

Exploration of Systems Thinking in the Universities of Technology in KwaZulu-Natal

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ABSTRACT

The environment in which organisations operate is almost unpredictable and hence they have to deal with complex challenges. It is necessary for organisations to continuously improve their processes and practices to remain competitive. The Universities of Technology (UoTs) are not immune from those challenges. Systems thinking philosophy has been identified as an effective management approach that helps organisations deal with such challenges. Hence, this study explores the application of systems thinking in the UoTs in KwaZulu-Natal. KwaZulu-Natal, one of the nine provinces of South Africa, created in 1994 when the Zulu Bantustan of KwaZulu and Natal Province were merged. It is located in the southeast part of the country. The province has two UoTs situated within the eThekweni District Municipality.

Organisational silos are still prevalent in the UoTs. This creates an attitude of “us-and-them”. Consequently, collaborative efforts across the organisations become difficult. Systems thinking has the ability to help UoTs respond effectively to complex and unpredictable challenges. It facilitates this possibility as it assists members to focus on the organisation as a whole, including its stakeholders, rather than on individual parts of the organisation. It considers the organisation as a complex system with interrelated parts. Hence, this paper provides insights on its application at the UoTs in KwaZulu-Natal.

Keywords: - Systems thinking, reductionist, Universities of Technology (UoTs), cross-functional collaboration, General Systems Theory, KwaZulu-Natal, organisational silos

INTRODUCTION

Systems thinking has been identified as a method that empowers organisations with the ability to respond effectively to operational challenges (Jackson, 2011). It stimulates a sense of a shared purpose and cross-functional collaboration in an organisation. The language of systems was initially used in relation to machines but lately applied as a concept that provides a holistic understanding of modern organisations (Pellisier, 2012). Kelly (2012) defines systems

thinking as an overarching understanding of how a group of interdependent, interrelated and interacting components influences one another to achieve a common goal within a whole.

Given this understanding, Naicker and Mestry (2015) argue that in an organisational context where there is a lack of systems culture, members of the organisations fail to understand the bigger picture. This creates silo practices in an organisation. Jackson (2011) adds that organisations encounter problems where management practices are still informed by a reductionism approach rather than assessing interrelationships between organisational elements. Stowell and Welch (2012) allude to the fact that systems thinking has been effective for both private and public organisations. Hence, this paper provides insights into its significance in the Universities of Technologies (UoTs) in KwaZulu-Natal.

According to Brits (2011), it is essential for different sections or departments of the university to function as interrelated and interdependent elements. Mingers and White (2009) stress that in systems thinking, the emphasis is on understanding relationships and interactions of parts instead of individual elements of the system. In an organisational context, this includes various sections of the organisation that are interacting to achieve broader organisational goals. It becomes difficult to implement organisational strategy where departments operate in silos (Hammond, 2019). Thus, the organisational members focus on departmental rather than broader institutional goals. Hence, systems thinking promotes holistic thinking and encourages people to share knowledge beyond their functional boundaries (Brits, 2011).

The UoTs are driven by research, innovation, teaching, learning and engagement (Mthembu, 2012). De la Rey (2015) concurs that the additional core functions of the universities include community engagement, innovation and entrepreneurship. Hence, it is necessary to explore an alternative management approach that will help UoTs respond effectively to the needs of its stakeholders, including students and parents. Complex challenges confronting UoTs require new thinking. Thus, Bitzer (2010) alludes to the fact that the current management practices informed by reductionist thinking are ineffective in dealing with complex challenges. There is thus a need to consider an approach that improves processes and practices from a holistic perspective. Jackson (2011) observes that the UoTs operate in a rapidly changing environment yet are generally very slow to adapt.

CHALLENGES ENCOUNTERED BY UoTs

The UoTs operate in a rapidly changing environment yet are generally slow to adapt (Jackson, 2011). This results in such institutions adopting silo practices. This affects cross-departmental communication and knowledge sharing (Brits, 2011), resulting in organisational members focusing on departmental or faculty goals rather than broader institutional goals.

