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How to Build Sustainable Online Communities: Implications from Lithuania Urban Communities Case Study

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Abstract: This research aims to extend our knowledge about the factors for increasing participation and sustainability of digitally enhanced communities. Thus, the subject of the research is online community projects which act as the catalysts for collective behaviors exhibited through the crowd effect. Typical to online communities and their social orientation is the use of new forms of self-regulation and self-governance. Sustainable online communities can improve public services and lead to broader civic participation. The communities were analyzed in the course of experimental qualitative research that was conducted in Lithuania. Participants in digital urban communities and initiators of such platforms were interviewed face-to-face. Analysis of the empirical data revealed different motivational, socio-cultural, and organizational factors influencing the sustainable online community ecosystem. According to the research results, community organizers and IT developers should focus on online collaborations through technologies that create social value (collective decision-making tools, gamification, virtual brainstorming, and other technological solutions).

Keywords: online community; motivation; crowd; collective intelligence; sustainability; ICT

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1. Introduction

There is no doubt that the ubiquity and availability of the Internet is one of the vital prerequisites for a new form of interconnection, different forms of social cohesion, and conditions that help to collectively build interaction. "High-speed broadband has the potential to fundamentally alter communication practices within the community [. . .] influence transformation of culture and society" [1]. Levy [2] suggests that "online communities are a new way of making society with the support of new communication technology based on objective collaboration rather than on close and persisting bonds". Enabled by information and communication technologies (ICT), "communities may exhibit higher intelligent features than a traditional community because ICT provides an effective communication channel for the exchange of masses of data, information, and knowledge" [3]. Three fields of innovation influence the development of networked society: digitally enabled connectivity (leading to the emergence of collective intelligence); the move towards openness in public data (enabling the observation of social problems faster); and new forms of co-creation online (activating self-organization and collaborative decision making). Social technologies may also encourage political and non-political collaboration such as voting, organizing disaster aid, and decision-making for community and government.

Despite the significance and optimism surrounding the discussion of the efficiency of online activities and their influence on the public good, research has hitherto been fragmented. Although there is a common agreement that collaborative technologies [4–6] lead to positive effects for society, the existence of ICT tools and platforms do not necessarily increase citizen engagement and enthusiasm [7]. Indeed, the majority of scientific research on online communities has been oriented towards governmental initiatives and the integration of e-participation [8,9], e-democracy [10,11], and open data tools [12]. According to McNutt

et al. [13], the sustainability of online communities depends on the motivation to develop strong relationships between business entities, governmental institutions, NGOs, and more informal groups and to maximize collaboration influence, creating collective resources and removing the duplication of efforts. Moreover, sustainable interaction stabilizes and activates knowledge sharing, technology exchange, and integration for pursuing mutual profit; further, it may play an important role in establishing a community's sustainable differentiation and long-term value-creating strategy [14,15].

Our research aims to deepen and expand the knowledge that will enable community managers to design motivation strategies for engagement and to apply scientific-based organizational and technological measures for increasing the sustainability of community ecosystems.

2. Theoretical Insights on Online Communities and Their Sustainability Goals

2.1. Online Communities as Collective Intelligence Ecosystems

The United Nations Sustainable Development Goals [16] demand financial resources and mobilization of intelligence from people around the globe. Whatever their composition, groups of individuals (e.g., communities) are sources of wisdom. According to Luo et al. [17], community "refers to any human group in which the members have some common characteristics, share the same interests or views, and have similar purposes". Community intelligence as a form of collective intelligence that refers to a group's capacity to recognize obstacles in a social context and apply sustainable and effective problem-solving methods [18]. The rapid development of the Internet has enabled new and efficient ways of exchanging knowledge within communities; consequently, online communities are of particular importance. Online communities all share common characteristics despite variations in user base and objectives. Lykourentzou et al. [19] define an online community as a "system which hosts an adequately large group of people, who act for their individual goals, but whose group actions aim and may result—through technology facilitation—in a higher-level intelligence and benefit of the community". Knowledge creation here is influenced not only by individual human actors but also by digital technologies. Communities are looking for responsible ways, and new methods and mindsets, to elevate human intelligence by harnessing more data, learning faster, and accelerating innovation for development.

"Intelligence" in online platforms can be described as "collective", not only in the sense "that it arises from interactions (which is nothing new), but does so according to specific principles better known for extracting wisdom from crowds" [20]. Thus, a community is able to deliver higher levels of intelligent efficacy than any individual member. Lykourentzou et al. [19] define online community as a "system which hosts an adequately large group of people, who act for their individual goals, but whose group actions aim and may result—through technology facilitation—in a higher-level intelligence and benefit of the community".

"Crowd wisdom" means such a community commonly exhibits higher-level intelligent capability than any individual member of that community. Surowiecki [21] identified the four basic criteria for the emergence of collective intelligence: diversity, decentralization, independence, and an appropriate mechanism for information aggregation. Online communities merge these components and may be considered sustainable collective intelligence (CI) ecosystems [17]. Online communities have flexible and often ambiguous boundaries. Hence, members enjoy greater freedom in being able to join or leave as opposed to the fixed boundaries characteristic of institutional organizations. Such flexibility segregates online communities from business, governmental and other institutionalized organizations.

Mass participation in online interactions ensures the emergence of greater intellectual capabilities. The "swarm effect" differentiates CI from a team or organizational intelligence because the latter lack a large number of members. For online communities, it is easier to engage a varied pool of members in terms of demography, education, and culture leading to a continuous and diverse "feed" of new ideas and knowledge. Common to all online

platforms is a decentralized structure and distribution of leadership, which influences the self-organization and self-governance capabilities of that community (decentralization and independence). Lack of direct communication is an often-mentioned deficiency of online communities. Yet, compared to traditional communities they can maintain more efficient operations. Firstly, ICT provides an effective communication channel for massive exchange of data, information, and knowledge and secondly the computation capabilities of modern ICT may be of great help for the information processing tasks within the entire community" [3].

