

Information management as a measure of the higher institution quality performance

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Abstract

The emergent analytical properties of the Actor-Network theory and the Information management could provide very successful new tools to the quality Assurance of higher education. A new measuring property is proposed to globally evaluate the performance and efficiency of the individual and system components in the higher institutions based on the conductivity. A direct relationship is discovered between the connectivity in the higher institution systems and/or individuals' performance.

Keywords: Information, Management, Quality, Administration, Actor-Network Theory

1. Introduction:

There is no doubt that connectivity and communication is the main characteristic of our modern technology. From microscopic to the macroscopic world; Wherever you look, there's a kind of connection. Starting from your own network of cells and organs in your body, where everything is carefully and highly connected to each other, up to your mobile phone, laptop, the internet, and electric power plant. Accordingly, if the connection is disturbed, this means that something is going wrong. So, let me say it as mentioned in the second song lyrics of the Symphony of Science project by John D. Boswell "We are all connected. To each other, biologically. To the earth, chemically. To the rest of the universe atomically" [1].

Connectivity in the higher institution could be addressed in two independent themes, within and transborder. However, the whole picture is seen as many co-centric environments. If we consider the university is the origin of that connected network, then the society and the rest of the world could be seen globally as co-centric media (Fig. 1). The mutual outboard connections are the most expected type of connection between those implicit environments. Nevertheless, within each environment, especially the first one (University), interconnections in addition to the external connections should be highly considered. Simply, because the university won't be able to establish a stable external connection network unless there is a high level of understanding in terms of the mutual connection between the main parties there, the Rectorate (management), Administration, Academics, Research & Development, and Students.

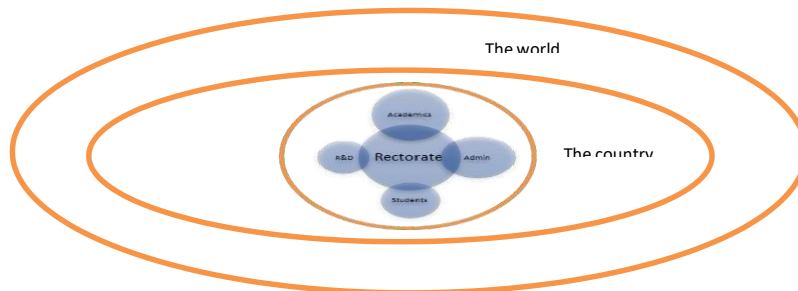


Figure 1: The different environments of the connectivity

Malfunction or slowness of the connectivity in any direction internally or externally will destructively affect the growing expectation of the higher institution. Those exponentially growing expectations are one of the recent essences of our modern technology impressions. Moreover, that situation implies and uncovers many properties of the capacity and readiness of the system's active components. For instance, if a given institute can establish external mutual connections with other institutions, organizations, industry, and the rest of the world in terms of students, administrations, and staff exchange, international meetings, conferences, projects, spin-off companies, memorandum of understanding with other universities, etc. this reflects a healthy environment of high activity of qualified staffs, academics, and management.

The huge influence of the internet everywhere and in everything created another effect of connectivity, which is related to the transfer of knowledge. Since teaching and learning are forms of knowledge transfer, so they are rapidly affected by this Permittivity of the connection through the internet. The current situation tells us that, the virtual part (in terms of online courses) of the near future higher institutions are getting bigger, accepted, and more organized [2,3]. The situation does not stop at this level, but many other web-based platforms started to be in action and attract many students all over the world [4,5]. Of course, they will not replace the standard academic and research system, but slowly they will be the standard, so we should somehow accept that we must update our way of transferring knowledge. Un responding to those global changes will negatively affect the ranking and the performance of the higher institution.

