

THE ROLE OF KEY STAKEHOLDERS IN THE TECHNOLOGY MANAGEMENT PROCESS

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This article is dedicated to the issue of the management and leadership specifics in the technology management context. That implies an analysis of organizational and personal sources of the Chief Technology Officer (CTO) position influence through interaction with core internal and external stakeholders. The practical basis of this article is an international project “Intelligent use of biomass along the Danube: R&D network formation with German, Hungarian, Slovak and Romanian partners”.

A chief technology officer (CTO) is an executive-level position in a company or other entity whose occupation is focused on scientific and technological issues within an organization (Smith, 2002). Or, in other words, a CTO is a manager who oversees current technologies and creates relevant policies for their efficient application and strategic development. In order to achieve this CTOs should have the necessary business knowledge to align technology-related decisions with general organizational strategy, its functioning specify and market orientation. In real business practice a wide range of top and middle managers partially or fully perform the CTO functions in spite of the lack of this position nominal existence within a company/organization. This situation quite often leads to reduction of the managerial capacity and improper prioritisation. To avoid this, managers who are under the strong influence of technological factors should have clear understanding of implemented managerial and technical roles. The situation is often complicated by the fact that technology management activities are realized by CTOs indirectly (i.e. through others process participants). Due to this, in the case of positions combinations, CTOs are often perceived more as managers in the general sense. As the result of such perspective, the technology specifics of their functionality might remain in the shadow.

Nevertheless, technological competences of the CTO's position are traditionally considered as a main source of their organizational influence and main reason of “involvement into upper echelons of management teams”. (O'Neill and Bridenbaugh 1992; Hopkins and Jenkins, 2008 etc.). Important to note that nowadays this approach has a wide number of supporters due to the sharp grow of technologies complexity. As the result of it, modern CTOs must develop their technological competence not only so intensively than ever before, but moreover - to do it with interdisciplinary orientation. It is obviously that, such high standards and multi-diversity of technological knowledge just unaffordable for a single person. CTOs just cannot be competent in absolutely all matters and subjects. In this regard, their core tasks include skillful coordination of internal and external stakeholders as sources of the requirement information, managerial and performing activities. It means that, despite the fact that a deep knowledge of technology is a vitally important prerequisite for the CTOs functional effectiveness, they also must be good managers who are able to influence, convince, inspire and guide other participants of the technology management processes (i.e. internal and external stakeholders, direct performers and supporters etc.).

In the context of the CTO research literature, the most thorough study of the stakeholders' impact on the CTO's activities was realized by Roger D. Smith (2002). The author identified CTO's core business relationships which can be considered as an “empower” of the CTO's organizational role and the source of personal influence. The author in detail described the basic principles of CTOs interaction with core functional positions and business units. However, despite all undeniable advantages of the study, Smith does not draw a clear line between internal and external stakeholders. As the result of it the analysis of “side

stakeholders” in his study has a superficial character. Moreover, some stakeholders in each particular business situation may belong either to organization or to be an independent unit otherwise have mixed nature (e.g. Board of Directors controlled by shareholders). Based on the Smith ideas a new stakeholders’ model was developed by Petrikhin & Lohmüller (2016).

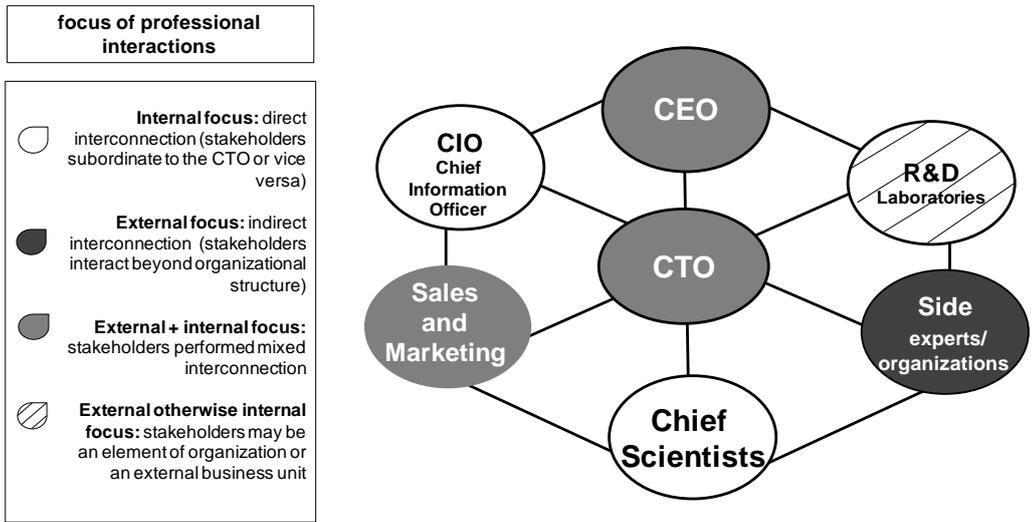


Figure 1: “STO’s key stakeholder’s model”, based on Smith, 2003 (Triple Helix Conference 2016)