2.2. Factors Motivating Crowd Engagement

What are the factors motivating crowd engagement in online communities? The creators of the collective intelligence (CI) genome [22] argue that money, love, and glory lead people to participate in crowd activities. Wise et al. [23] adapted this proposed model for the public sector and offered five supplementary "genes" i.e., (Self) interest, Civic duty, Evaluation, Feedback public, and Feedback (not public). Other scholars distinguish intrinsic and extrinsic motivation factors in the creation of collective intelligence [24]. Building on this, Wang [25] identified a set of motivating factors to be considered and addressed to promote wide participation: extrinsic motivation type, autonomy, or competence-related and relatedness-related motivation types. Extrinsic motivation is based on monetary compensations and prizes [26], peer recognition, career opportunities or on enhancing status in the community [26,27]. Autonomy related motivation may be characterized as a sense of ownership or an ability to control the situation, or an opportunity to realize personal creativity [28,29]. Competence related motivation is grounded in the opportunity to learn and improve [27]. The aspiration to belong to a group may be based on altruism or the intention to find friends [26]. Frey et al. [26] concluded that people driven by intrinsic motivation factors contribute the most valuable input, as their contributions are made without regard to expectations of reciprocity. The study by Wasko & Faraj [30] also found that "people contribute their knowledge when they perceive that it enhances their professional reputations, when they have the experience to share, and when they are structurally embedded in the network". Further, many agree that social feedback present in the network may intensify participants' activity [28]. Users typically choose communities that provide more feedback than others [31].

A lot of research explores citizen motivation in open government projects too. The results of a Wijnhoven et al. [32] survey reveal different motivations for participation in open government projects related to three objectives: collaborative democracy, citizen sourcing, and citizen ideation & innovation. Aitamurto et al. [33] claim that intrinsic motivations in crowdsourced policy-making projects include fulfilling a civic duty, affecting the law for social reasons, and deliberating with and learning from peers. Extrinsic motivations include changing the law for financial gain or other benefits.

The analysis of various motivation factors and their impact upon crowd activity points to the conclusion that the combination of motivational elements plays a crucial role in the success of the collective intelligence system. Maintaining a sustainable and engaged user base in the long term is not an easy task because of changing user expectations, attention, and motivation [34–36]. Previous studies show that users leave projects before they are completed [37]. A balanced proportion of users need to be active contributors (e.g., ask questions, provide information, share expertise and ideas) [38]. Even though motivational drivers for participating in development work have a strong personal dimension it is still possible to identify patterns based on the type of users, platforms, and community [39]. Extensive research on online communities by Wang and Fesenmeier [40] claims that motivations may vary with both the members and nature of the community. The dynamics of online communities mediated by computer networks is complex and sensitive "because they lack many of the physical cues that are used in face-to-face communication" according to Wang and Fesenmeier [40]. Current research has mainly focused on individual differences when it comes to participatory motivation. However, to provide communities with

methods and tools related to the enrolment and retention of participants, it is important to identify and analyze dimensions that serve to identify common patterns in communities in general.

3. Qualitative Analysis of Motivation Factors in Lithuanian Urban Communities

3.1. Methodology of Qualitative Research

The focus of this research is online, socially oriented urban community projects that act as catalysts for the emergence of collective intelligence (CI). The 15 community projects investigated operate within Lithuania. The investigation explored collective decision-making tools, new forms of self-regulation, and self-governance. The research sample was established according to the following criteria: Lithuanian origin of urban (related to town or city) communities; communities with specific goals and social innovation orientation; and communities able to involve a critical mass of users (a large number). Most of the analyzed platforms were initiated by non-profit organizations. Such organizations were already established before extending their activities into the digital ground, such as VšĮ Geros valios projektai, VšĮ Lietuva be šešėlio, VšĮ Actio Catholica Patria, VšĮ Global Lithuanian Leaders, VšĮ Paveldo projektai, VšĮ Mes Darom, VšĮ Baltijos aplinkos forumas, VšĮ Baltosios pirštinės, and VšĮ Europos namai. In 4 platforms citizens were the initiators and undertook the active role of creating the platform and inviting others to use the services (VšĮ Žaliasis taškas, VšĮ Namas Plius, VšĮ Sveiko vaiko institutas, MB Maži dideli).

The case studies and the qualitative research participants (members or initiators of the community) were selected after consideration of data gathered during the experimental phase of the research. Firstly, pilot interviews were conducted which allowed us to optimize and amend the research questionnaire. Face-to-face interviews were conducted with 20 participants of networked urban communities, and 10 initiators of community projects (30 interviews all together), achieving a participation rate of 80% (male 45%, female 55%, aged between 24 and 58, 100% having achieved higher education degrees). The participants verbally agreed to be part of the research project and were not compensated for their collaboration. Pseudonyms are used throughout the paper to protect their privacy. The research procedure was approved by the Ethical Committee of Social Innovation Centre at Mykolas Romeris University. Members of the research group contacted potential respondents by e-mail or by phone. Digital voice recorders were used to record the interviews, the average length of each interview lasted approximately 90 min. The digital recording was then transcribed.