Muchie and Baskaran (2010) indicate that higher education institutions are faced with a number of almost insurmountable and unpredictable challenges. It is in this context that the external stakeholders put UoTs under constant scrutiny (Bitzer, 2010). They are under constant pressure to meet the needs of their stakeholders (Notshulwana, 2011), and thus expected to respond positively to their stakeholders and remain accountable. Hence, this study explores the effectiveness of systems thinking in the UoTs in KwaZulu-Natal. KwaZulu-Natal is one of the

nine provinces of South Africa created in 1994 when the Zulu Bantustan of KwaZulu and Natal Province were merged. It is located in the southeast of the country.

The rest of the paper discusses the theory that was reviewed in study, the discussion, recommendations, as well as the conclusion.

THEORETICAL CONSIDERATIONS FOR THIS STUDY

This section presents the overview of systems thinking, the influence of silo practices in organisations, the effect of systems thinking in dealing with complex and unpredictable challenges, as well as systems thinking as an opposite to a reductionist approach. Systems thinking as a process to form strategic partnerships concludes this section.

Overview of Systems Thinking

This section begins with General Systems Theory that represents the foundation of systems thinking. It provides valuable insights into understanding connections in a social and ecological context. It is through Hammond's contention (2019) that General Systems Theory has received attention from a number of disciplines. In providing the historical development of General Systems Theory, Van Assche, Valentinov and Verschraegen (2019) conclude that it was Ludwig von Bertalanffy who coined the term General Systems Theory. The development of such a theory is based on biological insights and principles.

At the core of General Systems Theory is the principle of interaction within systems and between systems and their environments (Van Assche et al., 2019). This is an important understanding in terms of how organisations interact with their environment and how elements of an organisation interact to achieve broader organisational goals. The idea for the development of General Systems Theory was a need for a transdisciplinary science that could be used to deal with complex challenges. In essence, the General Systems Theory plays an important role in policy development process at organisational, national and global levels. According to Hammond (2019), the General Systems Theory has an influence on organisational theory. Organisations should be viewed as entities that are part of the larger socioeconomic system in which they operate (Langstrand, 2016). Hence, the lack of systems thinking understanding in the universities provides the basis in which Langstrand (2016) refers to them as "old fashioned" universities. It is in this context this paper explores the Systems Theory.

Higher education institutions are regarded as open systems, yet processes and practices are generally informed by reductionist approaches (Naicker & Mestry, 2015). Hence, this study assesses systems thinking from the view of silo practices in the UoTs in KwaZulu-Natal. Thus, the General Systems Theory that informs systems thinking, challenges the mechanistic view of the organisation. Van Assche, et al., (2019) believe that mechanistic science has contributed to some of the catastrophes and failure to manage complex situations.

Modern organisations face a number of chronic challenges that include ever-evolving competition, technological changes, fluctuating demands and human-made or natural disasters (Vagnoni and Khoddani 2016). To remain competitive, organisations should adapt to effective

management concepts. Hence, Robbins, Decenzo and Coulter (2011) define system thinking as a management approach that views an organisation as a system with a set of interrelated and interdependent parts arranged in a manner that produces a unified whole. This understanding is necessary to grasp a situation during a decision-making process and policy formulation.

Systems thinking is a management concept that provides holistic understanding of the situation in the organisation during strategic formulation and policy development (Jackson, 2011). Cusins (1994) points out that systems thinking theory provides a point of reference for a systems thinking. He accentuates that systems thinking can be applied to a number of contexts. Hence, this paper explores systems thinking in the context of UoTs in KwaZulu-Natal.

The Influence of Silo Practices in Organisations

The concept of organisational silos has not been thoroughly investigated (Cilliers & Greyvenstein, 2012). Organisational silos are characteristics of an organisation where operations are informed by a mechanistic view. Where organisational silos exist, there is strong emphasis on using specialisation to arrange various units. Systems thinking, on the other hand, challenges silos in an organisation. It promotes the idea that organisations should not be viewed from a mechanistic but rather a systems point of view. Organisational silos are still prevalent in the UoTs (Smulowitz, 2015). The problem with organisational silos is that they create an “us and them” attitude and, as a result, collaboration across the organisation becomes difficult.

