

The Future of Information Systems  
***Democracy of Things (DoT) Vol. 3:***  
***The Future of Online Gaming as a Civic Service***

Computer Science 601: Survey of Computing and Information Systems (Rev 4)

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**Abstract:** Online games and digital open worlds have become today's democracy. Plain and simple. Your chances of engaging any citizen out there are better in the context of a virtual or digital reality. There are leading-edge case studies and examples of online digital game platforms such as Minecraft being leveraged for urban planning and smart city development by progressive civic organizations, and it's about time that all civic entities take note. This research paper challenges and posits that this is a viable form of citizen engagement that should be explored while the time is right as civic digital transformation initiatives are becoming the norm, ensuring that innovative opportunities such as these are heard, discussed, explored and become part of underlying framework of a civic organizations operation is its underlying purpose, to plant that seed. This is the third volume in The Democracy of Things series, an attempt to better understand the evolution and progression of today's cybernetics in the context of everything digital.

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## Introduction

Ask a kid what game they're playing today, and you'll probably hear Minecraft. Online Gaming has become an essential form of entertainment today. Open world games and Massive Multiplayer Online Role-Playing Games such as Minecraft are a progressive example of where things have come, gone and come back again with gaming. Minecraft is all about building and exploring worlds made of simple blocks, it is a digital version of Lego built in Java and it looks and feels like an 80s Atari game at first glance. Put it into the right hands, and magic results. To get a hands-on sense in less than a minute of the kind of magic we're talking about, before stepping into this paper, step into YouTube, search for Official Minecraft Trailer, watch it, listen to it, it'll only take a minute. If you're online, click through [here](#). [13]

These gaming platforms have evolved into real examples of digital citizen collaboration and engagement, all age groups considered. AI has become an integral part of these new games, especially open worlds, emulating real cities, in fact, emulating democracy, block for block.

Civic entities are investing tons of dollars on complex multicomponent solutions to drive citizen engagement, encourage social innovation and manage open data. This research paper, Vol 3 of a series on progressive cybernetics, or the "Democracy of Things(DoT)" posits that gaming platforms have the potential to become an effective component of a progressive cybernetics eco-system by speculating on how gaming can integrate with the internal elements of a civic organization's eco-system or operations.

## History

### Serious Games

Game industry has become a part of our lives, while it continues to be a growing beast, its role and potential in shaping actual society is relatively untapped. Business in general is starting to engage the gaming industry as a creative force, with primary applications in the area of learning and development. [1]

Serious games have mainly been pedagogical in nature, training, education in a wide array of industries including government, military and defence, health care and more, mainly focused on training, teaching and informing. [1]

Serious games are story driven and while they contain elements of simulation, their outcomes are essentially actual story objects or variants of context and are more geared towards emulation vs. simulation. Serious games encourage cognitive skills development in the context of subject areas, including "analytic and spatial skills, strategic skills and insight, learning and recollection capabilities, psychomotor skills, and visual selective attention". [1]

While the focus of this context may be digital games, it is important to emphasize that the connotation of virtual supersedes digital, virtual in this context is representative of the underlying ideas, imagination and art of storytelling that makes up the story objects or data that is represented digitally. While a digital world may facilitate and augment human perception of any given situation, expected outcomes are never steadfast in any virtual environment, whether digital or that of our imagination, the choices and challenges players are faced with are not part of the digital world, they are story objects and a result of human reasoning. "Yet the virtual is not a product of the digital world alone but virtual artefacts have been used ever since perception and consciousness emerged in life." [1]

## Massive Multiplayer Online Role-Playing Game (MMORPG)

The seeds of serious gaming is evident in MMORPGs or Massive Multiplayer Online Role-Playing Games, which are rooted in their “pen and paper” role-playing predecessors, reinforcing the notion that virtual is by no means synonymous to digital in this discussions context. Rather, technology advancements have made it possible for these games and their communities virtual reality to be rendered and experienced digitally. MMORPG communities have achieved the development of complete virtual societies, with their own “social conventions and ettiques, economic models and even shared community values...new worlds with its own structures and expectations – complete with a unique culture.” [2]

## Open World Games

Open world gaming has been around for a while, specifically as early as Colossal Cave Adventure in 1976, which in essence attempts to eliminate the feeling of the constraints posed by a procedural gaming experience, specifically, don't box the player in and rather create a sense of exploration and discovery driven by a symbolic storyline. [3]

The earliest example of building economies in games comes from as far back as 1968's “The Sumer Game”, where the goal was to “grow your economy so that your city could expand and support a larger population.” The concept developed into what has probably become the most recognized series of city building games, the infamous SimCity. Over the years, SimCity has evolved into a comprehensive digital game, where players are provided with the means to develop urban areas, their infrastructure and economies from scratch. SimCity has experienced the development stages of most digital games to date, growing from a simple simulation platform into a full-fledged multiplayer laden collaborative platform, beautiful and elegant in its presentation and exhaustively realistic in its implementation and capability to surpass simulation and espouse emulation. [4] [5]

The most recent entry into the open world gaming foray is Minecraft, a phenomenon in its own right that has taken the gaming world by storm, where its simplicity in implementation compared to its competition, has facilitated its ascension as a platform that combines the elements of serious games, MMORPGs and open world games into one cohesive information system implementation and much more. [3]

## Research, speculation and developments

The ideas and opportunities posed by smart cities are semantically married to the notion of creating new worlds tethered to traditional economics. All of the makings of civic citizen engagement are by no means new is the virtual worlds of MMORPGs “in which ‘players’ reliance on others gives rise to robust communities, ones in which players transact their relationships through their virtual characters – not only on the game itself – but also through [digital means such as] instant messaging, web forums, email and voice -over IP networks.” [2] It can be inferred that civic entities such as municipalities, are playing catch up in an effort to implement ICT frameworks that clearly emulate the semantics of such games.

Ubisoft's recent Watchdogs (including 2) core game concept revolves around smart city technology concepts, and in game like fashion, the notion of hacking the open world, “The fantasy of controlling an entire city came first. Everything else followed logically.” [6] Ubisoft's “Disrupt” game engine was specifically designed to create a dynamic, life like rendition of a city “that reacts to the players and their actions”, extending multiplayer capabilities to real world companion apps that can be downloaded onto mobile phones, providing gamers with real time multiplayer collaboration capabilities, where the concept of offline starts to slowly fade away, emulating a future that is presently becoming an online reality in the age of the smart city. [7]

Of late, open world gaming has progressively evolved, arguably influenced by the storytelling mechanics of role playing games into “city- or state-scaled” labyrinth like sandboxes. The current state of technology has afforded game producers the ability to emulate fairly complete and beautiful replicas of real cities, such as GTA IV’s rendition of New York, GTA V’s rendition of Los Angeles, Watchdogs rendition of Chicago. The worlds are not only structurally and visually complete, a tremendous amount of Artificial intelligence is blended into the production, emulating real life kinetics for the immersed player; that includes a host of entities from people, to animals, to vehicles, to all sorts. The truth is, if you can think about it, it’s probably been emulated inside of a game production today, even more true, the player or citizen of the subculture can create it. [3] This is partly due to amazing innovations in the gaming space that afford gamers creationist abilities. In SecondLife, a leading open world MMORPG, provides fans with extensive mod capabilities and mechanisms to create their own rendition of 3D landscapes, digitally complementing virtual subcultures [2], in effect bridging the virtual and digital divide. Minecraft’s creation mode and its mod capabilities is another more accessible example of an open-ended gaming platform suited for the creationists and crafters at heart that is introducing a younger generation to this genre of gaming. The mind-boggling simplicity of engineering and interacting in worlds developed by something as simple as blocks is ingeniously becoming a next gen tool for urban development and planning, including smart cities.

*“In its procedurally generated worlds, there could be anything waiting just over the horizon or buried deep beneath your feet, and you could make anything you dream of, if only you have the patience to see it through...you could create or join a multiplayer server and get to it – depending on the server, you could fight, chat, collaborate, annoy, compete, and troll other people to your heart’s content.” [3]*

In actuality, Minecraft has already been applied by civic entities in the realm of urban planning and development. With engaging youth in civic processes as a core objective, the Geocraft initiative out of the Netherlands is an example of a successful experiment to replicate the real world virtually via Minecraft as a means of to “visualize future developments and their implications, providing relevant information during design processes.” The initiative proves that Spatial Data Infrastructure can be translated and consumed by the Minecraft platform to visually represent a real-world space for consumption by the citizen, it posits and positions to prove that not only structural entities can be represented within Minecraft, but actual Internet of Things infrastructure (i.e. sensors) can all be folded into a complete and dynamic package of accessible and meaningful (open) data. [8]

