IMMERSION FOR MOBILIZATION: USE OF 360-DEGREE VIDEOS AND VIRTUAL REALITY IN PUBLIC ADMINISTRATION

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Abstract

Purpose of the study: The article presents ongoing research that experiments the use of technological innovations in public administration. The hypothesis is that technologies can promote mobilization through immersion in virtual reality.

Methodology: The technologies chosen were the videos produced in 360-degree cameras and virtual reality glasses, to bring public policymakers closer to the realities that such policies will address.

Main Findings: This paper presents the theoretical basis, techniques and methodologies used to achieve the objectives and the current state of research, allowing new suggestions from academic and scientific peers to contribute to the improvement of this work.

Implications: This study was based on UN (United Nations) experiences in trying to raise funds for Syrian refugee camps in Jordan.

Keywords: Innovation in Public Administration, Virtual Reality, 360-degree Videos, Immersion, Empathy.

INTRODUCTION

In a context in which the complexity and the unpredictability are increasingly parts of the decision-making process, the public policymakers need new tools to help them to experiment, explore different scenarios and evaluate the *trade- offs* of a decision in a safe and pressure-free environment (NESTA, 2018a).

Taking the above statement into consideration, this research is devoted to investigating how simulation based on 360-degree imaging and virtual reality visualization technologies can contribute to collective cause engagement, scenario assessments, and support decision-making by *policymakers*?

A general virtualization movement today affects not only information and communication, but also bodies, economic functioning, collective frames of sensitivity, or the exercise of intelligence. Virtualization even reaches the modalities of being together, the constitution of the 'we': virtual communities, virtual enterprises, e-democracy (Levy, 1996; Xiaoyun, & Siqi, 2018).

Several decisions made by policymakers take place in an extremely distant environment and different from where such policies will be effectively implemented. Most government policies, programs and projects will impact an environment that has never been visited by formulators.

Similarly, many NGOs - Non-Governmental Organizations - and other civil organizations have difficulty in mobilizing the population for their causes, precisely because of the difficulty in empathizing with those who can support their causes and collaborate to the execution of their purposes.

Today, the area of information and communication technology provides accessible resources to promote the virtual approach of people from previously unreachable realities. Such technologies have been widely used in most developed countries for entertainment, education and private industry.

Very recently, the public sector has been experimenting with the use of simulation and virtualization technologies to promote empathy, that is, the approximation between beings to allow a better understanding of each other's reality.

In 2018, in Brazil, there are very few reports of its use and almost no analysis of results of experiments with virtual reality in the public sector and, therefore, a fertile field for research to collaborate to:

- Validating experiments generated by the project, analysing their impacts, implications and peculiarities;
- Contributing to the still modest corpus of international research on simulations and virtual reality in public issues.

The support of ENAP – National School of Public Administration – and the Ministry of Planning, Development and Management will allow this research to be carried out, as it demands-resources in the acquisition of 360-degree video recording and virtual reality glasses equipment, hours of video production, hours of dedication by the team, researchers to support the groups selected for the experiment, as well as giving the necessary visibility to the project to gain the adhesion and enrolment of relevant proposals by the candidates to be supported by the experiment.

The focus on innovation in the public sector is the motto for this research, which promotes the engagement of society and

public managers in causes of collective interest, creatively and unusually, supported by high technology, the currently accessible but still unknown for the majority of the population.

The experimentation approach and the creation of an open experiment, create more possibilities for cooperation, interaction and replication of this initiative in other unforeseen realities by this research, expanding the program's scalability, which can be played at the federal, state and both nationally and internationally.

The experiment in question has the potential to turn into a service design tool, used both in the early stages to capture user behaviour, scenario building, solution prototyping, and post-deployment improvement, by adding elements to the existing reality and assessing impacts of change.

One of the marginal gains of the experiment and, consequently, of the research associated with it is the validation of the method and the tool used to measure its effectiveness, as proposed by ENAP research directives.