The interview method allows evaluation of a wider context and unlocks new possibilities to interpret the situation in online projects more flexibly than by measuring numerical values [41]. In addition, it provides a wide range of information, resulting in the evaluation of the whole contextual environment and the identification of the relationship between the situation and the behavior in an online community. The literature [41,42] suggests several limitations of the interview method, including biased and subjective interpretation of collected data and the ambiguity of respondent's replies. To avoid such discrepancies, a standardized interview instrument was used. It included definitions of concepts and terms that were explained to the research participants in advance. Moreover, to attain each respondent's positive attitude and cooperation, considerable attention was paid to both the choice of the environment and interview date. To sum up, the choice of interview method predetermines some complications i.e., ensuring research validity and reliability, stimulating respondents' motivation, and decreasing subjectivity. However, taking into consideration the multilayer structure of the researched phenomenon, a limited amount of research in the field, and a need for comprehensive understanding to describe, explain, and operationalize it, the interview method is considered to be a proper and applicable technique to achieve the research purpose. Several precautionary tools proposed by Flick [42] were used to minimize the negative impact of these limitations, e.g., rigor and creativity, consistency and flexibility, transparency and feedback.

Dimensions, and their definitions discussed in the theoretical part of the paper, were used to design questions for the empirical research instrument. The questionnaire starts with questions defining the general information of online communities (i.e., project title, aim, respondent's relation to the project, and his/her demographic characteristics) and then leads to questions analyzing different dimensions and processes related to motivation (*How are different groups and strata involved? how are they motivated? What means of motivation could be used? What would help to involve more participants? Are you satisfied with the way activities/processes occur?*); satisfaction with the activity (*Is everything developing as expected?*); independence and teamwork (*How does such managerial features of the project, such as the possibility to work in a team, contribute to the project success? What has influence? Can you choose anonymous or public participation? Does it have any influence?*); group diversity (*How useful is group diversity of an online community project?*); dynamics, openness, and flexibility (*Is there a possibility to observe what others are doing? Is online visibility an option? How often do you communicate in a project? What influence does activity of other group members have on participants? How do managerial features of the project (e.g., possibility to act at any time convenient for the participant, no time limits) contribute to project success?*). Comparison of the data based on similarities and differences of the aspects discussed by the respondents lead to the identification of reoccurring themes and categories. This is considered a categorization or variable-oriented part of analysis [43]. During this stage, all the data were divided into smaller categories and conceptual structures.

The next section will provide experimental research results and their interpretation.

3.2. Experimental Research Results and Insights

Three categories of participant motivation in online communities were identified by generalizing the theoretical insights associated with the research data (Table 1). These included: intellectual motivation (related to the attractive content, relevant information, and potential of intellectual interaction); social motivation (most frequently discussed by the research participants, consisting of social communication, group communication, social recognition, and possibilities of self-realization); and material motivation, which is linked with tangible measures providing financial and material benefits such as journeys, gifts, and financial incentives. The following factors for increasing the sustainability of the online community were identified and further discussed: diversity, openness, dynamism, and flexibility. A separate discussion was initiated about possible threats to online communities' activities.

3.2.1. Intellectual Motivation

Theoretical analysis of cases of intellectual motivation indicates that this type of motivation can be related to the following factors: the need for autonomy, which covers satisfaction [26], control over one's activity(ies) [28], the possibility to express individual creativity [29], self-expression [22], and learning or the development of various competencies [27]. According to the research data, the most common factors as motives for participation in online communities are the need to express one's creativity, to learn, and to share possibilities of self-realization voluntarily. In the majority of interviews, the participants discussed intellectual motivations (*R16: Motivation of participation is getting information. People who discuss things even give advice because they have lived through similar situations. R13: As I have mentioned, legal psychological consultation. Additional services. Everybody must be motivated because the major part of the information is under one roof. R19: The main motivation is knowledge exchange, acquaintances, communication, getting new contacts, exchanging information about tools, measures, resources to carry out that marketing activity*). It is those Internet platforms oriented towards solving social issues or discussing social innovation for the urban community that are most often searched in order to find relevant information, or to "expand one's outlook in general", because it is "interesting to read different articles and comments". Besides, participants visiting these pages usually take the opportunity to express their opinion, suggesting possible improvements and sharing their knowledge.

Participants interested in urban community life consider educational, social, ecological, as well as environmental, climate change-related issues to be the most relevant. However, the motivation of participants is negatively influenced by several factors, including the lack of communication culture and ethics, professional competence, and the impact of solving urban social problems by structuring the real voice of society. Participants miss the clear structure and clarity of topics, the freedom to express their opinion, relevant topics/communities, and the convenience of technological solutions.

Table 1. Major and minor categories identified during qualitative research.

Major Categories	Minor Categories
Intellectual motivation (benefits related to the assessment of content)	Self-expression Possibility to express individual creativity or opinion Autonomy, satisfaction, having control over one's activity Learning and sharing, getting information Knowledge exchange Curiosity
Social motivation (benefits related to social communication)	Belonging to a community, status in the community Safety and confidence Communication and new contacts Visibility, recognition Additional services Gaining experience, carrier advancement Anonymity/publicity Independence from social influence
Material motivation (financial benefits)	External motives related to career needs, maintaining status Potential benefits related to content provided in the platforms Experience through the capabilities of others
Diversity	Demographic, educational, and cultural differences Problems and opportunities caused by diversity
Dynamics, openness, flexibility	Teamwork and individual participation in a group Virtual accessibility, non-virtual relation Leadership, collective decision making Norms and ethics
Threats and obstacles for engagement	Data protection Privileged access to community resources Accessibility Social responsibility

3.2.2. Social Motivation

Even though the means and conditions of intellectual and social motivation are in some cases defined as closely related concepts, this research separates them into the benefits related to the assessment of contents (intellectual), and the benefits related to social communication (social). The research participants define belonging to a community as a motive stimulating them to act and not to leave the online community, providing safety and confidence, and satisfying the need to communicate online. To a great extent, the research data confirm the conclusions of Malone et al. [22], i.e., in most online community's *love* and *glory* are the main motives determining one's decision to participate. The need for love and glory is satisfied by social motivation in online communities (*R10: Symbolic capital of the group, visibility of activities, a possibility to gain experience, develop creative activities. R9: Simply to be in the company of the like-minded, to participate in entertaining events sometimes. R6: The possibility to implement original creative non-commercial ideas. R5: This is communication among professionals, publicity is perhaps even desirable; R12: As I have mentioned, legal psychological consultation. Additional services. Everybody must be motivated, because the major part of information is under one roof. R19: Or simply to transfer part of experience to a younger generation*). External social links, as with other types of social motivation, is oriented towards the participant's aspiration to establish their status in the community. The latter is related to the desire to be socially recognized [30], evaluated by other members or in other communities [27], and for career advancement [26].