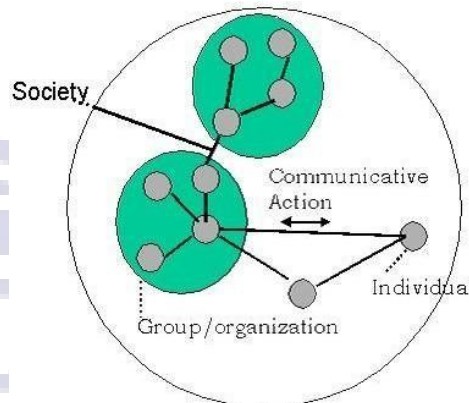


Figure 2: Networks connecting individuals, groups, organizations, and societies. (Source: Van Dijk 2001/2003)

The previously mentioned effect is just one at a specific dimension of many others related to the significance of the connectivity. It is just mentioned because of its importance in the body of any higher institution, and the society as well. Connectivity is reorganizing the structure of the knowledge demand and this is a very critical situation, where the most connected entities or structures will control the future. Therefore, it is time to consider the degree of connectivity internally and externally in the higher institution systems as one of the scaling measures of quality Assurance.

This paper is planned to highlight the importance of connectivity in the general sense of the current situation, and this will be the introductory part. Then, the methodology part will present the concept that we can apply to extract the emergent measuring property of connectivity from Actor-

Network Theory and Information management. Developments in the study of information management have led to much advancement in real-world applications. One such application is the leveraging of organizational structure and networks to help facilitate more productive working environments in corporations and companies. Some exploration of our proposal will be the topic for the discussion part. So, I will describe and analyze the benefits of a scaling measure of the connectivity based on those theories to the Quality Assurance in the higher institution systems. Finally, a summary evaluation for the necessity of the connectivity measure for the internal and external performance of a given institute.

2. The Methodology:

In the introduction section, connectivity and its consequences are highlighted in general. To put connectivity into action as a measurable activity, we must have a philosophy or platform. To achieve our aim, we should consider the connectivity through a concept and measure way. Therefore, we have two theories, one of them will be to some extent the conceptual platform. So, let's start by the theory that assesses the connectivity contribution from humans and non-humans on the same level, which is the Actor-Network theory (ANT) [6], that is developed in the 1980s by science and technology studies (STS) scholars Michel Callon, Bruno Latour, and many others including the sociologist John Law. ANT is seen as the theoretical and methodological approach where everything in the social and material worlds exists in constantly shifting networks. So, the central goal of ANT is to explore how heterogeneous networks are built or assembled and maintained to achieve connectivity by assuming that nothing exists outside those relationships. Based on today's givens, we may apply ANT to understand this inevitable diverse combination of technology with humans.

Despite that argument about the ANT in other fields of science, our approach is just interested in the core idea of the parallel contribution and the same level processing of the ANT theory toward achieving connectivity. Consequently, the connected Networks are made up of actors which are both human and non-human (technology), technology is a part of the equation and not anymore just a tool.

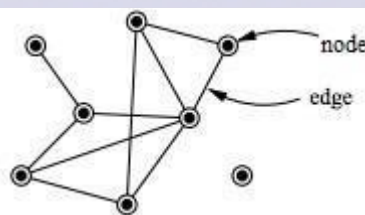


Figure 3:

The important part of our approach is based on Information management [7,8]. A network can be defined as a graph in which nodes (e.g. names of the higher institution) and/or edges (e.g. type of the connection) have attributes. One of the defining features of a network is its overall degree of connectivity. This overall degree of connectivity is important because it defines whether we are dealing a relatively isolated system where it will be the properties of the components in isolation that is of primary significance or if it is a highly interconnected system where it will be the properties of the network that really define the overall system.

One way of contextualizing the degree of connectivity to a network is by talking about how easy or difficult it is for a node in the network (e.g. University) to make a connection with another. The more difficult the less dense the connections will be, and vice versa. The density of a network is defined as a ratio between the number of edges to the number of possible edges, and this will correlate to the average degree of connectivity to the node in the network. As we increase or decrease the cost of interaction between components, we should see the overall level of connectivity increase or decrease respectively, and thus the overall network becomes more integrated or disintegrated. The overall level of connectivity may not always grow or decay in a linear fashion but may reach tipping points where it changes at a nonlinear exponential rate.

