Co-production and Nudging: The Enabling Role of ICT

Maddalena Sorrentino[1]([⊠]) [iD], Laura Iacovone[1] [iD], and Paolo Depaoli[2]

[1] University of Milano, Via Conservatorio 7, 20122 Milan, Italy
`maddalena.sorrentino@unimi.it`
[2] Università della Tuscia, Viterbo, Italy

Abstract. Co-production and nudging reflect the new paths taken by governments in the digital transformation age. Both are behaviour-based tools of public action. Both are premised on the idea that citizen engagement in public services is essential for problem solving. Thus far, however, these topics of debate have been addressed in isolation. The aim of this explorative paper is twofold: to come to an overall assessment about the potential of co-production and nudging, analysing the links between them, and the role that ICT plays in improving citizen behaviours. Drawing on a service lens, the paper makes the case that co-production and nudging can be combined to support citizens in their 'service user journey'. This tentative exercise is a conceptual one, but hopefully one that broadens the understanding of citizens' participation mediated by digital technologies. In essence, the joint adoption of co-production and nudging could help design and deliver services that better meet citizen needs.

Keywords: Co-production · Nudging · Public services · ICT platforms · User experience

1 Background

Influencing citizens' behaviour is central to problem solving, and a large variety of instruments are used for this purpose in various policy areas and public service sectors. Ideas on co-production or "the mixing of the productive efforts of consumer/citizens and of their official producers" [1] have been widely discussed by local and central governments across developed and developing countries since the 1970s. In the last few years, the notion that citizens can be encouraged to act in socially beneficial ways has been referred to by the term nudge (i.e., light touch interventions), popularised by Thaler and Sunstein [2] bestseller. As citizens, communities and policymakers, we want to stop 'bad behaviours': people vandalising our cars, stealing our possessions or threatening our children. We want to encourage 'good behaviours': volunteering, voting and recycling [3].

It is commonly assumed that the crucial problem of co-production at an organizational level is that it is challenging and complex [4], while nudging (as a light-touch technique) tends to be narrow in scope, easy to implement and is characterised by less persistent effects [5]. Scholars also underscore how co-production and nudging – despite arising from divergent cognitive assumptions – go hand in hand with social innovation, defined as "innovations that are social both in their ends and means … that simultaneously meet social needs … and create social relationships or collaborations. They are innovations that are not only good for society but also enhance society's capacity to act" [6: 9].

To date, the two strategies have been largely investigated in isolation and from distinct academic backgrounds. Further, the role of information and communication technologies (ICTs) for effective citizen engagement in service design and implementation has remained an under-researched topic in Behavioural Public Policy.

In response to these gaps, the qualitative paper addresses a main question: *What role does ICT play in enabling the public action tools of co-production and nudging?* and aims to provide answers, adding on to the scholarly discourse on behavioural policymaking [7], public service management [8] and related developments.

Investigating the potential of the two tools is both necessary and timely because of the extent to which many contemporary policy challenges are being addressed through strategies of citizen engagement in problem solving. The paper argues that co-production is much more than a form of service delivery, and nudging is wider than "giving messages or creating defaults" [5: 11]. Specifically, the confluence of two broad factors sets the context for positive combination between nudging and co-production strategies: on one side, the widespread presence of ICT tools and social media at all levels of society and in government activities, which has significantly expanded the diversity and convenience of the interactions across 'service journey' [9]. And, on the other, some recent studies [10, 11] that propose the 'hybridisation of nudge', or a joint use of nudging and co-production, as an enhancement to the current behavioural tools.

The line of argument unfolds in four steps. The paper first illustrates the research approach then selectively summarises the debate on co-production and nudging in public domains. Second, it pinpoints the key features of these tools of action according to diverse interrelated dimensions, including the assumptions of behaviour change strategies and the role of citizens at individual and collective levels. Third, it outlines the role of ICTs to enhance customer interaction and to ensure ongoing citizen engagement. Fourth, the paper proposes a conceptual framework that summarizes the essence of co-production and nudging from the service standpoint. The paper concludes with an overview of the key issues that reinforces the need to further study the nexus between co-production and nudging.

