Enhancing Innovation Capabilities in Kazakhstan's Emerging Tech Startups: A Roadmap for Success Based on Critical Factors

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NAZARBAYEV UNIVERSITY

School of Engineering and Digital Sciences

In partnership with

Graduate School of Business

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Declaration

We, Aset Zhumatai, Ali Temirgali, Anastassiya Kim and Diana Kairula, declare that the research contained in this thesis, unless otherwise formally indicated within the text, is the author's original work. The thesis has not been previously submitted to this or any other university for a degree and does not incorporate any material already submitted for a degree.

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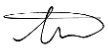
Ali Temirgali Signature: 

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Abstract

The following study investigates the innovative capability of technology startups in Kazakhstan, identifying critical success factors within an evolving digital economy. The main objectives of the research are to identify critical success factors affecting the innovative capability of startups, create a framework to measure the IC of startups, identify the implications of revealed factors on the Kazakhstani scale, and develop recommendations for the startups' owners and policymakers. The research focused on the application of multifaceted approaches with a combination of quantitative and qualitative methodologies. Central to the primary data collection was the utilization of the Delphi method, leading to a novel perspective on how diverse internal factors, including leadership type, cooperation, employee satisfaction, emotional intelligence, and diversity, contribute to startups' innovation. The data analysis was developed using the Pearson correlation method with the Python programming language application. Findings suggest a positive correlation between transformational leadership style, employee job satisfaction level, emotional intelligence, involvement in multiple cooperation types, gender diversity, and startups' innovative capabilities. These insights are vital for stakeholders seeking to foster a sturdy startup ecosystem in Kazakhstan and similar developing economies.

Keywords: Innovative Capability, Startups, Emotional Intelligence, Leadership style, Employee Satisfaction, Cooperation, Diversity, Delphi method

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Contents

List of Tables

List of Figures

Chapter 1. Introduction

1.1. Background information on startup ecosystem in Kazakhstan

Kazakhstan was historically reliant on its vast natural resources. Revenue from the oil and gas sector, and mineral exports has traditionally accounted for a significant portion of the country's GDP. As a result, any geopolitical events that cause fluctuations in global commodity prices have had a direct impact on Kazakhstan's economic performance, making it vulnerable to external market forces. In the surge of technology advancements and digitalization, Kazakhstan is seeking a significant transformation to diversify its economy. Also, it is going to be a strategy for the country to shift from upper middle-income countries to high income countries (World Bank, n.d.). In his message in 2023 to the Kazakhstani nation, president Kassym-Jomart Tokayev emphasized that the country should be transformed into digitalization and become IT-centric (Akorda.kz, 2023). One of the drivers of the high-technology sector is the startup ecosystem. In the rapidly evolving landscape of global technology, startups have emerged as pivotal engines of economic growth, innovation, and technological advancement (Ojaghi, Mohammadi & Yazdani, 2019).

The government put a great emphasis on developing the startup ecosystem by investing in innovation clusters, technology parks and business incubators. In the last decade, innovation clusters such as Astanahub, Nazarbayev University Innovation Cluster (NURIS) organized acceleration and incubator programs for startups and connected young entrepreneurs with investors, angel investors and venture capitalists (Khussainova et al., 2020).

The initiatives are bringing results and according to Startupblink's Global Startup Ecosystem report, Kazakhstan is the leader among Central Asia countries (Startupblink, 2023). In addition, recent research by RISE research, Global Ventures, EA Group, the Kazakhstan Ministry of Digital Development, Innovation and Aerospace Industry, KPMG and Crunchbase revealed that venture capital volume in Kazakhstan increased exponentially in the last five years and the Country is leader in Central Asia and Caucasus region in terms of venture capital ecosystem (Zhanturina et al., 2024). However, it is still ranked to be 73rd worldwide which indicates that there is room for improvement (Startupblink, 2023).

There are several startups in Kazakhstan which are successfully operating and transforming the economy and other sectors in the country. Sergek group implements Artificial Intelligence (AI) and smart city solutions to control the traffic and increase road safety. It

helped to reduce the crime occurrences by 50% and reduced the mortality from road accidents by 40% (Sergek Group, n.d). Med-tech startup Cerebra helps to prevent neurologic deficit and brain cell death by implementing AI and Computer Vision (CV) technologies to detect the brain stroke within 10 minutes (Cerebra, n.d). Some platform-based ecommerce marketplaces were created by startups such as Ticketon, Chocofamily, Kolesa, Arbuz, and etc (Zhanturina et al., 2024).

1.2. Statement of the problem

Although there are a higher number of startups in recent years, there are still some challenges that inhibit the development of the startup ecosystem. Apart from finance, there is a lack in the entrepreneurial thinking of startup founders, they are focused on the local market not global. They need to acquire and train entrepreneurial spirit. The next is the lack of knowledge on how to develop the project, and to apply innovative strategies instead of copying existing business models when the idea does not work. Moreover, the lack of connection between the educational sector and the startup ecosystem. There is insufficient level of cooperation between them for the exchange of experience and knowledge. Also, lack of qualified personnel to develop startup skills and develop local entrepreneurial ecosystems within universities (Future Laboratories, 2022).

After developing the startup ecosystem, the survival of emerging startups is another challenge. Because about 80% of startups fail in their first years. Innovation is considered to be one of the critical factors that lead to startup survival and overall success (Aminova & Marchi, 2021; Dessyana & Riyanti, 2017). Despite a large amount of studies regarding positive correlation of innovation and startup success, there is still lack of agreement on how to measure innovation performance of organizations and common framework to improve Innovative Capabilities (IC) of startups (Audretsch et al., 2020; Birchall et al., 2011). This problem becomes even more relevant when it comes to Kazakhstani startups, as success factors can be different than other countries due to size of economy, cultural and political specificities.

Another problem which is relevant in the local context is the lack of research on success factors of IC of companies (Seitzhanov et al., 2020). But startups operate differently compared to other big companies, and from our findings, there is no research done on identifying critical success factors and measuring IC in startups. Currently research about startups is focused on developing the startup ecosystem and development of an innovative

economy in Kazakhstan. They use startups as a tool or factor that improves the innovation of the economy, or as a driver of innovation in the economy. Most studies assess the implications of latest government attempts to support the development of the startup ecosystem such as activities of technoparks, accelerator and incubator programs (Magrupova et al., 2021; Khusainova et al., 2020; Seitzhanov et al., 2020; Zakiyeva, 2020). In this regard, this study will be a new research area for the local community.

1.3. Objectives of the study

The primary objectives of the current research are to:

- Create a framework to measure the IC level of startups as a combination of Product, Process and Business Model Innovation
- Identify five critical success factors that shape IC of startups from academic papers and case studies
- Assess the relevance of identified factors on Kazakhstani startups based on interview and self-assessment test results
- Identify the most relevant critical factors of IC for Kazakhstani context
- Give recommendations for startups and policy makers on how to leverage IC of startups based on findings

1.4. Significance of the study

This study could be potentially important for various stakeholders in Kazakhstan's technology sector and other areas. For policymakers, it provides research-based information to create policies that improve startup innovation and development. They could highlight the most important factors that should be targeted and be focused on improving them. Entrepreneurs and startup founders can use the findings to identify critical success factors and formulate it for strategic planning. The study results and insights will be supported by a recommended roadmap, and startups can follow them to enhance their IC. Also, innovation clusters such as NURIS and Astana hub can use the results of current study to conduct workshops and training programs for startups. Finally, the research adds to the scholarly conversation about technology startups in Kazakhstan and overall in middle-income economies, setting the stage for upcoming studies in this field.

1.5. Scope of the study

The scope of this project is defined by its geographical focus, the industry sectors and the specific aspects of startup performance and innovation it analyzes. At the beginning, it should be mentioned that the study aims to analyze and explore only startups, not established companies and not small and medium enterprises (SMEs). Geographically, the study is focused on Kazakhstan. The sectors considered include, but are not limited to, fintech, MedTech, edtech, Internet of Things (IoT) technology and other IT service startups. Last but not least, the study aims to explore critical factors that shape IC of startups and assess their performance in terms of success in innovation, rather than success in financial and market share performances.

Chapter 2. Literature Review

2.1. Innovative capability

Despite the general agreement that innovation is crucial to a firm's competitiveness, the reason why some of them innovate while others do not is still up for debate. The concept of IC, which is defined as the ability or potential of a firm to create innovations (Saunila, 2020), might be a possible answer to this.

Many studies support the belief that businesses must have the necessary skills to be innovative (Farida & Setiawan, 2022; Lounsbury et al., 2019; Rosenbusch et al., 2011). Researchers confirm that specific capabilities are crucial to differentiate companies from competitors in their competitive landscape. These capabilities, or combinations of them, allow firms to promote innovation either in products, processes, or business models.

While the concept of IC continues to be the subject of intense research interest, there are still large knowledge gaps, especially regarding startups or new businesses. The main reason for that is because the majority of previous research has focused on larger, more established companies and SMEs (Akhtar, 2023; Daronco et al., 2023; Saunila, 2016; Si et al., 2018).

Even current frameworks on startup innovation examine the factors from the viewpoint of a well-established startup ecosystem. For example, in Spender et al.'s (2016) study, the authors highlight the significance of intermediaries, specifically boundary spanners, in influencing the network processes of startups. Additionally, they claim that a network of venture capital has a positive impact on the innovation performance of startups. However, in countries with an underdeveloped startup ecosystem, such factors are not applicable due to the absence of established venture firms, intermediaries, and similar entities. Hence, it is essential to create a conceptual and theoretical framework to examine the IC of startup companies in countries with emerging economies and growing startup ecosystems.

In the current study, a comprehensive literature review was conducted to explore definitions of IC, theoretical models, and structures of frameworks that are used in different contexts. It was then adapted to startup companies by considering their uniqueness and differences from established firms, as well as the specifics of their operating economies. So, it ensures both the theoretical relevance and practicality of the framework for the companies themselves and the policymakers that need to assess the innovativeness of startups.

2.2. Analysis of existing frameworks

When it comes to understanding and evaluating IC in companies, the literature continuously stresses the importance of three components: input, process, and output. Each of these components brings different kinds of discussions and debates to the research. For example, experts argue about the essential factors affecting the IC of organizations, the nature of their interconnectivity, and the measurement of intangible inputs (Tikas, 2023). Moreover, there might be some challenges that are related to measuring impact of innovation processes, such as innovation development, knowledge management, etc. (Daronco et al., 2023). Therefore, extensive research on the topic of IC was reviewed to address such issues and explore the various approaches employed in studying these framework components.

For instance, in the seminal work by Crossan & Apaydin (2010), a multi-dimensional framework of organizational innovation was developed. The authors of the study constructed a theoretical model based on the aforementioned components: inputs, the innovation process, and its outcomes. They classify determinants of innovation into leadership, organizational, and process-level inputs. Each input was supported by established theory: leadership by the upper echelon theory, organizational inputs by the theory of dynamic capabilities, and process level by process theory, respectively.

In another pioneering study by Dervitsiotis (2010), the main aim was to investigate a concept of firms' innovation excellence. The resulting framework also had a configuration of input, process, and output triad. More specifically, inputs there included organizational culture, leadership style, resources, employee and supplier participation, customer feedback, and innovation strategy.

According to Saunila & Ukko (2012), the measurement of IC and its connection to performance measures should also follow a similar structure by analyzing the success factors of IC and connecting them to innovation outputs. Therefore, the authors highlight the need for incorporating some other metrics related to business performance, which are customer retention, customer satisfaction, market share, employee satisfaction, employee retention, and employee skills.

Each element in such a framework configuration influences a firm's capability for effective innovation in a unique but connected way:

- First, the input component includes the fundamental factors that drive innovation. Literature frequently describes inputs based on the availability of resources (financial, human, technology, etc.), contextual factors (startup age, company size, industry type, etc.), and other determinants.

- Second, innovation processes are the systems and activities that help organizations achieve their innovation potential. Examples include idea generation, innovation development and management, value creation, and capture processes.

- Last, the outcomes of innovation activities include product, process, or business model innovations. Outputs may also vary by magnitude of innovation (radical or incremental), level of disruption, and difficulty of implementation.

Since the main objective of this research is to study critical success factors (CSFs) for Kazakhstani IT startups, the focus will be on inputs and their impact on innovation outcomes. However, it should be noted that, in contrast to large companies and SMEs, start-ups in the initial stage do not have a wide range of resources available. They also have a limited R&D budget because of their reliance on personal savings or small initial investments. Furthermore, startups do not hire skilled and experienced professionals; they rather operate with a lean team. Considering all of this, the impact of some resource types, such as financial or human capital, will be neglected in the current study. In addition to that, the scope of the study includes the analysis of startup companies of the same size (small startups with 10-15 employees on average) operating in one industry (the IT sector). Thus, this paper will neglect resources and contextual factors and mainly discuss the influence of so-called determinants, or CSFs, on the IC of Kazakhstani IT startups.

In general, there is a relatively large body of literature that particularly focuses on the identification of factors that influence organizations' IC. For instance, in the study by Ponta et al. (2022), which used a large-scale data analysis machine learning technique, determinants were thoroughly studied and grouped into three main categories: external, internal, and time-related determinants. The external factors are market conditions, competition, and regulatory environments, whereas the internal factors are organizational culture, leadership styles, and human resource management practices. Time-related parameters are historical events, economic or technological changes that influence the organization's IC over time.

Furthermore, a systematic review of the literature on innovation intermediaries was conducted in the research by Feser (2023). This framework identifies internal and contextual factors as the two main categories of intermediaries that are associated with innovative outcomes and their impact on business performance. Contextual factors include general firm characteristics like financial metrics, ownership structure, number of employees, and year of entry. The internal factors are leadership qualities and knowledge management practices.

