

E.2 Why they participate – motivational functions of digital platforms for bottom-up urbanism

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Research

1 Introduction

Public participation is an increasing topic in the context of smart cities. In general, we differentiate between top-down and bottom-up participation. But when we dig deeper there are several variations of participation from mobile participation (Ertiö, 2015) to planning the city space through Minecraft (Falco & Kleinhans, 2018). As there is a strong focus on technocratic and expert-driven forms of smart cities (Simonofski, Serral Asensio, De Smedt, & Snoeck, 2019), the means of participation can lead towards tokenism. Therefore, we see a pivot towards a more citizen-centric approach of smart cities.

On the one hand, the relationship between citizens and the government is changing. Citizens evolve from residents to co-creators and the government, once the administrator of the city, is becoming a collaborator (Foth, 2017). On the other hand, the citizens perspective is not present, as studies which explore the motivations of the engagement of citizens are not in the focus of researchers (Tomor, Meijer, Michels, & Geertman, 2019). However, this perspective seems to be necessary since motivation can lead to increased participation if opportunities are created and designed to have fun (Wijnhoven, Ehrenhard, & Kuhn, 2015).

A rising concept for a citizen-centric approach are participatory platforms which offer “citizen control” of Arnstein (1969) by enabling bottom-up participation and framing the playground for citizens in their city where they are provided with self-governance (Abel, Miether, Plötzky, & Robra-Bissantz, 2021). The motivation to use those platforms is considered an important challenge but is not deeply researched (Simonofski, Hertoghe, Steegmans, Snoeck, & Wautelet, 2021). Which leads us to our research question: *What are the motivations of citizens to participate on bottom-up urbanism platforms?*

Motivations are broadly researched and elaborated in the field of volunteering (Güntert, Strubel, Kals, & Wehner, 2016). Citizen participation can be seen as a voluntary activity with the goal of a collective decision making and an influence on urban design (Verba, Scholzman, & Brady, 1995). Our focus on bottom-up participation and self-governance of the activities has an even greater overlap with volunteering considering the autonomous decision making that lies in the concept. Citizens are the source of the ideas and take care of the implementation themselves (Manzini, 2014).

Therefore, their motivations are key success factors. By deliberately addressing the motivations, voluntary citizens can also be won over for activities and projects in the future (Güntert et al., 2016).

Motivation arises from a motive (“an individual’s psychological disposition” (Leimeister, Huber, Bretschneider, & Krcmar, 2009)) and from a situation where incentives trigger certain behavior (Wijnhoven et al., 2015). The widespread functional theory describes the dynamic processes with different functions that explain a certain part of motivation. The understanding function of the voluntary function inventory (VFI, Clary et al., 1998) for example contains motives related acquiring new knowledge or skills.

Motivation is triggered by individual and social functions. These functions are the origin when we start and sustain action. The control is not directly explainable, and we see one person and another doing the same task being triggered by different functions. The VFI is broadly used and approved in recent studies (Chacón, Gutiérrez, Sauto, Vecina, & Pérez, 2017). The functions contain:

- *Values* express what is relevant in relation to altruistic and humanitarian realms.
- *Understanding* is oriented in terms of knowing, collecting and improving competencies, skills and experiences.
- *Career* is seen where knowledge is acquired, or advantages are gained in professional related to business or professional areas.
- *Social* acts to fulfill expectations in personal environment.
- *Protective* is oriented on distracting of the own problems or feel better in relation to others.
- *Enhancement* is centered around the own achievements, self-development and feeling important.

Since there is no evidence in the field of bottom-up urbanism and motivation is too complex to understand based on a single theory (Wilson, 2000), we supplement the VFI with the experience function by Stefan T. Güntert, Neufeind, & Wehner (2015) and intrinsic motivation by Millette & Gagné (2008):

- *Experience* is divided between the bond with the city environment and the excitement to engage in activities.
- *Intrinsic Motivation* expands the Understanding by a more autonomous exercise of the activity itself.