2   Research Approach and Theoretical Framework

Given the relatively novel and broad topic of this paper, the most indicated research method is a qualitative approach [12]. Specifically, the following sections conceptually explore co-production and nudging, and their potential. Here, we do not address the issue of whether citizen engagement in public services is a good idea but how the new policy tools can be characterised and what their main organisational implications are.

To situate three key concepts—in particular, co-production, nudging, ICT—in the larger context of behavioural service logic, and thereby evidence the ensuing managerial issues for PSOs (Public Service Organisations), the paper applies a service-based lens [13] as this perspective has much to offer contemporary public sector organisations engaged in the reconfiguration of their delivery systems. As Grönroos puts it, '[PSOs] can be as user-focused and service-oriented as private service organisations. Therefore, what is required is good service management' [8: 788].

The research path begins by discussing how the surge of co-production and nudging reflects in literature. To this end, the paper selectively reviews the latest evidence from information systems, service management and public management studies. We included relevant research work based on our reading that reflects our own viewpoint and expertise.

The paper then introduces ICTs as key enablers of communication and interaction between public service providers and citizens. In light of the evidences gathered, and on the basis of the Grönroos and Voima model [14], we offer a conceptual framework that captures different concepts and issues which underpin a broadened view of co-production and nudging across the citizen journey. In our opinion, the proposed conceptualisation shows convincingly how, taken together, nudging and co-production can co-exist and mutually support each other *also* thanks to the pervasiveness and influence of Internet and social media.

Informed by a service logic, the overall aim of the proposed research path is to develop a stronger understanding of user involvement in an era of increasingly complex citizen behaviour fostered by digital technologies.

3   User Involvement in Public Service Delivery

The environmental pressures and public needs that public service organisations face in our society are dynamic and evolving, 'creating mounting challenges for a single government agency to cope with alone' [15: 199]. These challenges require governments to set out 'new approaches to public service delivery that emphasise the power of civic society to tackle the big social challenges' [16: 157]. Citizens play a decisive role in the success of policies. Without their response, governance remains limited [17].

Therefore, influencing behaviour is central to public policy design and implementation [3, 7, 18]: "when citizens are engaged, motivated and willing to change their behaviours, it is much easier for governments to achieve their policy objectives. …. When citizens are switched off, antagonistic to governments…, public policy gets much harder to implement and poor outcomes are the result" [19: 1].

3.1 Co-production

Co-production and co-creation have become ubiquitous terms in contemporary policy [20, 21]. 'Co-creation' is conceptualised as collaboration in creation of value through shared inventiveness, design and other discretionary behaviours, whereas 'co-production' is more narrowly defined as participation within parameters defined by the focal organisation (e.g. selecting from predetermined options). The importance of co-creation is "in the capacity to use previously unexploited citizens' resources and capabilities" [22: 7], namely knowledge and expertise.

Recently, the Web 2.0 and the advances in ICT have inspired the development of interactive platforms that build on extensive input from citizens, integration of knowledge and user participation with important potential impact on public service delivery. At the instrumental level, the advent of the Internet's unique many-to-many interactivity enables 'ubiquitous co-production' in virtual or physical spaces [23]. At the institutional level, the new media foster a sense of shared identity with public-sector organisations as well as a sense of community among citizens. For example, an analysis of the co-production of public service support and safety in the Netherlands [23] points out that the new media not only shift co-production away from a rational approach to a more social approach, but also strengthen the emphasis on social and playful interactions by transforming participation into a real-life game.