In addition to that, most of the research papers explore the impact of diversity as critical to gaining organizational IC. For example, one study points out that cultural diversity in manufacturing firms has a mediating effect on the relationship between IC and performance outputs (Ahmad et al., 2019). It was also identified that gender diversity in SMEs positively affects knowledge combination capability and innovation performance (Maria Ruiz-Jimenez et al., 2016).

The availability of excess or slack resources, as well as the decentralized and deformalized structure of organizations, were also considered to be main factors that affect IC (Liu et al., 2018; Le et al., 2020). Concerning the leadership styles in organizations, numerous studies confirm that they have a great role in IC and firm performance (Ding et al., 2019; Pasaribu et al., 2021; Singh et al., 2022). Scholars also emphasize cooperation as an external determinant of IC, which includes a company's interactions with other businesses, suppliers, customers, or academic institutions (Purwanto et al., 2021).

Table 1 below demonstrates the most common factors mentioned in the reviewed literature. These factors represent recurring inputs that were frequently mentioned across the existing frameworks during the review process.

Table 1. Common determinants from the existing frameworks

Determinants		Author(s)
Leadership	Transformational Transactional Passive-avoidant	Saunila, 2017; Ding et al., 2019; Pasaribu et al., 2021; Singh et al., 2022;
Organizational culture	Trust Communication Working environment Atmosphere Employee retention Employee satisfaction	Saunila & Ukko, 2012; Muchtar & Qamaria, 2014; Saunila, 2017; Liu et al., 2018; Lounsbury et al., 2019; Le et al., 2020; Singh et al., 2022; Feser, 2023;
Resources	Financial assets Human capital Slack resources	An et al., 2018; Liu et al., 2018; Tikas, 2023; Zhang & Jedin, 2023
Diversity	Age Gender Culture Ethnicity Educational background	Maria Ruiz-Jiménez et al., 2016; Wang & Dass, 2017; Ahmad et al., 2019; N. Wang et al., 2023; X.
Cooperation	Suppliers Customers Competitors Universities and research institutes Government	Podrug et al., 2017; Alshanty & Emeagwali, 2019; Lafuente et al., 2019; Yasmeen et al., 2019; Paoloni et al., 2020; Purwanto et al., 2021; Feser, 2023;
Technology	Technology assimilation Use of latest technology Digital capability Digital transformation	Su et al., 2018; Khin & Ho, 2019; Rhee & Stephens, 2020; Xing et al., 2023

Apart from that, the Delphi approach was implemented to identify input factors that are relevant in the context of Kazakhstani emerging technology startups. Consequently, the current study retained several inputs, including leadership, diversity, cooperation, and employee satisfaction. Also, an additional factor of CEOs' emotional intelligence (EI) was found to be highly important in startup companies. Taking all of these into account, the framework for IC in startups was developed as shown in Figure 1.

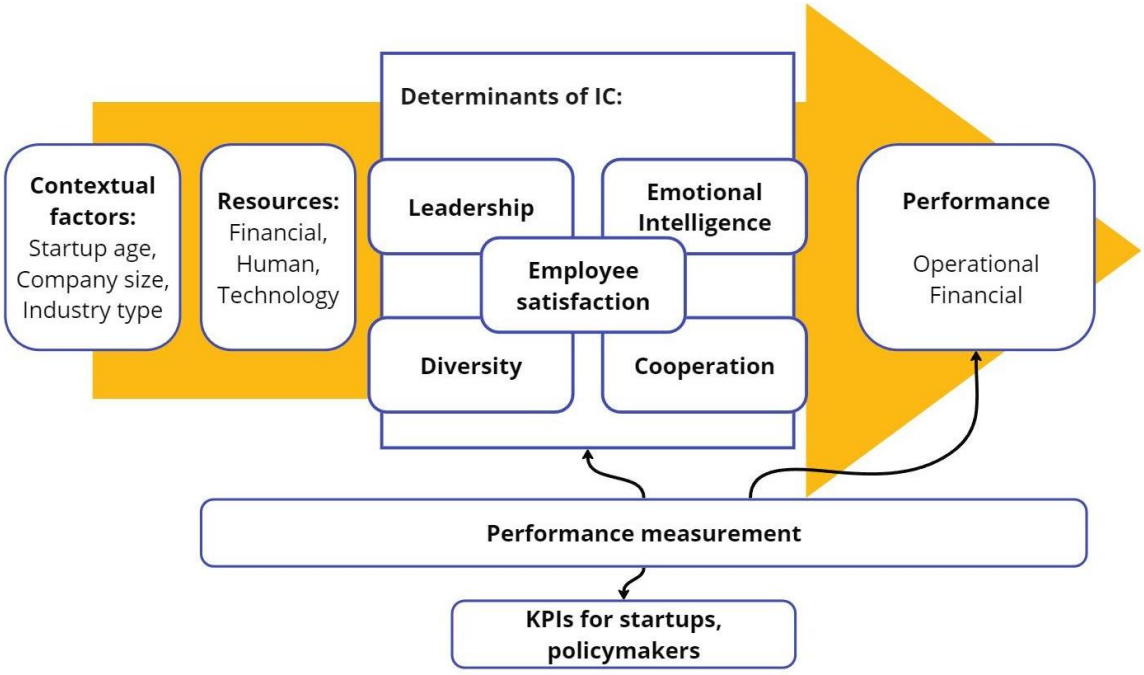

Figure 1. Framework for IC assessment in emerging technology startups

2.3. Leadership

Leadership is one of the crucial factors that directly impacts innovative activity in most businesses. According to the resource-based view developed by Barney (1991), unique resources and skills guarantee a sustainable competitive advantage for organizations. Indeed, people are the most valuable resources that companies have. They are the ones who contribute to the creation and realization of innovations. Most importantly, the company's innovation is greatly influenced by its leaders. Therefore, as Eddleston et al. (2008) stated, effective leadership is one of the organization's key strategic resources.

A lot of studies have highlighted a strong relationship between leadership styles, innovation, and organizational performance (Sethibe & Steyn, 2015). They state that commitment and employee involvement are directly impacted by leadership, which consequently affects the success of innovative projects. Researchers also claim that the failure of innovation

initiatives often arises from ineffective leadership skills, such as a lack of vision, poor communication, and insufficient motivation for imaginative thinking.

To evaluate the effect of leadership on an organization's innovation, researchers apply theories or models mostly based on two key styles of leadership behavior: transactional and transformational leadership. One such model is the full range of leadership model (FRLM), which was defined by Bass & Avolio (1994) by building on Burns's (1978) model. More specifically, they introduced a laissez-faire style, which is the lowest type of leadership, when employees are given the freedom to make all decisions themselves. Afterwards, authors expanded transactional leadership in terms of three components: passive management by exception, active management by exception, and contingent reward. According to them, the transformational style should consider more detailed parameters such as individual consideration (InC), intellectual stimulation (IS), inspirational motivation (IM), and idealized influence (II). The complete FLRM model is presented in Figure 2.

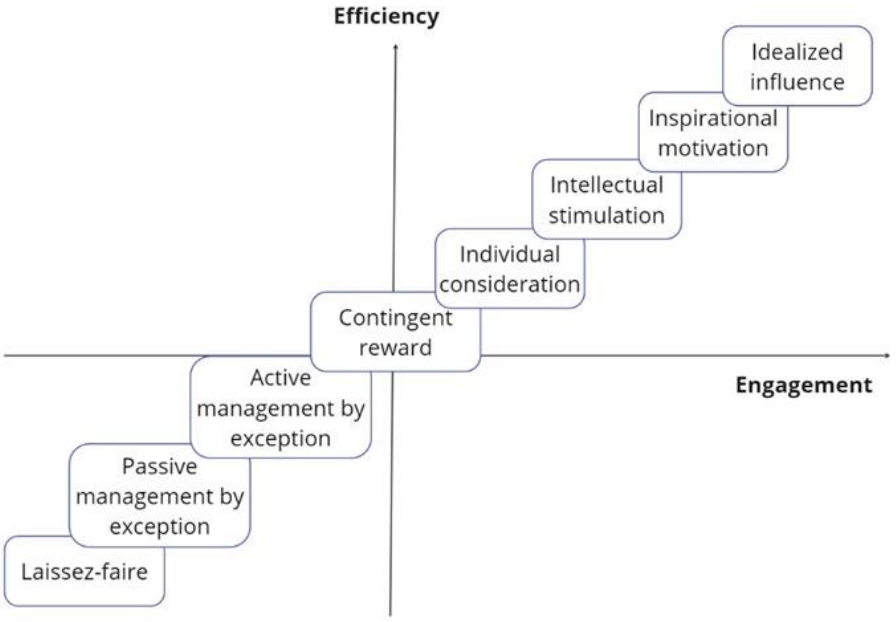

Figure 2. FRLM model reproduced from Bass & Avolio (1994)

Transformational leadership

The existing literature highlights the significance of transformational leadership style in creating an environment that is favorable to innovation, in which leaders encourage and inspire employees to think imaginatively and take measured risks. For instance, the results of a study by Muchtar & Qamaria (2014) indicate that transformational leadership had a direct positive impact on innovation with a meditative effect on organizational culture in

43.3% of cases. Furthermore, data from 150 leaders of Malaysian companies was analyzed in the research work by Samad (2012). As a result, it was concluded that transformational leadership style, and specifically the charismatic aspect of it, is one of the most important factors in achieving product or service innovation, and enhancing overall organizational performance. Moreover, different leadership styles and their contribution to the innovation atmosphere were explored by Xie et al. (2018). Researchers pointed out that transformational leadership builds trust and strengthens individual identification of employees, which consequently plays a significant role in creating an innovative atmosphere in enterprises.

Hypothesis 1a: There is a positive correlation between transformational leadership and IC of the startup.

Transactional leadership

The academic literature on leadership styles has revealed the importance of transactional leadership and the role of rewards in promoting innovation in organizations. One study by Faraz et al. (2018) examined the effect of transactional leadership by collecting data from 260 middle managers of Pakistani companies. And it was revealed that a transactional leadership style has a positive relationship with the innovative behavior of employees. Moreover, the mediating effect of intrinsic motivation was investigated during the study. Other scholars also agree that transactional leadership as well as transformational leadership helps to promote employees' motivation to innovate (Syah Putra et al., 2021). According to these researchers, innovative activities are typically enhanced by motivators, which include both intrinsic and extrinsic motivation types.

Hypothesis 1b: There is a positive correlation between transactional leadership and IC of the startup.

Passive-avoidant leadership

Many previous studies have confirmed that passive-avoidant is an ineffective type of leadership. According to Xie et al. (2018), a passive-avoidant leader is a manager who stays away from making decisions, ignores organizational issues that already exist, and gives employees full authority. That is why this type of leadership is determined to be the least effective and successful. Consequently, the passive-avoidant approach was revealed to have detrimental effects on the innovational environment inside the organizations. In the study by Ryan & Tipu (2013), the Multifactor Leadership Questionnaire (MLQ) was used to investigate the relationship between leadership behaviors and innovation propensity in

Pakistan. The study's findings showed that there is a two-factor structure consisting of active and passive-avoidant leadership types. The study reports that active leaders motivate team members toward a common goal, foster innovation and creativity, and support members. On the contrary, the authors claimed passive-avoidant leaders offer team members very little direction or assistance, hence it negatively affects innovative propensity. At the same time, they assert that self-motivated followers may still be capable of being innovative as long as they are acting as their own supervisor. So, passive-avoidant leadership style may not uniformly affect all aspects of a startup's operations or innovation processes. It may have little impact on IC because team members may react differently to lack of guidance and support.

Hypothesis 1c: There is a weak correlation between passive-avoidant leadership and IC of the startup, which can be either positive or negative.

As previously mentioned, MLQ is a widely recognized tool for evaluating leadership behavior. It is based on the model developed by Bass & Avolio (1994). The test's applicability was validated in many different applications by Antonakis et al. (2003). Additionally, its reliability as a tool for organizational practice and research studies was assessed by Bajcar & Babiak (2022). Moreover, research showed that this test is applicable to diverse cultural contexts, including emerging economies (Leong & Fischer, 2010). Also, in that study, the universality of transformational leadership was tested using a mixed-effects meta-analysis of 40 articles that used MLQ based on 54 independent samples from 18 nations, including countries with emerging economies.

It is important to note that there is lots of literature indicating that the MLQ assessment test is suitable for spreading out to startup leaders. For instance, the influence of founder-CEOs on startup performance was explored using a sample of 102 startups, including feedback from a total of 372 employees (Zaech & Baldegger, 2017). The results of the work agreed with the research that utilized MLQ on established businesses and large organizations. The authors also investigated that transformational leadership was considered to have a significant and positive effect on startup performance, while there were no direct relations found in transactional or laissez-faire leadership.

MLQ was utilized in the current study to determine the leadership styles of startup founders/CEOs and consequently analyze the correlation between various ways of leading startup companies and their IC.

2.4. Employee job satisfaction

What is employee satisfaction?

Job satisfaction is one of the most studied job attitudes among workplace psychological constructs (Judge et al., 2021; Belias & Koustelios, 2014). According to Locke (1969), job satisfaction is viewed as a positive emotional state resulting from the appraisal of one's job experiences, where an individual's job contributes to or facilitates the achievement of their job values. This definition emphasizes the emotional aspect of how an individual feels about their job overall. Spector (1997) expands on this by suggesting that job satisfaction can be seen as a collection of attitudes about various facets or components of one's job, or as a general feeling towards one's work. Mustaqim and Sary (2022) claim that for the startups in their initial stage, founders' experience is the most influential factor. However, for the long term growth strategic human resource management is important.

How is employee satisfaction measured?

Judge et al. (2021) discussed two approaches that can be used in measuring employee job satisfaction level: global and multi-faceted measures. If the people asked just overall satisfaction degree with all the aspects of jobs it is considered to be global measures. On the other hand, multi-faceted measures target different aspects of a job. Authors suggest using multi-faceted measures as it is more reliable and can be used to assess the structural validity and dimensionality.