*“Potentially, all geospatial data of a specific geographical area can be added, including real-time sensor information from the Internet of Things. We can visualise data from different sources superimposed on each other. Not only concrete structures can be depicted, but also features like the amount of air pollution, traffic capacity, noise disturbance, energy labels, energy use and supply, flood risk, etc. The results of impact models can be superimposed on topographical data, 2D data can be combined with 3D data, etc. This results in an inventive representation of the city, visualizing the specific aspects of the city you want to analyse or display.” [8]*

## Discussion: The Future of Online Gaming as a Civic Service

### Social Innovation

Budget Hero, published and administered by the American Public Media, educates citizen players by immersing them in fiscal decision-making activities by “controlling the expenses and revenues of the federal government in relation” to the impact that time has on economic indicators such as deficit/surplus ratio, size of government, and budget bust year and debt % of GDP ration.” This is a fairly simple example of how gaming can be used for social innovation. [1]

As described in DoT Vol 2., the technology and infrastructure that is being imminently applied by civic entities to drive citizen engagement in a wide array of mixed and matched technologies or methods, including social networking platforms, crowdsourcing methods et al. all as a means of encouraging citizen engagement, especially in the space of contributions to social innovation as a means of innovating solutions for budding smart cities. The aforementioned examples of gaming platforms as information systems are clear examples of comprehensive all in one solutions that clearly combine all the aspired elements and functions of the information systems solutions that civic entities are working hard to build and implement.

With technology accessibility issues being at the forefront of this context today, it can be assumed that in real life, there are probably more users of platforms such as SecondLife and Minecraft combined than that of any engaged users of current state civic citizen engagement platforms. At the very least, one could consider the relative investment of creating a civic online presence via SecondLife or Minecraft is going to be much less than that of developing proprietary information systems for citizen engagement.

Think about it innovatively for a moment. With accessibility still an issue, have and have nots is not just a matter of having access to the technology and ICT infrastructure, its becoming a question of having the knowledge to use and apply the tools in context. [1] What that means is that users that opt in to use the engagement platforms being developed by a city are up against a learning curve each and every time, that includes learning about a new mobile app, interactive web site, etc. Platforms such as SecondLife or Minecraft offer a streamlined and consistent portal for engagement, the rules of engagement or use are consistent, you learn how to navigate and interact with an unlimited realm of possibilities once and for life. Advancement in mobile technologies clearly make such platforms accessible while on the go, effectively addressing what can be a real problem of socially isolating oneself in a closed environment (in a room, behind a computer) to access these virtual worlds or what is slowly becoming virtual representations of our world. Another successful example of the use of Minecraft for urban development is UN-Habitat's Block-by-Block program, which provides an end to end 20 step manual handbook on the process of going about it, see Figure 1 below for an outline of the methodology straight from the handbook. [9]

**Summary of method**

1. Based on images, plans, Google Maps and other available materials, a Minecraft model is produced by UN-Habitat's Minecraft consultants.
2. UN-Habitat arranges for a Minecraft expert to provide Minecraft training and support.
3. Project staff, with the support of the Minecraft expert, hold workshops with community participants, project staff and partners in order to:
  - Train participants in the basics of Minecraft modelling
  - Facilitate a dialogue on issues regarding the space
  - Produce Minecraft models incorporating the proposed design ideas
  - Collate the ideas that are included in the models
4. The participants are divided into groups of 2-4 people, with one computer provided for each group.
5. The workshops need to provide sufficient time for participants to develop their ideas in Minecraft. Depending on the level of prior IT and Minecraft knowledge, two to four days is recommended.
6. Project staff facilitates a final workshop where the refined models are shown to stakeholders to generate discussion.
7. The Minecraft proposals feed into the professional design work.

Figure 1 – Methodology for using Minecraft for community participation [9]

### Big Data, Measurement, Delivery, Standards and Process Improvement

With the open data paradigm at the forefront of big data opportunities for civic entities, the problem of making a wealth of continuously created data meaningful for use by civic entities can benefit from the learnings of the applied use of gaming in the civic context thus far. As noted by the Geocraft example, the methods to translate data into consumable information is definitely accessible and possible, even though it does require some investment to setup, real consideration needs to be put into maintenance of such a data framework, especially for a national effort such as a virtual representation of an entire country. Maintenance in this context does not only mean keeping the lights on, it also means ensuring that data objects are transformed and maintained as story objects, which require meta-data characteristics and properties to be carefully designed and documented to be fit for purpose, which in this context means emulating (or simulating) the “real world and [to] raise real strategies and solutions for real problems” that civic incubators and accelerators can bank on as an input to civic innovation methods such as hackathons. [8] Considerations also need to include that once the data makes it in to such a platform, refinements that occur as a result of exposure to the open world need to be iteratively considered and accounted for in any of the data baselines they originated from; it is within these variances that much value is expected to be harvested from. Ensuring that the data remains relevant to both the civic entity and needs of the engaged citizen is absolutely key. Part of measurement should ensure or at the very least document the level of utilization of interfacing (or use) the data has resulted in, ensuring as much as possible that the data that’s is being processed and made available within such a platform (open world) results in some return on investment for all parties involved. It is also important to recognize that proper open data management has the potential to identify gaps in data sets and that the platforms or activities the data is used in are positioned to reciprocally support bridging those gaps. [10]

*“Ideally, the emergent need for specific datasets, not yet in the public domain, which would enable the proper functioning or performance of the applications under development, should affect data owners in such a way to promote faster, and more effective, policies and practices of public sector information disclosure.” [10]*

Assuming that making data more accessible is a key goal for the open data paradigm, careful consideration is required in designing big data solutions, specifically in making data consumable and accessible for the purposes of integration and interfacing. The specific case studies described here in such as Geocraft [8] or UN-Habitat [9] provide solid examples to spring from, efficiently and effectively, without having to be a gaming company. In addition, a case study about the city of Catania’s experience with the process of producing linked data for smart cities provides some important principles, practices and guidelines, especially when considering the problem posed by heterogeneity of data in the context of what has been discussed so far. The following points are important considerations:

- *“The heterogeneity problem has to be tackled at different levels. On the one hand, syntactic interoperability is needed to unify the format of knowledge sources enabling, e.g., distributed query. Syntactic interoperability can be achieved by conforming to universal knowledge representation languages and by adopting standards practices.” [11]*
- *“On the other hand, semantic interoperability is also needed. Semantic interoperability can be achieved by adopting a uniform data representation and formalizing all concepts into a holistic data model (conceptual interoperability).” [11]*
- *“The whole process followed the good practices of formal representation and naming in use in the domain of the Semantic Web and Linked Open Data. In particular the guidelines of the W3C Organization Ontology for generating, publishing and consuming Linked Open Data for organizational structures have been ensued.” [11]*



A deep delve into the Geocraft [8] and Producing Linked Data for Smart Cities: the case of Catania [11] case studies are highly recommended for a deeper understanding of what is involved to technically (and properly) integrate data with gaming platforms such as Minecraft.

## Conclusion

Online gaming and open worlds have evolved into self-sustainable entities. Without a doubt citizen of all ages are probably more engaged with this form of entertainment than they are with politics, this is inevitable given that such games appeal to young adults and these are endearing target for civic organizations, after all they are the future. Civic organizations such as municipalities have embarked on the monumental task of digital transformation and recreating themselves to be digital friendly in this digital era, where everything is digital digital digital. Digital is clearly becoming the means for access to the citizen. Digital open worlds are tested examples of virtual democracy. Millions of people emulate real world semantics in vast online worlds, their own democracy, their own terms. Civic organizations are starting to take notice, we're seeing examples of these digital worlds being tapped into and we're seeing it happen repeatedly and being formalized by the likes of organization's such as the United Nations. There is absolutely no question that gaming platforms information systems have evolved into assets that civic organizations can only dream of, full on open worlds, artificial intelligence and machine learning, it's all been done full blast inside of these games. 99% of this paper's content ascribes for how civic entities can potentially integrate open data with these platforms by presenting and discussing some simple real-world Lego like case studies, insinuating that integrating such platforms into a civic organizations operation (or eco-system) is definitely possible. With 1% left in the reader's attention span, the ultimate question to be asked is what if civic entities had access to these gaming assets and specifically the artificial intelligence that's been developed for such open worlds. What if civic entities knew how to use such assets? Where could we go?

In Michael Mann's most recent movie, *Blackhat*, the villain, right before his death says something intriguing to the film's protagonist: "I'm a gamer...I hire people to do sub-symbolic stuff." [12] Take a moment to read between the lines and you'll probably figure out that those lines are starting to dissipate into a virtual reality, and there-in lies the opportunity to imagine what the future may hold for the Democracy of Things. As John Lennon said, Imagine.

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