3.2 Nudging

Nudges are private or public initiatives that steer people in particular directions but also allow them to go their own way [17]. Nudges are 'relatively unobtrusive measures' [24] aimed at obtaining a behaviour that generates a collective benefit. For example, reducing water consumption through nudge has an immediate impact on the users' bill but generates beneficial results on the environment that increase when the new behaviour becomes a habit. A reminder is a nudge, so is a warning. A GPS device nudges; the same applies to a default rule [17]. According to Sunstein and Walmsley, "to qualify as a nudge, an initiative must not impose significant material incentives (including disincentives)" [17: xix]. Nudging also uses technology to deliver desired changes in behaviour. In this case digital nudging can be considered a subtle form of using design, information and interaction elements to guide the user behaviour in digital environments [25].

A tangible example of nudging strategies at work in public institutions is the United Kingdom Behavioural Insights Team (BIT) [26]. BIT is a Cabinet Office partner that works with more than 50 public institutions in the UK for finding innovative ways to improve public policy through choice architecture. Nudge units and teams can also be found in the US, the Netherlands, Australia and Canada, to name just a few [17].

3.3 Critical Voices

Recent research on behavioural public policies increasingly reports criticisms. In a chapter significantly titled 'The dark side of co-creation and co-production', Steen and colleagues [27] address 'potential evils', including the deliberate rejection of responsibility, failing accountability, rising transaction costs, loss of democracy, reinforced inequalities, implicit demands and co-destruction. Not even the application of nudging is exempt from criticism. For example, according to [28], nudges target citizens biases and heuristics by modifying the choice environment in which they operate and as such, they often leave citizens out of the deliberative process, compromising their ability to own and sustain long-term behavioural changes. A nudge is often deemed to be opaque and manipulative, one that co-opts the internal cognitive processes of individuals and overrides their consent.

In terms of legitimacy, nudging, but above all co-production initiatives, risk breaking the link "between citizens and the services they receive in return for the taxes they pay". [29: 38]. As observed by Salamon, "it is not surprising that citizens might begin to wonder where their taxes are going and what they receive in return" [29: ibidem].

The review of critical voices could go on further. However, what we want to highlight here is that recent elaborations increasingly address the broader ethical and moral implications of behavioural policymaking, and crucial issues such as the autonomy of the agent and the transparency of tools.

4 Framing the Debate

Reconstructing systematically the debate about co-production and nudging is beyond the scope of this paper. A useful starting point is to consider both as 'tools' or 'instruments' of public action, which is "an identifiable method through which collective action is structured to address a public problem" [29: 19].

This broad description suggests that—in addition to their *defining* features—tools vary in the level of specificity with which they define eligible purposes and in the range of eligible recipients (ibidem, original emphasis). Additionally, and more interestingly, tools are institutionally relevant, in that they 'structure action', which means "they are regularised patterns of interaction among individuals or organisations" [29]. They define the 'choice architecture', that is, who are involved in the operation of public programmes, what their roles are, and how they relate. In this view, interaction is meant as a mutual or reciprocal action in which the involved parties have an effect upon one another [30].

John and colleagues [31] identify two possible ways in which public administrations can induce citizens to adopt responsible behaviour:

– acting on awareness and active participation with respect to objectives of common well-being (*Think* strategy); and
– trying to involve citizens with emotional incentives to obtain effects that overcome any barriers and inertia (*Nudge* strategy).

Volunteering and co-production are two notable examples of *Think*-based strategy [25] in that they assume reflexivity, sharing values and civic-minded behaviour by the citizen/service user. This distinction between Think and Nudge will be resumed in the concluding section.

Table 1 (below) outlines in a simplified way several analytical dimensions of co-production and nudging, derived from top international studies. The list, far from exhaustive, gives a broad view of the variables at work. It should also be noted that policy tools rarely appear in a pure form [29]. For example, co-creation and co-production often have overlapping that makes them difficult to distinguish. Table 1 captures the overall diversity of co-production and nudging, in terms of objectives and role of public institutions. The two tools also carry different understandings of human behaviour and theory of change and, as a result, stand for different approaches to mobilise action in the public realm [31]. For a discussion, see also: [11].