Solutions regarding anonymity/publicity in the network can be defined as important social motivation factors to be involved (or otherwise) in online community activities. The literature review revealed the dual role of anonymity in online communities. The possibility to express oneself anonymously encourages creativity and independence from external influences while offering ideas. However, it can also cause problems for community managers due to the decreased potential of control. The research data confirm Goldie's [44] view that a person's data protection and anonymity ensures greater self-expression due to the ability to arrive at independent solutions. According to Norvaišas et al. [45] to eliminate negative social, psychological, or other subjective factors it is necessary to ensure the participant's anonymity in virtual space. This effectively eliminates the opinions of authoritative group members, allowing equal weight to be accorded to the ideas of all participants [46]. We should note that anonymity allows participants to afford less respect to group and social norms. This research revealed that for the communities analyzed, participants can either lose their sense of responsibility or fail to respect generally accepted norms if they hide behind anonymity. The research participants also pointed out that anonymous participation can increase the number of participants in discussions, but this is not acceptable in the activities of communities that unite professionals. Some participants stated that anonymity stimulates more active and open group cooperation. Another interesting point is that citizens often do not feel safe in reporting issues and engage in platform activities due to limited anonymity and whistle-blower protection in the country (*R2: People are afraid, they do not report the issues due to limited anonymity and source protection. And the municipalities know and agree with such limitations. R9: When a person posts his opinion, votes, it is important to everybody to know who is voting for that. When responsibility is anonymous or collective, it is nobody's. R13: when there is quite a big space of anonymity, it provokes some people to show themselves not in a good way*).

3.2.3. Material Motivation

The financial benefits satisfied by material motivation are also mentioned by research participants, although less frequently. Research by Royo et al. [47] indicates that for public sector crowdsourcing initiatives, intrinsic motivation and intangible rewards seem to be enough to motivate participants. Our research also shows that material motivation was not present in the platforms selected for research. Frey et al. [26] attribute financial benefit to external motives closely related to career needs, maintaining one's status, and also recognition. Intellectual motivation can only be indirectly related to financial benefit due to a potential benefit content provided to participants. In other words, participants may indirectly seek to gain some experience through the capabilities of others and use it for their purposes. However, in the present research, the latter is attributed to social motives.

3.2.4. Diversity of Participants/a Group

Group diversity defines participants' demographic, educational and cultural differences. The sources of new ideas and knowledge can be found by attracting new members into online communities. The assumption that group decisions are more accurate than individual ones due to the involvement of diverse opinions and approaches was empirically confirmed by Wise et al. [23], Hong and Page [46], and Krause et al. [48]. In the long run, group variety, an abundance of talents, and the level of participant involvement determines the quality of the results of the community activity and its continuity [48] as well as providing encouragement to make better decisions (*R1: Let's say cases involving cruel behavior can be taken and are usually taken by people who are older and have much experience and perhaps more patience, and these with projects-events, the youth have more enthusiasm. R10: Diversity is necessary to find better solutions perhaps, you'll exchange experience. R16: Diversity presents more various information, presents various information to every participant. It is possible to look at the same situation from different angles, to see. R5: It is useful perhaps, because one can debate and discuss issues of a various scope. In this area in general it is important to have education which is both technological and managerial, and not only researchers, managers or representatives*

of public sector. R1: (. . .) it is also important to involve psychologists, psychiatrists, medical doctors. Such a composition, such diversity is good. R7: Group diversity really creates pluses, because you get to know a lot of new <things>, and this is good from the perspective of broadening one's horizon. R9: It is useful simply because it is looking at one and the same project, at some things in a different way, from a different angle, and every person brings his/her know-how which is adapted). Analysis revealed that the majority of respondents notice a positive influence of diversity. According to the research data, diversity fosters the processes occurring within the community and helps it to find better solutions. However, respondents mentioned several problems caused by the diversity too i.e., interruptions of discussions, difficulty in finding common ground, distorted competitiveness among participants, difficulty in finding a consensus, generation/age differences, and complicated coordination (*R18: sometimes in the context of discussions different mentality hinders certain things, but on the whole group diversity is only a plus, not a minus. R19: To my belief, because it is difficult to find things that are in common. R6: However, different challenges and problems emerge alongside diversity, because, let's say, about 4–5 years ago everybody lived in peace and quiet, I think that about 3 years ago conflicts, rivalry and verbal conflicts appeared. All conflicts and all the rest arise because of competition. R17: Group diversity also creates a lot of minuses, because every group does something in a completely different way and imagines that it is the only right way to do it. R1: I really face the problem that volunteers do not speak a common language when one and the same issue is discussed by a 20 year-old man and a 60 year-old woman, perhaps it is normal when that opinion. R2: As to minuses—it is more complicated to coordinate when people have different aspirations, although sometimes it is complicated to organize in a narrow field, too, when people are different*).

