AN APPROACH FOR RE-ENGINEERING THE TAXATION PROCESS TO SUPPORT PARTICIPATORY BUDGET ALLOCATION

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The project is co-funded by the European Social Fund and National Resources (EPEAEK II) PYTHAGORAS.

Abstract – The tax collection process has been described as a bureaucratic one, that confines citizen involvement to the role of passive fulfillment of administrative and financial obligations. Active citizen participation, in the form of some political say on the allocation of collected taxes which could potentially improve and further legitimize tax collection, is not a part of the traditional taxation model. In this paper we describe a new taxation model which, in the spirit of participatory budgeting approaches, supports active citizens' participation on decision making regarding tax funds allocation.

1. - Introduction

We are moving towards a globally formed information society, where easy access to knowledge is a one-way road towards social evolution. This cultural change has been acknowledged and supported by most governments in the E.U., who have initiated an effort towards providing all the necessary electronic means required for this transition. Citizens and customers can now conduct transactions (completely or partially, depending on the service sophistication level) electronically, without the need of physical presence. Although this effort

does in fact results to more efficient and convenient services, its potentials on the other hand are limited due to the "mossy" architectural "status quo" of client–server networks which is still used.

The current social and organizational model of government can be though of as a pyramid of authority. In this pyramid each layer is controlled by its upper level having a relationship which can only be described as a one-way unequal relationship, using principles similar to the Client-Server model for socio-technical systems. The limitations of such a system are many, in terms of performance and stability, and at the same time its philosophy does not facilitate participation and equitability, two fundamental principles of our next generation societies [1].

This paper describes a revised–extended version of the Peered Taxation Model [1], the development of which aims to transform the current client-server taxation scheme into a participative one, by adopting the P2P theory, were tax payers no longer assume a passive tax paying position, but become active peers, sensibly involved on the decision making process.

2. - P2P taxation model

Peer-to-Peer networks, contrary to the client–server ones, follow a de-centralized approach towards ad hoc network management, using end-to-end communication with shared ownership, offering stability and scalability.

From a socio-technical standpoint, the P2P architecture can be described as the extension of the Marxian ideology on today's human networks [2], technology-based or not. Concisely speaking the term "P2P network" refers to networks where its participants can be described as equivalent. In such a network every participant can operate both as a client and a server, in order to serve the common goals, forming bidirectional relationships.

However from our point of view, the most important attribute of the P2P model is participation. It transforms simple peers (clients) into active members of the system, involved both in system's operation and system's strategy planning. It uses altruistic principles, compatible to the spirit and philosophy of ideal societies: "Everyone is equal and has the same abilities and liabilities" – "A world where every citizen is an active member of a social network". Lastly, its socio-technical architecture creates enriched social capital between the peer nodes due to mesh-like bidirectional relationships.

Although this newly defined model is described as P2P, the focus of our work was not to create a pure P2P model, whose members are fully equivalent, but to adopt certain P2P principles on the current client-server model. We have used the same structure as the one used on the pre-existing taxation scheme, but we have re-allocated the responsibilities and capabilities of the four participants.

The notion of a peered budgeting system is not new. It has been described [3] as a "Participatory Budgeting" system, "a mechanism which brings communities closer to the decision-making process around the public budget". Existing PB approaches can be thought of as "a flexible set of community engagement techniques, adaptable to local circumstances, sharing a common principle: power lies with those who decide how new money is to be spent". Although some would characterize such an approach towards fund management as "unrealistic", PB has been successfully practiced in a number of local communities (first used in 1989 in the municipality of Porto Alegre [3]) as a means to help poorer citizens and

neighborhoods receive greater levels of public spending. Today it has been adopted by 300 local authorities around the world, involving more than 12 million people [4]. It manages to play a key role in engaging citizens and transforming them into active social participants (Bradford case [5]). The success of PB initiatives on a local level was the main motive for initiating an effort to design a PB taxation scheme, operating on a national level.

2.1 - Model's Participants

The aim of this effort is not to "void" the existing taxation model but to introduce tax payers' participation on decision making. The number and categories of the participants, as defined on the current taxation model [1], will remain unchanged. However their responsibilities will be reallocated, aiming to "share" authority in a more democratic manner. The peer taxation stakeholders are thus the *tax payers*, the *central authority* and the *revenue service*, whose proposed roles and interaction are illustrated in figure 1 and described in detail in the following paragraphs. The architecture of figure 1 includes also a newly introduced entity, namely the *e-service*, which offers the necessary infrastructure (mechanisms, tools and policies) for the operation of the peered taxation model.