Table 1. Key characteristics of co-production and nudging (authors' elaboration)

Dimensions	Co-production	Nudging
Goals	Increase the effectiveness of public services according to the needs of users and reduce inefficiencies, with the ultimate goal of increasing the well-being of the community and nurturing consensus towards the political entity. It is essential, but not obvious, to obtain the involvement of service recipients. Citizens' preferences are malleable, because individuals are open to reasoning and questioning to achieve a higher collective good. The approach is typical of modern democracy, with a medium-long-term horizon, in which people are willing to invest their energies	Making individual behaviours harmonious, channelling them in a more or less conscious way towards collective action. Obtain socially desirable behaviours, especially when they are daily and for which an immediate change is desired (short-term horizon) Citizens' preferences are understood in this sense to be fixed and rather elementary. Governments are therefore confronted with people centred on individual benefits, and as 'cognitive misers' they assume that citizens tend to assimilate simple concepts and mental shortcuts. A change in behaviour therefore occurs more for the perception of a personal benefit than a collective one

Table 1. (*continued*)

Dimensions	Co-production	Nudging
Theoretical underpinnings	The concept of co-production is originally developed as part of the studies in Political theory and Policy analysis. On the political science side, a conceptual difference is theorised between the production of goods and services. On the economic science side, the traditional distinction between consumers and producers is broken Co-creation mostly focuses on the ability and the opportunity to involve users in the definition and design of the services	Nudging builds on economic theory and psychology: the first identifies the costs and benefits of the behaviours that the second allows to study and understand. Nudge marketing finds its theoretical foundations in the contributions of neuromarketing. Drawing on studies of the brain responses of individuals, neuromarketing has demonstrated the nature of human beings as 'cognitive misers', i.e. they tend to have the maximum result with the minimum (cognitive) effort. This leads them to repeat decisions that in the past may have had a positive result (heuristics, such as cognitive shortcuts)
Role of the citizen	The citizen is the recipient of public policies, the user of the services, an unpaid volunteer. He/she is a lay actor. Is also a source of competence. The user contributes directly to the production with the 'regular producer' and, in some cases, the service cannot proceed without the consumer being at the same time willing to get involved in the production. In co-production, the investment by the citizen is on average significant. The consumer is asked to share own knowledge and skills to directly contribute to the service performance. The user learns, experiments and engages with the provider organisation	Someone who can be induced to do something in line with the organisation's objectives by overcoming psychological barriers through the use of emotional incentives capable of shifting the focus and reducing the typical decision-making process Consumer analysis and demand segmentation are mainly aimed at knowing the traits and points of possible 'activation' Nudging aims to orient a final behaviour in one direction or the other. The citizen's effort is often in having to change habits that can be harmful. Unhinging habits is anything but simple and immediate

(*continued*)

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Dimensions	Co-production	Nudging
Role of the public service provider	The PSO designs the service by providing for the presence of input from the citizen	Is the main source of stimuli and incentives. The PSO is the client of the nudge to induce changes in the attitudes and behaviours of the service recipients

Literature agrees that communication among public organisations and citizens plays a central role in ensuring successful behavioural strategies [32]. This is not surprising, since conventional tools of government have always had an informational core [33]. In the case of nudging, communication using distinct media induces the policy recipient to behave in the desired way, leaving the citizen to believe that he/she is faced with a 'free' choice (and not 'conditioned'). In the case of co-production, however, communication has an impact on how the service process proceeds, and on how interactions (with the provider and with other recipients) are performed.

Whatever relationship approach the PSO adopts when embarking on a strategy of citizen engagement, effective communication and interaction processes should be properly designed and mobilized [13]. Thus it is imperative for PSOs to develop structures and processes that engage citizens "coherently and consistently over time and space and across a multitude of service interfaces" [9: 43].