According to Judge et al. (2021) the research studies about job satisfaction start its roots from the beginning of the last century. Job dissatisfaction during the Great Depression has been a subject for researchers to understand the causes, and emotions were considered as the primary factor of job dissatisfaction. Years later, in 1959, Herzberg's two-factor theory by Herzberg, Mausner and Snyderman was published. Motivated by Maslow's hierarchy of needs, Herzberg identified that satisfaction and dissatisfaction with a job are impacted by two sets of factors called motivation and hygiene. Motivation factors determine job satisfaction as "the need of the people for self-growth and self-actualization". It includes advancement, work itself, possibility of growth, responsibility, recognition, achievement. On the other hand, hygiene factors which are defined as "the need to avoid unpleasantness" are less important for job satisfaction. Interpersonal relationships, salary, policies and administration, supervision and working conditions are examples of hygiene factors.

Although Herzberg's theory has become one of the most used in job satisfaction research (Alshmemri et al., 2017), it also underscores the complexity of measuring job satisfaction.

The Job Characteristics Model developed in 1974 by Hackman and Oldham suggests that job satisfaction is influenced by five key factors: autonomy, feedback, skill variety, task identity, and task significance. Autonomy is defined as a level of freedom and independence, which gives an individual a sense of control and ownership. Feedback helps people to improve the effectiveness of their performance and enables continuous improvement. Skill variety is the degree of engagement in various activities and prevents monotonous and repetitive tasks. Task identity offers employees the opportunity to complete whole work from the beginning to the end, enhancing their sense of accomplishment and contribution. Lastly, task significance emphasizes the importance of the job's impact on the lives or work of others (Ali et al., 2014).

How does employee satisfaction relate to innovation?

Recent studies show strong correlation between job satisfaction and innovative performance (Choi et al., 2020; Abu-Shanab & Subaih, 2019; Mustaqim & Sary, 2022; Park & Rahmani, 2021). Studies identify the factors affecting job satisfaction and its further implication on innovative performance. Some papers analyze a single factor and its implications for employee satisfaction and innovation level. For instance, Uslu (2015) studied how employee ownership affects job satisfaction. Ownership was defined as appreciation by the management, autonomy, and authority. Empowered employees feel emotional commitment to the organization and greater satisfaction. According to Uslu, satisfaction enables people to create new ideas and new methods. These findings were supported by the correlation analysis during the study. Mustaqim and Sary (2022) in another paper researched the relationship between career development and job satisfaction and found strong positive effects.

On the other side, another group of studies did correlation analysis between multi-faceted job satisfaction indexes and innovation performance. Park and Rahmani (2021) constructed a rating for job satisfaction from five components which are culture, work-life balance, senior management, career and compensation. Choi et al. (2020) found that the employment quality is positively correlated with innovation performance. With colleagues, they identified employment quality as a combined index derived from wage level, employment stability, education and training, working hours, social security and benefits and work-life balance factors. Similar studies where combinations of factors were correlated to innovation were

conducted by Abu-Shanab and Subaih in 2019. Despite the variations in factors identified across different studies, there are common workplace environment aspects that reflect employee satisfaction.

Employee satisfaction with career growth within the organization, education and overall growth opportunities offered by the organization significantly increases the innovation performance in terms of the quantity (Park & Rahmani, 2021). Career development is about structuring the career progress of workers. Companies can fulfill career development needs of employees by promoting and filling key management positions internally (Abu-Shanab & Subaih, 2019).

Hypothesis 2a: Employee satisfaction with career development and growth opportunities are positively correlated with IC.

Most popular definitions of corporate culture is formulated by Schein in 2004 as "the pattern of basic assumptions that a group has invented, or discovered in learning to cope with its problems of external adaptation and internal integration, and that have worked well enough to be considered valid and, therefore, to be taught to new members as the correct way to perceive, think, and feel in relation to those problems" and Claver in 2001 who stated "organizational culture is a set of values, symbols and rituals, shared by the members of a specific firm, which describes the way things are done in an organization in order to solve both internal management problems and those related to customers, suppliers and environment" (Belias & Koustelios, 2014). Authors claim that corporate culture is one of the key elements identifying an employee's motivation and that the perception of employees should be aligned with organizational values for better satisfaction. Park and Rahmani (2021) found a weak correlation between employee satisfaction with corporate values and innovation performance.

Hypothesis 2b: Employee satisfaction with corporate culture of startups is positively correlated with IC.

The term 'compensations' refers to employee's salaries and bonuses. This factor is significant for the employee's satisfaction. However, its effect on innovation is controversial. While Chang et al. (2015) argues that non-executive employee stock options encourage innovation by increasing employees' incentives to take risks, Park and Rahmani (2021) found that excessive compensation significantly reduces the innovation performance. They explain such a result with the fact that extrinsic motivation can deteriorate employee creativity. Authors found a similar pattern with work-life balance, where employee satisfaction with

work-life balance reduces innovation. They assume that one of the possible reasons is that work-life balance programs distract employees to spend more time at work and engage in innovation activities.

Work-life balance (WLB) is often defined as the ability to manage time and energy between working time and personal life (Wibowo, 2024). Multiple studies have concluded that work life balance positively impacts innovation performance (Wibowo, 2024; Ko et al., 2020; James, 2011). Ko et al. (2020) found that WLB increases the R&D performance. They explain it with the loyalty of employees to the management when perceiving WLB benefits, and consequently, likeness of making suggestions for improvement. James (2011) studied the effect of preferred WLB arrangements and their positive effects on innovation. However, Park and Rahmani (2021) concluded that companies should not over-invest in WLB programs as it will reduce the innovation performance. But they mentioned that it is not the case for the organizations with high R&D investments.

Hypothesis 2c: Employee satisfaction with compensation amount on work done is positively correlated with IC.

2.5. Emotional intelligence

Nowadays the topic of human intelligence is one of the most frequently investigated and analyzed in the scope of human psychology and individual characterization. The number of research in the field of cognitive abilities and its measurement are well developed, conducted and documented, although some of them demonstrate the narrowed character of IQ concept. It is believed that cognitive intelligence is a potential predictor of educational and professional success, while incomplete in the analyses of successful functionality in everyday life (Neubauer & Freudenthaler, 2005). Taking this into account, the construct of more modern and emerging emotional intelligence is more functional.

Emotional intelligence (EI), emerges as a crucial area of study, offering valuable insights into the intricacies of human behavior and thought processes. As Amy Ingram (2017) and others state, emotional intelligence refers to the ability to identify, facilitate, and understand one’s own emotions and those of others. The term emotions that occur as the base of emotional intelligence, recognized as one of four fundamental classes of mental operations (Mayer et al., 2000). These classes include motivation, emotion, cognition, and consciousness. Motivations carry out basic acts for the satisfaction of survival and reproductive needs. Emotions appear as the adaptation to the relationship’s buildings

between individuals and their surroundings. Cognition allows the individual to gain new knowledge from the environment and participate in the decision making of new situations. The term emotional intelligence determines and examines the intersection between those concepts. Study (Dulewicz & Higgs, 2004) demonstrates seven separate individual elements of emotional intelligence, which are:

- Self-awareness – awareness of a person's own feelings and the ability to manage them.
- Emotional resilience – the ability to maintain a person's own performance under emotional pressure.
- Motivation – the possibility to have the drive and energy to perform challenging long-term goals and targets.
- Inter-personal sensitivity – the ability to show sensitivity and empathy towards other individual human beings.
- Influence – the ability to have an influence over people and persuade personal views.
- Intuitiveness – the ability to use intuition in the decision-making process.
- Conscientiousness – the ability to be consistent in personal words and actions, being able to behave according to ethical standards.

The first framework of emotional intelligence developed by Salovey and Mayer (1990) presented followingly:

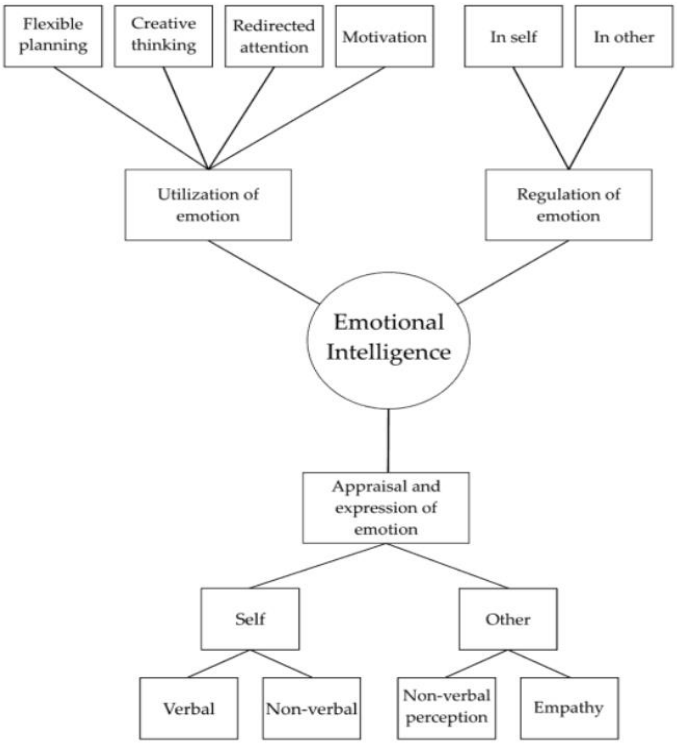

Figure 3. Model of emotional intelligence by Salovey and Mayer (1990)

The more recent model of emotional intelligence presented in Table 2 was developed by Goleman and Boyatzis (2017) and contains four domains and twelve competencies.

Table 2. Emotional intelligence domains and competencies reproduced from Goleman and Boyatzis (2017)

<table>
<tr><th>Self-Awareness</th><th>Self-Management</th><th>Social Awareness</th><th>Relationship management</th></tr>
<tr><td rowspan="5">Emotional Self-Awareness</td><td>Emotional self-control</td><td rowspan="2">Empathy</td><td>Influence</td></tr>
<tr><td>Adaptability</td><td>Coach and mentor</td></tr>
<tr><td>Achievement orientation</td><td rowspan="3">Organizational awareness</td><td>Conflict management</td></tr>
<tr><td rowspan="2">Positive outlook</td><td>Teamwork</td></tr>
<tr><td>Inspirational Leadership</td></tr>
</table>

Emotional intelligence has been extensively studied on scientific and research evidence. However, until the last few years little research had been done on the organizational context. O'Boyle's research (2011) indicates EI as a predictor of job performance, labor, leadership, and negotiation process. Amy Ingram (2017) analyzes the relationships between EI and venture performance in entrepreneurship, discussing the entrepreneur's intrapersonal and interpersonal abilities in terms of problem-solving, decision making and social demands. According to this research both intrapersonal and interpersonal elements of EI show positive effect on the overall venture and individual job performances for the firm. Moreover, the owner's interpersonal EI has a positive effect over both the individual and group functioning, leading to better performance. Additionally, the owner's understanding and management of their own emotions (intrapersonal component) also play a significant role in performance, particularly in how they interact with others in key tasks within the venture.

The next research (Guruleva, 2021) examines social and personal abilities of a leader, closely examining the awareness and relationship management, on the focus of Finnish SMEs. It was found out that leaders do not usually consider the intrapersonal component (self-awareness, self-regulation, and motivation) of EI to be the core of their business performance drive force. However, the interpersonal component indicated to be the change initiator in the companies. Social skills, motivation and empathy play a crucial role in the management,

together with the leader's overall emotional competences. In brief, social awareness clusters appeared to be the most influential in the process of work optimization and business drive.

Hypothesis 3a: There is a relationship between the intrapersonal component of EI and innovativeness of companies.

Hypothesis 3b: In the organizational context, interpersonal components of emotional intelligence (such as social awareness and empathy) have a stronger influence on innovative capabilities compared to intrapersonal components (such as self-awareness and self-regulation).

The investigation into the role of emotional intelligence in entrepreneurship (McLaughlin, 2012) explores its significance and implications. The empirical results of this investigation present a positive correlation between higher level of EI and entrepreneurial success. In overall, emotional intelligence positively affects the growth and business volume, higher competitive advantage at the similar stage of development, and the company performance. Importantly, the study shows that higher EI level advances the social interactions leading to better cooperations with investors, customers, partners, suppliers, and employees. With the higher intra- and inter-personal components of EI entrepreneurs are able to obtain the competitive advantage and increase business performance.

The next empirical study (Alotaibi & Badawi, 2023) describes the effect of emotional intelligence on entrepreneurial success on the Saudi Arabia scale. Authors propose a theoretical framework that links the EI and the performance of entrepreneurships. Research revealed that a high level of EI positively relates to entrepreneurial success. The ability to manage, understand and regulate emotions has the greatest influence on success than other dimensions of EI, due to the possibility to have higher competitive advantage. Overall, emotional intelligence leads to success in terms of staff satisfaction, social responsibility, self-satisfaction, customer satisfaction, and firm performance.

The next research (Cranston, 2022) represents a closer look at the impact of a founder's emotional intelligence level to the growth possibility of the startups. The author presents an integrated framework of emotional intelligence and a business growth model connection. Interestingly, research concluded that when using the turnover as a measure of growth the positive relationship between EI and business growth cannot be supported. However, the study displays a strong positive correlation between founders with higher EI level and the employees' job satisfaction.

The research presented by Andrey Reznikov (2018) analyzes the connection between the startups' success and the emotional intelligence of their founders based on empirical study. Overall, the study presents a positive correlation between higher levels of emotional intelligence and startup success. Moreover, self-awareness and motivation were presented to be less important than other elements, while self-regulation, social skill and empathy appeared to be more important for startup success.