Tax payers: Their primary responsibility will still be tax payment, however now they will have the ability to denote the domains (e.g. public agencies, institutions, projects, etc.) to which their taxes should be allocated. In order to facilitate the taxpayers' decision process on their tax allocation, access to detailed information concerning past performance of different funding domains, as well as their future plans will be made available to tax payers from the funding domains catalogue. During the decision process, tax payers may additionally involve themselves into communication and knowledge exchange with other taxpayers, exploiting tools provided by the Revenue Services and mostly by the E-service. This communication may serve multiple goals: taxpayers will communicate with each other with the objective of making informed individual decisions about how to allocate their tax contributions at different public domains, taking into account other taxpayers' views; this could in fact be a single- or multiple-round process, depending on taxpayers' interest; or they be engaged in a discussion among peers so that some uniform decisions about the allocation of tax contributions could be reached and proposed to all participants for their voluntary compliance. As an output of the decision process, each tax payer returns to the revenue service the *evaluated domain catalogue*, which comprises of *(domain, percentage)* pairs indicating the portion of the total funding that the tax payer wishes to be directed to the specific domain.

E-service: the e-service will operate as a true revenue service. It will also take advantage of the communication capabilities offered by the Internet, in the form of forums, direct chat and e-mail between different taxpayers and revenue services. Information concerning projects will be made available through the e-service.

Central authority: The central authority is still responsible for the settlement of the revenue services and the collection of the tax funds. One additional task is assigned to it, that of the generation of the funding domains catalogue. The allocation of the tax funds is still a responsibility of the central authority; however this responsibility is directly affected by the taxpayers' demands as expressed by a *consolidated domain evaluation catalogue*, synthesized from the evaluated domain catalogues submitted by the tax payers.

Revenue services: The revenue services continue to operate as a link between central authorities and taxpayers, being also responsible for forwarding the domain catalogue from the

central authority to the tax payers and the evaluated domain lists to the opposite direction. Moreover the revenue services will operate as a communication path between tax payers and an information center, parallel to the e-service.