5   The Roles of ICT

Technological advances affect citizens' ability to participate in government services [34]. This opportunity, on a *systemic* level, could reshape the role of government in society and the role of citizens in public governance [28]. On a *meso* (organisational) level, however, IS/IT technologies induce the redesign of internal processes: "Internet becomes part of the service process" [13: 290]. On a *micro* level, technology impacts citizen experience [13].

According to an extensive study developed by Lember [35], ICT plays three possible roles: indirect, transformative and substitutive. In the first case (indirect role), digital technologies can enable effective co-production by allowing for more efficient information flows and providing support functions. Digital nudges utilise many online technologies and channels, including e-mail, SMS, push notifications, mobile apps, social media, gamification, e-commerce, e-government and location services [36]. In addition, digital nudges offer three key advantages to PSOs: they are relatively inexpensive, they are able to spread quickly, and they facilitate data production and increase outcome measurability [36].

For example, in the field of local utilities, such as energy, water and waste management, real-time data collection and provision can provide governments with an opportunity to nudge how citizens contribute to service delivery: users can be notified of

how their real-time energy consumption compares to their neighbours', consequently nudging them to change their behaviour and thus how they co-produce environmental protection [37]. In the education field, digital nudges have shown a promise for combating persistent disparities in educational outcomes. Parents and students are provided with small bits of information regularly with easily operationalised tasks and practices "in order to overcome both information asymmetries and the cognitive load required for behaviour change" [38: 568]. This support encourages service recipients to behave in ways that are more consistent with positive educational outcomes [38].

Technologies can also transform the traditional forms of co-production. Digital tools can create entirely new practices, whereas some just add a digital layer on top of the usual human-centred co-production [35]. This is the case, for example, of assisted living solutions such as telecare and telehealth. Hackathons represent both a new tool of co-production and a source for new co-production initiatives, including apps and other ICT tools. Living labs are a bottom-up approach to directly test digital technologies with their users and solve local issues through community-focused civic hacking.

Through various digital platforms, governments can tap into the collective wisdom of crowds by systematically collecting ideas, opinions, solutions and data from service users and civil society. Well-known examples include participation platforms, such as 'We the People' in the USA; 'Grand Débat National' in France. Digital platforms supporting constitutional reforms were used in Iceland and Estonia [35].

Finally, there are technologies that have the potential to substitute the traditional co-production practices. According to Lember and colleagues [35], current technological developments mean, on the one hand, the co-production process can be fully or partly automated, changing—paradoxically—the role of the engaged citizens from active to passive. Consider, for example, the use of the remote monitoring sensors that can provide 24/7 real-time and automated feedback about the health conditions of a patient. In parallel, there is also an increasing presence of ICTs that give the full control of service provision to users *without* a need for direct or even indirect government participation. When citizens own and decide on the initiatives, choose the design and implementation methods, and co-create digital solutions without the presence of the central coordinating authority (e.g., the government), digital transformation may effectively substitute traditional service provision models with models of self-organisation.

In sum, the main argument to arise from the current debate is that new forms of responsiveness in public service delivery are emerging [39]. At the centre of these developments is the inclusion of user needs into the service process. This integration enabled and enhanced by ICT allows services to be dynamically recomposed and delivered [22].

6   Conceptualizing the Citizen Journey

How can we, in light of recent developments, conceptualise efficaciously – meaning in a way that fully captures also the technological advancements and the evolution of the research agenda – the joint adoption of co-production and nudging strategies across increasingly complex and diverse citizen interfaces?

A useful starting point here is the concept of 'value creation spheres' elaborated by Grönroos and Voima [13, 14]. This conceptualisation includes a distinct provider sphere,

a customer sphere and a joint sphere. In the provider sphere, processes and activities are performed by the organisation to create an engagement platform for the co-creation of value. In the customer sphere, the customer creates value-in-use independent of the provider and may also integrate with resources from other sources. The organisation can influence customer value creation efforts and act as a co-creator in the joint sphere [40]. The flow of the value process moves from the joint sphere to the citizen sphere.