Ronit Yitshaki (2021) in her study examines the role of emotional intelligence in high-tech startup's psychological ownership and venture growth based on empirical research. The findings show that the higher level of emotional intelligence positively associated with problem solving, and ability to act, leads to changes and achieve desired venture level. Moreover, the self-regulation and sense of identification were found to be insignificant to the firm's performance. Overall, the study highlights the need to increase the level of EI for founders in order to manage effective-cognitive processes associated with the ability to manage startup growth.

The next study (Sharma et al., 2023) discusses the level of emotional intelligence to the employees' IC in the workplace. It identifies the connection between innovation and emotional intelligence, describing what kind of skills and competencies leaders should have to facilitate innovation and competitive advantage. Briefly, the EI appears to be a crucial factor in driving the workplace innovation implementation. There is a distinctive necessity in the continuous innovation in the entrepreneurial sphere, that is why both elements of EI are important in developing a better workforce and innovative work culture for higher organizational effectiveness.

Hypothesis 3c: Emotional intelligence significantly contributes to the IC. Leaders with higher emotional intelligence levels will be more effective in facilitating innovation and fostering a culture of creativity and adaptability among employees.

After an extensive review of existing literature, it was discovered that while there is a substantial body of research on the relationship between emotional intelligence and entrepreneurship/SMEs, the impact of emotional intelligence on startup companies remains relatively understudied. Therefore, the scope of the presented research includes identifying and measuring the emotional intelligence levels of startup CEOs and examining their correlation with overall startup performance. According to Conte (2005), there are four main measures of emotional intelligence: the Emotional Competence Inventory (ECI), the

Emotional Quotient Inventory (EQ-i), the Multifactor Emotional Intelligence Scale (MEIS), and the Mayer–Salovey–Caruso Emotional Intelligence Test V.2 (MSCEIT V.2).

The ECI, developed in 2000 by Boyatzis, Goleman, and colleagues, assesses 20 competencies organized into clusters of self-awareness, social awareness, self-management, and social skills (Boyatzis et al., 2000). The EQ-i, also developed in 2000, comprises a 133-item self-report measure that takes approximately 30 minutes to complete. It evaluates emotional intelligence across five scales: intrapersonal, interpersonal, adaptability, general mood, and stress management. Both the MEIS and MSCEIT V.2 tests were initially developed in 2000, with the latter being an updated version by Mayer and colleagues. The MSCEIT V.2 measures emotional intelligence through four scores in categories of perception of emotion, integration and assimilation of emotion, knowledge about emotions, and management of emotions. While all of these tests demonstrate consistency and reliability in their results, they also possess disadvantages that hinder their suitability for use in the current research study. Firstly, there's a concern regarding the potential obsolescence of these tests, as they were all developed in the early 2000s and have seen minimal adjustments since then to align with the current global landscape. Secondly, nearly all of these tests require a significant time commitment from respondents, typically ranging from 30 to 40 minutes, which is not suitable for our study's requirements. Lastly, it's worth noting that these tests may not be entirely appropriate for the audience in Kazakhstan, a developing country with unique cultural norms and characteristics. That is why the alternative method for measuring emotional intelligence was chosen.

The EmIn (Emotional Intelligence) questionnaire was initially developed by senior researcher D.V. Lyusin in 2006 and later adjusted in 2009 (Lyusin, 2009). The test was developed in a country with characteristics similar to those of a developing country, which enables easier interpretation for respondents. Additionally, the test was initially developed in the Russian language, which facilitates easier adaptation and reduces the potential for misunderstandings during the translation process of questions. The test assesses the level of emotional intelligence through nine main scales and subscales, including interpersonal EI, intrapersonal EI, understanding of emotions, emotional management, understanding other people's emotions, management of other people's emotions, understanding your emotions, managing your emotions, and expression control. The test demonstrates a high level of consistency and reliability, as indicated by Cronbach's alpha internal consistency indices of 0.8 and higher, a Kaiser-Meyer-Olkin (KMO) measure of 0.79, and a Bartlett's sphericity coefficient of less than 0.001 (Lyusin, 2009). Importantly, previous research studies

(Pankova, 2010; Chulanova, 2018) have utilized the EmIn questionnaire in analyzing the emotional intelligence levels of founders and CEOs, with consistent and reliable results.

2.6. Cooperation

Nowadays, the number of startups is experiencing unprecedented growth, driven by the combination of different factors including technological advancements, constantly evolving consumer preferences, and the unique entrepreneurial culture. In such a dynamic landscape the role of cooperation and collaboration for the startups is indisputable. Startups often emerge from collaborative efforts, where individuals with diverse skill sets come together to address market gaps and capitalize on emerging opportunities. Moreover, cooperation among startups themselves, as well as with established firms, can facilitate knowledge sharing, resource pooling, and market expansion, contributing to the overall growth of the entrepreneurial ecosystem.

According to the literature (Gimenez-Fernandez et al., 2019) the two main challenges experienced by all of the startups are their small size and newness. The following constraints include primarily the limited access to crucial human, financial and complementary resources. However, startups show an advantage in the ability to have an inventive capability, performing operational structures flexibly and adaptively. Cooperation with different structures are made in order to minimize the limitations. Existing literature on the effect of the number of cooperations to the firm's performance and innovativeness primarily focuses on the large firms, neglecting the uniqueness of the startups.

Literature (Garidis & Rossmann, 2019) highlights different types of cooperations that are possible for startups. Theys include strategic partnerships, joint ventures, Research and Development (R&D) collaborations, supplier and vendor partnerships, customer co-creation, accelerator and incubator programs, open innovation platforms, and scientific conferences. By engaging in these types of cooperation, startups can access valuable resources, expertise, and opportunities that can accelerate their innovation efforts and enhance their competitiveness in the market. The potential partners and entities for the startups are also highlighted. They include other startups, established companies (incumbents), universities and research institutions, industry experts and consultants, investors and venture capitalists, government agencies and economic development organizations, and nonprofit organizations and social enterprises. With the help of these entities, startups gain an ability to bring together different advantages, resources, and expertise to fuel innovation, foster growth, and achieve competitive advantage in the market.

Hypothesis 4a: Startups that engage in strategic partnerships with established companies (incumbents) experience greater innovation effectiveness compared to others.

According to Garidis and Rossman (2019) cooperations between startups and incumbent firms helps to increase innovation effectiveness and corporate performance. Startups that commonly struggle from the insufficient number of resources, can profit in terms of experience gaining, networks' development, customers' acquisitions, and resource attraction. On the other side, the incumbent firms gain advantage in the development of their existing business model and increase their level of innovativeness. There are a number of research that study the different frameworks and models of how such cooperations are made and the implications that accompany them.

The four common models used by tech industry corporations to engage with startups and their characteristics and challenges are outlined by Weiblen and Chesbrough (2015) in their study on engaging with startups to enhance corporate innovation. The first model is Corporate venturing, which involves participating in the success of external innovation to gain strategic insights into non-core markets. However, this demands a considerable investment and a deep understanding of external innovation ecosystems. The next model is Corporate Incubation that provides a path to market for promising innovations originating within the corporation but lying outside its core operations. Although, this model requires the allocation of dedicated resources and infrastructure to nurture internal innovation initiatives effectively. In contrast, the Startup Program (Outside-In) strategy aims to draw in external innovation to stimulate and advance corporate innovation efforts. Its disadvantage is that it requires the establishment of effective mechanisms for identifying and integrating external innovations into the corporate structure. Finally, the last model is the Startup Program (Platform) that fosters external innovation that elaborates existing corporate innovations, forming a mutually beneficial relationship between startups and the corporate platform. However, achieving success with this model hinges on aligning the objectives and operations of external startups with the corporate platform for seamless integration and collaboration.

The next framework discussed by Corvello and colleagues (Corvello et al., 2023) focuses on building "Start-up Acceleration Capability (SAC)" through effective collaboration between large organizations/companies and start-ups. This framework is based on the concept of dynamic capabilities, specifically tree components which are sensing, seizing, and re-configuring. The framework highlights the necessity to integrate the startup's IC to the existing business models of larger companies for the long-term development and innovation

creation. The SAC framework emphasizes the necessity of rapid decision-making systems, the development of suitable business models, and the reconfiguration of organizational resources, capabilities, and processes to appropriate the value created in cooperation with start-ups. Overall, the authors state that by cooperating with startups large corporations can enhance their IC and competitiveness through successful collaborations with start-ups. The SAC framework represents by itself the guidelines and structured approach, following which larger companies can maximize the value of collaborations with start-ups and stay ahead in today's dynamic business landscape.

The next article (Niever, Scholz, & Hahn, 2022) discusses the role of collaboration between early-stage startups and SMEs in driving the innovation process. The research highlights that cooperations and partnerships create competitive advantage for both startups and SMEs. Interestingly, the research describes the phases through which the collaboration between startups and SMEs typically progress. The first phase is - Learn phase, where the partners are getting to know each other and understand potential areas of collaboration. Next, Match stage, which includes the evaluation of ideas and determination of compatibility between partners. Third - Test phase, where the pilot project is launched to validate the collaboration. The last stage is the Partner phase, when long-term agreements are negotiated, and further opportunities are explored. The following phases of collaboration represent a structured framework for startups and SMEs to create a sustainable and mutually beneficial partnership.

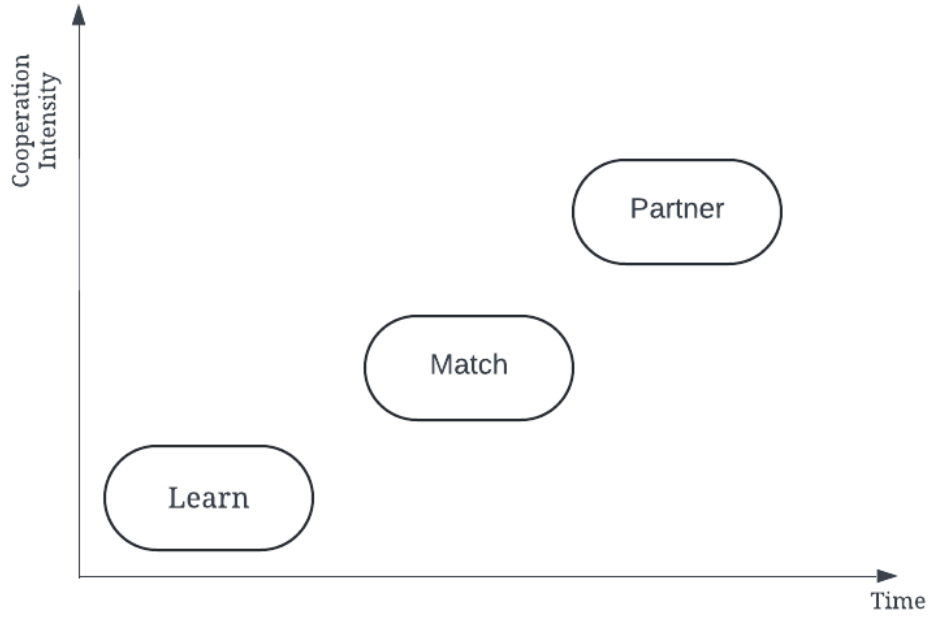

Figure 4. Framework of cooperation between startups and SMEs

(Niever, Scholz, & Hahn, 2022)

Aside from the cooperations with the large and incumbent firms, startups can largely benefit from the collaboration with the other startups. Research (Gupta et al., 2021) indicates several ways in terms of which startups can benefit from their collaborations. These benefits include access to diverse ideas and expertise, two-way knowledge transfer, overcoming limitations, strategic alliances for complementary strengths, enhanced differentiation and cost reduction, and network effects and value creation. Overall, startup collaboration creates a culture of open innovation, facilitates knowledge exchange, and creates a mutually beneficial connection that leads to the innovation drive, sustainable competitiveness, and sustainable growth.

Hypothesis 4b: Startups engaged in multiple types of cooperation, such as strategic partnerships, joint ventures, and accelerator programs, achieve higher levels of innovation effectiveness and corporate performance compared to startups with limited cooperation strategies.

2.7. Diversity

Diversity is increasingly recognized as a critical factor in driving innovation within startups (Gkypali et al., 2017; Boudreaux, 2020; Tshetshema & Chan, 2020). Prior to analyzing the effect of diversity on innovation capability it is crucial to clarify the definition of the term "diversity". Most researchers define diversity simply as the degree of attribute variety among group members (Kim, 2017; Tshetshema & Chan, 2020). Harrison and Klein (2007) propose a framework that conceptualizes diversity in three distinct aspects - separation, variety, and disparity - each influencing team dynamics and outcomes differently. Østergaard et al. (2011) define diversity in startup teams as the presence of individuals with a variety of skills, perspectives, and experiences. The diversity can be indicated in different ways, such as demographic characteristics (nationality, age, gender) and professional backgrounds (educational background, experience) (Bell et al., 2011; Østergaard et al., 2011). Groups that have a balanced proportion of members with different characteristics are seen as diverse or heterogeneous, while a homogeneous team consists of members who share similar attributes or backgrounds (Tshetshema & Chan, 2020).

Numerous studies have highlighted the positive correlation between diversity and innovation in various organizational contexts, including startups. For example, a study by Bell et al. (2011) found that diverse teams are more likely to generate innovative ideas and solutions compared to homogeneous teams. This is due to the diverse perspectives and approaches brought by team members from different backgrounds. According to Díaz-García et al.

