OPEN NETWORKS – COMMON PATH TOWARD SUSTAINABILITY

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ABSTRACT

In order to improve sustainability and quality of personal life, as well as to achieve many other specific goals, all social individuals and especially their leaders, design and apply different organizational models. The growth in social complexity requires invention and application of significantly different models of organization than those that are used in less complex surroundings. Since they tend to improve freedom of choice, independence, flexibility, cost reduction and simplifying of complex procedures, open networks ensure that the benefits of cooperation may be distributed between significantly larger number of individuals than is the case with closed networks.
1. INTRODUCTION

Despite of remarkable progress in the fields of science and technology, our society is still officially organized on the outdated paradigms and organizational, cultural and educational models that seriously jeopardize its sustainability and survival. Practical examples that confirm this claim can be found on every corner.

A problem of inequality between rich and poor people is getting bigger and bigger. As Piketty (2014) emphasizes, the main driver of inequality - the tendency of returns on capital to exceed the rate of economic growth - today threatens to generate extreme inequalities that stir discontent and undermine democratic values. How big this differences are shows Oxfam’s report (2015), presented on the annual World Economic Forum meeting which was held in Davos in 2015., by predicting that the richest 1% will own more than all the rest by 2016. By taking all this into account it is quite obvious that our society has not yet managed to identify organizational model that will ensure balanced social development.

At the same time environmentalist and ecologists are constantly trying to warn us that actual consumer culture isn’t sustainable and ecologically acceptable. If total human population growth, that will reach 8.4 billion by mid-2030, and 9.6 billion people by mid-2050, stays accompanied by consumer, egoistic and selfish culture this will provide such an enormous pressure on our environment that we should start preparing ourselves for some sort of collapse even if it will not come in its full scope and scale. According Asquith et al. (2015) the growing scale in complexity of humanity's interactions and environmental impacts suggest that new governance models are both necessary and desirable. Hence the question is not should we change our organizational and behavioral patterns, but how should we do it.

To expect any kind of positive change toward sustainable social re-organization, first necessary step is to educate critical mass of people - not only about a need for a change, but even about methodology that can be used. Fortunately this is already happening. As Schieffer and Lessem (2014) emphasize, in many parts of the world, from Zimbabwe to Egypt, form Nigeria to Slovenia, there are innovative approaches in holistic development and integral education that demonstrate their potential. The second step in so needed social re-organization is to recognize and develop organizational models that will ensure integration, cooperation and further education of people who are willing to collaborate in solving of specific social problems and needs. At this moment there are at least three developmental ideas which suggest how our society should be re-organized and these are: democratic, technocratic and open model.

The problem of this research stems from the fact that our society is still in an open quest for the organizational model that could most easily reduce problems of ecological overload and strong social segregation. Presented paper suggests that phenomenon of open networking should be regarded as highly efficient and practical tool in dealing with these complex tasks. The purpose of this research is to demonstrate that tendency toward integrative policies in the form of openness becomes the core strategy of private and public organizations that are
trying to increase participation, innovation, motivation and satisfaction of their users and/or customers. Additional goal of this paper is to investigate key features of open networking and qualitative differences in its organizational design. To clarify its main hypothesis this paper seeks to provide answers on the following questions:

- Why do we need more open networks?
- What are the main advantages and disadvantages of open networks?
- How to design an open network?

Presented paper consists of four closely associated sections. Section one explains the problem of the research, purpose of the research and its main objectives. Section two explains methodology of the research. Section three opens up discussion about three organizational models that our society follows and points out the literature that is closely connected with it. Moreover, this section explains main advantages and disadvantages of open networking and tries to stress out the main guidelines about design of open networks. Section four brings conclusive remarks and responses to introductory questions.

2. METHODOLOGY

Methodology of presented research is primarily based on excessive qualitative analysis of the literature and practical examples which are closely connected with holistic and system thinking, social re-organization and sustainable living. Application of these insights into economic sphere implies that the goal we want to achieve can never be observed regardless from the means and methods by which we strive to achieve it. For example, sustainable economies is the one which tries to save time and resources and in this kind of society measure of success is not the working time, but the free time. From holistic economic paradigm the question „How to reduce costs?” is more fundamental than the question „How to make profit?” (Rafajac and Safić: 2013) and it is because the knowledge about reduction of costs ensures better embedding in our own environment and provides savings of resources-energy in dealing with tasks and challenges (time-entropy) that may arise from increment in complexity.