In the previous work on participatory platforms, we found 23 platforms out of a pool of 143 platforms that offer self-governance and a bottom-up approach to empower thousands of people and help them realize their projects (Abel et al., 2021). Our research on motivations is based on two studies: a quantitative study to investigate the usability of VFI with our additions, and a qualitative study with the platform operators of participatory platforms to prove the applicability in the practical domain.

Enhancement	Understanding	bottom ^{up} city.org
Values	Social	Experience
Career	Protective	Intrinsic Motivation

Figure 1: Tool of motivational functions for bottom-up urbanism on participatory platforms

Our findings show that the set of items Enhancement, Understanding, Values, Social, Experience, Career, Protective, Experience and Intrinsic Motivation define a comprehensive base to evaluate the motivations and that practitioners can derive structural elements for their participatory platforms.

2 Methodology

In a design-science research (DSR) approach we developed a supporting framework not only to evaluate the motivations, but to build participatory platforms based on the motivation of the citizens. The development is guided along the five-phase cycle of the General Methodology of DSR according to Vaishnavi & Kuechler (2015). First, we conducted a literature review based on the motivational functions of participation to gain a general understanding for this approach. We extracted a questionnaire of established constructs of the VFI by Clary & Snyder (1999) in the German adaptation from Oostlander, Güntert, Schie & Wehner (2014) and supplemented the VFI with two more constructs. Second, the questionnaire was distributed through social media channels, forums of participatory platforms and directly via mail to project teams and the platform operators. It was filled out by users (n = 155) of eleven existing platforms around the world (stratified sampling, Patton, 2014). Third, in an exploratory factor analysis (see table 1) we extracted the underlying factors to form a comprehensive model to evaluate motivations of citizens to participate. Fourth, we evaluated the model within a workshop in which the platform founders used our tool to align the findings with the existing structure.

3 Results

Study 1 From the eleven platforms of the sample we received $N = 155$ completed questionnaires. The participants were 49.7% female, 48.4% male and 1.9% diverse. The mean age was $M = 36.39$ years ($SD = 13.77$; range: 18 - 78 years). 39.4% were students, 36.8% were employed, 11% were self-employed and 12.9% stated 'other' as their type of employment.

Since the VFI was expanded and was also tested in a new context of bottom-up urbanism, an exploratory factor analysis (EFA) was deemed necessary to assess the factor structure to investigate. Variables that correlate strongly with each other are combined into one factor. Factors are determined that explain the observed relationships between the factors as comprehensively and completely as possible (Backhaus et al., 2018). As a supplement to the EFA for each identified factor a reliability analysis was performed to examine internal consistency (Cronbach, 1951) with an additional criterion: (1) each Factor had a value greater than or equal to 1 (Kaiser, 1974), (2) each item had a factor loading equal to or greater than .5 (Backhaus, Erichson, Plinke, & Weiber, 2018; Hair, Black, Babin, & Anderson, 2010), (3) a factor consisted of at least three items (Hair et al., 2010), (4) identified factors and their items can be interpreted in the theoretical context.

The variables SW5 and W5 did not load on any factor greater than .5 and were therefore eliminated.

Table 1: exploratory factor analysis (EFA)

factor	item	factor load	Cronbach's α
Career (K)	K2	,82	,89
	K1	,81	
	K4	,75	
	K4	,71	
	K5	,57	
Enhancement (SW)	SW3	,80	,88
	SW2	,76	
	SW1	,69	
	SW4	,56	

Protective (S)	S1	,71	,85
	S5	,66	
	S2	,62	
	S4	,61	
	S3	,56	
Social (SA)	SA4	,83	,86
	SA5	,78	
	SA3	,76	
	SA1	,64	
	SA2	,54	
Understanding (E)	E2	,77	,88
	E3	,74	
	E4	,68	
	E1	,65	
	E5	,63	
Values (W)	W3	,78	,84
	W1	,74	
	W2	,72	
	W4	,67	
Experience (EXP)	C2	,73	,90
	C3	,70	
	C1	,55	
	EX2	,82	
	EX1	,74	
	EX4	,64	
	EX5	,61	
	EX3	,51	
Intrinsic Motivation (INTRIN)	INTRIN1	,83	,86
	INTRIN2	,76	
	INTRIN3	,66	

Verification of the Kaiser-Meyer-Olkin criterion (sample suitability: .85 and Bartlett-Test highly significant ($p < ,001$)) and the scree plot justified the extraction of eight factors, each with values greater than 1, explaining an overall variance of 62.88%. The respective items each loaded $>.5$ on the assumed factor, so that they can be assigned to the previously postulated factor according to existing conventions (Backhaus et al., 2018; Hair et al., 2010). Internal consistency was high for all eight factors (all Cronbach's alpha $>.8$).