(2013) diverse experiences and viewpoints increase a group's ability to come up with new solutions to problems – a key attribute of innovation capability. This effect is achieved due to the distinctive qualities of each member, that offer varied viewpoints, or the interpersonal processes taking place in diverse teams. Moreover, some researchers note a positive relation between diversity and creativity in the team (Shin et al., 2012; Hundschell et al., 2021). Østergaard et al. (2011) emphasize the direct connection between diversity in the team and diversity of the in-group knowledge base, which can give a rise to new organizational competences. However, this study also mentions the negative effect of diversity. Although diversity fosters the increase in quality of the problem-solving process, it also may decrease the pace of implementing those solutions into practice (Østergaard et al. 2011). In addition to that, dissimilarities within the team can trigger clashes and mistrust, due to increased difficulty of communication and interchange (Díaz-García et al., 2013).

Gender diversity

A group's gender diversity may be measured by looking at the ratio of men to women (Tshetshema & Chan, 2020). Most empirical studies show positive correlation between a team's gender diversity and its innovative performance (Díaz-García et al., 2013; Xie et al., 2020; Ruiz-Jiménez & Fuentes-Fuentes, 2016). Xie et al. (2020) came to the conclusion that gender diversity in research groups can increase innovation capability by offering informational advantages to the process, particularly when process complexity is high. Gender heterogeneity at management level appears to support an environment in the organization that fosters innovation in processes and products by promoting employee empowerment and efficient utilization of resources (Jiménez & Fuentes-Fuentes, 2016). Díaz-García et al. (2013) highlight the impact of gender diversity within research and development teams, demonstrating its role in fostering radical innovation solutions. The incremental innovations, however, do not benefit from the teams with gender diversity, as this type of innovation may require different sets of skills and conditions. Moreover, according to some studies, teams with gender diversity frequently display higher levels of in-group conflict, which in turn led to decreased creativity (Hundschell et al., 2021).

Hypothesis 5a: There is a positive correlation between gender diversity and innovative activity of the startup.

Ethnic diversity

Ethnic diversity refers to the presence of members from different cultural and national backgrounds within a group (Tshetshema & Chan, 2020). According to a study by Wise et al. (2022), startups with ethnically diverse teams tend to raise more investment capital, which is a good indicator of startup's innovativeness and overall success. Additionally, multinational teams show higher individual and team creativity (Hundschell et al., 2021). Existing research on ethnic diversity and its impact on team's likelihood to innovate show no significant correlation (Brixy et al., 2020; Wise et al., 2022, Østergaard et al. 2011).

Hypothesis 5b: There is no significant correlation between ethnic diversity and innovative activity of the startup.

Age diversity

Age diversity refers to the presence of members from various age groups within a team (Tshetshema & Chan, 2020). Age diversity is linked to a range of experiences and perspectives, all of which may enhance decision-making and creativity (Pesch et al., 2015). Research by Østergaard et al. (2011) suggests that age-diverse teams show higher levels of IC, as it creates a balance between younger generation's creativity and older members' experience. However, the study also suggests that differences in views on the problems, as well as higher risk-aversiveness of older members, may lead to conflicts and disagreements that can hinder the process of problem-solving. Many empirical studies on age diversity's effect on team's IC conclude that there is no significant correlation between this factor and group performance (Pesch et al., 2015; Schneid et al., 2016).

Hypothesis 5c: Age diversity is not correlated with innovative activity of the startup.

Educational background diversity

Educational background diversity refers to the presence of members with varying educational qualifications and levels of education within a team (Bell et al., 2011). Educational background diversity contributes to innovation capability by bringing together individuals with varied expertise and knowledge base (Østergaard et al., 2011). Different studies conclude that teams with diverse educational backgrounds show higher levels of creativity and innovation capability (Bell et al., 2011; Garcia Martinez et al., 2016; Bolli et al., 2017; Mohammadi et al., 2017).

Hypothesis 5d: Diversity in educational background is positively correlated with innovative activity of the startup.

Overall, the hypotheses of the study are summarized and presented in Table 3.

Table 3. Hypotheses of the study

Factor	Hypothesis	Description
Leadership Styles	H1a	Transformational leadership is positively correlated with IC
	H1b	Transactional leadership is positively correlated with IC
	H1c	Passive-avoidant leadership is negatively correlated with IC
Employee Satisfaction	H2	Overall employee satisfaction is positively correlated with IC
	H2a	Satisfaction with career development opportunities is positively correlated with IC
	H2b	Satisfaction with corporate culture is positively correlated with IC
	H2c	Satisfaction with compensation is positively correlated with IC
Emotional Intelligence	H3	Total EI level is positively correlated with IC
	H3a	Intrapersonal EI is correlated with IC
	H3b	Interpersonal EI is positively correlated with IC
Cooperation	H4a	Cooperation with established businesses is positively correlated with IC
	H4b	Engagement in multiple types of cooperation is positively correlated with IC
Diversity	H5a	Gender diversity within startup teams is positively correlated with IC
	H5b	Ethnic diversity is not correlated with IC
	H5c	Age diversity is not correlated with IC
	H5d	Diversity in educational backgrounds is positively correlated with IC

Chapter 3. Methodology

3.1. Variables

Table 4. List of Variables

Variables	Definition
D	Diversity
Dg	Gender diversity
Da	Age diversity
Dn	Ethnic diversity
Deb	Educational background diversity
Ltf	Transformational leadership
Ltc	Transactional leadership
Lpa	Passive-avoidant leadership
Cmc	Cooperation with mature companies
Co	Cooperation overall
Ea	Intrapersonal
Ee	Interpersonal
Emin	Emotional intelligence
Sc	Employee satisfaction with career development opportunities
Sa	Employee satisfaction with corporate culture
Ss	Employee satisfaction with compensation
S	Total employee satisfaction

3.1.1. Independent variables

Diversity in this research consists of four aspects: gender, ethnicity, age and educational background. Gender, ethnicity, and educational background are categorical variables (Østergaard et al., 2011). In this study there are two categories for gender diversity (Dg): male or female. Ethnicity variable (Dn) is grouped into four blocks: Western countries (includes EU, Canada, Australia, and USA), CIS countries, Asia-Pacific region (includes China, South Korea and Japan) and the rest of the world. Educational background (Deb) was preliminarily divided into six combinations of categories based on two characteristics: level (bachelor, masters, doctorate) and area (STEM or humanitarian) of education. In order to measure the categorical variables, we used the Blau heterogeneity index. The Blau index is

a statistical tool that can be utilized to measure the degree of heterogeneity in the group based on categorical attributes (Calculator Academy Team, 2023). The output value of the index ranges between 0 and 1. Index being equal to 0 means that the group is completely homogeneous and to 1 represents complete heterogeneity. However, for binary variables, such as gender diversity, the range is from 0 to 0.5, as it is the highest possible output (Yap et al., 2017).

$$I = 1 - \sum_{i=1}^{n} P_i^2 \quad (1)$$

here I is the Blau index for the certain diversity aspect, Pi is the proportion of a certain category in the group and n – total number of categories. Proportion is calculated simply by dividing the number of members of a certain category by the total number of startup employees.

The last type of diversity is age diversity (Da). Unlike the previous three types, this variable is continuous. For continuous variables we use a coefficient of variation (Kim, 2017).

$$CV = s/\bar{x} \quad (2)$$

where CV is coefficient of variation, s is the standard deviation and $\bar{x}$ – sample mean.

Finally, we introduce a diversity variable (D) that is basically a mean representation of diversity. It is calculated as the mean of the above mentioned four diversities. This variable serves to capture the summary effect of all diversity aspects on the innovation capability of the organization.

Cooperation variable (Co) is introduced to measure the level of cooperation of the startup with external entities. In order to measure this variable, we used the 5-point Likert scale, where 1 means no cooperation and 5 means extensive level of cooperation. As a result of literature review, in the interview questionnaire we included the following nine entities: universities, mature companies, same industry startups, customers, investors, government, research centers, incubators-accelerators and conferences. All organizations are assumed to have equal weights in calculations; hence the cooperation variable is equal to average points

of all items. In addition to that, a separate variable for the cooperation with mature companies (Cc) is added to study the effect of startup - company collaboration.

The same 5-point Likert scale is used for employee satisfaction parameter (Es) measurement. In the survey for employees, we included five items of satisfaction: salary, career growth opportunities, company culture, workload and company atmosphere. As for the cooperation variable, all items of satisfaction are considered to have equal weight. Consequently, the Es variable is equal to the average of points of all satisfaction facets. To understand the discrete effect of some aspects of satisfaction, three additional variables, namely, satisfaction with the salary (Ss), with the corporate culture (Sa) and with the career growth opportunities (Sc) was added to the analysis.

For the identification of leadership style, we used the MLQ test. The MLQ test is designed in survey format and contains "five transformational, three transactional, one laissez-faire and three outcome scales" (Lowe et al., 1996). Survey respondent rates his/her agreement with each of the 45 items in 0-4 scale Likert scale. After the analysis of the respondents' answers to the test questions, the average values of transformational (Ltf), transactional (Ltc) and passive-avoidant (Lpa) leaderships are calculated.

For the assessment of emotional intelligence (EI) of the CEO, we used the EmIn test developed by D.B. Lyusin. This test consists of 46 statements, that are evaluated by the respondent whether he agrees or disagrees with these statements (Lyusin, 2009). This test uses a 4-point Likert scale, where 1 means completely disagree and 4 means totally agree. The result of this test is presented as a score for nine different categories and one as an overall score of emotional intelligence (Ei). In this research we use only the interpersonal emotional intelligence (Ee), intrapersonal intelligence (Ea) and overall, EI score (Ei) of the respondent.

3.1.2. Dependent variables

The output parameter of the IC of the startup consists of three main aspects: business model innovation (BMI), product innovation (PrI) and process innovation (PcI). The innovation level of each aspect is assessed and compared based on two measures of innovation – quantity of innovation and quality of innovation. Quantity measure is simply the number of innovations the firm has introduced in the last few years. It can be a radical innovative product, patent, small innovative improvement into the product, optimization technique, new sales methods, etc. However, the quality measure assesses the level of the introduced innovation. In other words, it measures whether the innovation is incremental, radical,

sustaining, or disruptive. Using our expertise on technical aspects of innovation and comparing the innovation measures of all startups under the study, we assign a comparative score ranging from 0 to 5 to each innovation aspect of the startup. Innovation capability is calculated as the average of three aspects of innovation.

$$IC = (PcI + PrI + BMI)/3 \quad (3)$$

3.2. Delphi method

The Delphi method is a structured and iterative technique used to gather and refine the opinions of a group of experts (Hong et al., 2019). It involves multiple rounds of surveys, where participants provide their opinions and feedback on a certain topic (Sourani & Sohail, 2014). After each round, the interview facilitator summarizes the expert opinions on the topic and provides the summary of responses to the panel. This iterative process continues until all ideas or opinions converge. The Delphi method can be used in various areas, such as forecasting or decision-making. To date, a number of studies have confirmed the effectiveness of the Delphi method as a validation tool. Chan's comparative study (2022) concluded that the Delphi consensus approach yields more significant results for data validation than the generic consensus method.

In our research, we engaged two startup founders to provide feedback on our interview questionnaire and initial understanding of the topic. Through the application of the Delphi method, we refined the research question, list of factors, and methods. Initially, we categorized startups into certain phases based on their age, distinguishing between startup and growth stages. However, our experts highlighted the inadequacy of this classification, emphasizing the lack of distinct boundary between those stages and the pivotal role of investment raising stages in startup development. Consequently, we revised our interview questions to align with investment stages, including pre-seed, seed, and subsequent funding rounds.

Furthermore, the Delphi method elicited a reevaluation of our output variables for assessing startup success. While our previous metrics included factors such as investments raised, product development, sales numbers, financial performance and employee number growth, our experts noted the need for a more accurate evaluation framework focused on innovation capability. Afterward, we refined our assessment criteria to prioritize the quantity and quality of innovations generated by startups. This revised measure aims to provide a clearer and

more comprehensive understanding of the IC shown by startups, aligning closely with the primary objective of our study.

Finally, the Delphi method was used in the results validation process. Specifically, the applicability of results and their relevance was studied. Startup founders and executives were approached, and the results were presented. Experts shared their opinions on whether the findings of the study relate to their practical observations. Moreover, they suggested courses of action on how to apply the results into the practice to enhance innovation capability in startups.

3.3. Data analysis

Pearson correlation coefficient

For the data analysis on correlation of singular input factors with innovation level, we use Pearson's correlation coefficients. Specifically, we use its estimation for the sample (Rodgers & Nicewander, 1988).

$$r = \frac{\Sigma(x_i - \bar{x})(y_i - \bar{y})}{(\Sigma(x_i - \bar{x})^2)^{1/2}(\Sigma(y_i - \bar{y})^2)^{1/2}} \quad (4)$$

where x is input parameters, y is product variable and r is correlation coefficient.

This coefficient is useful in identifying linear correlations between input and output variables, as well as between independent variables. However, this method is not suited for identification of complex non-linear correlations if they are present. Moreover, it correlates only pairs of variables, and cannot be used for correlating a set of inputs.

Pearson correlation analysis is performed using the Pandas package in the python software. Pandas package contains different tools and functions that can be used in the analysis of data. Among all methods we used the DataFrame.corr() function. This function calculates a correlation between pairs of columns (or inputs) using one of three correlation methods: pearson, kendall or spearman. By default, it uses the Pearson method to analyze the data. Cells that do not contain any data are labeled as "not a number" (NaN) and dropped from the analysis to not distort the results. The python code used for the analysis is shown in Figure 5.

```
import pandas as pd
import seaborn as sns
import matplotlib.pyplot as plt

df3 = pd.read_excel('1.xlsx')

X3=df3[['Dg', 'Dn', 'Da', 'Deb', 'D', 'Cc', 'Co', 'Ea', 'Ee',
        'Ei', 'Ltf', 'Ltc', 'Lpa', 'Sc', 'Sa', 'Ss', 'S']]

Y3=df3[['IC']]

train1 = pd.concat([X3, Y3], axis=1)
fig, ax = plt.subplots(figsize=(15,8))
sns.heatmap(train1.corr(), annot=True, square=True, ax=ax)
```

Figure 5. Python code for the analysis

3.4. Sample and data gathering process

The study examines innovation and optimization within the context of Kazakhstan's emerging technology startup landscape, with a specific focus on startups participating in the NURIS program. This program, facilitated by the university, serves as a platform for ideas acceleration and networking among startups. Among the 30 startups affiliated with the program, 20 are actively engaged in emerging technologies development. These startups typically exhibit characteristics of small-scale enterprises, with an average workforce size of approximately five employees. On average, these startups have been operational for approximately two years, mostly being within the seed period of development. While a small number of startups have product sales, the majority are still in the process of product development. Overall, we contacted 20 startups, of which 9 have positively responded. We contacted the startup owners through digital communication channels, specifically WhatsApp and Telegram messengers, using contact information provided by the university.