3. RESULTS

Since every new level of social complexity creates new specific problems, our society is compelled to continuously improve its behavioral and organizational patterns. In order to overcome its actual problems of excessive inequality and extreme ecological overload, our society seeks new organizational models that will ensure significant reduction of costs and higher levels of social cohesion, cooperation and collaboration, from those that are currently
achieved. As it is shown in figure 1, in contemporary literature is possible to detect three main proposals that suggesting how to carry out this socio-economic transformation and these are: democratic, technocratic and open model.

**FIGURE 1:** Three main courses of socio-economic transformation

![Diagram showing three main courses of socio-economic transformation](image)

*Source: Made by authors*

First model relates to all those who are promoting an idea of economic democracy and includes growing number of economists, sociologists, philosophers, social activists and authors such as Dahl (1985), Yearwood (2004), Engler (2010), Maheshvarananda (2012) and others. Economic democracy is a socio-economic arrangement in which the local economic institutions are democratically controlled. There is no doubt that respecting each others’ opinions is important for maintaining positive relationships. Organizations that allow everyone’s voice to be heard are usually more successful in motivation and commitment of interrelated individuals, than those that do not allow an ongoing conversation. However, if everyone's opinion is taken as a decisive management tool in organizational context, (especially there where the most of members do not know each other), then this usually brings more problems than benefits. The biggest problem is hidden in the voters themselves who may be irrational and/or highly uninformed about many political issues. Additional problems of democracy are related with its propensity toward: uncontrolled rise in bureaucracy; too much rules; tyranny of the majority; political instability; lack of political education; etc. For all this reasons democratic model of governance usually produces average results and sometimes even worse than that. Most proponents of the democratic model propose and support closed and semi-closed systems of governance.

Second developmental course is the technocratic model. Advocates of this model can be found between economists, engineers, sociologists, futurists and in many cases between people who are already on some positions of power. The technocracy represents a model of social governance in which technical decisions and leadership positions are selected on the
basis of specialized knowledge and performance, rather than on democratic elections where participate even those without such knowledge or skills. Among writers who promote this model of social governance the most prominent are Scott (1933), Keyes and Fresco (1969), Veblen (1994) and Bell (1999). Advocates of this model usually base their proposals around technology, information control, deep hierarchy and top down approach which all correspond with strictly closed and only sometimes semi-closed systems of governance.

In the opposing camp are the authors, such as Rivers (1993) and Mejias (2006), who are trying to stress out that an uncritical approach in application of technology may compromise our own human nature and well-being. According to philosopher Aničić (2015), the first problem with the technocratic worldview is hidden in the ontology of the term “techne” (Ancient Greek: τέχνη is often translated as "craftsmanship", "craft", or "art"). Defining and evaluation of the virtues that certain society supports and encourages are the processes that occur within the lens of the society in which they exist. In The Republic written by Plato around 380 BCE the definitions of justice, the order and character of the just city-state and the just-man were quite different than those that we use these days. The second problem of technocracy is that nobody can be smart enough to comprehend all knowledge and information that are needed in management of complex systems – even if he has a supercomputer. For example, being a qualified doctor may not mean you're capable of making health policy decisions. The third problem is consisted in the fact that conducting of empirical research and finding of answers represents only one side of the management. The other side involves work on the subjects such as: ethics, motivation, liberty, equality and fairness, (...), and these are all qualitative issues that cannot be successfully managed in any other way but through wide social consensus and dialogue. Other problems of technocracy are: tendency to oligarchy where power is concentrated among a few professionals; lack of morality; biasness; etc. Of course, all this criticism does not mean that the smart use of technology may not be extremely useful in dealing with complex social problems such as ecological overload and economic inequality. At the very end, the problem is not in technology per se - it is in the way we use it.