Most of the participants came from the platforms *wechange* (N = 64, 41,3%) and *Sandkasten* (N = 50, 32,3%). The measured importance is shown in figure 2. The motivations are significantly higher at the *Sandkasten* platform except Values and Understanding. Both platforms share the same ranking of the importance (1 – “not at all important” to 5 – “completely important”) of the single functions.

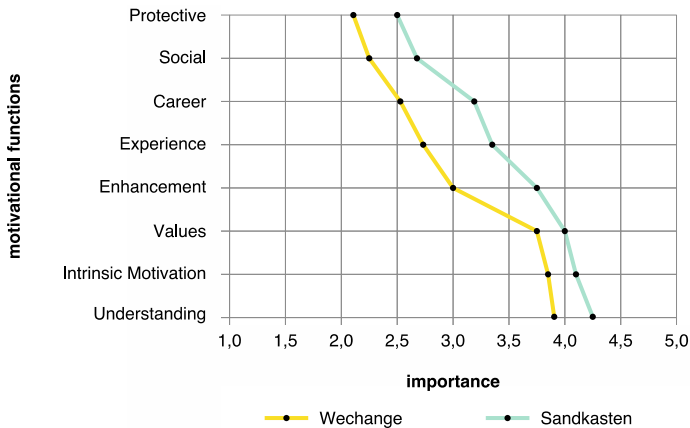


Figure 2: motivational functions and their importance

Study 2 In the more in-depth study we presented the results from study 1 to some team members of the platforms *wechange*¹ and *Sandkasten*². Both sessions were a mix of presentation (30 minutes) and a workshop part (60 minutes) where the operators used the motivational functions to explain citizens behavior and the usage of their platforms. One team was composed with two male participants with one short and one long affiliation to the company behind the platform. The other team consisted of two female and one male participant with a mix of short and long affiliation to the platforms company. All participants were from various positions but are all included in design decisions of the platform.

The workshop and the following discussion showed the usage of the tool with the specific functions and an overall experience to work with motivation in general:

Enhancement is seen as a central role of each platform. It is directly linked to the participation mechanisms on the platform (e.g., sharing of infrastructure or starting a project) which are the interaction tools between the users.

¹ <https://wechange.de/>

² <https://www.sandkasten.tu-braunschweig.de/>

The platform is a communicator of the achievements and a mediator of general supply and demand construct. Where some people see a need for projects, other people join their work or support in other ways (e. g. crowdfunding).

Understanding seems to be happening in the “experimental space” of a participatory platform with a low threshold to engage with people and their topics. By communicating about the projects the understanding function is triggered to move to action or sustain motivation by the people from the project which is presented. This then is multiplied in the community as a whole which strongly identifies themselves with their actions. The space of participatory platforms is even seen as a complementary space to acquiring new knowledge or improving skills which is not offered, for example, in the studies at the university.

Values are the cohesion of the community with the focus of discussions, expressed through projects and reflected in communication. In multiple forms of the communication on the platform the values are directly addressed (“There is nothing good, unless you do it”) and state what to expect if you are joining the community. In the case of *wechange* the platform seems to be a product of the values itself: The company is cooperative, which is independent from big shareholders, they highly value privacy and do not sell any data or offer advertising opportunities and the platform is open-source and hosted by a sustainable IT-provider.

Social in the context of participatory platforms is pulled away from the personal environment and drawn to the community environment. One is triggered by the activities in the community which have a dominant role in the communication of the platforms. The community “pushes” with a positive attitude to being active and sustain their work. But social adjustment is functioning in groups of the personal environment as a low threshold to participation on platforms. This also is an observation in the community where project leader draw collaborators. As the project team grows and is more visible it draws even more collaborators into the project.