Before approaching startup founders, a certificate to conduct research with minimal risk was obtained from the Collaborative Institutional Training Initiatives (CITI) program (see Appendix B). The mini course. Formal permissions to conduct interviews and surveys were asked from the CEOs or management team representatives of the startups. After obtaining consent, interview dates were coordinated, with participants briefed on the anticipated duration of the interview process, including the Multifactor Leadership Questionnaire and Emotional Intelligence tests. However, depending on the preferences of the participant, the latter two tests could be sent prior to or after the main interview. In addition, interview questions were prepared in English and translated into Russian for the convenience of interviewees.

3.4.1. Interview

The interview structure consisted of a predefined set of questions, shared with participants in advance. Preceding the interviews, participants were presented with consent forms describing the scope and objectives of the study, alongside an acknowledgment of the anticipated time commitment for the interview and assessment processes. Interviews typically extended for approximately 30 minutes, with an additional fifteen minutes allocated for each test administration. This structured approach ensured consistency in data collection procedures while allowing for exploratory dialogue to obtain additional information on the innovation and optimization strategies adopted by the startups.

The interview questions consisted of four main blocks. The first part was about the educational background of the founders, their experience of founding startups. Also, general information about the startup was collected to identify its scope and make sure of the relevance to the study. Additional metrics were asked such as the stage (pre-seed, seed, series A and growth) and demographic description of the startup.

The second part of the interview was dedicated to gathering information about the cooperation level of the startup with different entities such as research centers, universities, same industry startups and mature companies, incubators or accelerators and stakeholders, namely, customers, investors, and government if the startup works with government agencies. Interviewees assessed the cooperation level with them in 1-5 Likert scale. To reduce the bias and ensure the cooperation is related to innovation and idea generation, additional questions were asked to elaborate the cooperation level and results were updated accordingly.

The next block was related to the diversity level within the company. Four categories of diversity were studied: gender, ethnicity, age, and educational heterogeneity. Respondents were asked to tell the number of women, number of women in managerial positions, number of employees with different nationalities, number of key (decision-making) employees and their educational background. They were quantified using the Blau index and coefficient of variation as described in Section 3.1.1.

The answers for the last part of the interview were used to rate the IC of the startups. IC was measured based on the three main types of innovation: BMI, Product and Process Innovation. For the BMI, founders were asked whether their startups' business models are innovative and if yes, in what way. For Product Innovation, it was important to understand how often

they create new products, and how often they upgrade them. Also, the number of patents, copyrights or trademarks were the indicators of innovativeness. Process Innovation was measured from the questions regarding the number of optimization techniques implemented throughout product development. IC measurements were assigned in the end, after collecting all the interview results. Companies were given comparative points on a 1-5 scale. They were compared based on the quantity and quality of their innovation as discussed in Section 3.1.2.

3.4.2. EmIn questionnaire

The EmIn questionnaire consists of 46 statements, in relation to which the respondent should express their degree of agreement in scale from 1 to 4 (completely disagree, rather disagree, rather agree, totally agree). Those statements are combined in five subscales, which later combined into four more general scales (Lyusin, 2009):

- Interpersonal Emotional Intelligence (general scale) – the ability to understand other people's emotions and manage them.
- Intrapersonal Emotional Intelligence (general scale) – the ability to understand and manage own emotions.
- Understanding of emotions (general scale) – the ability to understand own and others' emotions.
- Management of emotions (general scale) – the ability to manage own and other's emotions.
- Understanding of other people's emotions (subscale) - the ability to understand a person's emotional state based on external manifestations of emotions (facial expressions, gestures, sound of voice) and/or intuitively, sensitivity to the internal states of other people.
- Management of other people's emotions (subscale) - the ability to induce certain emotions in other people, and to reduce the intensity of unwanted emotions. Probably, there is a tendency to manipulate people.
- Understanding of own emotions (subscale) - the ability to understand own emotions: their recognition and identification, understanding the reasons, the ability to verbally describe them.
- Management of own emotions (subscale) - the ability and necessity to manage own emotions, to purposely call and maintain desired emotions and reduce unwanted ones.

- Control of expressions (subscale) – the ability to control external demonstration of own emotions.

In order to calculate the results, there are several certain rules. The answers to the questions (statements) are counted in terms of direct and inverse values (Table 5).

Table 5. Answers interpretations' points for EmIn

Answer variations	Direct values (points)	Inverse values (points)
Completely disagree	0	3
Rather disagree	1	2
Rather agree	2	1
Totally agree	3	0

3.4.3. MLQ

Overall, MLQ consists of 45 situational questions (36 items pertaining to leadership styles and 9 items to leadership outcomes). Respondents give answers to these questions on a scale from 0 (not at all) to 4 (frequently, if not always). Leaving blanks in case of being unsure is also acceptable. So, answers were converted into direct and inverse values, as in Table 6.

Table 6. Answers interpretations' points for MLQ

Answer variations	Direct values (points)	Inverse values (points)
Unsure	-	-
Not at all	0	4
Once in a while	1	3
Sometimes	2	2
Fairly often	3	1
Frequently, if not always	4	0

Data collection was conducted through a license "MLQ Transform Survey Hosting: Self Form (Data)" from the distributor Mind Garden, which is an international publisher of psychological assessments. The collected data was retrieved from the platform in XML document format, which included the preliminary results of the assessment. To be more precise, the scores were given to each subscale under the following general leadership aspect:

- Transformational leadership (general scale) - the leadership style that fosters integrity, trust, encouragement, innovation, and personal development.
    - Builds Trust, IIA (subscale) - the leader's ability to create a trustworthy environment.

    - Acts with Integrity, IIB (subscale) - the consistency of leaders' actions with their words.
    - Encourages Others, IM (subscale) - the leader’s ability to motivate team members.
    - Encourages Innovative Thinking, IS (subscale) - the leader’s ability to encourage new ideas and creative solutions.
    - Coaches & Develops People, ICD (subscale) - the leader’s effort in coaching and personal development of team members.
- Transactional leadership (general scale) - the leadership style that emphasizes rewards and supervision over the employees.
    - Rewards Achievement, CR (subscale) - the leader’s tendency to reward accomplishments.
    - Monitors Deviations & Mistakes, MBEA (subscale) - the leader’s tendency to monitor and address errors and deviations from standards.
- Passive-avoidant leadership (general scale) - the leadership style that avoids making decisions and taking responsibilities.
    - Fights Fires, MBEP (subscale) - the leader’s tendency to take action only in response to problems.
    - Avoids Involvement, LF (subscale) - the leader's tendency to avoid engaging in leadership responsibilities.

Afterward, the average values of transformational, transactional, and passive-avoidant leaderships were calculated on a scale 0-4.

3.4.4. Employee satisfaction survey

The employee satisfaction survey was prepared in Google Forms. It was prepared in three languages: Kazakh, Russian, and English. The survey ensured respondent anonymity and limited each participant to a single submission. Firstly, respondents were informed about the aim of the study and required to indicate that they participate in the study voluntarily. Then, general questions about their gender and age were asked. There were five questions in the survey asking about their satisfaction with salary, company’s culture, career and development opportunities, workload and overall atmosphere in the company. The definitions for the company's culture and atmosphere were provided as a description under the questions. The link for the survey was given to CEOs to send to their chats.

Chapter 4. Results

4.1 Data description

For the calculation of the level of emotional intelligence, respondents were analyzed in terms of five subscales and four scales. The main general scales include Interpersonal Emotional intelligence, Intrapersonal Emotional Intelligence, Understanding of emotions, and Management of emotions. Based on them the final Total level of emotional intelligence was analyzed (Table 7).

Table 7. EmIn questionnaire scaled results

Company	**Interpersonal EI**	**Intrapersonal EI**	**Understanding of emotions**	**Management of emotions**	**Total level of EI**
Company 1	3	4	3	5	4
Company 2	4	3	3	4	3
Company 3	3	4	3	3	4
Company 4	4	1	3	1	1
Company 5	3	3	3	3	3
Company 6	4	3	3	3	3
Company 7	4	3	4	3	4
Total Average	**3.57**	**3**	**3.14**	**3.14**	**3.15**

After calculation and scaling of the results, they were grouped for further identification and analysis. The main scales for the results' analysis are the Interpersonal emotional intelligence, Intrapersonal emotional intelligence, and Overall level of emotional intelligence. The total number of respondents was 9 CEOs of different IT startups. Among the respondents 57% showed the medium level of interpersonal EI, and 43% the high level of interpersonal EI. In terms of Intrapersonal EI 57% represented medium level, 29% high level and only 14% showed low level. Finally, the results for the overall level of emotional intelligence revealed that 43% of respondents have a high level of emotional intelligence, 43% the medium level and 14% low level.

The Multifactor Leadership questionnaire revealed that managers have mixed leadership styles, on average scoring 70% on transformational leadership characteristics with the highest score being 84.5% and lowest – 47%. However, the highest average score was observed on transactional leadership qualities - 75.7%. Finally, on average only 15.5% of passive-avoidant qualities were inherent to startup managers. Table 8 below presents the results of MLQ on scale 0-4.

Table 8. MLQ test results

Company	Transformational leadership	Transactional leadership	Passive-avoidant leadership
Company 1	3.08	3.3	0.3
Company 2	2.88	3.4	0.75
Company 4	2.58	2.9	0.3
Company 6	1.88	2.9	0.5
Company 7	3.18	2.65	1
Company 8	2.62	3	0.75
Company 9	3.38	3.05	0.75
Total average	**2.8**	**3.03**	**0.62**

The satisfaction survey among employees showed a high level of satisfaction with the workplace. The response rate for the survey was low, in total 10 employees from four startups responded to the survey. Average satisfaction level scores out of 5 are shown in Table 9. All of the respondents totally agreed that they are fulfilled with the atmosphere and culture in the companies they work for. It was found that employees are slightly less content with career growth perspectives in the startups, satisfaction level on average was around 95%. The survey revealed that factors such as salary and workload are the least satisfactory aspects of the work in startups, as the satisfaction level was recorded to be 85.7% and 88.6% for salary and workload, respectively.

Table 9. Employee satisfaction survey results

Company	Compensation	Career growth and development opportunities	Company's culture	Workload	Atmosphere in the company
Company 1	4	4.33	4.67	4.67	5
Company 6	4.75	4.75	4.75	4.25	5
Company 7	3.5	4.5	5	5	5
Company 8	4	5	5	4	5
Total average	**4.06**	**4.65**	**4.85**	**4.48**	**5.00**

The last two factors were identified through the interview of the startup representatives. The interview showed that startups overall have a high level of cooperation with other organizations. Six out of nine startups rated their cooperation with mature companies with the highest score, which resulted in the highest average cooperation level among other entities – 4.1. Universities, conferences, and incubator-accelerator programs on average

scored slightly above 3 out of 5 possible. The incubator-accelerator programs received controversial results. Almost half of the interviewed startups rated the collaboration with such organizations as the highest (5), while the other half gave the lowest possible score – 1. Same industry startups and research centers were identified to be the least popular organizations the startups cooperate with. As startup representatives explained, they usually keep only informal collaboration channels with same industry startups, without any significant collaborated efforts in research.

The interview results showed that startups usually have a low level of diversity in their teams. On average, across all types of diversity, the Blau index was around 0.28, indicating a high degree of homogeneity in the workforce composition. Specifically, ethnicity emerged as the least diverse factor among startup teams, with a Blau index of 0.12. Conversely, startups exhibited relatively higher diversity in educational backgrounds, with the Blau index just above 0.5. Gender and age diversity within startup teams were found to be moderate, with Blau indices of 0.276 and 0.204, respectively.

From the interview results, it was found that startups have more Product Innovations. The second highest IC is BMI. Although BMI has a higher average score than Process Innovation, some of the startups have been assigned the least score for BMI. Process Innovation level is almost uniform for the startups, there is no significant variance as in the case of BMI. Three startups out of nine had higher than average IC scores. IC was calculated as an average of Product, Process and BM Innovations and results are listed in Table 10.

Table 10. IC scores of the startups

Company	**Product Innovation**	**Process Innovation**	**BMI**	**IC**
Company 1	3	3	4	**3.33**
Company 2	5	2	1	**2.67**
Company 3	3.5	2	5	**3.50**
Company 4	4.5	3	5	**4.17**
Company 5	4	4	1	**3.00**
Company 6	3.5	3.5	3	**3.33**
Company 7	4.5	3	2.5	**3.33**
Company 8	4.5	3	2	**3.17**
Company 9	5	3	5	**4.33**
Total average	**4.17**	**2.94**	**3.18**	**3.43**

4.2 Pearson correlation analysis

By employing the Pearson correlation method, the current study uncovered clear patterns that both support and challenge different hypotheses concerning the factors that impact IC in IT startups. Table 11 and Figure 6 below present a summary of results.

Figure 6. Heatmap of correlations analysis

Figure 6 shows the correlation coefficients between all variables, including between input variables. Based on the value of the coefficient between -1 and 1, the 'pyplot' package colors the correlation matrix according to the legend depicted to the right of the heatmap.