The third management model relates to all those who are promoting an idea of open networking. Unlike the two previously discussed models in this type of governance most organizations are semi-open or completely open. In this special case, a network represents a group of two or more individuals linked together through some sort of communicational infrastructure, while openness is defined as readiness of individuals and organizations to cooperate in such a way that the benefits of their cooperation can be distributed to others with as few obstacles as possible. Due to this decision (preference), to be (at least in its core aspects) free and accessible for everyone, open networks manage to achieve far greater impact on the society in which they operate, than is the case with closed and semi-closed networks. For example, copy-left book and open source software may reach far greater number of users unlike those that are expensive and copyright protected. Since the difference in openness between different organizations in practice may be quite vague, in this category of open networks some authors include even those organizations that are not completely
opened. For example, organizations such as eBay, Airbnb, Zipcar, Google, Facebook, (...), are all semi-opened networks but with clear tendency to accept everyone who wishes to cooperate under certain conditions and for this reason they can be accounted into the category of open networks.

In orthodox camp are authors who claim that these organizations, despite the fact that they advertise themselves as open, cannot be considered as such, since in its core sense open model of governance is closely connected with the open source movement and peer-to-peer (P2P) paradigm. Some of the main proponents of this model are Tornvalds and Diamond (2001), who wrote about development of the Linux, and Kostakis and Bauwens (2014), who are co-founders and activists of the P2P Foundation. As Stalden (2005:19) explains, products and services of open networks are result of voluntary collaborative effort of a large number of individuals who each pursue diverging personal and collective agendas when participating in this process. Some of the main motivations for engaging in open networks are peer recognition, efficiency, aesthetic pleasure, financial gain or particular social or political belief.

When discussion goes toward open networking it is possible to distinguish two main processes: peer production and peer governance. According to Benkler (2007), commons-based peer production is the process in which the inputs and outputs are shared, freely or conditionally, in an institutional form that leaves them equally available for all to use as they choose at their individual discretion. To ensure that the knowledge generated is available for free use, commons-based projects are usually shared under some sort of open license (GNU, Creative Commons, Copyleft).

Moreover, Benkler (2007) notes that peer production enterprises have two primary advantages over traditional hierarchical approaches to production:

- **Information gains**: Peer production allows individuals to self-assign tasks that suit their own skills, expertise, and interests. Contributors can generate and share dynamic content that reflects the individual skills and the "variability of human creativity."
- **Allocation gains**: Great variability of human and information resources leads to substantial increasing returns to scale to the number of people, resources and projects that may be accomplished without need for a contract or other factor permitting the proper use of the resource for a project.

Peer governance is a mode of bottom-up participative decision-making process that in production and management of common values tries to stay open as much as possible. Leading by example is the core developmental strategy in the open model of governance. According to Kostakis (2010), the main characteristics of peer governance are equipotentiality, heterarchy, holoptism (the ability for any participant to see the whole), openness, networking, and transparency. As Bauwens (2005) emphasizes, the aim of peer governance is to maximize the self-allocation and self-aggregation by the community, and to have forms of decision-making that do not function apart and against the broader
collective from which they spring. Even though at these days open source software and P2P projects can be found around every corner, in mainstream economic science, politics and culture, their significance (and fundamentality) is still not adequately recognized and valorized. For this very reason, one of the key goals of this paper is to point out why open networks are so important. As it is shown in the figure 2, openness enables transparency which fosters diversity, which in turn reinforces openness. In other words, without openness and transparency, there cannot be enough mutual trust that is curial ingredient of social networking, knowledge sharing and innovation. Since they are not managed through command and control in open networks mutual trust becomes main fuel of economic transformation.

FIGURE 2: Why is openness so important?