Bento, Tagliabue and Lorenzo (2020) provide historical development of the term ‘organisational silos’ and point out that it originates in the 1800s in Europe, from agricultural fields where trenches were dug during the winter season to store grains. In a business context, the organisational silos are a metaphor meaning pockets of interaction and knowledge in organisations (Bitzer, 2010). Organisational silos are, in fact, organisational settings informed by a reductionist approach where there are barriers to communication and exchange of knowledge across the organisations. According to Montingoe and Langerman (2019), a silo is a rigid, vertical structure that protects itself from interacting with other silos. Silos can be manifested at the level of physical or psychological barriers that separate people or units in an organisation. It becomes difficult for members of the organisation to collaborate across the organisation where there is a strong silo mentality (Vanderstraeten, 2019).

Silo mentality promotes an inward-looking attitude (Montingoe & Langerman, 2019). Rigid organisational structures, especially the bigger organisations, silo mentality is easily entrenched. System thinking is thus developed to break organisational silos. Bento, et al. (2020) argue that silo mentality impacts negatively on the overall operations of the entity. Where silo mentality is prevalent there is a general reluctance from organisational members to share best practices across the organisation.

Systems Thinking as an Opposite to Reductionist Approach

A number of authors have identified reductionism as an opposite of systems thinking (Flood, 2010; Ellis, 2011; Montingoe & Langerman, 2019). Systems thinking focuses on the individual units and their relationships, as well as the interactions within the whole (Jackson, 2011).

Reductionism, on the other hand, ignores the interactions, relationships and interdependencies of parts within the whole (Selway, 2011). It results in the fragmentation of organisational systems. According to Conti (2010), a lack of systems perspective promotes specialisation and fragmentation. The argument is that with this approach, the overall picture is lost, which means interdependence and the relationship of the components within the whole is ignored (Naicker & Mestry, 2015). Challenging the mechanistic model, which is informed by a reductionist approach, Palaima and Skarzauskiene (2010) accentuate that there is a need for modern organisations to consider approaches that inspire flexibility, as well as responsiveness. Those who studied the historical development of systems thinking (Flood, 2010; Ellis, 2011; Bento, et al., 2020; Cilliers & Greyvenstein, 2012) articulate that the reductionist approach breaks down system elements and considers them individually, thus resulting in a silo attitude. In challenging silo mentality, Selway (2011) articulated a number of factors that showed shortcomings of the silo mentality. Reductionism creates a limited perspective where people think only about what is happening in their departmental boundaries and ignore what is happening in other parts of the organisation. Given the forces for change in the business environment, Selway (2011) emphasised the importance of teamwork, where individual staff members rely on others to achieve organisational goals. Reductionism promotes a culture of competition, where people claim superiority over others, which does not support the organisation in achieving its strategic goals.

Cilliers and Greyvenstein (2012) indicate that organisational silos are a prevalent phenomenon that has not been thoroughly researched. Contrary to a silo culture, systems thinking stimulates the quest for a broader perspective. Nisula and Pekkola (2018) reveal that educational systems are predominantly grounded on a reductionist approach. Ellis (2011) infers that many institutions of higher learning have a culture of defending academic turf. This implies that staff tend to defend their territories and, as a consequence, barriers are put in place to discourage collaboration across the institution (Ellis, 2011). Hence, Gaffon and Cloete (2010) advise that functional silos should be eliminated in order to achieve organisational efficiency.

Systems Thinking as a Process to Form Strategic Partnerships

External stakeholders play a critical role in the affairs of a university. According to Bitzer (2010), external stakeholders have a role in scrutinising university operations to ensure that quality is not compromised but continuously improved. Systems thinking recognises the interconnectedness and interdependence of all the elements of a system (Naicker & Mestry, 2015). This suggests a need to consider perspectives of all relevant stakeholders, particularly during decision-making.

From a systems thinking perspective, the holistic understanding of a situation is paramount (Slabbert, 2018). It should create a conducive atmosphere for internal and external stakeholders of a university, thus contributing positively to the improvement of university operations. It is with this understanding that Smulowitz (2015) asserts that the stakeholder engagement process plays a role in the primary business of a university. The emphasis is on all the university structures and stakeholders that should work together to achieve university goals.

DISCUSSION

This study explores the applicability of systems thinking in the UoTs in KwaZulu-Natal. Institutions for Higher education in South Africa are faced with a number of almost insurmountable and unpredictable challenges (Muchie & Baskaran, 2010). Thus, the UoTs as public institutions must be accountable to their stakeholders. It is in this context that Bitzer (2010) argues that the UoTs are under constant pressure to meet the needs of their stakeholders. On the point of universities playing a role in solving some of the social challenges, Smulowitz (2015) concurs that it is the role of a university to produce graduates who solve economic problems in society. Consequently, the need for a shared purpose is essential in ensuring that the various units in the university work towards a common strategic goal. Stowell and Welch (2012) are of the view that systems thinking tends to be effective in assisting organisations to work towards a common goal. Hence, Behl and Ferreira (2014) indicate that systems thinking stimulates organisational members to think about a system as a whole instead of focusing on parts of the system. Consequently, members of the organisation do not adopt an “us and them” attitude; instead, the focus is on achieving broader organisational goals.

RECOMMENDATIONS

Modern organisations continue to encounter multifaceted challenges and are expected to adapt and meet the needs of interactive stakeholders in order to survive (Slabbert, 2018). It is for this reason that Hosking (2017) stresses that everyone across the organisation has to be agile. This indicates that the environment in which UoTs operate has become turbulent and unpredictable. It has become necessary to adopt management approaches that make it possible for organisations to respond effectively to such challenges. Based on the logical facts as presented by this paper, the following recommendations are relevant on the application of systems thinking at UoTs:

- Institutions of Higher Learning must holistically be viewed as organisations with a number of systems and subsystems that should always be working together to achieve common goals of the university. This understanding is critical for policy formulation and as institutions that respond effectively to the needs of all relevant stakeholders.
- Such institutions must display a sense of shared purpose. Functional silos do not contribute to continuous improvement of practices and operations in the UoTs. Breaking down the silos helps create the space for cross-functional collaboration. This promotes an understanding of the interrelationships and interdependence of various sections in public higher education institutions. Hence, cross-functional collaboration across different departments and faculties is important (Brits, 2011). Therefore, cross-sector collaboration is a strategic imperative as support units of the university play a critical role in the primary functions of academic departments.
- The UoTs must play a role in solving the economic and social challenges in South Africa. According to Smulowitz (2015), the key role of a university is to produce graduates who will solve economic problems in society

CONCLUSION

It has been determined that a number of benefits results from systems thinking. These include the use of a holistic approach that considers all critical aspects of the business (Hebel, 2007). Swanepoel (2010) describes the work environment in higher education as having gone through various changes. Hence, it is critical for UoTs to respond effectively to the continuously changing higher education environment. Mystification of higher education in South Africa is one factor that requires systems thinking approach (Brits, 2011). This cannot be addressed from a reductionist perspective. The use of resources, introduction of foundation courses, lecture workloads, student accommodation and throughput rate are some of the factors that affect the mystification of higher education (Smulowitz, 2015). Failing to deal with these factors from a holistic perspective, the mystification will not achieve the desired outcomes. The relevant approach in this regard will be systems thinking, as it considers all the elements of the situation. Hlalele (2010) commented that if school education is weak there is little that universities can do to address existing anomalies. This indicates that systems thinking should be considered under such circumstances (Hammond, 2019). This will result in a situation where a sense of a shared purpose is encouraged.

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