The size of a network is significant because it sets the context for how close or far on average one node in the network is from another. This is important because it tells us how quickly something will spread through the network and how integrated different components in the network are likely to be. Two important metrics for capturing that overall distance between nodes are; the network diameter and its average path length. The arises a question of how close things are in a network?. It is not just a product of its size but is also a product of the structure of the network as we would expect. Some network structures give us only a linear propagation, while others give us exponential growth in the number of nodes we can connect to as we move away from the source.

3. Discussion and Conclusions:

It is obvious that we can get a new scaling measure based on our proposed methodology. However, to achieve such an approach, we need to specify some elements based on the definitions of the ANT and Information management. The main strategy to avoid any confusion, the components in any of the two theories could be the student, administrator, equipment, Professor, program, department, faculty, ... etc. Then applying the Information management analysis, which implies measures of connectivity, Robustness, Centrality, Assortative, and disassortative mixing as well. Network optimization analysis [9] under the umbrella of the ANT, can also in addition to providing a way to see how much we are connected, to provide a better design of our academic systems, that secure more stability, performance, influence, and dynamic of the system.

Connectivity is a direct indication of the activity and the competence in the higher education institutions. By comparison between the university's connectivity, we can easily recognize such property. Connectivity of the staff members is foretelling their ranking or weight. You can do it by yourself through Google scholar, which is one of the pieces of evidence for that connectivity. You'll find the most cited scientists or papers are either connected to many other scientists/papers or they are connected to a few but those few are already connected to many others. You can not find those highly productive scientists or highly impacted papers in poorly connected universities as you may compare with figures 3, and 4.

Based on our approach, we may study the state of the connectivity in many ways and throughout different levels. It is a huge field of research and its results will provide many key features for the academicians and the management's people. So, it needs time and data in order to see where you are and your performativity. The connectivity as a tool is still in the beginning and maybe we can come to some standard schemes to have a new Quality Assurance tool that goes beyond the standard way of evaluating the higher institutions. This emergent tool will also provide a good way of transforming the effective mechanisms of connectivity between institutions of similar interests.

In conclusion, there is a sort of direct relationship between connectivity and the functional performance at the higher education institutions and its components at all levels (Fig. 3, and 4). So, we need to invest in this dimension to see to how much extent we can improve the growing needs of connectivity and ways of transferring and sharing knowledge. Private quality Assurance organizations can lead this kind of research, they can collectively distribute the task and then share the benefits.