Cohen's standard was employed to interpret the magnitude of correlations. According to Cohen, a correlation coefficient of 0.1 - 0.29 is considered small, 0.3 - 0.49 is categorized as medium, and 0.5 or greater is judged as large. Moreover, by applying a significance threshold, hypotheses that exhibit correlations below 0.1 have been excluded from consideration and labeled as insignificant.

Table 11. Correlation coefficients

Hypothesis	Description	Correlation with IC	Interpretation
H1a	Transformational leadership	0.21	Weak positive
H1b	Transactional leadership	-0.37	Moderate negative
H1c	Passive-avoidant leadership	-0.27	Weak negative
H2	Total employee satisfaction	0.071	Insignificant
H2a	Employee satisfaction with career development opportunities	-0.81	Strong negative
H2b	Employee satisfaction with corporate culture	-0.57	Strong negative
H2c	Employee satisfaction with compensation	0.081	Insignificant
H3	Total EI	0.45	Moderate positive
H3a	Intrapersonal EI	0.24	Weak positive
H3b	Interpersonal EI	-0.22	Weak negative
H4a	Cooperation with established businesses	0.04	Insignificant
H4b	Engagement in multiple cooperation types	0.57	Strong positive
H5a	Gender diversity	0.26	Weak positive
H5b	Ethnic diversity	0.09	Insignificant
H5c	Age diversity	-0.31	Moderate negative
H5d	Educational background diversity	0.09	Insignificant

First, transformational leadership showed a weak positive influence on IC ($r = 0.21$). In terms of transactional leadership style, it was found to have a moderate negative correlation ($r =$ - 0.37). So, even though H1a was supported, H1b was refuted, contrary to the initial expectations. Additionally, the passive-avoidant leadership style exhibited a weak negative impact ($r =$ - 0.27), which supports the hypothesis H1c.

Moreover, according to the hypothesis H2a, a strong negative correlation ($r =$ - 0.81) emerged between employee satisfaction with career growth and development opportunities and IC of startups. Similarly, employee satisfaction with corporate culture had a strong negative correlation ($r =$ - 0.57) with IC and hypothesis H2b was not supported. The employee's satisfaction with the compensation and total employee satisfaction were not correlated with IC. Strength of correlation was significantly weaker ($r = 0.071$ and $r =$0.081 respectively), hence hypotheses H2 and H2c were disregarded.

In relation to emotional intelligence, there was a moderate positive correlation ($r = 0.45$) between the total EI score and IC. More precisely, the study found that there was a weak positive correlation ($r = 0.24$) resulting from intrapersonal EI, whereas interpersonal EI shows a contradictory relationship with a weak negative correlation ($r = - 0.22$). Thus, it can be concluded that H3 was validated, while H3a and H3b were not supported, and the results were contrary.

Furthermore, analyzing the cooperation aspect, engagement in multiple types of cooperative endeavors was determined to be the most correlated factor ($r = 0.57$). On the other hand, cooperation with established companies was found to have an insignificant positive correlation with IC ($r = 0.04$), hence both hypotheses H4a and H4b were considered to be valid.

Last, gender diversity showed a moderate positive impact on IC ($r = 0.26$), supporting the hypothesis H5a that it positively correlates with IC of the startup. Age diversity however was moderately negatively correlated ($r = - 0.31$), which contradicts the H5c. Additionally, ethnic and educational background diversities were determined to exhibit very weak positive correlation ($r = 0.09$). Therefore, results of this study provide support for the hypothesis H5b. However, they do not support the alternative hypothesis H5d that educational background diversity positively correlates with IC.

Additionally, the outcomes of the Delphi method provided comparable results. Experts agree that leadership styles, EI, diversity, and cooperation are important factors in the given context. Overall, the current study reveals a complex interaction of various factors influencing IC in IT startups. More specifically, the correlations of transformational leadership and multiple types of cooperation with IC were strongly positive, which supports the proposed hypotheses. Besides, passive-avoidant leadership and age diversity exhibited negative correlations with startup's IC, which need to be carefully considered by startup leaders.

Chapter 5. Discussion

5.1. Leadership

Hypothesis H1a was supported by correlation analysis. Transformational leadership had a moderate positive relationship with IC, meaning that leaders with transformational leadership style lead the startup to more innovations compared to transactional and passive-avoidant leadership styles. The findings of the current study support Zaech and Baldegger's work (2017). The authors found that only transformational leadership has strong correlation with IC in startups, while no direct relationship was found between IC and other two types of leadership, namely transactional and passive avoidant. One of the possible reasons for this is a high portion of startup founders with transformational and transactional leadership style.

Regarding the transactional style, it was expected that transactional leadership style would be positively related to IC, however results revealed negative correlation. The reason is the implementation of the leadership style. From MLQ test results, the majority of the leaders have a transactional leadership style which is based on a reward system. However, a survey among employees revealed that they are least satisfied with the compensation amount. Moreover, findings that claim positive correlation between transactional style and negative correlation with passive-avoidant style studied large or medium enterprises (Faraz et al., 2018; Xie et al., 2018). This could indicate the need for another research to identify the impact of successfully implemented transactional leadership style on IC.

5.2. Employee satisfaction

None of the hypotheses regarding the correlation between employee satisfaction factors and IC were supported. The response rate from employees was very low to gain valuable information from the data. On the contrary, unexpected results were achieved with career growth and development opportunities and the company's culture. They have strong negative correlations with IC. Those results cannot be generalized, because the IC of companies 1, 6, 7, 8 whose employees responded are almost the same. None of the employees with high or low IC participated in the survey. Moreover, the sample size was too small, and the model is highly sensitive to any number of variables. Thus, it is recommended to study the effect of employee satisfaction on IC with a greater number of startups and employees.

Nevertheless, the survey results were useful for another aspect of the analysis. Among all the companies that were studied, only employees of one company with transactional leadership style are satisfied with their salary and bonuses. This result supports the previous justification about implementation of transactional leadership style.

5.3. Emotional intelligence

The relationship between EI and IC of startups is a relatively less researched area. In regard to EI, the discussion should be around intrapersonal and interpersonal EI. There were a limited number of studies that focused solely on the relationship between EI types and IC. The study revealed that most of the CEOs (86%) have medium and high levels of emotional intelligence. 100% of the CEOs showed either medium or high level of interpersonal EI. However, during the correlation analysis it was revealed that there is a positive correlation between the Intrapersonal component of EI to the IC of the company, and no significant correlation between interpersonal component and IC. Moreover, there is a correlation between the overall level of EI with the IC. In order to further research this area, it is recommended to do additional research focused solely on the correlation between each component of EI and the IC but on a larger sample size.

From the perspective of current research, it can be assumed that the intrapersonal component of emotional intelligence is more important for the CEOs to develop the IC of their startups. That can be due to several reasons. Firstly, intrapersonal EI is about self-awareness, self-regulation, and motivation, and it is mostly associated with transformational leadership style (Kumar, 2014). The results also correspond to the correlation between leadership style and IC. Secondly, CEOs with higher levels of intrapersonal EI are more adaptable and flexible, able to make quick decisions in response to market trends, customer feedback, or internal challenges, which are crucial for fostering a culture of innovation within the company. Finally, due to the fact that startups are usually operated in dynamic environments with a small number of employees at the beginning stages, the CEOs' passionate nature, their vision for the company and ability to inspire and motivate others to pursue innovative ideas is crucial.

5.4. Cooperation

Startup engagement with multiple partners or entities is key for increasing ICs. The strong positive relationship indicates that startups with strong cooperation with multiple partners have higher IC. The most valuable cooperation partners for startups are

Accelerator/Incubator programs. It was proven both statistically and from observations. From the interviews, it was found that startups that actively participate in such programs got great support from mentors. They explain it with the fact that accelerator programs combine startups from different industries and with different business models. They have knowledge that can be valuable for startups.

In addition, there is a weak positive relationship between cooperation with Universities and Research centers. However, it is not clear whether this cooperation type leads to higher IC, but not vice-versa. During interviews, it was observed that startups collaborate with research centers to test their own innovative products. Instead of being a key factor that leads to IC, it could be a pivotal element to successfully implement the innovative idea. On the other hand, some of the founders highlighted the importance of expertise and engineering capabilities of research center specialists. Their feedback on prototype development is considered valuable for startups, and this is the reason why startups can leverage their IC by collaborating with them.

5.5. Diversity

Although the hypothesis that gender diversity positively affects the IC was supported, it should be researched further to assess its true correlation strength level. The reason is the lack of startups with gender diversity, which prevents conclusive assessment of its relationship with IC. This study revealed another problem of Kazakhstani startups, which is a lack of gender diversity, and especially lack of women in managerial positions.

It was expected that age diversity will not affect the IC of high technology startups. However, there was a strong negative correlation with IC. It can be explained by two factors. The first is related to the lack of data, and consequently high sensitivity to outliers. There was only one startup which had very low age diversity but very high IC, and thus its weight during correlation became significant. The correlation between age diversity and IC without the above-mentioned company was equal to -0.26 (difference is 0.27). Even though it still shows the negative correlation, the analysis shows that lack of data could significantly affect the correlation values.

Interviews showed that startups do not care about the gender of employees, rather they pay more attention to technical capabilities. This fact increased the expectation that diversity in educational background and technical capabilities will be strongly correlated with IC.

However, it was not supported by the correlation analysis. The reason is that almost every startup is diverse in terms of the educational background of key employees.

Chapter 6. Recommendations

Based on the results obtained during the research, several recommendations for the startup founders and policy makers have been identified. The main recommendations are based on the correlation analysis results, which identified factors that have the strongest effect on the company's performance and IC.

The first recommendation is the development of transformational leadership of the CEOs. There is a strong need for clear vision creation and sharing with the employees. With the transformational leadership style appearance, there is the possibility of encouraging innovation and creativity culture within the company. In order to develop this leadership style it is recommended to attend leadership training programs, which should be either locally or globally certified.

The next recommendation is to increase the level of emotional intelligence. With the development of the EI, the CEO would be able to advance the self-awareness level, better manage emotions, and increase problem-solving skills. It is recommended to attend special types of courses and work on verbal and non-verbal communication skills. The leadership style and Emotional Intelligence are both learnable skills and it requires some time and practice to increase them. Incubator and Accelerator programs such as NURIS and Astana hub could organize training programs or workshops to leverage startup CEOs' transformational leadership style and Emotional Intelligence level.

Finally, the cooperation level and gender diversity inside a company should be enlarged. It is recommended for the startup to not only collaborate with established companies and other startups but also to constantly participate in various accelerator or incubator programs, conferences, and research centers. Policy makers should increase the capabilities of accelerators and innovation clusters by hiring experienced mentors. Additionally, diversity enhances the IC, and performance of a startup, by providing additional skills, perspectives, and creativity levels.

Chapter 7. Limitations

The main limitation of the study is the small sample size of startups. There were only nine companies that were analyzed. Firstly, it leads to a high sensitivity model to outliers and any small changes in the values. Secondly, insufficient data prevents conclusive assessment of IC with some key factors such as gender diversity and employee satisfaction. This limitation suggests caution in the generalization of our findings and underscores the need for further research with a broader dataset to validate and expand upon our initial observations.

Another limitation of the study is a possible bias from the respondent's side, as the study mainly considers self-assessment. However, it should be noted that several methods were used to minimize the bias during the study. Firstly, MLQ and EmIn tests were used which are designed to eliminate such biases. Secondly, during the interview, respondents were asked to elaborate and justify their assessments and based on them scores were adjusted manually.

Chapter 8. Conclusion

The aim of the present research was to examine the IT startups in Kazakhstan and explore the impact of critical factors affecting their IC. The combined use of the Delphi method and Pearson correlation analysis provided a thorough examination of innovation in this particular context, wherein certain hypotheses have been confirmed while others have been called into question.

The findings of the study revealed that adopting transformational leadership style and engaging in various forms of cooperation enhances IC. Moreover, the presence of transactional and passive-avoidant leadership, as well as age diversity had a detrimental impact on IC. The study also emphasizes the complexity of EI and employee satisfaction in innovation. Interpersonal EI had a surprising negative correlation with IC, but intrapersonal EI had a positive effect, which shows that different EI components may influence innovation differently.

This study contributes empirical evidence to the discussion on innovation in startup companies, specifically in a distinct cultural and economic context. It also addresses the challenges and opportunities faced by IT startups in Kazakhstan and offers valuable insights for other developing and middle-income economies aiming to establish an innovation ecosystem.

To summarize, this study highlights the complex nature of startup innovation and emphasizes the importance of customized strategies that make use of human and organizational resources. This facilitates the promotion of startup innovation for policymakers, managers, and scholars.

Chapter 9. Future work

Further research can be continued in two directions. First is to continue this research with a higher sample size. It can give more precise results by minimizing the sensitivity. Also, to have a better picture about the implication of diversity to IC, more diverse teams could be targeted. For the correlation analysis to be more precise it is recommended to have at least 30 companies and CEOs analyzed. Secondly, research can be done with a greater focus on the factors that had the highest correlation with IC, i.e. overall level of emotional intelligence, transformational leadership style and engagement in multiple cooperation types. It is possible to have additional research specifically on each of the presented factors.

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Appendices

Appendix A. Interview questions

Background of founding team/CEO:

1. What is your educational background?
    a) Bachelor's (STEM)
    b) BA (humanitarian)
    c) Masters (STEM)
    d) Masters (humanitarian)
    e) PhD (STEM)
    f) PhD (Humanitarian)
    g) Other

2. Any founding experience in founders? (number of startups before)
    a) none
    b) 1-2
    c) 3-5
    d) More than 5

Additional metrics:

3. What is the **age** of the startup?
    a) Startup stage
        i) Pre seed
        ii) Seed
        iii) Series A
    b) Growth stage (after raising investment) (Series B, C ...)