Source: Jarche (2012)

The main advantages of open networks are:

- _Freedom of individual choice and independence_ – only in this type of networks individuals are completely free to choose their own way of doing things without forced subjugation to the majority or superiors;
- _Flexibility_ – diversity of connections, solutions and approaches which is inherent in the open model arrangements ensures simple and quick adjustment of all elements in the case of any risk and constrain, which in turn provides dynamic stability of open systems;
- _Cost reduction_ – since open networks tend to include everyone who are interested in cooperation, economy of scale and scope ensure that products and services within open networks are usually free or extremely cheap in relation to the added value that is produced;
- **Simplifying of complex procedures** – even though on the micro-perspective everything that is cheap and accessible doesn’t have to automatically be simple for use, from macro-perspective it become obvious that most products and services that are designed to be open and accessible significantly simplify procedures which are related to their acquisition;

- **The realization of other goals that would otherwise be unattainable** - this relates to all socially important goals that could not be achieved without large scale cooperation and collaboration such as: ecological sustainability, detection of corruption, education, healthcare, (...).

Even though open networks are irreplaceable in attaining of above mentioned social tasks, they still have some deficiencies that should be identified and reduced. One of very few authors who critically examine openness is Tkacz (2012), who recognizes that concept of openness implies antagonism, or something that the language of openness would describe as closures. Even the most open projects, such as Linux, have same closures, such as rules and licenses that try to ensure that these projects stay open as they were originally designed. Since at these days there are so many different projects and networks that are advertised as open, Tkacz (2012) claims that ambiguity of the term open has led to the point where discussion about it may become flawless. Other authors, such as Janssen et al. (2012), claim that concept of opening of all data may in some aspects even be negative if additionally increases complexity and that open data add no additional value unless they are used by someone with proper knowledge of interpretation.

The main drawbacks of open networks are:

- **Unclear purpose and vision** - the unfounded idealization of open networks won’t help in their promotion. There are specific areas of socio-economic life, such as security and payment issues, that cannot be successfully managed through open networking;

- **Short-term decrease in competitive advantages** – while in the short-term period open exchange of information may cause a decrease in competitive advantages of those who are involved, in the long-run openness usually supports innovations and sustainability;

- **High dependence on the morality and ethics of the participants** – since they tend to be open for everyone, open networks can be easily abused from those who don’t share the same values, morality and ethics. For this reason, founders of open networks are usually trying to develop technical solutions and organizational rules that will prevent this type of behavior;

- **The lack of privacy** – in some cases, participation in open networks can cause the privacy problems for those who are involved. Education of participants about this issue can be very helpful.

Despite the fact that democratic, technocratic and open models are mutually pervasive and interdependent (see figure 1), deeper analysis shows that open networking represent a fundamental principle of organization and governance. In other words, neither democracy nor technocracy would be able to achieve their current potential, without open exchange of
information and knowledge. In similar way, open networking could never reach its actual potential without technological progress (in exchange of information) and democratic values that support righteousness.

If we are ready to follow the same terminology that Raymond (2001) applied in order to indicate the differences in open source software design, the architecture of open networks can also be classified in two basic models: Cathedral and Bazaar. Within cathedral-open network specific benefits of every level (e.g. profits), are mainly distributed between members of that level, while everyone else share the same core benefit (e.g. information and web-shop). An example is the eBay. Within Bazaar open networks there are no special benefits between different organizational levels and users. This type of open network is still quite rare and can be linked with Linux operating system; Wikipedia; TPB network; etc. By analyzing several different open source projects Benkler and Nissenbaum (2006) have recognized three common characteristics in their organizational design and these are:

- **Modularity** - objectives must be divisible into components, or modules, each of which can be independently produced. That allows participants to work asynchronously, without having to wait for each other's contributions or coordinate with each other in person;

- **Granularity** - which refers to the degree to which objects are broken down into smaller pieces (module size). Different levels of granularity allow people with different levels of motivation to work together by contributing small or large grained modules, consistent with their level of interest in the project and their motivation;

- **Low-cost of integration** - standardization within the same developmental framework and independent quality control represent the main mechanisms by which the modules are integrated into a whole end product.