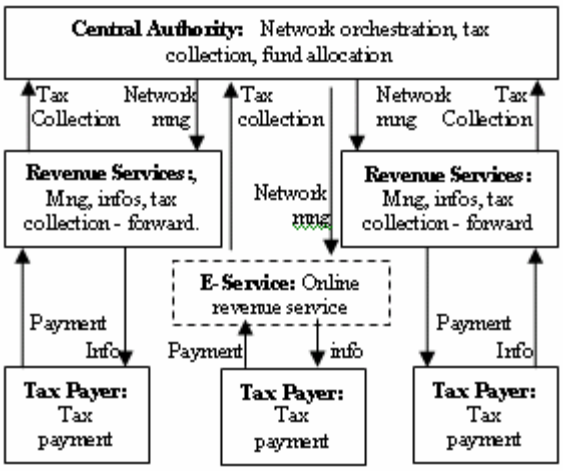

Figure 1. Current Taxation Scheme

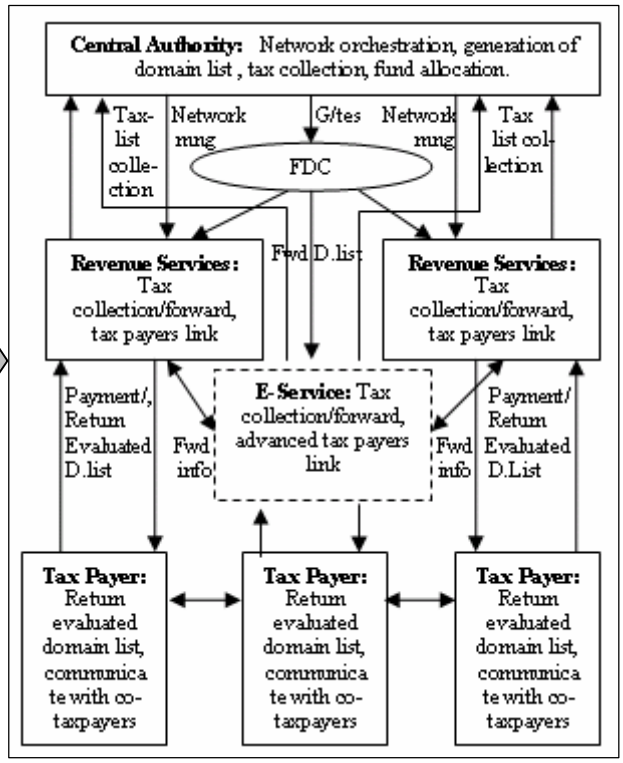

Figure 2. Peered Taxation Scheme

2.2 - Funding Domains Catalogue

The proposed system includes a new entity, namely the "funding domains catalogue" (FDC), a term used to describe the list of available public entities (public agencies, institutions, projects, initiatives) that can be chosen for funding by taxpayers. This list is generated by the higher authority in coaction with each domain. Its validity will be audited by an external authority, to be then evaluated by taxpayers, and returned to the central authority. The domain list structure consists of two basic sections per domain: its past/undergoing works and its future works:

Past/Undergoing works: This includes a description of the domains' past and undergoing projects and their achievements. This information will allow tax payers to evaluate domains' past performance.

Future works: This section contains a description of the domains' future plans, providing thus information that will enable tax payers to evaluate domains' vision.

In more detail, for each domain the following information could be submitted for every project: Project name / ID (unique information for the project); description (a brief project description including project objectives, deliverables, workplan etc); duration; required funding per year; E.U. participation (percentage of E.U. funding, if any); budget plan (includes required levels of annual funding, external subsidies and private funds vs. public participation, etc.); sponsor ("contractor/s" responsible for project completion); other domains involved; and additional information (e.g. website, executive documentation, contact details and so forth). The

information provided by the FDC (Figure 2) will be brief in nature; however it can be supplemented by additional data. Tax payers will be able to receive detailed information for any project or for some domain in general, from the external sources referenced as well as by contacting the sponsors themselves.

Domain List								
	Health Care							
	Projects name / ID	Description	Duration	Funding/year	E.U part	Sponsor	Other Domains	Additional Information
Undergoing works	1. Research on	Funding for Onasio's	Uncertain	4.000.000	None	Onasio	None	www: www.onasio.gr/research/cancer
	lung cancer	Hospital research						phone: 210 6463231/fax: 210 6439363
		on lung cancer						P.A: Ydras 2, Athens, Attiki, 13212
	2. Construction of	Construction of	Finished	9.000.000 €	20%	J.B	Minenv	www: www.onasio.gr/research/cancer
	Rafinas General	general hospital for						phone: 210 6463231/fax: 210 6439363
	Hospital	the Mesogeia region						P.A: Ydras 2, Athens, Attiki, 13212
	Projects name / ID	Description	Duration	Funding/year	E.U part	Sponsor	Other Domains	Additional Information
Future works	1.Establishment of	Establishment of che-	May 2007	4.000.000 €	40%	A.K.P	none	www: www.hlt.gr/projects/expansion
	chemothe rapy	motherapy clinics in	to					phone:210 6182312/ fax 210 6153423
	clinics	50% of Attica Hospitals	Jun 2011					P.A: Ioniou 13, Marousi, Attiki, 16821

Figure 3. Funding domains catalogue (based on fictional data)

2.3 - Tax-payers communication

An important part of this model is the facilities that will host citizen-to-citizen (C2C) communication. C2C communication could become a valuable tool that will operate not only as a mean of knowledge sharing, but also as the basic infrastructure towards public awareness and social participation. Proper implementation is essential to avoid phenomena of extreme localization (e.g. FDC decision based on tax payers' personal-local interest, ignoring greater needs). As already described C2C communication will be facilitated via traditional and electronic means. Revenue services will operate as an intermediation hub allowing the creation of "virtual" citizen communities. Forums will become the means were citizens and domain representatives could engage in discussions and debates. Citizens will have the opportunity to express their ideas and receive feedback from others citizens. Ideas receiving positive feedback may be submitted to the proper domains introducing additional Citizen to Domain (C2D) communication paths. It should be noted that this form of citizen expression can be achieved through a number of e-deliberation methods, including consultations, surveys and polls, petitions as well as voting initiatives. Although similar work has been made (e.g. "DanmarksDebatten – citizen participation in public debate" in Denmark [6] and "Direct democracy portal – Today I decide" in Estonia [7]), extending "traditional" citizen participation paradigms to taxation could bring great value.