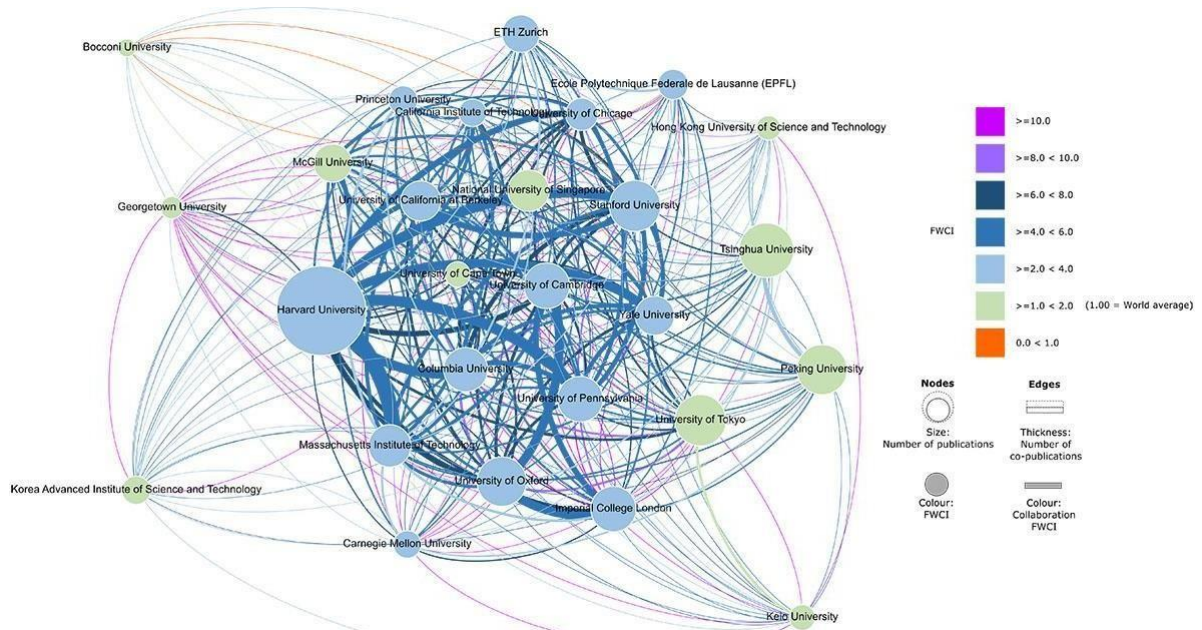


Figure 3: Collaboration among GULF group members
 (source: <https://www.elsevier.com/connect/at-davos-how-can-research-drive-collaboration-in-a-fractured-world>)

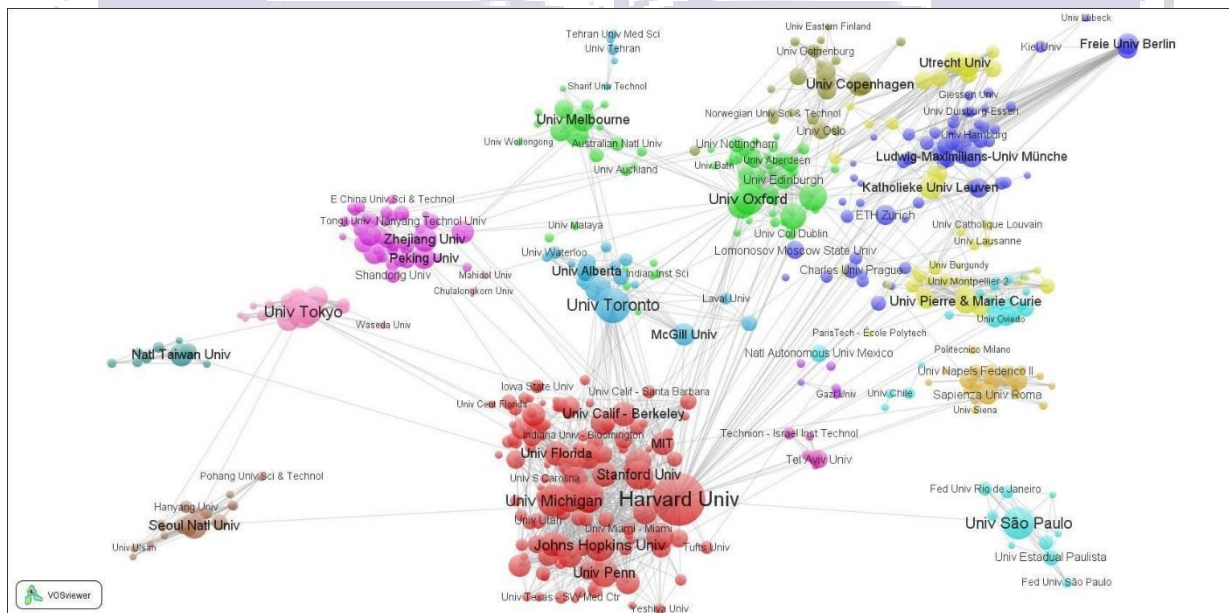


Figure 4: Nees Jan van Eck, (Source: Bibliometric network analysis using # VOSviewer. Part 4/6: Co-author + university collaboration maps).

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