3.2.5. Dynamics, Openness and Flexibility

As the result of the research, two sub-categories have been distinguished within the category of group dynamics: teamwork and individual participation in a group. The analysis of the research data revealed the following aspects characteristic of teamwork: virtual accessibility, non-virtual relation, anonymity, and team management. Virtual accessibility is related to the possibilities provided by social technologies and the Internet. Social technologies enable their users to join and create new virtual and dynamic relations. Attracting participants who live in different areas and participate in different media is one important result of enjoying virtual accessibility (*R10: We need different resources as a help while organizing events, implementing some projects, looking for speakers, assistants, designers, volunteers, and the possibility to disseminate this information within the group, to use the group's external links is very important while solving such issues. R1: The accessibility that one can reach all volunteers in a fast way, all volunteers in a fast way and at the same time, saves a lot, a lot of time. R8: If there is an idea which needs a team and it is announced and it is said that people's help is necessary, we'll say that this possibility to call in a team instantaneously is a convenient, time saving thing*). The research data disclosed advantages of virtual accessibility and confirm statements by Engel et al. [49] that groups communicating online can solve problems more efficiently than unconnected individuals or organizations. The feature which was established during the research can be related to the so-called social communication based on computer-supported collaborative work [18] which enables the implementation of a variety of activities and the resolution of different tasks (*R2: Brainstorming' is continuously going on, the result is really good. R10: Teamwork is depending on the situation, most of our activities under implementation require at least two people. The possibility to create a team for an activity directly adds to success*). The issue of team management is relevant in a discussion on teamwork in a virtual environment. Levy et al. [2] state that any social influence can diminish the quality of a collective solution. In such instances, team management is closely associated with hierarchy-related social and psychological problems. On the other hand, research participants indicated team management as a necessity when managing large groups of people in order to preserve principles that are valuable to the community i.e., transparency, ethics, etc. (*R18: . . . with the portal growth there emerged a big challenge of how to manage that big flow of discussions and remain perhaps ethical, as transparent as possible, due*

to this the need to have moderators in each and every group has arisen. R6: There are people who organize some activities, (. . .) there is quite a number of such teams, kernels; there are some overlapping ones. And also, there are simply people who do the management). Group management solutions are also relevant while unravelling the tendency in which the opinions of previous participants of the community influence the opinions of those who joined later [23]. This research revealed that in the case of the analyzed communities, participants can lose a sense of responsibility or might not respect generally accepted norms if their real identity is not disclosed (*R9: (. . .) when a person posts his opinion, votes, it is important to everybody to know who is voting for that. When responsibility is anonymous or collective, it is nobody's. R13: (. . .) when there is quite a big space of anonymity, it provokes some people to show themselves not in a good way*). The research participants also pointed out that anonymous participation is not acceptable in the activities of communities uniting professionals (*R5: (. . .) this is communication among professionals, publicity is perhaps even desirable. R2 (. . .) here it is you who wants to be recognized, because then you will be a very big expert in that subject*). It was also observed that the examined online communities choose different solutions related to participants' anonymity and publicity: participation using pseudonyms (*R14: Everybody could choose any pseudonym they wanted. R7: Participants register using pseudonyms. R3: If one wants to comment, he has to enter his pseudonym, exclusively anonymous participation. R15: Public participation is not possible (. . .) Anonymity on the platform itself is cornerstone. R16: Participation is anonymous, however, registration on that website includes presenting one's name, surname and the Internet address*), registered participation using undisclosed personal data (*R4: The profile itself that you have filled out, your information, you cannot regulate all invisibilities; whether they see it publicly, or whether only those who are linked, or those who have confirmed their identity. R19: No, there is no such a possibility to choose anonymity. R2: There is no anonymity with us (. . .) here it is you who wants to be recognized, because then you will be a very big expert in that subject. R9: It is only public, there is nothing like anonymous participation)*, participation with the possibility to choose the level of data disclosure (*R13: People are not forced to somehow register using their name, surname. Everyone can choose any username. R20: One can read being not logged in, but if you want to write something, you have to log in, and in order to log in, you have to register there. To create a certain virtual account of your own (. . .) One can participate either using their own name or anonymously. R8: This is an individual matter, everybody has that of his own. If he does not want to write his name, surname or present other personal data, we do not forbid this*), and public participation (*R2: We do not have anonymity here, I think that anonymity is necessary 'for whistle blowing', but not for offering ideas or participation in a project. R6: There is no anonymity. As much as it was allowed, it appeared completely not allowed. R9: No. It is related to a financial operation. Anonymity is not possible. R20: There is only public, no anonymous participation exists. And of course, when a person posts his opinion, votes, it is important to everybody to know who is voting for that. When responsibility is anonymous or collective, it is nobody's*). Nonetheless, it should be mentioned that the majority of projects chose at least the minimal identification means to introduce a more effective participant control in respect to following rules and norms of ethics.

3.2.6. Threats and Obstacles to Engagement

According to Arniani et al. [50] "one of the main risks . . . in citizen engagement is the danger of engaging only those people who are already engaged in an issue, thereby deepening the gap between those already participating and those left behind". Certain threats linked with the communities' development can be discerned such as becoming enmeshed and possibly isolated with a particular community. Or there may be constraints on individual freedom and privileged access to community resources and limitations for outsiders to engage. Participants mentioned several threats that can influence virtual accessibility, including one's income level, urban/non-urban location, sexual orientation, privileged access to community resources, cultural background, and communication language. Participants identified the security of virtual communication as an important factor in their motivation to engage, i.e., to engage or not to engage. They also feel that all members of

an online community should be held strictly accountable if they violate another person's rights. Furthermore, it was felt that platform managers must take responsibility for the content and that government must regulate the dissemination of information online and the behavior of online communities. Participants also mentioned the potential for identity theft whereby a celebrity's profile or blog is stolen and misused, as well as the greater prevalence of intolerance and defamation online. It should be noted that even though virtual accessibility is mentioned as an important feature of the online community project in terms of teamwork, some participants stress the importance of non-virtual communication occurring alongside virtual accessibility (*R14: It is difficult to achieve something without live communication. Perhaps part of that community has to be only virtual, but some kind of a kernel meets in reality*).