Google’s innovation ecosystem offers a basic example of a cathedral open network design (see figure 3). By providing a cheap, commodity platform, Google has encouraged a broad range of content providers, consumers, innovators and advertisers to build applications, share data, and purchase services in a way that allows it to crowd-source ideas and then “cherry pick” and invest in the best of these (Fishenden and Thompson, 2012). As O’Reilly (2010) argues, the secret to the success of bellwethers like Google, Amazon, eBay, Wikipedia, Facebook and Twitter is that each of these sites, in its own way, has learned to harness the power of its users to add values to …(and), to concretely its offerings. From organizational point of view, all these platforms play the role of a keystone - the component that holds all others in place.
FIGURE 3: Google’s Innovation Ecosystem

Source: Iyer and Davenport (2008:4)

According to Iyer and Davenport (2008), since neither Google nor third-party developer knows whether customers will find them useful, investing in this type of products and services can be very speculative. However, if customers find usefulness then they benefit from faster access to more profuse innovations; Google benefits because it creates additional options for driving incremental traffic; third-party developer benefits if one of its applications creates enough value to warrant negotiations with Google to arrange a revenue-sharing deal. The business strategy of cathedral open networking can be summarized in the following question: How can we, with this what we got, create something that will be worth several times more in a way that some people will be ready to pay for some of our services, while everyone else will get our core service/product and added value for free? In most cases, open network architecture is based on the “tight-loose” principle. This means taking the strict control over strategic items—platform, rules, communications and licenses; while everything else beyond this orbit should be left to the third party developers and final users.
At recent time, there are more and more authors who support an idea of open e-government and suggest that implementation of an open model of governance in public sector may ensure reduction of costs and higher levels of innovation and citizen participation. Their claims are confirmed by Sojung and Thompson (2013) who have analyzed South Korea’s e-Government Open Source Initiative and noted six main lessons for managing Development Framework Ecosystems that are presented in Table 1. As Fishenden and Thompson (2012) note, the implementation of an open model of governance in the public sphere can be seen as the disintegration of tightly integrated, proprietary systems traditionally organized around the supplier and service provider – and their re-aggregation, in the form of services, around the citizen in such a way as to take advantages of the utility economies of a rapidly evolving service marketplaces.

**TABLE 1. Six Lessons for Managing Development Framework Ecosystems**

| - Focus on collective stakeholder benefits to secure buy-in; |
| - Evolve from open sourcing to open outputs; |
| - Operate openly but under strong formal governance; |
| - Develop horizontal infrastructure and vertical domains concurrently; |
| - Build trust and open source software mindset for ecosystem cohesiveness; |
| - Extend the development framework for use with emerging technologies and in other countries. |

*Source: Sojung and Thompson (2013)*

According to the United Nations E-Government Rankings 2014, South Korea and Netherlands are the best countries in the category of “e-participation”. In the report named United Nations E-government survey (2014) is said that there are seven key criteria that enable e-participation: archived information; public datasets on government performance, such as in education; access to government websites in more than one language; social networking features; e-consultation mechanisms; online polls and consultation tools; and e-decision making tools.
FIGURE 4. Top 50 countries on e-participation, by region (A) and by income level (B)


The UN E-government survey (2014) recognizes three basic stages of e-governance: provision of information online and upon demand; consultation of citizens before designing public policies and services; and empowerment of people through co-design of policy options and co-production of public services. Figure 4A shows that European and Asian countries are leading in development of e-governance models, while figure 4B implies that transformation toward electronic forms of governance is the most frequent in high and upper middle income countries.

Table 2 lists the countries that score more than 66.6 per cent in all three stages of e-participation. These are all high income countries except for Colombia, which is an upper middle income country. While the figure 4B shows that higher incomes are in positive correlation with e-participation, the table 2 implies that there are not many countries in the world which can achieve this. The top two countries, the Netherlands and the Republic of Korea, are tied with an average total score of 90 per cent provision of all the services assessed.