Experience is bond to physical events. At *Sandkasten* there is a feeling of togetherness on the campus connected through the experiences at events or places which have arisen from projects (e. g., benches of old pallets). This even is shown through being a part of the community on the platform and actively participate in the design of the environment. Using this feeling is again a central theme in the communication strategy (e. g., “your” campus or “we” are doing it together). At *wechange*, there seems to be less excitement or fear of missing out. But in the community space on the platform we see several possibilities to participate at local events and to find them.

Career appears as a clear concept in motivational functioning. Project related experiences are a foundation to career competencies. They do not necessarily have to be externally approved or written down but push the self-esteem and work as stories to ground the competencies if needed. Even if the work on participatory platforms is voluntary it can lead to employment relationships in the very field of expertise gained on the platform or it can lead people to found companies. In addition, *wechange* and other platforms offer places for job advertisements from companies with the same values as the platform itself.

Protective is not causing a motivation but acts as anti-motivation for participation. At *Sandkasten* the observation is that people are not participating if they are not feeling to well, are not successful with their studies or are not equipped with money to not work in their spare time. And the theme of protection is reinterpreted to a more general understanding of protection of the environment by working in projects in this field.

Intrinsic motivation is the all-encompassing function to the motivation to participate. It acts as the identification with the project and the work to be done itself. As a foundation, the work on the project resonates to just be enough and triggers sustained motivation on almost every step along the way.

In general working with the tool of motivational functions gave the participants a new perspective on their daily work. It helps them focus on the users with a measurable outcome and a scientific foundation that is seen as valuable for decision making. But the functioning of single parts of the platforms (e. g., participation mechanisms or communication campaigns) are not solely linked to one motivational function but seem to be attributed to two or more functions. And because of the intrapersonal view of motivation, the participants missed a perspective of individuals as part of a community which is not properly explainable with this tool. The presentation of the tool and the implementation in the workshop felt difficult to totally understand the functions. The participants therefore needed more time to use the tool in more in-depth manner to identify the functioning holistic. The workshop could have given more time for the self-analytical part and should be done more regularly with re-interrogation of the characteristics and changes in the motivational functions.

4 Discussion & Conclusion

Overall the VFI and additional functions *Intrinsic Motivation* and *Experience* show a high rigor and fit for the topic of bottom-up participatory platforms. Our findings in terms of importance for the citizens align with the meta-study from Chacón et al. (2017) where the other-oriented functions Values and Understanding show higher scores than self-oriented functions *Career* and *Protective*.

In comparison of the platforms *wechange* and *Sandkasten* we measured a clear and, in some parts, significant difference of the importance of the motivational functions (figure 2). An explanatory approach could be the focus of the platforms: where *wechange* is focused on discussions, *Sandkasten* is focused on implementation of projects (see Abel et al., 2021). This could lead to higher engagement and motivation of the citizens because of the concrete outcomes. A more hands-on mentality may be more fitting to motivate participation than an analytical approach to solve problems that lead to conceptual solutions.

The study 2 with the operators of the platforms offers a more detailed view into the interpretation of the functions. The specific understanding for example with *Protective* seems not to fit the mindset of the operators and the citizens. The new examples and application in context of the bottom-up urbanism should lead to adapted und rethought definitions of the functions. Our understanding from over 20 years, where Clary et al. (1998) started, has changed in some parts of our society where digital platforms offer new ways of volunteering and the climate crisis made us work on different topics.

Even though the tool shows a high relevance for their work, handling and understanding were not clear or properly developed. So, the presentation and the scientific guidance for example to survey the data should match the skills and needs of the platform operators.

It is questionable if the sample size of the study which comes mostly from two platforms shows a representative result. Both platforms come from Germany. Therefore, the results should only be transferred and interpreted on the basis of a renewed regional study. These studies were focused on the citizens, but future research must achieve different perspectives to draw a holistic picture. The voluntary and participatory systems, and therefore the motivations, can be enhanced autonomy supportive structures (Li, Wu, & Kee, 2016) that are not only influenced by the platform operators but by the city government motivation (see Huang & Feeney, 2016).

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