Relationship of Complexity Leadership Functions with Entrepreneurial Orientation: Moderating Effect of Information System Implementation

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DEDICATION

This study is dedicated to my father and mother (late), who always extended their support to me and without whom I would have not been able to achieved anything in life.

This study is also dedicated to my wife and children who have always been a source of inspiration for me and gave me strength during hard times.

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ABSTRACT

The telecommunication sector is the largest service provider of the internet and one of the key players in Pakistan's economic development. Firms in the telecommunication sector need to diversify to meet economic development goals. Using resource based view as an overarching theory, the telecommunication sector can get hold of the opportunities by investigating three capital resources, leadership, entrepreneurial orientation, and information system implementation. The purpose of this study is to examine three capital resources by exploring the fine-grain interactions of complexity leadership functions, investigating the relationship of complexity leadership functions with entrepreneurial orientation, and evaluating the effect of information system implementation as a moderator. To carry out this study, a mixed-method approach was adopted. Initially, interviews were carried out to develop the instrument containing fine-grain interactions using the snowball sampling technique. The developed instrument was distributed amongst the different tiers of management in Pakistan's telecommunication service provider organizations through convenience sampling. A sample of 288 responses was collected using convenient sampling and was then analyzed using structural equation modeling. The study results show that generative leadership function, information gathering leadership function, and information using leadership function support the relationship with the entrepreneurial orientation. However, the administrative leadership function was found out to support the relationship with entrepreneurial orientation partially, and the community building leadership function did not support the relationship with entrepreneurial orientation. The moderation of information system implementation was also not supported between the relationships of generative leadership function, administrative leadership function, and information using leadership function and entrepreneurial orientation. However, it was found out to have a reverse relationship between information gathering leadership function and entrepreneurial orientation. This suggests that although interactions of complexity leadership function do impact entrepreneurial orientation, information system implementation at large does not have a moderating effect between relationships. This study provides a new lens to assess the organizations, open new avenues for further research, and provide useful interactions for practitioners.

Keywords: Complexity Leadership, Entrepreneurial Orientation, Information System Implementation, Resource-Based View, Telecommunication Sector Pakistan

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CHAPTER 1

INTRODUCTION

1.1 Introduction

This study uses the lens of Resource Based View (RBV) Theory to investigate the three key resources (i) Entrepreneurial Orientation, (ii) Complexity Leadership, and (iii) Information System Implementation. Past literature suggests that organizations develop their strategic orientation to main the competitive advantage in the market (Abdulrab, Alwaheeb, Al-Mamary, Alshammari, Balhareth, Soltane, & Saleem; Lumpkin & Dess, 1996). To take the strategic decisions, entrepreneurial orientation has been emphasized by the scholars in the past literature (Hunt, 2021). It allows the organizations to initiate new ventures, products, and services in the market. The literature also suggests that leadership plays an important role in organization's strategic decision making (Covin, Green, & Slevin, 2006). The decisions taken by the organizations for new ventures are based on the market information provided by the information system (Goundar, Lal, Kumar, Sen, & Singh, 2021). Due to the complex nature of the entrepreneurship and non-linearity of the system (Fredin & Lidén, 2020), complexity leadership provides the system of action which increases the resonance of the organization to adapt to changes in the environment (Baltaci & Balcı, 2017). In addition, a resource like information system provides an edge to the organizations to process the information for any changes providing a competitive edge to the organizations. Therefore, in this study, the relationship of complexity leadership has been tested with entrepreneurial orientation, and information system implementation has been tested as a moderator.

1.2 Background

Providing the resources to the organizations for the development of capabilities is not enough. It requires coordination between the resources to establish a synchronized action.

Grant (1991) suggests that the teams' coordination and cooperation should be maintained to maintain the relationship between the resources and capabilities. To keep the cooperative relationship between the individuals, the individuals must be given a conducive environment. The organizations' organizational values and traditions are developed so that the individuals find themselves part of the community. These relationships, values, traditions, and community development in an organization are the leadership's responsibilities. The leadership is also responsible for providing organizational resources such as developing the hierarchical structure in an organization which provides an organization a basic layout of coordinating with each other (Daily, Certo, & Dalton, 1999). Therefore, leadership has a responsibility of developing and managing the resources so that the resources remain an asset to the organization to establish competitiveness (Hitt, Bierman, Shimizu, & Kochhar, 2001; Wright, Dunford, & Snell, 2001). As leadership provides the resources that are valuable, rare, and inimitable (Pesic, Milic, & Stankovic, 2013), leadership can be considered as an organization part of the resource based view framework.

To compete with the market and continuously adapt to the external environment, the organizations must undertake the process of exploration and exploitation. This process helps the organizations to gain strength and improve their capabilities to strategize effectively. The exploration and exploitation process can also be considered entrepreneurial orientation, which is regarded as an essential resource (Lisboa, Skarmeas, & Lages, 2011). Entrepreneurial orientation as a resource is an individual's mindset and cognitive ability, leading to new ventures and innovative products or services (Alvarez & Busenitz, 2001). Entrepreneurial orientation has been studied as a precursor to product and technology innovation (Zhou, Yim, & Tse, 2005). In Pakistan, Ayub, Razzaq, Aslam, and Iftekhar (2013) also found out that entrepreneurial orientation essentially plays a role in developing innovative solutions. As entrepreneurial orientation is considered strategic orientation, it can be an important measure for organizations to organize themselves from within. Therefore, scholars consider entrepreneurial orientation to be the organization (O) part of the resource based view framework. This suggests that entrepreneurial orientation deals with organizing resources internal to the organization (Wiklund & Shepherd, 2003).

To collect the information, information system implementation in the organizations proves to be an excellent resource (Bharadwaj, 2000), enabling the organizations to remain aligned with the market requirement. The resource-based view suggests that the organization must keep changing to the changing market requirements and gain a competitive advantage to survive in the market (Eisenhardt & Martin, 2000). The usage of information system is considered to be useful for the growth of an organization. It enables the organizations to gain profitability by developing strategies leading to an innovative solution with marketable differentiation. On the other hand, the information system implementation is also considered one of the key resources to store the information used later for beneficial purposes through data analytics (Rivard, Raymond, & Verreault, 2006). Information system implementation enhances work efficiency by providing various benefits such as exchanging information, coordination between the stakeholders, integrating the activities with the channel partners (Wu, Yeniyurt, Kim, & Cavusgil, 2006). The information system becomes an exclusive and exhaustive source of information, making it valuable and rare if used appropriately (Wade & Hulland, 2004). In Pakistan, the information system has also been found to be a key source of information helping organizations in learning orientation and knowledge management (Lodhi, Ali, Bukhari, & Mubin, 2017). Therefore, keeping in view the importance of information system as a resource, information system implementation has become an essential part of the organizations that can help them transform digitally and align themselves to the industrial revolution.

There have been three major industrial revolutions that have been widely noted (Blinder, 2006). The first industrial revolution related to steam-powered industries and machines. The second industrial revolution was about services. After mass production and manufacturing, a shift towards electronics and information technology escalated, which gave passage to the third industrial revolution involving electronics and information technology, also known as the information age. Later, information technology and electronics further evolved to the next generation to provide services like cloud computing and the internet of things (IoT). It paved the way for the industrial revolution 4.0 (Georgakopoulos, Jayaraman, Fazia, Villari, & Ranjan, 2016; Ooi, Lee, Tan, Hew, & Hew, 2018; Xu, Xu, & Li, 2018). Industrial revolution 4.0 became the prime focus for all the industries, where the major shift was towards the businesses' complete automation. In this generation, the importance of

internet-related applications such as cloud computing, digital stores, online shopping, and IoT became one of the major attractions. This evolution of technology-enabled humans to interact with humans to do a job and enabled humans to interact with machines and machines to interact with the machine, giving its way to the fourth industrial revolution.

Keeping in view the importance of the internet in the fourth industrial revolution, the telecommunication sector in Pakistan, being the largest internet service provider, has shifted its focus from voice communication to data communication, enabling digital technology. Telecommunication organizations with this digital technology have ample scope to seize the market opportunity and diversify themselves through private or public partnerships. The telecommunication industry has shown diversification by providing voice and data communication services, such as money transfer and micro-financing banking (SBP, 2018). As a major source of connectivity, telecommunication organizations can use this connectivity to benefit at various levels. Using high-speed connectivity, telecommunication organizations can take entrepreneurial initiatives. These services can help Pakistan's economic development by filling various educational, health, and industrial innovation gaps. To develop telecommunication organizations' entrepreneurial posture, it is vital to study the relationship between their capital resources.

1.3 Problem Statement

United Nations developed a blueprint for all the developing and developed member countries in 2015. This blueprint provided a vision that all the nations will try attaining sustainability by the year 2030. This blueprint is the road map for sustainable economic development for all the countries, which involves seventeen goals, need to be achieved for sustainability. These goals include removing poverty, removing hunger, good health, and well-being, quality education, gender equality, cleanliness and sanitation, affordable and clean energy, decent work and growth, industrial innovation and infrastructure, reduce inequalities, sustainable cities and communities, responsible consumption, and production, climate action, life below water, life and land, peace, justice, and strong institutions, and partnership for other goals. The internet has been emphasized in industrial innovation and

infrastructure for the information and knowledge that can foster better education, innovation, and entrepreneurial activities. The provision of the internet has been recommended and emphasized for all countries (UN, 2019).

According to Kiani (2018), Pakistan secured 55.6 points under SDG's global index, which is lower than the regional peers like Bangladesh, which scored 56.2 points, and India, which scored 58.1 points and was ranked 122 on the sustainable development goal's index out of 157 nations. In addition, the concerns like poverty, education, health, unemployment, climate, and poor governance of urbanization were highlighted. According to the Ministry of Planning, Development, and Reforms (MoPDR, 2019), Pakistan has made improvements in various sectors. The poverty was reduced from 40.8% to 38.8%. In the health sector, 66% of the population was covered with vaccination with a reduced mortality rate of under five to 74 per 100,000 and neonatal to 42 per 100,000. On the other hand, UNICEF (2020) suggests that 22.84 million children are still out of school. According to Brollo, Hanedar, and Walker (2021), Pakistan is still either at par or below the median for Emerging Market and Developing Economies (EMDEs) in multiple sectors and needs to emphasize more maintaining the targeted sustainable development goals. The studies have found that awareness of sustainable development goals across Pakistan varies across cities according to the business size and their affiliation with United Nations (Javeed, Khan, Rehman, & Khurshid, 2021). Therefore, it is strongly suggested that initiatives like improvement in the health sector by creating a health data generation and provision of internet facilities in remote areas to increase e-education and e-health facilities should be taken (MoPDR, 2019).

Being one of the internet's largest service providers, telecommunication firms have shown consistent growth over time. However, there are several challenges and barriers where the telecommunication sector can emphasize more. The challenges listed by Hanif, Yunfei, and Hanif (2018) are the adequate provision of the spectrum to the areas where there is no or limited coverage, a public-private partnership for achieving the sustainable development goals suggested by (UN, 2019), improving the mobile banking coverage and service, removing literacy barriers by providing e-learning applications and services, offer e-health services in the remote areas and providing a secure environment for the money transaction online. Planning Commission of Pakistan emphasizes that the telecommunication industry

must play its role in enhancing the role of information and communication technology in various disciplines such as real-time data for easier monitoring of security, tracking cell phone data for identifying the population in the region, increasing their role in the social service by introducing e-health solutions, monitoring financial flows, use specialized sensors for environment monitoring, employ spatial data for developing sustainable solutions for the urban sprawls and slums, taking initiatives in the e-learning and use big data monitoring and evaluation for development initiatives (MoPDR, 2017). It provides an enormous scope of opportunity for Pakistan's telecommunication sector to advance into new dimensions and expand towards new horizons.

As the telecommunication industry in Pakistan has shown enormous growth (Butt, 2018; PTA, 2019), it has also contributed to Pakistan's economic development (Din, Mangla, & Jamil, 2016). Keeping in view the importance of the internet and Pakistan's telecommunication industry being Pakistan’s major internet source, (MoPDR, 2017) has emphasized that the telecommunication organizations expand into existing and new directions to fill the opportunity gaps. Muhammad Muneeb, Karbassi Yazdi, Wanke, Yiyin, and Chughtai (2020) also suggested in their study that telecommunication organizations are in a virtual quarantine related to the implementation of sustainable entrepreneurship to gain advantages in the market. To gain a sustainable advantage through new initiatives (Muneeb, Yazdi, Wanke, Yiyin, & Chughtai, 2020), telecommunication organizations need to enable their entrepreneurial posture. Enabling entrepreneurial posture requires organizational capital resources and competencies (Covin & Selvin, 1991). Leadership has been considered an important organizational resource (Singh, Giudice, Tarba, & Bernardi, 2019). Leadership being a multi-role resource, allows to control, structure, support, coordinate, and develop the organization’s strategic posture (Jogaratnam, 2017). The organization's strategic posture represents the organization’s entrepreneurial orientation and has also been considered an important organizational resource (Campbell & Park, 2016; Lisboa et al., 2011). Entrepreneurial orientation represents an organization’s overall focus towards new business development and diversification. As information plays a key role in starting a new business and keeping competitiveness, information system implementation as a physical capital resource can help the leadership to gain market information and determine the organizational focus according to the market requirements (Badewi, Salim, Al Asfahani, & Shehata, 2020;

Pohludka, Stverkova, & Ślusarczyk, 2018; Zeplin Jiwa Husada, Hotlan, & Ferry, 2020). It is therefore necessary that the telecommunication organizations focus on these three resources (i) leadership, (ii) entrepreneurial orientation, and (iii) information system implementation so that the telecommunication organizations can contribute their role in meeting the sustainable development goals by diversifying in the identified areas.

1.4 Gap Analysis

The behavior of the organizations should not be considered linear (Bolton & Stolcis, 2008). The organization's system is complex, where the organization's output depends on the various activities depending on each other. The sum of these activities generates non-linearity within the organizations that tend to go towards linearity by adapting to the environment. According to Dooley (1997), organizations self-organize themselves through a feedback mechanism to return to the state of linearity. This feedback mechanism to gain linearity helps the overall system to evolve. Considering organizations as complex adaptive systems, using traditional leadership theories to evaluate the organizational outcomes poses an issue. To address this issue, interactions-based complexity leadership theory can be used to investigate the organizational environment and its outcome (Arena & Uhl-Bien, 2016; Baltaci & Balcı, 2017; Lichtenstein, Uhl-Bien, Marion, Seers, Orton, & Schreiber, 2006).

Leadership in a complex adaptive environment differs from traditional leadership theories. Uhl-Bien, Marion, and McKelvey (2007) suggested that complexity leadership is about leadership in an organization rather than an individual leader. Such interactions are governed by the rules and regulations known as the fine-grain interactions resulting in the coarse-grain properties' formation. These coarse-grain properties are managerial capabilities where the fine-grain interactions and coarse-grain properties are bi-directional, forming a feedback system. This feedback system helps maintain the organization's performance through adaptation and self-organizing (Alase, 2017; Hazy, 2011a). According to Weberg (2013), the leadership theory has four conceptual frameworks: traits, styles, transformation, and complexity. Leadership discussed in various studies primarily focuses on the attributes of the leader and emotions of the followers, which allows them to give each other value and

helps them to work together (Marion & Uhl-Bien, 2001b; Murphy, Rhodes, Meek, & Denyer, 2017).

Table 1.1: Summary of Studies on Constructs

	Variable Name	Reference
Entrepreneurial Orientation	• Performance • Leadership Styles • Organizational Culture • Organizational Learning • Knowledge Management	(Kreiser, 2011) (Öncer, 2013) (Engelen, Flatten, Thalmann, & Brettel, 2014) (Brettel, Chomik, & Flatten, 2015) (Archwell & Mason, 2021) (Al-Dhaafri, Al-Swidi, & van der Wiele, 2016a) (Chavez, Yu, Jacobs, & Feng, 2017) (Cherchem, 2017) (Zhu, Liu, & Chen, 2018) (Yamin, 2020)
Information System Implementation	• Organizational Culture • Corporate Entrepreneurship • Entrepreneurial Orientation • Business Performance • Leadership • Organizational Learning • Knowledge Management	(Sedera & Gable, 2010) (Liu, 2011) (Shao, Feng, & Liu, 2012) (Law, 2020) (Ghazikalaye & Roshani, 2016) (Shao, Feng, & Hu, 2017) (Ante, 2021) (Sutduean, Singsa, Sriyakul, & Jermsittiparsert, 2019) (Jafari & Zolfagharian, 2019) (Schlichter, Klyver, & Haug, 2020)
Complexity Leadership	• Absorptive Capacity • Team Norm Strength	(Hazy & Prottas, 2018)

It is well established that traditional leadership theories which play an important role in the development of the basic structure of the organization, also plays a significant role in the performance and growth of the organization (Alrowwad, Obeidat, Tarhini, & Aqqad, 2017; Bhargavi & Yaseen, 2016; García-Morales, Jiménez-Barrionuevo, & Gutiérrez-Gutiérrez, 2012; Kuria, Namusonge, & Iravo, 2016; Para-González, Jiménez-Jiménez, & Martínez-Lorente, 2018; Visser, van Knippenberg, Van Kleef, & Wisse, 2013). Leadership

is responsible for developing the culture, environment, strategies, and envisioning an organization's prospects (Farrell, 2018; Hartnell, Kinicki, Lambert, Fugate, & Doyle Corner, 2016; Hazy, 2008; Zahari & Shurbagi, 2012). Previous studies also show that significant relationships between leadership and entrepreneurial orientation (Abbasi & Zamani-Miandashti, 2013; Arham, Sulaiman, Kamarudin, & Muenjohn, 2017; Bakir, 2017; Dzomonda, Fatoki, & Oni, 2017; Engelen, Gupta, Strenger, & Brettel, 2015; Luu, 2017) and leadership and information system implementation (Afsar & Badir, 2017; Agha, 2019; Aldholay, Isaac, Abdullah, & Ramayah, 2018; Coetzer, Bussin, & Geldenhuys, 2017; Lee, 2018; Rezvani, Dong, & Khosravi, 2017; Seyal & Rahman, 2014; Shao et al., 2017; Tseng, 2017)

Table 1.1 summarizes the past studies carried out on all the three capital resources discussed in this study. A systematic literature review was carried out to identify the range of studies carried out on each resource in the past ten years. A systematic literature review was carried out using a range of journal databases such as SAGE, Science Direct, Elsevier, Emerald, and Taylor & Francis and search engines such as Google Scholar. According to Table 1.1, entrepreneurial orientation has been studied with organizational performance, leadership styles, organizational culture, and organizational learning. Similarly, information system implementation has been studied extensively with organizational culture, corporate entrepreneurship, entrepreneurial orientation, business complexity, and business performance. However, complexity leadership functions have only been studied with variables such as absorptive capacity and team norm strength. The relationship of complexity leadership with any other organizational constructs is scarce to find and is suggested to be studied (Hazy & Prottas, 2018).

After an extensive literature review, three gaps, categorized as theoretical gap, empirical gap, and contextual gap, were identified. The three research gaps and their details are given below.

1. Complexity leadership functions were proposed by (Hazy & Uhl-Bien, 2015). However, identifying fine-grain interactions that catalyze the day-to-day practices in organizational routine was not identified. Although past literature (Hazy & Prottas, 2018) identified fine-grain interactions, two major issues remained under

consideration. First, the authors were unable to identify the fine-grain interactions of all the complexity leadership functions. Second, the clarity of belongingness of fine-grain interactions to its respective leadership function was missing. The fine-grain interactions for generative leadership function and information gathering leadership function were pooled together. Similarly, the fine-grain interactions for administrative leadership function and information using leadership function were also pooled together, creating two subscales. Given that each complexity leadership function has a different outcome (Hazy & Uhl-Bien, 2015), the development of these subscales and pooling of fine-grain interactions creates ambiguity about the relevance of each fine-grain interaction to its respective leadership function. This suggests that an instrument should be developed consisting of all the complexity leadership functions' fine-grain interactions. Jensen (2021) also suggest that to understand the leadership mechanism and its outcome, interactions of all the five complexity leadership functions need to be studied. Therefore, developing an instrument that could identify all the complexity leadership functions' fine-grain interactions leads to the theoretical gap.

2. As complexity leadership functions have not been extensively studied with the organizational outcome or intermediate level organizational constructs, there is limited empirical evidence of the effect of complexity leadership functions on the organizational dynamics (Tourish, 2018). This provides an empirical gap suggesting that more empirical studies should be conducted with the organizational constructs. The empirical evidence will reveal the relationship of complexity leadership functions with the behavior of the organizations. Hazy and Prottas (2018) have also suggested that the studies on complexity leadership functions and intermediate organizational constructs /constructs with organizational level outcomes should be carried out.
3. Traditional leadership theories have been previously studied in Pakistan's telecommunication organizations, but complexity leadership theory has never been studied in this context. Therefore, studying complexity leadership functions' relationship with entrepreneurial orientation and investigating the moderating effect

of information system implementation in Pakistan's telecommunication sector provides a contextual gap.

1.4.1 Research Questions

The research questions of this study are:

1. What are the fine-grain interactions of each complexity leadership function?
   1.1 What are the fine-grain interactions of generative leadership function?
   1.2 What are the fine-grain interactions of administrative leadership function?
   1.3 What are the fine-grain interactions of community building leadership function?
   1.4 What are the fine-grain interactions of information gathering leadership function?
   1.5 What are the fine-grain interactions of information usage leadership function?
2. Is there a relationship between the complexity leadership functions and entrepreneurial orientation?
   2.1 Is there a relationship between generative leadership function and entrepreneurial orientation?
   2.2 Is there a relationship between administrative leadership function and entrepreneurial orientation?
   2.3 Is there a relationship between community building leadership function and entrepreneurial orientation?
   2.4 Is there a relationship between the information gathering leadership function and entrepreneurial orientation?
   2.5 Is there a relationship between the information using leadership function and entrepreneurial orientation?
3. Does information system implementation moderate the relationship of complexity leadership functions and entrepreneurial orientation?
   3.1 Does information system implementation moderate the relationship of generative leadership and entrepreneurial orientation?
   3.2 Does information system implementation moderate the relationship of administrative leadership and entrepreneurial orientation?

3.3 Does information system implementation moderate the relationship of information gathering leadership and entrepreneurial orientation?

3.4 Does information system implementation moderate the relationship of information using leadership and entrepreneurial orientation?

1.4.2 Objectives of the Study

The objectives of this study are as under:

1. To explore the fine-grain interactions of each complexity leadership function
   1.1 To explore the fine-grain interactions of the generative leadership function
   1.2 To explore the fine-grain interactions of the administrative leadership function
   1.3 To explore the fine-grain interactions of community building leadership function
   1.4 To explore the fine-grain interactions of information gathering leadership function
   1.5 To explore the fine-grain interactions of information using leadership function
2. To investigate the relationship of complexity leadership functions and entrepreneurial orientation
   2.1 To investigate the relationship of generative leadership function and entrepreneurial orientation
   2.2 To investigate the relationship of administrative leadership function and entrepreneurial orientation
   2.3 To investigate the relationship of community leadership function and entrepreneurial orientation
   2.4 To investigate the relationship of information gathering leadership function and entrepreneurial orientation
   2.5 To investigate the relationship of information using leadership function and entrepreneurial orientation
3. To examine the moderating effect of information system implementation between the relationship of complexity leadership functions and entrepreneurial orientation

3.1 To examine the moderating effect of information system implementation between the relationship of generative leadership function and entrepreneurial orientation

3.2 To examine the moderating effect of information system implementation between the relationship of administrative leadership function and entrepreneurial orientation

3.3 To examine the moderating effect of information system implementation between the relationship of community building leadership function and entrepreneurial orientation

3.4 To examine the moderating effect of information system implementation between the relationship of information gathering leadership function and entrepreneurial orientation

3.5 To examine the moderating effect of information system implementation between the relationship of information using leadership function and entrepreneurial orientation

1.5 Significance of the Study

This study makes a significant theoretical, empirical, and contextual contribution to complexity leadership theory. This study identifies the fine-grain interactions of five complexity leadership functions: generative leadership function, administrative leadership function, community building leadership function, information gathering leadership function, and information using leadership function. It contributes substantially in the field of complexity leadership by developing an instrument of complexity leadership functions. As complexity leadership is in the infancy stage and has not been tested extensively, this study tests the complexity leadership functions' relationship with entrepreneurial orientation contributing theoretically to complexity leadership. This study's results provide the most common fine-grain interactions that can help develop an entrepreneurial posture providing significant empirical contribution.

This study empirically contributes that the benefits of the information system implementation can prove significant for entrepreneurial orientation development. However,

outcomes of information system implementation are yet to be adopted as fine-grain interactions. This study contributes explicitly to Pakistan's telecommunication sector to develop and maintain its entrepreneurial posture by inculcating the identified fine-grain interactions of respective complexity leadership functions. As identified earlier, Pakistan's telecommunication sector has a large opportunity window to use its expertise to fill the market gaps and help Pakistan attain sustainable development goals. The fine-grain interactions identified in this study will help the telecommunication sector initiate and maintain the entrepreneurial process and explore further expansion opportunities.

CHAPTER 2

LITERATURE REVIEW

2.1 Resource Based View

Organizations try to sustain their position in the market by starting new avenues and offering new products and innovative solutions. Organizations try to gain a competitive edge over their competitors by proactively identifying the market opportunities and developing the product and solutions for the market. To gain the advantage, organizations require certain resources that play an essential role in attaining their goals. Barney (1991) proposed a framework according to which the organization's competitive advantage is based on the strategies. These strategies aim to exploit the organization's strengths by responding to environmental opportunities while neutralizing threats and avoiding weaknesses. This strategizing process by utilizing its resources is also known as a resource-based view (Delery & Roumpi, 2017; Yu, Chavez, Jacobs, & Feng, 2018).

The resource-based view presented six types of resources necessary for the organizations to grow in the market (Grant, 1991). These resources are (i) physical resources which include equipment used and physical location of the organization, (ii) technological resources, which includes the software used within organizations to record the detailed transactions of the organizations, (iii) human resources, which includes training, judgment, experience, intelligence, and relationships between the workers and managers, (iv) financial resources which have the finance-related resources to carry out the operations, (v) the organizational resource such as formal reporting structure, coordinating structure and formal and informal planning and (vi) reputation, with which the organization tends to maintain its image in the market. The resources are divided into three categories: First, physical capital resources such as equipment, technology, and geographic location. Second, human capital resources, experience, judgment, relationships, and intelligence of the organization's

employees, and third are organizational capital resources that include the organizational structure, controlling, and coordinating system (Jensen, Cobbs, & Turner, 2016; Pertusa-Ortega, Molina-Azorín, & Claver-Cortés, 2010).

According to Wernerfelt (1984), resources are the assets that can be tangible or intangible and can provide unique value in the market for competitive gain (Chatzoglou, Chatzoudes, Sarigiannidis, & Theriou, 2018). The resources are considered valuable, rare, inimitable, and organizational (Barney & Wright, 1998). Valuable resources allow the organizations to exploit the market opportunity and gain competitiveness. The rarity of the resource refers to the availability of the resource in the given environment. Inimitability refers to the creation of a substitute. If the organization has a valuable and rare resource, it is the cost of the resource that allows it to be inimitable. The last condition refers to how the organization organizes these resources to make it effective enough to remain competitive in the market (Barney, 2014). Past literature shows extensive number of studies using resource based view framework and tangible and intangible resources to investigate the organizations' competitive gains (Galbreath & Galvin, 2004; Kamasak, 2017; Knott, 2015; Lin, Tsai, Wu, & Kiang, 2012).

2.2 Complexity Leadership

Marion and Uhl-Bien (2001a) defined complexity leadership as the process in which new organizational behaviors and directions emerge based on the dynamic interactions between the individuals in the organization. According to Hazy (2011a), complexity leadership is the set of coordinated activities that affect the organizational system. Later, Hazy (2015) defined that complexity leadership is not personal, rather is a recognizable pattern of social and relational organizing within an organization by using five leadership functions among autonomous individuals as they form into a system of action. These complexity leadership functions are (i) Generative Leadership Function, (ii) Administrative Leadership Function, (iii) Community Leadership Building Function, (iv) Information Gathering Leadership Function, and (v) Information Using Leadership Function. According to the definition of complexity leadership, the studies' focus has majorly shifted from the personal perspective to the leader-follower perspective (Graen & Uhl-Bien, 1995).

In the leader-follower leadership perspective, the feedback is in the form of high-quality exchange consisting of mutual trust, respect, and obligation and low-quality exchange consisting of characteristics such as low level of mutual trust, respect, and obligation. The reporting of high-quality exchange is presented by individuals who go beyond their responsibility to achieve the tasks. The low-quality exchange is presented by the individuals who stick to their job description only. This kind of relationship response is created when leaders face resource constraints and develop a trust factor amongst the unit members. This perspective provides good knowledge about the dyadic relationship between the individuals. This dyadic relationship within a social network forms a complex system based on the interactions between the individuals. The change in one individual's behavior brings a change in others' behavior, hence changing the whole environment. Therefore, these relationships between the individuals based on their nature can be considered as non-linear and non-intuitive. Any relation with such non-linear and non-intuitive property between the supervisor and subordinate in an organizational setup is considered as a complexity leadership (Allen, 2001; Marion & Uhl-Bien, 2001b; Porter-O'Grady, 2020).

Studying the complexity leadership is the behaviors and values that are a major concern of the interest. Plsek and Wilson (2001) call these behaviors and values natural attractors. The organizational environment is embedded with these natural attractors where the behavior enables an individual to interact with another individual at a specific time. These natural attractors may vary from time to time and from situation to situation. This unpredictability of the behavior based on the environmental factors generate a non-linear pattern within the system. This non-linearity tends to come to equilibrium when the interactions between both individuals settle the situation of chaos. The interaction between the individuals tends to highlight the space between them. The greater the space, the lesser is the possibility of interaction and the higher the non-linearity. If the individuals' interaction space is low, higher will be the interactions leading towards adaptability and later towards the equilibrium stage (Goldstein, Hazy, & Lichtenstein, 2010). If studied on a day-to-day basis, these interactions between the individuals can provide fruitful information for the type of behavior of the organization. This behavior of the organization can help determine the organization's cultural perspective, which may help predict the organization's overall direction.

Complexity leadership involves interactions carried out between the leaders and members of the organization. These day-to-day interactions between the individuals of various hierarchies bound by the organizational rules are called fine-grain interactions (Hazy, 2011a; Jensen, 2021). As the leadership practices catalyze these fine-grain interactions (Hazy & Uhl-Bien, 2015) and interaction is a leadership activity that initiates a new practice or reinforces an existing practice (Hazy & Prottas, 2018). In this study, the term interaction is used commonly. Figure 2.1 explains the relationship between fine-grain interactions and coarse-grain outcomes. The term fine-grain and coarse-grain can be termed as a qualifier for the day-to-day interactions and managerial outcomes. The fine-grain interactions between the individuals are controlled by the set of rules that may be the organizations' policies or the norms based on which the individuals may behave in a certain manner. These fine-grain interactions initiate a mechanism that is non-linear in nature. Due to the principle of adaption, these interactions converge to provide managerial outcomes which are also known as coarse-grain properties (Hazy & Uhl-Bien, 2015). Coarse-grain outcomes develop the organizational culture and environment, allowing organizations to behave in a predictable manner (Hazy, 2011a, 2011b). Suppose either of the rules is changed in the organizational system. In that case, fine-grain interactions between the individuals change again, initiating a mechanism to be converged to a certain coarse-grain outcome. This process of evolution from fine-grain interaction to the coarse-grain outcome through adaptability shows performance of the organization even if the organizations are not in the state of the equilibrium (Carroll & Burton, 2000; Francis & Isaac, 2020; Holland & Miller, 1991; Kauffman, 1993; Lawless & Anderson, 1996; Levinthal, 1997; Surie & Hazy, 2006).

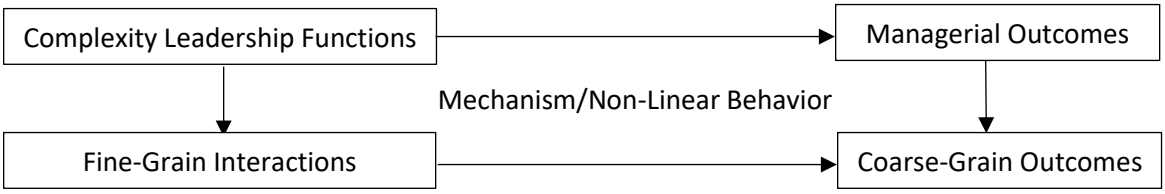

Figure 2.1: Complexity Leadership Interaction and Outcome

Leadership complexity does not rule out the hierarchical structures in organizations and provides a dynamic interaction system between the different hierarchies. After the initiation of the interactions between these hierarchies, a dynamic mechanism is originated. This mechanism allows everyone to adapt to the changes aligning with the dynamic system.

Uhl-Bien and Marion (2009) suggest that this adaptive function created due to dynamic mechanism is considered completely adaptive if there is a well-defined two-way interaction between the hierarchies. The equilibrium within the system is difficult to attain if the interaction between different hierarchies is not well established and if the interaction between the hierarchies is not dynamic. Hence, the organization with no or little dynamic interaction will remain in a state of in-equilibrium and on the verge of chaos. Therefore, it is necessary that the dynamic interactions between the organization's hierarchy are developed to attain a balanced environment. Complexity leadership functions proposed by (Hazy & Uhl-Bien, 2015) and their outcomes are discussed in the sections below.

2.2.1 Generative Leadership Function

In a working environment, the generative leadership function forms a system of action that helps develop new solutions and changes the thinking process. The generative leader function helps transform the thought process, finding the solution to the problems in a new and unique way. This leads the working force in an organization towards creativity and innovation (Bushe, 2019; Edwards-Groves & Rönnerman, 2021). The generative leadership function identifies the opportunities in all the situations, finds all the possible answers by estimating all the assumptions, encourages other people to explore, trusts the subordinates, and keeps their spirits high (Disch, 2009). The outcomes or coarse-grain properties of generative leadership function include entrepreneurial orientation, autonomy, entrepreneurial process, experimentation, new product development, and adaptation (Hazy & Uhl-Bien, 2015).

While working in a team, the team members generate an image that helps them work more progressively by developing an environment. The image is considered to be generative when they adopt a new method for solving daily work problems. Bushe (2013) suggests that a generative image affects thinking, leading to a better decision-making process. This image evokes the working attitudes of individuals. These attitudes and assumptions formulate the way individuals think, developing the organization's culture (Di Stefano, Scrima, & Parry, 2019; Domínguez Escrig, Mallén Broch, Lapiedra Alcamí, & Chiva Gómez, 2020). This

cycle helps develop an environment where innovation and creativeness can be harnessed. The generative image creates a process that helps the people understand each other and enable them to work with each other by developing a common understanding. This enactment of the individuals provides them with cognitive harmony benefiting them to work innovatively (Mombourquette & Adams, 2018).

In complexity leadership, generative leadership function is based on the two-way interactional system, which is different from a few organizational members at the top, deciding on their own for the betterment of the organization. In any organizational system, the objective is to increase and bring innovativeness; therefore, the generative leadership function can be considered essentially important at all the organization's tiers (Surie & Hazy, 2006). The perspective of generative leadership function is different from other leadership perspectives. The generative leadership function visualizes environment as a key factor for the performance of the organization where the environment is purely an outcome of the interactions of the individuals working for that organization (Anderson, 1999; Hage, 1999; Kauffman, 1993; Levinthal, 1997; Schonour, 2019; Siggelkow & Rivkin, 2005). Edmondson and Harvey (2018) suggest that individuals within the cross-boundary teams interact to provide innovative solutions. In cross-boundary teams, individuals from different backgrounds and experiences bring knowledge diversity, producing innovative solutions to the problems. Similarly, individuals interact in cross-functional teams to effectively provide innovative solutions (Blindenbach-Driessen, 2009).

Rowe and Hogarth (2005) suggest that there should be a generative relationship between the individuals in a system. The generative relationship between individuals enhances newness and innovativeness in work. Considering organization as a system, three basic components, (i) convergent, (ii) generative, and (iii) adaptive, work together to deliver innovativeness (Hazy, 2011a). The convergent is one of the causes through which all the individuals working together are converged at one point. This cause can be the goal or the aim of an organization where everyone converges. Convergence acts as a controlling mechanism through which the individuals in an organization can be controlled. On the other hand, the complete opposite is generative. Generative is about newness and innovativeness. The generative component provides individuals with autonomy and openness to work and

share information and ideas by interacting with each other. It also provides freedom rather than control, creating tension between both generative and convergent components. To create balance within the system and bring symmetry between both the components, the unifying force must be implied (Hazy, 2012). This unifying force, also known as the adaptive component, helps to balance the tension between generative and convergent developing internal and external boundaries of both the system (Hazy, 2011a).

Generative leadership provides a high degree of a normative and a lower level of direct control (Åteg, Wilhelmson, Backström, Åberg, Olsson, & Önnered, 2009). This high normative control and low direct control provide a system with an equilibrium. Hazy and Uhl-Bien (2015) conceptualized that generative leadership function generates a mechanism of emergence providing coarse-grain outcomes of adaptive possibilities such as autonomy, openness, and orientation towards the entrepreneurial work. Any system with autonomy, openness, and orientation towards entrepreneurial activities shows a significant innovativeness level. Generative leadership function therefore helps the organizations to develop an innovative environment.

2.2.2 Administrative Leadership Function

Organizations plan, control, and develop a structured approach to organize their day-to-day operations. Administrative leadership function involves day-to-day fine-grain interactions that produce the coarse-grain outcome such as role clarity, consistent routines, a clear chain of responsibility, efficiency, and performance through the mechanism of entrainment (Hazy & Uhl-Bien, 2015). Entrainment allows the organizations to fall in a rhythmic process aligning all the organizations' members. The alignment between the organizations' members is caused by social interactions where the individuals based on the daily interactions tend to harmonize with each other over the period (Borrie, Barrett, Willi, & Berisha, 2019; Kelly & Karau, 1993; Reid & Reed, 2000; Thommes, Uitdewilligen, Rico, & Waller, 2020). The interactions in administrative leadership function allow the division of responsibilities to the other individuals. Clarifying each individual’s responsibility for their role in the organization, keeping a clear chain of responsibility, and making the consistent

routines harmonize the organization's operation. This harmony in the day-to-day operations helps develop a consistent routine of working, which helps achieve the target in time. The achievement of targets in time also helps increase the individuals' efficiency and, eventually, the organization's overall performance. According to Hazy and Uhl-Bien (2015), the administrative leadership function eliminates confusion by clarifying the responsibilities. It focuses on implementing the policies, processes, and procedures (Uhl-Bien et al., 2007).

In organizations, leaders define tasks and jobs for their subordinates (Alanazi, Alharthey, & Rasli, 2013; Huynh & Hua, 2020; Ju, Huang, Liu, Qin, Hu, & Chen, 2019; Malik, Aziz, & Hassan, 2014; Polston-Murdoch, 2013). The members of the organizations are given instructions for clarity in the tasks. Supervisors continuously monitor the subordinates' progress and provide appropriate feedback (Somech, 2005). This enables the supervisors to maintain a controlled environment in which the goals are clearly defined, and individuals are expected to work on the assigned task to achieve the goal. To achieve the goals, the directives are provided to the units or teams which they work upon. This directedness and goal achievement takes away the individual thinking and effort towards the goal achievement where the directives are fixed, and there is little place for the self-driven decision (Martin, Liao, & Campbell, 2013).

The controlled environment enables an individual at the higher tier to decide what needs to be achieved by the rest of the human resources available to him (Polston-Murdoch, 2013). This allows the higher tier's clarity on how tasks can be further distributed to the concerned human resource. The day-to-day routine, which can bring organizational control, can only be achieved when the organization is well structured and everyone knows the reporting hierarchy. If the organization's structure is well defined, it also allows the individuals to identify and orient themselves to their and other individuals’ positions. This clear demarcation of position helps the higher tier to maintain better governance (Wheelen, Hunger, Hoffman, & Bamford, 2017). This governance allows the individuals in the higher tier to manage the tasks appropriately. The realization of authority helps discipline the other individuals and integrate all the individuals as one entity (Pearce & Sims Jr, 2002).

Leadership does not act independently to maintain order within the organization. It operates within a certain jurisdiction by following the policies and standard operating

procedures defined in the organization (Gündemir, Dovidio, Homan, & De Dreu, 2017). These policies and standard operating procedures provide guidelines to operate within certain boundaries. Individuals' day-to-day routine depends on these already defined policies allowing them to act uniquely and predictably. However, the defined policies evolve over the period, and it is the dynamic human behavior that allows changing the standard rules of operation as time passes (Khaw, Glimcher, & Louie, 2017; Reddy, Montambault, Masuda, Keenan, Butler, Fisher, Asah, & Gneezy, 2017). Suppose the policies and set standards are inappropriate for daily transactions. In that case, the day-to-day interactions based on the dynamic behavior will potentially change the rules to provide more consistency in the routines. This consistency in the individuals' routines will allow the individuals to operate with consistency and achieve the given targets and goals efficiently (Langdon, 2017).

2.2.3 Community Building Leadership Function

It allows the individuals to come closer to each other behave in an organization as a community. A community can be expressed as a social gathering where every individual understands another individual (Dakiche, Tayeb, Slimani, & Benatchba, 2019). Community building leadership function generates managerial outcomes like community building, trust, intrinsic motivation, citizenship behavior, and orientation of a community through the mechanism of belongingness and shared identity (Hazy & Uhl-Bien, 2015). This leadership function enables bonding between the coworkers where one individual act as support to another individual. This increases the strength of the relationship between the individuals and allows them to help each other in their daily routines. Such supportive behavior helps develop trust and citizenship behavior (Ford, Wang, Jin, & Eisenberger, 2018). One of the principles which can shape the organization as a community, bring trust, enhance employee interaction with each other, encourage fair treatment with each other and bring citizenship behavior is justice within the organization (Ajlouni, Kaur, & Alomari, 2021; Kouchi, Hashemi, & Beshlideh, 2016; Tefera & Hunsaker, 2020; Tremblay, 2017; Yu, Mai, Tsai, & Dai, 2018).

Fassina, Jones, and Uggerslev (2008) link citizenship behavior with organizational justice and suggest that citizenship behavior can be affected by three types of organizational

justice. First is procedural citizenship behavior, which refers to the fairness of the organization's procedures to all the individuals within the organization. This means that procedures once defined in the organization should apply to every individual in the same way. The second is interactional justice which refers to interpersonal justice. Interpersonal citizenship refers to every individual's fairness of treatment and shows that all individuals are treated equally. The third distributive justice is the amount of the outcome that an individual receives. The outcome here refers to the income or pay of an individual compared to the work the individual is doing. Bahrami, Montazeralfaraj, Gazar, and Tafti (2014) suggest information justice as another factor that helps bring citizenship behavior into the organization. Informational justice refers to the equality of information passed on to one individual as compared to another individual. If one individual is passed on more information than the other individual, it perturbs the outcome of citizenship behavior. This shows that the interactions in this leadership function must bring fairness to the system so that every individual gets the feeling of being treated as equal and considers that the system has an element of justice (Blader & Tyler, 2013; Janssens & Steyaert, 2019).

The coarse-grain outcomes of community building leadership function such as trust and citizenship behavior, it is also necessary for the superiors to have a supportive behavior (Meierhans, Rietmann, & Jonas, 2008). Supportive superiors' behavior helps the employees to communicate daily with each other for a better work environment (Shin, Oh, Sim, & Lee, 2016; Wu & Parker, 2017). The supportive behavior does not imply that the individuals will be given all the resources to work. Instead, it is the individual's willingness to share the responsibility and share the burden of work with others. This behavior of an individual allows other individuals to develop a reliance on others. In such cases, one individual relies on the other to share the responsibility and work as a team (Wang, Zhang, Thomas, Yu, & Spitzmueller, 2017). The supportive behavior also enables a transparent environment in the organization to help the individuals develop trust in others. Therefore, in the community building leadership function, supportive behavior allows the individuals to gain trust and maintain citizenship behavior (Meierhans, Rietmann, & Jonas, 2008).

Individuals support each other by showing an intent to work with each other either as supervisors or subordinates (Kim, Atwater, Jolly, Ugwuanyi, Baik, & Yu, 2021; Parris &

Peachey, 2013; Van Dierendonck, 2011). In such cases, an individual's self-interest is bonded with the self-interest of other individuals. This allows individuals to learn about each other. According to Avolio, Walumbwa, and Weber (2009), individuals extending such a supportive behavior in the organizational environment possess ten characteristics (i) listening, (ii) empathy, (iii) healing, (iv) awareness, (v) persuasion (vi) conceptualization (vii) foresight (viii) stewardship (ix) commitment (x) building community. Community building leadership function, therefore, encourages one individual to extend the support to another individual without compromising their interest to develop the environment of community building, trust, intrinsic motivation, citizenship behavior, and orientation of a being a community (Vondey, 2010; Yoshida, Sendjaya, Hirst, & Cooper, 2014). It enables every individual within an organization to act ethically and preserve moral values.

2.2.4 Information Gathering Leadership Function

The information gathering leadership function encourages the individuals to learn from each other based on their daily interactions. Information gathering leadership function through integrating and synthesizing distributed information provides the managerial outcomes of exploring data, listening, and learning culture (Hazy & Uhl-Bien, 2015). Individuals, when interacting with each other, they pass on different types of information. Individuals learn either from outside the organization or within the organization (Serrat, 2017). Information is also gathered through personal experiences of individuals' professional lives. This kind of firsthand flow of information accumulates knowledge within the organization (Grigoriou & Rothaermel, 2017). Therefore, one of the major sources of information is the exchange of information between the individuals themselves.

Information is also shared between the supervisor and subordinate while sharing the feedback (Beenen, Pichler, & Levy, 2017). Feedback allows the subordinates to learn and keep that information to be passed on to others. The feedback is not limited to the hierarchical approach, which is usually studied as a top-down approach, but it can be considered both ways (Lam, Peng, Wong, & Lau, 2017). Information gathering leadership function, therefore, allows a dyadic relationship between the supervisor and subordinate. This dyadic relationship

allows individuals to collect information from multiple sources such as customers, colleagues, competitors, media, and the internet. This two-way interaction between individuals forms a sequence of information flow, allowing the individuals to make better decisions (Bol & Leiby, 2021; De Stobbeleir, Ashford, & Buyens, 2011).

In the information gathering leadership function, information flow from top to bottom and vice versa is only possible through two-way interactions if individuals are open to speaking and imparting information openly. The environment in which the individuals are open to speaking to each other enhances the culture of learning and listening (Gastil, 1994). According to Bass and Bass (2009, p. 52), "Leadership is an interaction between two or more members of a group that often involves a structuring or restructuring of the situation and the perceptions and expectations of the members…. Leadership occurs when one group member modifies the motivation and competencies of others in the group. Any member of the group can exhibit some amount of leadership ….". Individuals working together must take each other's point of view under consideration without considering the position. An opinion given by any individual should be considered essentially important. Passing information is also easy when the organizational environment allows basic principles such as inclusiveness, equal participation, and deliberation. Individuals being part of the organization should participate in the organizational decisions, which initiate the flow of information and learning environment (Fishkin, 1991). Choi (2007) suggests that the individuals share the values and beliefs in an environment that allows them to participate.

Individuals in the groups may find speaking openly more effective and productive, and some may favor a more restricted environment. The meta-analysis results show that people working in groups tend to align more towards an open environment where everyone can speak and listen to others openly instead of the restricted environment where listening and speaking are not encouraged (Kim, Beehr, & Prewett, 2018). The group members are more prone to the exchange of information from the other participants rather than remaining in their confined boundaries and operating within those boundaries without exchanging any information (Cerantola, 2019). The exchange of information also extends towards the participative action of the individuals encouraging them to indulge themselves in the process of decision making (Hayek, Williams Jr, Taneja, & Salem, 2015; Li & Qian, 2016; Treurniet

& Wolbers, 2021; Wang, Wang, & Li, 2018). Northouse (2018) also suggests that participative behavior is required when clarity is needed and the tasks are unclear or unstructured. Therefore, the information gathering leadership function allows the participants to exchange information by participating in discussions and developing listening and learning culture in the organization.

2.2.5 Information Using Leadership Function

Information using leadership function reinforces the information to decide about the new ways of doing the business by leaving the older methods. This leadership function allows the organization to set a new direction through fine-grain interactions, leading to a managerial outcome such as accountability culture, convergence orientation, clear responsibilities, and clear authority through a ratcheting mechanism (Hazy & Uhl-Bien, 2015). Information using leadership function deals with the progress of the organization by focusing on the organizational position. The ratcheting mechanism does not allow the organization to move in the reverse direction and restrict it to new ways. An excellent example of information using leadership function is shifting Intel from the old ways of Dynamic Random Access Memory (DRAM) business to a new microprocessor business. The managerial outcome of this function shows that to maintain the organization's current course, the fine-grain interactions must generate an accountability culture. This accountability culture is possible when the individuals have control and authority over other individuals (Romme, 2019). To bring accountability, the goals established earlier must be monitored and assessed for completion (Ahyaruddin & Akbar, 2016; Hall, Frink, & Buckley, 2017; Han & Perry, 2020). The interactions like progress monitoring allow revealing the direction of the organization.

As information using leadership function allows the accountability culture to prevail, the two-way interactions in this leadership function allow individuals at the higher tier have a stronger hold over the individuals in the lower tier. The authorities at the higher tier envision, steer the organizational responsibilities, monitor the tasks being carried out, allocate the resources, evaluate the performance and reward anyone attaining the goals aligning to the organization's vision (Ghauri, 2018). Information using leadership function

allows the leadership to be authoritative (Northouse, 2017), autocratic (Kibbe, 2019), and provide a reward system (Avolio, Bass, & Jung, 1999; Azman, 2017; Bass, 1997; Care, Bernstein, Chapman, Diaz Reviriego, Dressler, Felipe-Lucia, Friis, Graham, Hänke, Haider, Hernández-Morcillo, Hoffmann, Kernecker, Nicol, Piñeiro, Pitt, Schill, Seufert, Shu, Valencia, & Zaehringer, 2021; Idemobi, Ngige, & Ofili, 2017) for the individuals working in the organization. It allows the subordinates to show progress and achievements to the supervisors. Although authority and autocracy have been used interchangeably, Bass and Avolio (1990) suggest a correlation between the both. The fundamental difference between autocratic and authoritarian is the presence of information (Choi, 2007). In an autocracy, information is present with the leaders at that time of the decision-making. In authoritarianism, the leaders use their ability to persuade the followers with the decisions taken. Also, the leader may choose the autocracy to decide if the leader is under high pressure and the consensus is not being developed. Authoritative leadership is used to sort out the team members' problems (Slevin & Pinto, 2007). As there is no participation by the followers in the decision making in both authoritarian and autocratic leadership, there is little sense of community (Nanjundeswaraswamy & Swamy, 2014).

Based on the authoritative and autocratic nature, where the outcome is accountability, information using leadership function leads to the organization's centralization (De Hoogh, Greer, & Den Hartog, 2015). The decisions in such organizations are taken centrally. In this perspective, information using leadership function is like the administrative leadership function, but the mechanism and the managerial outcomes differentiate it from an administrative function. The establishment of a hierarchical structure ensures the monitoring of the progress and growth of the organization. Although the organization's growth can be monitored in different ways, economic growth is the primary method of measuring the progress of any organization (De Hoogh et al., 2015). Authority and autocracy within an organization provide strict control over the progression and economic growth (de Luque, Washburn, Waldman, & House, 2008; Dughera, 2021; Puni, Ofei, & Okoe, 2014). The organizations must have critical resources based on which they operate to earn the revenue. According to Huang, Xu, Chiu, Lam, and Farh (2015), organizations with lesser resources tend to have high autocratic leadership, and organizations with higher critical resources tend

to have low autocratic leadership. Information using leadership, therefore, provides accountability through monitoring of the goals and tasks decided.

2.3 Entrepreneurial Orientation

Starting something new, like developing a new venture, product, or market service, is considered entrepreneurial activity. Entrepreneurs seek new opportunities in the market to start new ventures. Keeping in view the opportunities in the competitive market, the characterization of the opportunity can be traced back to (Schumpeter, 1934) and (Kirzner, 2009). Schumpeter (1934) suggests that opportunity in the market can be created based on innovativeness, disrupting the existing market. On the other hand, (Kirzner, 2009) emphasizes seeking opportunities within the system through alertness. Acs and Audretsch (1988) suggest that innovative entrepreneurial initiatives are more likely to originate from organizations encouraging research and development. In either case, entrepreneurial behavior or entrepreneurial intentions are important and have remained understudy in the past (Al-Jubari, Hassan, & Liñán, 2019; Audretsch & Link, 2019; Darmanto & Yuliari, 2018; Douglas, Shepherd, & Venugopal, 2021; Kotlar & Sieger, 2019). Along with the behavior and intention, studies are conducted on entrepreneurial orientation (Haider, Asad, & Fatima, 2017; Shan, Song, & Ju, 2016; Taheri, Bititci, Gannon, & Cordina, 2019; Wales, Gupta, Marino, & Shirokova, 2019; Wales, Kraus, Filser, Stöckmann, & Covin, 2021).

According to Lumpkin and Dess (1996, p. 136), entrepreneurial orientation refers to the processes, practices, and decision-making activities that lead to new entry characterized by one or more of the following dimensions: a propensity to act autonomously, a willingness to innovate, and take risks, and a tendency to be aggressive toward competitors and proactive relative to marketplace opportunities. It is the driving force for economic and social development growth by setting up new corporations' businesses and enterprises, resulting in jobs, an improved economy, and leading toward a stable society. The main idea behind the notion of entrepreneurship is some new business entry. The entrepreneurial initiative involves introducing new businesses that an individual may initiate, but organizations have also been found to take new initiatives by introducing business avenues for them (Baron &

Markman, 2018; Elia, Margherita, & Petti, 2016; Glinyanova, Bouncken, Tiberius, & Cuenca Ballester, 2021).

Entrepreneurial orientation has been a topic of interest for scholars in Pakistan as well (Aziz, Hasnain, Awais, Shahzadi, & Afzal, 2017). It has been used to see the performance of the organizations at the small, medium, and large scale (Nazar, Ramzani, & Temoor Anjum, 2018; Shah & Ahmad, 2019). Previous studies have shown that scholars have studied entrepreneurial orientation within Pakistan's context with various organizational level constructs (Bhatti, Rehman, & Rumman, 2020; Hussain, Shah, Rehman, & Khan, 2018; Khan & Ahmed, 2019; Soomro & Shah, 2019). The studies have found that organizations use their networking as a key for developing their entrepreneurial orientation (Asad, Sharif, & Hafeez, 2016). The information collected from the networking helps strategize new ventures, products, and services.

The studies show that entrepreneurial orientation allows understanding strategy-making processes based on which organizations make their entrepreneurial decisions (Shan et al., 2016). The leaders and corporate managers use a decision-making process to maintain the vision, achieve goals, and produce a competitive advantage. Strategizing is critical for any organization and includes drafting, scrutiny, decisiveness, and other outlooks representing the practices that the organization should adopt. Any organization should constantly search for new opportunities and not be bound to what already exists to be strategically entrepreneurial. To enter a new market, an organization should devise a plan to proactively identify the market gap and take a risk to fill the gap through innovative and new solutions. This will allow the organizations to increase their capabilities improve their performance (Aziz et al., 2017) by improving their capabilities (Bhatti et al., 2020), and gain a competitive edge over the other organizations (Ferreira, Coelho, & Moutinho, 2018). Entrepreneurial orientation has a total of five dimensions, (i) Innovativeness, (ii) Proactiveness, (iii) Risk-Taking, (iv) Autonomy, and (v) Competitive Aggressiveness (Lumpkin & Dess, 2015).

2.3.1 Innovativeness

Innovativeness refers to an organization's aptness to assist an innovation notion and uniqueness and engage in it, leading to some new product or service in the market (Zawawi, Wahab, Al-Mamun, Yaacob, Kumar, & Fazal, 2016). This decision to bring something new to the market will help the organization grow and gain a competitive edge. Story, Boso, and Cadogan (2015) also suggested that innovativeness can be interpreted as developing new product lines and changing organizational behavior to experiment with new and revolutionary ideas. According to Ince, Imamoglu, and Turkcan (2016), innovativeness means offering new products in the market or developing a new business process. Innovativeness is generally considered as the development of a product that may lead to a disruptive market. Disruptive innovativeness is usually linked with new technological advancements (Christensen, Raynor, & McDonald, 2015; Zubizarreta, Ganzarain, Cuadrado, & Lizarralde, 2021). Gobble (2016) argues that disruptive innovativeness depends on how and to whom the product's value is being delivered in the market. New technology is not necessary for disruptive innovativeness. Differentiated values can still be provided using the old technology using innovatively.

Innovation is the generation of new ideas which can develop into new products and services. On the other hand, innovative behavior is the intention of an employee to come up with new ideas, products, processes, and services (Shin, Yuan, & Zhou, 2017). Yuan and Woodman (2010) proposed innovative behavior as an image of outcome expectation. Innovative behavior is either due to the social-political perspective or efficiency-oriented perspective. An individual in an organization tries to develop an innovative behavior if the organization support innovativeness (Afsar & Badir, 2017; Farrukh, Ghazzawi, Raza, & Shahzad, 2021; Qi, Liu, Wei, & Hu, 2019). Organizations supporting innovation and innovative ideas encourage everyone in the organization to act innovatively. Sharing innovative ideas with others such as peers and supervisors and encouraging creative thinking allow the relationships within the organizations to grow. This relationship helps everyone remain out of the stagnant routines and encourages an exploratory nature. Exploration allows finding new possibilities to solve the problems (Bernal, Maicas, & Vargas, 2019; Hou, Hong, & Zhu, 2019). Exploration also enables the learning culture allowing everyone to gain

information from their surroundings. Rhee, Park, and Lee (2010) suggest that the organization's learning culture is enabled through entrepreneurial orientation.

Recognizing the innovative solution can be achieved through three behavioral tasks (i) idea generation, (ii) idea promotion, and (iii) idea realization (Janssen, 2000). The idea generation is the first step leading to an abstract idea. In the second step, idea promotion, the abstract idea is promoted or diffused amongst the rest for adoption. In the realization stage, the third stage, the adopted idea is experienced by the others and recognized as a good idea. To attain innovative behavior, physical activities and cognitive activities play an essential role (Messmann & Mulder, 2011). Physical activities are accompanied by the cognitive activities reflected in daily routine. This implies that the individuals' activities show the mental ability to carry out the jobs in an organizational setup. These mental and physical abilities allow individuals to learn from external and internal sources. The sources which provide information and encourages learning are the market and individuals themselves. Innovativeness has been discussed previously for innovative ideas (Xing, Liu, Wang, Shen, & Zhu, 2019).

Learning orientation is an organization-wide activity in which every individual in the organization shares information and knowledge with other individuals (Hussain et al., 2018). Information can be gained through two different types of exposures faced by individuals. These two types of exposures are internal and external exposures. The individuals are internally exposed to the processes and the organization's policies, which later form the organization's environment. External exposure includes the changes in the market. Mark change is dependent on the customer requirements and needs, change in the relationships with the external stakeholders such as vendors or suppliers, and changes imposed by the government such as policies. Previous studies have shown that organizations with higher learning orientation also show the capability to develop innovative solutions. This shows that learning orientation increases organizations' innovative ability to increase their performance (Calantone, Cavusgil, & Zhao, 2002). De Clercq, Zahid, and Belausteguigoitia (2017) found that employees have conflicts while carrying out various assigned tasks. Learning orientation helps increase the creativity of the employees by reducing the conflict between them.

To develop an innovative idea, it is essential to develop a market orientation and learning culture (Hult, Hurley, & Knight, 2004). Market orientation refers to the identification of the needs and

wants of the customers. These needs and wants create a market pull generating new products and services (Grönroos, 1989), which eventually fulfill the customers' needs and wants. Market orientation allows the firms to think ahead and formulate a vision and strategy that can help the organization grow and sustainability by affecting profitability (Maatoofi & Tajeddini, 2011) and performance (Jabeen & Mahmood, 2015; Kara, Spillan, & DeShields Jr, 2005; Zafar, Hafeez, & Mohd Shariff, 2016). Hult, Ketchen Jr, and Slater (2005) suggest that the organizations that focus on the market gather information and process it to comply with the organizational goals and lead the organization towards success. Market orientation provides information about the market's changing requirements, enabling the organizations to develop innovative solutions that could meet these requirements. Innovativeness also enhances the market penetration capability and helps in initiating new ventures through learning and identifying the opportunities (Herman, Sulhaini, & Farida, 2021; Lumpkin & Dess, 2005).

Innovation can be divided into different types. The first is incremental innovation which involves improving existing products and services using existing knowledge of the organization. On the other hand, the second is a radical innovation, which involves developing innovative solutions for the new market and new customer shape. The radical innovations impact the lives of the customers and are influenced by new knowledge (Sheng & Chien, 2016). A long history of innovativeness shows that it has remained an essential part of an organization's growth and performance (Acar & Özşahin, 2018; Bari, Fanchen, & Baloch, 2016; Domi, Keco, Capelleras, & Mehmeti, 2019; Groza, Zmich, & Rajabi, 2021). The organization depends highly on how innovative they are. Organizations failing to provide innovative solutions according to the market requirements fail to exist. Therefore, it is essential to exercise the creative thinking process and remain innovative to start a new venture. These practices enable the organizations to think out of the box and provide creative solutions, enabling the organization to remain better entrepreneurially oriented.

2.3.2 Proactiveness

Proactiveness is the firm's ability to recognize changes in the market, identify any opportunities, and seize them before anyone else does it. It is a forward-looking ability of the organization which enables organizations to anticipate future possibilities. Organizations with proactive behavior analyze, evaluate, and decide to make the first move in identifying

the market opportunities. Proactiveness is also referred to as one of the essential dimensions for entrepreneurial orientation as it suggests the keenness and ability to judge the future of the market. Although organizations entering second in the market can have a forward-looking perspective with novelty in its working, the second movers' or first movers' success depends on the proactiveness (Gao, Ge, Lang, & Xu, 2018). Proactiveness is the process involved in analyzing and acting in the forecasted occurrence to seek new opportunities that are not related to the market's current need. Proactiveness can also be described as anticipating the market's future needs (Kocak, Carsrud, & Oflazoglu, 2017; Liu, Ko, Ngugi, & Takeda, 2017).

A proactive approach helps organizations in problem avoidance by giving them knowledge about the surrounding environment ahead of time. This proactive behavior enables organizations to assess the possible difficulties in expanding the bases and resolving these difficulties through timely decisions. Lumpkin, Cogliser, and Schneider (2009) suggest that protectiveness is an opportunity-seeking behavior that allows the organizations to continuously seek market gaps and develop strategies to fill these gaps by offering the production services the market needs. Lumpkin and Dess (1996) refer to proactiveness as anticipation about the future's needs and reacting to it to keep ahead in the marketplace. This suggests that organizations must continuously exercise proactive approaches to fulfill their customers' needs by developing the products and services accordingly (Ha, Lee, & Seong, 2021; Ozdemir, Kandemir, & Eng, 2017).

Proactiveness has a relationship with the organizational environment (Horng, Tsai, Yang, & Liu, 2016). There is a broad categorization of environmental changes. Environmental changes may include a shift in customer's behavior towards the product of the services, change in the policies and processes of the organization, change in the technological artifacts which are being used to make the products and services, change in the policies developed by the government such as policies regarding taxations or variation in the import duties of the equipment or restrictions imposed on technological equipment being used for the product development or services (Evans, Vladimirova, Holgado, Van Fossen, Yang, Silva, & Barlow, 2017; Khan & Mir, 2016; Mustonen, Karjaluoto, & Jayawardhena, 2016). These changes directly impact the manufacturing and services industry and indirectly affects the customers. It is the organization's responsibility to proactively preempt these kinds of changes and develop the strategies to sustain if these changes are occurring. It is the futuristic thought process that enables organizations to foresee the upcoming changes. This proactive approach can earn them revenue even when the environmental changes are not in favor of the organizations (Zahra & Covin, 1995).

There is evidence that proactiveness has a strong relationship with the market orientation (Herhausen, 2016; Liu et al., 2017). Market orientation enables the organizations to identify the customers' needs and apply this information to provide the products and services that may fulfill the customers' needs (Rakthin, Calantone, & Wang, 2016). Market orientation enables the organizations to envision prospects through which organizations may serve the customers. It also enables an organization to adapt to the changes according to the market requirement. Proactiveness provides identification of future requirements helping organizations to make better decisions for entrepreneurial success. The organizations that proactively monitor market requirements and environmental changes tend to capture the market's major share (Lumpkin & Dess, 1996; Wiklund & Shepherd, 2005). Organizations high in proactive behavior are seen to perform much better than the other organizations that lack proactiveness (Oni, 2012). Therefore, organizations must take a proactive approach to start something new (Green, Covin, & Slevin, 2008).

2.3.3 Risk-Taking

Risk-taking refers to an element of uncertainty initiated during an entrepreneurial process. It is opposite to the situation where the outcome is known. Risk-taking, therefore, has been described as one of the key factors in entrepreneurship. Baule and Fandel (2016) suggest that risk-taking refers to the seizing of opportunity under uncertain circumstances. Businesses take risks such as getting a big sum of loans by forecasting their possible revenue and pledging a substantially large number of assets. Ventures not completely thought through could end up with failure. As Miller (1983) discussed, the risk-taking propensity is an ability in which owners or corporate managers of the firms pledge their assets and wait for an uncertain outcome.

Risk is associated with every action, behavior, or decision that an individual or an organization takes. Based on the business's perceived outcome, risk management involves the choice of alternatives available for any action, behavior, or decision (Ansell & Wharton, 1992). Diversified studies among people of different backgrounds have led researchers to associate risk with perception, and therefore, it involves variation in values, experiences, context, cognition, and situation. Although examining the individuals' perception within the organizational setup helps identify the risks associated with their daily

routines, it is important to analyze if the risk management involves actual uncertainties or just the perception or the combination of both. Risk cannot always be negative, and there are opportunities with positive outcomes (Hock-Doepgen, Clauss, Kraus, & Cheng, 2021; Jeffrey, Lévesque, & Maxwell, 2016). Despite numerous insights, the term risk incorporates an undesirable outcome in the modern world. According to Bannister and Bawcutt (1981), risk can be taken as a catalyst for success. To achieve entrepreneurial success, it is necessary to manage the risks appropriately (Brustbauer, 2016).

Managing the risks is an ongoing and continuous process. It's a planned and disciplined approach that aligns strategy, processes, people, knowledge, and technology for managing uncertainties effectively (Barton, Shenkir, & Walker, 2002). Over time, risk management has become an integral part of any effective management system and a key ingredient of the decision-making process. The risk management process analyzes both external and internal contexts. It also involves assessing risk, identifying risk, and analyzing the potential of the risk. Effective risk management requires support from top management, regular and independent monitoring and auditing, effective communication, training program, and development in the attitude and behavior of risk management (Hopkin, 2018). Since perception may vary from one individual to another, it can be divided into two main categories based on their behavior towards events. First are risk seekers, who like to take risks, and second is risk evaders, who do not intend to take the risk and avoid the risk. To determine how much risk is involved in an event, certain analyses such as 'cost & benefit' or 'loss & gain' can be used (Fatemi & Luft, 2002). The same theory applies to organizational risks since every organization has a unique culture; therefore, the definition of risk varies from organization to organization (Adams, 1995). Types of risks may vary from organization to organization based on their organizational culture.

Risk-taking has been studied as an essential part of the entrepreneurial orientation due to its importance for an entrepreneur (Covin & Slevin, 1989; Covin & Wales, 2012). When an entrepreneur decides to initiate a start-up, the chances of success of the venture are unknown. Therefore, entrepreneurs need to assess the possible problems they may face while running the business. Careful assessment of the problems leads to a lower number of risks. These careful assessments are also known as risk mitigation (Basak, 2019; Bommer, Crowley, & Pinho, 2015). An entrepreneur may face various kinds of risks, which can be categorized into internal and external risks. The internal risks may include risks such as human-related risks, technological risks, operations-related risks, financial risks, marketing-related risks, and strategic risks (Amankwah-Amoah & Wang, 2019). Similarly, external

risks involve external sources such as suppliers, government, political instability, changes in the market, government policies and economic changes, and competitors (Sadgrove, 2016).

Entrepreneurs' risks can be categorized into different categories: one, the situations that are unseen and are unpredictable; second, situations that can be foreseen and or predictable (Tarabic & Morar, 2019). Organizations can do a little about unseen and unpredictable, but they can mitigate what they can foresee and is predictable. Any natural disaster cannot be foreseen, and is unpredictable, whereas the change in market demand can be foreseen, and hence it is predictable. For situations that can be foreseen and predictable, entrepreneurs use their skills and knowledge to mitigate such risks and minimize failure (Rodriguez-Sanchez, Williams, & Brotons, 2019). An entrepreneur's risk propensity also depends on their perception of the risk. This risk perception is a belief system in which an entrepreneur believes that the risk may exist. The entrepreneur may underestimate this perception of the risk or the probability of events being miscalculated due to this belief system. Therefore, an entrepreneur must use the skills and knowledge to shape self-confidence and self-efficacy (Macko & Tyszka, 2009).

2.3.4 Competitive Aggressiveness

Competitive aggressiveness allows businesses to compete in the market aggressively. A freshly started business is more handicapped than the others and needs to be appropriately planned for the competition. So new businesses are expected to fail unless they adopt a competitive, aggressive behavior against the competitors. Competitive aggressiveness is an organization's ability to challenge existing competitors and attain a position in the market by capturing the market's substantial share. The competition is said to be aggressive when the competitors stand face to face with each other and try competing to become market leaders either on the cost, quality, the ability of the firm to deliver quickly, and the ability of the firm to launch a new product at low cost (Kaur, Kumar, & Kumar, 2017).

Organizations strategize competitive aggressiveness to remain ahead of others in the market (Ibidunni, Ibidunni, Olokundun, Oke, Ayeni, Falola, Salau, & Borishade, 2018). These strategies contain different actions through which the organizations may try to remain ahead of each other. These actions may contain marketing strategies, pricing strategies, product strategies, and service strategies (Chen, Dong, Li, & Zhao, 2020; Giachetti, 2016; Reeves, 2019; Salavou, 2015). These strategies are the competitive attacks of one organization on another. These competitive attacks can be distributed in

four different dimensions, (i) attack volume, (ii) attack duration, (iii) attack complexity, and (iv) attack unpredictability (Ferrier, 2001). The attack volume contains the number of competitive actions combined in one competitive attack. If an organization carries out competitive attacks with more competitive actions, it will have a competitive edge. The attack duration is the time through which rivals attack each other to gain a competitive edge. Attack complexity, on the other hand, is a sequence of competitive actions in a competitive attack. An organization may have a different sequence of competitive actions combined in one competitive attack. The unpredictability of competitive attack with arrivals do not have any knowledge about the competitor's offering is known as the unpredictability of competitive attack.

Competitive aggressiveness is proportional to appearing, and the disappearance of the number of opportunities is within the industry. The higher the number of opportunities in the market, the higher will be the competitive aggressiveness. These opportunities enable organizations to develop strategies to perform competitive actions to stay ahead (Nadkarni, Chen, & Chen, 2016). Covin and Covin (1990) suggest that competitive aggressiveness also depends on the organizations' technological sophistication. Technological sophistication refers to the complexity of operations involved in the development of products and services. Suppose the organization is developing a product that involves extensive research and development. In that case, such organizations are expected to have higher technological sophistication than organizations that do not have an extensive method of product development research. The organization having the upper hand in technological sophistication proves to have more aggressive behavior. Organizations spending time and money on research tend to capture a substantial market share (Alexa, Alexa, & Avasilcăi, 2016). The studies also show that the decision-makers who bear losses are risk seekers, while the decision-makers who protect their gains are not risk-takers. The individuals who are risk-takers and can face the market's unpredictability also tend to compete more aggressively, showing more competitive aggressiveness (Ferrier, Fhionnlaoich, Smith, & Grimm, 2002).

Competitive aggressiveness proves to support higher performance in a hostile environment (Lumpkin & Dess, 2001). Ferrier et al. (2002) suggested that firms thriving for financial competence will also prove to be competitive aggressive. Organizations well oriented to the market requirements keep the customer demands under consideration (Mokhtar, 2020). Due to the intensive competition in fulfilling customer demands, the firms' competitive aggressiveness has shifted to the customer domain. The studies have shown that competing on the customer's front provides the firms with better

performance and competitive advantage (Kocaoglu & Acar, 2016). Slater and Narver (1994) suggest that a competitive environment such as greater hostility and rivalry between the firms provides better market orientation, increasing the organization's performance. Leyerer (2012) suggests that the competitive aggressiveness in an organization also depends on how they learn from their surroundings. Organizations leaning towards the competitive environment show an entrepreneurial culture. Such organizations tend to face challenges and provide better entrepreneurial outcomes than the organizations that lack competitive culture. Organizations with a competitive culture remain continuously exercising new and innovative ideas to compete with their competitors. This attribute of the members of the organizations makes them entrepreneurially strong.

2.3.5 Autonomy

Autonomy refers to the independence given to individuals to share ideas. In contrast with the approach where top managers stimulate entrepreneurial activity, autonomy is the bottom-up approach to starting something new. Autonomy can be provided to the individual through the organizational environment. This suggests that the organizational environments that can allow the employees to exchange information and develop creative ideas prove to be better for organizational performance (Leyerer, 2012). Organizations with strict control over the employees and are structured generally have restricted forms of these processes of exploration and experimentation (Sarros, Cooper, & Santora, 2008). The organizations that provide freedom to their employees to explore information and experimentation with ideas tend to have autonomy in their culture and environment. It is the opportunity provided to the individuals in organizations to gather and share innovative ideas to develop new ventures, products, or services (Bouncken, Ratzmann, Barwinski, & Kraus, 2020; Wekerle, Trabasso, Loures da Costa, Villela, Brandão, & Leonardi, 2017). Under the authoritative settings of the organization, the individuals' autonomous behavior reduces, limiting the decision-making capabilities of the individuals (Stavrakakis, Kioupkiolis, Katsambekis, Nikisianis, & Siomos, 2016).

Organization exercising the autonomous decision-making culture delegates the powers to the individuals in the organizations. Delegation enhances internal motivation where individuals are provided with a feeling that they are allowed to work independently and that they are in complete control of what and how they are doing their job (Martin et al., 2013; Perkins & Zimmerman, 1995;

Spreitzer, 1995; Ugoani, 2020). Levesque and Minniti (2006) suggest that delegation is shifting power down the hierarchy where the individuals are given autonomy to make the decisions and find the solution to the problem. This enables the individuals to take full charge of the assigned task and complete independence of how the task should be performed. On the other hand, Leach, Wall, and Jackson (2003) suggest that delegation means sharing responsibilities. Delegative interaction gives an individual responsibility and freedom to work independently. If delegated and are given autonomy over their work, individuals working in teams can improve their autonomous decision-making capability by meeting and interacting face to face. This interaction can help understand the problems each member of the team faces and suggest the solution to the problems by common understanding (Kirkman, Rosen, Tesluk, & Gibson, 2004). Individuals at the lower tier show willingness to share their responsibilities, showing an autonomous behavior towards an entrepreneurial endeavor.

The entrepreneurial process is the combination of self-organized activities in which the individuals are self-determined to initiate something new (Shir, Nikolaev, & Wincent, 2019). Individuals given the freedom to think can perform better entrepreneurially. Al-Jubari, Hassan, and Hashim (2017) found out that autonomy alone does not bring entrepreneurial intention; rather, it depends on the factors like subjective norms and attitudes. The surrounding environment's effect on individuals' autonomous behavior defines the individuals' commitment, loyalty, and effort towards the work (Basu & Green, 1997). Autonomy is, therefore, an essential feature for a workplace that enables coworkers to work as a team. The workplace allows autonomous teams and groups to interact (Bouncken & Reuschl, 2018). These autonomous interactions in an organizational environment help individuals openly discuss and share new ideas, increasing knowledge sharing and knowledge transfer to others in the organization, thus increasing innovativeness (Kusa & Peszko, 2018; Sankowska, 2013). Autonomy has therefore been considered essential for entrepreneurial development (Gelderen, 2016).

2.4 Information System Implementation

Information system implementation has proven to play an important role in the work efficiency and growth of the businesses (Arabmazar Yazdi, Nasseri, Nekoee Zadeh, & Moradi, 2017; Esmeray, 2016; Lee, Choi, Lee, Min, & Lee, 2016; Mohammed, Idris, Saridakis, & Benson, 2020). The information system is a technology that is being used to

increase responsiveness by reducing the service time (Kotha & Swamidass, 2000). It is defined as, “An automated production system of people, machines, and tools for the planning and control of the production process, including the procurement of raw materials, parts, and components, and the shipment and service of finished products” (Pennings, 1987, p. 198). It provides organizations with speed and high reliability (Kohli, 2017). According to Kotha and Swamidass (2000), information systems are information exchange technologies such as databases. Databases can store a large amount of data such as financial data, supply management system data, inventory system, human resources system, and customer relationship management system. Dangayach and Deshmukh (2004) suggest that information system implementation is an administrative system that enables the firm to store the data and contains the modules such as inventory systems and supply chain management systems.

Information system implementation has revolutionized organizations where manual processes have been transformed into automated processes. According to McDermott and Stock (1999), information system implementation can be categorized into operational, organizational, and competitive benefits. The benefit of the information system implementation involves interdepartmental connection. Organizations can record the different organizational systems' day-to-day operations (Madanhire & Mbohwa, 2016; Yap & Lee, 2020). The information system implemented in the organizations has five pillars: financial management system, supply chain management system, customer management system, manufacturing management system, and human resource management system (Briscoe, 2016).

Figure 2.2 shows the task distribution of the five pillars of the information system. The customer relationship management system collects the information related to the customers (Tseng, 2016). The financial management system allows computing the organizations' financial details (Huang, 2019). The human resource management system handles the pay roles of the employees and other human resource management issues. Manufacturing management system stores details related to raw materials and production details, and sales management system keeps the record of the number of sales accords by the organization, which helps in developing the marketing and sales strategies (Angelovski, Angelovski, & Le Nguyen, 2019; Huang, 2019; Muneer, 2020). Almajali, Masa'deh, and

Tarhini (2016) suggest that the information system plays an important role in storing the information related to organizations' daily transactions. Although information system implementation requires organizational resources, it plays an important role in rapid organizational growth (Martins & Santos, 2021; Tian & Xu, 2015).

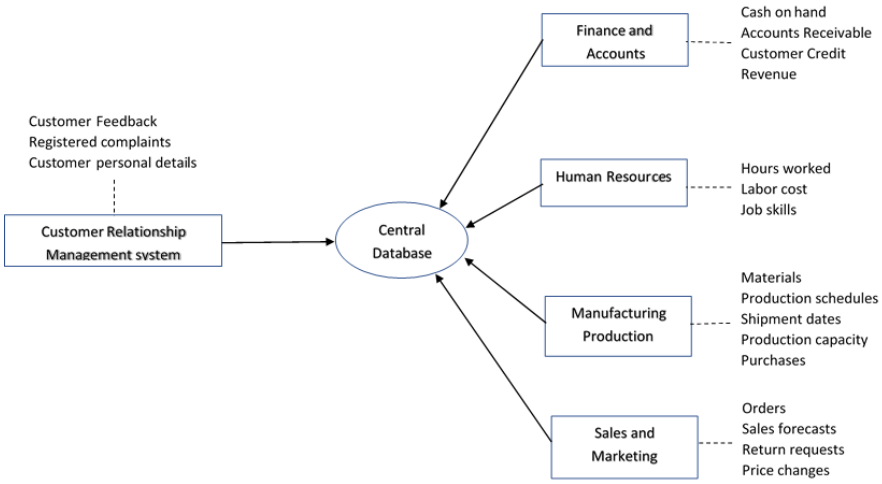

Figure 2.2: Working of Information System

(Adapted from: (Parmar, 2019))

There is extensive research carried out on the implementation of the information system in the Pakistani context (Ahmed, Shaikh, & Sarim, 2017). Past studies show that the information system has been considered an important resource for organizations (Ruivo, Oliveira, & Neto, 2015). Lodhi, Abdullah, and Shahzad (2016) suggest that an information system assures the performance and growth of an employee, ensuring the organization's performance and growth. It provides organizations with operational benefits, managerial benefits, strategic benefits, organizational benefits, and IT benefits (Kazmi & Mäntymäki, 2018). Organizations in Pakistan are rapidly adopting information systems; however, the literature also suggests several issues related to adoption and implementation (Malik & Khan, 2021). Organizations use information systems for their daily human resource management, customer management, financial management, and supply chain management.

McDermott and Stock (1999) proposed three basic benefits of information system implementation. The three benefits which can be gained from the information systems are i) Organizational Benefits, ii) Operational Benefits, and iii) Competitive Benefits. Organizational benefits are those benefits through which the organizations can improve the communication channels between different stakeholders, improve business processes and improve managerial control (Rouhani & Mehri, 2018). Operational benefits can increase the teams' work flow, increase efficiency, reliability, and quality, and provide better output (Huang & Handfield, 2015). Competitive benefits relate to the growth of the organization (Bharati & Chaudhury, 2015). Organizations in which the information system is implemented tend to have a faster growth rate and have better performance (Reinartz, Krafft, & Hoyer, 2004). As an information system combines integrated modules, such as a customer relationship management system and enterprise resource planning system, these three benefits provide an effective approach to access the information and process it for beneficial use (Madanhire & Mbohwa, 2016).

2.4.1 Operational Benefits

The information system is now an integrated part of the industries worldwide and is considered the main part of the organizational infrastructure (Tole & Matei, 2016). Different pillars of information systems make life easy for business operations and decision-making daily. Information system implementation is expected to provide continuous support across the various organizational functions with enhanced workflow, improvement of business processes, and improved order management (Chofreh, Goni, & Klemeš, 2018). Information system implementation helps obtain information about all the internal and external stakeholders (Brown & Mooketsi, 2018; Houti, El Abbadi, & Abouabdellah, 2017; Soukaina, 2021). The internal stakeholders are the individuals working in an organization, and external stakeholders are the vendors and suppliers.

During daily operations, organizations maintain relationships with the suppliers to develop better supply chain management (Acar, Tarim, Zaim, Zaim, & Delen, 2017; Bastas & Liyanage, 2018). This supply chain management helps in improving the supplier

relationship with the organizations. Similarly, it helps the organizations to take a strategic level decision. According to Huang and Handfield (2015), the organizations using the information system act more maturely in developing the relationship with the suppliers, strategically handling the supply chain, and managing the supplies appropriately. Information systems also prove beneficial in procurement processes, payment to the supplier or vendor, order management systems, and contracting with third-party vendors. According to Huang and Handfield (2015), the organizations using information systems act more maturely in developing the relationship with the suppliers, strategically handling the supply chain, and managing the supplies more appropriately.

Information system implementation does not help in attaining efficiency alone, but the individuals interacting with the information system must develop the strategies to solve better the problems in daily operations (Alok & Mocherla, 2016; Masa'deh, Raja'a, Mufleh, & Alrowwad, 2017; Rezvani et al., 2017). Developing an information system according to the requirements of the stakeholders plays a vital role in unobstructed operations. The information system also allows the stakeholders to communicate with each other. This provides stakeholders with an easy and quick method of accomplishing the tasks. Individuals working in the organization need to align themselves to the information system's processes (Reinartz et al., 2004). Chen and Popovich (2003) also suggest that information system implementation is successful if the information system integrates the organization's processes, and the individuals using the information system find it easy to follow these processes.

Implementing the information system allows organizations to control many operational expenses (Kanchana & Sri, 2018). Reduction in operational expense is one of the major reasons organizations implement the information system. The information system allows the paperless working environment to digitize the records and reduce paper and manual record systems. Organizational initiative to replace the old manual system with an information system helps the organizations to make their daily tasks effective and efficient. The information system increases the organization's operational performance by providing an effective platform for information flow (Haislip & Richardson, 2017). Information stored in the information system helps the organizations in information processing (Saldanha,

Mithas, & Krishnan, 2017). This processed information helps organizations to develop effective strategies and make better decisions. This allows the organizations to monitor every action being carried out in the organization. The processing of information also allows the organizations to identify possible opportunities in the market (Bigley, 2019; Kale, 2016; Razzaq & Mohammed, 2020).

Identifying the opportunities in the market leads to designing new products and services that may fill the market gap. According to Greasley and Wang (2016), information system implementation can help every individual in the organization by providing highly coordinated actions. These coordinated actions provide organizations with swift operations. The information system also provides business intelligence related to customer requirements, customer feedback, and daily sales. Reports generated through the business intelligence system are used to develop better solutions to satisfy the customers and offer them a better product or service. Nykamp (2019) suggests that implementing the information system emphasizes customer, channel, brand, and customer relationship management.

2.4.2 Organizational Benefits

The information system provides an end-to-end solution for organizations. Laudon and Laudon (1999) discuss Nike's end-to-end solution of supply chain management system. The information system is divided into two streams. (i) The upper stream deals with the pre-manufacturing stakeholders and (ii) downstream with the post-manufacturing stakeholders. In contrast, a manufacturing firm like Nike falls in the middle of upstream and downstream stakeholders. The information system keeps a complete record of the stakeholders in the upper stream, such as the raw material suppliers to the manufacturers and contract suppliers who provide the firm with the supplies. Once the manufacturing firm manufactures the products, it is passed onto the stakeholders in downstream. The stakeholders in downstream include distributors, retailers, and customers. An information system with the manufacturers having the details of all the upstream and downstream stakeholders can record the complete supply chain process and evaluate for the organization's best outcome. Information processing through information systems can easily tell which supplier is supplying most of

the material and how much cost and time. The system can evaluate the best supplier and reduce the time's cost and supply so that the manufacturer can timely provide the required orders in the market at a lesser cost (Chowdhury & Yadav, 2020; Dallasega, Rally, Rauch, & Matt, 2016). Information system implementation allows the demand to be obtained from the market by creating a communication channel with different sales points. The organization uses this sales information to predict the potential demand of the market. The demand is communicated further for manufacturing and eventually to the suppliers. Acquiring the information from the distributors and the stores allows the organization to demand more raw material from the supplier to be manufactured and passed onto the downstream stakeholders (Rajabion, Mokhtari, Khordehbinan, Zare, & Hassani, 2019). The information system also incorporates the customers as one of the downstream stakeholders. This allows the organization to get direct feedback from the customers and improve its products and services. Therefore, information system implementation provides an end-to-end communication channel from a supplier to the customer, benefiting the organization to make timely decisions.

Information system implementation can prove to be quick access for organizations to access and process the information. It can help in the implementation in various ways. It can help maintain hierarchical control by assigning the subordinates' goals and tasks (Rajabion et al., 2019). The information system can also monitor the employees by monitoring their tasks and generating their progress reports. The information system can help the managers to evaluate the overall goals met by the various teams in the organizations to see if the overall goals of the organizations are meeting the required threshold and identify the steps which can be taken to avoid the state of uncertainty (van Hillo & Weigand, 2016). The information provided by the information system can also evaluate the amount of the resources to be allocated and restricted to the teams for successful completion of goals. It also allows the containment of the sharing of resources. Once the resources are allocated to the group or the team, the information system helps the groups and teams identify the resources utilized. It also helps in identifying the amount of resources remaining for the rest of the task. The information related to the resources helps the organization's teams keep track of the resources required for further task accomplishment (Madapusi & D'Souza, 2012).

Organizations implement information systems to avoid the complexities involved in the firm's planning and operations (Mahmud, Ramayah, & Kurnia, 2017). It can reduce the risk by providing information to the organizations (Brusset & Teller, 2017). This information can help the organizations with historical and current data and provide prospective information by forecasting based on historical and current data. As information systems are automated for certain activities, they can raise a flag or trigger an alarming system to provide the organization's already existing position. The study carried out by Aldammas and Al-Mudimigh (2011) explores that proper implementation of the information system is necessary to avoid further hazards and risks to the organization. The study shows that information systems can help organizations manage their risks by providing them with timely information. The study includes environmental uncertainty and suggests that the information system plays an important role in mitigating the risks even if the uncertainty level is high (Tian & Xu, 2015).

2.4.3 Competitive Benefits

Alomari, Amir, Aziz, and Auzair (2018) discuss that firms implement information systems to attain higher competitive benefits. According to Fernandez, Zainol, and Ahmad (2017), information system implementation provides the best value in terms of productivity, inventory management, asset utilization, collection efficiency, return on investment, and equity return utilized according to its ability. The information system provides organizations with high integration of the processes, increasing the overall efficiency and competitive advantage. For example, information system implementation substantially improves order processing (Kocaoglu & Acar, 2016; Rudolph & Emmelmann, 2017). The order processing improvement provides the organization with better customer loyalty (Schmidt, Drews, & Schirmer, 2016). The information system improves the operations, processes of logistic support, return on assets, and return on sales providing the organization with a competitive edge (Dziea, Sikora, & Nowak, 2016; Nikulina, Butyugina, & Gorbunova, 2019; Pham, Misra, & Ahuja, 2019; Worster, Weirich, & Andera, 2017). Information system

implementation supports higher-level management in forecasting and predicting possible strategies to gain a competitive edge (Bi, Davison, & Smyrnios, 2019; Elgohary, 2019).

Due to information, coordination between the teams also allows the organizations to provide effective competitiveness (Andrianto, 2019; Dick & Akbulut, 2017). The teams use the information system information to develop strategies for better product or service delivery. The operational and organizational benefits of the information system implementation increase the shares of the organization in the market by increasing the organization's financial stability (Abdelmoniem, 2016). Hitt, Wu, and Zhou (2002) discuss the effect of information system implementation on return on productivity and return on equity. They found out that although productivity increases due to information systems, return on equity decreases. Extensive research on information system implementation and organizational competitiveness show that information system implementation proves to be beneficial in increasing overall performance, efficiency, and growth of the organization (Lim, Mohamed, & Karim, 2018; Peters, Wieder, Sutton, & Wakefield, 2016; Richards, Yeoh, Chong, & Popovič, 2019; Trieu, 2017).

Firm growth is dependent on customer loyalty and customer satisfaction (Chao & Shih, 2018; Smith, 2016; Song, Kim, & Kim, 2016). To satisfy the customer properly, firms need to know the customer's needs. Information systems implemented in the organizations can help to provide the need of the customer. Information system stores, analyze, structure, and interpret customer requirements. It can also calculate and forecast the potential effect of any product or service launched by the organization. Organizations with entrepreneurial cultures rely heavily on market information for their growth. Information systems are reliable sources of information, collect the desired data from the market, and help organizations develop innovative solutions (Al-Dhaafri, Al-Swidi, & Yusoff, 2016b; Wang, Zhou, Duan, Wang, Song, & Hu, 2021). The competitive benefits of information system implementation have been studied in business intelligence and big data analysis (Gupta & George, 2016; O'Connor & Kelly, 2017; Sun, Sun, & Strang, 2018).

Based on the literature review, Figure 2.3 shows the research framework of the study.

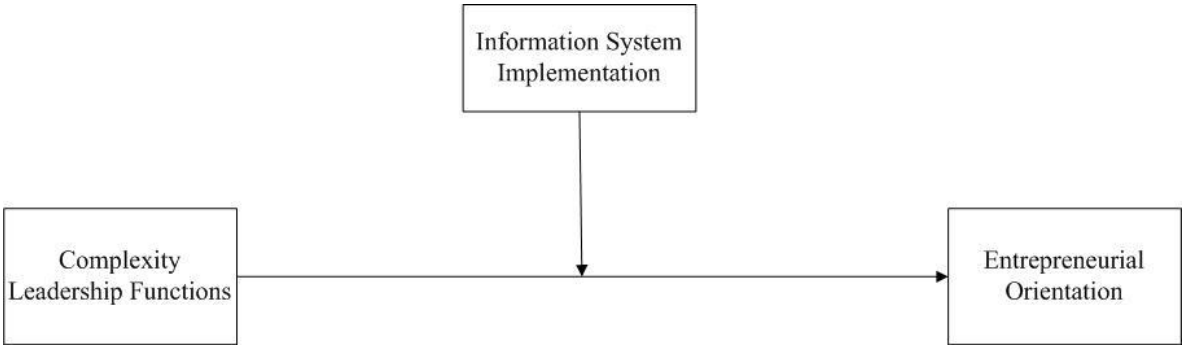

Figure 2.3: Research Framework

2.5 Theoretical Framework

2.5.1 Generative Leadership and Entrepreneurial Orientation

Generative action can be considered an individual's ability to create something new or provide a new solution to a problem. According to Oldham and Cummings (1996), creativity is an individual's imaginative power to propose a solution to an existing problem in a new way, while innovation is an implementation of a creative idea. The interactions in generative leadership function lead to the outcome of entrepreneurial exploration and experimentation. This entrepreneurial exploitation and experimentation process leads to innovative solution development (Lindholm-Dahlstrand, Andersson, & Carlsson, 2018). These solutions may disrupt the market and start a new trend (Das, Verburg, Verbraeck, & Bonebakker, 2018; Nagy, Schuessler, & Dubinsky, 2016). The generative leadership function leads to an autonomous thought process between the organization's individuals rather than a few organizational members sitting at the top, forming its hierarchy. The key is to increase the organization's innovativeness by providing autonomy and freedom of thought at all the tiers of the organization. Surie and Hazy (2006) suggest five types of interactions of generative leadership function, (i) Interaction Experience, (ii) Interaction Alignment, (iii) Interaction Speed, (iv) Interaction Leveraging, and (v) Interaction Partitioning. These types are the processes that help develop an innovative solution by regulating the complexity and enhancing the interactions at work. The interactional system, like the generative leadership function, also shows that the organization encourages an open environment where the

individuals are free to communicate and make the decisions for possible new ventures (Lehmann & Seitz, 2016).

The generative leadership function encourages an open environment where everyone can openly communicate and share their thoughts (Augustsson, Richter, Hasson, & von Thiele Schwarz, 2017; Dodge, Dwyer, Witzeman, Neylon, & Taylor, 2017). This type of openness provides a conducive environment where the exchange of ideas becomes unobstructed. Sharing ideas initiates an exchange of arguments between the individuals, which may reshape the ideas and refine them according to the market requirements. An organizational environment that allows the individuals to devise their work procedures and schedule their tasks provides the individuals with enough power to manage their way. This type of freedom may lead to the autonomous decision-making process for more creative work in the organization (Henriksen, Cain, & Mishra, 2018; Orth & Volmer, 2017). The empowerment amongst the individuals provides two different organizational perspectives: the delegation of powers to the individual so that the individuals can take decisions on their own, and the second perspective of empowerment is based on the psychological state of an individual, which affects individual's meaningfulness, competence, self-determination and impact (Ahearne, Mathieu, & Rapp, 2005). In either case, empowerment allows individuals to create something new. Kirkman et al. (2004) suggest that team interactions play an important role in team empowerment and performance. The teams' empowerment allows freedom to think and act entrepreneurially (Henao-Zapata & Peiró, 2018; Sulistyo, 2016).

Ukil (2016) suggests that empowerment is the delegation of powers to the subordinates. By empowering subordinates, their understanding of work and how it will contribute to organizational effectiveness increases. Superiors who empower expresses confidence in subordinates' competence. This confidence of superiors empowers subordinates to develop healthy relationships with each other. Supervisors provide subordinates autonomy for the decision-making, which increases the employee's self-determination enhancing the entrepreneurial behavior (Baluku, Leonsio, Bantu, & Otto, 2019; Croonen, Brand, & Huizingh, 2016; Kamil & Nasurdin, 2016). Previous studies show that individuals who are empowered can produce innovative solutions (Berraies & Hamouda, 2018; Tanniru & Sandhu, 2019), take a higher amount of risk (Agner, 2017; Clouder &

Adefila, 2017) and show proactive behavior (Huang, 2017; Newman, Schwarz, Cooper, & Sendjaya, 2017; Yin, Xing, Li, & Guo, 2017) which can lead the development of the solution and gain a competitive edge for the organization.

The generative leadership function encourages generative thinking, which enhances intellectual stimulant behavior (Çekmecelioğlu & Özbağ, 2016). This intellectual stimulant behavior allows individuals to start the process of critical thinking. This critical thinking arouses the follower's thought process to generate innovative methods of resolving the problem and developing new products or services. Previous studies show that intellectual stimulation plays an important role in organizational creativity (Li, Bhutto, Nasiri, Shaikh, & Samo, 2018; Peng, Lin, Schaubroeck, McDonough III, Hu, & Zhang, 2016). Intellectual stimulation is one of the dimensions of transformational leadership. According to Marion and Uhl-Bien (2001b), transformational leadership assumes the responsibilities like empowerment, which may act bottom-up compared to delegation, which acts as top-down. This bottom-up approach of interactions in individuals generates the emergence mechanism, which leads to innovative idea generation. Bass (1999), in their study, suggests that organizational creativity cannot be achieved directly. Leadership affects the individual's belief that one can be creative and come up with creative ideas and innovative solutions. This creative role-identity of an individual then affects creative self-efficacy, which is the person's actual capability to be creative and innovative. This is when the creativity within an organization leads to a new venture (Lund, Byrge, & Nielsen, 2017; Sklaveniti, 2017; Warnick, Kier, LaFrance, & Cuttler, 2021). Intellectual stimulation is two-way generative interactions between the leaders and the follower. They share their thoughts and come up with new and innovative ideas to start a new venture. Entrepreneurship in itself has been explained as a complex phenomenon (Fredin & Lidén, 2020). The dynamic behavior of entrepreneurial actions can be understood through the mechanisms of complexity leadership. Hazy and Uhl-Bien (2015) also suggest that generative leadership function leads to exploitation and experimentation for new and product development and entrepreneurial processes. The evidence of generative interactions leading to the new product or service development and entrepreneurial process suggest that:

H1: Generative leadership function has a significant relationship with entrepreneurial orientation.

2.5.2 Administrative Leadership and Entrepreneurial Orientation

The administrative leadership function provides individuals with consistency in day-to-day actions to achieve the targeted goals. To achieve the organizational goals, individuals at the higher tier set the individuals' targets at the lower tier and clarify the expectations to be met for organizational achievement. This initiates interactions that can lead to role clarity, efficiency, performance, and consistent routines (Malik, 2012). Past literature suggests that organizations set their goals as a norm to compete with the market (Malik et al., 2014). These goals are then passed on to the lower hierarchy to the individuals working on everyday tasks. This whole process in which an organization can stay ahead in the market competition by dividing goals, targets, and tasks at a smaller level comes with interacting daily. The higher tier individuals, such as managers, pass the directives to the lower tier individuals to clarify the organization's goals. They mutually set the targets so that the pre-established goals can be achieved (Nechansky, 2016). These directives set a specific role of an individual within an organization which sets their responsibilities. To fulfill their responsibilities, individuals have to plan for the targets to be achieved. Achievement of the targets assigned to an individual enables the organization to take one step closer to the overall visualized bigger goal. According to Malik et al. (2014), the role of the employees in the organization is to perform the assigned task to be held answerable for its completion. This leads to directive behavior in the organization, which demands the commitment of the employee.

The administrative leadership function initiates day-to-day interactions, resulting in fulfilling the superiors' expectations with their subordinates (Famakin & Abisuga, 2016). In the administrative leadership function, the superiors tend to clarify what is expected of them to their subordinates. Previous studies show that individuals in the lower tier lose their independence to think creatively (Li, Liu, & Luo, 2018). This shows that the lower-tier individuals do not feel independent due to the administrative leadership function and have little freedom to make their choices during work. Studies also reveal that individuals also

have lesser freedom to decide their own (Northouse, 2018). This control at the organizational level allows higher tier individuals to take full control and make the organization's strategic decisions. In the controlled organizational environment, the higher tier interaction with the lower tier is usually investigative. The investigative nature of the two-way interaction inquires about the progress of the tasks assigned, which has a similar effect on the organization's individuals (Northouse, 2018; Wakabi, 2016).

The leadership in an organization emphasizes the completion of the tasks leading to the organization's goals. Task assigned to the individuals set high standards and expects to meet these high standards. The interactions based on assigned tasks create a structured environment in an organization that enables the superiors to control subordinates. The task allows generating a sense of clarity in each individual's roles for the organization's growth (Akhtar & Zia-ur-Rehman, 2017; Olsen, Bjaalid, & Mikkelsen, 2017). This also defines a clear chain of responsibility and hierarchical structure in which the monitory, reward system, and punishment are linked with completing tasks (Halevy, Y. Chou, & D. Galinsky, 2011). The reward system provides the individuals with a sense of achievement by fulfilling the ambitions of superiors. The individuals who cannot achieve the targets and goals established by their superiors are also punished. The supervisors may follow active mode management by exception or passive management mode by exception based on the requirement (Avolio et al., 1999; Breevaart, Bakker, Hetland, Demerouti, Olsen, & Espevik, 2014). This highly directional chain of command leads to a centralized system (Hu, Gu, & Chen, 2013). The studies have shown directive, and higher control subsides the creative ideas leading to a new venture, product, or service (Łukowski, 2017).

The literature in the past shows that such circumstances in which the individuals are compelled to do the tasks they have not defined provide a naïve response towards creativity and innovativeness (Somech, 2005). This high form of dictation by the superiors takes away the initiative of the subordinates to think independently. This also enables subordinates to rely entirely on their superiors for their decisions. Individuals who have pressure from the higher tier lose the power to make decisions independently. Subordinates under these circumstances are more concerned about fulfilling the tasks and goals and do not explore different methods to exploit their information. As directive behavior demands clear order and

control, experimenting with a different possible solution is not encouraged. Directive behavior of directive behavior is preferred due to the complicated tasks and unstructured jobs (Jordán, Palacios-Marqués, & Devece, 2018). As the venture takes off, leadership involving directions and task assignments is not preferred. Still, when the venture reaches maturity, directiveness and task assignments play an important role in bringing stability (Kesting, Ulhøi, Song, & Niu, 2015). The administrative leadership function is responsible for routine synchronization, which brings clarity by defining goals, tasks, and directives (Hazy & Uhl-Bien, 2015). As the administrative function of complexity leadership encourages hierarchical structure and encourages a collective engagement to generate new ideas (Uhl-Bien & Marion, 2009), it is suggested that:

H2: Administrative leadership function has a significant relationship with entrepreneurial orientation.

2.5.3 Community Building Leadership Function and Entrepreneurial Orientation

Community building leadership function produces outcomes like trust and citizenship behavior. This leadership function allows the individuals to get closer to each other and create an environment that supports bonding between the employees (Hazy & Uhl-Bien, 2015). It allows individuals to go beyond their defined responsibilities. These actions increase their commitment towards the organization, clarity in task accomplishment through the feedback process, clarity about the employees' organizational support, and the subordinates' behavior (Nielsen, Hrivnak, & Shaw, 2009). A workplace that offers its employees a supportive mechanism allows them to perform better (Nica, 2016; Rofcanin, Las Heras, & Bakker, 2017). Previous studies reveal that the environment that allows the employees to come close to each other increases the bonding between the employees and the organization (Colquitt, Greenberg, & Zapata-Phelan, 2005). This bonding is also responsible for the individuals' support for each other compared to the organizational support. To create an entrepreneurial climate in the organization, the organizations must have full support for the employee, allowing them to explore new opportunities and experiment to develop differentiated solutions (Aldabbas, Pinnington, & Lahrech, 2021; Kang, Matusik, Kim, & Phillips, 2016;

Srhoj, Batarelo Kokić, & Krišto, 2017). An organization's supportive environment helps the employees broaden the thinking process horizon, openly discuss the ideas with the other employees, and develop innovative solutions (Alpkan, Bulut, Gunday, Ulusoy, & Kilic, 2010).

Starting a new venture differs from creating a venture within a large organization. Larger organizations can support their employees with the resources and the policies that enable them to work independently to achieve the organizational vision. Podsakoff, MacKenzie, Paine, and Bachrach (2000) emphasize providing good citizenship behavior to the employees to work innovatively. The day-to-day interactions that reflect community building bind the individuals together, allowing them to participate voluntarily in new solution development. This participation also permits the uniform distribution of information in the organization, which improves the work's creativity. Zehir, Müceldili, and Zehir (2012) studied the importance of organizational citizenship behavior for Turkey's corporate sector's entrepreneurial process and found out a significant relationship between entrepreneurial orientation and organizational citizenship behavior. In the corporate sector, developed organizations, due to their developed infrastructure, allow them to develop new ideas for possible new ventures.

In developed organizations, high-performance human resource practices such as selecting highly skilled staff, providing the employees with progressive career paths and promotions, job security, appraisals, rewards, and employee retention impact the employees' entrepreneurial skills (Bamberger & Meshoulam, 2000). All these practices allow the employees to work with complete dedication to the organization. The attractions like rewards and benefits based on satisfactory performance enable the individuals to develop new solution development methods, which later help them grow. Dizgah, Gilaninia, Alipour, and Asgari (2011) studied organizational citizenship behavior as a mediator between higher performance human resource practices and entrepreneurial orientation in the corporate sector. Organizational citizenship behavior practices positively and significantly enhanced the effect of higher performance human resource practices positively and significantly on entrepreneurial orientation dimensions by providing a conducive environment. The behaviors like trust, empathy, honesty, respect, and internal support enable individuals to interact and

share thoughts openly (Kim, Eisenberger, & Baik, 2016; Reader, Mearns, Lopes, & Kuha, 2017).

These behaviors also allow individuals to create an open environment where everyone has a mutual understanding. The individuals having a mutual agreement allows them to devise their work procedures, choose their work schedule, and define tasks. The flexibility to tolerate each other allows the empowered behavior to be inculcated in the individuals. The individuals' empowered behavior enables them to think out of the defined boundaries and create innovative solutions to meet the desired goals (Audenaert & Decramer, 2018). The studies have shown that empowerment leads to entrepreneurial activity (Sulistyo, 2016). As community building leadership function encourages a conducive environment through trust in each other and empowers the individuals to think independently, it can play an essential part in developing the entrepreneurial activity.

Previous studies show that the behaviors which enhance the community building, ethical climate, and citizenship behavior in the organizations are linked with the entrepreneurial orientation and development of organizational support (D. De Clercq, D. Dimov, & N. T. Thongpapanl, 2010b; Neubaum, Mitchell, & Schminke, 2004). This organizational support motivates the employees of the organization to devote themselves to the help of others. If organizational citizenship behavior is high, individuals will go beyond their job description to proactively identify new opportunities (Valsania, Moriano, & Molero, 2016). Keeping in view the complexity leadership, community building leadership helps to defend the coarse-grain position of the organizational eco-system (Hazy, 2011b). An eco-system encouraging proactive identification of new opportunities and generation of new ideas due to community building leadership function suggests that:

H3: Community building leadership function has a significant relationship with the entrepreneurial orientation

2.5.4 Information Gathering Leadership Function and Entrepreneurial Orientation

Information gathering leadership function provides an outcome of learning culture, listening culture, and exploration or data collection. In this function, individuals interact to absorb the information provided to them and process this information. Information plays an essential role in the development of organizations (Namada, 2018). Information turns into the knowledge which helps the organizations to remain on the leading edge of the market (González-Valiente, Costas, Noyons, Steinerová, & Šušol, 2021; Seyyed-Amiri, Shirkavand, Chalak, & Rezaeei, 2017). It is evident from the past literature that information gathered by the organizations has been linked with organizational growth and performance (Valmohammadi & Ahmadi, 2015). The organizations having a market-oriented culture usually have an external focus (Cameron & Quinn, 2011). The organization's external focus allows them to see what products or services their competitors offer. The organizations observe their competitors and gain information from their competitors (Søilen, 2017). This helps them compare their products or services with their competitors, identify the deficiencies, and provide them at competitive prices. To gain essential information, every organization takes advantage of social media (Felix, Rauschnabel, & Hinsch, 2017; Williams & Woodacre, 2016). This information on social media can become a quick learning guide for other organizations to remain in touch with their competitors' offerings.

Past literature shows that the information gathered leads to the accumulation of knowledge (Smith, 2001). Knowledge is an information repository that can be retrieved easily and used for identifying market gaps (Kazanjian, Drazin, & Glynn, 2017; Martinez-Conesa, Soto-Acosta, & Carayannis, 2017). Studies earlier show that knowledge has been one of the essential resources for organizational growth (Abu Bakar, Yusof, Tufail, & Virgiyanti, 2016). It has been considered an intangible resource that allows the organization to gain an edge over the market by keeping the differentiation (Rothberg & Erickson, 2017). Market information and knowledge also enable the organizations to gauge the potential demand for the product or service and launch their campaign accordingly (Brandmeier, Bogner, Brossog, & Franke, 2016). Knowledge also helps the organizations adopt the new technological change to identify the market opportunities. Knowledge also helps the organizations to identify any innovation which needs to be brought into the product or service

(Obeidat, Al-Suradi, Masa'deh, & Tarhini, 2016; Shujahat, Ali, Nawaz, Durst, & Kianto, 2018).

An organization that knows the market variables can make the right decision at the right time. Wiklund and Shepherd (2003) studied the Swedish small and medium-sized industries for knowledge, entrepreneurial orientation, and performance. They found out that innovating, being proactive, and taking risk enhances an organization's knowledge base resources and performance. This is due to the generation of learning culture, which is possible because of information and knowledge (Khan, Saengon, Charoenpoom, Soonthornpipit, & Chongcharoen, 2021; Schmitz, Rebelo, Gracia, & Tomás, 2014). Wang (2008) found out that learning culture is an essential element between the relationship of entrepreneurial orientation and the organization's performance. Molina and Callahan (2009) suggest a strong relationship between organizational learning orientation, entrepreneurship, and organizational performance. Individual learning plays a very important in the organization. The individuals working in an organization learn from their environment to start the entrepreneurial activity within the organization (Schröer, 2016). As a part of their day-to-day routine, the individuals with entrepreneurial intentions think differently and try solving the problem differently. These individuals use different skills to identify new opportunities and gaps in the market to create new solutions. This identification of the gaps in the market for new opportunities requires information of the market.

The market information and knowledge from an individual are then processed and passed on at the organizational level. This passing on of information at the higher level becomes knowledge for the organization, which is used for developing the strategies and decisions for better organizational performance (Abubakar, Elrehail, Alatailat, & Elçi, 2019; North & Varvakis, 2016). Organizations leverage the knowledge resource to develop innovative solutions, proactively increase the chance for gaining the opportunity and take the risk by minimizing the potential of failure through knowledge. Therefore, the organizations' knowledge acts as an essential resource to perform innovatively (Gomes & Wojahn, 2017). Madhoushi, Sadati, Delavari, Mehdivand, and Mihandost (2011) identified that information gathering and management play an essential role in the organization's entrepreneurial orientation and innovative performance. Complexity leadership helps develop a network of

individuals at a system level, assuring the ease of information flow (Clarke, 2013). This information gathering function of leadership enables the organizations to develop strategies based on the collected information and knowledge to create innovative solutions, take risks, proactively identify the opportunity for gaining an edge in the market, suggesting that:

H4: Information gathering leadership function has a significant relationship with entrepreneurial orientation.

2.5.5 Information Using Leadership Function and Entrepreneurial Orientation

Information using leadership function provides the outcome of accountability culture, convergence orientation, clear responsibilities, and clear authority. It allows the organizations to abandon the old business practices and create new business. The organizations' new business direction creates new markets with new products and services (Christensen, McDonald, Altman, & Palmer, 2016; Gomber, Kauffman, Parker, & Weber, 2018; Karimi & Walter, 2016). Organizations to learn more about the market orientation, take advantage of any information being passed onto them through different sources, implement the useful information and stay on the competing edge using the new methods and processes in the business (Nowacki & Bachnik, 2016). Porter, Roper, Mason, Rossini, and Banks (1991) suggest that considering the business is affected due to multiple circumstances around them. Any technological change can force the organization to change its business offerings. Organizations align themselves to the changing environment and change their business models accordingly (Bereznoy, 2019).

Change in the environment where different stakeholders such as customers, suppliers, and vendors interact with each other may force the organization to change its business practices and business model (Foss & Saebi, 2017). Similarly, the policies made by the government, changes in the laws by the government, shifts in the societal norms, and circumstances such as political stability or instability can all influence the organizations to change the methods of the business (Khan & Mir, 2016). All these circumstances within a system allow the organizations to shift in business norms by utilizing their information. Organizations use the information related to these changing environments to start a

completely new venture or modify the existing venture according to the new requirements (Harrison & Mason, 2017; Kuechle, Boulu-Reshef, & Carr, 2016). Based on the gathered information, information using leadership function provides the organizations with an accountability culture to orient themselves with the market's competitive nature.

To compete with the market, organizations try to diversify and provide new products and services (Huang & Yao, 2019). During diversification, the businesses may change so diversely that the new structure may become irreversible, and the business may be unable to retract to the previous position. This allows the organizations to maintain their position in the market and increase their adaptability towards the changes. Organizations plan to attain a sustainable position in the market which can provide them a competitive edge. Organizational goals set for gaining competitive advantage are based on the organizational knowledge augmented from its environment from different sources. To achieve the goals, the organization design various tasks which the organizations continuously monitor. Monitoring goals allows the organization to bring the organization's accountability culture, enabling the organizations to retain the decided course of action (Guskey, 2007).

Although accountability culture has been studied as a negative influencer towards information flow and innovative solution development (Stoker, Looise, Fisscher, & Jong, 2001), accountability culture brought from information using leadership function helps the organizations to use the information to avoid retching behavior. It shows the organization’s control towards already decided goals. Cameron and Quinn (2011) suggest that the hierarchical system of information can be maintained by appointing managers as information relaying sources to the top management. Therefore, the hierarchical system does not obstruct information flow and allows the organization to converge its efforts to remain entrepreneurially oriented. Based on the hierarchical system, information using leadership function provides organizational status, enabling the organization to maintain its new business practices and stop the organization from sliding back to the previous business norms (Hazy & Prottas, 2018; Hazy & Uhl-Bien, 2015).

Organizations that are equipped with the dynamic decision-making capability of changing themselves with the market requirements and retaining the organizations' decided path do not stop them from further exploration (Guisado-González, González-Blanco, &

Coca-Pérez, 2017; Parida, Lahti, & Wincent, 2016). This dynamism in the organizational environment allows the organization to develop diversity in its businesses. The outcomes of information using leadership function show that the information organizations have can become more aware of their goals and targets, increasing the propensity to identify the opportunity proactively. The adaptive nature of complexity leadership helps organizations adapt to the changes and shift their direction towards new avenues (Arena & Uhl-Bien, 2016; Clarke, 2013). This brings higher risk-taking propensity, innovative competence, and a proactive approach to gain the organization's market opportunity affecting the overall entrepreneurial orientation. This suggests that:

H5: Information using leadership function has a significant relationship with entrepreneurial orientation

2.5.6 Generative Leadership Function, Entrepreneurial Orientation, and Information System Implementation

The primary outcome of the generative leadership function is the experimentation and entrepreneurial process. An organization needs to develop internal and external awareness about the market and environment (Surie & Hazy, 2006). This helps the organizations remain aligned with the emerging trends and reshape organizations' thought processes according to the changing environment. The generative leadership function provides an organization with the freedom to evaluate the situation and learn by exploring and exploiting market opportunities (Hazy, 2011a). This experimentation and exploitation of organizational knowledge, also known as organizational learning, are related to entrepreneurial orientation (Kreiser, 2011). In earlier studies, generative leadership has been studied to develop an entrepreneurial culture in organizations (Åteg et al., 2009). Leadership equipped with generative actions inculcate the generativity in the subordinates as well. This allows the employees to break the routine and develop new solutions for the existing problems.

As generativity leads to the entrepreneurial process, generative actions are considered essential for the development of new products, services, processes, and new ventures. This

process of a new product or service development requires experimentation based on the explored information. Any new idea does not come into existence unless there is substantial information already exists. For example, market information is considered too important as it tells the organizations about the market demands. The market information can include information regarding customers' requirements. These customer requirements can provide the trends in which the market is moving. Understanding the customer's demand can provide new ideas to fulfill the demands of the customers. Alone information regarding the market does not provide the organizations with an edge. The organizations need to explore the other aspects of the market, such as internal or external factors. The internal influencing factors include the organization's internal processes, such as the organizations' relationship and its vendors or suppliers largely. The external factors may include the government's taxation, the buyers' purchasing capacity, and the buyers' behavior towards the existing products and services. These influential parameters affect the organizations working towards the new product/ service development. These influential parameters may form a complex system to evaluate the requirement of the exact demand of the market.

Information systems have helped organizations transform where the same has proven to be useful in enhancing the organizations' performance (Brynjolfsson & Hitt, 2000; Melville, Kraemer, & Gurbaxani, 2004). Information system implementation helps organizations to determine their current progress and develop a strategic plan efficiently. According to Chen and Popovich (2003), enterprise resource planning is usually used in the back office functions like analyzing the profitability analysis, production planning, inventory management, shipping, payrolls, and personal planning. Enterprise resource planning helps to integrate the different parts of the organization, maintains the data in the back-end database where the data can be retrieved (March & Hevner, 2007), and produces the results that can help the management of the organizations analyze and take the decisions accordingly (Goundar, Khan, Singh, Lal, Lal, & Singh, 2021). Therefore, information system helps to improve management control for better organizational performance. Hunton, Lippincott, and Reck (2003) studied the difference between the information system adopters and non-adopters and found out that return on assets, return on investment, and asset turnover for the organizations had improved over the period of three years which had adopted the information system as compared to the organizations which did not adopt information system. It is

therefore important to understand that information system has overall benefits for an organizational performance and growth.

Information systems can help organizations evaluate if the new products or services will help the organization earn more revenue in the long run (Relich, 2013). The customer relationship management system takes care of the investigation of external influencing factors like customer's requirements, their demands, their behavior towards the existing products or services, and their immediate response towards the product or service (Hsin Chang, 2007; Mithas, Krishnan, & Fornell, 2005). It enables the customers to interact with the system and provide immediate feedback. Organizations can analyze the weakness of their product or service and take appropriate actions to improve it. It provides information regarding the internal affairs of the organizations. Enterprise resource planning deals with interdepartmental operations like human resources, finance, marketing, sales, procurement, and inventory management system. It can help the organizations monitor the internal management system, such as financial records, which are further affected by supplier management systems, inventory, and human resources. This internal information about the organization provides improved integrated processes and communication in the organizations (Ignatiadis & Nandhakumar, 2009). If the organization wants to invest, the enterprise resource planning system combined with the customer relationship management system provides a complete set of information required by the organization. Looking at this information, organizations can explore the possibilities of new ventures, products, and services to be started (Pohludka et al., 2018). The information system also allows predicting if the new venture, product, or service can potentially be feasible for the organization's overall goals or not.

The actual reason why an information system assists any organization in their generative process is the accurate and reliable information that can be integrated with the business process for organizational growth. Earlier studies have made it evident that the information system has played an essential role in developing an organization's innovative capabilities (Swanson & Ramiller, 2004). As information provided by the information system allows the organizations to explore in much convenient way, the knowledge accumulation with the organizations helps the organizations to try new methods of working, alter the old

processes with the new processes and tailor innovative solutions for already existing problems precisely based on the information provided by the information system. Technology helps re-engineer the processes and make the processes more efficient and robust by replacing the old processes with innovating processes (Davenport & Innovation, 1993). Chor, Wisdom, Olin, Hoagwood, and Horwitz (2015) proposed a framework in which technology adoption is affected by the four contextual levels. These contextual levels include the external environment, organizational environment, innovativeness, and individual perspective, and all four contextual levels have a total of twenty-seven predictors for adopting the technology. Out of the twenty-seven predictors, seven predictors are from the context innovation. The organization wants to attain the relative advantage, make their cost more efficient, make work compatible, facilitate the work, remove the work's facilitation barriers, minimize the risks in the decisions, and produce ease. Based on this framework, Chor et al. (2015) measured the predictors and suggested that some predictors should be modifiable as the predictors may change over time. The information system implementation's ability to support experimentation and complexity leadership's nature to adapt based on information suggests that information system implementation may moderate the relationship of generative leadership function and entrepreneurial orientation. Therefore, it is hypothesized that:

H6: Information system implementation significantly moderates the relationship between generative leadership function and entrepreneurial orientation.

2.5.7 Administrative Leadership Function, Entrepreneurial Orientation, and Information System Implementation

One of the information system's responsibilities is to assist the human resource department in their daily job (Johnson, Lukaszewski, & Stone, 2016). The information system module with the human resource department, also known as the human resource management system, provides information about the employees. Employees' information may contain personal information, the organization's historical record, role in the

organization, job description and records like salaries and benefits withdrawn, their projects, and their yearly targets to be achieved. A human resource management system with an enormous storage capability allows the storage of the employee's information. It also stores the information related to the tasks and jobs allocated to the employees. For example, an information system can store the assigned tasks and their progress. The information system records the information related to the organization's internal and external condition, providing the organization with historical data. It also provides external information such as customer feedback and competitors' offerings. Using this information, organizations can evaluate themselves to estimate their strengths, weaknesses, threats, and opportunities.

Although this transparency within the system helps bring clarity with the subordinates and the supervisors and increases the control over the subordinates (Ignatiadis & Nandhakumar, 2009). The information system can be used to gain control and increase the employee's empowerment (Sia, Tang, Soh, & Boh, 2002a). The choice of empowerment and control resides in the culture of the organization. If the organization's culture supports a bottom-up approach, it may enable the information system to be a simple source for idea generation. However, if the organization's culture supports a strict hierarchical control over the employees, the information system can be used to monitor and control the employees (Sia, Tang, Soh, & Boh, 2002b). In this case, the information system can be used to enable the top-down approach.

The studies have shown that the organization's strict control does not allow the free circulation of ideas and limits the subordinates' ability to speak openly (Goodman, Zammuto, & Gifford, 2001). Extensive studies on the usage of information systems suggest that information systems can improve organizations' efficiency and performance (Hong, Dobrzykowski, Park, HassabElnaby, Hwang, & Vonderembse, 2012; Nicolaou & Bhattacharya, 2006; Uwizeyemungu & Raymond, 2010; Velcu, 2007). However, strictly using an information system to monitor employees' progress may limit employees' open thinking. To initiate the organization's entrepreneurial activity, it is recommended that the employees are empowered to make decisions, have the autonomy to work, and facilitate the bottom-up approach rather than the top-down approach towards the task accomplishments. There is substantial evidence that the information system helps explore, enabling the

employees to propose ideas to gain a competitive edge (Li & Zhao, 2006). The administrative function of complexity leadership also encourages collective engagement (Uhl-Bien & Marion, 2009), empowering the employees to initiate entrepreneurial ideas. This suggests that:

H7: Information system implementation significantly moderates the relationship between administrative leadership function and entrepreneurial orientation.

2.5.8 Information Gathering Leadership Function, Entrepreneurial Orientation, and Information System Implementation

Information gathering leadership function provides an outcome of learning culture, exploration, and data collection. It allows the organizations to gain knowledge about the surrounding environment and learn from it. An organization's capacity to learn from the information passed on through internal and external sources allows organizations to maneuver according to the market requirements. One of the largest sources of information for organizations is information system implementation. Information system helps manage the knowledge that can be retrieved and synthesized to start a new product or service development (Kuo, Lai, & Lee, 2011). Previous studies show that information system has been studied extensively for the information gathering and accumulation of knowledge (Acar et al., 2017; Aydiner, Acar, Zaim, & Delen, 2019; Centobelli, Cerchione, & Esposito, 2019). Seven-Eleven, Japan, allows the customers to shop online using their hand-held devices using point of sales (POS). Each transaction made by the customer at the POS is stored in the information system. This allows the Seven-Eleven to assess the pattern of sales through the POS. The information system of customers' sales provides information about the customers' choice of products helping Seven-Eleven, Japan, to increase its revenues (Nonaka, Umemoto, & Senoo, 1996). Like Seven-Eleven, the process of knowledge creation through the information system helps organizations develop innovative ideas to attract more customers. To align with their strategic orientation, organizations take managerial, operational, and

competitive benefits from the information systems. This source of information becomes a knowledge management system for the firms.

Information is an essential part of all the corporate organizations where they use the information system to enhance their capabilities (Ghazaleh, Abdallah, & Khan, 2019; Jafari & Zolfagharian, 2019). Simsek, Lubatkin, Veiga, and Dino (2009) suggested that information system implementation allows organizations to indulge in entrepreneurial activities to develop new solutions, processes, products, and services. It also assists in making the strategic decision regarding the start of the new ventures, market sensing, and entrepreneurial activities at the organizational level. Al-Dhaafri, Yusoff, and Al-Swidi (2013) suggested that information system implementation enhances organizational excellence and performance by equipping the organization with entrepreneurial orientation. Studies have shown that information system implementation brings quality to the organizational level processes and helps organizations take entrepreneurial initiatives more appropriately (Al-Dhaafri et al., 2016b; Gill, Shahzad, & Ramalu, 2018; Suprapto, Tarigan, & Basana, 2017).

Keeping in view the benefits of the information system implementation, it is evident that information system implementation helps develop strategic orientation based on the market requirements (Kindermann, Beutel, Garcia de Lomana, Strese, Bendig, & Brettel, 2020). Information system implementation becomes a support system that helps the knowledge management life cycle complete within the organizations (Maier & Hadrich, 2011). It allows organizations to learn from the historical data and predict prospects' possible assumptions (Jenab, Staub, Moslehpour, & Wu, 2019). Bhatt (2000) suggests that information system implementation increases the learning capability of organizations. The organizations' learning capability starts with individuals' ability to learn, and organizations train them to enhance learning capability. If an organization's learning capability is high, the organizations are very receptive to the external environment's knowledge and seek information for their betterment (Loon, 2019). As information system implementation helps obtain the data efficiently and organizational learning is an important part of the complexity leadership, it is expected that the information system implementation may moderate between information gathering leadership function and entrepreneurial orientation. Therefore, it is hypothesized that:

H8: Information system implementation significantly moderates the relationship between information gathering leadership function and entrepreneurial orientation.

2.5.9 Information Using Leadership Function, Entrepreneurial Orientation, and Information System Implementation

Information using leadership function provides an outcome of accountability culture, clear responsibilities, and clear authority over resources. It allows the organizations to monitor the progress of the organizational goals. The organization's ability to continuously monitor the organization's progress and performance can enable the organization to adapt to the changing environment (Schmitt & Klarner, 2015). Information system implementation provides information about is the current as well as the historical data. This information provides facts about the organization's current situation and forecasts the organizational progression, keeping in view the environmental factors (Khan, 2019). This enables the organizations to view the possibilities based on which the organizations can remain competitive in the market (Mrđa, 2016). Organizations do not use information systems to store the data only; instead, to use the data for beneficial purposes. It allows the organizations to embed the organizational processes within the information system.

The information system can be used for task assignments and reporting across the management hierarchy (Abdel-Rahim & Stevens, 2018). Individuals in the lower hierarchy in the organization can use the information system to report the tasks assigned to them. This brings the accountability culture within an organization where every individual can be held accountable for their assigned responsibilities. This digitized system can also help determine all the tasks assigned to the respective teams and whether the organization is heading towards the predetermined direction. For example, the customer requirements, marketing strategies, and information related to sales of each salesperson can be evaluated for the organization's revenue (Nunoo, 2019; Qi, Zhang, Jeon, & Zhou, 2016; Singh & Wajgi, 2016). To adapt to the changing requirements of the customers, organizations develop new solutions for the customers. Using an information system, organizations also estimate the number of sales that

they can make. These predicted sales can be monitored to see if the organizational targets are being achieved successfully.

An organization starting a new product line, a new service or entirely a new venture that may diversify the organization's business need to keep track of the business's progression. The information system implementation provides a pivotal role in providing this essential information (Rajnoha, Štefko, Merková, & Dobrovič, 2016). Information system implementation allows the organizations to evaluate and analyze the cost being incurred on the newly started product line, services required for a venture, and the revenues earned through the new streams. According to Tagliavini, Faverio, Ravarini, Pigni, Buonanno, and Callaos (2002), organizations can opt for related diversification or differentiated diversification for organizational growth. Information system implementation helps in adopting both types of diversifications (Michael, 2007). This expansion in the business can be directly linked with the performance of the organization. There is substantial evidence that information system implementation helps increase the organizations' performance (Hendricks, Singhal, & Stratman, 2007; Melville et al., 2004; Wieder, Booth, Matolcsy, & Ossimitz, 2006). This suggests that the information system helps the organizations monitor their performance and project's current status and forecast their performance. Esteves (2006) suggests that information system implementation helps maintain the alignment in the organizational goals that benefit the organization by developing the businesses. In complexity leadership, the information allows system-wide emergent learning and adaptability (Lichtenstein et al., 2006). This emergent learning can help understand the possible causes that may lead to the businesses' failure and adapt to the market by identifying new opportunities. As information system implementation helps the organizations to adapt and make strategic decisions, it is suggested that:

H9: Information system implementation significantly moderates the relationship between information using leadership function and entrepreneurial orientation.

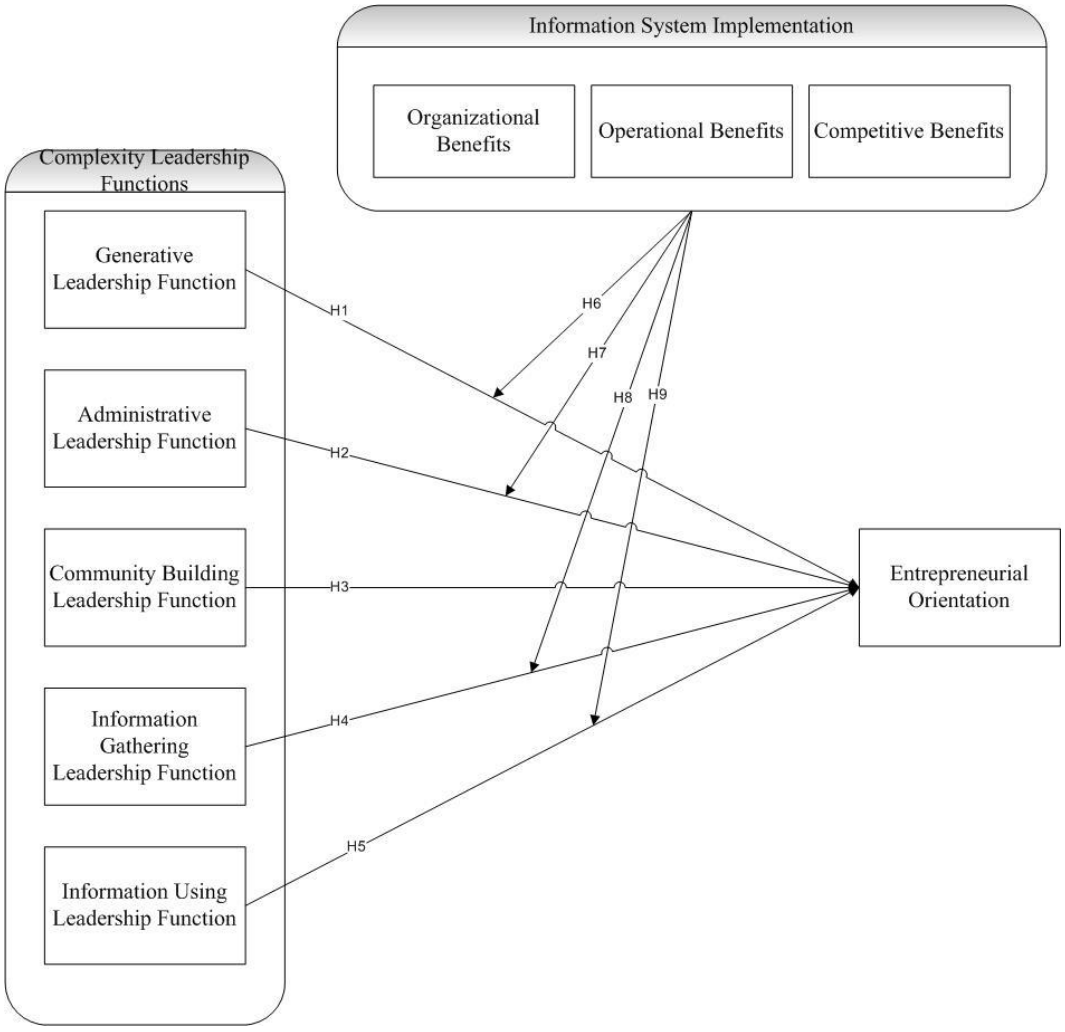

Figure 2.4: Theoretical Framework

CHAPTER 3

RESEARCH METHODOLOGY

3.1 Research Design

Ontology refers to the assumptions related to reality. In management, the ontological stance enables us to see the organizations, management, individuals' working lives, and organizational events as the research objects. Much of the research has been carried out in the past, which observes that organizations gather key resources to gain a competitive edge in the market (Donnellan & Rutledge, 2019; Gordon, Lee, & Lucas, 2005; Hossain, Hussain, Kannan, & Nair, 2021). Teece, Pisano, and Shuen (1997) suggest that the key resource can be coupled to be used innovatively to gain competitiveness in the market. Keeping in view that the resources can be used together to achieve better outcome, this study investigates if complexity leadership functions can significantly generate entrepreneurial orientation as an outcome and information system implementation can significantly moderate the relationships of complexity leadership and entrepreneurial orientation. To investigate the objectives, sequential exploratory study was adopted. According to Creswell and Creswell (2017), a sequential exploratory study is adopted when there is little known about the phenomenon, and the phenomenon needs to be explored.

Sequential exploratory strategy can be conducted in two phases. The first phase of the strategy is qualitative, in which qualitative data is collected from the respondents. Then the outcome of the qualitative data is tested quantitatively for the confirmation of the qualitative results. Creswell and Clark (2017) suggest that sequential exploratory strategy can be adopted in three different stages, (i) In stage one, the data is collected from the respondents, (ii) In stage 2, the qualitative data is analyzed for the possible themes which can be used for the development of the instrument and (iii) In stage 3, the developed instrument

is administered to the sample population for the confirmation of the instrument developed as a result of the qualitative study. As the first phase of this study deals with the socially constructed realities narrated and interpreted by the participants of the interview and in the second phase true reality is examined by the causal explanation (Saunders, Lewis, Thornhill, & Bristow, 2015), constructivism was adopted for the first phase of this study and positivism was adopted for the second phase of the study. The three stages adopted (two phases) with the details of each stage are given in Figure 3.1.

Morgan (1998) suggests that a sequential exploratory strategy is appropriate when the elements of the emerging theory need to be tested. As the complexity leadership functions proposed (Hazy & Uhl-Bien, 2015) has not been properly investigated yet, and the interactions in these functions are yet to be identified. A sequential exploratory strategy turns out to be a way forward for the identification of the interactions and development of the instrument, which can be tested later quantitatively.

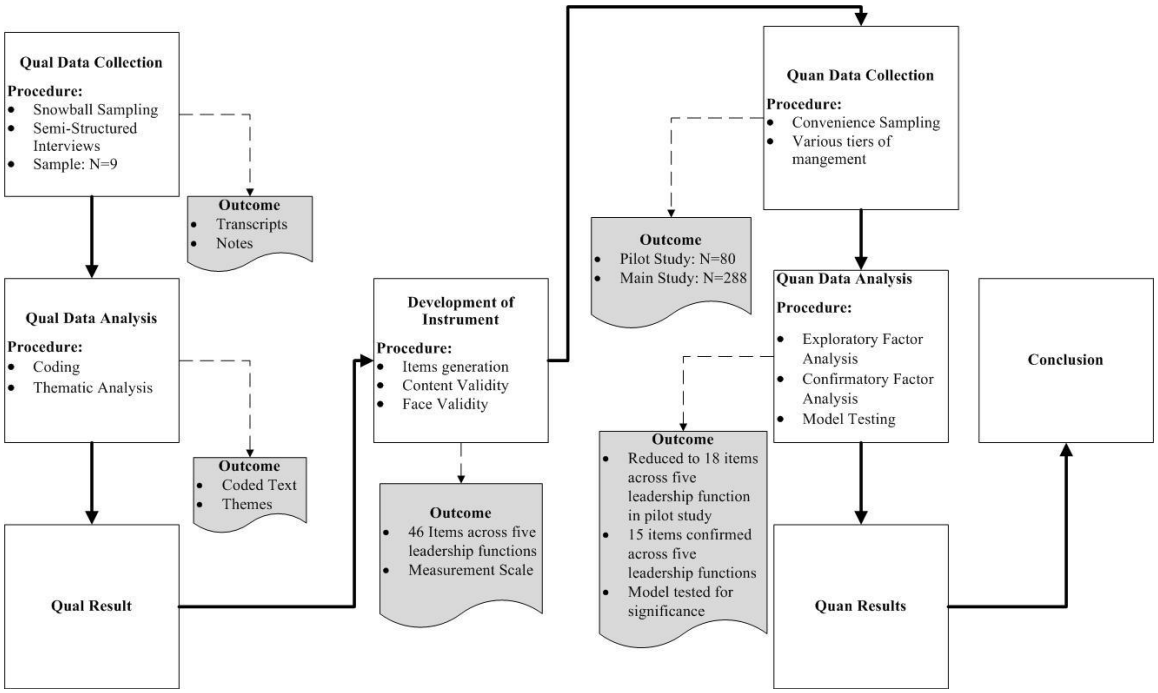

Figure 3.1: Stages of the Study

3.1.1 Qualitative Study

3.1.1.1 Sampling for Interviews

As non-probability sampling is used widely in qualitative research, Neuman (2007) suggests different non-probability sampling types. The sampling techniques include convenience sampling, which allows the researcher to access the respondent quickly. The sample in this sampling strategy may include the people the researcher knows already. This sampling technique is also known as accidental sampling. Another one is quota sampling, in which the population is divided into different categories, and the researcher then collects the data from these different categories of the population. Purposive sampling is one in which possible cases fitting the criteria are addressed for the data collection. Snowball sampling is getting access to referrals. The respondent gets referred to another respondent and keeps on increasing the sample size.

This study collected data from 9 respondents using the snowball technique, which is generally consistent with the sample size recommendations (Berman, 2017; Creswell & Poth, 2016, 2017). Myers (2019) suggests that the selection of the participants depends on the purpose of the study. As the purpose of the study was to identify the fine-grain interactions in all the complexity leadership functions. The two tiers of management, high level, and middle level, were considered adequate to provide information related to fine-grain interactions. The respondents' details are included in Appendix - A. Initially, the respondents were contacted based on convenience, and the referral was asked once interviewed. The respondent provided the referral, which led to more interviews. Each referral was contacted on the telephone, asking for permission for the interview. The referrals who agreed were then interviewed. According to Morse (1995), theoretical saturation is considered an appropriate sampling adequacy method as no new data arrives in the study. This study achieved theoretical saturation after the fifth interview, but four more interviews were conducted to ensure no new information was obtained. After the ninth interview, as no further information was added, the process of data collection was stopped.

Before conducting the interview, an interview guide was prepared (Appendix - B) using the guidelines of (Taylor, Bogdan, & DeVault, 2015), which two academic experts validated. The respondents were initially briefed about the complexity leadership functions. The respondents were also handed over with the description of each complexity leadership function (Appendix - B) and their outcomes. Once the respondents understood the complexity leadership function and its outcomes, they were asked a series of questions (Appendix - B) about the complexity leadership function. Myers (2019) discussed that the questions should be focused so that the respondent should provide necessary details. The questions were focused on the outcomes of each complexity leadership function so that it is easy for the respondents to reveal the possible fine-grain interactions for each complexity leadership function (Hazy & Uhl-Bien, 2015). These questions were direct questions about the interactions that may lead to the complexity leadership's respective outcome. Some of the questions were randomly asked either as moderation or as probing questions (Creswell & Creswell, 2017).

3.1.1.2 Instrument Development Procedure

Based on the interviews, an instrument was developed to validate the fine-grain interactions. A step-by-step procedure of the questionnaire development is given below:

Step 1: The interviews were recorded later to be transcribed. Creswell and Creswell (2017) have suggested audio and visual aid while taking the interview. On the respondents' request, to keep the respondents' confidentiality, the respondents' names and designation were not disclosed. They were ensured that the information provided by them would remain with the researcher only. Once the transcriptions were done, recordings were removed from the recording device as suggested by (Matheson, 2007). The transcriptions were then coded and for the extraction of meaningful themes as per the guidance of (Braun & Clarke, 2006).

Step 2: The themes were used to develop the statements for the instrument as per the recommendations of (Giesen, Meertens, Vis-Visschers, & Beukenhorst, 2012; Gillham, 2000; Kumar, 2019; Rattray & Jones, 2007). Each statement was created based on the

respondents' views in the interviews and themes generated from the interviews. The initial instrument contained a total of 39 items.

Step 3: Twelve experts were contacted for the instrument's content validity and face validity once the instrument was ready. A total of six experts agreed to the validation of the instrument. Four out of six experts were from the higher-level management and middle-level of the telecommunication industry. In contrast, two experts were from an academic background with experience in instrument development. One of the academic sector experts was from the local university, and one of the experts was from a foreign university and had conceptualized the complexity leadership functions (Hazy & Uhl-Bien, 2015). To check the validity of the items' content in the instrument, the most common method described by (Hinkin, Tracey, & Enz, 1997) was used. The experts were given the instrument along with the definitions of each construct. The experts were then asked to assess each item's relevance in a construct according to its definition. The experts were also given complete freedom to change the content of items, remove the items or suggest which could make the construct more meaningful. The experts suggested changes the content of the items to make the items of each construct more meaningful. Only one item was dropped from the scale, whereas 8 items were suggested to be added to the instrument by the panel experts generating 46 items in the instrument. After incorporating all the experts' suggestions, the instrument was discussed with the panel experts once again for their final comments.

Step 4: Once the content was validated, the instrument was passed on for face validity to three industry experts. All the feedbacks of panel experts were incorporated in the instrument to generate the instrument given in Appendix - C.

Step 5: After the content validity and face validity, the questionnaire was administered for the pilot study to be factor-analyzed as suggested by (Hinkin et al., 1997) where exploratory factor analysis was carried out to extract the factors from the 5 constructs containing 46 questions (Appendix - C). The construct of the generative leadership function contained 11 items. The construct of administrative leadership function contained 8 items, community building function total of 10 items, information gathering leadership function total of 10 items, and information using leadership function total of 7 items. The extraction of these items resulted in commonly performed interactions between the individuals of the

telecommunication sector. A pilot study was conducted on the sample of N=80 where the pilot study's primary focus was mainly the reduction of items in the developed instrument and is considered to be the first step towards the development of the scale (Yong & Pearce, 2013). Principal Axis Factoring was used as an extraction method as suggested by (Field, 2013). Osborne, Costello, and Kellow (2008) and Field (2013) suggested that if the factors correlate with each other above 0.3, Promax rotation should be used. The correlation between the correlation matrix factors ranged from 0.124 to 0.431. Therefore, Promax was used as a rotation method.

Table 3.1: KMO and Bartlett's Test for Dimension Reduction

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.710
Bartlett's Test of Sphericity	Approx. Chi-Square	560.733
	df	153
	Sig.	.000

The exploratory factor analysis was carried out by keeping three key rules under consideration, (i) the factors with the lower communalities suggested by (Child, 2006; Yong & Pearce, 2013) were removed, (ii) any factor loading less than 0.3 were removed (Field, 2013) and (iii) the factors cross-loading each other were also removed. Based on the criteria defined, exploratory factor analysis resulted in five factors, generative leadership function, administrative leadership function, community building leadership function, information gathering leadership function, and information using leadership function. Table 3.4 shows the extracted factors of each leadership function. The sample size adequacy for the exploratory factor analysis was checked using the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and the significance level. The sampling adequacy (KMO) was found out to be adequate with $KMO = 0.710$ with the $p = 0.000$ (Field, 2013). Table 3.3 shows the details of the sampling adequacy (KMO) and its significance. The anti-image matrix also shows that all the elements in the diagonal are above 0.5, suggesting an adequate correlation of each factor. The extracted factors were tested for reliability. Table 3.3 shows that the reliability of all the constructs was found out to be acceptable and above 0.7 as suggested by (Field, 2013).

Table 3.2: Exploratory Factor Analysis for Dimension Reduction

Variable	Items	Factors					Cronbach (α)
		1	2	3	4	5	
IGLF	Information is gathered by discussing competitor's products/services			.811			0.801
	Information is gathered by discussing customers' feedback			.767			
	Information is gathered from employees' feedback			.698			
GLF	Even smallest need of the customer is given importance		.598				0.820
	Resources and time are provided to try new things		.812				
	New approaches are encouraged		.908				
ALF	Job descriptions are defined clearly					.577	0.760
	Targets are established for everyone					.885	
	Tasks are assigned to everyone					.640	
	Key performance indicators for everyone are decided					.426	
	Team members are insisted to do their assigned work					.593	
CBLF	Everyone is honest with each other	.913					0.769
	Everyone is respected	.811					
	Everyone is treated fairly	.529					
IULF	Achievement of targets is evaluated				.758		0.712
	Tasks performance is monitored				.662		
	Key performance indicators are evaluated by supervisor				.570		
	Deadlines to achieve the tasks are regularly reinforced				.599		

Extraction Method: Principal Axis Factoring.
Rotation Method: Promax with Kaiser Normalization.

a. Rotation converged in 5 iterations.

IGLF = Information Gathering Leadership Function, GLF = Generative Leadership Function, ALF = Administrative Leadership Function, CBLF = Community Building Leadership Function, IULF = Information Using Leadership Function

3.1.2 Quantitative Method

3.1.2.1 Sampling Technique and Respondents

The target population of the telecommunication industry is 30000 (Azeem, 2016; Times, 2019). Keeping in view Bartlett (2001), the estimated sample size was 380 respondents. To select the respondents for the study, the theories were consulted again. Complexity leadership refer to the locally enacted two-way fine-grain interactions in various tiers of management and have an organizational distribution (Hazy & Prottas, 2018; Hazy & Uhl-Bien, 2015), entrepreneurial orientation has been acknowledged to have an influence of both top-down and bottom-up processes (Lumpkin et al., 2009; Van Doorn, Heyden, Tröster, & Volberda, 2015) and information system implementation has the benefits at the organizational level (Chang, 2006; McDermott & Stock, 1999). Therefore, individuals working in various tiers of management in the telecommunication sector were selected as respondents. A focal person in each telecommunication organization was identified and was forwarded with the request to collect the data and the questionnaire. The questionnaires were distributed amongst the telecommunication organizations' respondents using the convenience sampling technique (Kumar, 2019; Neuman, 2007) all across Pakistan with the guidance and help of the focal person. During the dissemination of the questionnaire, each respondent was asked for their level of management before handing over the questionnaire. The departments where the questionnaires could not be distributed by hand, they were handed over to the concerned in-charge with instructions of distribution. The questionnaires were also distributed to the regional offices with the assistance of the telecommunication organizations.

A total of 386 questionnaires was collected from the respondents. A total of 26 questionnaires from 386 responses were either not usable or incomplete. The completed responses were checked for the outliers as suggested by (Field, 2013). A total of 58 responses were identified to be univariate outliers, and 14 responses were found out to be multivariate outliers and were excluded from the study (Field, 2013). The remaining sample of 288 responses was considered as a usable sample. The adequacy of the sample was also confirmed using G*Power (Faul, Erdfelder, Buchner, & Lang, 2009). G*Power has been used in the

previous studies to calculate the sample size (Al-Hussami, Hammad, & Alsoleihat, 2018; Alias, Rasdi, & Said, 2012; Carvalho & Rabechini Junior, 2015). Using G*Power, Effect Size $f^2 = 0.15$, α error prob = 0.05, Power (1-β err prob) = 0.95, and total number predictors = 6; the sample computed was found out to be 146, which is much below the sample size considered in this study. The sample indicated by G*Power is also in line with the suggestions of (Hair, Black, Babin, Anderson, & Tatham, 2009) for the 95% confidence interval. Based on the sample size calculated using G*Power and suggestions of (Hair et al., 2009; Israel, 1992), the sample of 288 was found out to be adequate for this study.

To achieve the objectives of this study, a sample of 288 was further analyzed using SPSS 23 for normality and multi-collinearity in the data, and AMOS 21 was used for the confirmatory factor analysis and structural equation modeling (SEM) (Begovic, 2018; Raei, 2018). AMOS is one of the most popular tools to assess SEM. SEM is advocated as a comprehensive method to evaluate the model by providing better explanatory ability and statistical efficiency. SEM has also been found out to be better than the techniques used for multivariate techniques such as multiple regression (Byrne, 2010; Cheng, 2001). According to Hair, Black, Babin, Anderson, and Tatham (1998), SEM provides better explanatory ability and statistical efficiency for the model testing. The SEM software, like AMOS, unlike SPSS statistical software, allows evaluating the causal relationship in the model with multiple measurement items, giving it more statistical strength (Ong & Puteh, 2017). Due to SEM's efficiency and the popularity of AMOS, evaluating the model of this study using SEM in AMOS becomes an obvious choice.

3.1.2.2 Measurement Instrument

The instrument of entrepreneurial orientation (Appendix - C), consisting a total of 18 items, was taken from (Hughes & Morgan, 2007), which adopts the five dimensions of (Lumpkin & Dess, 1996). The five dimensions include innovativeness, risk-taking,

proactiveness, competitive aggressiveness, and autonomy. The instrument of information system implementation with a total of 14 items in the questionnaire was adopted from (McDermott & Stock, 1999). The details of each instrument adoption and the number of items can be seen in Table 3.1. The instrument of information system implementation has three dimensions, organizational benefits, operational benefits, and competitive benefits.

Table 3.3: Instrument Adoption Details

Variable Name	Items	Reference
Entrepreneurial Orientation	18	(Hughes & Morgan, 2007)
Information System Implementation	14	(McDermott & Stock, 1999)
Complexity Leadership Functions	46	The instrument developed as a result of the qualitative study

The instrument of five complexity leadership functions, consisting of a total of 46 items, was developed in this study. As this study aims to measure the frequency of fine-grain interactions daily, measuring the interactions on an interval-level measurement scale was ideal. However, based on the suggestions of the respondents, review panel members, and detailed study (Ahmed & Azmi bin Mohamed, 2017; Amundsen & Martinsen, 2014; Hinkin et al., 1997; Rattray & Jones, 2007), the Likert scale was selected with five options for the respondents measuring from the range of 1 to 5 (1 = Never; 2 = Seldom ; 3 = Half the Time; 4 = Usually; 5 =Always).

3.1.2.3 Operational Definitions

Concepts are abstract ideas which due to their subjectivity, cannot be measured. To measure the concepts, they need to be translated into measurable indicators, which are also considered variables. This conversion of a concept to its quantifiable and measurable form becomes possible when the variable is operationally defined (Kumar, 2019). The operational definition of a variable is a specific way the variable can be measured and provides

quantifiable measures to measure the variable. In this study, the operational definitions of the variables used are given in Table 3.2.

Table 3.4: Operational Definitions

Variable	Definition	Source
Complexity Leadership Function		
Generative Leadership Function	Generative leadership function refers to the fine-grain interactions that allow the organizations to generate new ideas, produce something new, using a new approach or experimentation	Developed during the study
Administrative Leadership Function	Administrative leadership function refers to the fine-grain interactions which allow the organizations to keep their internal system organized by defining goals and keeping role clarity within an organizational hierarchy.	Developed during the study
Community Building Leadership Function	Community building leadership function refers to the fine-grain interactions which enable belongingness and citizenship behavior in the organization.	Developed during the study
Information Gathering Leadership Function	Information gathering leadership function refers to the fine-grain interactions that enable absorption of information and learning in the organization.	Developed during the study
Information Using Leadership Function	Information using leadership function refers to the fine-grain interactions that allow the organizations to change the plan of action and decide to move in a new direction.	Developed during the study
Entrepreneurial Orientation		
Innovativeness	A willingness to introduce newness and novelty through experimentation and creative processes aimed at developing new products and services, as well as new processes	(Lumpkin & Dess, 2005)
Proactiveness	A forward-looking perspective characteristic of a marketplace leader that has the foresight to seize opportunities in anticipation of future demand	(Lumpkin & Dess, 2005)
Risk Taking	Making decisions and taking action without certain knowledge of probable outcomes; some undertakings may also involve making substantial resource commitments in the process of venturing forward	(Lumpkin & Dess, 2005)
Competitive Aggressiveness	An intense effort to outperform industry rivals. It is characterized by a combative posture or an aggressive response aimed at	(Lumpkin & Dess, 2005)

	improving position or overcoming a threat in a competitive marketplace	
Autonomy	Independent action by an individual or team aimed at bringing forth a business concept or vision and carrying it through to completion	(Lumpkin & Dess, 2005)
Information System Implementation		
Operational Benefits	Measures for the effectiveness of set of operations, such as output levels, efficiency, cost reduction, reliability, repeatability, quality, and flexibility.	(McDermott & Stock, 1999)
Organizational Benefits	Measures relating to organizational and managerial benefits including the extent to which the technology has improved workflows, communication, integration of business activities, and management control.	(McDermott & Stock, 1999)
Competitive Benefits	Measures that relate to competitive performance, including sales growth, market share, and return on investment	(McDermott & Stock, 1999)

CHAPTER 4

ANALYSIS AND FINDINGS

4.1 Qualitative Analysis of Interviews

4.1.1 Information Gathering Leadership Function

The primary response of all the respondents was the discussion on feedback obtained. All the strongly emphasized that it is essential for them to keep an external view on the customers, market, and competitors. They need to see what the competitors are offering. According to the respondents, they need to align themselves with the existing market, in which there are different stakeholders such as customers, competitors, and us. To understand the dynamics of the market, they need to know what the customer wants. But the importance is also given to what the competitors are offering. If the competitors are offering a service or product which we are not offering, the customer is expected to shift the loyalty to the competitor. Therefore, the respondents agreed that they regularly take the customers' feedback and keep noting the competitors' offerings to their customers. While talking about the customer feedbacks, one of the respondents categorically mentioned:

> *"At our organization, we have a fully maintained customer feedback system. The purpose of the system is to take complaints and customer requirements. We regularly gather the perception of the customers and their requirements. Their feelings towards the services or products and what they require from us are properly documented. We then discuss the customers' information and design the services based on these requirements so that they can get benefited from what we are offering."*

The interviews revealed that the frequent discussions of the respondents with their colleagues resulted in more information. These discussions allowed them to share their

experience with others and allow others to add to their experience. The exchange in the experiences resulted in suggesting opinions to each other for attaining better outcome. One of the respondents revealed:

"We learn more when we discuss particular agendas with each other. In the meetings and otherwise, deliberations and discussions are carried out. The purpose is to exchange personal ideas and experiences. To solve the problem, everyone participates by giving their suggestions."

Customer feedback was found out to be taken through the internet. One of the respondents mentioned that:

"We have our official customer portal and social media, giving us good information about the customer's requirements. We have designated employees who monitor the portal and pass on the customers' information being provided on the portal."

The respondents identified the conferences and meetings as another source of information. They say that they regularly participate in different conferences, seminars, and symposiums of their related areas. They meet different people in such gatherings, their competitors as well. The discussions in such forums provide us with good information about competitors and new products or services which can be offered in the market. One of the responses was:

"The conferences, seminars or symposiums are really important. You come to meet all types of people there. The international service providers, vendors, and of course, competitors. It's a great learning experience."

4.1.2 Generative Leadership Function

After gathering the requirements from the customers and the feedback from the competitors, all the respondents agreed to bring the matter to the respective platform in their offices. This allowed the sharing of information with the rest of the members of the organization. One of the respondents mentioned that,

"The information that is gathered from different platforms is certainly discussed at different forums. If the competitor is offering a service or a product that we are not, we discuss with each other different possibilities that we can offer. The feedback is first analyzed for the benefits that it may bring to the organization."

The respondents emphasized that to provide new services, they need to go through a process of thinking. This process enables them to exercise their minds for different solutions. The respondent said:

"In the meetings, we brainstorm and generate new ideas on how differentiation can be offered to the customers which no other competitor is offering. These ideas are then formally exercised by calculating how the firm can benefit themselves by benefiting their customers. Complete resources are given to the teams to develop the ideas that can offer something new to the customers."

Another respondent emphasized on in-depth analysis of the data.

"The customer needs are not difficult to find. Sometimes we cannot exactly pinpoint the requirements, but we keep trying. What we have to offer goes much beyond just the customer requirements. The information that is being obtained through different sources is to be analyzed critically for its utility. This critical analysis helps us in identifying how the information can be best transformed for the development of service, which can create a differentiated market for us. This difference in the market helps to fill the gap for the customers and edge in the market with a new line of products or services."

All the respondents agreed on meeting the customer requirements, but one of the respondents specified that the customers' little needs are to be taken care of. The respondents said

"It is necessary that all the requirements of the customers are taken seriously. One does not know which requirement is the tip-off point of the customer. Retaining customers is essential for us. Therefore, we must take care of all the requirements and needs of the customer in focus. To maintain our customers' satisfaction level, we

interact with the customer to identify even the smallest of their need and find the new ways to fulfill the needs."

4.1.3 Administrative Leadership Function

The respondents' response was unanimous for the goal setting and task assignment to bring structure to the organization and provide the teams with role clarity. All the respondents replied that the team members' tasks are assigned the tasks they must accomplish. These tasks act as the smaller goals which are required to achieve the bigger target. In accordance with this, one of the respondents replied

"There are goals that everyone has to achieve. There are targets set for everyone so that they can focus what they have to do."

The focus of the respondents was on the long-term and short-term goals. This focus was elaborated by one of the respondents as:

"These goals and targets are long term, which is evaluated after every fixed time period, like a quarter or a month. For some teams, it is a quarter, and for some, it is a monthly process."

Another respondent termed it as key performance indicators and said:

"Other than long term goals and targets, all the team members have their key performance indicators. They must perform certain duties regularly, and they are bound to it. These duties are properly noted, and their performance is gauged on both the long-term goals that they have to achieve as well as their daily tasks and operation."

One of the respondents also replied similarly and said

"All the organizations work on the same principle of assignments. The job description of an individual does not bring clarity about the job. If clarity is to be given to the individual about their job, more realistic targets and goals are to be assigned to

these individuals. The jobs that these people do daily become their key performance indicators. These task assignments, goal establishment, and key performance indicators are the primary gauges through which we measure an individual's performance. If they are not performing well, we can investigate his or her clarity level through the same gauge."

4.1.4 Information Using Leadership Function

In this case, the respondents' primary response for the accountability and check the balance of the task assignments was the evaluation of the goals and targets set earlier. The respondents agreed that the key performance indicators should be evaluated so that accountability remains in the system. The respondent mentioned in the discussion

"We set the goals and targets at the beginning of the year and evaluate what we had achieved previously. This allows us to monitor our performance of the organization. This also allows us to bring the accountability culture within the organization."

The accountability culture acts as a judge for the previous progress and as an instrument for further assignments. According to one of the respondents

"The assignments are taken intelligently. Overestimation of the goals and tasks is avoided. While we are establishing the goals, one is very clear that when a certain task or goal is assigned to someone, they should achieve it through the year. The reward for achieving the goal is high, but the punishment for not achieving the goal is equally daunting. This fear keeps everyone on their feet."

Another response that was similar but provided another view was:

"When the organizations set their targets at the beginning of the year, they intend to keep them real. We at a higher level do not set unrealistic targets. We must keep the achievability of the targets under consideration as well. When passed onto the

teams or eventually to the individuals, they are very much in control to achieve their targets through the right strategy. It is not like that we assign them the tasks and leave them on their own. We support them, allow them to share their problems, and help them where we think we can. Eventually, we ensure that all the targets that we had set have been achieved. This is how we move ahead."

4.1.5 Community Building Leadership Function

To provide members of the organization with a feeling of a community, the respondents emphasized equality. This is when all the members of the organizations are treated equally. One member of the organization provides help to another person in need and assists them in work-related problems. Community is also developed when the members of the organizations are given full support from the organizations as well as the other members of the organization. This act of providing support allows the members of the organizations to solve each other's problems. Living in a community allows the members to share the problems and provide others with an honest solution. According to the respondents, the community building practices were only possible if the members of the organizations treated each other with respect. According to one of the respondents

"I think to respect for each other counts a lot for developing a community within an organization. We keep into consideration that the element of respect while communicating with each other. Irrespective of the position of the employee, everyone is respected for their contribution to the organization."

The same respondent also emphasized the trust

"Everyone in this organization is assigned with a job and has certain responsibilities. We trust that the individual will carry out the job honestly and with complete passion. This boding of trust keeps us together as a community."

Another respondent identified the possible interactions as

"In our working environment, we help each other. We act as a family where every person is there to provide help to another person. If any of our colleagues are having a work-related issue, we must support them. We assist them in work. We allow the other person to reveal all the issues they may have and then provide possible remedies to the problem. Most of these problems are work-related, but we do not limit ourselves to work. If one has to work as a community, one does not have to limit themselves to work. We share our work problems as well as personal problems. This act of sharing the problems and issues helps us understand each other's circumstances in which every individual is working in. Once we understand everyone's limitations, we then assist each other accordingly."

Another respondent emphasized it as:

"Organizations do not act successfully individually or by themselves. People run it. Unless the people are satisfied with the organization, the organization will never work to its full capacity. One of the satisfaction measurements is providing all the members of the organizations with equal rights, proper organizational and individual support, and assistance by the peers and the supervisors. The members of the organizations must have tolerance for each other. Every individual works in a different capacity, thus making everyone's case different from the other. Therefore, everyone should be respected from the bottom of the organization to the top."

4.2 Theme Extraction

Based on the analysis above, Table 4.1 shows different themes being developed. Two themes were identified in the information gathering leadership function, which discussed *"discussing feedback"* and *"information sharing".* Two themes, *"defining tasks"* and *"maintaining hierarchy"* emerged in an administrative leadership function. Two themes, *"thinking"* and *"solution development process"* emerged in the generative leadership function. *"Task evaluation," "reinforcement for submissions"*, and *"task elimination"* were identified in information using leadership function, and three themes, *"mutual respect"*, *"understating each other"* and *"providing support"* were identified in community building leadership function.

Table 4.1: Themes of Complexity Leadership Functions

Complexity Leadership Function	Theme
Generative Leadership Function	• Brain Storming • Solution Development Process
Administrative Leadership Function	• Maintaining Hierarchy • Defining Tasks
Community Building Leadership Function	• Understanding Each other • Providing Support • Mutual Respect
Information Gathering Leadership Function	• Discussing Feedback • Information Sharing
Information Using Leadership Function	• Task Evaluation • Reinforcement for Submissions • Task Elimination

4.3 Quantitative Analysis

4.3.1 Normality

Initially, the responses were checked for univariate and multivariate outliers. The outliers are the different responses from the rest of the responses and do not reside within the range. The outliers were checked using case-wise z-scores. Cases with values exceeding ±3.29 were considered absolute outliers and were removed from the study (Aftan & Hanapi, 2018; Fidell, 2007; Field, 2013). The multivariate outliers were detected by calculating the Mahalanobis distance test using Chi-Square as suggested by (Field, 2013). In the Mahalanobis test, any response less than $p<0.001$ was considered a multivariate outlier and was excluded from the study (Kline, 2005). The complete details of the Mahalanobis test and the Chi-Square values can be seen in Appendix - D.

As normality of data is one of the pre-requisites of the covariance based structural equation modeling, data was checked for normality after taking out the outliers. The normality of the responses was checked by observing the skewness and kurtosis of the data. The data can be considered to be normal if the skewness of the data is within the range of -2 and 2 and kurtosis of the data is within the range of -3 and 3 (Beck II, 2017; Curran, West, & Finch, 1996). The data's descriptive statistics show that the minimum skewness and kurtosis of the data remain in range, suggesting the data's normal distribution. As the pilot study had already reduced the items from each of the exogenous constructs, the items related to complexity leadership only, which were reduced through exploratory factor analysis, were considered for the test of skewness and kurtosis along with the other variables in the model. The details of the descriptive statistics can be seen in Appendix - D.

Next, the linearity and homoscedasticity were tested using the scatter plot and P-P Plot, showing that the assumptions for linearity and homoscedasticity were not violated. The points are well distributed in the scatter plot and do not show any funnel-shaped pattern or curve in the points suggesting that the data was linear as well as homoscedastic (Field, 2013). To further assess if the data did not violate the assumption of homoscedasticity, the Breusch-Pagan test was conducted (Astivia & Zumbo, 2019). The analysis of variance shows *p-value = 0.182,* which is larger than the significance value of $p < 0.05$, confirming the assumption of homoscedasticity. The residual histogram plots also show that errors are normally distributed. The plots for residual normality, linearity, homoscedasticity, and Breusch-Pagan test results are given in Appendix – D.

After checking the multivariate normality and linearity, the data was checked for the common method variance. Common method variance or common method bias is performed to check of the instrument introduces any bias. If the items given in the instrument provide bias, the variation in the responses is generally caused by the instrument itself rather than the respondents (Chang, Van Witteloostuijn, & Eden, 2010). Such responses are contaminated where the noise in the response stems from the biased instrument. To check this biasness of the instrument, Harman’s single factor test was performed as suggested in various studies (Aydogmus, Camgoz, Ergeneli, & Ekmekci, 2018; Han, Lee, & Beyerlein, 2019; Magsaysay & Hechanova, 2017). The unrotated solution accounted for only 18.28% of the variance,

which is much below the 50% threshold. This suggests that the common method bias was not a problem in this case. The constructs were then tested for any issues of multicollinearity. According to Field (2013), if the value of VIF is below 10, the hypothesis about the presence of multicollinearity can be rejected. In this study, all the variables were much below 10, with the lowest VIF of 1.008 and the highest VIF of 1.114. The results of Harman's single factor are shown in Appendix - D.

4.3.2 Demographics

The respondents who participated in the study comprised 73.3% males and 26.7% females. 10.1% of the respondents were from high-level management, 44.4% were from middle-level management, and 45.5% were from low-level management. The responses included 19.8% of the responses from the age group under age 25, 49.7% of the respondents were from the age group of 26 to 35, 21.9% of the responses were from the age group from 36-45, 8.3% of the responses were from the age group between 46 to 55 years of age and only 0.3% of the respondents were from the age group between 56-65 years to of age. The education reflects that f 56.6% of the respondents had the education equivalent to undergraduate, and 43.4% of the respondents had the education equivalent to graduation. 19.8% of the responses were collected from Ufone, 24.0% of the responses were collected from PTCL, 21.5% of the responses were collected from Mobilink, 19.4% of the responses were collected from Telenor, 15.3% of the responses were collected from Zong.

4.3.3 Exploratory Factor Analysis

Before proceeding to the confirmatory factor analysis, unidimensionality was tested using exploratory factor analysis of the cleansed data (N=288). The exploratory factor analysis included all the items that were reduced earlier in dimension reduction, and items from moderating and endogenous constructs were added. Exploratory factor analysis of all

the constructs will filter out the items that may have lower loadings and cross load on other items. As this time, main data was used for the exploratory factor analysis, Principal Axis Factoring was used as an extraction method with Promax as a rotation as suggested by (Field, 2013). Principal axis factoring does not have any distributional assumption (Baglin, 2014) and has been widely used for exploratory factor analysis (Bakker & Xanthopoulou, 2013; Di Fabio & Peiró, 2018; Ricard, Klijn, Lewis, & Ysa, 2017). As the correlation between the correlation matrix factors was found out to be above 0.3, Promax was used as a rotation method (Field, 2013; Osborne et al., 2008).

Table 4.2: KMO and Bartlett's Test of Sphericity

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.830
Bartlett's Test of Sphericity	Approx. Chi-Square	4210.283
	df	741
	Sig.	.000

During the exploratory factor analysis process, one of the dimensions of entrepreneurial orientation, proactiveness, had to be excluded along with the three items of autonomy due to the poor factor loadings. One item from the dimension operational benefits and one item from the organizational benefits was excluded in information system implementation due to the high cross-loadings and poor loadings. One item of operational benefits was loaded on the organizational benefits and was excluded from the study due to the theoretical grounds. One item from information using leadership function and one two items from administrative leadership function was reduced due to low loading and cross-loading. After excluding the items with low loadings and high cross-loadings, the sample size adequacy for the exploratory factor analysis was checked using the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and its significance level. Table 4.2 shows that sampling adequacy (KMO) was found out to be adequate with $KMO = 0.830$ with the $p = 0.000$. According to Field (2013), sampling adequacy (KMO) was found out to be acceptable. The anti-image matrix also shows that all the diagonal elements are above 0.5, suggesting an adequate correlation of each factor. The factors extracted as a result of exploratory factor analysis resulted in a total of 53.99% of the variance. The variance explained above 0.5 is

considered adequate (Streiner, 1994). The extracted items for each dimension can be seen in Table 4.3.

Table 4.3: Exploratory Factor Analysis

Variable	Factor											
	1	2	3	4	5	6	7	8	9	10	11	12
IGF1							.557					
IGF2							.749					
IGF3							.854					
GF7			.700									
GF8			.878									
GF9			.751									
AF1								.582				
AF2								.792				
AF3								.752				
CBF7										.714		
CBF8										.675		
CBF10										.744		
IUF1						.694						
IUF2						.714						
IUF3						.758						
RT1				.734								
RT2				.813								
RT3				.625								
INN1					.886							
INN2					.603							
INN3					.773							
CA1											.632	
CA2											.791	
CA3											.582	
AM1									.665			
AM2									.623			
AM3									.639			
ISI3		.725										
ISI4		.597										
ISI5		.671										
ISI6		.512										
ISI7	.561											

ISI8	.742	
ISI9	.542	
ISI10	.586	
ISI11	.560	
ISI12		.577
ISI13		.687
ISI14		.769

Extraction Method: Principal Axis Factoring.
Rotation Method: Promax with Kaiser Normalization.
Rotation converged in 8 iterations.a

CBF = Community Building Leadership Function, GF = Generative Leadership Function, IUF = Information Using Leadership Function, IGF = Information Gathering Leadership Function, AF = Administrative Leadership Function, RT = Risk Taking, INN = Innovativeness, CA = Competitive Aggressiveness, AM = Autonomy ISI = Information System Implementation

4.3.4 Confirmatory Factor Analysis

4.3.4.1 *Entrepreneurial Orientation*

Initially, confirmatory factor analysis was carried out for the four dimensions of entrepreneurial orientation extracted during exploratory factor analysis in Table 4.3. To assess the model's validity and the goodness-of-fit, a plugin was used developed by (Gaskin & Lim, 2016). The results produced by the plugin provide the values for composite reliability (CR), average variance extracted (AVE), MSV, and MaxR(H). MaxR(H) is Maximum Composite Reliability with improved calculations for CR (McDonald, 1981). Figure 4.1 shows the measurement model of first-order of entrepreneurial orientation. To assess the measurement model, CR and AVE was checked for the convergent validity of entrepreneurial orientation.

Table 4.4 shows the CR of all the four constructs of entrepreneurial orientation are above the threshold of 0.7 as suggested by (Hair et al., 2009), and MaxR(H) of all the constructs is also above the threshold of 0.7 (Cudeck, Jöreskog, Sörbom, & Du Toit, 2001). The values of AVE of all the constructs were also found out to be above 0.5 as suggested by

(Hair et al., 2009) and are less than the CR and MaxR(H). On the other hand, MSV is less than the values of AVE and CR and Max(H)R. The square root of AVE in the diagonal column also shows higher values than the correlation coefficients of any of the constructs suggesting discriminant validity of the constructs of entrepreneurial orientation (Fornell & Larcker, 1981). The correlation between the four entrepreneurial orientation constructs shows that all the constructs have a highly significant correlation with each other.

Table 4.4: Convergent and Discriminant Validity of Entrepreneurial Orientation

	CR	AVE	MSV	MaxR(H)	INN	CA	AM	RT
INN	0.831	0.622	0.370	0.837	**0.788**			
CA	0.753	0.504	0.370	0.753	0.609***	**0.710**		
AM	0.753	0.505	0.361	0.759	0.600***	0.601***	**0.711**	
RT	0.777	0.537	0.348	0.777	0.590***	0.527***	0.563***	**0.733**

INN= Innovativeness, CA=Competitive Aggressiveness, AM=Autonomy, RT=Risk Taking

† p < 0.100, * p < 0.050, ** p < 0.010, *** p < 0.001

Table 4.5: First-Order Goodness-of-Fit of Entrepreneurial Orientation

Measure	Threshold	Estimate
CMIN/DF	Between 1 and 3	1.122
CFI	>0.95	0.995
TLI	>0.90	0.993
GFI	>0.90	0.970
AGFI	>0.80	0.951
SRMR	<0.08	0.036
RMSEA	<0.06	0.021

After confirming the validity of the first-order constructs of the entrepreneurial orientation, goodness-of-fit indices were observed to see if the model validated meets the goodness-of-fit indices' thresholds. Table 4.5 shows that the values of all the indices are well in the acceptable range. The CMIN/DF (χ^2/df) was found out to be between the range of 1 and 3, CFI was calculated to be 0.995, which is above the threshold of 0.95, TLI was calculated to be 0.993, which is also above the threshold of 0.90, GFI was also found out to be 0.970, and above the threshold of 0.90, AGFI was found out to be 0.951 which is above the threshold of 0.80. SRMR was found out to be 0.036, which was below the threshold of 0.08, RMSEA was found out to be 0.021, which is below the threshold of 0.06. This suggests that the four dimensions of the first-order construct of entrepreneurial orientation are acceptable to measure entrepreneurial orientation

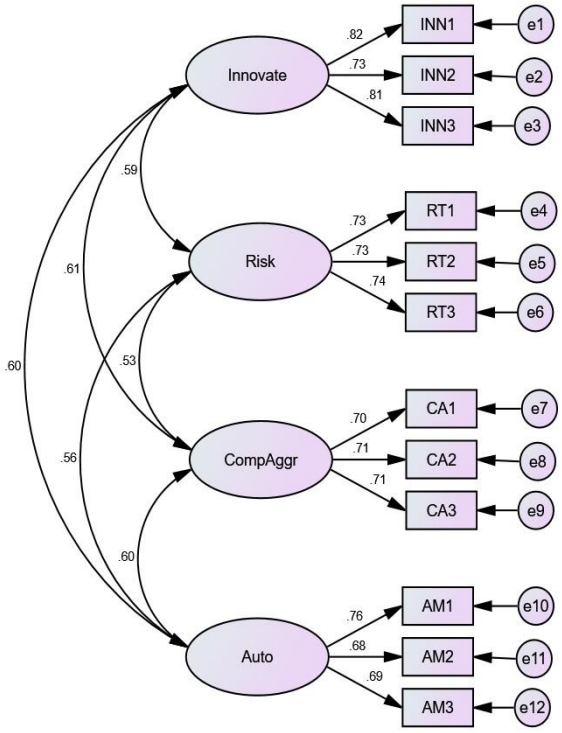

Figure 4.1: Confirmatory Factor Analysis of First-Order of Entrepreneurial Orientation

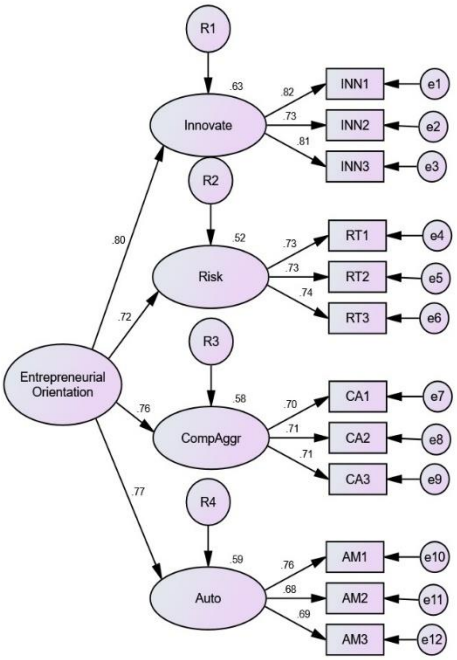

Figure 4.2: Confirmatory Factor Analysis of Second-Order of Entrepreneurial Orientation

After the confirmation of the first-order entrepreneurial orientation, the confirmatory factor analysis was performed for the second-order entrepreneurial orientation. To test the second-order confirmatory factor analysis, the four constructs were connected to entrepreneurial orientation, as shown in Figure 4.2, and checked for the goodness-of-fit again. All the factor loadings connecting to the first order were found to be above 0.7, whereas the factor loadings of first-order constructs were also found to be above 0.7. All the goodness-of-fit indices were found out to be in the acceptable range. The CMIN/DF (χ^2/df) was found out to be 1.12, which is between the range of 1 and 3, CFI was calculated to be 0.995, which is above the threshold of 0.95, TLI was calculated to be 0.994, which is also above the threshold of 0.90, GFI was also found out to be 0.969, and above the threshold of 0.90, AGFI was found out to be 0.951 which is above the threshold of 0.80. SRMR was found out to be 0.019, which was below the threshold of 0.08, RMSEA was found out to be 0.021, which is below the threshold of 0.06. The details of goodness-of-fit indices can also be seen in Table 4.6.

Table 4.6: Second-Order Goodness-of-Fit of Entrepreneurial Orientation

Measure	Threshold	Estimate
CMIN/DF	Between 1 and 3	1.12
CFI	>0.95	0.996
TLI	>0.90	0.995
GFI	>0.90	0.970
AGFI	>0.80	0.953
SRMR	<0.08	0.037
RMSEA	<0.06	0.018

4.3.4.2 *Information System Implementation*

Information system implementation has three dimensions, organizational benefits, operational benefits, and competitive benefits. After exploratory factor analysis, three items for organizational benefits, five items for operational benefits and three items for competitive benefits were retained. The confirmatory factor analysis revealed that the organizational benefits and operational benefits could not achieve the discriminant validity as their AVE remained below the threshold of 0.5. The items were deleted for improving the AVE, but convergent validity for both the constructs remained below 0.5. However, the third dimension, competitive benefits, was retained for confirmatory factor analysis of the complete model due to the optimum CR and AVE. Competitive benefits were found out to have CR of 0.766 and AVE of 0.522.

4.3.4.3 *Complete Measurement Model*

Once the higher-order constructs of entrepreneurial orientation and information system implementation were validated using confirmatory factor analysis. A complete model with exogenous and endogenous constructs was checked for validity using confirmatory factor analysis, as shown in Figure 4.3. The measurement model was assessed for convergent validity and discriminant validity first. The results in Table 4.7 show that the CR and MaxR(H) is above the threshold of 0.7. The generative leadership function has the CR of 0.818 and MaxR(H) of 0.832. Information gathering leadership function has the CR of 0.764 and MaxR(H) of 0.816, community building leadership function has the CR of 0.750 and MaxR(H) of 0.753, information using leadership function has the CR of 0.760 and MaxR(H) of 0.763, administrative leadership function has the CR of 0.749 and MaxR(H) of 0.760, entrepreneurial orientation which is a higher order construct has the CR of 0.841 and MaxR(H) of 0.844 and information system implementation, in which competitive advantage was the only dimension confirmed has the CR of 0.765 and MaxR(H) of 0.776. The values of the CR and MaxR(H) of all the constructs are above the threshold of 0.7 and confirm the convergent validity.

AVE, MSV, and correlations in Table 4.7 provide substantial information about the discriminant validity. The AVE values of all the constructs are above 0.5, and MSV is much below the AVE, suggesting discriminant validity of all the constructs. According to Table 4.7, community building leadership has an AVE of 0.501 and MSV to be 0.009. The generative leadership function was found to have AVE of 0.601 and MSV to be 0.265. The information using leadership function was found to have AVE of 0.513 and MSV to be 0.169. The information gathering leadership function was found to have AVE of 0.529 and MSV to be 0.086. The administrative leadership function was found out to have AVE of 0.501 and MSV to be 0.097. Information system implementation was found out to have AVE of 0.522 and MSV to be 0.333, and entrepreneurial orientation was found out to have AVE of 0.569 and MSV to be 0.333. Similarly, AVE's square root in the diagonal of all the constructs is higher than the correlation coefficients suggesting discriminant validity (Fornell & Larcker, 1981).

Table 4.7: Convergent and Discriminant Validity of Complete Measurement Model

	CR	AVE	MSV	MaxR(H)	GF	AF	CBF	IGF	IUF	ISI	EO
GF	0.818	0.601	0.258	0.832	**0.775**						
AF	0.749	0.501	0.097	0.760	0.311***	**0.708**					
CBF	0.750	0.501	0.009	0.753	0.013	-0.052	**0.708**				
IGF	0.764	0.529	0.084	0.816	0.090	0.119	0.013	**0.727**			
IUF	0.76	0.513	0.17	0.763	0.217**	0.150†	0.095	0.09	**0.717**		
ISI	0.765	0.522	0.337	0.776	0.281***	0.135†	-0.020	0.236**	0.249**	**0.723**	
EO	0.848	0.582	0.337	0.851	0.508***	0.207**	-0.019	0.290***	0.413***	0.580***	**0.763**

CBF = Community Building Leadership Function, GF = Generative Leadership Function, IUF = Information Using Leadership Function, IGF = Information Gathering Leadership Function, AF = Administrative Leadership Function, ISI = Information System Implementation, EO = Entrepreneurial Orientation

† $p < 0.100$, * $p < 0.050$, ** $p < 0.010$, *** $p < 0.001$

Table 4.8: Goodness-of-Fit of Complete Measurement Model

Measure	Threshold	Estimate
CMIN/DF	Between 1 and 3	1.152
CFI	>0.95	0.979
TLI	>0.90	0.976
GFI	>0.90	0.911
AGFI	>0.80	0.891
SRMR	<0.08	0.047
RMSEA	<0.06	0.023

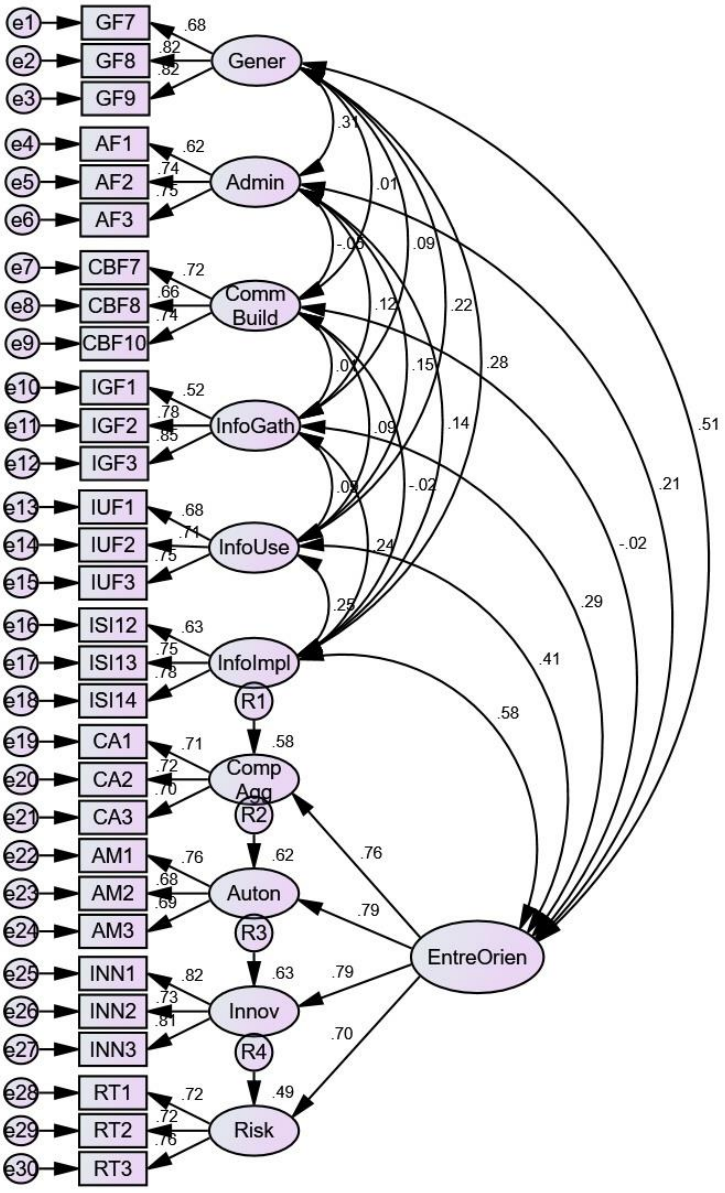

Figure 4.3: Confirmatory Factor Analysis of Complete Measurement Model

After determining the convergent and discriminant validity of the constructs, the goodness-of-fit was of the measurement model was checked. The values in Table 4.8 show that all the goodness-of-fit indices were in the acceptable range, which confirms that the goodness-of-fit of the measurement model. The CMIN/DF (χ^2/df) was found out to be 1.152, which is between the range of 1 and 3, CFI was calculated to be 0.979, which is above the threshold of 0.95, TLI was calculated to be 0.976, which is also above the threshold of 0.90,

GFI was also found out to be 0.911, and above the threshold of 0.90, AGFI was found out to be 0.891 which is above the threshold of 0.80. SRMR was found out to be 0.047, which was below the threshold of 0.08, and RMSEA was found out to be 0.023, which is below the threshold of 0.06.

4.4 Hypothesis Testing

The relationship between the variables was tested using structural equation modeling (SEM) in AMOS 21. SEM is a well-known technique that combines first-generation method assessment such as regression, path, and confirmatory factor analysis. SEM allows the researchers to study the direct and indirect relationships of the variables such as moderation and mediation. To check the relationships between the variables and test the hypotheses defined in this study, initially, SEM was run for the direct effect of complexity leadership functions on entrepreneurial orientation. Later, SEM was used to test the relationship of moderating variable information system implementation between complexity leadership functions and entrepreneurial orientation.

4.4.1 Direct Effect

Figure 4.4 shows the SEM of the direct relationship between the complexity leadership function and entrepreneurial orientation. The structural model initially tested for goodness-of-fit indices before reporting the results of the model. The model was found out to meet the goodness-of-fit criterion with CMIN/DF (χ^2/df) to be 1.071, which is between the range of 1 and 3, CFI to be 0.991, which is above the threshold of 0.95, TLI to be 0.990, which is also above the threshold of 0.90, GFI to be 0.922 and above the threshold of 0.90, AGFI was found out to be 0.905, which is above the threshold of 0.80. SRMR was found out to be 0.066, which was below the threshold of 0.08, RMSEA was found out to be 0.016, which is below the threshold of 0.06.

After observing the structural model's goodness-of-fit in Table 4.9, the relationships between exogenous and endogenous variables were checked. The structural model shown in Figure 4.4 shows the direct effect of exogenous variables on the endogenous variable. The results direct effect in Table 4.10 show that generative leadership function has a significant relationship with entrepreneurial orientation *(Estimate = .704, t-value = 5.338, p-value = .000)* supporting Hypothesis 1, information gathering leadership function has a significant relationship with entrepreneurial orientation *(Estimate = .423, t-value = 3.557, p-value = .000)* supporting Hypothesis 4, and information using leadership function has a significant relationship with entrepreneurial orientation *(Estimate = . 555, t-value = 4.278, p-value = .000)* accepting Hypothesis 5. These results show that the fine-grain interactions in these respective complexity leadership functions provide orientation towards the new business or new venture in telecommunication organizations.

Community building leadership function and administrative leadership function were found to have an insignificant relationship with entrepreneurial orientation with *(Estimate = -.091, t-value = -0.807, p-value = .420)* and *(Estimate = .092, t-value = 0.822, p-value = .411)*. Although the results show an insignificant relationship of administrative leadership function with entrepreneurial orientation, administrative leadership function significantly correlates with the entrepreneurial orientation in Table 4.4. Hypothesis 2 is partially supported because of the significant correlation results, whereas Hypothesis 3 is not supported. This suggests that fine-grain interactions in community building leadership function do not help generate new business ideas or new ventures, and fine-grain interactions of administrative leadership function lineate towards the generation of new business ideas and a new venture in telecommunication organizations. The effect size of exogenous variables on each dimension of the exogenous variable entrepreneurial orientation were noted to be, $R^2 = 0.23$ for innovativeness, $R^2 = 0.26$ for competitive aggressiveness, $R^2 = 0.20$ for autonomy and $R^2 = 0.14$ for risk taking. The exogenous variables' overall effect size on the entrepreneurial orientation was found out to be $R^2 = 0.27$, suggesting that the exogenous construct has an overall effect of 27% on the entrepreneurial orientation.

Table 4.9: Goodness-of-Fit of Complete Structural Model

Measure	Threshold	Estimate
CMIN/DF	Between 1 and 3	1.071
CFI	>0.95	0.991
TLI	>0.90	0.990
GFI	>0.90	0.922
AGFI	>0.80	0.905
SRMR	<0.08	0.066
RMSEA	<0.06	0.016

Table 4.10: Results of Direct Relationship

Direct Relationship	Estimate	t-value	Sig
EO <--- IGF	.423	3.557	***
EO <--- IUF	.555	4.278	***
EO <--- CBF	-.091	-.807	.420
EO <--- GF	.704	5.338	***
EO <--- AF	.092	.822	.411

CBF = Community Building Leadership Function, GF = Generative Leadership Function, IUF = Information Using Leadership Function, IGF = Information Gathering Leadership Function, AF = Administrative Leadership Function, EO = Entrepreneurial Orientation

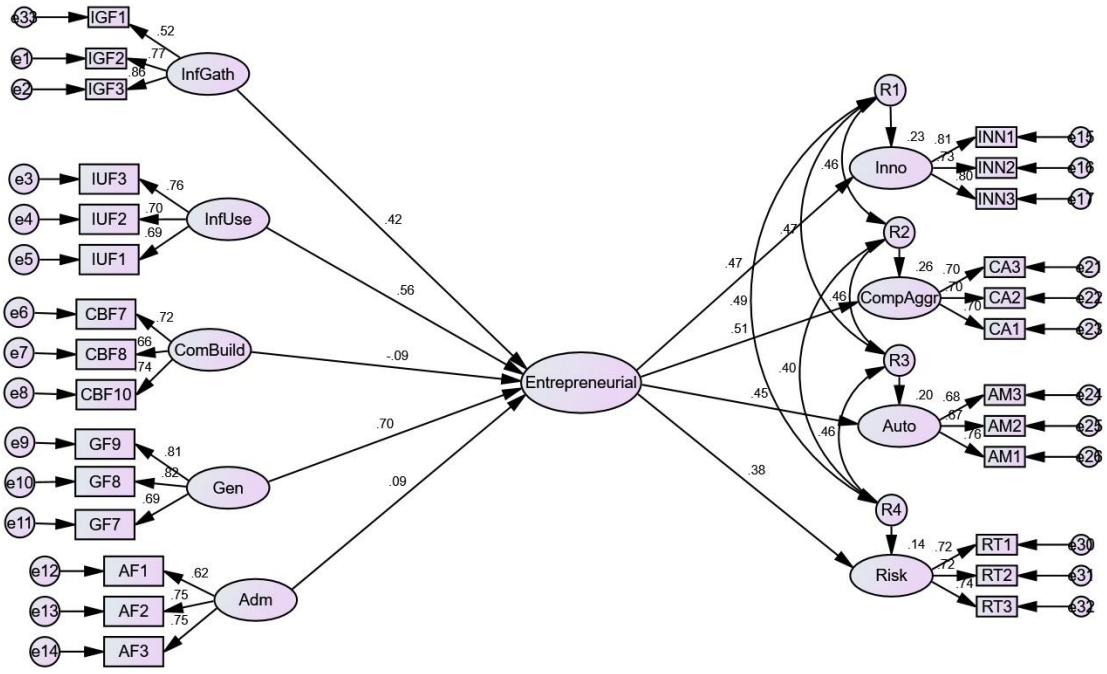

Figure 4.4: Structural Model for Direct Relationship

4.4.2 Moderation of Information System Implementation

According to Baron and Kenny (1986), the moderator is a variable that affects the relationship between the independent and dependent variables. In this study, information system implementation was used as a moderator between the complexity leadership function and entrepreneurial orientation. To moderate information system implementation between the relationship of exogenous and endogenous variables, guidelines of (Dawson, 2014; Hopwood, 2007) were followed the model of which can be seen in Figure 4.9. The standardized scores of the exogenous variables along with the moderating variables were taken first. The interaction terms were calculated based on these standardized scores, and the endogenous variable was left raw. The model was first tested for model fitness. The model was found out to meet the goodness-of-fit criterion with CMIN/DF (χ^2/df) to be 1.582, which is between the range of 1 and 3, CFI to be 0.967, which is above the threshold of 0.95, TLI to be 0.951, which is also above threshold of 0.90, GFI to be 0.930 and above the threshold of 0.90, AGFI was found out to be 0.887, which is above threshold of 0.80. SRMR was found

out to be 0.066, which was below the threshold of 0.08, RMSEA was found out to be 0.045, which is below the threshold of 0.06. The model-fit-indices can be seen in Table 4.11.

Table 4.11: Goodness-of-Fit of Moderation Model

Measure	Threshold	Estimate
CMIN/DF	Between 1 and 3	1.241
CFI	>0.95	0.975
TLI	>0.90	0.962
GFI	>0.90	0.944
AGFI	>0.80	0.909
SRMR	<0.08	0.041
RMSEA	<0.06	0.029

Table 4.12: Moderating Effect of Information System Implementation between Information Gathering Leadership and Entrepreneurial Orientation

	Estimate	t-value	p-value
EO <--- IGF	.199	2.493	.013
EO <--- ISI	.536	5.806	***
EO <--- IGF*ISI	-.166	-2.066	.039

IGF = Information Gathering Leadership Function, EO = Entrepreneurial Orientation, ISI = Information System Implementation

Table 4.12 show that information system implementation shows a significant relationship with entrepreneurial orientation with *(Estimate = .536, t-value = 5.806, p-value = .000)* and information gathering leadership function also has a significant relationship with entrepreneurial orientation with *(Estimate = .199, t-value = 2.493, p-value = .013).* The

results also show a negative moderating effect between the relationship of information gathering leadership function and entrepreneurial orientation with *(Estimate = -.166, t-value = -2.066, p-value = .039)* supporting Hypothesis 8. The interaction slopes in Figure 4.5 show clear intersection with a slight declining slope showing the negative influence of information system implementation between the relationship of information gathering leadership function and entrepreneurial orientation.

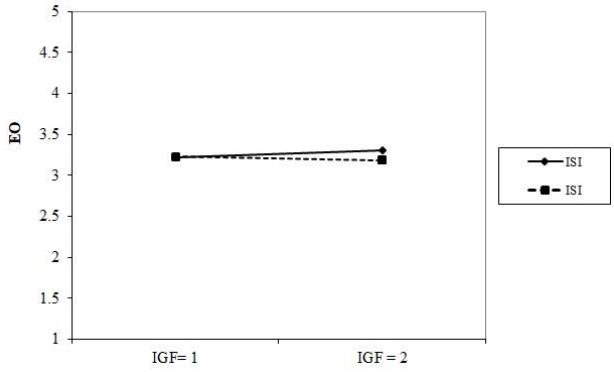

Figure 4.5: IGI-ISI Interaction Slopes

Table 4.13: Moderation of Information System Implementation between the relationship of Generative Leadership Function and Entrepreneurial Orientation

	Estimate	t-value	p-value
EO <--- GF	.472	5.212	***
EO <--- ISI	.536	5.806	***
EO <--- GF*ISI	.030	.368	.713

GF = Generative Leadership Function, EO = Entrepreneurial Orientation, ISI = Information System Implementation

According to Table 4.13 generative leadership function has a significant relationship with entrepreneurial orientation with *(Estimate = .472, t-value = 5.212, p-value = .000)* and information system implementation shows an insignificant moderating effect between the relationship of generative leadership function and entrepreneurial orientation with *(Estimate = .030, t-value = .368, p-value = .713)* failing to support Hypothesis 6. The interaction slopes

in Figure 4.6 show that both the slopes remain parallel to each other with an inclining trend. The inclining trend reflects the positive relationship, but as the slopes do not intersect, information system implementation fails to moderate the relationship of generative leadership function and entrepreneurial orientation.

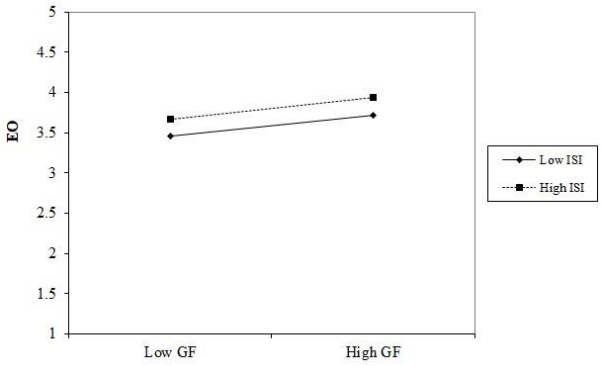

Figure 4.6: GF-ISI Interaction Slopes

According to Table 4.14, administrative leadership function has a significant relationship with entrepreneurial orientation with *(Estimate = .067, t-value = .840, p-value = .401)* and information system implementation shows an insignificant moderating effect between the relationship of administrative leadership function and entrepreneurial orientation with *(Estimate = -.071, t-value = .888, p-value = .374)* failing to support Hypothesis 7. The interaction slopes in Figure 4.7 show that both the slopes remain parallel and do not intersect with each other. This shows that information system implementation fails to moderate the relationship between administrative leadership function and entrepreneurial orientation.

Table 4.14: Moderation of Information System Implementation between the Relationship of Administrative Leadership Function and Entrepreneurial Orientation

	Estimate	t-value	p-value
EO <--- AF	.067	.840	.401
EO <--- ISI	.536	5.806	***
EO <--- AF*ISI	-.071	-.888	.374

AF = Administrative Leadership Function, EO = Entrepreneurial Orientation, ISI = Information System Implementation

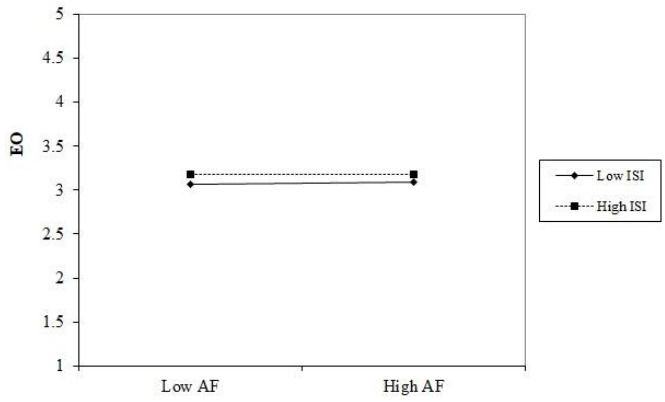

Figure 4.7: AF-ISI Interaction Slopes

According to Table 4.15, information using leadership function has a significant relationship with entrepreneurial orientation with *(Estimate = .328, t-value = 3.916, p-value = .000)* and information system implementation shows an insignificant moderating effect between the relationship of information using leadership function and entrepreneurial orientation with *(Estimate = .025, t-value = .308, p-value = .758)* failing to support Hypothesis 9. The interaction slopes in Figure 4.8 show that both the slopes remain parallel to each other with an inclining trend. The inclining trend reflects the positive effect, but the slopes do not intersect. This shows that information system implementation fails to moderate information using leadership function and entrepreneurial orientation.

Table 4.15: Moderation of Information System Implementation between the Relationship of Information Using Leadership Function and Entrepreneurial Orientation

	Estimate	t-value	p-value
EO <--- IUF	.328	3.916	***
EO <--- ISI	.536	5.806	***
EO <--- IUF*ISI	.025	.308	.758

IUF = Information Using Leadership Function, EO = Entrepreneurial Orientation, ISI = Information System Implementation

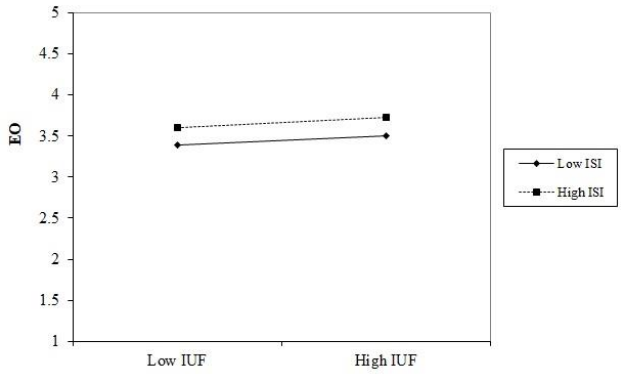

Figure 4.8: IUF-ISI Interaction Slopes

This reveals that information system implementation does not play any significant role in the fine-grain interactions of the respective complexity leadership functions to affect the orientation to generate new business ideas or new ventures in telecommunication organizations.

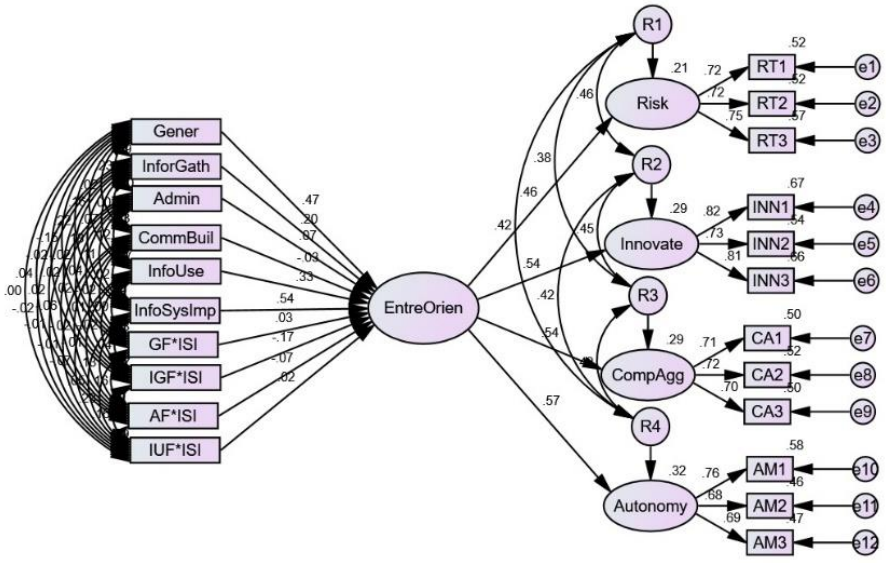

Figure 4.9: Structural Model of Moderation

Table 4.16: Hypotheses Testing Information

Hypotheses		Supported	Not Supported
Hypothesis 1	GF -- > EO	Yes	-
Hypothesis 2	AF -- > EO	Partially Yes	-
Hypothesis 3	CBF -- > EO	-	No
Hypothesis 4	IGF -- > EO	Yes	-
Hypothesis 5	IUF -- > EO	Yes	-
Hypothesis 6	GF*ISI	-	No
Hypothesis 7	AF*ISI	-	No
Hypothesis 8	IGF*ISI	Yes	-
Hypothesis 9	IUF*ISI	-	No

CBF = Community Building Leadership Function, GF = Generative Leadership Function, IUF = Information Using Leadership Function, IGF = Information Gathering Leadership Function, AF = Administrative Leadership Function, ISI = Information System Implementation, EO = Entrepreneurial Orientation

The effect size of exogenous variables on each dimension of the exogenous variable entrepreneurial orientation were noted to be, $R^2 = 0.29$ for innovativeness, $R^2 = 0.29$ for competitive aggressiveness, $R^2 = 0.32$ for autonomy and $R^2 = 0.21$ for risk taking. The exogenous variables' overall effect size on the entrepreneurial orientation was found out to be $R^2 = 0.36$, suggesting that the exogenous construct has an overall effect of 36% on the entrepreneurial orientation. The details of the hypotheses which were supported, partially supported, and not supported can be seen in Figure 4.16.

Chapter 5

Discussions and Conclusion

5.1 Discussion

The study investigates the theoretical, empirical, and contextual research gap in the complexity paradigm where fine-grain interactions in the complexity leadership functions were identified and studied for the effect on the entrepreneurial orientation. Similarly, information system implementation was also studied for its effect on the relationship of complexity leadership functions and entrepreneurial orientation as a moderator. This section discusses the results and provides theoretical reasoning and justifications based on the previous studies conducted in similar areas.

Hypothesis 1: The empirical results show a significant relationship between generative leadership function and entrepreneurial orientation in telecommunication organizations. The results reveal that the fine-grain interactions of generative leadership function help develop an orientation for new businesses and ventures. The findings of this hypothesis remain consistent with the arguments made in the previous literature on generative leadership (Carmeli & Dothan, 2017; Castillo & Trinh, 2018; Hazy & Uhl-Bien, 2015; Mike, 2018; Surie & Hazy, 2006). The findings of this study suggest that telecommunication organizations give key importance to the customers' needs. The individuals in telecommunication organizations operate to develop new solutions based on the customer requirements and their needs. The individuals also encourage the development of new ideas by providing them with appropriate resources and time. These findings are in compliance with the previous findings, which show that the organizations' generativity promotes newness, innovativeness, creativity, exploration, and collaboration (Hazy & Uhl-Bien, 2013). The fine-grain interactions in the generative leadership function help

telecommunication organizations orient towards an entrepreneurial activity, which is also recommended in previous studies (Özdemirci, 2011). Therefore, it is suggested that telecommunication organizations should enhance the identified fine-grain interactions in generative leadership function to increase the generative actions within the organization.

Hypothesis 2: The results of Hypothesis 2 show an insignificant relationship between administrative leadership function and entrepreneurial orientation. In this study, the most common fine-grain interactions identified in the administrative leadership function were defining the job description, establishing the targets, and assigning tasks. Earlier studies on leadership show that followers' compliance by assignment of tasks, setting the goals, and fixing the jobs negatively affects the innovative idea generation and sharing ideas (Pieterse, Van Knippenberg, Schippers, & Stam, 2010). This type of leadership creates a hierarchical approach in the organization creating control over the subordinates (Epitropaki & Martin, 2013). This restricts the flow of information to different management levels, blocking the ideas generated to solve the problem at different levels. As the organization's core idea of entrepreneurial activity is to explore and exploit, the hierarchical and controlling approach tends to negate the entrepreneurial activity. However, the relationship of such studies has not always been found to have negative relationships. Khan, Aslam, and Riaz (2012) found that such leadership styles tend to positively affect the innovative work environment. Oke, Munshi, and Walumbwa (2009) also found out that leadership styles involving practices to develop the structural mechanism can benefit radical outcomes such as collaborating in a new joint venture. Zhou (2016) found an insignificant relationship of task-oriented personality between leadership and entrepreneurial team performance. Task-oriented leadership also shows an insignificant relationship with innovativeness and risk taking, two essential dimensions of entrepreneurial orientation (Sazesh & Siadat, 2016). Yan and Sorenson (2003) studied the effect of leadership on collective entrepreneurship and found out that the overall effect of task-oriented leadership was insignificant. This shows that leadership, which involves hierarchy and task orientation, may vary from case to case. The contextual difference may also be one of the reasons for the variation in the results. As in this study, administrative leadership function had a significant correlation with entrepreneurial orientation but failed to have a significant relationship. Telecommunication organizations tend to show evidence of the positive and significant influence of administrative leadership

function on entrepreneurial activities. Keeping in view the contextual variation in the results of previous studies, the relationship of administrative leadership function and entrepreneurial orientation needs to be studied further in other contextual settings to confirm the transferability of findings.

Hypothesis 3: The findings of Hypothesis 3 also show an insignificant relationship between community building leadership function and entrepreneurial orientation. In this study, the community building leadership function comprises fine-grain interactions such as being honest with each other, respecting, and treating fair treatment. These fine-grain interactions tend to form the bonding between the individuals within the organization. The organization's bonding and citizenship behavior show that employee engagement with each other tends to provide better support and help enhance the organization's entrepreneurial activities (Kassa & Raju, 2015). However, Xerri and Brunetto (2013) found out that organizational citizenship behavior does not significantly contribute to generating new products or services at the organizational level. The past literature suggests that organizations supporting fairness in the system introduce a conducive environment, encouraging the openness to speak and entrepreneurial initiatives (Covin, Rigtering, Hughes, Kraus, Cheng, & Bouncken, 2020; D. De Clercq, D. Dimov, & N. Thongpapanl, 2010a). However, the individuals and the teams may be competing together to gain better opportunities. The interest of the individuals and working groups to gain the opportunity also decreases the knowledge sharing, damaging the entrepreneurial posture of the organization (Dorn, Schweiger, & Albers, 2016; Tsai, 2002). In such cases, the working groups may show some form of bonding through respect, fairness, and honesty, but at the same time lack to contribute to developing entrepreneurial posture. However, this must be understood that the community building leadership function outcomes such as citizenship behavior, employee engagement, and intrinsic motivation do have past evidence to enhance entrepreneurial orientation (De Clercq et al., 2010b; Spillecke & Brettel, 2014). The results of this study and presentation of the theoretical reasoning suggest further investigation in other contexts. Considering this contextual variation, the community building leadership function's insignificant relationship with entrepreneurial orientation suggests that telecommunication organizations do possess community-like features. However, the competition for better opportunities may hinder the initiation of entrepreneurial activities. Therefore, the insignificance of the relationship of

community building leadership function with entrepreneurial orientation must be investigated further to confirm the findings.

Hypothesis 4: Information gathering leadership function in Hypothesis 4 has a significant relationship with entrepreneurial orientation. The fine-grain interactions in the information gathering leadership function focus on the discussions on customer feedback, competitor feedback, and employee feedback. These fine-grain interactions of the information gathering leadership collect the data directly from the market. Market information has been considered vital for the new product and venture development (Eckhardt, Ciuchta, & Carpenter, 2018). Organizations learn from their internal as well as external environment to gain a competitive advantage in the market. The information assists in the opportunity recognition and decision making by changing the subjective beliefs of the individuals working in organizations (Eckhardt et al., 2018). It allows the organizations to see new avenues to initiate a venture and develop a sustainable position. Oppenheim, Stenson, and Wilson (2003) suggest that information is an asset for the organizations which they use to assess the changing business environment and change their objectives accordingly. Information has always been found to play a pivotal role in providing organizations with the market edge (Clemons, Croson, & Weber, 1996). In this study, this significant relationship of information gathering leadership function with entrepreneurial orientation remains consistent with the previous studies on learning culture, information, and knowledge management (Abiodun & Muhammed Isa, 2016; Amin, Thurasamy, Aldakhil, & Kaswuri, 2016; Caseiro & Coelho, 2018; Gruber-Muecke & Hofer, 2015; Wolff, Pett, & Ring, 2015). The study results reveal that telecommunication organizations should focus on customer, competitor, and employee feedback for gaining a competitive advantage.

Hypothesis 5: Information using leadership function was found out to have a positive influence on entrepreneurial orientation as hypothesized in Hypothesis 5. The fine-grain interactions in information using leadership function include evaluation targets, monitoring task performance, and evaluating key performance indicators. These fine-grain interactions allow the organizations to monitor if the organizations are achieving the established goals. This monitoring brings the accountability culture within the organizations. (Jamali, Sidani, & Zouein, 2009) also suggests that organizations first set their goals and then monitor the

progress of the goals regularly. The organizations keep evaluating the internal and external changes and modifying their plan of action accordingly (Ben-Menahem, Kwee, Volberda, & Van Den Bosch, 2013). The organizations that monitor the changing market requirements and take appropriate actions to align the market requirements with the organization's internal capabilities exhibit better entrepreneurial orientation (Cho & Jung, 2014). Keeping in view the ability to reform their internal ability proactively and innovatively identify and capture the market opportunity reflects the entrepreneurial behavior of the organization (Lee, Lee, & Pennings, 2001). As the organizations measure the key performance indicators to evaluate the organizations' performance (Ishaq Bhatti, Awan, & Razaq, 2014), telecommunication organizations frequently monitor the tasks accomplished and key performance indicators to orient themselves about the position and direction of the organization (Klučka & Kelíšek, 2018). These continuous monitoring actions also allow telecommunication organizations to evaluate themselves to adapt to the changing market requirements.

Hypothesis 6-9: In this study, the moderating effect of information system implementation is either negative or not supported between the complexity leadership functions and entrepreneurial orientation. The information system has been studied earlier as an excellent source of information and knowledge about customer needs and market requirements (Abu Amuna, Al Shobaki, Abu-Naser, & Badwan, 2017; Girchenko, Ovsiannikova, & Girchenko, 2017; Santouridis & Veraki, 2017). It has also been used to monitor the organizational progress and performance (Aremu, Shahzad, & Hassan, 2018; Chen, Elbashir, Peng, & Zhu, 2016; Gupta, Kumar, Singh, Foropon, & Chandra, 2018; Hassan, Jabar, Sidi, Jusoh, & Abdullah, 2018; Wanyoike, 2017). Due to the beneficial usage of the information system, information system implementation has also been studied as an important tool for entrepreneurial activities (Pohludka et al., 2018). However, an information system proves to be beneficial only if it has been appropriately implemented or the users know how to use the information system to its full capacity for their good. The insignificance of information system implementation in this study may have various reasons.

For the successful implementation of the information system, the life cycle of information system implementation needs to be completed (Hasibuan & Dantes, 2012; Somers & Nelson, 2004). Liu, Feng, Hu, and Huang (2010) suggest two perspectives of

assimilation. One is the breadth, which means how broadly information system is used in the organization. The second is depth, which means the extent to which the user uses the information system. Depth is not considered to be achieved by using the information system as routine work but by responding to the non-routine. Users can be classified from transactional users to VIP users. Transactional users use information systems based on what they are trained to do. They neither know anything about information systems beyond their daily usage nor do they use information systems innovatively. Then there are power users who try to understand how information systems are linked to companywide scope and create analytical reports from the information system. Power user has a limitation and is unable to change the processes. VIP users usually use the information system with full capacity by running the analytical reports and can change the processes. Transactional users who usually have the job to enter or extract the data from the information system and do not analytically analyze it; may lead to an insignificant role of information system implementation (Liu et al., 2010). The negative and insignificant effect of information system implementation as a moderator in telecommunication organizations indicate the transactional usage of information system on a larger scale and VIP usage to a smaller scale.

The transactional use and limited knowledge about the depth of the information system may lead to inappropriate user acceptance or adoption of the technology (Venkatesh & Davis, 2000; Verma, Bhattacharyya, & Kumar, 2018). User acceptance plays an important role in adopting the technology where the user feels comfortable with the information system. In telecommunication organizations, the users not having complete information about the information system's usage may be caused by low self-efficacy, control, maturity, and playfulness to explore the information system. A low level of self-efficacy, control, and playfulness may be driven by the usage of the information system discussed by (Liu et al., 2010). Users in telecommunication organizations who have limited access to information systems cannot perceive the information system's full potential. As the provision of information is more related to the level of usage, the role of the information system may vary with usage. Therefore, it is necessary that the belief about the usage and usefulness of the information system should be well regulated to add the information provided by the information system to their day-to-day interactions. Successful implementation of the information system in the telecommunication organizations will help the leadership to

exercise the experimentation, maintain better control, develop improved learning culture and build enhanced strategies to bring diversification in the organization.

Complexity leadership is still in the infancy stage, and not much empirical evidence can be found. As the study's focus was identifying the interactions of all the complexity leadership functions, and this is the first time the effect of complexity leadership functions have been tested on entrepreneurial orientation, the study cannot be checked for consistency with any prior evidence. However, the past literature on leadership and entrepreneurial orientation may have some relevance to the constructs' relationship. For example, Wales, Patel, and Lumpkin (2013) reported R^2 of 0.21 when tested CEO Narcissism and entrepreneurial orientation. Similarly, Vilkotyte (2015) studied leader-member exchange relationship with entrepreneurial orientation and reported R^2 of innovativeness to be 0.056, proactiveness to be 0.083, and risk-taking to be 0.108. Similarly, Obeidat, Yousef, Nofal, and Masa'deh (2018) studied transformational leadership with an entrepreneurial orientation which resulted in an R^2 of 0.27. Entrepreneurial orientation, on the other hand, being an intermediate construct, has largely been tested with an organizational outcome such as performance. Past literature on entrepreneurial orientation suggests that R^2 has been below low in most cases. For example, Lee and Lim (2009) reported R^2 to be 0.32, Awang, Khalid, Yusof, Kassim, Ismail, Zain, and Madar (2009) reported R^2 to be 0.15, Lumpkin and Dess (2001) reported 0.15, 0.08, and 0.07 for sales growth, return on sales and profitability respectively. Similarly, Covin et al. (2006) reported R^2 of 0.06, Wiklund (1999) reported R^2 of 0.26, Wiklund and Shepherd (2005) reported R^2 of 0.26, and Hughes and Morgan (2007) reported R^2 of 0.10 and 0.13 for product performance and customer performance respectively.

5.2 Implications

5.2.1 Theoretical Implications

This study makes significant contributions to the existing body of knowledge. This study contributes to the theory of complexity leadership by developing the instrument in

which fine-grain interactions of all the five complexity leadership functions have been identified. This study also contributes to the resource-based theory where it provides a new lens through which the organizations can use their resources. It is important to understand that the organizations club their resources to gain a competitive advantage. Considering organizations as a complex adaptive system, fine-grain interactions have long been discussed in complexity literature for their role in creating organizational outcomes. These fine-grain interactions and pattern of the social network of the individuals within the organization have been emphasized for generating an ecosystem, which enables the organizations to adapt to the changing environment. The complexity leadership functions and the fine-grain interactions identified in this study are the resources that can help organizations gain better organizational outcomes.

In this study, complexity leadership functions were tested with entrepreneurial orientation. This study provides empirical evidence that the fine-grain interactions in generative leadership function, information gathering leadership function, and information using leadership function can be adopted to gain the entrepreneurial posture. As complexity leadership functions provide a new lens to evaluate the organizations, this study's findings provide important evidence that complexity leadership functions can be used to assess the organizational level outcomes. As moderation of information system implementation was largely not supported in this study, it suggests that fine-grain interactions that may provide entrepreneurial orientation do not depend on the information system implementation. The moderation's findings further imply that the implementation of information systems as a resource should be studied in-depth, keeping in view the impact in the fine-grain interactions of each complexity leadership function. The theoretical contribution of this study in resource based theory as well as in complexity leadership.

5.2.2 Managerial Implications

The results of this study help the managers of telecommunication organizations to organize their day-to-day interactions. As the managers play a key role in aligning the organization’s strategic goals, the fine-grain interaction identified in this study will help the managers decide to improve the strategic posture of the telecommunication organizations. Using these observations, the managers can inculcate the interactions within their day-to-day routines, providing them better results. However, the set of interactions in each complexity leadership function for different organizational environments may vary. The significant relationship of generative leadership function, information gathering leadership function, and information using leadership function with entrepreneurial orientation in this study suggest that the fine-grain interactions of these leadership functions can be adopted to enhance the orientation towards developing new business solutions.

5.2.3 Practical Implications

This study can have high implications in day-to-day practices in all the working environments, especially for Pakistan's telecommunication sector. Previously, organizations were assessed based on either leadership traits, behavior, or styles. Complexity leadership functions provide a new lens to evaluate the organizations through fine-grain interactions. Adopting these fine-grain interactions of complexity leadership functions will help telecommunication organizations get a competitive edge in the market. The findings of this study also provide information about the effect of information system implementation as a moderator. Telecommunication organizations can emphasize the usage of the information system. The information system can play an important role for the members of telecommunication organizations to adapt their fine-grain interactions based on the information system's information. The study encourages telecommunication organizations to focus on the implementation of all the tiers of management.

5.3 Limitations and Recommended Future Work

It is important that while defining the research study's scope, the boundaries of the research study are drawn. To explore the practices or fine-grain interactions of complexity leadership function, a mixed-method study was adopted. As the complexity leadership considers the dyadic interactions between the leader and members of the organization, multiple tiers of management were selected for the qualitative and quantitative data collection. Overall, the model tested in this study was restricted to the three resources. This limitation of the study to three resources is due to the evidence that these resources can provide the organizations with a competitive edge in the market. Although this study has made substantial contributions in the respective field theoretically, empirically, and contextually, it has its limitations. As the problem was related to the telecommunication industry, the data was collected only from Pakistan's telecommunication sector. The instrument developed during this study can be tested for its validation in other industrial sectors as well.

There are five major areas suggested in which this study can be extended in the future. First, the instrument developed in this study can be tested in different organizational environments. The contextual variation may also vary the identification of the fine-grain interactions and their effect on entrepreneurial orientation. Further studies in various contexts may allow understanding of the findings of this study to remain the same as other contexts. The instrument developed in this study should be tested with other intermediate organizational constructs and constructs with organizational outcomes. For example, different intermediate constructs such as organizational culture, job satisfaction, organizational learning, and role clarity, while organizational outcome constructs can be organizational performance and innovativeness. The interactions may vary from industry to industry, so the most common interactions resulting in organizational behavior can be identified. This will add further knowledge in complexity leadership literature, leading to the better undertaking of fine-grain interaction and their role in developing the overall organizational environment and organizational behavior.

Second, the interactions identified in this study are not exhaustive, the instrument can further be extended, and more interactions can be added to the instrument. Although the interviews conducted in this study reached theoretical saturation in the telecommunication sector, more interviews can be conducted in other industrial sectors to identify more interactions. This study's approach involved a sequential exploratory strategy suggested by (Creswell & Creswell, 2017). More interactions can be explored by looking at the previous leadership perspectives deductively, as suggested by (Giesen et al., 2012; Hinkin et al., 1997). Third, as these fine-grain interactions lead to the behavior, it is worth studying if the leadership behaviors correlate with the fine-grain interactions of complexity leadership functions. This will allow researchers and practitioners to understand which interactions can lead to a certain required behavior.

Fourth, based on these fine-grain interactions and the fine-grain interactions further to be identified, one of the major extensions of this work is to study the complexity leadership functions as a complex adaptive system. Future studies can be done by using computational modeling or dynamic system modeling. This will provide an insight into the organization's behavior using fine-grain interactions of complexity leadership functions. This will also provide an insight into the dynamism of the organization to adapt to the changing environment. This dynamic system and computational modeling will also help forecast the organizational outcomes based on the dynamics of the leadership functions within a complex system. Fifth, moderation of information system implementation was not supported at large in this study. This shows that the relationship between the fine-grain interactions and entrepreneurial orientation has either no or negative effect on the information system. Studies can be conducted to investigate how interactions in a working environment of the telecommunication industry can be based on the information provided by the information systems. Initially, the overall adoption level of information systems in telecommunication organizations should also be investigated, and then, the relation of fine-grain interactions based on information systems should be studied in detail.

5.4 Conclusion

This study contributes significantly to complexity leadership theory by exploring fine-grain interactions for each complexity leadership function from the telecommunication sector and investigating their relationship with entrepreneurial orientation. One of the major contributions of this study is developing an instrument by conducting a qualitative study that resulted in an instrument with 46 fine-grain interactions for all the five complexity leadership functions. The quantitative study confirmed a total of 15 interactions in total for all the five complexity leadership functions. Three fine-grain interactions "Even smallest need of the customer is given importance", "Resources and time are provided to try new things" and "New approaches are encouraged" were identified in generative leadership function, three fine-grain interactions "Job descriptions are defined clearly", "Targets are established for everyone" and "Tasks are assigned to everyone" were identified in administrative leadership function, three fine-grain interaction "Everyone is honest with each other", "Everyone is respected" and "Everyone is treated fairly" were identified in community building leadership function, three fine-grain interactions "Information is gathered by discussing competitor's products/services", "Information is gathered by discussing customer's feedback", and "Information is gathered by discussing employee's feedback" were identified in information gathering leadership function and three fine-grain interactions "Achievement of targets is evaluated", "Tasks performance is monitored" and "Key performance indicators are evaluated by supervisor" were identified in information using leadership function. This ensured the completion of the study's first objective, identifying the interactions for each complexity leadership function. The confirmation of 15 fine-grain interactions in five complexity leadership functions further clarifies that majorly the fine-grain inteactions were cupled based on the themes.

In the generative leadership function the fine-grain interactions related to the theme "Solution Development Process" were retained. Similarly, in the administrative leadership function the fine-grain interactions related to "Defining Tasks" were retained. In the community building leadership function, the fine-grain interactions from "Mutual Respect" were retained. In the information gathering leadership function, the fine-grain interactions from the theme "Discussing Feedback" were retained, and the information using leadership

function, the fine-grain interactions from the theme “Task Evaluation” were retained. This concludes that the telecommunication organizations tend to adopt fine-grain interactions which promote the solution development process, defining tasks, mutual respect, discussing feedback and task evaluation. As in this study, fine-grain interactions of each complexity leadership function were explored successfully; this also covers the gap identified in the study of (Hazy & Prottas, 2018).

For the second objective, the relationship of five complexity leadership functions was investigated with entrepreneurial orientation. Three of the five complexity leadership functions, generative leadership function, information gathering leadership function, and information using leadership function, were found to have a significant positive relationship with the entrepreneurial orientation. The community building leadership function was not found to have any significant relationship, and the administrative leadership function was found to have a significant positive correlation but an insignificant relationship. This resulted in accomplishing the second objective by successfully investigating the relationship of complexity leadership functions with entrepreneurial orientation. As this study investigates the relationship of complexity leadership function with one of the organizational constructs, this covers another gap identified (Hazy & Prottas, 2018).

The third objective was to investigate the effect of information system implementation as a moderator. Information system implementation was found to be insignificant between the relationship of generative leadership function, administrative leadership function, and information using leadership function and entrepreneurial orientation, suggesting that information system implementation does not play any significant role in the relationship. However, the role of information system implementation between information gathering leadership function and entrepreneurial orientation has been significant and negative, suggesting that the information system implementation reduces the effect of information gathering leadership function on entrepreneurial orientation.

This study concludes that fine-grain interactions of generative leadership function, information gathering leadership function, and information using leadership function can play an important role in developing the telecommunication organizations' entrepreneurial

orientation. On the other hand, information system implementation does not significantly enhance the relationship of complexity leadership functions with entrepreneurial orientation.

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Appendix - A

Information of Interview Respondents

Management Position	Mode of Interview	Place of Interview	Company
High Level Management	Face to Face	Office	PTCL
High Level Management	Face to Face	Office	PTCL
High Level Management	Face to Face	Office	PTCL
High Level Management	Face to Face	Office	Zong
Middle Level Management	Face to Face	Office	Telenor
Middle Level Management	Face to Face	Office	Telenor
Middle Level Management	Face to Face	Office	Zong
Middle Level Management	Face to Face	Office	Mobilink
Middle Level Management	Face to Face	Office	Ufone

Appendix - B

Interview Guide

Estimated Time (mins)	Activity Before Interview	Purpose of Question	Question: English	Any Further Questions
1	Introducing the interviewer	-	-	-
1	Explaining basic purpose of the interview	-	-	-
3	Introducing the topic	-	-	-
1	Taking final consent for the interview	-	-	-
15	Direct Interview Question	To explore fine-grain interactions in generative leadership function	Which day to day interactions may lead to the outcomes like entrepreneurial process and experimentation?	Probing questions (if any). Ask any other fine-grain interactions that the respondent can think of? Cross-Check Questions.
15	Direct Interview Question	To explore fine-grain interactions in administrative leadership function	Which day to day interactions may lead to the outcomes like role clarity, consistent routines and clear chain of responsibility?	Probing questions (if any). Ask any other fine-grain interactions that the respondent can think of? Cross-Check Questions.

15	Direct Interview Question	To explore fine-grain interactions in community building leadership function	Which day to day interactions may lead to the outcomes like identity orientation, intrinsic motivation, citizenship behaviour, trust and strong shared identity.	Probing questions (if any). Ask any other fine-grain interactions that the respondent can think of? Cross-Check Questions.
15	Direct Interview Question	To explore fine-grain interactions in information gathering leadership function	Which day to day interactions may lead to the outcomes like learning culture and exploration of data?	Probing questions (if any). Ask any other fine-grain interactions that the respondent can think of? Cross-Check Questions.
15	Direct Interview Question	To explore fine-grain interactions in information using leadership function	Which day to day interactions may lead to the outcome of accountability, clear authority over resources and clear responsibility?	Probing questions (if any). Ask any other fine-grain interactions that the respondent can think of? Cross-Check Questions.

Description and Outcomes of Complexity Leadership Functions for Questionnaire Development

Complexity Leadership Function	Description	Outcomes
Generative Leadership Function	The interactions which enable individuals to generate new ideas through experimentation and allows the development of new product/ service/ venture.	Experimentation Entrepreneurial Process New product/service development
Administrative Leadership Function	The interactions which enable individuals to involve themselves directing and guiding each other to accomplish a defined goal	Consistent Routines Role Clarity Clear chain if responsibility Efficiency
Community Building Leadership Function	The interactions which enable the individuals to realize that they are also the part of the same working environment or system	Identity Orientation Intrinsic Motivation Citizenship behavior Strong shared identity Trust
Information Gathering Leadership Function	The interactions which enable the individuals to learn through exchange of information carried out in discussion	Exploration and data collection Listening Learning Culture

Information Using Leadership Function	The interactions which enable the individuals to use the information and allows the	Clear authority over resources Clear responsibility Accountability Culture

Appendix - C

Survey Questionnaire

In this section each statement reflects interaction/practice/event which may occur in your daily life. Please read the statement carefully and "✓" one option (from 1 to 5) to identify occurrence of each interaction in past 60 working days.

Information Gathering Leadership Function						
In our organization:		**1**	**2**	**3**	**4**	**5**
1	Information is gathered by discussing competitor's products/services	☐	☐	☐	☐	☐
2	Information is gathered by discussing customer's feedback	☐	☐	☐	☐	☐
3	Information is gathered by discussing employee's feedback	☐	☐	☐	☐	☐
4	Information is gathered by social media/internet	☐	☐	☐	☐	☐
5	Discussions are carried out to solve the problem	☐	☐	☐	☐	☐
6	Opinions to solve the problems are encouraged	☐	☐	☐	☐	☐
7	Information is passed on to the personnel who may be interested	☐	☐	☐	☐	☐
8	Information is gathered from different conferences/trainings/gatherings	☐	☐	☐	☐	☐
9	Everyone's learning experiences are listened to	☐	☐	☐	☐	☐
10	Assumptions are challenged	☐	☐	☐	☐	☐
Generative Leadership Function						
In our organization:		**1**	**2**	**3**	**4**	**5**
1	The generation of new ideas is encouraged	☐	☐	☐	☐	☐
2	Brainstorming is an essential part of solution development	☐	☐	☐	☐	☐
3	Feedback is analyzed for useful information	☐	☐	☐	☐	☐
4	Different solutions are proposed for new products/services	☐	☐	☐	☐	☐
5	Comparative analysis of different solutions is carried out	☐	☐	☐	☐	☐
6	Customer needs are transformed into new products/services	☐	☐	☐	☐	☐
7	Even smallest need of the customer is given importance	☐	☐	☐	☐	☐
8	Resources and time are provided to try new things	☐	☐	☐	☐	☐
9	New approaches are encouraged	☐	☐	☐	☐	☐
10	Failures are forgiven	☐	☐	☐	☐	☐
11	Learning visits to other organizations are encouraged	☐	☐	☐	☐	☐
Administrative Leadership Function						
In our organization:		**1**	**2**	**3**	**4**	**5**
1	Job descriptions are defined clearly	☐	☐	☐	☐	☐
2	Targets are established for everyone	☐	☐	☐	☐	☐
3	Tasks are assigned to everyone	☐	☐	☐	☐	☐
4	Deadlines to achieve the tasks are assigned	☐	☐	☐	☐	☐
5	Chains of responsibility and accountability are maintained	☐	☐	☐	☐	☐

6	Key performance indicators for everyone are decided	☐	☐	☐	☐	☐
7	Team members are insisted to do their assigned work	☐	☐	☐	☐	☐
8	Distractions are avoided	☐	☐	☐	☐	☐
Information Using Leadership Function						
In our organization:		**1**	**2**	**3**	**4**	**5**
1	Achievement of targets is evaluated	☐	☐	☐	☐	☐
2	Tasks performance is monitored	☐	☐	☐	☐	☐
3	Key performance indicators are evaluated by supervisor	☐	☐	☐	☐	☐
4	Deadlines to achieve the tasks are regularly reinforced	☐	☐	☐	☐	☐
5	Updates on tasks are regularly submitted	☐	☐	☐	☐	☐
6	Updates on goal accomplishments are reviewed	☐	☐	☐	☐	☐
7	Unnecessary effort and failing projects are eliminated	☐	☐	☐	☐	☐
Community Building Leadership Function						
In our organization:		**1**	**2**	**3**	**4**	**5**
1	Environment of mutual trust exists	☐	☐	☐	☐	☐
2	Equal importance as a human being is given to everyone	☐	☐	☐	☐	☐
3	Assistance is provided when addressing problems	☐	☐	☐	☐	☐
4	Everyone feels part of a community	☐	☐	☐	☐	☐
5	Support is provided to learn new skills	☐	☐	☐	☐	☐
6	Individual needs are considered and addressed	☐	☐	☐	☐	☐
7	Everyone is honest with each other	☐	☐	☐	☐	☐
8	Everyone is respected	☐	☐	☐	☐	☐
9	Everyone describe an inspirational future	☐	☐	☐	☐	☐
10	Everyone is treated fairly	☐	☐	☐	☐	☐
Risk Taking						
In our organization:		**1**	**2**	**3**	**4**	**5**
1	The term “risk taker” is considered as a positive trait	☐	☐	☐	☐	☐
2	Employees are encouraged to take calculated risks	☐	☐	☐	☐	☐
3	Emphasis is given to both exploration and experimentation for opportunities.	☐	☐	☐	☐	☐
Innovativeness						
In our organization:		**1**	**2**	**3**	**4**	**5**
1	We actively promote improvements and innovations	☐	☐	☐	☐	☐
2	Our work is creative in its operational methods	☐	☐	☐	☐	☐
3	Our work seeks out new methods to implement things	☐	☐	☐	☐	☐
Proactiveness						
In our organization:		**1**	**2**	**3**	**4**	**5**
1	We always try to take the initiative in every situation (e.g., against competitors, in projects when working with others)	☐	☐	☐	☐	☐
2	We excel at identifying opportunities	☐	☐	☐	☐	☐
3	We initiate actions to which other organizations respond	☐	☐	☐	☐	☐
Competitive Aggressiveness						
In our organization:		**1**	**2**	**3**	**4**	**5**
1	Our work is intensely competitive	☐	☐	☐	☐	☐
2	We try to out-maneuver the competition as best as we can	☐	☐	☐	☐	☐
3	In general, our work takes a bold or aggressive approach when competing	☐	☐	☐	☐	☐
Autonomy						

In our organization:		1	2	3	4	5
1	We are permitted to act and think without interference	☐	☐	☐	☐	☐
2	We can perform jobs that allow us to initiate changes in the way we perform our work tasks	☐	☐	☐	☐	☐
3	We are given freedom and independence to decide on how to go about doing our work	☐	☐	☐	☐	☐
4	We are given freedom to communicate without interference	☐	☐	☐	☐	☐
5	We are given authority and responsibility to act alone if we think it to be in the best interests of the business	☐	☐	☐	☐	☐
6	We have access to all vital information related to the assigned task	☐	☐	☐	☐	☐
Organizational Benefits						
In our organization information system:		**1**	**2**	**3**	**4**	**5**
1	Improves my communication	☐	☐	☐	☐	☐
2	Improves integration of business activity for me	☐	☐	☐	☐	☐
3	Improves my management control	☐	☐	☐	☐	☐
4	Meets my organizational goals	☐	☐	☐	☐	☐
Operational Benefits						
5	Improves my workflow	☐	☐	☐	☐	☐
6	Increases my output	☐	☐	☐	☐	☐
7	Increases my efficiency	☐	☐	☐	☐	☐
8	Increases my reliability	☐	☐	☐	☐	☐
9	Decreases repeatability in work	☐	☐	☐	☐	☐
10	Increases the quality of my work	☐	☐	☐	☐	☐
11	Increases flexibility in my work	☐	☐	☐	☐	☐
Competitive Benefits						
12	Increases sales growth	☐	☐	☐	☐	☐
13	Increases return on investment	☐	☐	☐	☐	☐
14	Increases market share	☐	☐	☐	☐	☐

Appendix - D

Assumptions of Regression

Mahalanobis Test

Case No	Mahalanobis Distance	Chi-Square Value	Case No	Mahalanobis Distance	Chi-Square Value	Case No	Mahalanobis Distance	Chi-Square Value
1	16.17109	0.01286	23	10.46907	0.10624	45	8.86757	0.18116
2	15.76791	0.01506	24	10.34288	0.11094	46	8.79898	0.1852
3	15.19271	0.01881	25	10.30075	0.11255	47	8.77708	0.18651
4	13.4087	0.03699	26	10.26377	0.11397	48	8.72474	0.18966
5	13.1281	0.04105	27	10.19316	0.11675	49	8.61902	0.19616
6	12.27605	0.05609	28	10.14525	0.11867	50	8.59275	0.19781
7	12.14637	0.05878	29	10.10452	0.12032	51	8.58376	0.19838
8	12.06076	0.06063	30	10.09041	0.1209	52	8.56519	0.19955
9	11.77775	0.06711	31	9.96633	0.12608	53	8.5571	0.20006
10	11.73017	0.06827	32	9.95507	0.12656	54	8.5517	0.2004
11	11.65156	0.07021	33	9.81529	0.13265	55	8.52505	0.2021
12	11.56275	0.07247	34	9.54962	0.14495	56	8.496	0.20397
13	11.49119	0.07433	35	9.42626	0.15099	57	8.44321	0.2074
14	11.19283	0.0826	36	9.3576	0.15444	58	8.42537	0.20857
15	10.96066	0.0896	37	9.2256	0.16128	59	8.39019	0.21089
16	10.93291	0.09047	38	9.17292	0.16408	60	8.30565	0.21655
17	10.93024	0.09056	39	9.16865	0.16431	61	8.28739	0.2178
18	10.92432	0.09074	40	9.0845	0.16888	62	8.18056	0.22517
19	10.75881	0.09612	41	9.07369	0.16948	63	8.1509	0.22726

20	10.70595	0.0979	42	9.06326	0.17005	64	8.13802	0.22816
21	10.70404	0.09797	43	8.95513	0.17612	65	8.1361	0.2283
22	10.58284	0.10216	44	8.95272	0.17625	66	8.11585	0.22974
67	8.07394	0.23274	94	7.33843	0.29068	121	6.39745	0.38017
68	8.06369	0.23347	95	7.28977	0.29488	122	6.25924	0.39479
69	8.06073	0.23369	96	7.27771	0.29593	123	6.19172	0.40206
70	8.01107	0.23729	97	7.23434	0.29972	124	6.12582	0.40924
71	7.94076	0.24248	98	7.11331	0.3105	125	6.10701	0.41131
72	7.88225	0.24686	99	7.092	0.31242	126	6.06387	0.41607
73	7.8666	0.24804	100	7.08722	0.31286	127	6.04274	0.41842
74	7.83816	0.2502	101	7.05198	0.31607	128	6.03158	0.41966
75	7.83105	0.25074	102	7.04406	0.31679	129	6.01105	0.42195
76	7.81521	0.25196	103	7.00202	0.32066	130	6.00823	0.42227
77	7.79043	0.25386	104	6.99423	0.32138	131	5.99432	0.42383
78	7.76145	0.25611	105	6.99159	0.32163	132	5.98749	0.42459
79	7.75044	0.25696	106	6.98388	0.32234	133	5.93984	0.42996
80	7.69288	0.26148	107	6.97815	0.32287	134	5.93673	0.43032
81	7.69052	0.26166	108	6.93524	0.32688	135	5.92569	0.43157
82	7.66127	0.26398	109	6.87374	0.33268	136	5.9187	0.43236
83	7.63823	0.26582	110	6.80484	0.33927	137	5.91081	0.43325
84	7.5748	0.27094	111	6.80484	0.33927	138	5.90191	0.43427
85	7.56231	0.27195	112	6.78841	0.34086	139	5.88615	0.43606
86	7.54515	0.27336	113	6.6975	0.34973	140	5.86979	0.43793
87	7.52649	0.27489	114	6.69675	0.3498	141	5.83471	0.44196
88	7.49849	0.27719	115	6.68673	0.35079	142	5.81386	0.44436
89	7.47563	0.27909	116	6.67049	0.3524	143	5.7578	0.45086
90	7.43916	0.28213	117	6.59533	0.3599	144	5.72435	0.45477

91	7.42621	0.28322	118	6.50084	0.36948	145	5.71859	0.45544
92	7.39058	0.28623	119	6.44339	0.37539	146	5.64421	0.4642
93	7.36611	0.28831	120	6.41615	0.37822	147	5.63893	0.46483
148	5.62419	0.46658	175	4.84701	0.56358	202	4.14366	0.65724
149	5.58904	0.47076	176	4.83643	0.56496	203	4.1409	0.65762
150	5.47439	0.48456	177	4.82305	0.5667	204	4.12482	0.65979
151	5.4019	0.49339	178	4.80578	0.56895	205	4.09849	0.66335
152	5.39322	0.49446	179	4.77813	0.57257	206	4.09103	0.66436
153	5.34981	0.49979	180	4.65952	0.58816	207	4.0891	0.66462
154	5.32385	0.503	181	4.61545	0.59399	208	4.08519	0.66515
155	5.24617	0.51265	182	4.61346	0.59425	209	4.07666	0.6663
156	5.2367	0.51383	183	4.60973	0.59475	210	4.05867	0.66874
157	5.22657	0.5151	184	4.58736	0.59771	211	4.0177	0.67428
158	5.21743	0.51624	185	4.57847	0.5989	212	3.99448	0.67742
159	5.2046	0.51785	186	4.56475	0.60072	213	3.98142	0.67919
160	5.17494	0.52158	187	4.56426	0.60078	214	3.97983	0.67941
161	5.16235	0.52317	188	4.50594	0.60855	215	3.94535	0.68407
162	5.15588	0.52398	189	4.49251	0.61034	216	3.93845	0.68501
163	5.14411	0.52547	190	4.4652	0.61399	217	3.86076	0.69551
164	5.12243	0.52821	191	4.45701	0.61508	218	3.83101	0.69953
165	5.12082	0.52841	192	4.4544	0.61543	219	3.81506	0.70169
166	5.08249	0.53328	193	4.40043	0.62266	220	3.65885	0.72273
167	5.05561	0.5367	194	4.38716	0.62444	221	3.65047	0.72386
168	5.0521	0.53715	195	4.38033	0.62535	222	3.64145	0.72506
169	4.98165	0.54617	196	4.32149	0.63326	223	3.63465	0.72598
170	4.95477	0.54963	197	4.30582	0.63537	224	3.63103	0.72646
171	4.94845	0.55044	198	4.26633	0.64068	225	3.58019	0.73327

172	4.92488	0.55348	199	4.23455	0.64497	226	3.57802	0.73356
173	4.90168	0.55648	200	4.23421	0.64502	227	3.56045	0.73591
174	4.864	0.56137	201	4.20457	0.64901	228	3.55012	0.73729
229	3.54072	0.73854	256	2.37415	0.88228	283	1.01902	0.98488
230	3.49972	0.74401	257	2.27237	0.89302	284	0.93474	0.98797
231	3.49972	0.74401	258	2.27159	0.8931	285	0.81854	0.99157
232	3.49894	0.74411	259	2.2675	0.89353	286	0.69983	0.99449
233	3.48453	0.74603	260	2.24919	0.89541	287	0.33061	0.99933
234	3.47034	0.74791	261	2.16848	0.90357	288	0.29844	0.9995
235	3.4457	0.75118	262	2.14016	0.90637			
236	3.43069	0.75317	263	2.08866	0.91137			
237	3.36378	0.762	264	1.98445	0.92112			
238	3.30615	0.76956	265	1.96917	0.92251			
239	3.30015	0.77034	266	1.93639	0.92545			
240	3.24174	0.77795	267	1.91193	0.92762			
241	3.20679	0.78248	268	1.86256	0.93189			
242	3.10025	0.79616	269	1.84408	0.93347			
243	3.03699	0.80419	270	1.83773	0.934			
244	3.03679	0.80421	271	1.7537	0.9409			
245	3.03671	0.80423	272	1.66778	0.94758			
246	2.91349	0.81962	273	1.55149	0.956			
247	2.82397	0.83059	274	1.54583	0.95639			
248	2.66626	0.84942	275	1.54529	0.95643			
249	2.66418	0.84966	276	1.52489	0.95782			
250	2.55653	0.86209	277	1.49919	0.95955			
251	2.5552	0.86224	278	1.35145	0.96875			
252	2.50014	0.86845	279	1.32867	0.97005			

253	2.46545	0.87231	280	1.25826	0.97391
254	2.43373	0.87581	281	1.22239	0.97576
255	2.40332	0.87913	282	1.12883	0.98025

Descriptive Statistics and Normality Tests of the Measurement Items

	Minimum	Maximum	Mean	Std. Deviation	Skewness	Kurtosis
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic
IGF1	2	5	3.82	.596	-.120	.080
IGF2	3	5	4.04	.724	-.058	-1.085
IGF3	3	5	3.92	.733	.131	-1.123
GF7	1	5	3.72	1.002	-.291	-.807
GF8	1	5	3.62	.944	-.244	-.714
GF9	1	5	3.70	.887	-.410	-.353
AF1	1	5	4.02	.660	-.312	.697
AF2	3	5	4.04	.664	-.042	-.719
AF3	3	5	4.21	.677	-.280	-.831
CBF7	3	5	3.75	.687	.363	-.867
CBF8	3	5	4.07	.624	-.046	-.428
CBF10	1	5	3.85	.676	-.077	.153
IUF1	1	5	4.01	.641	-.332	.997
IUF2	1	5	4.07	.623	-.399	1.437
IUF3	1	5	4.03	.646	-.345	.956
RT1	2	5	3.53	.741	.061	-.309
RT2	1	5	3.71	.764	-.254	.047
RT3	2	5	3.65	.727	-.120	-.220
INN1	3	5	3.94	.756	.098	-1.240
INN2	3	5	3.96	.707	.059	-.989
INN3	3	5	4.00	.733	.000	-1.129
CA1	1	5	3.97	.750	-.142	-.447
CA2	1	5	3.95	.709	-.171	-.051
CA3	1	5	3.95	.694	-.182	.115
AM1	1	5	3.76	.720	-.612	.781
AM2	1	5	3.77	.735	-.461	.496
AM3	1	5	3.73	.799	-.372	.013
ISI3	3	5	3.84	.657	.176	-.714
ISI4	3	5	3.85	.615	.099	-.440
ISI5	3	5	3.82	.626	.153	-.550

ISI6	2	5	3.97	.680	-.095	-.450
ISI7	1	5	3.96	.712	-.465	.686
ISI8	1	5	3.95	.709	-.407	.562
ISI9	1	5	3.72	.903	-.385	-.056
ISI10	1	5	4.02	.749	-.730	1.301
ISI11	1	5	3.93	.707	-.670	1.592
ISI12	1	5	3.93	.774	-.477	.504
ISI13	1	5	3.95	.750	-.420	.278
ISI14	1	5	3.87	.752	-.329	.157

Common Method Bias

Total Variance Explained

	Initial Eigenvalues			Extraction Sums of Squared Loadings		
Factor	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	8.257	20.138	20.138	7.496	18.282	18.282
2	3.644	8.887	29.025			
3	2.177	5.309	34.334			
4	2.161	5.270	39.604			
5	2.002	4.884	44.488			
6	1.837	4.482	48.970			
7	1.437	3.504	52.474			
8	1.337	3.260	55.734			
9	1.219	2.973	58.707			
10	1.143	2.789	61.496			
11	1.103	2.690	64.186			
12	1.073	2.616	66.802			
13	.927	2.262	69.063			
14	.799	1.949	71.013			
15	.757	1.847	72.860			
16	.726	1.772	74.631			
17	.713	1.738	76.369			
18	.689	1.680	78.050			
19	.617	1.506	79.556			
20	.599	1.460	81.016			
21	.567	1.382	82.398			
22	.537	1.309	83.707			

23	.515	1.256	84.963
24	.506	1.234	86.197
25	.477	1.163	87.359
26	.447	1.091	88.450
27	.414	1.009	89.459
28	.404	.985	90.444
29	.385	.938	91.382
30	.376	.916	92.299
31	.363	.886	93.185
32	.354	.863	94.048
33	.331	.807	94.855
34	.321	.782	95.637
35	.311	.759	96.397
36	.290	.707	97.103
37	.276	.673	97.776
38	.256	.625	98.401
39	.242	.589	98.990
40	.225	.548	99.538
41	.189	.462	100.000

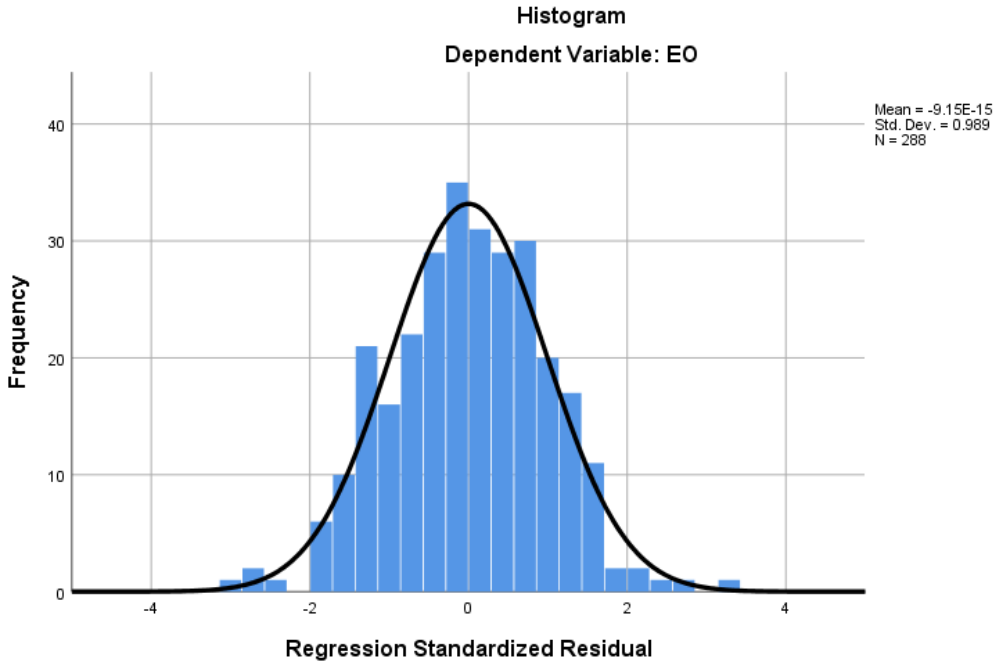
Variance Inflation Factor Test of Multicollinearity

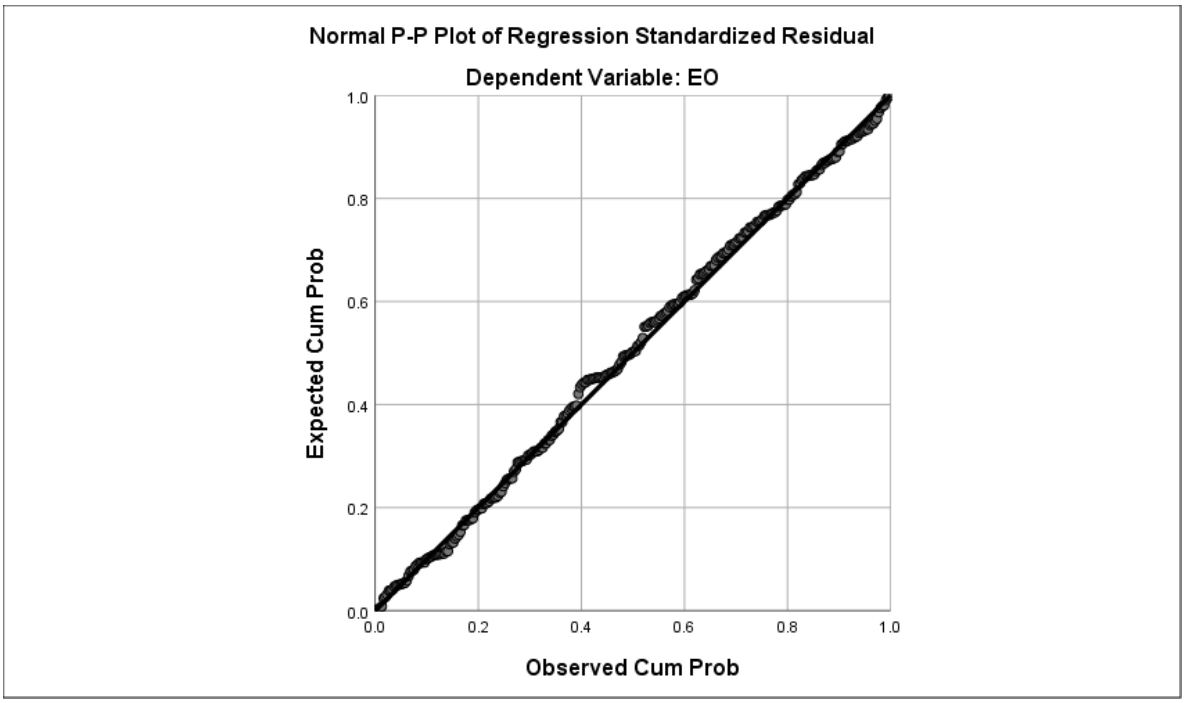
		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
Model		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	1.152	.324		3.561	.000		
	GF	.180	.030	.306	6.022	.000	.898	1.114
	IGF	.097	.041	.115	2.346	.020	.958	1.044
	AF	.022	.043	.026	.515	.607	.934	1.070
	CBF	-.019	.042	-.022	-.447	.655	.992	1.008
	IUF	.175	.045	.193	3.874	.000	.938	1.066
	ISI	.231	.039	.304	5.988	.000	.899	1.112

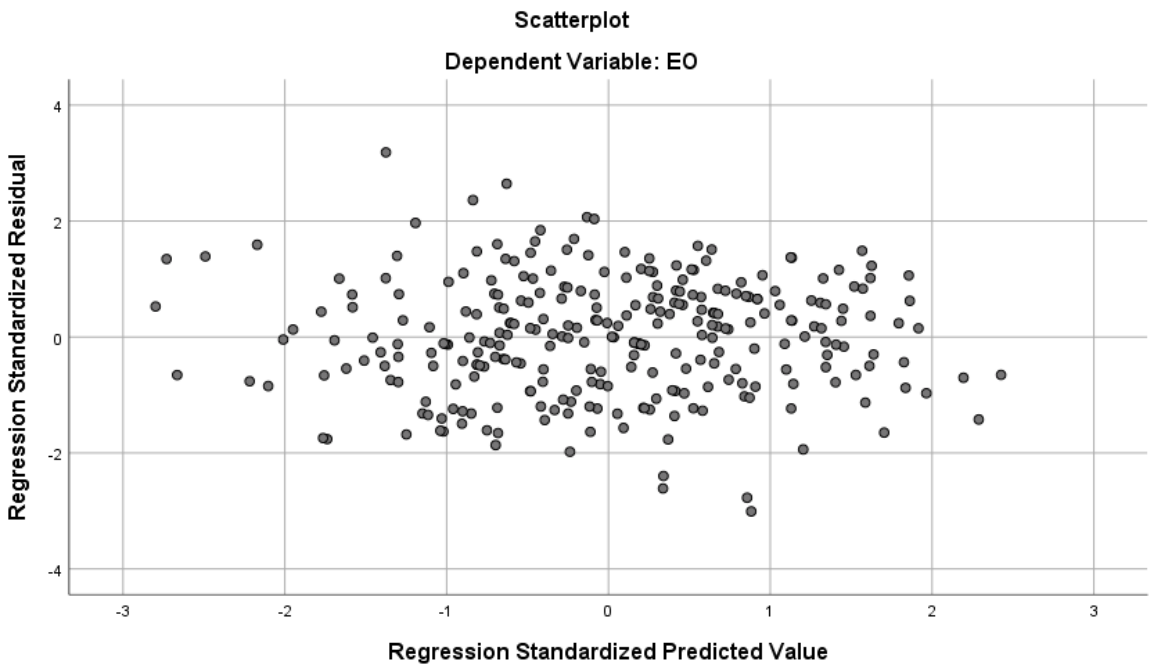
a. Dependent Variable: EO

GF = Generative Leadership Function, IGF = Information Gathering Leadership Function, AF = Administrative Leadership Function, CBF = Community Building Leadership Function, IUF = Information Using Leadership Function, ISI = Information System Implementation, EO = Entrepreneurial Orientation

Linearity and Homoscedasticity of Data







ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3.613	1	3.613	1.788	.182[b]
	Residual	577.908	286	2.021		
	Total	581.522	287			

a. Dependent Variable: g

b. Predictors: (Constant), Unstandardized Predicted Value