The model is based on the categorization of key stakeholders due to their belonging to the organizational structure and main focus of communicative interaction. For instance the “Sales and Marketing department” is mentioned here as an external-internal stakeholder. It is directly related to the fact that despite that this department is obviously an “organization element” its communicational channels are focused more on “end consumers”. It should be noted that this model is a logical generalization that aims to demonstrate the complexity and multi-dimensional level of relationships among a CTO and core stakeholders. Besides that, each unique business case should be considered in the context of its internal and external characteristics as market conditions, low restrictions, number of staff, used technologies, sources etc. Based on such unique quantitative and qualitative characteristics a combination of key stakeholders can significantly vary.

The mentioned model was used as an initial tool for the CTO’s functionality analysis in terms of “Intelligent use of biomass along the Danube” project. The project started in 2015 and is still going on. Its core objectives are: 1) Formation of a scientific and industrial cluster for joint projects implementation in the context of biomass use 2) development and strengthening research, technological and business cooperation among the countries in the Danube Region. The partners' collaboration implies searching for a balanced regional solution in the areas of biomass growing, storing and processing.



Slovak University of Agriculture (Research laboratory), Nitra, Slovakia (© Photo: SGIT, April 2016)



University of Bucharest, Research Center (UB), Bucharest, Romania (© Photo: SGIT, June 2016)

Important to note that although the all partners project-participants are closely associated with “*biomass technologies*”, overall the meaning of this *term* due to each particular company/organization have serious deviation: from technologies in the area of agro forestry to satellite technologies for volume and energy potential biomass assessment. The functional specificity and areas of responsibility of the CTOs also vary considerably. In terms of specifics of decision making procedures as well as - key internal-external stakeholders’ influence all partners-organizations were classified by means of organizational specifics: universities, private research institutes and companies. Despite the fact that the project participants represent different countries, each category distinctly has common (to some extent) organizational tendencies and properties.

All the universities taking part in the project demonstrate the following features (a general trend with varying degrees): high dependence on external stakeholders such as foundations and ministries; medium-low initiative of R&D projects participation; orientation towards long-term cooperation and strategic technology development and knowledge exchange. The project team members defined at the universities as the CTOs also exhibit similar characteristics: a high negative influence of the lack of the official CTO position (i.e. they perform lots of non-technological functions, and as a rule the overlapping of their areas of responsibility has a negative impact on the technologies development and innovations promotion); their motivation in the project participation from the organizational position may be characterized as medium, from the viewpoint of their personal interest as low; the managerial influence on the strategic decisions in terms of technology use and development was evaluated as medium-low.

All the companies taking part in the project demonstrate the following features (a general trend with varying degrees): low dependence on external stakeholders and high dependence on ‘mixed’ stakeholders, e.g., CEO, Marketing and Sales department; medium-high initiative of R&D projects participation; orientation towards short-term, focused cooperation and operational technology application. The project team members defined at the companies as the CTOs also exhibit similar characteristics: a low negative influence of the lack of the official CTO position (i.e. they perform lots of non-technological functions, and as a rule the overlapping of their areas of responsibility has a positive impact on the technologies development and innovations promotion due to high numbers of managerial leverages); their motivation in the project participation from the organizational position may be characterized as high, from the viewpoint of their personal interest as medium; the managerial influence on the strategic decisions in terms of technology use and development was evaluated as high.



Experimental Plantation of fast-growing energy plants: Salix, (University farm, SUA) (© Photo: SGIT, April 2016)



AgroBioTech Research Centre (SUA campus) Nitra, Slovakia (© Photo: SGIT, April 2016)

All the research institutes taking part in the project demonstrate the following features: medium dependence on external stakeholders and high dependence on internal stakeholders, e.g., CIO, CS, R&D laboratories and centers; the highest initiative of R&D projects participation; a relatively balanced orientation towards operational and strategic technology application with a focus on the practical results obtained from the project activity and long-term scientific relation maintenance. The project team members defined at the companies as

the CTOs also exhibit similar characteristics: a medium negative influence of the lack of the official CTO position, i.e. this mostly negative side of the issue was expressed as imbalance of the operational and strategic priority of their technological responsibilities; their motivation in the project participation from the organizational position may be characterized as high, from the viewpoint of their personal interest as high, too; the managerial influence on the strategic decisions in terms of technology use and development was evaluated as medium.

Although the reliability of the obtained dataset is high, the current research results should not be interpreted on the universal scale, since the investigated academic and business units may not fully represent the general trend of technology management specifics. In the realm of further research we intend to include a wider number of organizations and companies. Also, it should be taken into account that the investigation of sources of organizational and personal managerial power of CTOs is limited due to regional specifics. Nevertheless, the chosen methodology of the current study contributed significantly to the reliability and validity of the results.

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