> *[... and due to their character of permanent experimentation, innovation activities in the public sector still lack effective evaluation mechanisms that allow a real measurement of their effectiveness (ENAP, 2018).*

The result of the research contributes to the compendium produced by the group of researchers of the Institute of Applied Social Sciences of Unifal, which has relevant production in the public area, in its *stricto sensu* postgraduate programs in Public Management and Society, in the Interdisciplinary area, and the Professional Program in Public Administration, coordinated by one of the researchers of the Laboratory of Public Policies for Smarter Cities, among other postgraduate and undergraduate programs.

Finally, the analysis of the results of the experiment has the practical purpose of:

> *validating the appropriateness of design methodologies to address public management challenges...],* *[...] the potential development of new technology trends for public policy applications and/or the development of the basis for impact assessment of innovation activities in public policy and public management (ENAP, 2018).*

GENERAL AND SPECIFIC OBJECTIVES

The use of simulation of all kinds has been increasing to promote the approach described above. Nesta, UK Innovation Lab, has compiled some simulation projects that are being experimented around the world and presented some relevant considerations, which motivated this researcher's visit to that lab in London, where researchers from Nesta presented the details that led to this experiment.

This research has the main objective of evaluating the use of information technology-based simulation, more specifically virtual reality, to promote the approximation between decisionmakers and the portion of society that will be impacted by such decisions.

The experiment includes the creation and implementation of a preparatory course for the use of basic production of virtual reality content, used to train people interested in promoting empathy among individuals and groups in society who need some kind of support, which can be provided by others but living in mutually distant and diverse environments.

Some adjacent objectives are the verification of the level of engagement of society in projects contemplated by the proposed experiment and the creation of historical records of the themes addressed during the experiment;

THEORETICAL REFERENCE

The term Virtual Reality (VR) was first used, at the end of the 1980s, by Jaron Lanier (Biocca & Levy, 1995), artist and computer scientist that proposed convergence between two opposing concepts, virtual and real, on a new concept: virtual reality.

Virtual reality is a kind of simulation of physical reality, just as the cave art of Altamira simulates the physical world with wall paintings dating back more than 30 thousand years ago.

William Bricken (cited by Wooley, 1992) captured the essence of virtual reality when he stated that psychology is the physics of virtual reality. It is the media for body and mind extension. Through virtual reality, we can reach places, times, environments that may be inaccessible for any reason in the real world.

Games like reality simulation

One way to promote immersion through simulation is by using games. The Fields of View is an Indian research organization, non-profit, based in Bangalore. It specializes in the development of public policy games, focusing on the intersection of culture, technology and social sciences to design new tools for public policymakers and society (Fields of View, 2017; Tongo, Corpuz, & Caminade, 2017).

In 2015, Fields of View collaborated with Media LAB Amsterdam to develop Rubbish! a board game that addresses the waste crisis in Bangalore.

The game is modelled on real world data, and the mechanics are simple - providing a powerful lesson for players. The game offers players - often citizens or politicians - the opportunity to look at the city's waste management ecosystem from the perspective of waste collection centre managers and better understand the limitations under which they work, highlighting the importance collaboration between stakeholders to solve the waste crisis.

In the context of Bangalore, the use of Rubbish! allowed different stakeholder groups to understand each other's perspectives, triggering preferences or choices, facilitating conversations that might not otherwise have happened (Fields of View, 2017).

According to the company, what Fields of View hopes to achieve through games like Rubbish! is to improve policymaking in India: make it faster and more flexible, more relevant and linked to the lives of those affected, and more sensitive to the country's large scale of social and economic change.

Virtual reality expanding immersion

Virtual reality-based on information technology can extend and enhance the user experience, promoting greater citizen immersion, making use of games, movies, simulations and expansions of reality, among other strategies.

Simulation, broadly defined as the imitation of a real-world process, system, or actor for experimentation purposes, is now being used in more exciting and experimental ways than ever before. Until recently, it was used by governments in disaster preparedness and through war games for better emergency planning and tactical preparation. The scope and scope of policy simulation is now undoubtedly expanding, providing the much-needed "safe space" to experiment with new approaches.