Platforms struggle with low rates of community engagement (*R5: We have a community, a lot of people. But we do not know how to engage with them. How to involve them into action*). This could be due to the lack of focus on content and user needs when designing initiatives e.g., *We have such a fancy, sophisticated solution and are waiting for the demand in the society (R3)*. According to the interviewees, community movements and civic society organizations focus too much on the ICT side of the co-creative processes and ignore social motivation factors (*R4: The movement is lost in the creation of tools. Most of the platforms do not know how to engage the users*). People are less likely to interact with others in the community if the platform is difficult to understand, technically demanding, and/or complicated to use.

4. Discussion

Our research focused attention on the question of how an online community can mobilize all available resources of data, knowledge, and intelligence to achieve sustainability and to act most effectively. The priority by acting this way is to engage a much wider pool of citizens with their capacity to make use of their information and contribute to the resolution of social problems. Diverse digital tools and channels result in problems of management, collaborative decision-making, security, credibility, and content quality of online community platforms. Moreover, participants claim that some of the online initiatives focus only on the formation of society's voice, and do not lead to actionable outcomes, government feedback, or co-creative synergy in general. The platform initiators interviewed talked about the difficulties of succeeding and reaching their goals (*R5: We were expecting more action in the virtual platform, more communication, more bottom-up projects and solutions. We had such illusions but they failed*). The review of empirical findings on the online communities in Lithuania shows that enduring communities oriented towards solving clear tasks and solving smaller external or internal problems are more active, they connect to the system more frequently and seek more contacts. Moreover, such communities often use integrated and sophisticated digital solutions. In addition, such virtual communities are larger. These research outcomes correlate with the findings of Wijnhoven et al. [32], that "projects with lower ambitions result in more participation than more ambitious projects, which implies that considerable steps need to be taken to realize the full potential".

The research results point to the conclusion that motivation is a necessary, though not a sufficient, condition for active contribution. The use of innovative social technologies is important to take advantage of citizen knowledge to find solutions to social problems. Participants interested in urban community life consider educational, social, ecological, as well as environmental, climate change-related issues to be the most relevant. However, the motivation of participants is negatively influenced by some factors, including the lack of communication culture and ethics, professional competence, and the impact of solving urban social problems by structuring the real voice of the society. Research by Royo et al. [47] also confirms that publishing the final results and indicating how the ideas selected will be further developed are pending tasks that are essential for increasing citizen engagement. Users mention "the virtual accessibility" and "friendly environment in the virtual platform" as the additional facilitator for members to contribute and collaborate among themselves, more actively share attitudes and get more involved in the everyday life

of the virtual community. Understandably, the members of such communities demonstrate a greater enthusiasm during interviews. Participants miss the clear structure and clarity of topics, the freedom to express their opinion, relevant topics/communities, and the convenience of technological solutions. Quite a few of them mentioned that the main motivator keeping them in a team was the social significance of their activities, most often associated with the external influence of the online community and the transfer of ideas to the outside. It is a social discourse that becomes that motivator which not only keeps them identified with the virtual community but also encourages new members to join them and to justify their expectations for a long period. Another motivator is the sense of security associated with being on the platform, with information openness, flexibility and the interactivity of the program inevitably creating a greater sense of affection and satisfaction. The research shows that new members find themselves at the center of an online community, so it is imperative as early as possible to create an environment where they can feel safe and comfortable in sharing their ideas. In that case, the motivation of a new member would be constantly strengthened and supported by a variety of feedback-building measures.

Our research results verify the results of Aitomurto et al. [33] on motivation factors in open government projects. The motivations driving the participation were in part similar to those observed in traditional democratic processes, such as elections, as well as other online collaborations such as crowdsourced journalism and citizen science. However, participants in online community projects did not mention such categories as civic duty, public feedback, collaborative democracy, etc. related to public initiatives.

The study has several limitations. The research was conducted as an exploratory study with a small number of participants and should be expanded to other stakeholders' groups and places, and also supported by representative survey results.

5. Conclusions

Online communities and the factors promoting representative participation and impact need to be better researched. The complexity and diversity of motivation forms are such that they create serious challenges for community organizers to find the right balance between community and individual tasks, and also provide reasonable solutions and combinations of incentives to engage participants in dedicated actions. Analysis of the data and research participants suggests that social motivation is more important than intellectual motivation and material motivation.

It is important that community organizers and IT developers support online collaboration with technologies that create social value. Firstly, they have to foster trust by providing a transparent management structure. Secondly, they have to initiate collective decision-making, virtual brainstorming, gamification, and other technological solutions by providing convenient technological solutions for these activities. Thirdly, they have to appoint moderators or encourage distributed leadership models for maintaining a focus on the main problems of the community, etc.

Lithuania in particular, and society across the EU in general, urgently requires progressive innovations to upgrade processes of citizen engagement between society and the public. It is hoped that this study will stimulate further research that provides a better understanding of the factors that influence sustainable online community ecosystems. Sustainable online communities can enable broad democratic participation and improve public services. A critical reflection on engagement and heavily technology-supported co-creation practices is important to understand what works by implementing motivation strategies and sustainability measures, and what doesn't work and why. In further research, the engagement motivation and collaboration dynamics should be analyzed from the progressive cooperation science [51] and self-determination theory perspectives [25] in order to establish a balanced motivation system and advanced tools for the right audiences.