The conceptual framework outlined in Fig. 1, which draws on the Grönroos and Voima model, captures the different issues that underpin a broadened view on co-production and nudging across the citizen journey. The framework consists of three parts: two areas that partially overlap (provider and citizen spheres) with a central area of intersection (joint sphere). The chart distinguishes between the context of interaction (e.g., ICT platform), represented by the grey circle, in which the provider and users may interact, the flows of communication (mono and bi-directional), represented by the three horizontal arrows, and the service lifecycle. The white dots orbiting the grey circle identify the touchpoints in which the interactions occur, meaning all those moments of learning that can translate into the acquisition of valuable knowledge for the provider. The triangles indicate the direction in which the information flows. The outer circle delineates the relevant activities in which the principle actors are, respectively, the provider and the user, with different levels of engagement (service concept, design, development, delivery, experience, post-experience assessment).
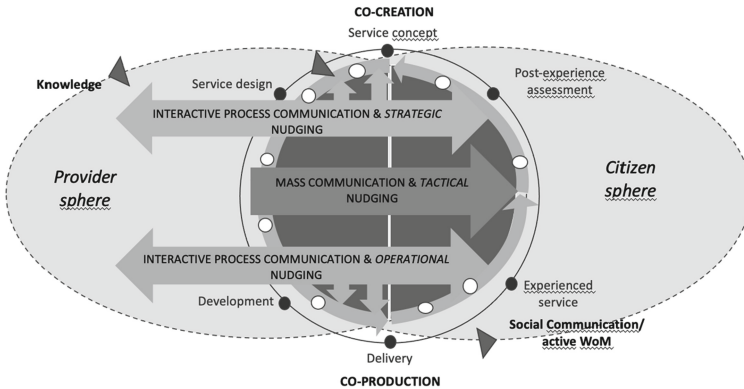

Fig. 1. A broadened view of co-production and nudging across citizen journey (adapted from: [13, 14: 286]

Citizens are directly involved in the service system as co-creators and co-producers. Encounters take place in an environment that is partly planned and controlled by the service provider. In the joint sphere, co-creation and co-production take place. The core of the process is the series of service encounters where the provider and the user, supported by digital and physical resources, "meet and interact" [13: 494]. These encounters influence user's value-creation [13: ibidem]. The social/Word of mouth (WoM) communication between citizens allows the recipients to exchange shared impressions about the service and, more generally, their consensus of the public provider. The social/Word of

mouth (WoM) communication is situated to the right of the chart (user sphere) because it takes outside the direct reach of the provider [13: 359].

Overall, the chart connects communication, nudging and co-production to the different phases of the service life cycle:

1. In the service design phase, in which prevails an interactive and bidirectional *process communication* aimed at co-creation, citizen engagement has a strategic nature (**strategic nudging**), insofar that it inspires the concept service/concept design. Importantly, the same kind of process communication also occurs in the final phase of post-experience assessment because it reflects the public provider's strategic need to be able to assess user satisfaction and thus consensus;

2. The development phase sees *mass communication* (one-directional and comparable to advertising) prevail. Here, the PSO works in isolation in the provider sphere. Mass communication is also important in the consumption/experience/assessment phase inasmuch that it helps to reassure the users of the choice they have made. The provider's use of nudging focuses on behavioural goals that are measurable in the short term (**tactical nudging**). The PSOs tend to outsource the management of tactical nudging to external communications agencies, whereas in the Concept and Design phases (point 1), nudging is itself embedded in the public actor's service culture;

3. The service delivery phase sees the return of *process communication.* However, unlike the first phase (point 1), process communication here is a necessary condition to operationally support the user once they have accepted the "promise" (offer) of those activities in which they are an active player (co-production) for what concerns the delivery and the actual 'consumption' of the experienced service. It is therefore always an interactive communication, a precious occasion in which the digital applications can extract information useful to the decision-making process. This type of nudging activity (**operational nudging**) should be handled by the provider's internal staff (not third-party suppliers) because the various forms of contact enable the acquisition of a growing understanding of the user's needs, values, intentions and habits.

