful anonymization before they published. So, it seems that a direct threat is not posed. However, ChatGPT collects data about the sequence of questions and in general the behavior of each registered user, and possibly user's browser data (IP and device information) as well. These personal data, which reflect sensitive attitudes, concerns, interests and sometimes political orientations of future business plans, might be used in inappropriate ways. To mitigate these issues, appropriate measures should be taken to prevent the consent-less transfer, use, or processing of these data.

ii) The ChatGPT has some weaknesses (that might be overcome in the future) in the synthesis of existing information and the development of various kinds of inference, such as summaries and conclusions, so there might be mistakes, which can mislead OGD users (or potential users) with respect to what OGD have been published on topics of user's interest, and/or draw incorrect conclusions from them. This, in combination with the 'black-box' nature of ChatGPT for its users (most of them cannot understand how it works), could scare them away and demotivate them from using it.

iii) In the absence of the requisite regulatory framework for such tools, there are dangers pertaining to cyber-crimes, faulty algorithms, mismatched or biased inferences, misplaced, insufficient, overly generalized, illogical, or culturally-insensitive results.

iv) Linguistic differences across countries might result in algorithmic biases and reinforcement training might be inadequate or inappropriate-for instance, the implications of the etymological differences across languages might be a potential downside of ChatGPT vis-a-vis OGD's understanding and across country comparisons.

v) Semantic issues might pose barriers for ChatGPT to better summarize/analyze OGD.

## 5 Research Agenda

Based on the above mentioned capabilities and issues described in the previous Sect. 4 we proceeded to the development of a future research agenda concerning the exploitation of ChatGPT in the OGD domain, as this is quite new research topic, so extensive research is required in order to increase its efficiency, effectiveness and maturity in general. The proposed research agenda consists of research areas and specific research topics for each of them that require investigation.

### 5.1 Research Area I: ChatGPT Application for Furthering OGD Use and Value Generation

– In terms of furthering OGD awareness and use among the potential users, emphasis has been laid on strategic planning and execution by the governments with a personalized and customized target positioning among the target user cohorts [19, 42]. In this

vein, harnessing ChatGPT for furthering OGD use and value generation shall serve as a watershed for the users in comprehending the nuances of OGD and the possibilities of value derivation from them, thereby furthering the relevant innovation landscape across numerous socio-economic sectors.

- ChatGPT exploitation by the OGD users hailing from different backgrounds alongside their research and information-seeking behaviors are also important aspects of further research given that the learning-goal orientation is different across the users apart from the personal involvement and perceptions on their occupational performance and social behavior too [14].

- ChatGPT adoption and usage studies vis-a-vis OGD are always a viable line of research across Information Systems theories such that the behavioral intention as well as actual usage and adoption may be gauged across or within cases at individual, group, organizational, regional, country and cultural levels.

- ChatGPT use for processing of data is a very important capability, especially for users who are not familiar with statistics and use of them for data processing as well as drawing conclusions from them; so, it is quite important to investigate to what extent these capabilities are used, and how useful they are for users.

- Also, there are a plethora of research directions springing from the user engagement with ChatGPT vis-a-vis OGD for value creation activities not only with ChatGPT helping out with cues, guidelines, case studies and benchmarked examples for value creation activities by re-using/linking/interoperating OGD [16, 43]. Also, the OGD user would be helping in improvising ChatGPT itself for providing additional features, furthering its user-friendliness or taking into account user privacy while interfacing with ChatGPT functionalities.

## **5.2 Research Area II: ChatGPT Application for Facilitating/Improving OGD Publishing**

- Use of ChatGPT for the development of OGD strategies, for enabling a better understanding about users (or ‘potential users’) needs and preferences for OGD, as well as about their degree of satisfaction with already opened/published government data (and possibly identify problems and deficiencies of them), and also for enabling the collection of relevant knowledge and experience about opening/publishing government data from other government agencies (of the same country or other countries).

- Use of ChatGPT for developing Tutorials and guides pertaining to the OGD initiatives, in general, and, the country statistics across different indices, data catalogs/sectors or data publishers via ChatGPT may be a potent support mechanism for the government personnel for spearheading the OGD initiatives and this would help in furthering the morale and motivation of the personnel as well.

- Legal and regulatory issues vis-a-vis ChatGPT in terms of OGD applications need to be earmarked with special consideration for individual privacy and security as well as cybercrimes related with impersonation, identity theft, plagiarism, revelation of sensitive content, imprudent behavior, etc.

- Cultural dimensions across local and regional levels cutting across heterogeneous populace are also the potential research areas vis-a-vis ChatGPT invocation for OGD. Furthermore, national comparisons, assessment and evaluation studies, benchmarking,



efficacy of ChatGPT for furthering OGD understanding to meet the Society 5.0 and Industry 4.0 as also during the emergency situations like the ones during floods, fires, epidemics, etc. may be considered as viable research pointers.

– Institutionalization mechanisms for furthering user engagement with ChatGPT for better comprehending its utility vis-a-vis OGD need to be analyzed in further research-case in point may be the assessment of the campaign drives, target population, campaign pitch, government incentives, etc.

### 5.3 Research Area III: The Downside of ChatGPT Application for OGD

Finally, it is necessary to conduct research concerning the downside of the ChatGPT applications vis-a-vis OGD, in order to investigate its possible *dark sides*. This research stream may investigate *possible issues/risks* associated with ethical, privacy and security, technology complexity and technological self-efficacy, addictive behaviors, technology longevity and breakdown on account of systemic failure, etc.; these research pointers may be investigated across individual, group, organizational, national or cultural levels using different research methodologies.

## 6 Conclusions

The development of the ChatGPT has a great potential to provide quite useful capabilities and benefits for enhancing numerous human activities and economic sectors, and have substantial transformative as well as disruptive effects on them, but the realization of this potential might face significant problems and challenges, and might also pose some threats. These have already started to be researched for some sectors [15], but have not been research for the case of government, despite its high importance for economic and social life.

This study makes a first step towards filling this research gap, focusing on one of the most recently initiated, novel and promising activities of government that aims to contribute to the further development of data economy and society: the opening of large amounts of government data. Using the lenses of ‘affordances theory’ [22], it investigates the positive affordances (capabilities provided) and the negative affordances (issues posed, such as problems and risks) of ChatGPT in the area of OGD. Furthermore, based on them we proceed to the development of a future research agenda concerning the exploitation of ChatGPT application in the OGD domain. This will allow us to understand the research ramifications of the use of ChatGPT for OGD initiatives from the side of users and publishers. So, our study meets the call for further “multidisciplinary research” with a focus on “enhanced collective cognitive intelligence (human/ICT-enabled) for better governance” [38: 57).

Using a qualitative approach, which is based on a series of interviews with experts, it has been concluded that the use of ChatGPT in the area of OGD can offer significant and highly beneficial capabilities to both OGD users and publishers. From a public value perspective, these capabilities can promote two out of the four main types/categories of public values of the framework of 37: service-related values and professionalism-related values. In particular, with respect to service-related values ChatGPT can improve the

OGD provision service, by enabling government to make it more focused on potential users' needs, and also improve its accessibility and exploitation for the generation of economic and social value. At the same time, the use of ChatGPT in the area of OGD can pose privacy risks, and also can sometime mislead the users, due to its weaknesses in the synthesis of existing information and the development of various kinds of inference, such as summaries and conclusions, which sometimes result in mistakes (though it is expected that these weaknesses will be reduced in future improved versions of the ChatGPT).

Based on the above findings three main future research areas have been identified, which concern the use of ChatGPT for furthering OGD use and value generation, and for facilitating and improving OGD publishing by government, as well as the 'dark sides' of ChatGPT application in the area of OGD. It may be added here that the research areas and topics identified above may be investigated as standalone or integrated too. Besides, the evolution of ChatGPT with time may also lead to different research themes in terms of the efficacious impact and the related challenges vis-a-vis OGD initiatives from the users' and publishers' ends.

Finally, the present study leaves implications on one hand for research and on the other hand for practice and policy-making. With respect to research, it makes a contribution to the limited existing body of knowledge concerning the capabilities and benefits that the ChatGPT can provide to various human activities and economic sectors, which concerns a minimally examined sector with respect to such generative AI applications: the public sector, focusing on one of its most recently emerged and ambitious activity: the opening of government data. With respect to practice, it proposes some useful ways of ChatGPT exploitation by OGD users and publishers, which can improve the economic, social and political value generated by OGD. Our findings indicate that a better strategic blueprint and execution of OGD initiatives may be achieved by government if it takes in account the potential of ChatGPT and the capabilities it can provide. Finally, harnessing ChatGPT evolutionary trajectory would be better witnessed as the users' engagement increases with time thereby prompting the launch of suitable regulatory framework in the near future.

Our study has two main limitations. The first one is that it is dealing with the capabilities provided and the public values that can be promoted, as well as the issues posed, by the use of ChatGPT in one only government activity (that does not belong to the 'core' ones, however it is a very promising one), the opening of government data; so it is necessary to examine the same for the main 'core' government functions and activities (e.g. policy making, welfare, operations, etc. in various thematic domains). The second limitation is that our findings have been based on interviews with experts from Universities (knowledgeable about OGD on one hand and AI as well as ChatGPT on the other); so it is necessary to conduct similar research, based on interviews with government practitioners dealing with opening government data, as well as managers responsible for this (as they gradually gain knowledge about ChatGPT and start thinking about exploiting it in their activities and tasks), or even using Delphi methods.

## References

1. Open AI. ChatGPT. <https://chat.openai.com/auth/login>. Accessed 20 Feb 2023

2. Haque, M.U., Dharmadasa, I., Sworna, Z.T., Rajapakse, R.N., Ahmad, H.: "I think this is most disruptive technology": exploring sentiments of ChatGPT early adopters using Twitter data (2022). <https://doi.org/10.48550/arXiv.2212.05856>
3. Mashable. ChatGPT. <https://mashable.com/category/chatgpt>. Accessed 20 Feb 2023
4. Lund, B.D., Wang, T.: Chatting about ChatGPT: how many AI and GPT impact academia and libraries? *Library Hi Tech News*. <https://doi.org/10.1108/LHTN-01-2023-0009> (2023, in press)
5. NBC News. Americans are wary of AI tech like ChatGPT, data shows. <https://www.youtube.com/watch?v=rgP6zIP1-OU>. Accessed 20 Feb 2023
6. van Dis, E.A.M., Bollen, J., Zuidema, W., van Rooij, R., Bockting, C.L. ChatGPT: five pointers for research. *Nature* (2023). <https://www.nature.com/articles/d41586-023-00288-7>
7. CNET. Why we're obsessed with the mind-blowing ChatGPT AI chatbot (2023). <https://www.cnet.com/tech/computing/why-were-all-obsessed-with-the-mind-blowing-chatgpt-ai-chatbot/>
8. Ventayen, R.J.M.: OpenAI ChatGPT generated results: similarity index of artificial intelligence-based contents. *SSRN* (2023). <https://doi.org/10.2139/ssrn.4332664>
9. Aydin, O., Karaarslan, E.: OpenAI ChatGPT generated literature review: digital twin in healthcare. *Emerg. Comput. Technol.* **2**, 22–31 (2022)
10. Choi, J.H., Hickman, K.E., Monahan, A., Scharcz, D.: ChatGPT goes to law school. *SSRN. Minnesota Legal Stud. Res.* (2023). [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=4335905](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4335905)
11. Dowling, M., Lucey, B.: ChatGPT for (finance) research: the Bananarama conjecture. *Finance Res. Lett.* 103662 (2023)
12. Kirmani, A.R.: Artificial intelligence-enabled science poetry. *ACS Energy Lett.* **8**(1), 574–576 (2023)
13. Pavlik, J.V.: Collaborating with ChatGPT: Considering the implications of generative artificial intelligence for journalism and media education. *Journal. Mass Commun. Educ.* **78**(1), 84–93 (2023)
14. Mhlanga, D.: Open AI In education, the responsible and ethical use of ChatGPT towards lifelong learning. *SSRN* (2023). <https://doi.org/10.2139/ssrn.4354422>
15. Dwivedi, Y. K., Kshetri, N., Hughes, L., et al.: So what if ChatGPT wrote it?" Multidisciplinary perspectives on opportunities, challenges and implications of generative conversational AI for research, practice and policy. *Int. J. Inf. Manag.* **71**, 102642 (2023)
16. Jetzek, T., Avital, M., Bjorn-Andersen, N.: Data-driven innovation through open government data. *J. Theor. Appl. Electron. Commer. Res.* **9**(2), 100–120 (2014)
17. Wirtz, B.W., Birkmeyer, S.: Open government: origin, development, and conceptual perspectives. *Int. J. Public Adm.* **38**(5), 381–396 (2015)
18. Gao, Y., Janssen, M., Zhang, C.: Understanding the evolution of open government data research: towards open data sustainability and smartness. *Int. Rev. Adm. Sci.* (2021, in press). <https://doi.org/10.1177/00208523211009955>
19. Alexopoulos, C., Saxena, S., Janssen, M., Rizun, N. Whither the need and motivation for open government data (OGD) promotional strategies? *Digit. Policy, Regul. Gov.* (2023, in press). <https://doi.org/10.1108/DPRG-07-2022-0078>
20. Gasco-Hernandez, M., Martin, E.G., Reggi, L., Pyo, S., Luna-Reyes, L.F.: Promoting the use of open government data: cases of training and engagement. *Gov. Inf. Q.* **35**(2), 233–242 (2018)
21. Moore, M.: Public value as the focus of strategy. *Aust. J. Public Adm.* **53**(3), 296–303 (1994)
22. Pozzi, G., Pigni, F., Vitari, C.: Affordance theory in the IS discipline: a review and synthesis of the literature. In: *Proceedings of Twentieth Americas Conference on Information Systems (AMCIS)*, Savannah, USA (2014)