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References

1. *Institute for a Broadband-Enabled Society*; The University of Melbourne: Melbourne, Australia, 2013. Available online: http://www.broadband.unimelb.edu.au (accessed on 1 June 2020).
2. Lévy, P. From Social Computing to Reflexive Collective Intelligence: The IEML Research Program. *Inf. Sci.* **2010**, *180*, 71–94. [CrossRef]
3. Stiles, E.; Cui, X. Workings of Collective Intelligence within Open Source Communities. *Adv. Soc. Comput.* **2010**, *6007*, 282–289.
4. Ansell, C.; Gash, A. Collaborative Governance in Theory and Practice. *J. Public Adm. Res. Theory* **2007**, *18*, 543–571. [CrossRef]
5. Szkutaa, K.; Pizzicannellab, R.; Osimoa, D. Collaborative approaches to public sector innovation: A scoping study. *Telecommun. Policy* **2014**, *38*, 558–567. [CrossRef]
6. Bria, F.; NESTA; The Waag Society; ESADE; IRI. Future Everything. In *Growing a Digital Social Innovation Ecosystem for Europe DSI Final Report. A Study Prepared for the European Commission DG*; Nesta: London, UK, 2015.
7. Kreijveld, M. *Unlocking the Full Potential of the Crowd—A Government Perspective*; Springer: London, UK, 2010.
8. Limba, T. Implementation and perspective of electronic governance in Lithuania: The society interaction with public administration. *Inf. Moksl.* **2007**, *42–43*, 242–250.
9. Torfing, J.; Sørensen, E.; Røiseland, A. Transforming the public sector into an arena for co-creation: Barriers, drivers, benefits and ways forward. *Adm. Soc.* **2019**, *51*, 795–825. [CrossRef]
10. Lutz, C. Online but Still Not Taking Part? Investigating Online Participation Divides in Germany. Ph.D. Thesis, University of St. Gallen, Altstatten, Germany, November 2015.
11. Ferro, E.; Molinari, F. Making Sense of Gov 2.0 Strategies: "No Citizens, No Party". *J. Democr.* **2010**, *2*, 56–68. [CrossRef]
12. Smalskys, V.; Šilinskytė, A. Public Involvement at a Local Self-Government Level in the Context of Open Data. *Viešoji Polit. Adm.* **2016**, *5*, 641–656.
13. McNutt, J.G.; Justice, J.B.; Melitski, J.M.; Ahn, M.J.; Siddiqui, S.R.; Carter, D.T.; Kline, A.D. The diffusion of civic technology and open government in the United States. *Inf. Polity* **2016**, *21*, 153–170. [CrossRef]
14. Vargo, S.L.; Lusch, R.F. Inversions of service-dominant logic. *Mark. Theory* **2014**, *14*, 239–248. [CrossRef]
15. Leonidou, L.C.; Christodoulides, P.; Kyrgidou, L.P.; Palihawadana, D. Internal drivers and performance consequences of small firm green business strategy: The moderating role of external forces. *J. Bus. Ethics* **2017**, *140*, 585–606. [CrossRef]
16. Mulgan, G. Collective Intelligence and Achieving the Sustainable Development Goals. 2018. Available online: https://www.nesta.org.uk/blog/collective-intelligence-and-achieving-sustainable-development-goals/ (accessed on 8 December 2020).
17. Luo, S.; Xia, H.; Yoshida, T.; Wang, Z. Toward Collective Intelligence of Online Communities: A Primitive Conceptual Model. *J. Syst. Sci. Syst. Eng.* **2009**, *18*, 203–221. [CrossRef]
18. Skarzauskiene, A. Monitoring collective intelligence: A survey of Lithuanian Civic Tech//CSCW'18. In Proceedings of the Companion of the 2018 ACM Conference on Computer Supported Cooperative Work and Social Computing, Jersey City, NJ, USA, 3–7 November 2018.
19. Lykourentzou, I.; Vergados, D.J.; Kapetanios, E.; Loumos, V. Collective Intelligence Systems: Classification and Modelling. *J. Emerg. Technol. Web Intell.* **2011**, *3*, 217–226.
20. Schreiber, E.S. Intelligence is collective. In Proceedings of the Collective Intelligence 2015 Conference, Santa Clara, CA, USA, 31 May–2 June 2015.
21. Surowiecki, J. *Wisdom of Crowds*; Anchor Books: New York, NY, USA, 2005.
22. Malone, T.W.; Laubacher, R.; Dellarocas, C. The Collective Intelligence Genome. *MIT Sloan Manag. Rev.* **2010**, *51*, 21–31. [CrossRef]
23. Wise, S.; Paton, R.A.; Gegenhuber, T. Value Co-creation through Collective Intelligence in the Public Sector: A Review of US and European Initiatives. *Vine* **2012**, *42*, 251–276. [CrossRef]
24. Deci, E.L.; Ryan, R.M. Self-determination Theory: A Macrotheory of Human Motivation, Development, and Health. *Can. Psychol.* **2008**, *49*, 182–185. [CrossRef]