Although, as mentioned, tax payers' communication will be supported by the Revenue Services too; the e-service and electronic means in general will be the main medium for information sharing and communication. This introduces one additional element in societies' priorities list, which is the e-education of citizens. The creation of such an edge-based funding system requires adequate e-experience by the citizens, to fully access and use such resources. In this case, the term e-experience refers not only on having the required knowledge for using electronic services, but also on having the mentality to trust and adopt them to their every day needs. This brings out once more the need for (a) adequate e-education for the citizens and (b)

appropriate software design, in order to sufficiently couple citizens' conceptual model with e-services, offering at the same time an acceptable level of security and privacy.

The nature of this citizen-to-citizen communication would be that of an informed process for opinion-formation at the personal level, and potentially consensus-building at the level of groups. In the first case, citizens may act on an individual basis to acquire information and express their views. In the second case citizens may be organized into discussion groups, concerning the allocation of tax contributions, based on geographical (e.g. town of residence), tax allocation-related (e.g. funding domain) or personal criteria, aiming to reach and propose, as a group, a certain tax allocation scheme. The e-portal will be the center of both efforts, as most tasks will be partly or fully e-based:

- ***Citizen groups meetings*:** The "real life" meetings between group members comprise a very important part of this effort. Those meetings will be announced online in a systematic and reliable way; this announcement will include information about the time, place, agenda, members' participation and topic. The aim of those meetings will not only be to discuss certain topics, but also to motivate citizens on participating on the tax allocation procedure.

- ***e-Participation:*** Citizens will be able to actively use comment forms and online surveys to express their views. These ideas will be evaluated through expert reviews and public discussions, and voted using an e-voting system; ideas that are found to be highly accepted could be forwarded to the proper domain. In addition to that, although electronic forums will be also used as one of the primary means of participation, it will operate also as a citizen bonding tool, attracting and encouraging people to participate.

- ***In-person communication:*** Having been perceived as an impersonal and "cold" means of communication, the exclusive use of the Internet could discourage a certain category of citizens from participating. In-person communication could be supplementary used to attract this category of citizens. Contrary to typical citizen meetings, in-person communication could also bring great value by enabling citizens to participate on their own time, offering greater diversity of opinions, perspectives and geography.

- **E-mail communication:** The two-way nature of the Internet will be embraced by providing full support (citizen e-mail directory organized via various criteria) for direct e-mail communication. At the same time e-mail communication will create direct links with the different domains, enabling citizens' access to automated information notices based on citizen preference and direct communication with domains representatives.

It should be noted that C2C communication targeted towards uniformity of opinions could potentially build on a number of existing techniques for group consensus-building. Methods such as Delphi and especially the Policy Delphi variation [8], as well as other techniques such as the Nominal Group Technique [9] can be investigated as possible solutions in this context.

Apart from the "two way" core communication facilities and services that will be furnished by the e-portal and the funding domains catalogue, information services will become easily accessible to the tax payers. The e-portal and the FDC will provide detailed information about all the projects submitted by the different domains. In this "one way" communication procedure, tax payers will be able to receive instant access to detailed and accurate information

on certain projects. This information will have the same structure as the one used on the FDC, but each section will be analyzed in more detail.