23. Gao, Y., Janssen, M.: Generating value from government data using AI: an exploratory study. In: Viale Pereira, G., et al. (eds.) EGOV 2020. LNCS, vol. 12219, pp. 319–331. Springer, Cham (2020). [https://doi.org/10.1007/978-3-030-57599-1\\_24](https://doi.org/10.1007/978-3-030-57599-1_24)
24. Alford, J., Hughes, O.: Public value pragmatism as the next phase of public management. *Am. Rev. Public Adm.* **38**(2), 130–148 (2008)
25. Williams, I., Shearer, H.: Appraising public value: past, present and futures. *Public Adm.* **89**(4), 1367–1384 (2011)
26. Cordella, A., Bonina, C.: A public value perspective for ICT enabled public sector reforms: a theoretical reflection. *Gov. Inf. Q.* **29**(4), 512–520 (2012)
27. Rose, J., Persson, J.S., Heeager, L.T., Irani, Z.: Managing e-government: value positions and relationships. *Inf. Syst. J.* **25**(5), 531–571 (2015)
28. Toll, D., Lindgren, I., Melin, U., Madsen, C.: Values, benefits, considerations and risks of AI in government: a study of AI policy documents in Sweden. *eJ. eDemocr. Open Gov.* **12**(1), 40–60
29. Chen, Y.C., Ahn, M., Wang, Y.-F.: Artificial intelligence and public values: value impacts and governance in the public sector. *Sustainability* **15**, 4796 (2023)
30. Reyes, L.F.L., Chun, S.A.: Open government and public participation: issues and challenges in creating public value. *Inf. Polity* **17**(2), 77–81 (2012)
31. Wiedenhof, G.C., Matheus, R., Saxena, S., Alexopoulos, C.: Barriers towards open government data value co-creation: an empirical investigation. *Electron. J. Inf. Syst. Dev. Ctries* e12270 (2023, in press)
32. Ubaldi, B.: Open government data: towards empirical analysis of open government data initiatives. OECD Working Papers on Public Governance, 22, OECD Publishing, Paris (2013). <https://doi.org/10.1787/5k46bj4f03s7-en>
33. Zeleti, F.A., Ojo, A., Curry, E.: Exploring the economic value of open government data. *Gov. Inf. Q.* **33**(3), 535–551 (2016)
34. Harrison, T.M., et al.: Open government and e-government: democratic challenges from a public value perspective. In: 12th Annual International Digital Government Research Conference: Digital Government Innovation in Challenging Times, pp. 245–253 (2011)
35. McBride, K., Aavik, G., Toots, M., Kalvet, T., Krimmer, R.: How does open government data driven co-creation occur? Six factors and a ‘perfect storm’; insights from Chicago’s food inspection forecasting model. *Gov. Inf. Q.* **36**(1), 88–97 (2019)
36. Attard, J., Orlandi, F., Auer, S.: Value creation on open government data. In: 49th Hawaii International Conference on System Sciences (HICSS), Koloa, HI, USA, pp. 2605–2614 (2016)
37. Ruijter, E.H.J.M., Martinius, E.: Researching the democratic impact of open government data: a systematic literature review. *Inf. Polity* **1**, 1–18 (2017)
38. Charalabidis, Y., Alexopoulos, C., Euripidis, L.: A taxonomy of open government data research areas and topics. *J. Organ. Comput. Electron. Commer.* **26**(1–2), 41–63 (2016)
39. Corrales-Garay, D., Ortiz-de-Urbina-Criado, M., Mora-Valentín, E.M.: Knowledge areas, themes and future research on open data: a co-word analysis. *Gov. Inf. Q.* **36**(1), 77–87 (2019)
40. Wirtz, B.W., Weyerer, J.C., Becker, M., Muller, W.M.: Open government data: a systematic literature review of empirical research. *Electron. Mark.* **32**, 2381–2404 (2022)
41. Maylor, H., Blackmon, K., Huemann, M.: *Researching Business and Management*, 2nd edn. Palgrave – McMillan Education, UK (2017)
42. Chokki, A.P., Simonofski, A., Frenay, B., Vanderose, B.: Open government data awareness: eliciting citizens’ requirements for application design. *Transform. Gov.: People Process Policy* **16**(4), 377–390 (2022)
43. Shadbolt, N., et al.: Linked open government data: lessons from Data.gov.uk. *IEEE Intell. Syst.* **27**(3), 16–24 (2012)