7   Managerial Implications

Supporting citizen engagement in public services poses big challenges at an organisational level. For the behaviour change to be successful, process communication and mass communication both need to be properly planned and implemented. PSOs therefore must integrate multiple organisational functions, including information systems, service operations, human resources and even external partners, to create and deliver positive citizen experience.

The extent of these changes could be tremendous, especially where the capability gaps are remarkable, and the roots of the traditional bureaucratic paradigm (e.g., silo structures) are very deep. Consequently, the PSOs need much more than generic skills. For example, ICT skills *tout court* are not enough to manage digitally mediated co-production, such endeavours require project teams with inter-disciplinary skills (mirroring the big data analytical approach of the tech giants, which hire staff from social

sciences and humanities faculties). What makes the difference is to create digital channels in which the text, images and the structure of the apps facilitate participation, both on an emotional level (from 'I like it aesthetically' to 'it touches me emotionally') and on a cognitive level ('the site or the app is easy to use, and I understand what to click/fill in'). In other words, the PSO needs to simultaneously juggle several balls to create and exploit collaborative spaces; above all, it needs to apply the values and culture of service logic and lend an empathetic ear to the citizens and their needs.

8   Final Remarks and Contribution

It has been our goal to open up new debate on recent developments in public service strategies. In response to the question "*What role does ICT play in enabling the public action tools of co-production and nudging?*" we can say that nudging relies mainly on top-down logic designed by 'choice architects' [16], while co-production has a bottom-up logic and assumes that the public service provider is willing to permanently reconfigure its service offering. Co-production and nudging can operate independently or in combination with 'traditional' tools of government. ICT-based systems and platforms play a pivotal role in supporting and guiding relevant actors in their exchanges. Importantly, technologies act as generators of *actionable information* that PSOs can use for developing and adapting their service offering and for the measurement of outcomes.

The foregoing discussion also lends initial support for bridging co-production and nudging strategies, as suggested in recent studies [11: 10, 28], according to which 'hybridisation of nudge' can be a combination of the best features of reflexive strategies (like nudges) and reflective (or *think*) strategies. In this sense, the conceptual framework presented in Sect. 6 (Fig. 1) should be considered as an attempt to "connect the dots" and to start to understand in which way the two policy tools taken together could complement and refine the public service offering. Although, the policy context may be the factor that determines where one tool may be appropriate and not the other [11: 216–17].

From a conceptual standpoint, the paper has heuristic utility in that it recognises the differences between emergent forms of citizen engagement and thus can assist our understanding of the complexity of behavioural public policy in the digital era. The scheme contains significant departures from past research, not least the distinction between interactive process communication, mass communication and interactive process communication, and the distinction between strategic, tactical and operational nudging.

At a practical level, the framework helps to map the links between the contextual implications of blending co-production and nudging. Co-creation, co-production and nudging become blended whole and can become synergic within the life cycle of the relationship between the public service provider and the citizen. The service view looks beyond the instrumental role of ICTs to ensure continued citizen engagement across 'customer' journeys. However, there is no road map to citizen engagement in public services. Another key advantage of the framework is that is offers a practical tool for identifying and analysing the organisational and managerial capacities needed for PSOs to revise their traditional ideas of service design and operations.

As with any exploratory study, this paper raises even more questions than answers and comes with important limitations that we plan to redress in future research. First, we

acknowledge that our reading experience could have biased the analysis. Second, our framework addresses only a small number of complex issues related to citizen engagement. Third, the PSO perspective is skewed on the supply side. Finally, the application of service science principles in the conceptual framework needs to be empirically tested.

Our conclusion is that co-production and nudging are closer than they appear in the policy agenda. Therefore, we call on scholars to devote more resources to investigate this promising relationship.

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