<table>
<thead>
<tr>
<th>Country</th>
<th>E-information (%)</th>
<th>E-consultation (%)</th>
<th>E-decision making (%)</th>
<th>Total (%)</th>
<th>Income level</th>
<th>Region</th>
</tr>
</thead>
<tbody>
<tr>
<td>Netherlands</td>
<td>96.30</td>
<td>86.36</td>
<td>77.78</td>
<td>89.66</td>
<td>High</td>
<td>Europe</td>
</tr>
<tr>
<td>Republic of Korea</td>
<td>96.30</td>
<td>81.82</td>
<td>88.89</td>
<td>89.66</td>
<td>High</td>
<td>Asia</td>
</tr>
<tr>
<td>Uruguay</td>
<td>88.89</td>
<td>95.45</td>
<td>66.67</td>
<td>87.93</td>
<td>High</td>
<td>Americas</td>
</tr>
<tr>
<td>France</td>
<td>96.30</td>
<td>77.27</td>
<td>77.78</td>
<td>86.21</td>
<td>High</td>
<td>Europe</td>
</tr>
<tr>
<td>Japan</td>
<td>85.19</td>
<td>86.36</td>
<td>88.89</td>
<td>86.21</td>
<td>High</td>
<td>Asia</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>96.30</td>
<td>77.27</td>
<td>77.78</td>
<td>86.21</td>
<td>High</td>
<td>Europe</td>
</tr>
<tr>
<td>Australia</td>
<td>92.59</td>
<td>77.27</td>
<td>77.78</td>
<td>84.48</td>
<td>High</td>
<td>Oceania</td>
</tr>
<tr>
<td>Colombia</td>
<td>74.07</td>
<td>81.82</td>
<td>88.89</td>
<td>79.31</td>
<td>Upper middle</td>
<td>Americas</td>
</tr>
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</table>

Equally noteworthy are those countries that offered the greatest number of e-decision-making services. They represent features that allow the most active participation by citizens in influencing decision-making about public policies and services. Three countries, the Republic of Korea, Japan and Colombia, offered the greatest number of e-decision-making features at 89 per cent each.

4. CONCLUSION

Although an idea of a society governed by experts sounds tempting, especially in a crisis, history has shown that this model of governance works the best only in brief stints when was necessary to clean a mess made by incompetent and squabbling politicians. Since in any country powerful lobbies haggle and wrangle, even a wholly technocratic government can never fully escape politics. For this reason unconstrained technocracy gives no guarantee of good ideas or decisions. The same goes for democracy that cannot overcome the problem of incompetent voters. Third developmental course, that at recent years is gaining more importance, in both private and public sphere, is the open model of networking and governance. In most general sense, open networks are those that without any compulsion tend to distribute their core added values to all their members with as less restrictions as possible if they are ready to follow given rules of behavior.

By providing common development framework, open networks are in position to: enhance productivity of their members by using common modules and standard templates that minimize duplication of work; increase component reusability and interoperability by using standard codes and design interfaces; qualitatively improve communication, cooperation and cohesion between its members; significantly reduce segregation and total cost of organization. The main advantages of this kind of organization are; freedom of individual choice and independence; flexibility; cost reduction; simplifying of complex procedures and realization of other goals, such as ecological sustainability, detection of corruption, free education, (.), that would otherwise be unattainable. The main drawbacks of open networks are: unfounded idealization or unclear purpose and vision; short-term decrease in competitive advantages; high dependence on the morality and ethics of the other participants; and the lack of privacy.

Once when the basic infrastructure is built and rules are set, cooperation through open networks allows individuals and organization to: co-create value through large-scale collaboration; distribute this value where is needed; and if revenue is generated, to redistribute the revenue to all the contributors, in proportion to their contributions. Of course, most of this is possible due to: striking advances in information technology that have allowed the exchange of information in an extremely high speed and large scope; institutions that provide basic legal and infrastructural framework; social leaders who build and design such platforms; and regular people who use these networks.

Design of electronic open networks is usually achieved through modularity, granularity and low integration cost principles that are accompanied with the tight control of strategic issues,
while everything else beyond this orbit is left to the third party developers and final users. Since they are quite successful at dynamic balancing between many conflicting and mutually exclusive goals, (e.g. increase in quality and reduction of costs), open networks are becoming desirable not only in private sector but even in the public sphere. Although it might seem that all starting positions in the open networking are already occupied, the real truth is that open networking and open model of governance have a vast potential that still waits to be discovered, tested and applied.

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