25. Wang, K. Collective Innovation: The Known and the Unknown. In *Collective Intelligence 2014*; MIT Center for Collective Intelligence: Boston, MA, USA, 2014.
26. Frey, K.; Luethje, C.; Haag, S. Whom Should Firms Attract to Open Innovation Platforms? The Role of Knowledge Diversity and Motivation. *Long Range Plan.* **2011**, *44*, 397–420. [CrossRef]
27. Leimeister, J.M.; Huber, M.; Bretschneider, U.; Krcmar, H. Leveraging Crowdsourcing: Activation-supporting Components for IT-based Idea Competition. *J. Manag. Inf. Syst.* **2009**, *26*, 197–224. [CrossRef]
28. Von Hippel, E.; Von Krogh, G. Open Source Software and the "Private-collective" Innovation Model: Issues for Organization Science. *Organ. Sci.* **2003**, *14*, 209–223. [CrossRef]
29. Roberts, J.A.; Hann, I.H.; Slaughter, S.A. Understanding the Motivations, Participation, and Performance of Open Source Software Developers: A Longitudinal Study of the Apache Projects. *Manag. Sci.* **2006**, *52*, 984–999. [CrossRef]
30. Wasko, M.M.; Faraj, S. Why Should I Share? Examining Social Capital and Knowledge Contribution in Electronic Networks of Practice. *MIS Q.* **2005**, *29*, 35–37. [CrossRef]
31. Das, S.; Lavoie, A. Home Is Where the Up-Votes Are: Behavior Changes in Response to Feedback in Social Media. In Proceedings of the Collective Intelligence 2014, Cambridge, MA, USA, 10–12 June 2014; MIT Center for Collective Intelligence: Boston, MA, USA, 2014.
32. Wijnhoven, F.; Ehrenhard, M.; Kuhn, J. Open government objectives and participation motivations. *Gov. Inf. Q.* **2015**, *32*, 30–42. [CrossRef]
33. Aitamurto, T.; Landemore, H.; Galli, J.S. Unmasking the crowd: Participants' motivation factors, expectations, and profile in a crowdsourced law reform. *Inf. Commun. Soc.* **2017**, *20*, 1239–1260. [CrossRef]
34. Carr, C.L. Reciprocity: The golden rule of IS-user service relationship quality and cooperation. *Commun. ACM* **2006**, *49*, 77–83. [CrossRef]
35. Ley, B.; Ogonowski, C.; Mu, M.; Hess, J.; Race, N.; Randall, D.; Rouncefield, M.; Wulf, V. At home with users: A comparative view of Living Labs. *Interact. Comput.* **2015**, *27*, 21–35. [CrossRef]
36. Ogonowski, C.; Ley, B.; Hess, J.; Wan, L.; Wulf, V. Designing for the living room: Long-term user involvement in a living lab. In Proceedings of the SIGCHI Conference on Human Factors in Computing Systems, Paris, France, 27 April–2 May 2013; ACM: New York, NY, USA, 2013; pp. 1539–1548.
37. Habibipour, A.; Bergvall-Kareborn, B.; Ståhlbröst, A. How to Sustain User Engagement over Time: A Research Agenda. In Proceedings of the Twenty-Second Americas Conference on Information Systems, San Diego, CA, USA, 11–14 August 2016.
38. Anthony, D.; Smith, S.W.; Williamson, T. Reputation and reliability in collective goods: The case of the online encyclopedia Wikipedia. *Ration. Soc.* **2009**, *21*, 263–306. [CrossRef]
39. Ståhlbröst, A.; Bergvall-Kåreborn, B. Exploring user's motivation in innovation communities. *Int. J. Entrep. Innov. Manag.* **2011**, *14*, 298–314.
40. Wang, Y.; Fesenmaier, D.R. Assessing motivation of contribution in online communities: An empirical investigation of an online travel community. *Electron. Mark.* **2003**, *13*, 33–45.
41. Berg, L.B. *Qualitative Research Methods for the Social Sciences*, 7th ed.; California State University: Long Beach, CA, USA, 2009.
42. Flick, U. *An Introduction to Qualitative Research*, 4th ed.; SAGE Publications Ltd.: London, UK, 2009.
43. Bitinas, B.; Rupsiene, L.; Zydziunaite, V. *Kokybinių Tyrimų Metodologija*; Socialinių Mokslų Kolegija: Kaunas, Lithuania, 2008.
44. Goldie, J.L. Virtual Communities and the Social Dimension of Privacy. *Law Technol. J.* **2006**, *3*, 133.
45. Norvaišas, S.; Mažeika, A.; Paražinskaitė, G.; Skaržauskienė, A.; Šiugždaitė, R.; Tamošiūnaitė, R. *Networked Business Informatics studies: Methodical Guidelines*; Mykolo Romerio Universiteto Leidybos Centras: Vilnius, Lithuania, 2011.
46. Hong, L.; Page, S. Groups of Diverse Problem-solvers Can Outperform Groups of High-ability Problem-solvers. *Proc. Natl. Acad. Sci. USA* **2004**, *101*, 16385–16389. [CrossRef]
47. Royo, S.; Yetano, A. "Crowdsourcing" as a tool for e-participation: Two experiences regarding CO_2 emissions at municipal level. *Electron. Commer Res.* **2015**, *15*, 323–348. [CrossRef]
48. Krause, S.; James, R.; Faria, J.J.; Ruxton, G.D.; Krause, J. Swarm Intelligence in Humans: Diversity Can Trump Ability. *Anim. Behav.* **2011**, *81*, 941–948. [CrossRef]
49. Engel, D.; Woolley, A.W.; Jing, L.X.; Chabris, C.F.; Malone, T.W. Reading the Mind in the Eyes or Reading between the Lines? Theory of Mind Predicts Collective Intelligence Equally Well Online and Face-To-Face. *PLoS ONE* **2014**, *9*, e115212. [CrossRef] [PubMed]
50. Arniani, M.; Badii, A.; De Liddo, A.; Georgi, S.; Passani, A.; Piccolo, L.S.G.; Teli, M. *Collective Awareness Platform for Sustainability and Social Innovation: An Introduction*; European Commission's DG CONNECT: Nice, France, 2014.
51. de Paolo, A.M. Cooperation: Enjoying Collective Intelligence. In Proceedings of the Collective Intelligence Conference, Santa Clara, CA, USA, 31 May–2 June 2015; Available online: http://sites.lsa.umich.edu/collectiveintelligence/wp-content/uploads/sites/176/2015/05/Merletti-2015-CI-Abstract.pdf (accessed on 8 December 2020).