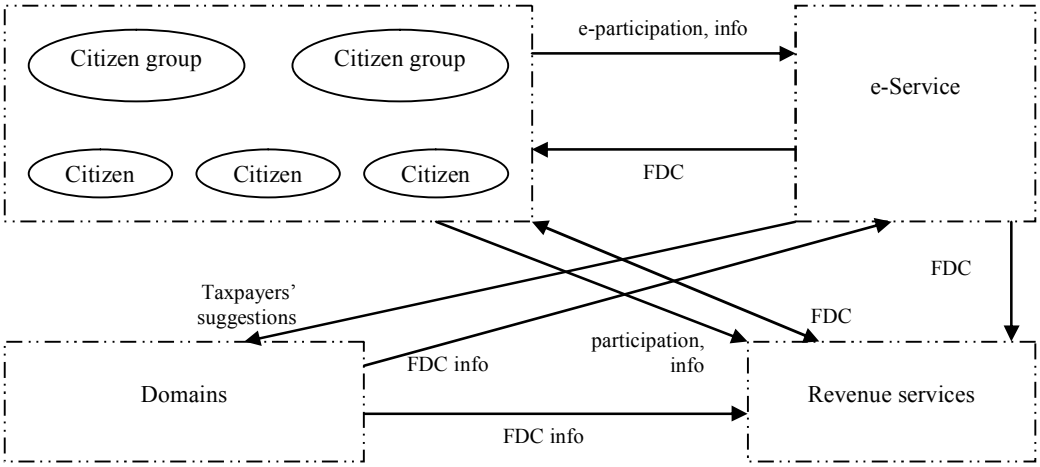

Figure 4. Tax payers' communication

Although the phrase "Citizens' communication" refers mainly to C2C e-transactions, in many cases officials' participation will take place, either as domains' representatives or "joiners". The e-portal, as mentioned will introduce an additional C2D communication channel, using the services described: officials' participation in citizen groups meetings, in-person and mail communication. In addition to that, officials' involvement will take place, especially in the systems early stages of operation, to organize and encourage citizens to participate. Therefore the need for proper e-education of selected officials on the use of the Internet, and especially on the use of the tools employed in the context of C2C and C2D communication, combined with advanced organizational skills significantly increases.

2.4 Types of Services

In order to facilitate citizen participation, Participatory Budgeting approaches commonly provide services such as [4] **city-wide forums** to involve local communities in discussion of thematic issues, strategic priorities and targets, and the evaluation and monitoring of ongoing activity; a **clearly set out annual cycle of dialogue and decision making**, which provides a framework for improving community engagement and building local networks; a **network of support aggencies** to circulate information and facilitate engagment; **budget literacy workshops**, giving people the information and confidence they need in order to engage meaningfully with public budgets; and **budget tables** which combine local and statutory priorities into one comprehensive investment plant to inform spending across a city or regeneration area.

The service offerings of the P2P taxation architecture will be based on a similar scheme. The transactional services already provided by the current taxation model, (such as electronic submission of tax return forms or VAT documents, electronic payments, etc), will remain unchanged: citizens will continue to pay their taxes on the revenue service or the e-service. However, now citizens will receive a more active position in the taxation "algorithm". They will have the ability to "influence" the tax fund allocation procedure by forwarding their feedback as well as their money. At the same time the required facilities towards deliberation

will be made available, increasing the efficiency of tax information delivery and at the same time encouraging C2C, and C2D to a lesser extend, communication. Taking these into account, the following types of services will be provided:

- **Informational services**: A category of services that already exists, providing personalized information to the tax payers. This information is to be extended in a supportive manner to the current scheme, including domains FDC information, financial and work data, but also "tax payers' community" data.

- **Transactional services**: This category includes pre-existing transactional services (tax payment), but also FDC related procedures.

- **Communicational services**: The majority of the communication services will be e-based, including e-voting procedures and e-forums. Conventional communicational services will also exist in the form of discussion groups, in person events, etc.

Additionally, these categories may be further subdivided to **C2C-oriented services**, i.e. informational and transactional services focused on citizens' communication, and **tax-oriented services,** i.e. informational and transactional services focused on the core tax payment process.

3. - P2P taxation scheme evaluation

The changes made to the existing model constitute an attempt to re-allocate in a more democratic manner the responsibilities among the members of the taxation network. Still the central authority is the root of the network, but on the other hand the taxpayers assume a more active position in the scheme. Such a meritocratic approach to tax allocation could affect positively the performance level of different domains. Funding assumes a "merit-based" dimension, and will only take place if past performance exceeds a certain threshold, as this is assessed by citizens. Therefore fundees will constantly try to improve themselves in order to convince citizens for the importance of their work, which can potentially lead to less corruption, better performance and funding efficiency. It should be noted, however, that this merit system may not be well-suited as the unique decision criterion in certain cases. Those cases involve services and domains whose deeds are not directly viewed by citizens (e.g. army, infrastructure work, etc) and in domains where maintenance funds are necessary (e.g. hospital maintenance on the health care domain). In such cases a basic level of funding could be applied, covering all the indispensable expenses, while any additional funding could be based on the taxpayers' evaluation.

Thereinafter, this philosophy in fund management and allocation could affect tax payers attitude causing the "Tragedy of Commons" effect, a conflict for resources between individuals interest [10]. Although the very nature of such a scheme differs in many ways from the one used in traditional commons, a similar effect could be expected. In the greensward paradigm, the one most commonly used to describe the Commons Tragedy phenomenon, where each herder anticipated his flock expansion being indifferent to the effect to be caused on the greensward in total, intending to maximize his own profit. In the peered taxation scheme, a "mutation" of the Commons Tragedy could be presented in the form of tax payers only being interested on funding domains and projects based on their own subjective needs. This would "crash" the basis of this effort, shifting from a valuable means of evaluation and planning, to a simple tax payers' census tool that risks to reproduce existing conflicts of priorities that

tantalize the current political agenda. A sense of responsible citizenship on behalf of the tax payers, alongside a minimum level of political consensus, are both essential factors for brushing aside personal interest for what is conceived as the public good.

4. - Conclusions and directions of future work

This work is part of a broader effort to investigate the migration of service infrastructures into the Peer-to-Peer paradigm. From a theoretical point of view, the P2P movement can be viewed as something more than a simple network architecture, but in fact as a philosophy. It can be described as a self-giving philosophy that allows every peer to equally participate, operating towards common good. Such an approach to social culture is the very essence of pure democracy and is a one-way road towards future societies. It encourages public learning, active citizenship/participation as well as an improved sense of social justice.

On the other hand, a number of limitations may affect the impact of this approach. First of all, the diversity and complexity of different taxation and budget decision systems at the local, regional and national level implies that porting of this approach to anyone of these settings, requires a prior study of political, legal as well as cultural factors that may affect its applicability. What is more, the large scale of application is always a factor introducing additional technical and operational complexities. In this respect, and although the underlying principles of the model remain the same, its application should preferably be guided by the often-cited "think big-start small" principle; pilot deployments can be planned within smaller and thus more homogeneous and manageable settings, such as at the municipality level, or even at intra-organizational contexts; take for example, the case of university students deliberating over how there fees should be re-invested to academic infrastructures.

Secondly, citizens may "fail to make the leap from the lack of basic infrastructure to the broader socioeconomic forces that shape their lives" [11]. They may not use it for long-term planning, being mainly interested in securing short to medium term works. In addition to that, a PB approach to taxation may become subject to manipulation by certain individuals in order to advance their own agendas. Thirdly, the e-nature of this approach combined with the limited number of citizens with Internet access, gives to this approach more the character of a complementary channel for discussing participatory budgeting, being mainly available to "e-citizens". This is why, at least at this point, the results from such an approach could not be considered as binding for the budget allocation process, but more as an additional feedback to be taken into account, together with a number of other factors, by the authority making the final budget decisions. As a result, the discussion and voting processes mentioned in the description of the model should not be interpreted as steps of a legally binding procedure, but rather as tools for arriving at a synthesis of views. What is more, the objective of an effective synthesis of views entails a number of additional issues, both at the process level (establishment of consensus-building processes) as well as at the level of technology (techniques for near duplicate identification, text summarization and the like that may need to be applied to the transcripts of e-dialogues).

Guided by these needs, the research will continue to explore new ways towards citizen participation. Currently our focus is on the adjustment of the P2P taxation model to today's needs and on the formulation of the funding domains catalogue. The granularity of the FDC, meaning whether or not tax payers should be able to opt for funding of entire domains or specific projects, is a matter of further investigation. A coarse-grain structure of the FDC list is

still under consideration, "streamlining" a structure using social criteria from every day life, including education, health, public works, etc. Moreover our next steps include fully defining the relationship between the elements of the model, focusing on the taxpayer-to-taxpayer link, and designing an e-service that will successfully support the requirements, in terms of communication, knowledge exchange and transactions, of this taxation model. With reference to the possibilities of enhancing this communication with specific methods (Delphi, NGT et al) that facilitate uniformity of opinions, the rich literature on the workflows and problems of consensus building (e.g. [12]) provides a very interesting direction of further research. We intent to examine ways to ascend potential issues that might occur, including a free-riding behavior [13], [14] by the taxpayers towards tax allocation, the Tragedy of the Commons effect and also any potential tax payers' privacy issues.

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