There is a greater need for smarter, more inclusive and more dynamic ways to build the capacity of policymakers. As a tool, simulation opens new perspectives to achieve this. First, it can help build better networks and break down silos by emphasizing the benefits of coordination and collaboration in the policymaking process (Endang, & Risal. 2017; Hussain, Md-Rus, & Al-Jaifi, 2017; NESTA, 2018b).

Simulation can also change perspectives, bringing specific issues to the agenda. The first VR project of the British newspaper The Guardian, for example, uses the power of virtual reality to raise awareness of the psychological impact of solitary confinement on prisoners in the United States. More and more people are disconnected from policy and decisionmakers and enabling technologies for simulation can help strengthen the empathy of future policymakers.

Anticipating the future implications of a new policy or emerging technology is not easy (Chan, 2018). The regulation has struggled to keep pace with technological development, adopting reactive approaches rather than proactive ones. The simulation has the potential to drive the way we think and plan changes in our economy (NESTA, 2018b).

Innovation systems are complex, involving multiple stakeholders and interests. As a result, there is a need for more and better data to improve our understanding of the impact of policy interventions or the true needs of their beneficiaries.

These examples illustrate the unique potential of simulation in integrating greater experimentation, collaboration, and flexibility into the policymaking process. Simulation also enables policymakers to better plan and account for the uncertainty and unpredictability in the policies they design, making it the most chosen method of innovation for addressing crucial challenges such as climate change, mental health or even the global refugee crisis.

The inspiring case

One of the biggest difficulties in promoting changes in humanitarian contexts is that the challenges are so far away from most people's daily lives. In response, the United Nations Virtual Reality series (UNVR) uses immersive storytelling to inspire greater empathy and understanding around the main humanitarian challenges of our time.

The UNVR is part of a much broad movement to foster the awareness of the difficulties that vulnerable communities around the world experience every day, particularly in the context of wars, mass migration and increased climate change (UNVR, 2017).

Between 2015 and 2017, the initiative, led by Action Campaign SDG - Sustainable Development Goals UN - the United Nations, produced ten short movies in VR, each one telling the story of war refugees or victims. One of them is Clouds over Sidra, a nine-minute virtual reality clip that was filmed in 2014 using the latest virtual reality technology and 360-degree footage. The main protagonist is 12-year-old Sidra, one of many children living in Jordan's Za'atari refugee camp - a camp that still houses nearly 80 thousand Syrian refugees.

Sidra takes the viewers around the camp, showing his home and his school. Clouds over Sidra was produced to encourage donations to Syrian refugees and promote informed discussion among policymakers and the general public, making this development challenge more evident.

In recent years, because of the power of total visual immersion, VR has been dubbed the "empathy machine." Although this is disputed by some, there is a consensus around the ability of new technology to make any topic, even complicated, more vivid and tangible (SDG, 2017). When Clouds over Sidra was released in January 2015 at the Davos World Economic Forum, the film's emotional impact on high-level participants was palpable.

The movies repercussion was huge: it was translated to more than 15 languages and is being shown in more than 40 countries by fundraiser UNICEF - United Nations Children's Fund. Preliminary evidence has shown that VR is twice as effective in raising funds, according to SDG. Several civil societies used it to influence public opinion. Moreover, it was widely watched and shared over the social media platforms.

Ultimately, however, the UNVR film series describes how simulation methods, such as VR and immersion, have a unique ability to raise awareness, bringing relevant issues ahead of the political agenda. In the words of Clouds over Sidra's director Gabo Arora: "I want to influence decisionmakers first and foremost."

METHODOLOGY

The best way to understand how simulation can be used as a policy method is to look over the examples. The initial premise of this research is the observation of the application of technologies and case analysis under various aspects related to Applied Social Sciences, more specifically to Public Administration and the formulation of public policies, which will ultimately be implemented through public projects.

Considering the examples presented so far, one can see the use of simulation and virtual reality as immersion instruments aiming to mobilize the entities responsible for transformations in society. That is, the VR used as a project tool, responsible for capturing people's attention, becoming a driving force for transformation and generating insights during the initial processes of project design.

Responsibility for research

It was recently created at the Federal University of Alfenas, the campus of Varginha-MG, a laboratory to research public policies to make cities smarter. Its name is PP4SCities - Public Policies for Smarter Cities and it is in the scope of this laboratory's work that this research arises.

PP4SCities, which is also a research group registered in the Graduate Chamber of Unifal and CNPq - National Council for Scientific and Technological Development, has as members professors and researchers of the Institute of Applied Social Sciences of that university (Table 1) and is under the responsibility of the head of the laboratory , Prof. Helio Lemes Costa PhD, author of this paper. Prof. Helio coordinates the research with the support of the other members of the group.

Table 1: Members of the Smarter Cities Public Policy Research Group (2018)

Name	Occupation	Situation
Prof. Dr Helio Lemes Costa Junior	Teacher / Researcher / Head	Effective Internal
Prof. Dr Antonio Carlos Andrade Ribeiro	Teacher / Researcher	Effective Internal
Prof. Paulo Roberto Rodrigues de Souza	Teacher / Researcher	Effective Internal
Prof. Dr Claudio Rodrigues Vilela	Teacher / Researcher	Effective external
Erick Alves Duarte Costa	Graduate student	Collaborating Intern
Haubertty Soares Vieira	Student Graduation	Collaborating Intern
João Pedro Chagas Auricchio	Student Graduation	Collaborating Intern

METHODOLOGICAL PATH

Methodological steps for conducting this research include:

- Looking at the cases reported above regarding global projects that use and have used VR to assist public policy issues, giving us an idea of the wide range of applications that simulation can have in the policymaking process;

- Completion the production of the online course for training on the use of content planning, technologies, storytelling, recording images in 360-degree, wearing VR glasses and other equipment for immersion in Virtual Reality, which will be offered for free to prospects of research;

- At least 10 groups of interest, selected by convenience by a calling for proposals, sent to the research lab, will receive recording cameras 360-degree and Virtual Reality viewing glasses and will be trained in the course offered by CEAD - Distance Education Center at Unifal;

- Group members will receive questionnaires before the experiment and will be followed up and observed during the experiment, they will be interviewed after their completion to confront their expectations and results, their perceptions and suggestions for process improvement;

- Preparation and writing of technical reports and scientific articles on the observations and analysis of the result of the experiment, to be published widely in events, periodicals and the form of eBooks on the research lab and InovaGov network websites and social media.

It is, therefore, a search quasi-experimental (Campbell & Stanley, 1963), with exploratory characteristics, the results of which will guide to new insights on the use of these technologies in public projects and political proposition. It is therefore,

quasi-experimental it is not a closed experiment and samples are not random, since the research group has a scope defined by its focus.

EXPECTED RESULTS

360-degree filming and virtual reality viewing technologies can drive people into almost total immersion in realities that they have never had access to in person.

The project envisages enabling organizations to work with these new technologies to promote empathy. So that the citizen, who is far from the complex reality of social problems, for example, can see with a closer level of reality, how the life of these people and the difficulties they go through. But the program is not limited to that.

This training is expected to form permanent citizen rights watchers' groups, recording the realities of interest groups so that they can be experienced by those who may interfere with their destinies through funding and/or creating the solutions to their problems. Another technical result is to gather agents, who have never had contact with their reality, with the beneficiaries of public support policies, which sometimes has this support as the only opportunity for recovery, improvement, or even survival.

Other possible applications are in environmental preservation, historical heritage, culture and national and regional folklore, in the conservation of history and culture in the form of immersive records.

The initiative aims to raise awareness in a way that they have never been touched before, as they have not yet had physical and real contact with that reality, making them aware of their beauty and pain and thus engaging in the creation of public policies, that solve the perceived problems in your virtual experiences.

The expected results, of a scientific nature, are the analysis of the impact of the use of immersion technologies in Virtual Reality on the agents involved in proposing projects and public policies.

RESEARCH DEVELOPMENT

Some activities described the methodology segment have already been carried out and the research is within the established schedule. Following are the steps that have already been completed and those that will be completed in the coming months.

Fundraising in the private sector was unsuccessful and the research is being fully funded by ENAP - National School of Public Administration, through its chair program.

The funds were used for purchasing VR cameras and glasses, as well as the preparation of the content creation course, which was already part of a PP4SCities lab.

Activities already performed are as follows:

- Finalization of the content creation course for Virtual Reality Immersion;

- Development of data collection instruments for the experiment: questionnaires, interviews and field notes structures;

- In-person presentation of this research project at ENAP, in Brasilia;

- Realization of the contest of projects to be contemplated with the course and the equipment of recording and exhibition of virtual reality;

- Conducting a pilot test of the application of content creation course;

- Analysis of the results of the content creation course pilot test.

Activities that will still be performed:

- Presentation of this research at national and international events, to gather suggestions for improvements in techniques and methods of execution;

- Selection of 10 projects to be followed by the PP4SCities laboratory team;

- Application of pre-experiment questionnaires, tabulation and analysis of collected data;

- Beginning of the online course for members of the 10 selected projects. The course has the expected duration of 30 days (24 hours);

- Monitoring the capture and production of content by the 10 groups covered;

- Presentation of the semi-annual progress report of the research project to ENAP;

- Monitoring the capture and production of content by the 10 groups covered;

- Holding workshops to raise awareness of the Society and public managers to analyse the impact of virtual reality;

- Conducting interviews with members of selected groups;

- Tabulation of data collected during the experiment;

- Writing of technical report and articles derived from the research performed;

- Preparation and presentation of the final report of the project to the ENAP evaluation committee, in Brasilia.

POSSIBLE APPLICATIONS OF THE STUDY FOR FEDERAL PUBLIC ADMINISTRATION

The virtual reality simulation technologies addressed in this research have immense potential for application in various areas of public management, but can be particularly useful for:

a) People's mobilization to raise funds to finance social projects, environmental, cultural, etc;

b) Preparing interest groups to observe and monitor and report activities that are potentially harmful to the Society, such as child labour, child prostitution, trafficking persons, abuse of the elderly, children and other citizens under the supervision of others, precariousness living conditions of refugees, drug addicts, among many other situations of social risks;

c) Generating a historical record of the cultural, artistic, religious and mystical activities for future consultation with capture of more details of the registered objects;

d) Since the content creation course will be open to the public, free of charge, on the Unifal Distance Education platform, any federal government entity may purchase the equipment and create content for VR, following the steps described in final project reports;

e) Possibility of the periodic and recurring reissue of the contest of projects to be contemplated with cameras and glasses, giving visibility to the projects and the contents produced;

f) Enabling project managers to create better solutions for society, given that they may have a more immersive view of the reality, promoting empathy and creating solutions from the view of the Society.

According to the Nesta laboratory (NESTA, 2018b), 2018 was a crucial year in the evolution of simulation to innovation, with the union of three dimensions: better technology, greater ability to handle large volumes of data and a change of mindset. There are numerous new simulation opportunities offered by the development of new technologies and the combination of existing ones, for example, virtual reality, big data and analytics that help us better understand the innovation systems and develop more robust models for simulation.

There is a noticeable change in the mindset of the population and public agents, with greater creativity in approaches to the design and implementation of public policies and projects. It is noticed a surprising enthusiasm into a growing group of people with the promises of the simulation for the design and implementation of more efficient and more inclusive policies.

These technology resources have great potential to help policymakers make better-informed decisions through the benefits of safe experimentation and testing.

CONCLUSION

The Brazilian public sector is still lacking initiatives that adopt cutting-edge technologies, such as virtual reality and 360-degree videos. With the present research, we intend to show measurable results from the application of innovations, comparing even with the results obtained in similar research conducted in other countries.

The presentation of this work in progress, aims to obtain peers insights and suggestions that might lead to a better, collaborative and creative work, resulting in useful conclusions for public management, not only Brazil, but worldwide.

Another reason for the exposition of this research is the inspiration of other scientists to replicate it in other realities and realms, which would allow an international and inter-institutional comparison of the results, shedding more light on the theme of technological innovation in Public Administration.

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