4. Number of employees in the startup: _

Diversity

5. Can you provide an overview of the current demographic background and experience of the leadership team and employees?*
    a) Number of women in the company?
    b) Number of women in managerial positions?
    c) Number of employees with foreign citizenship?
    d) Age of employees?
    e) *Educational background* of *key employees*
        i) Number of key employees (involved in decision making/idea generation): _____

ii) What is their educational background? (Put the number of employees with this degree)

1) Bachelor's (STEM) ___
2) Bachelor's (humanitarian) ___
3) Masters (STEM) ___
4) Masters (humanitarian) ___
5) PhD (STEM) ___
6) PhD (Humanitarian) ___
7) Other ___

Collaboration/Cooperation

6. To what extent do you cooperate (forming partnerships, sharing resources, knowledge, and working together towards common goals) with the following entities?* (1- no cooperation, 5 - extensive level of cooperation)

- Universities
- Mature companies
- Same industry startups
- Stakeholders:
    - Customers
    - Investors
    - Government
- Research centers
- Incubators-accelerators
- Conferences

7. How do you come up with innovative ideas and improvements in products? (To assess employee engagement)

Output factors (To assess IC):

1. To what extent is your BM innovative?
2. Product Innovation:
    a. Number of new products or services
    b. Number of patents/trademarks/copyrights
    c. Number of product/service improvements
3. Process innovations:
    a. Did you use any optimization techniques?
    b. How many of them did you implement?

Appendix B. CITI certificates

CITI PROGRAM

Completion Date 13-Jan-2024
Expiration Date 13-Jan-2027
Record ID 60497606

This is to certify that:

Aset Zhumatai

Not valid for renewal of certification through CME.

Has completed the following CITI Program course:

Students conducting no more than minimal risk research
(Curriculum Group)
Students - Class projects
(Course Learner Group)
1 - Basic Course
(Stage)

Under requirements set by:

Nazarbayev University

CITI
Collaborative Institutional Training Initiative

101 NE 3rd Avenue, Suite 320
Fort Lauderdale, FL 33301 US
www.citiprogram.org

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Figure 7. CITI Program course certificate to conduct minimum risk research

Appendix C. EmIn questionnaire interpretation

Table 12. EmIn results' interpretation

Scale	Direct statements	Inverse statements
Understanding of other people's emotions	1, 3, 11, 13, 20, 27, 29, 32, 34	38, 42, 46
Managements of other people's emotions	9, 15, 17, 24, 36	2, 5, 30, 40, 44
Understanding of own emotions	7, 14, 26	8, 18, 22, 31, 35, 41, 45
Management of own emotions	4, 25, 28, 37	12, 33, 43
Control of expressions	19, 21, 23	6, 10, 16, 39
Interpersonal Emotional intelligence	1, 3, 9, 11, 13, 15, 17, 20, 24, 27, 29, 32, 34, 36	2, 5, 30, 38, 40, 42, 44, 46
Intrapersonal Emotional Intelligence	4, 7, 14, 19, 21, 23, 25, 26, 28, 37	6, 8, 10, 12, 16, 18, 22, 31, 33, 35, 39, 41, 43, 45
Understanding of emotions	1, 3, 7, 11, 13, 14, 20, 26, 27, 29, 32, 34	8, 18, 22, 31, 35, 38, 41, 42, 45, 46
Management of emotions	4, 9, 15, 17, 19, 21, 23, 24, 25, 28, 36, 37	2, 5, 6, 10, 12, 16, 30, 33, 39, 40, 43, 44
Total level of emotional intelligence	1, 3, 4, 7, 9, 11, 13, 14, 15, 17, 19, 20, 21, 23, 24, 25, 26, 27, 28, 29, 32, 34, 36, 37	2, 5, 6, 8, 10, 12, 16, 18, 22, 30, 31, 33, 35, 38, 39, 40, 41, 42, 43, 44, 45, 46

Table 13. Normative indicators to EmIn

Scale	Very Low Level	Low Level	Medium Level	High Level	Very High Level
Understanding of other people's emotions	0-19	20-22	23-26	27-30	31 and more
Managements of other people's emotions	0-14	15-17	18-21	22-24	25 and more
Understanding of own emotions	0-13	14-16	17-21	22-25	26 and more
Management of own emotions	0-9	10-12	13-15	16-17	18 and more
Control of expressions	0-6	7-9	10-12	13-15	16 and more
Interpersonal Emotional intelligence	0-34	35-39	40-46	47-52	53 and more
Intrapersonal Emotional Intelligence	0-33	34-38	39-47	48-54	55 and more
Understanding of emotions	0-34	35-39	40-47	48-53	54 and more
Management of emotions	0-33	34-39	40-47	48-53	54 and more
Total level of emotional intelligence	0-71	72-78	79-92	93-104	105 and more

Appendix D. EmIn questionnaire questions

1. I notice when a close person is experiencing something even if he/she try to hide it.
2. If someone is upset with me, I don't know how to mend things with them.
3. I can easily guess a person's feelings from their facial expression.
4. I know what to do to improve my mood.
5. I usually can't influence my conversation partner's emotional state.
6. When I get irritated, I can't hold back and say whatever I think.
7. I understand well why I like or dislike certain people.
8. I don't immediately notice when I start getting angry.
9. I know how to improve the mood of those around me.
10. If I get carried away in a conversation, I speak too loudly and gesture actively.
11. I understand some people's emotional state without words.
12. In extreme situations, I can't force myself to control my emotions.
13. I easily understand the facial expressions and gestures of others.
14. When I'm angry, I know why.
15. I know how to cheer up someone in a difficult situation.
16. People around me consider me to be too emotional.
17. I am capable of calming down my close ones when they are stressed.
18. I find it difficult to describe my feelings towards others.
19. If I feel embarrassed when communicating with strangers, I can hide it.
20. By looking at a person, I can easily understand their emotional state.
21. I control the expression of emotions on my face.
22. Sometimes, I don't understand why I feel a certain emotion.
23. In critical situations, I can control the expression of my emotions.
24. If necessary, I can anger someone.
25. When I experience positive emotions, I know how to maintain that state.
26. Usually, I understand what emotion I'm feeling.
27. If someone tries to hide their emotions, I immediately sense it.
28. I know how to calm down if I get angry.
29. You can tell what a person feels just by listening to the tone of their voice.
30. I can't control other people's emotions.
31. I find it difficult to distinguish between feelings of guilt and shame.
32. I can accurately guess what my acquaintances are feeling.
33. I find it difficult to deal with a bad mood.

34. By carefully observing a person's facial expression, you can understand what emotions they are hiding.
35. I can't find the words to describe my feelings to my friends.
36. I manage to support people who confide in me about their feelings.
37. I can control my emotions.
38. If my conversation partner starts to get irritated, sometimes I notice it too late.
39. It's easy to guess what I'm feeling by the intonations of my voice.
40. If a close person is crying, I feel lost.
41. Sometimes I feel happy or sad for no reason.
42. I find it difficult to predict changes in the mood of the people around me.
43. I don't know how to overcome fear.
44. Sometimes I want to support someone, but they don't feel it or understand it.
45. There are feelings I can't accurately define.
46. I don't understand why some people get upset with me

Appendix E. MLQ results

Table 14. MLQ results for each subscale

Company	Builds Trust (IIA)	Acts with Integrity (IIB)	Encourages Others (IM)	Encourages Innovative Thinking (IS)	Coaches & Develops People (ICD)	Rewards Achievement (CR)	Monitors Deviations & Mistakes (MBEA)	Fights Fires (MBEP)	Avoids Involvement (LF)
Company 1	2.8	3	3	3.3	3.3	3.3	3.3	0.3	0.3
Company 2	2.3	2.8	2.8	3.5	3	3.3	3.5	1	0.5
Company 4	1.5	2.8	2.8	2.8	3	3.3	2.5	0.3	0.3
Company 6	1.8	2.8	0.5	2	2.3	3.3	2.5	0.5	0.5
Company 7	1.8	3.3	3.5	3.5	3.8	3	2.3	1	1
Company 8	1.8	3	3	2.8	2.5	3	3	0.5	1
Company 9	3	3.3	3.8	3	3.8	3.3	2.8	1	0.5
Total average	**2.14**	**3.00**	**2.77**	**2.99**	**3.10**	**3.21**	**2.84**	**0.66**	**0.59**

Appendix F. EmIn results

Table 15. EmIn results for each subscale

Company	Understanding of other people's emotions	Managements of other people's emotions	Understanding of own emotions	Management of own emotions	Control of expressions	Interpersonal Emotional intelligence	Intrapersonal Emotional Intelligence	Understanding of emotions	Management of emotions	Total level of emotional intelligence
1	23	20	19	15	16	43	50	42	51	93
2	24	23	17	15	11	47	43	41	49	90
3	24	19	23	14	13	43	50	47	46	93
4	27	20	13	7	2	47	22	40	29	70
5	22	20	20	16	11	42	47	42	47	90
6	28	20	19	14	9	48	42	47	43	90
7	27	21	23	15	9	48	47	50	45	94
Total average	25	20.42	19.14	13.71	10.14	45.43	43	44.14	44.29	88.57

Appendix G. Employee satisfaction survey

Consent form from employees

“Dear respondent,

First of all, thank you for participating in our Employee Satisfaction Rate Survey. We are the team of masters students at Nazarbayev University, Masters of Engineering Management program.

This survey aims to gather insights into employee satisfaction across various aspects of the workplace. Your responses will be used in research study titled “Enhancing Innovation Capabilities in Kazakhstan's Emerging Tech Startups: A Roadmap for Success Based on Critical Factors.”

Your responses are strictly confidential, and all data collected will be anonymized. No personally identifiable information will be disclosed or shared. Survey results will be reported in aggregate form only.

Participation in this survey is entirely voluntary, and you may choose to withdraw at any point without providing a reason. Your decision to participate or not will not impact your employment status or work relationships.

Completing the survey is estimated to take approximately 3 minutes.

If you have any questions or concerns about the survey, please contact aset.zhumatai@nu.edu.kz or +7705*****01”

Questions:

1. What is the company name?

   _____

2. Your gender:
   a. Male
   b. Female
   c. Other
3. What is your age?

   _____

4. To what extent are you satisfied with your salary?

	1	2	3	4	5	
Not satisfied	○	○	○	○	○	Very satisfied

5. To what extent are you satisfied with individual career growth and development opportunities in your company?

	1	2	3	4	5	
Not satisfied	○	○	○	○	○	Very satisfied

6. To what extent are you satisfied with your company's culture?

   Description: Company culture is the shared values and behaviors that define how people work together within an organization. Examples of company culture:

   Collaborative Culture: Emphasizes teamwork, open communication, and joint decision-making.

   Results-Driven Culture: Emphasizes achieving goals, measurable outcomes, and performance metrics.

   Work-Life Balance Culture: Prioritizes employee well-being and a balance between work and personal life.

	1	2	3	4	5	
Not satisfied	○	○	○	○	○	Very satisfied

7. To what extent are you satisfied with your workload?

	1	2	3	4	5	
Not satisfied	○	○	○	○	○	Very satisfied

8. To what extent are you satisfied with your the atmosphere in the company?

   Description: By atmosphere we mean physical environment, the interpersonal relationships, and the emotional tone of the workplace

	1	2	3	4	5	
Not satisfied	○	○	○	○	○	Very satisfied

Appendix H. Consent form for interview

Informed consent form for interview

Introduction. You are invited to participate in a research study entitled "Innovation and Optimization in Kazakhstan's Emerging Technology Startups: A Study of Critical Factors and Performance Metrics".

Procedures. The purpose of the research is to identify the critical factors influencing innovation and optimization in Kazakhstani technology startups, and to analyze the performance metrics used by these startups and their correlation with innovation performance. The interviews will be conducted either online (via video-telephony software programs like Zoom, Microsoft Teams or Google meet) or offline format. The Interviews will be conducted in either of three languages (Russian, Kazakh, English). During the interview, responses of interviewees will be audio recorded for each question. The interviews may last up to 30 minutes and be conducted in an individual format. Moreover, two external assessments will be conducted for emotional intelligence and leadership style before the interview.

Risks. Expected risks are associated with the possibilities of: (i) an interviewee perceiving certain questions as potentially sensitive and/or distressful; (ii) identifying the institutional position of an interviewee through the statements offered. In this context, you may not answer questions that you do not like, or which make you uncomfortable. You may also terminate your participation in the study at any moment. The audio recordings will be transferred into text format. The recordings will be destroyed once the project is finished.

Benefits. Potential benefits from this study include the advancements of Kazakhstani IT startups' innovation capabilities by providing key performance indicators. The results of this research might be used for academic purposes and be disseminated in scholarly journals and presentations.

Compensation. No tangible compensation will be given. A copy of the research results will be available at the conclusion of the study to those participants who request it by email to aset.zhumatai@nu.edu.kz.

Confidentiality & Privacy. Any information that is obtained during this study will be kept confidential to the full extent possible. All efforts, within reason, will be made to keep your personal information in your research record confidential. Access to data is given to only capstone team members and supervisors. The audio recordings will be destroyed after the project is completed.

Voluntary Nature of the Study. Participation in this study is strictly voluntary, and if agreement to participation is given, it can be withdrawn at any time without prejudice.

Points of Contact. If you will have any questions related to the project, you can contact:
Aset.zhumatai@nu.edu.kz, +7705*****01
Ali.temirgali@nu.edu.kz, Diana.kairula@nu.edu.kz, Anastassiya.kim@nu.edu.kz

Statement of Consent.
By signing this consent, you are indicating that you are at least 18 years old, have read and understood this consent form and agree to participate in this research study.

Name: Signature: Date: