Workforce in the regional economic development ecosystem (REDE):
A case study of Tarrant County, Texas

by

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B.A., University of Texas at Arlington, 1997
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AN ABSTRACT OF A DISSERTATION

submitted in partial fulfillment of the requirements for the degree

DOCTOR OF EDUCATION

Department of Educational Leadership and Adult Education
College of Education

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Manhattan, Kansas

2021

Abstract

This is a case study of Tarrant County, Texas, (TC) designed to shed light on workforce in the regional economic development ecosystem (REDE). The study was inspired by the Austin Technopolis Wheel and Model (Smilor, Gibson, & Kozmetsky, 1989; Gibson & Butler, 2013) and provides a practical look at the evolving REDE in Tarrant County, Texas, USA. The model is expanded to include the community college and teaching universities alongside research universities as additional categories of educational institution for study and analysis. Specific emphasis is placed on four areas of economic development including: Company Recruitment, Company Retention and Growth, Organic Growth (Startups/Entrepreneurship), and Collaborative Leadership Across Sectors. Fifty leaders and influencers from a variety of institutions and sectors involved in workforce and economic development activities in Tarrant County were interviewed. Analysis yielded insights into the current state of workforce and economic development as well as successes and failures in the region. This will help identify opportunities and gaps for Tarrant County leaders and influencers to enhance workforce and regional economic development as well as offer examples that other regions can consider and learn from as they navigate these challenges within their local context.

Key Words: Workforce, Regional Influencer, Economic Development, Workforce Development, Regional Economic Development Ecosystem (REDE), Innovation Ecosystem, Entrepreneurial Ecosystem, Education, Government, Private Sector, Startup, Risk Capital, Collaborative Leadership, Industry Cluster, Public Private Partnership, Austin Technopolis Model, Austin Technopolis Wheel, Triple Helix of Innovation, Quad Helix of Innovation, Business Incubators, Accelerators, Maker Spaces, Chambers of Commerce, Community Leadership

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Dedication

This dissertation is dedicated to Hannah, my loving wife and greatest gift. You are an inspiration and a blessing. I do not believe I could have made it to the finish line without you. Thank you for your patience and encouragement. Thank you for all the tasty meals, friendly reminders, loving suggestions, and meaningful insights. I am grateful for our shared faith and our calling to positively impact the lives of people locally and globally – together.

Thank you Mom, Dad, Shelly, Sara, and Eric. Your love is a tremendous blessing in my life. Your support and sacrifice have helped me to achieve my life goals. Your prayers have carried me through many years of working fulltime through four degrees, including this dissertation. You are my inspiration and the wind beneath my wings. Thank you!

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Chapter 1 - Introduction and Overview

Workforce in the Regional Economic Development Ecosystem (REDE) is a study designed to shed light on workforce in the regional economic development ecosystem (REDE) of Tarrant County, Texas, by gaining the unique perspectives of fifty regional leaders and influencers. The need for such a study and the idea to create a regional dashboard or balanced scorecard to facilitate dialogue and alignment across sectors in developing ecosystems first came when the researcher encountered a success story while conducting a research project. It made an immediate impression and spurred the question: Can this dialogue be replicated in other regions?

The story: In a meeting that took place in the early 2000's, eight regional leaders were brought together to discuss challenges and opportunities in a rapidly growing region that was facing new challenges with a recent influx of new residents and companies. In what had been a relatively sleepy college town until the late 1990's, that is now considered to be one of the fastest growing and most robust regional economies in the US, the rate of change had prompted a gathering of leaders specifically to bridge communities and consider regional strategies to manage growth. It was this initial meeting and spark that led to what one participant later described as "hundreds of meetings and gatherings over decades across the region that allowed everyone to build trust and find ways to work together." The shared desire to find creative solutions to address rapid growth in the region and work together for greater impact was made evident at a regional event where eight leaders and influencers were seated together and a conversation on the future ensued. They felt inspired and followed up; the rest is history.

Unlike most traditional events that the leaders were used to attending where people paid for tables, ate rubber chicken, and sat with the same familiar friends and colleagues each year, this event was formatted in a new way - to facilitate chance encounters and foster new

relationships. Every table had been deliberately put together as a group by organizers based on profiles, roles, and areas of interests in the community. As one organizer put it, "we stacked the cards by getting the right people in the room, selecting complimentary parties for each table, eating a good meal together, and sharing ideas." The event was also designed with an outcome in mind – to initiate dialogue that would lead to a regional plan for action. This was highly irregular in the region at the time and most in attendance were not sure what to think of it at first.

One table in particular is the focus of this story. Two at the table were economic development leaders in large cities in the region. One was a senior executive at a large corporation and major regional employer. Two were heavily involved in building an entrepreneurship and innovation ecosystem in the region, an entrepreneur and an investor. Two were educators, an administrator from a university and a professor from a local community college. The eighth and final member of the round table was an elected official who was seeking to champion innovative programs and collaborations for his city within the region.

At first, the group was a bit formal, but all were polite and engaging and within a few minutes they were carrying on a fruitful conversation. As part of a facilitated exercise, the group was asked to discuss what they felt were the greatest challenges and opportunities in their region and discuss any initiatives they were involved in or wanting to create. Lastly, the group was asked to envision potential collaborations that could help address the challenges of the day. What would they look like? How might they be implemented? And what kind of resources would be required to execute on their best ideas? Ideas were plentiful and the group enjoyed learning what one another had to say on each question. Within minutes they were fully engaged.

When the team reported out, they shared several important realizations they had come to as a group. The first observation made was how rare it was in their region for folks from

multiple cities with multiple perspectives who normally run in different circles from across the region to sit down together to share a meal and discuss the future. The second observation was that everyone was keenly aware of the challenges faced in the region and was open to explore ways to address them. These were people of action. In some cases, they were duplicating efforts. In other cases, they were both looking for partners for collaboration.

In what seemed like a cluster of cities where "everybody knows everybody," most of them were meeting for the first time. Those who knew one another in passing had never had dinner together or talked so openly about the future and ways to work together for the good of the community. The only two who knew one other well were already collaborating and seeking partners in education to develop a program to build the workforce in specific areas of the economy. It turned out that the educators and the entrepreneur were seeking to impact the same acute need in the community and wanted to conduct studies on the region to formulate a solution. The group acknowledged their shared goals, values, and love of the community. They quickly rallied around this discussion and began sharing ideas and experiences that got the group excited.

After an extended conversation over the meal, the group was astonished to learn all the good things the others were doing in their organizations and in service roles in the community. It became obvious once everyone had shared their goals and experiences that there were potential synergies to working together. The group was also pleasantly surprised to observe how quickly such a diverse group of individuals was able to agree on the need for greater communication and collaboration across sectors. In a city full of galas and fundraisers and conventions, this sort of experience was rare among them and they wanted more. By the evening's end, all had voiced that the region would benefit greatly from stronger relationships across cities, sectors, and circles of influence. In short, the group expressed a desire for an ongoing inclusive dialogue and a

regional strategy and vision they could all rally around. Each committed to explore ways to work together and invite others into the discussion that were value-aligned and action-oriented.

The group followed up after the event as promised and began meeting regularly from that day forward. They invited other interested parties from their communities and worked together to come up with a unified vision. They began to pool knowledge and resources to solve four difficult challenges faced in their region. A year later, four new initiatives were launched that had a major impact over time. From these efforts, a conference was born and two organizations were formed. A generation later, the effects of that open dialogue and their visionary leadership are evident in the region where they live and cross-sector engagement and collaborations are significantly more prevalent within their organizations. This can happen in your region as well.

Using Frameworks to Apply this Concept in a Regional Case Study

It is the quest of the researcher to build upon this inspiring example and explore practical replicable models applied to real-world circumstances to learn more. Questions the group raised that inspired this study include: How does workforce enhance or hinder economic development activities and how does economic development enhance or hinder workforce development? How well are we sharing knowledge and aligning efforts across organizations, disciplines, and professions to tackle complex and emerging societal challenges? How can leaders and influencers in higher education, economic development, and innovation and entrepreneurship ecosystems share knowledge, collaborate, and work in tandem to bring about the best possible outcomes for the region? What challenges do they face and where do they see gaps and opportunities? What steps can be taken to improve communication, collaboration, and alignment? Last but not least, what is the most efficient and effective research approach to gain meaningful, actionable insights in these areas within a relatively short time span with relatively

limited resources? The researcher's exploration of possible avenues of research and subsequent answers led to a case study of Tarrant County, Texas, part of the fastest growing metro area in the US. This study will place a similar cross-sector regional lens on a fast-growing county in a similar situation to the region described in the example. This study engaged 50 local leaders to gain their perspectives on the ecosystem, workforce, and regional economic development.

The origins of this study from a research perspective lie in two basic assumptions: 1. The current rate of technological change and societal impact from technology and globalization have permanently changed the way that regions must approach economic development in order to be successful (Smilor, Gibson & Kozmetsky, 1989; Gibson & Butler, 2013), and 2. These changes have led to a significant shift in regional economic development ecosystems and expanded expectations, roles, and influence among institutions of learning such as high schools, community colleges, and universities as active participants in economic development (Roueche, Baker & Rose, 1989). This study seeks insights on how to adjust regional strategies in light of these new and increasingly impactful dynamics within the regional economy.

These two seminal works published in 1989, one in the field of innovation and entrepreneurship ecosystems, and the other in the field of higher education, predicted a necessary shift toward collaborative leadership and called out old-school silos to be inefficient and ineffective in the emerging technology-based economy and increasingly diverse society. These concepts were revolutionary at the time and difficult for many to embrace. However, they are now part of mainstream discussion with ecosystem conferences and meetups held regularly in most major cities and increasingly being held in smaller towns and rural areas as a means to revive or kick start local economies. The challenge for most regions today is how to practically plan and implement such programs in these areas more than to debate their validity.

While they were written 30 years ago, these papers and books seem more relevant today than ever. This too was part of their prediction – that it would likely take a number of years, perhaps even decades, for most regions to fully embrace and adapt to this new reality (Smilor, Gibson & Kozmetsky, 1989; Gibson & Butler, 2013), and that it would require visionary leadership and unconventional approaches to serve the needs of a changing society ushering in a new knowledge-based economy (Roueche, Baker & Rose, 1989). It is not clear that they would have predicted for it to take 30 years. However, they did articulate a compelling case for proactive leadership across sectors to gain competitive advantage over slower moving regions. They provided ample evidence of some regions that had successfully taken this approach with great results. This study explores this concept in conversation with real-world leaders.

The ripples that these visionary authors started in their respective disciplines have resulted in wave after wave of new books, articles, and popular events on these topics in recent years. Regions seem to finally be coming around to the notion that working together as a regional ecosystem provides a number of distinct competitive advantages over going it in alone in traditional silos. This study is intended to provide a practical look at how one region is doing in these areas with the goal of putting together an easy-to-use dashboard or balanced scorecard and a step-by step process for engagement based on lessons learned. The goal is to spark dialogue, share ideas and experiences, identify gaps and opportunities, as well as equip regional leaders to facilitate a dialogue to foster a healthy and robust ecosystem that meets local needs.

Given the above stated assumptions and scope of the study, the researcher set out to find the best practical frameworks to gain a good understanding of these dynamics in Regional Economic Development Ecosystems (REDE – Detailed description provided in of Definition of Terms section later in this chapter). Detailed discussion of the literature in related disciplines is

provided in the Literature Review in Chapter 2 of this study. After weighing a number of models

and potential approaches, the researcher chose to utilize a combination of theoretical frameworks

for analysis of these changes in Tarrant County.

Figure 1. The Technopolis Wheel of Influencers
(Smilor, Gibson, & Kozmetsky, 1989)

The Technopolis Wheel of Influencers
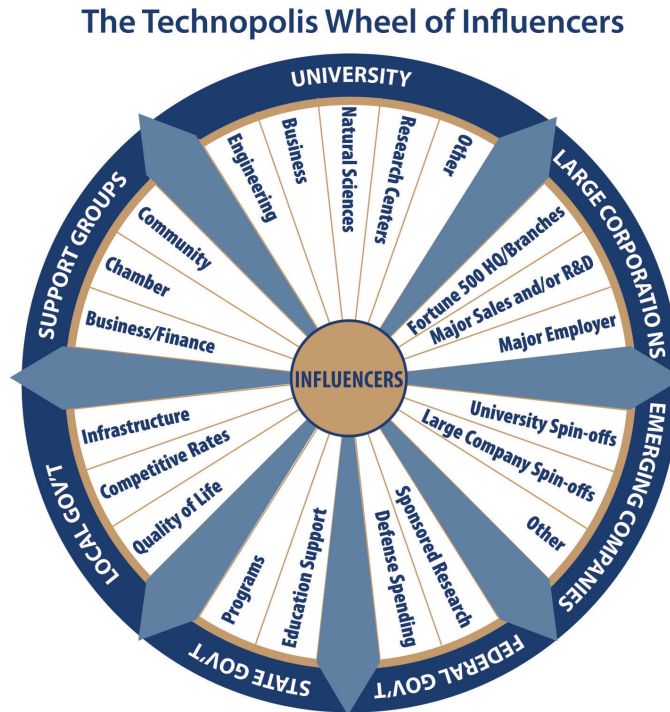
As an initial step, the Austin Technopolis Wheel (See Figure 1) was utilized to segment

regional influencers for interview and analyze workforce and economic development in the

region. By using the model to break down the complex dynamics of the ecosystem into more

observable influencer groups, the researcher is able to zoom in on challenges and opportunities

faced within each influencer group. Once these observations are identified, the analysis

framework provides an effective lens to study, compare, contrast, and consider ways that

knowledge can be shared and relationships can be enhanced through targeted areas of

collaboration. This process can be referred to as collaborative leadership coupled with knowledge and technology transfer and adoption, also known as KTTA.

As presented in the literature review section of this paper, researchers from a number of disciplines such as Kozmetsky, Gibson, Smilor, Roueche, Boggs, and Etzkowitz all identify leaders and influencers as integral to the successful bringing together of resources, people, and institutions to address the evolving needs of workforce and economic development. However, the researcher was not able to find significant examples of published research that used this methodology specifically to place a lens on the role of workforce in regional economic development ecosystems. This study is intended to fill that gap in the literature and identify opportunities for follow-on research.

The Technopolis Wheel of Influencers (Figure 1) published in the 1989 article Creating the Technopolis by Raymond Smilor, George Kozmetsky, and David Gibson, describes the regional economy development synergies that result from focused cooperation between key influencers from regional government, business, and academia. Austin has provided a definitive case model for Technopolis research and is the regional case study that informed and inspired the use of the model in ecosystem development in regions around the world. IC² Institute researchers at the University of Texas continue to explore methods and practices with various groups of regional actors. Their global network of researchers and practitioners continue to discover new approaches meant to transform and sustain regional economic development as technology becomes more and more advanced and the knowledge-based economy proliferates in different regions worldwide. Lessons learned are then incorporated back into the model.

This study expands and adjusts the Austin Technopolis Framework to fit the regional context of Tarrant County. Based on the literature (Roueche, Baker, & Rose, 1989; Boggs &

Cater, 1994; AACC, 2010, 2012, 2014; Porter, 1990; Porter & Kramer, 2011; Porter & Spriggs, 2013; Hisrich, Duening, & Lechter, 2015; Pistoresi, & Venturelli, 2015) this study expands the Austin Technopolis to include community colleges and specifically examines the role of the community college in regional entrepreneurship and innovation ecosystems, a topic often omitted from similar studies. The researcher also distinguishes between teaching and research universities based on feedback and insights gained from participants. The goal of adding these influencer categories is to further break down the segments to discern the unique needs, gaps, and opportunities that each group is dealing with as well as identify ways that each segment can combine knowledge and resources in collaboration. Leaders and influencers were then asked to share their own unique opinions, observations, perceptions, and experiences. They were also encouraged to weigh in with ideas and suggestions for additional models and approaches.

Figure 2. The Technopolis Model for the Analysis of Innovation Ecosystems
(Gibson & Butler, 2013)
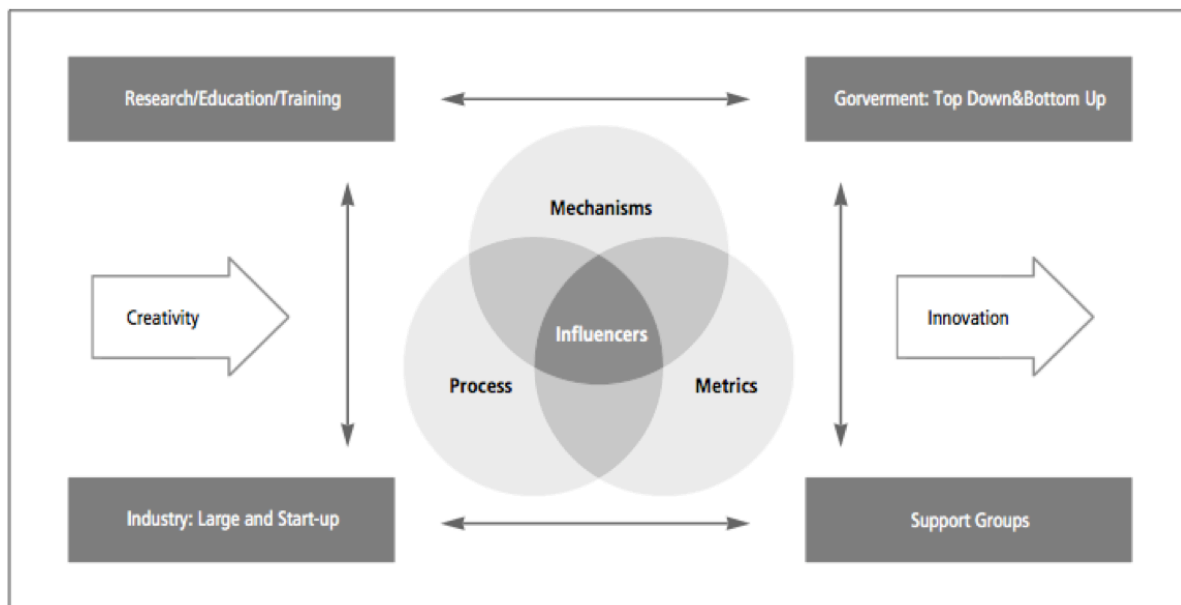
Impact is considered in this study through the lens of three drivers of value for the region: Human Capital (Education, training, and workforce), Economic Development (Recruitment,

retention, and organic growth), and Collaborative Leadership (Key influencer partnerships) to build the regional economy. The Technopolis Innovation Model (See Figure 2) provides a quick and easy way to identify and analyze relationships for knowledge transfer, collaborative leadership across sectors, and mechanisms for entrepreneurship, innovation, and wealth creation (Smilor, Gibson, & Kozmetsky, 1989; Gibson & Butler, 2013; Robison & Miller, 1991).

The model was used in this study to analyze and gain insights from the experiences and observations of participants. Where deemed helpful by the researcher, mechanisms identified during primary and secondary research were analyzed in terms of inputs, outputs, mechanisms, metrics, processes, and degree of success using this model. The culture, activities, and roles for each of the four sectors of influencers in Tarrant County were characterized in the local context and analysis was performed to consider gaps and opportunities.

This study utilized the Technopolis Innovation Model to consider ways to engage regional partners in all categories to devise plans for business development from their perspective and adjust offerings to include that value proposition. In keeping with the model, this study seeks to analyze and explore ways to develop value-added learning experiences for leaders and influencers as appropriate for each element of the wheel (Gibson & Butler, 2013). In order to gain a deeper understanding of gaps and opportunities applied to workforce and economic development in a real-world setting, the researcher conducted an in-depth case study of the regional economic development ecosystem (REDE) of Tarrant County, Texas, USA.

Participant Selection Criteria

Each leader was carefully selected and approached for the study based on four important factors:

1. The importance and relevance of the organizations they represent in the ecosystem.

2. Individual leadership roles in these organizations and other community organizations.

3. Their sustained influence and impact as ecosystem influencers in Tarrant County.

4. Their level of involvement in the ecosystem, workforce, and economic development.

Two Additional Frameworks for Analysis

Two additional established frameworks were utilized in the analysis of inputs from participants. For the purposes of this study, the lens is being placed specifically on cross-sector collaborations in workforce and economic development activities in Tarrant County, represented in the red overlapping portion of the following diagrams in Figures 3 and 5. It is within this scope and context that we approach this dialogue with leaders. Each model represents a body of ongoing research that compliments the work of Kozmetsky, Gibson, Smilor, and Butler as described in Chapter 2. These models focus on the interplay between sectors and regional actors and all are built on the premise that more deliberate and sustained interactions, shared knowledge, and aligned goals lead to better outcomes. Each model highlights different dynamics within the ecosystem. Together they yield a more comprehensive understanding from research.

Figure 3. The Triple Helix of Innovation
(Etzkowitz & Leydesdorff, 1997; Kimatu, 2016)

11
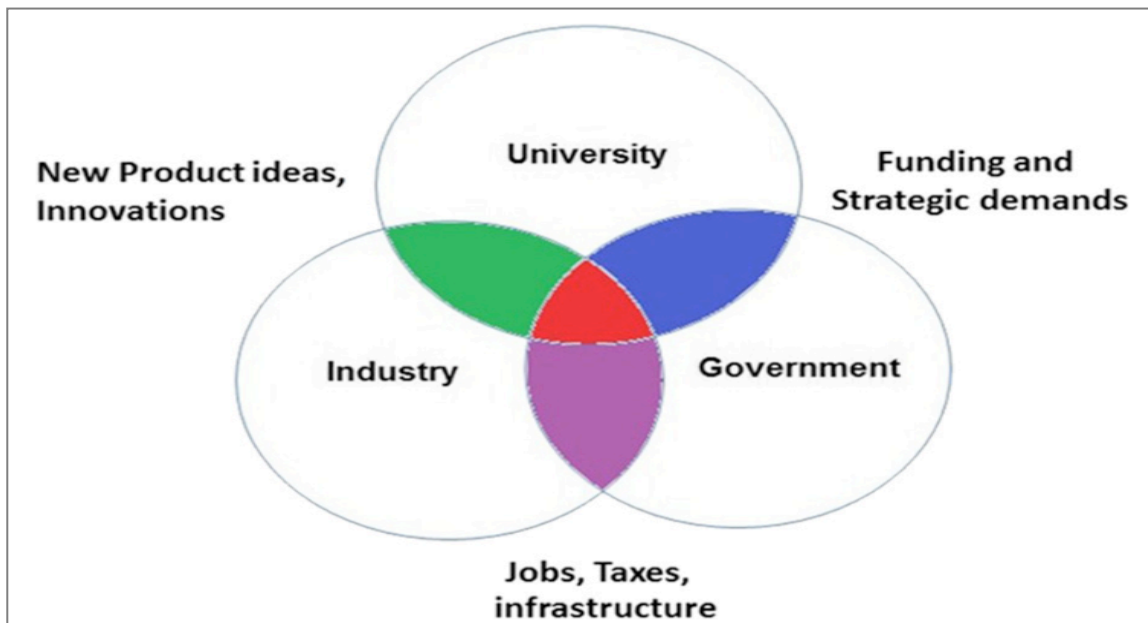
The triple helix of Innovation Model (Etzkowitz & Leydesdorff, 1997) (See Figure 3) places particular emphasis on the roles and interactions of three main sectors, ie: Government, University, and Industry. The model has been in wide use since the mid-nineties. Similar observations regarding the benefits of collaboration involving this triad have also been dubbed several other names by different groups of researchers from different disciplines and regions over time including the Golden Triangle by Wilson from the University of Massachusetts among others. The fact that the triad of relationships has been so widely studied lends credibility to its importance in the healthy functioning of innovation ecosystems.

Figure 4. The Triple Helix of Innovation – Circulatory System
(Dzisah & Etzkowitz, 2007)
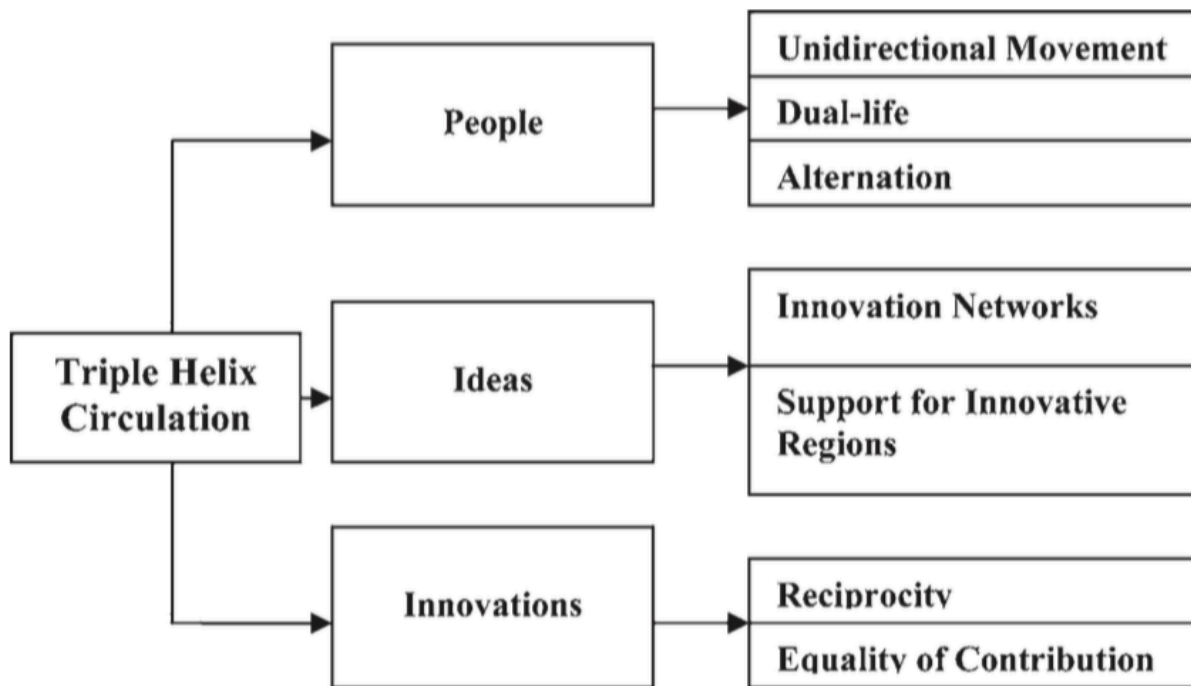
Each sector is described as serving a fundamental role or function within the ecosystem and interactions between them yield specific outcomes that benefit the community or region they serve. Interactions between university and government yield funding and strategic demands.

Interactions between government and industry yield jobs, taxes, and infrastructure. Interactions between university and industry yield new product ideas and innovations. Together they form a comprehensive infrastructure to support innovation.

Like the circulatory system in a living organism delivers replenished oxygen and nutrients to all parts of the body, the flow of people, ideas, and innovations brings crucial life-giving elements to the actors and projects in an innovation ecosystem (Dzisah & Etzkowitz, 2007). The authors assert that the breakdown of the flow of one or more of these elements can block or slow the rate of innovation ecosystems. They also suggest how they can be improved.

In more traditional or slow-moving environments built around functional silos with a central command and control structure, control can be exerted based on internal interests rather than the collective interests of society or the collaborative partners in play. The result is slower progress toward innovation goals, longer innovation cycles, and in some cases, lower motivation to innovate. Over time this can also lead to turnover among talented knowledge workers.

To resolve this problem they suggest that talent, knowledge, and technology flow freely between sectors, organizations, and work teams. This can include active recruitment of talent with experience in other sectors of the ecosystem, talent exchange or talent sharing as part of collaborative projects or programs, as well as focused training and professional development. This allows for a greater understanding of how each culture and organizational model functions and provides opportunities for more meaningful and effective collaborations over time.

For the purposes of this study, we will take a look at the concept of "helix transience," or the movement of key leaders and influencers who participated from one sector to another and sometimes back again, as an indicator for Tarrant County. The remaining elements of the model,

while extremely valuable for consideration, are outside the scope of this project and therefore a good candidate for consideration for follow-on research projects in the future.

Figure 5. The Quad Helix of Innovation (Depicting the rising importance of civic society as a means to address complex emerging issues in the REDE)
(Etzkowitz & Leydesdorff, 1997; Kimatu, 2016)
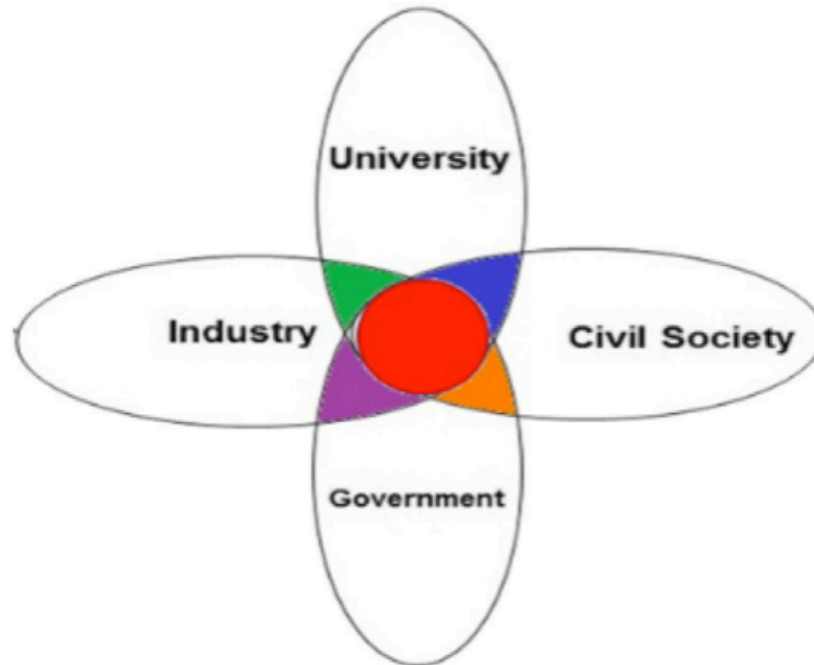
In keeping with the spirit and the evolutionary nature of the Triple Helix, in recent years an additional sector or "helix" has been added in some studies to include civil society or civic organizations that fill unmet needs in the ecosystem (Kimatu, 2016). This was originally observed in emerging economies with large-scale unmet needs and sometimes intense growing pains as societies adjust from rural and agrarian societies to more modernized industrial and knowledge-based economies. However, the model has been increasingly adopted for use in developed economies as well. This is described as a result of globalization, rapid technological advancements, and changing demographics (Afonso, Monteiro, & Thompson, 2010).

These needs can range widely depending on the circumstances. However, as societies seek to better understand and address the needs of people in a rapidly evolving environment, an increasing number of needs are being covered by organizations outside the traditional triad. The resulting version of the model is dubbed the Quad Helix of Innovation (Kimatu, 2016) (See Figure 5). This is yet another example of regional economies adjusting and evolving over time. It is also evidence of the rising importance of civil society as a means to address complex emerging issues in REDE's. Given the major role that civic organizations play in Tarrant County, and the increasing number of societal needs they address in the region, this fourth sector will be included for the purposes of this study.

Added Emphasis on the Role of Workforce

While these frameworks are well established and have been in use for decades, they do not emphasize the role of the community college as regional actor, nor do they place a specific lens on broad-based workforce development in regional ecosystems. Instead, most studies place a greater emphasis on research universities in education and on highly skilled and knowledge-based workers in the workforce. This study utilizes these frameworks to focus on community colleges in the REDE and uses a broader and more comprehensive definition of workforce to include all of those employed or unemployed and looking for a job within the region.

This approach focuses on the workforce capacity of the region as well as social mobility, addressing entrenched generational poverty, and other societal challenges faced in Tarrant County and elsewhere. In order to accommodate this broader approach, the research offers a thorough examination and set of conclusions regarding the role and influence of the community college along with other post-secondary educational institutions in regional economic

development ecosystems. The study provides a practical framework for leaders and influencers to identify gaps and opportunities for future engagement.

As previously mentioned, based on findings from the literature review and primary research, the researcher decided to augment the seven influencer categories in the Technopolis Wheel to include key stakeholder groups not represented in the original depiction of the model. Key leaders and organizations from these groups in Tarrant County were identified and added to reflect their growing importance in entrepreneurship and innovation ecosystems and shifting needs in economic development based on rapidly changing demographics, the impact of emerging technologies, and related economic factors. They were also found to be closely aligned in terms of mission, need for dedicated educational resources, and sense of urgency for updates to be implemented in economic development practices for regional economic growth.

The resulting list of targeted regional influencers for interview reflects an up-to-date version of the framework that is more closely aligned with the current state of the Tarrant County region and that reflects the evolving model of US education, training, and workforce development. After a careful selection process using the updated framework was completed, a total of 100 leaders and ecosystem influencers were identified, 70 were invited for interview, and 50 participated in the study. A detailed breakdown is provided in Chapter 4.

Focus on Four Specific Economic Development Activities

Four core economic development strategies from the International Economic Development Council (IEDC) training program, and specifically from the Introduction to Economic Development Manual, were used to design the interview instrument for the study. Influencer and community activities were assessed in four areas of economic development: Company relocation and investment (recruitment), growing existing companies (retention and

growth), creating new companies, products, and services (entrepreneurship and organic growth), and collaborative leadership (Institutional partnerships and global networks) to build a sustainable regional economy (Dragicevic, 2018; Powell & Grodal, 2005). Each term is defined later in the Definition of Terms section to provide clarity for the purposes of this study.

Based on these four strategies, the researcher formulated highly targeted questions about economic development in the region, the experiences of the leaders in the ecosystem, and their opinions and perceptions about the current and future role of workforce in the county. Information was then coded and mapped to inform conclusions and recommendations.

Findings reflect a significant shift in the role of workforce in regional economic development over recent years to include new activities, partners, and expectations from the communities they serve. One notable shift is the increased level of scrutiny from funding sources such as local, state, and federal government, as well as private sector sources such as foundations, high net worth individuals (HNWI), and corporate partners. As an example, many community colleges and state universities are being held to key performance indicators (KPI) in order to continue to receive public funding and support. This has drastically changed the role of educational leaders and increased the need for greater time and resources to have a positive impact on these KPI. As demands increase, so does the importance of workforce in the region.

It is evident in the literature and the case study that educational institutions locally and nationally are at a crossroads on how to best engage externally to meet evolving and expanding expectations and needs in the communities they serve. Institutions are weighing trade-offs in culture, resources, and impact between models focused on some combination of dual enrollment, university transfer, workforce development, community development, and economic

development. Almost all higher education institutions are a mix of these elements, while some have specialized in specific activities. Most are in a state of evaluation and flux.

This study is specifically focused on regional economic development ecosystems to fill a research gap and meet a practical need for regional leaders in workforce development. The researcher does openly acknowledge that community development activities are cited in the literature and the study to be important factors in the development of regional ecosystems and economies. However, much more focus has been placed on workforce and education in community development in decades past. There is substantially more literature available on this subject, hence the limited focus and scope of this study on economic development, and specifically on four areas of economic development that align closely with the changing demographics of students and the comprehensive nature of the higher education mission. This work is intended to help fill this gap in the literature. There is significant opportunity for institutions of higher education to become directly involved in the building of entrepreneurship and innovation ecosystems and in the leadership of regional economic development. In an effort to aid and equip regional leaders and influencers to identify opportunities and gaps and make informed decisions on how to best address them, the framework was applied to analyze inputs and provide practical recommendations for follow-up activities.

Purpose of the Study

The purpose of this study is to shed light on workforce in the REDE of Tarrant County, Texas. The researcher applied the Austin Technopolis Framework (Smilor, Gibson, & Kozmetsky, 1989 and Gibson and Butler, 2013) to identify and select a representative group of key influencers from a range of organizations involved in economic development in the county. In addition, the researcher focused on current, ongoing, and planned economic development

initiatives as well as observed successes and failures in the county to determine what is working and what is not, as well as consider additional strategies that could help to make countywide economic development collaborations more successful.

Statement of the Problem

Like no other time in human history, technology and globalization are driving change at unprecedented rates and drastically shifting the way economies work. Companies require new resources and a higher level of trained worker, and regions require greater levels of connectivity and collaboration to survive and thrive (Moore, 1997). Millions of people from all walks of life are struggling to find their place in these new economies, businesses large and small are seeking trained, skilled talent to compete, and educational institutions and governments at all levels are scrambling to meet their needs. However, traditional methods for economic development are no longer adequate to address these changes (Ascani, Crescenzi, & Lammarino, 2012). Formerly booming cities are on the decline, depressed economies continue to suffer, and only a few select cities and regions are managing to make adjustments and place calculated investments quickly enough to allow residents and businesses to grow and prosper. How are they doing it? This new paradigm requires a current in-depth examination of regional economic development that takes these changes into consideration and adjusts to meet the needs of the modern global technological landscape (McGahey & Vey, 2008). This study seeks to achieve this goal through the unique lens of the role of workforce in regional economic development ecosystems in the US, with a practical focus on informing and enabling regional leadership across government, education, and private enterprise to collaborate more effectively to impact regional economy.

Institutions of higher education are currently facing unprecedented levels of scrutiny, calls for accountability, and diminishing funding from the state, leading to questions about

economic impact and return on investment (ROI) for taxpayers and supporters. At the same time, institutions of higher education, and community colleges in particular, are being hailed as vitally important to the future success of both US education and the US economy at levels unprecedented in history. Many attribute the newfound scrutiny on higher education and the increased focus on community colleges to changing needs in the US economy that are not being adequately addressed in traditional education. These needs include: Increased costs of education, rapidly shifting demographics among US populations, emerging challenges in K-12 education and a resulting explosion in the need for remedial education at the post-secondary level, and expanding needs of employers for skilled workers in fields with practical working knowledge of new technologies and applications in the marketplace (Boggs & Cater, 1994; Boggs, 2011).

This places tremendous pressure on higher education leaders to shift from internal focus and culture to a culture of external engagement in order to evolve and address these needs. As this dialogue unfolds, the role of workforce in economic development, the impact that workforce has on regional economies, and the need for more effective workforce development activities is becoming more and more central to the leadership of higher education. It is also closely tied to the consideration of whether taxpayers are willing to continue to provide support to state colleges and universities in the communities they serve. In the meantime, institutions of higher education are seeking new avenues for financial support and exploring new strategies for sustainability (Carlino, Chatterjee, & Hunt, 2001).

In some cases, colleges and universities are already being measured based on economic indicators. Trends in the news and governmental discourse indicate that many federal, state, and local authorities intend to impose greater requirements on state-funded institutions of higher education to demonstrate their economic impact on the region in order to continue to receive

public funding. If this trend holds, it will require that higher education leaders consider their role in regional economic development ecosystems and weigh options for how to influence and impact economic development initiatives in their communities most effectively (Berger & Fisher, 2013). This is a relatively new focus for higher education leaders even though it has always been an embedded aspect of what colleges and universities provide. Leaders will therefore need new toolsets and enhanced skill sets in these areas to succeed.

How do cities and regions compete for talent, companies, and investment to grow the economy and improve quality of life in a hyper-competitive fast-moving technology-based global age? In 1989, two sets of scholars from different institutions and disciplines attempted to answer this question, both publishing seminal works predicting a coming tsunami of technological and societal change and addressing the role of collaborative leadership in fostering innovation and entrepreneurship in communities (Roueche, Baker, & Rose, 1989; Smilor, Gibson, & Kozmetsky, 1989).

They cited contemporary innovations such as the mobile phone, desktop computing, advances in medicine, and the emerging internet as precursors to a coming age of connectivity and cited technology as a means to bring people together. They painted a positive picture of economic growth for regions that learn to compete in these new economies, and particularly those who can rapidly train and deploy a skilled workforce to fuel growth. Even though their research efforts were not connected, and their backgrounds and approaches were different, the two teams provided strikingly similar evidence and overlapping recommendations for leaders to work together to proactively develop and sustain a technology based regional economy.

One group approached the problem from the perspective of the research university (Smilor, Gibson, & Kozmetsky, 1989). The other group approached the problem from the

perspective of the community college (Roueche, Baker, & Rose, 1989). Both keyed in on the potential impact of public-private partnerships and the importance of collaborative leadership across sectors and across borders. They tipped the hat to one another, acknowledging that universities, researchers, community colleges, and employers needed one another in this new age to compete and thrive given the rapid rate of change.

Both called for institutional and public policies to foster collaboration between education, government, and the private sector. Both declared the importance of education and training for economic growth and predicted a coming need for increased investment in education as new technologies emerge, greater numbers of learners and employers must be trained to keep up, and demands on higher education increase.

The challenges outlined in these two seminal works have since become more and more acute for both universities and community colleges and the communities they serve. Many scholars and practitioners proclaim that the time has come when these challenges must be addressed in order for the US economy, especially at the regional entrepreneurship and innovation ecosystem level, to sustain and continue to grow.

This study uses the tools and recommendations made by these scholars back in 1989 as a foundation, augments and updates them to fit the current reality, and applies the newly updated model to Tarrant County, Texas. Insights were used to develop a framework to enable regional leaders and influencers to recognize and assess opportunities, consider the unique role and culture of their institutions, and make informed decisions where to allocate resources and take action. According to Etzkowitz (1997), this requires significant leadership across sectors.

Significance of the Problem and Research

According to the World Economic Forum, 65% of the students entering grade school today will have jobs upon graduation in twenty years that do not yet exist because of rapid technological change, societal change, and globalization. How do we expect to prepare these students for roles that do not yet exist? How must our educational systems adjust to meet these unprecedented needs effectively in such a short timeframe? What challenges and opportunities exist for educational institutions and how can we address them?

The current rate of change is already greater than in any documented period in human history and is expected to increase by orders of magnitude in the coming two decades. This will require a significant shift in how regions approach economic development to include a greater emphasis and greater investment in workforce development and technical education (Clifton, 2011). As demands increase and timelines shorten for new technologies, markets, and the creation of new job titles and roles, regions that want to compete on the global stage will be required to increase capacity for rapid workforce development. It is very likely that public-private partnerships will continue to increase in order to achieve these goals, and parties on all sides of these partnerships will have to shift focus to become more agile for more rapid results if needs are to be met within the predicted timeframe of these developments. If accurate, higher education, government, and the private sector have twenty years or less to learn to work together more efficiently in order to effectively meet demands (Merisotis, 2015).

Yue and Kozmetsky (2005) paint a picture of changing workforce needs and rapidly shifting demographics and predict that higher education will not be able to keep up without a major shift of focus from internal metrics to external partnerships and impact. Gibson and Butler (2003) argue that research universities are well suited to meet many of the workforce and

innovation needs of the evolving Technopolis due to the knowledge base and research funding

they provide. Roueche, Baker, and Rose (1989) conclude that community colleges are vital to

the future of the US economy and quality of life and will likely grow more important as the rate

of new technology increases. They argue that community colleges are best suited to meet

workforce development needs by generating skilled talent for employers at an affordable rate.

The answer almost certainly lies in combination of these perspectives and approaches. It will

require institutions and sectors to work together, communicate, and collaborate to adapt and

address regional needs in a more timely fashion. This blending together will be crucial.

Feldman and Francis (2003) paint a clear picture of why leaders must open their eyes and

adjust quickly when they boldly proclaim: "Fortune favors the region that is most prepared. The

ability to make rapid leadership decisions, continually adjust, and rapidly create new programs

and partnerships will become more and more important as technology advances." The

availability of skilled talent in the region allows companies to quickly adopt and utilize new

technologies. This allows them to compete, grow, and hire additional talent at high wages. It

also enables technology transfer and commercialization from universities into the economy.

Both of these important mechanisms lead to job growth, wage growth, and increased tax

revenues. It is therefore of vital importance to have local capacity to rapidly identify workforce

needs and deploy resources to train workers at all levels and help companies boost employment

to compete, innovate, and grow. It is likely as scrutiny and oversight increase, that government

authorities and taxpayers will require greater accountability for higher education and other

workforce development partners to be more responsive (Kearney, Hisrich, & Roche, 2010).

As stated earlier, universities and community colleges are currently facing unprecedented

levels of scrutiny, calls for accountability, and diminishing funding from the state. The ability of

higher education institutions to work together to meet local needs is a crucial area for improvement. Questions are being raised about return on investment (ROI) and the impact they have on regional economies (good or bad). The emerging expectation is for regional workforce development efforts to begin to proactively help companies and industries to expand and shift and compete in order to increase earnings and investment regionally. This will require a shift in leadership approach, culture, organizational structure, and training (Foss & Gibson, 2015).

Research Questions

Research Questions: What role does workforce play in the REDE of Tarrant County? What are the specific dynamics at play in the ecosystem in regard to workforce and each of four categories of economic development activities in the county, ie: Company recruitment, Company retention and growth, Entrepreneurship (The creation of new companies), and Collaborative leadership across institutions and sectors? What is the REDE of Tarrant County doing well and what could be done to improve the responsiveness and performance of workforce and regional economic development within the ecosystem?

Definition of Terms

The following definitions include various concepts that are central to this study. If you are highly familiar with the history and complexity of regional ecosystems, you may choose to skip this section. For most readers, the purpose of this section is twofold: 1. To provide a broad definition as well as basic context for each of the key terms used in this study vis-à-vis the use of the term over time and broader usage in society. This is in large part intended to help inform the broad set of stakeholders in areas that may not be part of their daily work, but have some impact on the success of the REDE as a whole, and 2. To narrow that broader definition to define a practical working definition for the specific purposes and context of this study.

In cases in which the key terms are difficult to define, or the use of the term is quite different among key stakeholders, historical context is provided along with contextual or environmental aspects contributing to its usage. This dissertation is focused on the role of workforce in regional economic development. Examples, definitions, and usage of these key terms are intended to serve as basic explanations of the language used in the study intended to be approachable and easy to understand for a broad and diverse audience. Since the nature of regional economic development involves a wide range of actors from all walks of life, educational backgrounds, and organizational missions, definitions are provided with the goal of clarity and operational focus across this diverse population. In each case, the goal of the study is to provide a means for practical, actionable collaboration in the field.

Austin Technopolis Model: The Austin Technopolis Model was developed by researchers from the IC^2 Institute at the University of Texas at Austin including Smilor, Gibson, and Kozmetsky in the 1980's as a framework to chronicle the history and study the development of Austin, Texas, as a "city of technology" or "Technopolis" with a strong regional economy based on high technology development and related growth (See figure 2). They concluded that successful development was a result of significant levels of collaboration and influence among key organizations and leaders between the 1960's and the 1980's. Since the model was first introduced, it has been utilized in many regional studies worldwide and cited widely as a useful framework for regional development.

Austin Technopolis Wheel: Using the case of Austin, Texas, they developed a conceptual framework, the Austin Technopolis Wheel, to describe the key influencers that lead and

influence the process of high-technology development and economic growth in a Technopolis (See Figure 1). The wheel reflects the interaction of seven major segments in the institutional make-up of a Technopolis: the research university, large technology companies, small technology companies, state government, local government, federal government, and support groups. Finally, and perhaps most importantly, are key individuals, or influencers, who link the seven segments of the wheel. IC^2 Researchers continue to utilize the Technopolis Wheel to study regional development and continue to adapt the framework as they explore methods and practices to transform and sustain ecosystems worldwide.

Business Accelerators: A business accelerator is an organization or structured program that provides companies timely access to resources, contacts, mentorship, investors, and professional services to increase their chances of achieving goals such as becoming stable, self-sufficient businesses. Accelerators generally focus on periods of strain or high risk during the company lifecycle such as startup phase, rapid growth, and expansion. According to the Canadian bank BDC focused on entrepreneurs and startups, "Companies that use business accelerators are typically start-ups that have moved beyond the earliest stages of getting established. They have basically entered their "adolescence," meaning they can stand on their own two feet but need guidance and peer support to gain strength." Given this awkward stage of development, these companies often lack sufficient resources or experience to hire full-time professionals to meet these needs. In many cases, earlier stage companies that may not be mature enough to benefit from or qualify for an accelerator would consider applying to enter a business incubator, or seek out a unique accelerator program focused on early stages of development (BDC, 2018). Accelerators can also focus on specific industries, sectors, stages of company growth, or to help

bring entrepreneurs together to solve a specific societal problem or need. The primary goal is to bring companies together facing similar challenges and couple them with a support network.

Business Ecosystems: According to Moore (2006), "Business ecosystems are complex interrelated systems of businesses, government entities, educational institutions, and civic organizations that work together to identify opportunities, collaborate to overcome challenges, and proactively develop economies. For the last two centuries, economists have studied economies in three major forms in most of the literature including companies, markets, and heirarchies." The term business ecosystem, derived from observation of natural ecological ecosystems, emerged as a fourth form addressed in research in recent decades that encompasses the other three into one, and focuses on collaborative and competetive relationshionships in a given region. Ecosystem implies collaborative symbiotic relationships (Moore, 2006).

Business Incubators: According to BDC Bank, "A business incubator is a program that gives very early stage companies access to mentorship, investors, and other support to help them get established. Most companies that use business incubators are start-ups in their "childhood" phase, meaning they have just launched and are still defining their operational models and goals." Like eggs in a nest, these fledgling businesses are generally vulnerable to the harsh conditions of the marketplace and have difficulty competing on their own against established players. They experience a high level of need for external funding, advice, mentorship, and leadership in order to solidify a business model, product, or service to sustain the business over time. They seek resources to fill these needs as part of their "incubation". Businesses that are successfully incubated to the point of needing additional services to grow and face new

challenges (During periods of rapid growth for example), may consider a business accelerator for support. Some businesses benefit from both and some incubators will host accelerators to meet the needs of portfolio companies (BDC, 2018). Increasingly, incubators are becoming more and more focused on specific sectors of the economy, industry clusters, and areas of technology or research. In some cases, incubators are also focused on serving the needs of a particular population, group of entrepreneurs, or a specific geography to meet specific needs.

Chambers of Commerce: According to the Association of Chamber of Commerce Executives, "A chamber of commerce is an organization of businesses seeking to further their collective interests, while advancing their community, region, state or nation. Business owners in towns, cities and other territories voluntarily form these local societies and supporting networks to advocate on behalf of the community at large, economic prosperity, and business interests. Chambers have existed in the US for more than two centuries, with many having been established before the jurisdictions they represent. A business-led civic and economic advancement entity operating in a specific space may call itself any number of things, board of trade, business council, etc., but for the purposes of this study, they are all chambers of commerce. Currently, there are about 13,000 chambers registered in the official World Chambers Network registry. There are more than 4,000 chambers of commerce in the US with at least one full-time staff person and thousands more established as strictly volunteer entities. Although a chamber is a non-profit entity under federal tax law, such a 501(c)(6) is free to undertake supporting business activities (referred to as "unrelated business income") such as publishing, trade shows, insurance programs, etc. In many cases, these activities are subject to business income taxes. Many chambers establish charitable/educational foundations, known as 501(c)(3)

corporations, to support eligible parts of the chamber's agenda. The allowable purposes and rules related to such supporting foundations are different than those that have been established for 501(c)(6) organizations. Chamber missions vary, but they all tend to focus to some degree on five primary goals: Building communities (regions/states/nations) to which residents, visitors and investors are attracted; Promoting those communities; Striving to ensure future prosperity via a pro-business climate; Representing the unified voice of the employer community; and reducing transactional friction through well-functioning networks. Most are led by private-sector employers, self-funded, organized around boards/committees of volunteers and independent, and they share a common ambition for sustained prosperity of their community/region, built on thriving employers" (Association of Chamber of Commerce Executives, 2018).

Collaborative Leadership: According to Oxford, "The process of engaging collective intelligence to deliver results across organizational boundaries when ordinary mechanisms of control are absent. It's grounded in a belief that all of us together can be smarter, more creative, and more competent than any of us alone, especially when it comes to addressing the kinds of novel, complex, and multi-faceted problems that organizations face today. It calls on leaders to use the power of influence rather than positional authority to engage and align people, focus their teams, sustain momentum, and perform. Success depends on creating an environment of trust, mutual respect, and shared aspiration in which all can contribute fully and openly to achieving collective goals. Leaders must thus focus on relationships as well as results, and the medium through which they operate is high-quality conversation" (Oxford Leadership, 2018).

Community College: According to the Department of Homeland Security, "The United States offers many types of postsecondary education. One type of note, once unique to the United States but becoming known and established in other countries, is the community college. Community colleges, sometimes called junior colleges, are two-year schools that provide affordable postsecondary education as a pathway to a four-year degree." According to the American Association of Community Colleges, "1,167 community colleges in the United States enroll more than 12.4 million students and serve almost half of all undergraduate students in the United States. Many of these community colleges are Student and Exchange Visitor Program certified, and all have nationally recognized accreditation." Community colleges offer many options to meet the needs of students of all ages and backgrounds. Many of these institutions are open access, meaning that anyone can apply and enter the college, regardless of previous academic standing or training. These institutions often adjust and grow programming to fill the unique needs of regional employers, students, and universities for transfer. They offer for-credit and non-credit programming ranging from short workshops and skills training to two-year associate degrees. These colleges tend to fill training needs for general education diplomas (GED) and other gaps not filled by other institutions. They also provide community enrichment programs and cultural events and activities to enhance quality of life and promote lifelong learning in the regions they serve (U.S. Department of Homeland Security, 2018).

Community Development: According to the National Association of Community Development Extension Professionals, "Community development is a practice-based profession and academic discipline that promotes participative democracy, sustainable development, rights, equality, economic opportunity and social justice, through the organization, education and empowerment

of people within their communities, whether these be of locality, identity or interest, in urban and rural settings. Community Resources & Economic Development (CRED) Extension work with communities to support activities that encourage broad participation and result in social, environmental, and economic improvement as defined by the community" (National Association of Community Development Extension Professionals, 2018).

Company Recruitment (Employer Recruitment) for Economic Development: The economic development strategy used to grow the regional economy by attracting, recruiting, and retaining existing firms from other regions to relocate and invest in the local (target) region. This strategy requires significant marketing and outreach externally in order to brand and promote the assets and advantages of the region. Companies are identified and targeted based on the profile the region is seeking to recruit based on various factors, ie: reputation, strategic importance, fit in the ecosystem, industry, local market need, external market access, revenues, number of employees, pay rates, employee job satisfaction, etc.

The goal of this strategy is generally based on the number and quality of the jobs the employer will bring coupled with any tax revenues and other benefits. However, in many cases, the regional authorities (municipal, county, state, for and non-profit organizations) will offer tax benefits, free land, support services, etc. to entice these companies to invest in the move. This strategy is very popular among elected officials and is traditionally favored among many of the strategies available due to the immediate and measurable impact these companies can have on the region, as well as the positive press received upon relocation (IEDC, 2015).

Company Retention and Growth (Employer Retention and Growth) for Economic Development: The economic development strategy used to grow the regional economy by engaging existing local employers to identify their needs and proactively help them to find the resources and solutions they need to compete and grow. This leads to higher employment rates, employer satisfaction, increased regional services for economic development, higher tax revenues, as well as more developed talent in the ecosystem. While this strategy has been in use for a long time, it is of increasing importance as regions become more competitive and companies become more savvy about comparing and shopping locations for the best deal. In addition, high growth startups and traditional small businesses grossly outnumber large-scale companies and overall make up a larger percentage of national employment. They are already there and require less resources to address and often will invest in new facilities, personnel, and other key assets as local employers. For these reasons, ED professionals are increasing time and budgets in this area in order to have a greater impact with the same investment (IEDC, 2015).

Co-working Spaces: According to the co-working company Christie Spaces, **"**Membership-based workspaces where diverse groups of companies, startups, freelancers, remote workers, and other independent professionals work together in a shared, communal setting. Unlike a traditional office, coworking spaces consist of members who work for a range of different companies, ventures, and projects." Axis House, another co-working company, describes it as, "Coworking spaces often promote a culture where it is the norm to help each other out, and there are many opportunities to do so; the variety of workers in the space means that coworkers have unique skill sets that they can provide to other community members. The social mission is inherent in the Coworking Manifesto, an online document signed by members of more than

1,700 working spaces. It clearly articulates the values that the coworking movement aspires to, including community, collaboration, learning, and sustainability."

According to an article in the Harvard Business Review, "In many cases, a person is not just going to work as part of a coworking space; they're also part of a social movement. Coworking spaces are normally accessible 24/7 and promote a flexible schedule in which companies and employees can work when, where, and how they feel most productive and in balance. This atmosphere tends to spawn a creative culture and attracts entrepreneurial people who want to make a difference in their communities" (Spreitzer, Bacevice, & Garrett, 2015).

Economic Development (ED): According to Feldman (2016), "Economic Development (ED) is the expansion of capacities that contribute to the advancement of society through realization of individual, firm, and community potential. Economic Development is measured by a sustained increase in prosperity and quality of life through innovation, lowered transaction costs, and the utilization of capabilities toward the responsible production and diffusion of goods and services. Economic Development requires institutions grounded in norms of openness, tolerance for risk, appreciation for diversity, and confidence in the realization of mutual gain for the public and the private sector" (Feldman, et al, 2016). Studies show that the sustained deliberate focus of regions on ED can have a significant impact on measures for prosperity and quality of life (EDA, 2018).

ED Measurement: Economic Development can be measured by the level of sustained increase in prosperity and quality of life within a region. Common indicators of successful ED include job growth, wage growth, increased wealth, greater numbers and increased success of companies, and increased tax revenues within a region. These indicators can translate into improved factors

of quality of life over time such as health, security, sense of belonging, educational attainment, and financial prosperity within the region (EDA, 2018). All of these factors are measurable over time, however, not all are measured in all ecosystems. Metrics and measures vary greatly depending on the goals, culture, and role of the measuring institution or entity. For the purposes of this study, special attention will be paid to how different influencers measure ED success.

Education: According to the OECD, "Defining the scope of education for data collection, reference is made to the International Standard Classification of Education (ISCED) where education is defined as "organized and sustained communication designed to bring about learning". The key words in this formulation are to be understood as follows: "Communication" in this context requires a relation between two or more persons involving the transfer of information (messages, ideas, knowledge, strategies, etc.). "Organized" means planned in a pattern or sequence with established aims or curricula and which involves an educational agency that organizes the learning situation and teachers who are employed (including volunteers) to consciously organize the communication. "Sustained" means that the learning experience has the elements of duration and continuity. "Learning" is taken as any change in behavior, information, knowledge, understanding, attitudes, skills, or capabilities, which can be retained and cannot be ascribed to physical growth or to the development of inherited behavior patterns" (OECD, 2002).

For this report, "education" as an influencer group represents all levels, stages, and types of institutions practicing education in Tarrant County. Particular focus is placed on post-secondary educational institutions such as universities and community colleges as influencers in regional economic development. Secondary emphasis is placed on high schools and other institutions and community partners that collaborate with universities and community colleges

and/or participate in the educational growth of college students immediately prior to or just after post-secondary education. This can also include private companies and learning collectives.

Entrepreneurship Ecosystems: According to Stam (2021), "An entrepreneurial ecosystem is a set of interdependent actors and factors coordinated in such a way that they enable productive entrepreneurship within a particular territory" (Wurth, Stam, & Spigel, 2021). "In recent years the fields of entrepreneurship studies, economic geography, urban economics, and the economics of entrepreneurship have moved closer to each other through research on the context of entrepreneurship, the growing recognition that not all types of entrepreneurship are equally important for economic growth, and the increasing interest in the entrepreneurial actor (influencer) within urban and regional economics" (Stam & Spigel, 2016). These developments have culminated in an emerging entrepreneurial ecosystem approach that explicitly focuses on how urban and regional contexts affect ambitious entrepreneurship and how the success or failure of ambitious entrepreneurship affects performance of the regional economy, economic development, and quality of life (Blackburn, De Clercq, Heinonen, & Wang, 2017).

Functional Economic Region: According to Robinson, "The definition of a region is the first key step in an economic impact or economic base analysis. Which sub-areas such as counties, municipalities, ZIP Codes, or Metro Service Areas (MSA), should be included or excluded? What principles guide region definition? In short, it all depends on the goal of the study. If, for example, you want simply to view data on a single county for a report to county officials, then defining your region as that single county is the obvious choice. But if you are doing more in-

depth analysis, such as estimating the economic impact of a major factory closure in a small city, then the area that will likely be impacted is more difficult to define" (Robison, 2018).

In this study the region is analyzed using an input-output model with the ultimate goal of identifying high-impact opportunities for collaboration among regional influencers in economic development as defined in the Technopolis Wheel (See figure 1). Tarrant County, including all zip codes and all 41 municipalities, is the primary focus of the case study. However, economic analysis was also conducted on the Dallas-Fort Worth metro area (DFW) and the State of Texas to provide context for the study relative to regional economic development.

Government: "The Constitution of the United States declares a federal government divided into three branches: Legislative, Executive, and Judicial that govern a union of 50 states with federal agencies, laws, and programs. The federal government maintains jurisdiction over states in specific areas, but there is significant variance in state and laws and operating environments" (USA.gov, 2018). According to the White House, "Powers not granted to the federal government are reserved for states and the people, which are divided between state and local governments. All state governments are modeled after the federal government and consist of three branches: executive, legislative, and judicial. Local governments generally include two tiers: counties (also known as boroughs and parishes) and municipalities (also known as cities and towns). In some states, counties are divided into townships. Municipalities can be structured in many ways, as defined by state constitutions. Various kinds of districts also provide functions in local government outside county or municipal boundaries, such as school districts or fire protection districts. Municipal governments are generally organized around a population center and in most

cases correspond to the geographical designations used by the United States Census Bureau for reporting of housing and population statistics" (White House, 2018).

For the purposes of this study, all three levels of government defined above, federal, state, and local, are examined and considered as influencers in regional economic development. Specific jurisdiction, resources, budget, programs, and governing role of each level is also considered in relation to workforce and economic development ecosystems.

High School: According to the US Department of Education, "Also known as secondary schools, high schools enroll students in late adolescence (Normally ages 13-19) in the upper grades of the K-12 educational system, generally 9-12 with variations. In the United States these tend to be comprehensive schools enrolling students of widely different interests and capabilities who follow different educational tracks within the same school. These schools can be public, private, alternative school models such as charter or magnet schools focused on a particular focus or approach (technology, religion, accelerated learning models, etc.), or early college high schools developed as part of post-secondary schools such as community colleges and universities, and vary by state and school district" (U.S. Department of Education, 2008).

For the purposes of this study, we will focus primarily on post-secondary education, which includes high school students, in ever-growing numbers, who are earning university or community college credit while in high school through Early College High School (ECHS) and Dual Credit opportunities. The researcher also looked at General Diploma (GD) programs for people going back to complete their high school credential as part of workforce development. A variety of courses are available online or in person. While accreditation standards are consistent across locations and faculty who teach for college credit, the locations and formats can change,

ie: Some of these classes are taught at the high school, some at the university or community college, and some at community sites (Barton & Coley, 2011). This study considers the key role high schools play in collaborative partnerships, college transfer, and workforce development.

Industry Clusters: According to Slaper and Ortuzar (2015), "Industry clusters are regional concentrations of related industries. Clusters consist of companies, suppliers and service providers, as well as government agencies and other institutions that provide education, information, research and technical support to a regional economy. One might say that clusters are a network of economic relationships that create a competitive advantage for certain firms in a particular region. This advantage then becomes an enticement for similar industries and suppliers to those industries to develop or relocate to a region. These advantages are often associated with lower cost of doing business due to proximity and the availability of talent to fuel growth. A cluster-based approach starts with the industries and assets that are already present in the region and regional stakeholders pursue initiatives to make those industries better (SDRG, 2018). An approach for creating entirely new clusters in a region is a strategy to improve overall business environment conditions, by upgrading skills, access to finance and infrastructure, by streamlining government rules and regulations, by supporting local demand, and by being open to foreign investment and competition. Clusters are groups of inter-related industries that drive wealth creation in a region, primarily through export of goods and services" (Slaper & Ortuzar, 2015).

Innovation: According to Nicoara, et. al. (2013), "Innovation is known as the basic condition for the sustainability, durability and competitiveness of a business" (Nicoara, Maier & Maier, 2013). According to Jackson (2010), "The two ways to increase economic output within an economy

are to increase the number of inputs in the productive process, or think of new ways to get more output from the same number of inputs. The latter is the essence of what is broadly meant by innovation, which is defined as the introduction of new or significantly improved products (goods or services), processes, organizational methods, and marketing methods in internal business practices or the marketplace. Innovation is believed to be the fundamental source of significant wealth generation within an economy. Because high-tech industries offer higher growth potential, the best way to spur job creation and economic growth is by more efficient translation of innovations from the knowledge economy into the commercial sector. Federal, state, and local governments are actively seeking to grow their economies by creating jobs.

A higher growth rate for high-tech industries, in particular, offers a strong incentive for government entities to actively develop and nurture innovation" (Jackson, 2010). According to Corkindale (2008), "The term "innovation" is useful to define in three categories. Discontinuous innovations (also known as disruptive innovations), comprise something with a completely new-to-the-world set of attributes, which either gives rise to a new product category or industry, or a completely new way of solving an existing problem, giving rise to a new version of the product or service solution (That destroys the old industry norms and replaces them with the new). The latter concept is one coined by Schumpeter (1912, 1934) as Creative Destruction. Continuous Innovations (also known as incremental) comprise something with small-scale alterations or enhancements to existing products. There is a third class, Dynamic Continuous Innovations, where the technology may be new but the product into which it is put is, to all intents and purposes and as far as the user is concerned, just an improved or different form of what already exits" (Corkindale, 2008).

Innovation Ecosystems: According to Jackson (2010), "The innovation ecosystem is comprised of two distinct but largely separated economies: The knowledge economy, which is driven by fundamental research, and the commercial economy, which is driven by the marketplace. The two economies are weakly coupled because the resources invested in the knowledge economy are derived from the commercial sector; this includes government research and development (R&D) investments that are ultimately derived from tax revenues. An innovation ecosystem models the economic dynamics of the complex relationships that are formed between actors or entities whose functional goal is to enable technology development and innovation. In this context, the actors would include the material resources (funds, equipment, facilities, etc.) and the human capital (students, faculty, staff, industry researchers, industry representatives, etc.) that make up the institutional entities participating in the ecosystem, IE: Community colleges, universities, business firms, venture capitalists (VC), industry and university research institutes, federal or industrial supported Centers of Excellence, and state and/or local economic development and business assistance organizations, funding agencies, policy makers, etc.)" (Jackson, 2010). According to Adner and Kapoor (2009), "A firm's competitive advantage depends on its ability to create more value than its rivals. Greater value creation, in turn, depends on the firms' ability to innovate successfully. The ecosystem construct, as a way of making interdependencies more explicit, has gained prominence in both business strategy and practice. This approach therefore focuses on understanding coordination among partners in exchange networks that are characterized by both simultaneous cooperation and competition, in order to better understand how they each benefit from the exchange" (Adner & Kapoor, 2009).

Jolly Model for Technology Transfer and Commercialization (TT/TC): The Jolly Model was created by Vijay Jolly in 1997 to provide a practical framework and toolset for TT/TC professionals, commercialization partners, educators, and aspiring new talent. First, he breaks the technology commercialization process into nine components comprised of five major steps, and four identified opportunities between steps for the champions of innovation to mobilize resources and people to help communicate effectively and bring all necessary resources to the table for commercialization. Jolly's model is unique in that he focuses equally on advocating for the new innovation to move it from step to step as he does the steps themselves. This people-focused element is unique from similar models and has emerged as a differentiator for the Jolly Model among TT/TC professionals. In short, without the culture, talent, skills, and support mechanisms to effectively garner resources and support to advance the innovation, everything else is unlikely to succeed. Jolly, therefore, advocates for a deliberate people-focused approach to TT/TC that calls for education, skill development, and learning by doing among TT/TC professionals to effectively advocate and garner support at each stage of commercialization to advance the innovation to the next stage as defined in the model. The ultimate goal is to get the innovation transferred out of the research institution, commercialized, and in-use in the marketplace to solve problems, meet customer needs, and improve quality of life (Jolly, 1997).

Knowledge and Technology Transfer and Adoption (KTTA): Also known as Knowledge and Technology Transfer (KTT), Knowledge and Technology Transfer and Adoption (KTTA) is the process of sharing, exchanging, implementing, and leveraging knowledge, know-how, IP, talent, and the ability to execute a particular strategy or tactic between organizations and groups of collaborators. The "Adoption" component was added once the KTT movement had taken root,

in order to emphasize the fact that even organizations that are able to successfully transfer knowledge and technology often struggle with the culture, responsiveness, and openness needed to effectively adopt these assets and utilize them in a functional way.

This reinforces the importance of KTTA overall and the need for practical application of KTTA principles to affect positive outcomes. On the surface, it is the sharing of tricks of the trade. However, with the explosive rise in knowledge-based economies worldwide over the last 30 years, KTTA has become a discipline and area of extensive research, with a sophisticated body of work including best practices, professional development, and numerous examples of successful implementation in firms with good results. In some cases, the implementation of KTTA programs has led to major competitive advantage for firms. KTTA has therefore become increasingly popular among graduate education programs and corporate leadership programs. KTTA often entails connectivity and collaboration between private firms, public sector programs, and institutions of higher education.

"Firms (Along with these public sector and education partners) are searching for ways to connect external knowledge resources to their own knowledge production in order to increase productivity and improve commercialization outcomes. Beside other enterprises (suppliers, customers, competitors, etc.) public research organizations increasingly serve as a valuable source for in-house research and development (R&D) activities and innovation activities (or an external source of IP). Public research institutions may serve to support the technology generation or the adoption of a new technology. Furthermore, they may act as a competent research partner for concrete R&D problems or advise on technology strategies. All in all knowledge and technology transfer and adoption (KTTA) between public research organizations and private firms is conducted in various forms. Thus, it is advisable to define transfer activities

very broadly. Our definition of KTTA comprises any activities targeted at transferring knowledge and technology that may help a company or a research institution – depending on the direction of the transfer – to further promote its activities" (Arvanitis & Woerter, 2006).

Makerspaces: Definitions of makerspaces vary greatly based on discipline, perspective, and mission. Makerspaces are also evolving over time and rapidly increasing in number and diversity of host institutions, target populations, and desired outcomes. A broad definition that is popular among school librarians describes a makerspace as "a place where people come together to create and collaborate, to share resources, knowledge, and stuff" (Britton, 2012).

In principle, no two makerspaces are the same, nor should they be. There is no specific formula that fits all needs (Moorefield-Lang, 2015). The definition shifts depending on focus and goals. Some makerspaces focus on the core capabilities of the space such as technology, prototyping, or technical problem solving. Others focus on target populations of people or communities that use the space and cater offerings to meet their particular needs (Dougherty, 2012). There is also an important social phenomenon at work that sets makerspaces apart from a community standpoint. Both practitioners and patrons describe their makerspaces as "a social space where makers share the discovery process, support each other, and engage socially" while creating and discovering new ways to create (Barniskis, 2015). This environment tends to develop strongly networked groups with lots of knowledge sharing, skill building, and shared resources. This has helped makerspaces gain popularity and earned a reputation for loyal users and fervent proponents from the maker community (Barniskis, 2014).

On a practical note, many makerspaces are designed to meet a specific targeted need in the regional economy such as a gap in available equipment or skilled labor, and can be defined as

"a unique network of people, programming, and tools organized around a mandate associated with technical literacy or agency" (Whyte, 2017). While this is the case, many institutions and communities are trying to strike a functional balance between the freedom and expression of the traditional maker movement and the realities of the communities they hope to impact.

In this study, all of these elements are combined with entrepreneurship, innovation, and place making to be defined as: An organization, place, or facility that formally or informally provides space, equipment, materials, services, education, training, leadership, and/or related programming to foster and enable a culture and community of makers, doers, tinkerers, and/or creators. For the purposes of this study, particular focus is placed on the importance of these places, their networks, and the principles that make them successful in the workforce development and economic development of a region.

Organic Growth (Entrepreneurship) for Economic Development: Organic Growth in ED is also referred to as entrepreneurship or small business development. Entrepreneurship has many definitions (Davisson, Delmar, & Wiklund, 2006) such as "the creation of new organizations" (Gartner, 1988). It is also viewed as "the creation of new enterprise" (Low & McMillan, 1988) and "the process in which individuals, either on their own, in teams, or within an organization, pursue opportunities without regard to the resources they control" (Stevenson and Jarillo, 1990).

It is the "discovery and exploitation of profitable opportunities for private wealth, and as a consequence, social wealth as well" (Venkataraman, 1997). The classic view sums these up as "the creation of new economic activity", regardless of type of firm, stage of firm, size of firm, and position/rank of the individual entrepreneur (Schumpeter, 1934). From an economic development perspective, entrepreneurship is the culmination of these factors and is all about

starting and growing organizations that: 1. Employ people, 2. Pay taxes, and 3. Contribute knowledge, know-how, leadership, investment, resources, and a positive reputation to the region. "This produces shared value for the firm and community in three ways: 1. By preconceiving products and markets, redefining productivity in the value chain, and building supportive industry clusters at the company's locations. Each is a virtuous circle of shared value; improving value in one area provides opportunities in the others" (Porter & Kramer, 2011).

Entrepreneurial development includes a range of activities designed to assist and support entrepreneurs start new businesses and grow expanding businesses as well as investors to identify, evaluate, and invest in new and high potential firms to enable rapid growth. These activities can include all stages of product and service development, deployment, sales, distribution, customer relationship management, and innovations to kick start the cycle again. Entrepreneurial support for new business owners include technical assistance, financial assistance, mentorship and advisors, as well as introductions to key collaborators, investors, bankers, professional services, and customers. Some help companies establish relationships, develop customer base, and raise money. All entrepreneurship ED programs work under the premise that having more employers and helping them to become healthy, competitive, growing companies will lead to more jobs and higher quality of life for residents of the region (IEDC, 2015). The organic growth strategy attempts to match resources, knowledge, and networks to help bring this about.

Private Sector: Defining the private sector is essential to understanding their role, interests, and potential areas of participation in economic development. However, this can be difficult when working with a broad set of actors operating from diverse points of view. This has contributed to

some confusion in economic development circles and is attributed in some cases as an impediment to successful collaboration (Arndt, 1981). For example, The Organization for Economic Cooperation and Development (OECD) offers a very broad definition that includes "private corporations, households, and non-profit institutions serving households" (OECD, 2015). Many researchers and government entities strictly limit it to the corporate and business world, specifically "organizations that have a core strategy and mission to engage in profit-seeking activities through the production and provision of goods, services, and/or commercialization" (Di Bella, et al, 2013).

According to the Development Cooperation Network (DCN), the meaning also relates to private investors and private foundations. While some disagree about what category they fall into, "these long-standing privileged partners of official development policies seem set to see their role boosted in the future; they constitute a large percentage of what we understand to be the private sector" in economic development circles of policymakers and practitioners (Development Cooperation Network, 2011). An added level of complexity comes from the diversity among firms, their missions, needs, and their roles in the regional economy.

Companies bring together a wide variety of actors of all sizes including multinational corporations (MNC) with global interests and influence, large-scale enterprises (LSE) with mostly regional interests and influence, Small and Medium Enterprises (SME) that make up the vast majority of businesses with under 500 employees and less than US$50M in revenues, micro-enterprises with less than 10 employees, and even individual entrepreneurs. "In the context of development effectiveness, it is important to distinguish between the role of domestic companies and foreign multinationals. Their interests can be conflicting" (Development Cooperation

Network, 2011). In the same vein, large established companies may have significantly different goals and needs than startups and early-stage companies.

The same holds true with for and non-profit firms, especially in terms of terminology, goals, and worldview. Investors include a range of profiles including high net worth individuals (HNWI), angel investors, and angel groups who invest their own money, as well as institutional investors such as venture capitalists (VC) and private equity firms (PE), who hire professional teams and invest other people's money. Private family foundations, cause-based foundations, public service non-profits, and other group funds are yet another type of investors. Each of these may have different interests based on the stage of the companies they invest in, the types of projects in which they participate, or the impact they seek to have in their communities.

For the purposes of this study, all of these diverse actors are included in the definition of private sector. For profits, non-profits, not-for-profits, and hybrid firms along with all non-governmental investment organizations of all shapes and sizes are included. Households and informal enterprises (not legally registered) are not included. The key defining factors here are non-governmental and legally registered. While this group is diverse, they are all within the reporting system but not bound by public monies or regulated as government entities.

Public Private Partnerships (PPP): "Public private partnerships are loosely defined as cooperative institutional arrangements between public and private sector actors. They have gained wide interest around the world, but few people agree on what a PPP actually is" (Hodge & Greve, 2007). Differences often seem to lie in the primary purpose or goal of the PPP. Some see the PPP as "a new governance tool that will replace the traditional method of contracting for public services through competitive tendering" (Hodge & Greve, 2007). This use of the PPP is

very popular and has caused some controversy and public debate. Others see the PPP as "a new expression in the language of public management, one intended to include older, established procedures of involvement of private organizations in the delivery of public services" (Linder, 1999). Others view the PPP as "a new way to handle infrastructure projects, such as building tunnels and renewing harbors" (Savas, 2000). Some use the terms "contracting" and "public private partnership" almost interchangeably (Hodge & Greve, 2007).

For the purposes of this study, the PPP is defined to include any formal written agreement (binding or non-binding) between the public sector and private sector in which mutual consideration (a measurable exchange of value) is demonstrated. This would include all contracts, memos of understanding (MOU), letters of intent (LOI), and other written agreements including value exchange. Informal agreements that have not been drafted and agreed to in writing do not qualify by this definition, but would be included in the broader definition of collaborative leadership if agreed to by the leadership of the organizations involved.

Quality of Life (QoL) and How it is Measured: In its simplest form, quality of life is the measure of well-being among the residents of a particular region. It is also the primary focus and goal of regional economic development as a profession and discipline. Everyone aspires to live a good life. But what does good (or better) quality of life mean? (OECD, 2011) How can we accurately define and measure it? More importantly, how can we positively affect QoL over time? These questions and how answers to them have changed over time are crucial in the definition of this term for the purposes of this study. Since QoL is the primary underlying goal of regional economic development, without a clear understanding of QoL and how it is

measured, it would be difficult if not impossible to effectively approach regional economic development with any degree of confidence.

In traditional regional economics, QoL is often measured by indicators such as economic performance and growth. David Ricardo (1819) focused heavily on the economic competitiveness and growth of nations. Later, Nobel Prize Winner Robert Solow (1956) noted that technological innovation is also a major factor, and that regional economies are defined more by clusters of regional and inter-regional innovation than mere political borders, especially as technology becomes integral in society and economy (Carlino, et al., 2001; Crescenzi, et al., 2007). Over time, the ability of regions to compete became the primary focus in the study and pursuit of economic growth. The definitions, characteristics, and capacities of regions became more concentrated on systems of innovation and less on political jurisdictions (Pike et al., 2006).

In each of these cases, and many others, leading economists tended to "conceptualize an economy as a machine that produces economic output as a function of inputs such as labor, land, and equipment. Growth occurs when output increases. Output can increase either when we add more inputs or use technology or innovation in order to enhance the efficiency with which we transform inputs into outputs. In part because of straightforwardness, economic growth, with its emphasis on increases in population, employment or total output dominates the debate, despite the fact that increases in any or all of these could be associated with both improvements and/or declines in prosperity and quality of life" (Feldman, et al., 2016).

However, "over time, evidence has emerged that standard macro-economic statistics, such as GDP, which for a long time had been used as proxies to measure well-being, failed to give a true account of people's current and future living conditions. It is now widely recognized that data on GDP provide only a partial perspective on the broad range of factors that matter to

people's lives" (OECD, 2011). While this global dialogue is still taking place, great progress has been made toward agreement on the definition of a common set of indicators and proxies that can be measured and worked against to result in improved quality of life. In the current office of measures and statistics for the United Nations (UN), it is stated that "Quality of Life, or the notion of human welfare (well-being), is measured (in large part) by social indicators rather than by strictly "quantitative" measures of income and production (UN, 2018). To tackle this challenge, the UN has developed "the Human Development Index (HDI), a summary measure, developed by the United Nations Development Programme, of average achievement in key dimensions of human development: a long and healthy life, being knowledgeable, and having a decent standard of living" (UNDP, 2018).

Spanning all of these points of view in the research literature, we can distinguish three categories of measurement: 1. Economic welfare, which can include measures such as the GDP of home country, earnings, earning potential, employment, disposable income, economic mobility of individuals and families, wealth accumulation, wealth creation, and economic stability of the region. 2. Social well-being, with the main objective to show the degree of needs-satisfaction in seven areas: food, housing, health, education, recreation, social protection, and material standard. This category can also include physical security and safety. 3. Subjective well-being, defined as the subjective feelings, opinions, and perceptions of the members of a society using life-satisfaction surveys to the objective determinants of quality of life across countries, such as financial situation, health, political stability and security, family life and community, the climate, the threat of unemployment, political freedom, and gender equality (Eissel, et al., 2014). This can also include hassle factors and perceived difficulty or ease of

living. An example could be how hard or easy it is to start a new business in a region. It could also be related to the availability of goods, services, and resources within a region.

Building upon these principles, the OECD has developed the following measures that have become widely accepted as strong indicators to measure quality of life in two major categories to address both individual/household well-being, and societal or environmental factors: "Individual and household well-being measures include: Health status, Work and life balance, Education and skills, Social connections, Civic engagement and governance, Environmental quality, Personal security, Subjective well-being, Material Living Conditions, Income, wealth, Jobs and earnings, and Housing. Sustainability and well-being over time measures require preserving different types of capital: Natural capital, Economic capital, Human capital, Social capital" (OECD, 2011).

From a social sciences perspective, "the importance of subjectivity in the definition of what QoL really is seems to be a key aspect. We argue that this subjective dimension could be the starting point for a more thorough understanding of QoL. As the ancient philosopher Epictetus stated, "What disturbs men's minds is not events but their judgments on events" (Prior, 1991). The assessment of psychological, spiritual, social variables, as well as other variables not strictly related to physical health, should be an important part of how Quality of Life is evaluated in the future. Most of all, our findings show the necessity for researchers and scholars to promote a clearer definition of the concept. So far, what is available is still unsatisfying, and risks leading us astray, especially considering the ethical consequences that different perspectives on Quality of Life can and do have" (Barcaccia, et al., 2013). "The United States ranks No. 17 overall by survey respondents for providing a good quality of life, up one position from 2017. Its highest

ranking is for its job market, where it ranks fourth. Its second highest ranking came in affordability, where survey responses placed it No. 5" (US News and World Report, 2018).

For the purposes of this study, QoL is defined as the standard of health, wealth, comfort, and happiness experienced by an individual or group within a particular region. Measures for QoL include five primary factors: 1. Health, security, and safety, 2. Lifetime earnings and disposable income, 3. Wealth creation and social mobility, 4. Educational attainment, and 5. Sense of comfort and belonging. Emphasis was placed on the availability, access, and level of participation in the things needed for a good quality of life, and how they are impacted with focused workforce development and economic development initiatives.

Regional Economic Development Ecosystems (REDE): The organizations, people, collaborations, and programs that make up the totality of economic development activities within a regional ecosystem. REDE's therefore encompass a number of sub-ecosystems such as education ecosystems, business ecosystems, entrepreneurial ecosystems, innovation ecosystems, industry clusters, etc. Regional economic development ecosystems are defined first by the functional economic region (See definition in this section) and secondly defined by the activities of the regional influencers included in the Technopolis Wheel (See Figure 1.). Like the sub-ecosystems they encompass, REDE's were originally conceptualized from the observation of nature and complex ecological ecosystems that produce and sustain life. In a similar fashion, REDE's are optimally configured and operated to not only sustain and grow the "life" of businesses and the economy, but also to sustain and grow the "quality of life" (See definition in this section) of residents within the region. This process is called REDE Optimization and it is a

primary goal of this study to gain insights that can help regional leaders and influencers to positively impact Workforce and ED in Tarrant County.

Regional Influencer: The term regional influencer has been defined in different ways in the literature depending on discipline and perspective. In the Austin Technopolis Model, the regional influencer is defined as an organization or institution (Smilor, Gibson, Kozmetsky, 1989). However, in much of the literature on higher education and the community college, regional influencers are defined more broadly as institutions or leaders of institutions (Roueche, Baker, Rose, 1989). In the social sciences and other disciplines, influencers are defined much more broadly as individuals with key relationships who build trust and bring about change over time through these connections (Cialdini, 2007) or even networks who collaborate to bring about a particular outcome (Rogers, 2005).

For the purposes of this study, regional influencer will be defined as any person, group, or entity that has a significant sustained influence on the workforce or the regional economic development ecosystem. It is recognized that institutions do enjoy the benefit of collective resources, established policies and leadership, and a greater degree of stability over time than the individual in many cases, and that they are on the whole easier to track and measure. However, it is also evident in the literature and in primary research that key leaders as well as established networks in the community have had and continue to have a major long-term impact as influencers in the ecosystem. For this reason, all three are considered in this study.

Startups: Startups are diversified and complex in nature. Various entities such as government agencies, investors, incubators, and accelerators provide parameters such as how long the

business has been in existence (Generally up to three to five years), revenues (Generally ranging USD$1-5M), investment (Seed, Angel, Series A, etc.), and stages of growth (Early stage, idea, seed, company formation, growth, etc.) to define startups. However, these parameters are often provided based on the specific audience or company profile being served or sought to participate and engage. From an investment standpoint, startups are defined by growth and performance and general expectations of angels and venture capitalists have shifted over time to look for more rapid growth, larger scale, and higher revue performance, especially in technology. Three rules currently used to define startups in the venture capital world include: 1. USD$100M in annual revenues if it's a software company, or $100M in trailing revenue otherwise, 2. More than 500 employees, and 3. A valuation of USD$2.5B or greater. Clearly these rules are broad rules of thumb and vary greatly based on industry, stage of investment, and profile of the firm. However, they lend good context to the changing nature of startup ecosystems and the rising expectations of performance in the marketplace. Hence, the term "startups" should not be confused with "small business" and startups can emerge from within an existing firm, also known as a "spinout", or be built from scratch. The term is also used increasingly in social and non-profit enterprise as well as non-governmental organizations with a societal mission.

From a company standpoint, each startup is defined uniquely based on the nature of the founders, markets, products, and services involved. They have a defined lifecycle with several key stages, each with unique challenges, needs, and desired outcomes (Harvard University, 2011). These stages include: 1. The bootstrapping stage, in which founders utilize resources they can muster including personal finances and debt, leverage sweat equity, often unpaid, build support among key stakeholders, build value in the company or idea through revenues, IP, and seek resources from friends and family. 2. The seed stage, when founders begin to formalize

company structures, develop products and services, establish initial business models, expand the team, and garner outside investment, often from angel investors or early-stage venture capital. 3. The creation stage, when the emerging company begins to engage in the marketplace and compete with products, services, and relationships with commercial partners and customers. This stage can include multiple cycles of innovation, growth, investment, and pivots in company direction. Many scholars consider companies out of the startup phase when this third stage is complete (Salamzadeh & Kesim, 2015). For the purposes of this study, startups will be defined as any company in one of these three startup stages.

Technology Transfer and Commercialization (TT/TC): Technology Transfer is the process of licensing or purchasing intellectual property from a researcher, inventor, or research institution. Technology commercialization is the end-to-end process of taking basic research discoveries, applying them to solve a real-world problem, developing a viable product or service based on that innovation, and bringing it to market. "A company's involvement in the technology transfer and commercialization process together with a research organization that has an innovative scientific and technical outcome results is a real opportunity to innovate, compete, and grow. Thus, the collaboration between the stakeholders participating in the technology transfer and commercialization process is intended to result in an efficient use of available skills and resources, with a major influence on the outcome" (Nicoara, Maier & Maier, 2013). Scientific research and the subsequent harnessing of new technologies are seen as the wellspring of future wealth. For this reason, governments fund public investment in research, provide commercialization and economic development support, and encourage private industry to do the same (Corkindale, 2008). As in the case of Tarrant County, these activities take place in

research universities, institutes, private sector labs, and defense sector labs. There is also a significant amount of risk capital and investment associated with these activities.

Triple Helix of Innovation: The combination of resources and collaborative leadership between the private sector, government, and education in order to address societal challenges and seize opportunities for economic growth and improved quality of life. The term was coined by Henry Etzkowitz in 2002 and cited as one of the primary factors in the successful development and growth of the "innovation corridor" economy surrounding the Massachusetts Institute of Technology (MIT) as an educational institution, but also as a research institution that was able to successfully collaborate for technology commercialization. This concept is also known as the Golden Triangle of Innovation and has been widely researched across multiple disciplines.

Quad Helix of Innovation: An outgrowth of the "Triple Helix" model that emerged based on both observation and feedback from innovation ecosystems. This concept was reinforced through the work of a range of scholars over time who cited examples of civic involvement a as key factor in innovation and entrepreneurship, especially when viewed as a scaled model or ecosystem of diverse actors and influencers. The resulting model expands the original to include civic organizations and a strong sense of civil society as a fourth major component of successful innovation (Kimatu, 2016). This observation and expansion of the model is consistent with the expanded view of the Austin Technopolis Model as expressed by Gibson and Butler (2013). For these reasons, a strong sense of civil society and a high degree of involvement among civic organizations and leaders is increasingly seen as a key factor in regional workforce and

economic development. For the purposes of this study, civic leaders will be included as key influencers with a unique perspective and resources to support the regional ecosystem.

Workforce (WF): WF consists of the people engaged in or available for work in the labor pool of a particular region, including those who are employed and those who are unemployed but available for work (Bureau of Labor Statistics, 2020).

Workforce Development (WFD): "WFD is the coordination of public and private sector policies and programs to provide individuals with opportunity for sustainable livelihood and help organizations to achieve goals consistent with the societal context" (Jacobs & Hawley, 2021). Workforce development is a major support activity in economic development that includes education, job training, continuing education, and professional development with four primary aims: 1. Improve quality of life, 2. Improve skills of the workforce, 3. Help businesses to meet their human resource needs, and 4. Provide channels and opportunities for businesses and talent to connect (IEDC, 2015).

Increasingly, workforce development has become a joint pursuit between education, the private sector, and government. It is considered the single most important factor in regional competitiveness, especially in high-growth industries, all things technology, and knowledge-based economies. Expectations and needs in workforce development are rapidly involving to require greater investment, more intentional strategies, and greater collaboration between the public and private sector to be successful (Merisotis, 2015).

Furthermore, the importance of a well-trained, experienced, and up-to-date workforce is predicted to become much more important in the decades to come due to the rapid acceleration

of technology development and the proliferation of life-altering new products and services. According to the book, "The Coming Jobs War," workforce development and perpetual renewal of workforce knowledge and skills will become a necessary means of survival in future. Regions who fail to focus in this area will find themselves alienated, in a stagnant economy, and without sufficient employment and wages to sustain quality of life (Clifton, 2011).

However, due to significant differences in cultures and value systems between the public and private sector, there are significant challenges to successful regional development. This is largely due to differences in risk tolerance and time horizons. Businesses feel an immediate sense of urgency to compete and survive while education and government are more insulated from immediate impacts and prefer to allow time for workforce needs to become more apparent before choosing to act. In general, higher education and government value internal stability and control over risk-taking for external impact (Bercovitz & Feldman, 2006).

Businesses, on the other hand, value action and risk-taking to seize external opportunities over internal control and a strong sense of urgency to bring about needed changes to compete (Jacobs, 1992). This fundamental difference is at the heart of the current workforce debate in America, and is likely to dominate policy and practice in workforce development in the coming decade. It is widely recognized that educational institutions and government will have to become more proactive in order to achieve these goals, while the private sector will have to become more knowledgeable, patient, and willing to invest directly in workforce development in the future (Merisotis, 2015). This is especially true in the knowledge economy.

For the purposes of this study, WFD is viewed, observed, and analyzed using the broad lens of the Austin Technopolis Model and is intended to be inclusive and comprehensive in nature. The study intentionally seeks to include the perspectives of diverse regional leaders and

influencers in order to gain insights both internally (among Tarrant County influencers) and externally (among all actors in the region, whether involved in WF or ED or not). It is the goal of the researcher to identify opportunities and gaps that can be addressed in the ecosystem to develop the workforce and synergize this development with economic development activities.

Research Scope and Design: Delimitations, Limitations, and Assumptions

This study is focused on the region of Tarrant County, Texas, and conducted between July 2020 and April 2021. It is a case study of the workforce of Tarrant County and its evolving role in four areas of economic development within the region. Special attention is placed on gaps and opportunities as identified by interview participants. While some secondary research was conducted on the historical role of workforce and economic development in the region for context, the majority focus was placed on current and future economic development needs and activities. This is, however, an area of significant opportunity for follow-on research.

This study is not a comprehensive inventory of all workforce and economic development activities in the county, nor is it intended to depict a complete picture of the complex dynamics of the rapidly growing region. Instead, it is intended to accurately convey the sentiments expressed by the 50 individual leaders who participated in the interviews. Select leaders, who were identified as major regional influencers in the ecosystem and filling roles that involve workforce development and economic development, were included in the study. By definition, this focused approach limits the scope and scale of the study to their experiences.

From an economic development perspective, the problem was narrowed to four major economic development activities to gauge the potential areas of impact of workforce in the region including: 1. Company Recruitment, 2. Company Retention and Growth, 3. Organic Growth (Entrepreneurship/startups), and 4. Collaborative Leadership and Institutional

Partnerships for Regional Economic Development and Global Ecosystem Development. Findings from these four areas of research will be used to inform and empower leaders and influencers to meet current and emerging challenges, gaps, and opportunities. A framework is provided to navigate conversations around cross-sector collaboration, targeted initiatives, organizational decision-making, and engagement in regional economic development.

There are limitations to this study. Even though it may yield significant data and shed new light on the role of the Tarrant County workforce in the regional economy, findings will not be sufficient to generalize. The methodology employed seeks the opinions, perceptions, and experiences of interview participants and is a specific representation of their inputs. Findings of this report will serve as a single illustrative example within the specific context of these influencers in Tarrant County ecosystem. Similar studies in other regions or additional studies in the same region and comparative analysis using the framework is suggested to gain additional insights. Results will vary based on the unique workforce, economy, and assets of the region.

Assumptions include: 1. The sample studied was representative of the total population of regional leaders and influencers in Tarrant County. Careful segmentation based on proven models (Triple/Quadruple Helix of Innovation and the Austin Technopolis Wheel) took place to help ensure the best selection of a cross-section of leaders and influencers, 2. Responses received from regional leaders accurately reflected their opinions, experiences, and knowledge of the field. All answers were kept strictly confidential and all research findings were kept anonymous to encourage this openness and comfort sharing experiences among participants, 3. Both current and former leaders can accurately remember, reflect, and articulate the circumstances, challenges, and wins involved in economic development activities and partnerships, and 4. Participants in this study answered all questions posed honestly and earnestly.

Where appropriate, secondary research was combined with primary responses to help fill in any gaps and verify/reconcile factual information such as dates, and names. The researcher was intentional and deliberate in both selection and engagement of participants and made every effort to establish a strong and trusting rapport. In part this was to foster a culture of openness to discuss issues as a community, even when difficult, for the greater good.

All participants were encouraged to speak freely and assured that all answers would remain anonymous. All responses were voluntary, and participants were encouraged to skip any questions they felt uncomfortable answering. The goal was straightforward feedback to improve outcomes in the regional economic development ecosystem and quality of life. This goal was stated and agreed upon at the beginning of each interview to inspire alignment and participation.

Chapter 2 - Review of the Literature

The researcher approached the literature review as a trans-disciplinary effort to address observed gaps in shared knowledge and professional alignment between the disciplines of economics, business, and education as they relate to the development, enhancement, and utilization of regional economic development ecosystems (REDE's) to improve quality of life in the region. REDE's are defined in detail in the Definition of Terms section in the previous chapter. In short, they are regional ecosystems of diverse actors and influencers that work together to support, sustain, and impact economic development within a defined region. By definition, this involves all sorts of people from all walks of life. It also includes all aspects of the community and our interactions from home, to workplace, to education, to places of worship. This holistic approach to economic development comes with pros and cons.

The obvious pro is that the approach is inclusive and engaging for all stakeholders. In theory, this allows for all segments of leaders and influencers to bring forth their voices to help one another reach their full potential to positively impact the ecosystem. It provides a means for collaboration and contribution regardless of role in the ecosystem.

The most obvious potential con is that it requires people to share knowledge, skills, creativity, and trust with other people, professions, and organizations that may be outside their immediate circles of influence, and in some cases, outside their comfort zone. For these reasons, rather than dive deep in one discipline and try to relate observations in the REDE to that singular body of knowledge, this literature review will seek to zero in on the intersection of multiple disciplines to bring shared knowledge, best practices, and practical tools to light that could be helpful to leaders and influencers within the REDE.

Figure 6. Emerging Challenges Require Trans-disciplinary Approach to Problem Solving
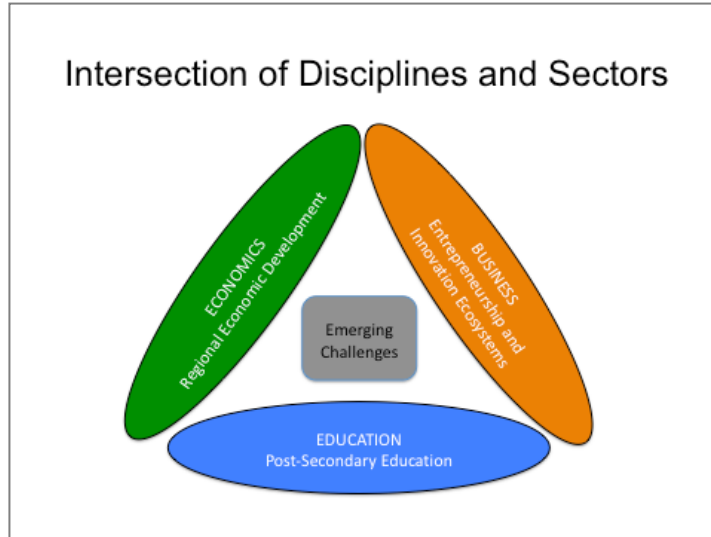
Ecosystems are ever changing and developing and adjusting to meet the needs of the region in real time (Carayannis & Campbell, 2006). Given the complexity and rapid nature of societal change as outlined in the introduction, leaders, researchers, educators, and ED and WF practitioners must share knowledge and place a combined lens on emerging challenges in order to effectively address them. The benefits to the region could be quite significant if successful.

This concept and approach seeks to combine best practices from multiple academic disciplines and professions in order to shed light on emerging challenges faced by society. In theory, by sharing knowledge and combining skillsets, the collective ecosystem can save significant time and resources. In addition, applying this shared knowledge within a specific real-world use case allows stakeholders to communicate and share ideas of how solutions might be crafted from a good understanding of the role that workforce plays in these ecosystems.

In order to gain a solid understanding of the complex challenges and opportunities that participating leaders and influencers shared in the study, the researcher identified three primary bodies of research and best practices to pull from and combine key elements to inform research. In particular, the sub-disciplines of: 1. Regional Economic Development in the field of

Economics, 2. Higher Education, Workforce Development, and Adult Learning in the field of Education, and 3. Entrepreneurship and Innovation Ecosystems in the field of Business.

The researcher sought a combined understanding of the literature and best practices in these three fields of education, training, and research in order to yield unique insights. Therefore, a review of the literature in these three areas was utilized to inform research design, instruments, and methodology with the goal of shedding new light in areas that may not be shared across disciplines in academia and across professions in the marketplace.

The researcher also sought to identify areas in which key challenges require additional research in order to better understand and address them. The resulting literature review and the study at hand yielded a number of follow-on opportunities for research that fall outside this carefully scoped study. As opportunities came to light, the researcher shared them in this study and a list of potential future topics is included. The researcher will continue to pursue these topics as new layers unfold. Talks are already underway with a number of regional scholars and researchers for joint studies to compliment and build upon this emerging body of work.

Figure 7. Trans-disciplinary Lens: Opportunity for Synergy and Impact
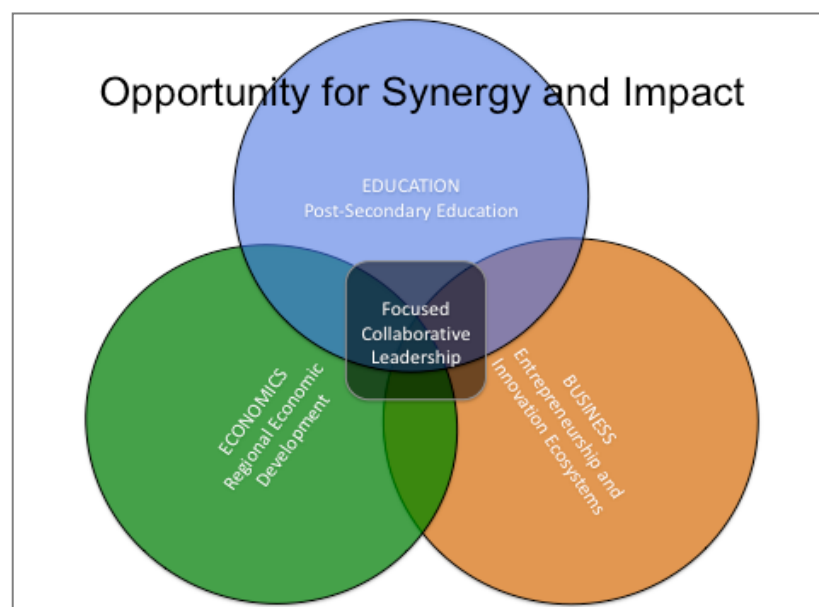
As a first step, a fact-finding process was undertaken in order to gain a clear understanding of the current context and general state of the ecosystem. Secondary research was conducted using publicly available data as well as available institutional data. Initial primary research was also conducted through attendance of ecosystem events and observation of regional economic development activities in the region. The researcher used these initial findings to zero in on select influencers for interview. A thorough analysis was conducted once sufficient data had been collected to shed light on the regional economy, economic initiatives, and dynamics over recent years, as well as influencers (organizations and leaders) in the ecosystem.

The REDE Through Multiple Theoretical Lenses

Smilor, Gibson, & Kozmetsky (1989) argue that the strategies and tactics used in economic development are rapidly changing due to new institutional alliances driven by the rapid increase in the number and diversity of new technologies entering the marketplace. Their argument is predicated on two basic assumptions: First, we are on the threshold of a new era of technological growth both domestically and globally that is changing the way that business is done and altering the way that people live, and second, as a result of this rapid shift in the use of technology, economic development has permanently changed. The role of institutional leaders as "executive champions" and collaborative agreements between institutions has increased in importance. The authors present a conceptual framework for collaborative leadership in innovation ecosystems including seven key segments. Using empirical data from surveys, interviews, and historical archives, they assess the role and impact of each segment and find that while each plays an important part, the research university is central to technology commercialization and regional economic growth. Four major factors are identified as especially important to successful regional economic development: The achievement of scientific

preeminence, the development of new technologies for emerging industries, the recruitment and retention of technology companies, and the creation of homegrown technology companies. While many of these concepts are not new, the article sheds new light on the importance of collaborative leadership and the alignment of vision, resources, and efforts across the seven segments for successful regional development.

Etzkowitz (2002; 2006; 2008; 2012) builds a case for collaboration between government, education, and the private sector in order to share resources, align efforts, and address the needs of the regional and national economies. The author identifies a number of potential synergies and efficiencies from all three sectors working together and points out that many major goals for economic development, especially in science, technology, and innovation, require all three to succeed. Even though these institutions have traditionally operated in relatively independent spheres, the emergence of knowledge-based economies, new technologies, and related research and development have led to the creation of hybrid organizations such as technology transfer offices, support services, and capital networks to fund new innovations. Etzkowitz presents a collaborative framework to help institutions to examine their role and find new ways to support these hybrid organizations as well as contribute to the ecosystem through increased collaboration with key institutions. Numerous regional and national examples are provided to show the importance of these collaborations across sectors as well as illustrate ways that the framework can be applied to drive innovation.

Rogers (2005) presents both problems and solutions for innovators and surrounding communities seeking to disseminate and diffuse technologies from laboratory to market. Grounding his analysis in historical examples and explaining how methods have evolved over time to the current state-of-the-art, he points out the importance of relationships and the need for

institutions to work together to facilitate the sharing of knowledge, mission, and technologies for diffusion. Building upon these relationships, Rogers (2005) provides examples and a comprehensive framework for systematically working toward open innovation and shared prosperity through shared knowledge. He provides numerous cases of both successful and unsuccessful efforts to diffuse innovations and points out ways that both individuals and institutions can avoid pitfalls and employ proven methods to be successful. Effective communication, interaction, and feedback from stakeholders are key to any change initiative and it is important to place any new idea or innovation in proper context to facilitate adoption. Without these elements, any new idea may fall short of broad-based adoption, regardless of how much better, or efficient, or innovative it may be. In the context of regional leaders and influencers seeking to align efforts for regional impact, these principals hold true and may be utilized by leaders within their organizations to help position new initiatives, technologies, and ideas for ecosystem dissemination and adoption.

Smilor and Gill (1986) make the case for "living incubators" as a means to rapidly and effectively help emerging technology companies to launch and grow with all the key ingredients necessary for business incubation, acceleration, and scale, ie: Talent, Technology, Capital, and Know-how. By linking these four crucial elements, the authors argue that incubators are able to affect the culture, energy, and ecosystem of the region to better support the entrepreneur and the innovator in order to launch and grow emerging technology companies. They encourage institutional and regional leaders to cultivate creative environments in which entrepreneurs, scientists, innovators, and capitalists meet through social, professional, and commercialization networks in order to share knowledge and resources to help businesses succeed.

In their proposed model, this inter-relation of government, academia, and industry is dubbed crucial to successful business incubation. The authors present a comprehensive framework to evaluate and enhance business incubation by improving linkages between entrepreneurs, investors, innovators, and end users. Business models and funding mechanisms for incubators are considered along with best practices for management including tenant selection, support services, graduation, and alumni engagement to help current tenants. This study provides foundational knowledge to evaluate incubation activities and links incubators, accelerators, and other hybrid organizations to government, education, research, and the private sector as drivers of regional economies. They argue, alongside other scholars, that without these key linkages, innovation and entrepreneurship efforts will suffer (Leydesdorff & Sun, 2009).

Florida (2005) makes the argument that globalization has changed the playing field, but not leveled it. He argues that the seminal publication "The World is Flat," by Richard Friedman (2005), is flawed in logic and is not supported by the factual evidence. The concept Friedman presents is compelling, ie: Labor markets have "flattened" globally so that highly trained professionals and the regions that seek to recruit them are interchangeable and thus in direct competition for talent, ideas, and capital. However, according to Florida, data on the growth and development of cities from 1800 to present show that the regions with the greatest economic growth, activity, and innovation are getting "spikier" (growing) and the regions lacking these attributes tend to be remaining flat (not growing). Florida (2005) presents evidence such as patents produced, economic productivity, and scientific research to demonstrate that the regions with the highest economic output, especially in creative industries, are poised to compete on the global stage and attract the best talent from the "flat" world of available labor sources originally presented by Friedman (2005).

In short, it is likely that the highest performing regions will continue to gain on the rest of the world while laggards will fall even farther behind, thus creating a "spiky" world of peaks and valleys in terms of performance and ability to compete on a global scale. This perspective and the evidence presented represent a major shift from the popularly accepted premise presented by Friedman and raises important questions for consideration by national, regional, and municipal governments. In order to take part in economic development, especially in knowledge-based industries, regions will have to consider ways to overcome these challenges and leverage the "Spiky" environment to compete. Florida argues that this is accomplished through the attraction and retention of highly skilled talent. However, Florida (2005) does not present a strategy for the "flat" cities and does not explore implications to regional economic development practices.

Pierre (2015) presents evidence that the role of cities is changing in relation to previously stratified layers of government and economic development activities in Europe and globally. He argues that this dynamic changes the roles and responsibilities of leaders and influencers in the region. As regional governments and national governments vie for economic growth through the recruitment, retention, and organic growth of companies, competition is increasing among municipalities to attract, retain, and grow companies and innovative industry clusters. Leading cities and local authorities are becoming more and more proactive, undertaking partnerships, investments, and collaborations that facilitate growth in ways that are largely independent from the regional and national authorities. Cities are developing their own strategies and working to brand themselves and their local assets for business with workforce attraction strategies.

Additionally, many companies seeking relocation are working with multiple potential cities get the best possible deal for them to succeed during the difficult early stages as well as during stages of major growth, re-invention, and re-tooling to meet market needs. This overall

shift has necessitated a change in how cities are governed and required new allocations of time, money, and resources to help cities to become more self-reliant and spur local institutions to improve collaboration and coordination of efforts to support the mission of sustained economic growth. While the paper does a good job of raising awareness that this shift is taking place, it may raise more questions than provide answers as to how to best go about this change or lead to a better understanding of what effects the change has had on regional competition and national governments. The one actionable takeaway is that cities are on the rise in importance and impact. More perspectives from the literature will be offered on this subject later in this chapter.

The common themes in each of these theories include: 1. The necessity of actors and influencers working together to bring about deliberate change in the environment in order to be successful, 2. The rate of change will continue to increase, so REDE's will have to become more effective at moving quickly to address emerging needs, and 3. This will require a significant amount of time, resources, and leadership from all sectors to accomplish. While there is some divergence in terms of "how" ecosystem leaders can most effectively address needs, these three areas of convergence provide an adequate starting point for regional collaboration and dialogue.

Ontology vs. Epistomology in Innovation Ecosystems Theory

Entrepreneurship and innovation ecosystems are conceptualized in much of the academic research in two distnct ways. One is focused on policy and the other is focused on practice. Ontology emphasizes its "being". Epistimology emphasizes "how it can be known". The fields of Entreprenurship and Sociology tend toward ontology. They hypothesize that ecosystems can be built and that it is largely a matter of leaders and influencers fully understanding all the components necessary and then aligning those components for success. O'shea, et. al (2019) discuss ecosystems as artifacts embedded in regional economies that can be studied and

observed. Roundy, et. al. (2017; 2018) describe how ecosystems exist all around us and in every

economy and region, often centralized or focused on a particular facet of the economy such as

technology, research, or a common interest. Several scholars discuss how these can be

connected and potentially work together through leadership and shared resources. This approach

emphasizes how leaders can work together to co-create or participate in the reality that is the

ecosystem. It also implies that leaders can opt out. In this instance it is largely a state of mind

and of practice that can be adopted, taught, and learned (Van de Ven, 1993). This view holds

that entreprenurship and innovation ecosystems emerge in a given region at a particular time and

under particular circumstances based on the stage of development and natrual evolution of the

region. These theories often cite a particular phenomenon that catalizes the environment and

brings influencers into alignment to create robust networks and dealflow.

Conversely, more established models from Economics, Institutional Theory,

Evolutionary Theory, and International Political Economics (IPE) favor Epistimology and focus

on how entrepreneurship and innovation ecosystems develop over time due to incremental shifts

in policy, organizations, and market dynamics (Constanza, et al, 2010). Emerging products,

services, and industries bring about ecosystems that various actors are drawn to engage around

(Katz & Gartner, 1988). It is a more systems view that tends toward macro trends and regional

dynamics that lead to the the convergence of both objective data and local subjective knowledge.

These theories tend to identify social, political, and economic factors that affect

ecosystem development, growth, and decline. Industry clusters and theories around Complexity

Economics and Evolutionary Economics often inform these approaches with an emphasis on the

factors and actors necessary to bring them about (Garnsey, et. al., 2010). This lifecycle view and

the factors that tend to accompany each phase of the lifecycle allow researchers to predict and in

some cases promote certain trends that affect the ecosystem by either enabling or constraining innovation and entrepreneurship activity. Elements of both approaches are incorporated into this study, and the researcher suggests that both approaches will be required to optimize the REDE.

Applying Innovation Ecosystems Theory and Best Practices in the REDE

Etzkowitz (2002; 2006) points out as an element of modern economic reality for all community-serving institutions that REDE's can no longer effectively serve the needs of stakeholders in silos and top-down centralized command and control structures. Instead, it is suggested that the attributes of effective and functional innovation ecosystems require an exchange of ideas, innovations, and people to succeed. In particular, it implies that in order for the workforce to be adequately prepared and aligned to succeed in the modern economy, that the education and training they receive will have to be more closely aligned with immediate market demands that add value on day one. All levels of education will have to work more closely with employers and move more quickly in unison to survive and thrive in the coming decades.

In the fast-moving knowledge economy, longstanding inefficiencies of inward-looking bureaucracies and poorly aligned levels of education will not be tolerated in the future by governments or employers (U.S. Department of Education, 2006). As innovation cycles accelerate, and expectations of better responsiveness to community needs increase, so too will expectations and measures of performance. In the future, institutions of higher education will be expected to build relationships with constituent groups from the outside community and proactively engage them to better understand and meet their needs (Altman & Vitucci, 2015).

Much research has been done regarding the development of entrepreneurship and innovation ecosystems to fuel regional economic development. Etzkowitz (2008) coined the phrase "Triple Helix of Innovation", arguing that the nexus of education, government, and the

private sector working together through collaborative leadership is key to developing and sustaining a technology-based entrepreneurship and innovation ecosystem.

Etzkowitz (2002; 2012) developed the model in the Boston regional ecosystem around MIT (2002), and later to the Silicon Valley regional ecosystem around Stanford (2012), and found ample evidence to support this claim. Aligned strategic vision for the region and cooperation between the private sector, education (research universities), and government were critical elements of growth for the two regions. Data indicate that human capital development and attraction was the most important factor for Silicon Valley's success, or the success of any high-performing region (Etzkowitz, 2012). This concept is central to this study.

The Diffusion of Innovations Through Regional Linkages and Relationships

Adjacent research in Sociology and Statistics has taken place on the diffusion of innovation and the role of collaborative leadership between innovators, entrepreneurs, private risk capital, corporations, and government to formulate and work toward a common vision for the region. Building upon his foundational work in the sixties, Everett Rogers (2005) declared visionary collaborative leadership across sectors to be a fundamental ingredient of successful regional economic development. He argues that entrepreneurship, innovation, and strong linkages between them, have made the difference for successful regions such as Silicon Valley (Rogers, 2005). His research points out that regions that promote these linkages outperform their peers who rely solely on organic relationships and traditional silos and organizational structures.

In keeping with this approach, we are witnessing a rise in the importance of proactive regional leadership across sectors to bring about targeted change and impact the competitive environment. The Organization for Economic Co-operation and Development (OECD) reports that local and regional leaders are driving economic development and actively competing for

talent, technology, and companies in the modern global economy (OECD, 2015). National

governments make arms-length investments in urban development. Cities, however, engage and

focus locally to mobilize constituents to meet specific needs and garner resources to make

markets (Katz & Noring, 2015). Despite unprecedented national, state, and regional efforts and

large-scale investments to build sustainable regional ecosystems, economic output of high-

performing regions is increasing while the rest remains comparatively flat (Florida, 2005). Much

of the growth is attributed to coopetition between regions, simultaneously competing and sharing

knowledge and resources. In struggling regions, it is a lack of available skilled talent that can

stall the scaling and growth of companies and cause them to fail or leave (Pierre, 2015).

Pulling the Pieces Together to Produce a Regionally Competitive Workforce

While teaching universities provide talent with advanced degrees and research

universities yield new technologies and innovations for commercialization, community colleges

allow cities to develop the trained workforce needed to scale technology startups and retain

corporations through skilled human capital (Foss & Gibson, 2015). Regions capable of synching

up efforts between research universities, teaching universities, and community colleges have a

greater chance of creating "stickiness" that keeps talent, companies, and technology within the

region (Rogers, 2005). For rapidly growing regions that are capable of attracting the workforce

needed to fuel companies, an influx of talent and investment could lead to a "living incubator"

for entrepreneurship and innovation (Smilor & Gill, 1986). Stewarding resources sustainably

can have a significant impact on the region long-term (Costanza, 1994; Costanza & Daly, 1992).

This is the goal of many ecosystems in the modern context; however, studies show that

most ecosystems outside of major growth centers and technological clusters are falling short and

struggling to make adjustments quickly enough to capitalize on opportunities (Arnkil, et al,

2010). The same research shows that these regions are failing to allocate adequate funding and human resources who are dedicated to overcome the entrenched culture and successfully address needs (Feldman & Kelley, 2003). Ironically, this same inverse relationship between increasing demands and expectations with flat or decreasing allocations of resources holds true in education as well as government offices tasked with workforce and economic development (AACC, 2010).

The increase of new technologies is changing how communities, regions, and nations anticipate and respond to the competitive environment. How they respond will largely determine the viability of their economies (Smilor, Gibson, & Kozmetsky, 1989). Closely related to this shift in societal needs is the phenomenon of declining support for education from states during a period of increasing costs, expectations, and demands. This is especially true for open enrollment institutions serving those most at risk and in need of quality education. The research indicates that this trend will hinder regional growth. It is not yet clear how the market will rationalize to overcome this challenge. McClenney (2011) says that courageous leadership is the crucial ingredient for the success of community colleges and other higher education institutions during the current period of intense change. In her view, leaders must be courageous enough to take financial, social, political, and professional risks for the good of the college. This will require new skills to navigate effectively. The key may lie in the new economic paradigm described by Kozmetsky (1989) coupled with the blending of old and new cultures described by Roueche (1989). They all seem to agree that change is taking place at unprecedented levels and the window to address emerging societal needs will not stay open long without consequences.

Bringing Educators Together for a Unified Approach to WFD

The role and importance of the community college is evolving quickly within the modern context and it is expected that business as usual will not be sufficient to keep up with shifting

demands and expectations of students, parents, legislators, and businesses (Boggs, 2011). However, there is a significant body of work on the mission and history of community colleges in the US. In particular, community colleges have historically focused on filling the gaps of unmet needs in the communities they serve. It is likely that this culture of filling the gaps in communities will serve as a major asset in the emerging economy (Cappelli, 2015).

Over recent decades, two important factors in regional economic development ecosystems have emerged as paramount for successful economic growth while simultaneously growing as gaps in the US economy: 1. Open access and affordable education for the masses, and 2. Targeted training and education to meet the workforce needs of regional employers (American Association of Community Colleges, 2014). Both are necessary to scale skilled workers and fill jobs. These cornerstones of regional workforce and economic development serve as the driving force behind the selection of community colleges as a focus of this study, not just research universities and teaching universities as is often the case in ecosystem discussions.

Studies focused on the community college as a participant in economic development were reviewed, compared, and contrasted with literature on regional economic development, entrepreneurial ecosystems, and collaborative leadership across sectors. While significant work has been done on workforce development, community development, and basic education for transfer to universities, gaps were identified in the literature in relation to community colleges as lead actors and influencers in regional economic development. Articles provide numerous examples reflecting recent changes in the US economy and education system, as well as a strong need for shared knowledge and resources between sectors, disciplines, and regional influencers (Williams, 2004). This study is intended to help fill these gaps.

This literature review seeks to place this study into historical context in terms of ongoing thought leadership and research in the fields of economic development, community college leadership, collaborative leadership, and public policy as it relates to education and all layers, levels, and types of institutions involved in post-secondary education.

High Schools and K-12 environments are also crucial and warrant significant consideration in this dialogue, but have been removed from the primary scope of this study to allow for adequate focus on higher education. Therefore, from an Education literature perspective, this is a review of topics including workforce, workforce development, economic development, higher education leadership (including the community college), and collaborative leadership to effectively serve community stakeholders across sectors (Williams, 2004).

Major Challenges Facing Higher Education

Higher Education is facing an impending financial crisis when viewed through the lens of 457 current Chief Business Officers (CBO) in higher education (223 public, 222 private, and 12 for-profit institutions). An astonishingly low 13% of CBO's who answered a Gallup survey expressed confidence that the financial model of their institution would sustain more than 10 years. Only 27% expressed confidence that the financial model would sustain more than 5 years. Some 73% lack confidence in the immediate financial wellbeing of the institution. And 21% indicate their institution has increased debt to fund projects and fewer then 3% consider it a good idea to take on additional debt at this time. Fewer than 4% believe the for-profit model of higher education is sustainable. A majority 68% is keenly focused on federal and state mandates.

CBO's expressed concern that colleges and universities are reaching the upper limits of what the market will bear in terms of tuition and fees. Overall, confidence is low and the outlook is "shaky at best" (Inside Higher Ed, 2013). Nine out of ten acknowledged the importance of

creating new revenue strategies for their institutions. Some 86% agreed that technology would or should play an important role in lowering cost and improving learning outcomes. More than 1/3 expressed confidence that senior administrators were realistic when it comes to financial matters. One in ten is satisfied with the level their institution is taking advantage of technology and the overwhelming majority is not confident resources are allocated efficiently. Factors combine to create a challenging situation for teachers and administrators alike (Inside Higher Ed, 2013).

The Iron Triangle and The Necessity to Lower the Cost of Education

When cost containment is discussed in education, many refer to the "Iron Triangle" as a framework for analysis including the three unique components of the community college (CC) mission: Quality, Access, and Cost (Boggs & Cater, 1994). It is touted as difficult to change one without affecting the other two. Some claim that it is impossible to have all three. However, US Education Secretary Duncan urges educators to consider ways to rise above this paradigm and carve out new models and enable students to graduate with as little debt burden as possible. The answer may lie in the very shift to external engagement and ecosystem leadership as described by scholars from other disciplines such as Entrepreneurship, Economics, and Sociology.

To compound this already dismal outlook for educational institutions, the ripple effect has reached students, families, and households at unprecedented rates as well. Between 1996 and 2015, student loan debt doubled on average and surpassed USD$1Trillion in 2011 at USD$23,000 per student on average (United States Department of Education, 2011). Household earnings fell 7% to USD$50,000 on average in the same period while consumer debt took up an average 10.5% of household income totaling USD$11.5 Trillion. Students have to work their way through and have less time, less money, and in many cases, much greater pressure while in school (Jewell & Sutin, 2012). Overall, this model is no longer sustainable without major

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changes to the manner in which institutions are funded. Increasing costs in higher education can no longer be carried by students through increased tuition and student loans (AACC, 2012).

Underlying the entire debate over community college funding is the dire need for educated, skilled, and flexible human capital in areas of rapid growth for the region (Abraham, 2015). Community colleges serve as the low cost workforce development leader in most regions of the US, training several times more learners of all ages and backgrounds seeking profesional development training, degrees to retool, and certificates. Unlike universites, community colleges are able to make adjustments each semester to reflect the needs of the community. It is about lifelong learning and applying new knowledge to compete (Shell, 2012). It is also about sustainable, affordable education that does not overburden the student with a lifetime of debt.

The Use of Data to Improve Internal (and External) Performance

McClenney and Mathis (2011) provide a practical "how to" guide for senior community college leaders to address the need for more effective leadership to improve on student equity, success, and completion. The same approach is also applicable in universities and K-12 districts (Achieving the Dream, 2014). According to the authors, these performance goals can be systematically achieved through data, analysis, and adjustment of policy and practice over time as an organization, and as professionals. Major challenges in the current community college environment are discussed and addressed with multiple suggestions for leaders to consider when working to improve the use of data and informed decision-making in their institutions. The case is made for leaders to set up structured internal capacity to leverage these tools over time to improve performance and better address the needs of faculty, staff, and most especially students. These changes embody a shift from "access-only" to an "access for student success" model providing a framework, terminology, and examples to improve attainment rates for institutions.

This case study utilizes the same basic notion of proactive data gathering and analysis for decision-making support to develop a dashboard for leaders seeking to engage the community. The application of this approach to align data, metrics, and efforts both internally and externally is crucial from an ecosystem perspective. This shift from internal metrics and focus to a blend of internal and external metrics and focus are in keeping with the concepts espoused by Foss and Gibson in their book, The Entrepreneurial University (2015). They lay out the case for leaders to move beyond the traditional academic culture and paradigm of entrenched bureaucracy and old-school convention. Instead, they advocate for leaders to track performance both internally and externally. They also advocate for professional development for faculty and staff where appropriate, progressive targeted hiring practices for entrepreneurial mindset and skills, and the development of a culture of entrepreneurship that celebrates faculty who take risks in order to launch new ventures. Institutions that place deliberate focus on these efforts are more likely to see a sustained impact. Institutions that do not are much more likely to fail (Potts, et al, 2018).

Business Model Innovation in Higher Education

Institutions of higher education are poised to re-invent themselves in the face of significant environmental changes (Kirshstein & Hurlburt, 2012; Mullen, 2011). Leaders are seeking ways to launch new self-sustaining and revenue generating programs and looking for creative ways to increase student success and improve operational efficiency (Foss & Gibson, 2015). This will require new areas of training for education leaders that include a more robust understanding of the business environment and related workforce demands. Colleges are also hoping to tap into sources of funding traditionally associated with universities such as endowments, research, and corporate partnerships (Denneen & Dretler, 2012). However,

community colleges have a long way to go to catch up with their counterparts and there are concerns that efforts to grow endowments will likely fall short of budget shortfalls.

Focusing on five areas, Jewell and Sutin (2012) proclaim that financial self-reliance is becoming the hallmark of higher education: 1. The Case for Reform, 2. Business Model Innovation, 3. Impediments to Institutional Change, 4. Less Traditional Methods to Diversify the Higher Ed Business model, 5. Illustrates Success Stories and Provides Replicable Models. Kirshstein and Hurlburt (2012) use financial data from 2000 to 2010 to determine how revenue patterns have shifted. They do this by looking at the following revenue metrics: Operating revenues by major sources, interaction between revenues from tuition and the state, tuition discounting, sticker price, gross tuition, and net tuition. The evidence of necessity for change in higher education is overwhelming. The question is whether leaders have the skills to manage this change and the will to endure the political, professional, and social resistance to address it.

The results yield a sobering look at community colleges and suggest an urgent need to innovate on the existing business model. Community colleges raised a mere 1.5% of what universities did from alumni and high net worth individuals (HNWI) in 2011 and many had no formal alumni engagement programs. Corporate engagement varies greatly between colleges and executive education and workforce development have sometimes fallen short of expectations. Some even lose money. While revenue per student increased to near USD$40,000 in public universities in 2010, community colleges numbers fell to under USD$5,000.

Community colleges are held to the same accreditation standards, adhere to open enrollment policies, and charge much less per credit hour. Community colleges are the only institutions in higher education receiving lower revenues per student than a decade earlier (Kirshstein & Hurlburt, 2012). However, many universities are also showing signs of financial

difficulties and some scholars are indicating that there could be a significant number of school closings in the next decade. This begins to beg the question of whether the existing model is sustainable. Many of the scholars listed here describe a necessity for change, and several indicate that societal, political, and economic factors are stacked against educational institutions that are not considering a more sustainable financial model and a more engaging and responsive customer service culture. It also raises questions around government funding into the future.

The Increasing Importance of Cities and Regions

Cities and regional clusters have become increasingly important drivers of economic growth over the last two centuries (Pike, Rodríguez-Pose, & Tomaney, 2006). As a result, we are witnessing a rise in the importance of regional leadership (Shaffer, 2015). Unlike national governments, which generally make arms-length investments in urban development, cities actually make markets (Katz & Noring, 2015). However, at a time of unprecedented national, state, and regional efforts to build sustainable regional ecosystems in cities across the US, economic output of high-performing regions is increasing while the rest remains comparatively flat (Florida, 2005). Much of the growth is attributed to "coopetition" between regions, simultaneously competing and sharing knowledge and resources in an increasingly competitive landscape. Local leaders are driving economic development and actively competing for talent and companies in the global economy (OECD, 2015). As stated earlier, this is supported by Florida (2005) who argues that regions lacking key factors of quality of life will continue to fall behind their peers and competitors in other regions. It is likely that without major intervention and deliberate planning and execution, the highest performing regions will continue to gain on the rest of the world while laggards will fall even farther behind. This could hinder their ability to compete on a global scale and could create a vicious downward cycle for these communities if

left unaddressed (Breznitz & Taylor, 2014). This perspective and the evidence presented raise important questions for consideration by national, regional, and municipal governments. Pierre (2015) presents evidence that the role of cities is changing and that government and economic development activities are merging efforts to compete. Cities and local authorities are becoming more and more proactive, undertaking partnerships, investments, and collaborations that are largely independent from national authorities (OECD, 2015). On the upside, this presents an opportunity for regional leaders and influencers to embrace this new paradigm and help their regions to compete. On the downside, it means that regions without such visionary leadership may suffer significantly in the years to come.

High-tech Clusters and the Knowledge Economy

Structural and factor-based (Asheim, Smith, & Oughton, 2011; Thirlwall, 2014) approaches to regional economic development are the two predominant schools of thought in the literature (Yeo, 2010; Cruz & Teixeira, 2010; Jungwirth & Müller, 2014). Competition is now based on the innovation of technologies that are knowledge-intensive (ie: supported by large investments in research and development), and very complex (ie: those with many components and multiple linkages among those components). It is widely accepted that major "knowledge-based" economies provide the best quality of life (Rycroft, 2006). This new level of speed and complexity is forcing leaders to work together in order to compete. However, it is not necessarily speeding up the rate at which companies and economies are able to innovate. Value is added through sharing resources and capabilities, not on speed (Rycroft 2006). This requires a conscious effort and strong relationships for education, policymakers, and local companies to align, communicate, and deploy programs to quickly address the needs of the community. Institutions of higher learning serve as talent development centers to meet the changing needs of

industry and research partners to create scientific discoveries and technology breakthroughs (Kearney, Hisrich, & Roche, 2007; 2010). By providing an environment where creativity can thrive and ideas can be incubated into tangible products, campuses provide a critical link between talent and industry (Cortese, 2003). This could be the saving grace for them financially.

State Politics Rule the Day

According to the American Association of State Colleges and Universities (AASCU), the single most important state education policy issue facing leaders in 2014 was "Harnessing Higher Education to Address State Economic Goals" (AASCU, 2014). State policy is considered a primary factor in successful economic development due to the competitive nature of states (Smilor, Gibson, and Kozmetsky, 1989). This means higher education can step in to fill this gap.

State Legislators are using five primary strategies to compete in the area of education to enable regional specialization through clusters and offer incentives (direct and indirect) to stimulate targeted growth industries (Michelau, 2008). This is a major opportunity for higher ed.

New companies looking to launch as well as established ones seeking good conditions for growth are fortunate to enjoy 50 distinct state regulatory environments from which to choose (Etzkowitz, 2006). This requires each state to implement policy to encourage and incentivize companies to relocate, invest locally, and grow larger while remaining within their state, which brings more jobs and enables the economy to grow (Andersson, Evers, & Griot, 2013). When asked the number one factor driving their decisions regarding where to locate their businesses, CEO's said "the availability of good talent to meet industry needs" is most important (Smith, Wellins, & Paese, 2015). It is the role of higher education to develop programs and talent and the role of state legislators to enact policies that support educators and enable stakeholders to identify and fulfill the economic needs of the state (Berger & Fisher, 2013). The end goal is

increased quality of life through sustained economic growth (AASCU, 2014; Heinemann & Sussna, 1977). States are vying hard to maximize federal higher education funding, mostly through federal research grants, but also through financial aid, infrastructure, development grants, and performance-related funding coming into the state (Altman & Vitucci, 2015).

As state budgets continue to decline, the traditional burden of funding colleges and universities will force change (Mortenson, 2012). In particular, federal funding offers an alternative source to offset recent budget cuts in state legislatures. The Obama Administration increased federal aid to the states during his tenure and was committed to leading change through federal education policy and funds to supplement state budgets (The White House, 2015). The Biden administration seems poised to continue this trend. Policy can boost economic capacity by strengthening industry clusters. Investments in research and development yield long-term return on investment and contribute to economic development and growth (Terplan, Bhatti, & Vi, 2014). Key performance indicators include the attraction of key scholars and talented graduate students, the licensing of technologies to industry, the spin-off of new companies, the attraction of major technology-based firms, increased local investment of federal and private sector funding (Sexton & Smilor 1985; Doutriaux, 1987). State legislators are in a unique position to ask tough questions that lead to a better education system aligned with state goals and promoting student access and success (Michelau, 2008). The greater question lies, however, in how well state policies, funding, and alignment with local actors will facilitate better outcomes to support regional economies. So far, results are mixed and approaches vary widely.

A Warp in Time

In the discussion of local, state, and national priorities, 1989 was a milestone year in the rapidly changing landscape of technology and regional economic development in America. That

same year, two sets of scholars from different institutions and disciplines published seminal works addressing the role of collaborative leadership in fostering innovation and entrepreneurship in communities, and provided strikingly similar evidence and overlapping recommendations (Smilor, Gibson, Kozmetsky, 1989; Roueche, Baker, Rose, 1989).

One group approached the problem from the perspective of the research university (Smilor, Gibson, Kozmetsky, 1989). The other group approached the problem from the perspective of community and technical colleges (Roueche, Baker, Rose, 1989). Both keyed in on public-private partnerships, the importance of collaborative leadership across sectors, and the fact that no institution, sector, or region can operate successfully in a rapidly evolving global economy without collaborating with outside colleagues and institutions. Both called for policies to foster and support these activities for the national economy and American quality of life. Education and cross-sector collaborative leadership were identified by many authors as the key to regional economic development and a robust knowledge economy (Delman & Madsen, 2007).

Twenty-six years later in 2015, the opportunity to align these stakeholders and share knowledge between universities and community colleges arrived in the form of Barak Obama. In 2014, President Obama declared that community college students reflect the future of education in America and are an important resource for economic development, especially for the skilled technology workforce. In 2015, the President called for free community college to all Americans in order to unleash the full potential of communities (The White House, 2015). While some support these efforts, others are skeptical that sufficient funding will be available in a difficult fiscal environment. In any case, this declaration permanently changed the dialogue.

Simultaneously, President Obama praised research universities and proclaimed them to be integral to the ability of the US to continue to innovate and compete on the world stage and

called for significant investment in research and development. At a speech at The University of Texas on August 9, 2010, entitled "Put Education First", the President praised the leadership of George Kozmetsky, Michael Dell, and other leaders who worked together to make Austin a thriving technology hub and heralded Austin as an example of successful regional economic transformation into a thriving knowledge-based economy. He cited the importance of an educated and skilled workforce to regional economic growth, and stressed goals for completion of degrees and certificates at all levels of higher education (Kanter, et al, 2011). This kind of direct praise from national leaders, unprecedented national attention on regional economic development, and the nexus between the research university and the community college, may be precursors to a shift in public policy predicted by Kozmetsky and Roueche some 25 years earlier. As this dialogue comes full circle, it is time for higher education leaders to step up and lead.

Collaborative Leadership for Regional Economic Development

Proactive leadership works. Roueche, Baker, and Rose examined the practices of 256 transformational presidents to learn what practices are working best to orchestrate transformation within the community college to reflect and meet the needs of the community. From this broad sampling of leaders, the authors chose 50 as "blue chippers" who have had a major impact on the profession, and who have made a major impact as leaders in their respective regions, cities, and colleges. They interviewed these presidents and their leadership teams to gain in-depth insights and weighed their actions against a framework of values to identify key attributes.

Building upon these findings, they considered current and emerging challenges and proposed ways leaders can learn from these examples and integrate proven strategies. Even though the book was written in the late eighties, it reads as if it were current. Authors present a fresh perspective on the role of the community college externally and propose that leaders

proactively work with other regional leaders in order to elevate the local economy. The time has come for this level of leadership.

Chapter 3 - Research Methodology

Chapter Overview

Chapter three includes a detailed description of the research methodology used in this study. A rationale is provided for why qualitative research was utilized and in particular the case study method. The research design is described in detail. The researcher describes how participants were selected, recruited, engaged, and observed during data collection. Examples are provided of data collection instruments and interview protocols. The coding of data and data analysis techniques utilized as well as measures taken to maintain anonymity and data security are also included. The validation process and limitations of the study are offered. The chapter concludes with a review of research goals and how they are met with the chosen methodology.

Rationale for Research Methodology

When writing a scientific or academic research paper or dissertation it is very important to be deliberate and thoughtful when choosing a topic as well as a resrach methodology and approach (Rudestam & Newton, 2001). There are four major considerations when selecting a research methodology: 1. The problem being investigated, 2. The purpose of the study, 3. Theory base, and 4. The nature of the data. Collectively, these factors provide a means to define unique research problem. It is the responsibility of the researcher to select an appropriate methodology that best addresses this unique research problem (Roberts, 2010). This study is focused on the role of workforce in economic development in Tarrant County, Texas, and in particular, on the experiences, observations, impressions, and opinions of leaders and influencers who are active participants in economic development activities. The goal of the study is to shed light on the role of workforce in economic development in this region. The theoretical basis for the study stem from the Austin Technopolis Framework which relies heavily on input from key influencers in

the ecosystem (Smilor, Gibson, & Kozmetsky, 1989; Gibson & Butler, 2013). See Figure 1 and Figure 2 for a more detailed description and graphical representation of the framework.

Data collected were specific to this region. Relatively limited publications are available to address this subject in Tarrant County. This was, in part, why the researcher chose this topic. In addition, qualitative methods are advantagious when a researcher is seeking to learn intricate details of a particular instance or phenomenon that can not be easily deduced or conveyed using quantitative data (Roberts, 2010). The qualitative data collected in this study was laregly experiential in nature to reflect the observations and lessons learned by key influencers in the region. While a foundational knowledge of the literature as well as the collection of some emperical data are included for broader context, the researcher intentionally did not prioritize inputs from participants to draw conclusions to support any given theory or model. In this study, the contextualized data and personal experiences of the people in the ecosystem allowed the researcher to gain deeper insights that are uniquely suited to meet the goals of this study. The case study method is specific to a case or bounded system and provides the researcher with qualitative data to better understand how a particular phenomenon works within that system (Burke & Christiensen, 2012). For these reasons, the case study is well-suited to address the research problem at hand to gain particular insights within Tarrant County.

Research Design

This study utilizes targeted interviews to learn about the role of workforce in economic development activities in Tarrant County, Texas. In particular, the researcher gained highly contextualized insights from key influencers and participants in economic development. The Austin Technopolis framework (Smilor, Gibson, & Kozmetsky, 1989; Gibson & Butler, 2013) serves as the theoretical and structural underpinning of the study. See Figure 1. The Technopolis

Wheel of Influencers and Figure 2. The Technopolis Innovation Model for details from literature and elements used to put together instruments and protocols for this study.

Findings were used to analyze economic development activities and weigh effects of workforce (both positive and negative) through the availability of trained human capital, focused economic development efforts, and collaborative leadership (Roueche, Baker, & Rose, 1989). Qualitative methods were employed. Secondary sources such as state records, and external reports from state agencies, professional organizations, educational institutions, and associations were also referenced. Primary research methods were employed using carefully crafted query instruments for targeted interviews. Key findings were applied and lessons learned were weighed against the literature to find consistencies and outliers for analysis. The researcher then distilled findings into actionable takeaways for contribution.

A mixture of sources was referenced ranging from academic peer-reviewed articles, books, historical documents, organizational documents, and government data. Secondary research was used to paint a picture of the current state of economic development in the region examined, the role and impact of Tarrant County institutions, as well as historical and ongoing examples of collaborations that have had an impact in the state. Primary sources were identified and approached using structured interview instruments to offer perspectives and context to inform and address research questions.

One of the primary goals of the study is to gather information that informs the comparison and contrast of different approaches currently in use, as well as identify what is and isn't working in different initiatives within the County. The researcher observed and analyzed responses from each of the regional influencers that participated in the study. Influencers were grouped based on categories of engagement (influencer roles and institutions) and impact in key

areas identified in the literature to be important indicators of successful economic development activities. Fifty regional leaders and influencers were interviewed from the seventy who were invited to participate. The researcher used the resulting data set to create a combined Dashboard and Balanced Scorecard highlighting issues raised in the interviews. The resulting tool can be used to facilitate future alignment and dialogue among leaders and influencers regarding the performance of the region as a whole and for each of the four areas of economic development identified and described in Chapter 1 of this study. Gaps and opportunities identified by each segment are also compared and contrasted.

Based on the interview protocol, and to show courtesy and appreciation to interview subjects (who will remain anonymous) who agreed to participate in the study, the researcher will share the final report with all participants upon completion. The researcher will also make any tools or frameworks that come out of the research available to the interviewed leaders in order to facilitate dialogue during annual strategic planning sessions. Ay public presentations of the data and findings will be in aggregate form and individual responses will remain anonymous.

Recruiting Interview Participants

A pre-study environmental scan of leading institutions, influencers, and initiatives in Tarrant County workforce and economic development was conducted. All assessment instruments, interview protocols, and key intelligence questions were informed and adjusted based on incoming data. Each leader was carefully selected and approached for the study based on four important factors:

1. The importance and relevance of the organizations they represent in the ecosystem.

2. Individual leadership roles in these organizations and other community organizations.

3. Their sustained influence and impact as ecosystem leaders in Tarrant County.

4. Their level of involvement in workforce and regional economic development.

These criteria were informed by the research (Smilor, Gibson, & Kozmetsky, 1989; Gibson & Butler, 2003). Each influencer selected has a strong reputation for leadership in at least one aspect of regional innovation, workforce, and economic development. The wide range of participants involved in the study represents each segment of the Technopolis Wheel with the goal of representing multiple areas of expertise and diverse points of view.

Observation of Interview Participants

Participants were interviewed and observed to gain deeper insights into the successes and challenges faced by them personally as well as their institutions in regard to workforce and economic development. In particular, interviews sought to identify and better understand insights gained while participants were engaged in regional economic development activities.

Available public records and other secondary sources were used to formulate key intelligence questions to be asked in assessment instruments and interviews. An emphasis was placed on four specific categories of activity as defined in the Economic Development Handbook, ie: Company recruitment, company retention and growth, entrepreneurial growth (startups/organic growth), and collaborative leadership across sectors (government, private sector, education, and civic organizations). As new questions came to light through primary and secondary research, the researcher incorporated them when appropriate to gain additional insights. Historical data was used to validate findings and inform dialogue during interviews. National benchmark data related to regional economic development and workforce activities in other regions was coupled with the Tarrant County environmental scan and used as an additional means to compare and validate findings.

Instrumentation

Several instruments were created and used by the researcher to collect, organize, analyze, and report out on data and findings from the study. Research design and methodologies employed include business intelligence techniques and tools for interview and assessment.

See Table 1. Assessment Tool for Ecosystem Engagement (Interview Protocol and informed consent) designed to inform data collection, sample selection, and the research process. The same instrument will provide a structure to document and guide research to apply the Technopolis framework. See Table 2. Data Grid (Matrix): Coding, Categorizing, and Analyzing Interview Responses for an example of the methodology and approach used to code responses during interviews by key intelligence question, role in the ecosystem, and themes that emerged during interviews. This tool was adjusted based on the specific findings at each stage of the study, shaped to meet the needs of the researcher, and informed and updated with each interview. The resulting data grid helped to map the data for structured analysis.

The assessment tool (interview protocol) was designed as a relatively short set of questions about level and type of engagement in workforce and regional economic development activities based on categories identified in the literature. This instrument was designed to gain as much useful information as possible in a short response time. This was intended to lower hassle for interview participants by making it short, focused, and easy to understand. It was the hope of the researcher to increase response rates and quality of response as a result of this simplification.

Interview protocols facilitated structured interviews by the researcher. The same basic set of questions was asked of all interview subjects. This was useful for the purposes of comparison and increased efficiency. However, more in-depth questions pertinent to the specific institution, person, region, or economy were asked as well when appropriate in order to gain

deeper insights. Data collected was mapped back into the data grid and compiled into the

resulting interview report providing information on the subject and answers to key intelligence

questions, quotes, and additional referrals and suggested sources of good information. A

summary of findings from these reports is included in the final deliverable.

Data Analysis and Validation of the Study

The researcher utilized a business intelligence data grid to collect and code data and

interview feedback to research questions. The grid provided a two-dimensional matrix with

questions and subjects. This tool was used to measure the quality and quantity of supporting

data to answer each question. The researcher mapped areas of strength and weakness in terms of

supporting data or evidence from the literature and the research to support a conclusion.

Additional research was be conducted until the confidence interval was sufficient or it was

determined that the data is unavailable. Assumptions were articulated in the final analysis and

the resulting data set was analyzed using triangulation from multiple sources to identify

consistencies and unique findings for consideration.

Limitations of the Study

Limitations of the study include: 1. A relatively small sample size of 50 targeted

interviews.   The researcher leveraged the Technopolis Wheel of Influencers and the Etzkowitz

Triple Helix of Innovation to ensure a diversity of inputs and to carefully select the participants

for invitation and involvement in the study. The researcher utilized a structured approach to data

coding and analysis to maximize value add from inputs and draw meaningful insights. 2. There

is a risk that the Austin Technopolis Framework is not readily compatible with the current

environment due to the time elapsed since its development in 1989. To the knowledge of the

researcher, this will be the first time the framework has been applied specifically through the lens

of the role of workforce in regional economic development. While incompatibility is one

possible outcome, the researcher is confident that the framework will at least provide a

meaningful structure for data collection and analysis, as well as dialogue with community

college leaders. It is likely that the landscape has changed some since the initial development of

the methodology. However, this has already been noted from literature review in the areas of

community colleges and teaching universities. The literature indicates a high degree of need for

workforce to engage in entrepreneurship, innovation, and regional economic development. Since

the Austin Technopolis Framework has proven useful for universities, government, and the

private sector in the past, it may be a matter of adjusting and/or augmenting the framework based

on the findings of this study. 3. There is a risk that the framework and related findings could

miss the mark in Tarrant County if not placed into the appropriate context. The terminology,

perspective, and mission of workforce and economic development can vary from region to

region and from stakeholder group to stakeholder group. It was therefore very important that the

researcher define terms carefully and clearly, and take the time to translate, educate, or explain as

needed to help interview subjects to maximize contributions. As part of this effort, a list of

definitions was included as part of the interview protocol and was reviewed with participants at

the beginning of each interview. In addition, participants were invited to weigh in with any

suggested edits or additions to those definitions in order to improve.

In qualitative research related to technology entrepreneurship and innovation, it is

important to utilize external validation through direct feedback from leaders in the trenches.

They are closest to the needs in marketplace because they serve them every day. The researcher

reserved the ability to go back to the leaders of these initiatives for validation as often as needed

to learn, adjust and improve (Hisrich, Duening, & Lechter, 2015). The resulting findings were

externally validated at multiple stages of the study to ensure accuracy, validity, and consistency. The interviewees selected for engagement and participation in the assessment process provided data and resources from their institutions and their own personal perspectives for comparison. Lastly, findings were compared against state-wide and national benchmarks where possible to compare performance and gain additional insights and perspective.

Summary Chart

TOPIC: THE ROLE OF WORKFORCE IN REGIONAL ECONOMIC DEVELOPMENT

Purpose of the Study

The purpose of this study is to shed light on the role of workforce in economic development in Tarrant County, Texas. The researcher will apply the Austin Technopolis Framework (Smilor, Gibson, & Kozmetsky, 1989) to identify and select a representative group of key influencers from a range of organizations involved in economic development in the county. In addition, the researcher will focus on past, ongoing, and planned economic development initiatives as well as successes and failures in the county to determine what is working and what is not, as well as consider additional strategies that could help to make economic development more successful.

Research Questions

Research Question #1	What role does workforce play in the REDE of Tarrant County?
Research Question #2	What are the specific dynamics at play in the ecosystem in regard to workforce and each of four categories of economic development activities in the county, ie: Company recruitment, Company retention and growth, Entrepreneurship (The creation of new companies), and Collaborative leadership across institutions and sectors?
Research Question #3	What is the REDE of Tarrant County doing well and what could be done to improve the responsiveness and performance of workforce and regional economic development within the ecosystem?

Design of Study

Research Agent	Eli D. Mercer
Timeframe of Study	February to April 2021
Unit of Analysis	The unit of analysis for the study of workforce and its role in economic development activities is the individual contributor. The unit of analysis used for workforce is the number of skilled workers and their level of mastery in a given job or function. The unit of analysis used for economic development is the number of companies, the number of jobs provided by the company, and the total economic impact.
Methodology	A qualitative study using secondary empirical data and primary interview data to identify common themes for analysis.
Type of Research Design	Case Study
Population	This study is specific to the case of Tarrant County, Texas. Interview participants were selected from key influencers who are actively involved in economic development efforts in the local market. Insights gained are primarily relevant to the local context. However, lessons learned may be extrapolated for comparison and contrast with other regional case studies.
Sample Selection	The researcher interview 50 targeted influencers and leaders in Tarrant County involved in economic development in the region. The study utilizes the Triple Helix of Innovation Model (Etzkowitz, 2002; Etzkowitz & Leydesdorff, 1997) and the Austin Technopolis Model (Smilor, Gibson, & Kozmetsky, 1989) to ensure a representative sample of interview subjects across several key types of organizations and sectors that tend to play a key role in regional economic development. Consideration was paid to knowledge, training, and skills a

	person has in workforce, economic development, and experience in the region.
Researcher's Role	The researcher is Eli D. Mercer, a technology entrepreneur and educator by training. Eli has extensive experience in both regional economic development and workforce development. His research is focused on innovation and entrepreneurship ecosystems. He is a native of North Texas and has lived and worked in Tarrant County at various stages of life dating back to 1990. He is currently CEO of Kingdom Ecosystems, LLC, a software company focused on ecosystem development. He is Board Chair of VBI (Venture Business Impact), a Tarrant County non-profit incubator and accelerator. He is also Chair of the Heart of North Texas Business Conference, former Dean of Technology, Health, and Business at Tarrant County College, and has taught Entrepreneurship at the University of Texas at Austin and International Business at Austin Community College.
Interview Protocol	Structured interview protocols were shared with participants in advanced and adhered to throughout data collection. All participants read and signed a form agreeing to participate and to the protocols. The same interview questions, sequence, and instruments were utilized in all interviews for consistency. Interviews took twenty minutes to an hour depending on availability and answers provided by the interview subjects. Interviews were conducted by Zoom for safety and convenience.
Data Collection Strategies	50 Targeted Interviews
Data Analysis Methods	The researcher utilized thematic analysis, often called Qualitative Content Analysis (QCA) in Europe, one of the most commonly used methods for analyzing qualitative data. QCA is a systematic method of qualitative data analysis.

	(Guest et al. 2012; Kuckartz, 2014; Mayring, 2014; 2015; Schreier, 2012). QCA consists of six steps: Step 1: Preparing the data, initiating text work, Step 2: Forming main categories corresponding to interview questions, Step 3: Coding data with the main categories, Step 4: Compiling text passages of the main categories and forming subcategories inductively on the material; assigning text passages to subcategories, Step 5: Category-based analyses and presenting results, Step 6: Reporting and documentation. Conclusions will answer research questions and address the purpose of the study.
Confidentiality	All individual responses will be kept anonymous.
Verification/trustworthiness	Interviews were carefully documented. Key words and themes were identified and coded based on interview responses. Triangulation was used to find common themes as well as identify unique outliers from interview responses provided.

Chapter 4 - Analysis of Data

Chapter Overview

In this chapter the researcher presents the data collected from research. The chapter begins with a brief recap of the research questions, the research methodology, data collection methods, and the rationale utilized in the study. The researcher presents a detailed breakdown and analysis of the attributes and overall outlooks of participants. The chapter concludes with a presentation of major themes that emerged from the 50 interviews including areas of convergence and divergence among the leaders in regard to the ecosystem, workforce, and economic development in Tarrant County.

Using Data to Shed Light on the Research Questions at Hand

The research questions for this study were crafted with the intention of shedding light on workforce in the regional economic development ecosystem (REDE) of Tarrant County, Texas, by gaining the unique perspectives of fifty regional leaders and influencers. Six summary insights gained from interviews regarding the evolving role of WF in Tarrant County include:

1. The WF is integral to successful business development in the region. There was consistent agreement on this subject. While there were differing ideas on what aspects of the WF were most important to focus on first, IE: Technology skills vs. trade skills vs. soft skills, all leaders interviewed stated that an effective WF is crucial to maintaining the current strong economy in Tarrant County as well developing the robust economy of the future that the county is seeking to build. They also shared that the competition for talent is fierce among regions and expected to become more and more competitive in the coming decade. This begs the question of WF strategy for the county and the region and provides ample motivation to invest in WF programs.

2. The role and nature of the WF in Tarrant County is changing. Increasingly, employers have more to do in order to attract and retain talent. Several leaders shared that employers have an increased responsibility to help meet a variety of challenges faced by employees as well as the community at large. This includes childcare, transportation, and flexibility in terms of time off and work from home policies. Increasingly, skilled employees have negotiating power as labor markets become more competitive and many are choosing to go where they feel best treated and best paid. It was also mentioned that countywide, municipal, and state programs that provide WF incentives and support might not be enough in the future. Employers will likely have to step up and partner proactively as competition for talent becomes more competitive.

3. Recent events have reshaped the landscape for years to come. Leaders shared stories of COVID and the effects on workforce and workplace across the county. One leader estimated that as much as 40% of the WF would not return to their previous jobs or would opt to leave and seek a new role or profession within 1 year of returning from the epidemic. Another likened the changing landscape to the return of the GI's at the end of World War II who had left as inexperienced farm boys and came back as men of the world. Just as they saw Europe and Asia and came back expecting more out of life upon return, members of the current WF have tasted work from home and time with family. They have had time and occasion to weigh priorities and consider the meaning of life and work from a quality of life perspective. As a result, flexible work schedules, hybrid office and work from home models, and enticing incentives to recruit and keep talent are all likely to emerge as more prevalent in the months and years ahead. Employers and communities will need to take these new life experiences into consideration as they interface

with returning talent. They will also have to remain flexible and be willing to incorporate

technology, flexibility, and next-generation opportunities to remain competitive in the future.

4. The WF is becoming more diverse with evolving wants and needs in an employer and in the

region in which they live. This includes age, culture, heritage, background, geography of origin,

religion, training, and experience levels. As the region becomes more focus on engaging,

supporting, and helping meet the needs of each unique segment of this diverse WF, special

attention must be made to utilize diversity as a strength, and resources must be dedicated to

facilitating and supporting the coming transition. Diversity requires new approaches to address

effectively, but also promises to offer significant benefits over time if effectively utilized.

5. Employers need more qualified and dependable workers who can hit the ground running, learn

quickly, and adapt to the environment to meet both internal and external needs. Some are

seeking talent with more credentials. Some are partnering with higher education to develop a

WF. Others are expanding in-house training and education programs to gain a competitive edge.

6. Numerous initiatives are underway and more are emerging to address these challenges and

opportunities. The key, according to leaders interviewed, is alignment of vision and mission,

sharing resources for synergy, and agreeing on ways to measure and improve impact over time.

Research Questions: What role does workforce play in the REDE of Tarrant County?

What are the specific dynamics at play in the ecosystem in regard to workforce and each of four

categories of economic development activities in the county, ie: Company recruitment, Company

retention and growth, Entrepreneurship (The creation of new companies), and Collaborative

leadership across institutions and sectors? What is the REDE of Tarrant County doing well and what could be done to improve the responsiveness and performance of workforce and regional economic development within the ecosystem?

These questions were framed in a manner that was intended to allow participants to share openly and freely from a wide range of unique roles, perspectives, and experiences in the ecosystem. It was, therefore, the goal of the researcher to be open-ended enough to cast a wide net and allow each participant to contribute freely. However, due to the applied nature of the research, and the goal of providing a practical framework for ecosystem leaders and influencers to facilitate follow-up dialogue and collaboration, the researcher sought to be specific as possible in scope to keep the conversation on track and focused in ways that would prove useful. The importance of this delicate balance is evident in data collected in the interviews and in the range and overlap of responses provided. This section will convey, to the best of the researcher's ability, the sentiments shared by the 50 leaders and influencers as accurately as possible. All participants and their responses remain anonymous.

Methods for Data Collection, Verification, and Trustworthiness

A structured approach was utilized in order to maintain consistency during interviews. Participants were asked a series of questions. While interviews remained conversational, the researcher made an effort to keep discussions focused on the research at hand. Where appropriate, the researcher asked follow-on questions to delve deeper into the responses in order to gain additional insights. See Table 1. Assessment Tool for Ecosystem Engagement (Letter and Interview Protocol) in the Appendix section of this report for details.

All interviews were conducted using Zoom calls in order to maximize convenience for participants as well as safety given recent concerns related to COVID 19 and social distancing

practices. The average discussion took 45-60 minutes. Participants were encouraged to share openly and to feel free to skip any questions they did not feel comfortable answering. Facts, figures, and references to secondary sources during interviews were later verified where possible in order to ensure accuracy and proper reporting. The names of specific individuals or institutions were intentionally minimized in the reporting of data. Instead, the majority focus was placed on the reporting out of regional dynamics identified by participants that could have a positive or negative effect on the responsiveness and readiness of the REDE in TC.

All interview responses were carefully reviewed for underlying themes, areas of convergence, and areas of divergence among answers provided by the participants. See Table 2. Data Grid (Matrix): Coding, Categorizing, and Analyzing Interview Responses in the Appendix section of this report for details. Attention was paid to key words and phrases used, as well as sentiments expressed by participants. Individual opinions, impressions, and experiences were considered, compared, and contrasted based on the unique attributes of participants and their role in the REDE. In addition, the researcher analyzed overlapping feedback to develop an overall sense of the collective experience of REDE participants. This analysis yielded a well-rounded view of the REDE in TC as reflected in interviews with the 50 participants.

The goal of analysis was to gain a clear and meaningful understanding of what the 50 leaders and influencers felt was most important to be shared and considered in order to address the research questions. The researcher sought to remain transparent, professional, and objective throughout the process of data collection, analysis, and reporting. It was the express goal of the researcher to ethically steward the individual and collective voices of interview participants in an honest, accurate, and honoring manner, while also ensuring that those voices remain anonymous. It was also the goal of the researcher to remain true to the stated goals, purpose, and scope of the

study, with the mission of adding measurable value for REDE leaders and influencers in Tarrant County and in other regions seeking to develop, grow, and learn from the findings of this study.

Sample Selection and Analysis

Using the Quad Helix of Innovation model and the expanded Technopolis Wheel of Influencers, 100 leaders and influencers in TC were identified for potential interviews. In keeping with the segmentation included in the methodologies, individuals were selected who represent a range of roles and organizations in the REDE. Of the 100 identified, 70 were prioritized and selected for invitation, with 30 being held in reserve for backup invitations in case there was not a sufficient response rate to complete the study and adequately inform conclusions.

Table 1. Breakdown of Participants: 100 Identified, 70 Invited, and 50 Interviewed
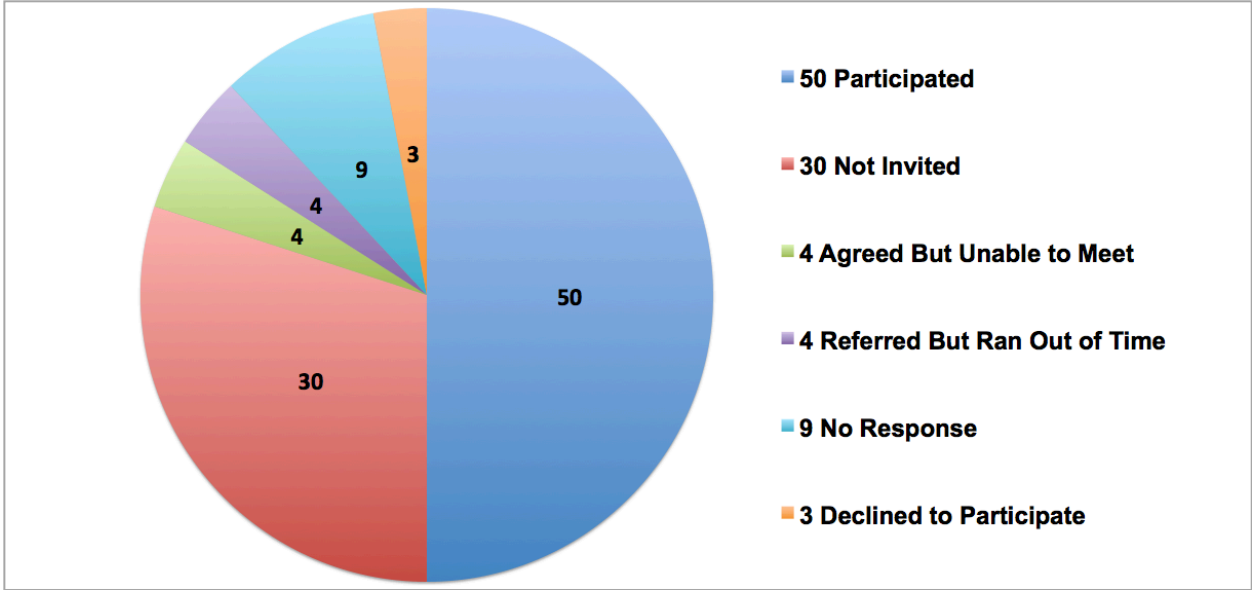
The goal of the researcher was a response rate of at least 50%. The study yielded a response rate of 71.43%. This is higher than average for similar studies. The high rate of participation reflects the strong interest of participants in the subject matter and the research questions involved in the study. It also reflects the open, engaging, and responsive culture of leaders and influencers in the REDE of TC. Of the 70 leaders who were invited, 54 agreed to

participate. Unfortunately, due to scheduling difficulties, 4 subjects were unable to participate within the time frame for interviews. Another 4 were referred and agreed to participate, but there was not enough time to get their interviews scheduled, conducted, coded, and analyzed for inclusion in this study. An additional 47 leaders and influencers were identified and referred to the researcher by participants to be good candidates for inclusion in the study. However, there was insufficient time and resources for inclusion within the timeframe and scope of this study. A total of 3 declined to participate and 9 of those invited did not respond to the request. All of these interview subjects will be considered for inclusion in follow-on research.

Table 2. Percentage of Male and Female Participants
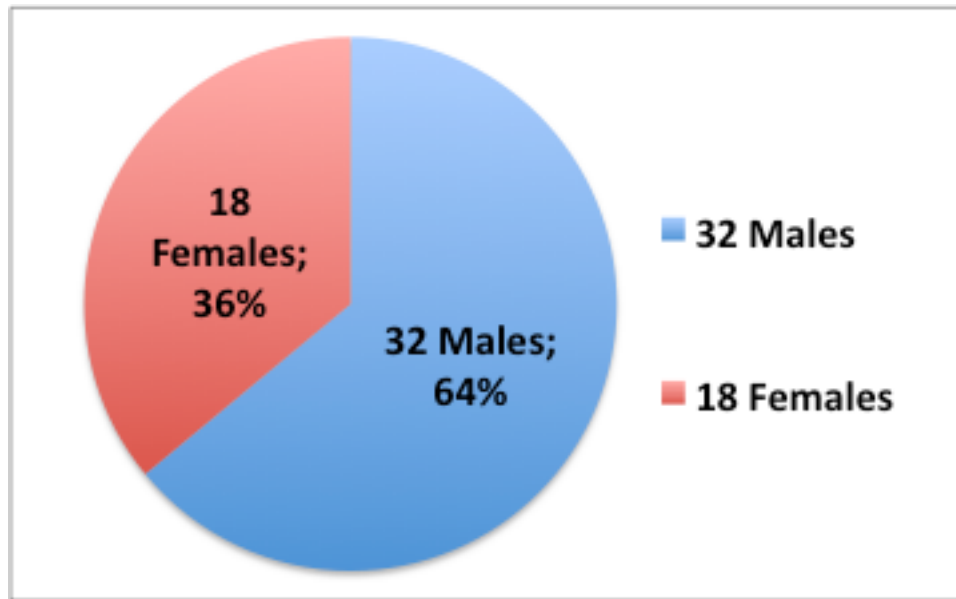
Table 4 provides a breakdown of the percentages of male and female participants. Since segmentation and selection were focused on sectors, roles, lead organizations, and influential leadership within the REDE in TC, it is also implied that these percentages are an accurate reflection of the current representation of men and women in leadership within the county.

While demographic diversity was not the primary driver of this segmentation methodology in terms of criteria for selection, the researcher wanted to see what the

characteristics of the resulting 50 participants would turn out to be and consider possible implications. After much effort was made to select and carefully prioritize potential interview subjects for invitation and engagement, it was gratifying to see the healthy diversity represented. Participants range in age from their late twenties to early eighties. The average age of participants is estimated to be around 50. Participants were approximately 1/3 female and 2/3 male, representing a broad range of ethnicities, cultures, backgrounds, and training.

TC leaders and influencers included in the study represent a diverse cross-section of the community including all walks of life, professions, and levels of community engagement. It is the belief of the researcher that this lends greater credibility and strength to the study. The rapid response of leaders is notable, especially given the fact that this research was conducted over a short period of time during the throes of a hotly contested election. Many interviewed were up for election, re-election, or heavily involved in the county election process. While a broad spectrum of political views was represented, it is also notable that no discussion of political party was ever brought up by the researcher or any of the 50 participants. Any mention of the election during interviews was either shared in the context of hopes for a brighter future, or in reference to the accomplishments of the current and past leadership in TC. The fact that so many took the time to meet in this busy time and share their experiences and ideas for the future speaks volumes about the culture of the REDE in TC. It is an indicator of the level of access to leaders that is available to ecosystem participants in the region. It also bodes well in terms of the level of opportunity for an even greater "coming together" among stakeholders as a result of ongoing engagement, dialogue, and collaboration regarding the development of the REDE of TC.

Applying Frameworks for Deeper Analysis

The Austin Technopolis Wheel (See Figure 1) was utilized to identify, segment, and prioritize regional leaders and influencers for interview. The researcher used the model to break down the complex dynamics of the ecosystem into more observable influencer groups, and then used criteria from the literature to select REDE leaders and influencers who were likely to have valuable knowledge and experience to contribute to the study and address research questions. By doing this, the researcher was able to zoom in on challenges and opportunities faced within each influencer group. The following tables provide a detailed breakdown of interview participants by sector and by segment within the expanded version of the model as developed by the researcher and presented in Chapter 1 of this study. All identified segments were represented. Each segment had at least 2 and as many as 9 leaders and influencers represented in the sample.

Table 3. Breakdown of Expanded Technopolis Wheel of Influencers by Group

Pie chart legend:
- 12% Research Universities
- 8% Teaching Univerities
- 8% Community Colleges
- 8% Large Corporations
- 6% Large-scale Enterprise
- 6% Small Business
- 8% Startups
- 4% Federal Government
- 4% State Government
- 16% Local Government
- 20% CIVIC and NGO's
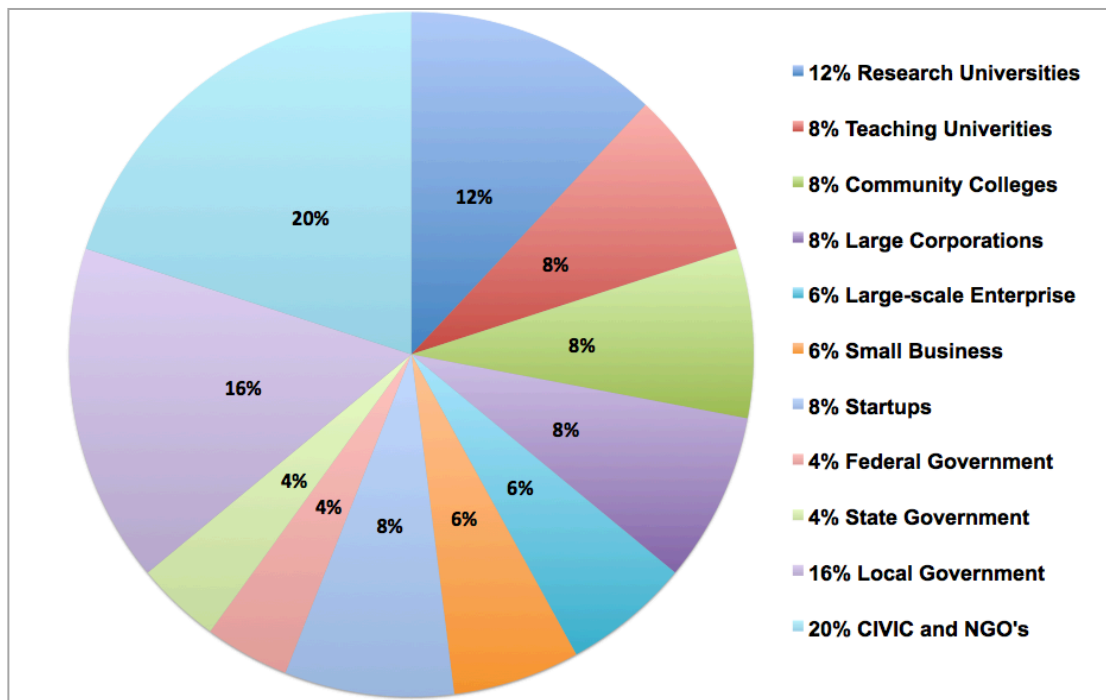
Two additional frameworks were utilized in the segmentation and analysis of participants and their inputs: The Triple Helix of Innovation (Etzkowitz, 1997) and the Quad Helix of Innovation (Kimatu, 2016) (See Figures 3 and 5). The triple helix places particular emphasis on the roles and interactions of three main sectors, ie: Government, Education, and Industry. The quad helix places additional emphasis on civic organizations (civil society) as a fourth sector that is seeking to address societal needs that are not being adequately met within the traditional triad. Special attention was paid to make sure that all sectors were adequately represented. Table 6 below shows a breakdown of participants by percentage:

Table 4. Breakdown of Triple/Quad Helix of Innovation Models By Group
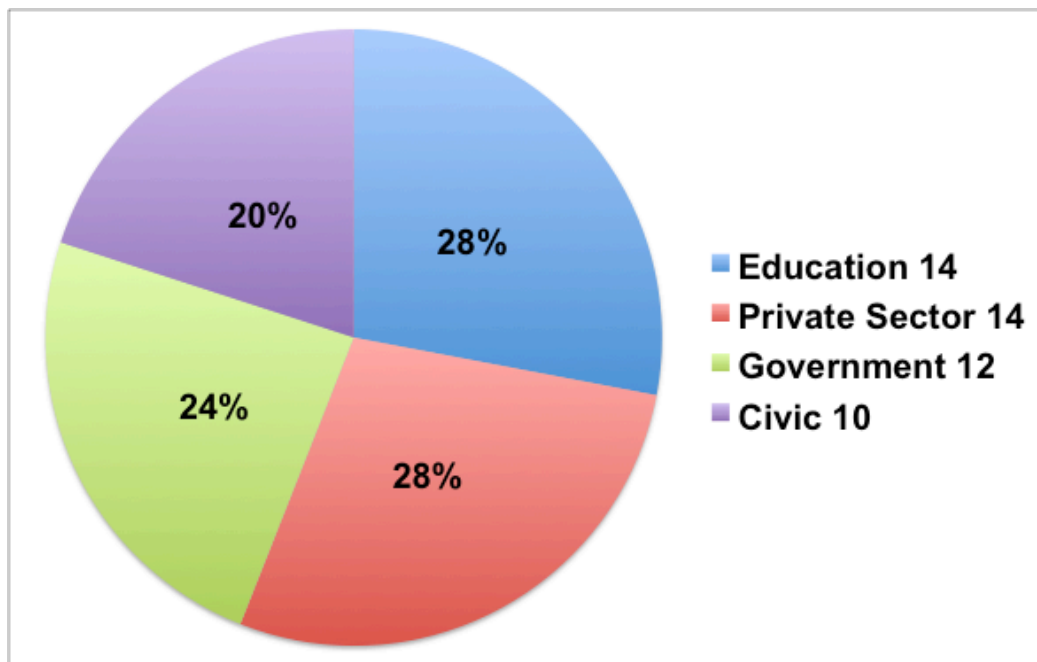
All four sectors were represented in the study with the lowest percentage being 20% and the highest being 28%. This relatively equal distribution of participants across the 4 sectors helps to ensure that diverse perspectives were included representing a range of roles and organizations in the REDE. For the purposes of this study, a lens is being placed specifically on

cross-sector collaborations in the ecosystem, workforce, and economic development activities in Tarrant County. These models focus on the interplay between sectors and regional actors and are built on the premise that more deliberate and sustained interactions, shared knowledge, and aligned goals across these sectors lead to better outcomes.

The REDE analysis frameworks that accompany these segmentation tools include The Technopolis Model for the Analysis of Innovation Ecosystems (Smilor, Gibson & Kozmetsky, 1989; Gibson & Butler, 2013), covered in detail in Chapter 5 of this study, and The Triple/Quad Helix of Innovation - Circulatory System (Dzisah & Etzkowitz, 2008), discussed below. As stated in Chapter 1, this study will utilize the concept of "helix transience" from this model to measure the flow of people across sectors in TC and leave the other key elements (The flow of ideas and innovations) as strong candidates for consideration for follow-on studies.

Helix transience is a measure of how many leaders have experience working in more than one sector. As presented by Dzisah and Etzkowitz (2007), helix transience is a strong indicator that leaders and influencers have relationships, knowledge, and experience that are well suited for cross-sector collaboration and the implementation of the triple helix. He argues that the more individual leaders with experience across sectors, the better the chances that the REDE will emerge as robust and globally competitive. He also provides examples from globally leading ecosystems such as Silicon Valley and the Boston Corridor in which leaders and influencers fitting this profile have served as key champions and change agents during important inflection points in their history and development.

As shown in Table 7 below, 72% of the participants in this study have experience in more than one sector. Many of them currently participate actively in more than one sector, and several are actively involved across 3 or 4 sectors within TC. This high level of helix transient leaders is

a strong indicator that the REDE in TC has the capacity to effectively implement and optimize

the triple/quad helix model for cross-sector collaboration. In addition, it is a strong indicator that

leaders and influencers will be more likely to adopt new frameworks and tools that involve

elements of more than one sector.

Table 5. Percentage of Helix Transient Participants by Group
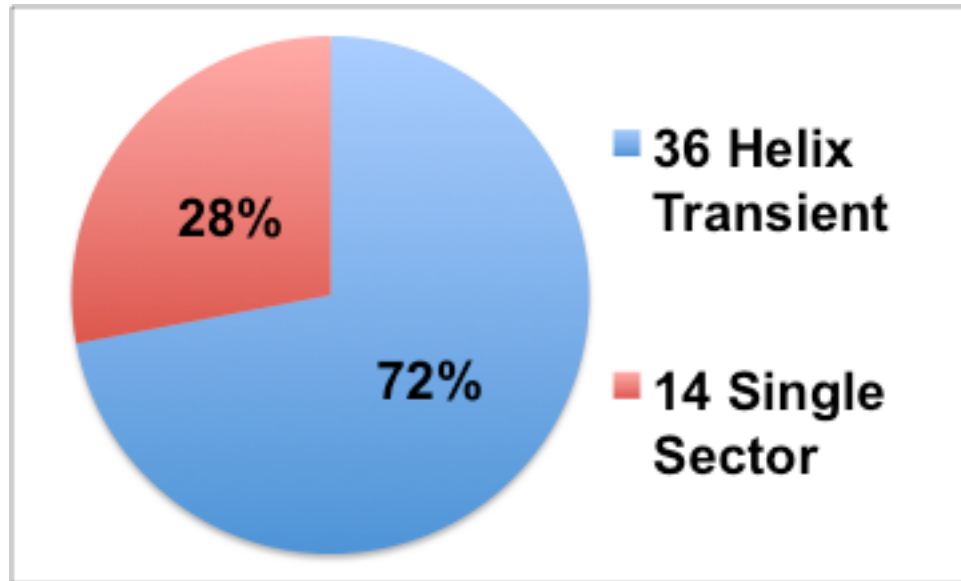
Another key indicator that is often used in conjunction with helix transience is the

measure of how many ecosystem leaders and influencers have experience outside the region. It

is also considered important to measure how many are natives, relocated, long-term residents,

and recent transplants. According to several scholars including Kozmetsky and Etzkowitz, the

greater the mix of outsiders with experiences in other cultures, regions, and REDE's, the better

for collaboration and openness to change.

In addition, it is important to consider how many leaders and influencers have significant

experience as long-time residents, and how many have chosen to stay in the region after having

relocated from other parts of the world. This is referred to as "stickiness" in the ecosystem and

is an indicator that the region is attractive for the retention of highly skilled talent. It is also an

indicator of how committed regional leaders and influencers are likely to be in terms of staying in the local market long enough to make a measurable difference. Last but not least, the higher the percentage of leaders who have chosen to stay long-term who have exposure elsewhere, the greater the body of knowledge and diversity of experiences. These factors can indicate the need for idea sharing and open forums to take advantage of these assets within the ecosystem.

In the case of the REDE of TC, Table 8 below provides a detailed breakdown of participants by category as they relate to native vs. relocated, as well as long-term resident vs. newcomer. Again, the results are positive indicators for TC in terms of potential capacity for rapid REDE development and change as a result of cross-sector collaboration. More than 66% of participants relocated to TC from other ecosystems. Fifty-four percent of participants are long-term residents who have chosen to remain in TC after having lived and worked in other ecosystems. This represents 82% of participants who have relocated to the region. This is an astonishingly high percentage and a very favorable indicator according to the model.

Table 6. Origin, Length of Residency, and External Exposure of Participants

27 Relocated and Now LT Resident	27	54%
12 Native - Left TC and Came Back	12	24%
6 Newly Relocated	6	12%
5 Native - Stayed in or Near TC	5	10%

A second positive indicator that was brought to light in the analysis is the significant population of REDE leaders and influencers (24%) who are natives of the region who left to gain education, training, professional experience, and exposure to other ecosystems, then chose to return home to live and work in TC. This is an additional indicator that there is a regional loyalty and an attractive enough market to attract and retain native talent even after they have been exposed to other ecosystems and market opportunities. These leaders have established family relationships and deep roots in the community that are difficult to establish for outsiders even after years of living in the region. This presents a unique opportunity for these returning leaders to influence the establishment in TC and bring about meaningful change in the areas of need that come to light in this study as well as additional ecosystem studies conducted.

A significant 12% of participants are newcomers who have brought in new ideas, cultures, and experiences from other ecosystems and managed to gain enough influence in the ecosystem to be included in this study based on selection criteria. While not an overwhelming percentage, it is a significant indicator that new leaders and new ideas are tolerated and even embraced in the existing culture and environment, at least to the degree that these leaders are included and have a platform for influence.

This may be an opportunity for growth in the REDE and an area worthy of follow-on research. If ecosystem leaders can offer newcomers the opportunity to share pros and cons of the ecosystem through fresh eyes, it could lend a credible and constructively critical point of view to the regional dialogue about the future that could otherwise take time and failures to identify. By addressing any potential barriers, newcomers currently in the ecosystem could have a greater positive impact. It could also lead to other talented leaders choosing to relocate to TC and stay

within the region. The REDE would be well positioned to implement a proactive recruitment strategy if these efforts were successful.

Last but not least, 10% of participants are native residents who have spent their entire career within the region. This indicator can have both positive and negative implications for the REDE depending on a number of factors. First, it is crucial that this number not be too high for the sufficient inflow of new talent, ideas, and experiences from other ecosystems. At 10%, the REDE of TC is in a healthy position and not in significant danger of stagnation according to the model. It may be suggested that some formal mechanism be developed for knowledge exchange (KTTA) between leaders, influencers, and newcomers, as well as natives who have returned.

On the other hand, it is important that there be a significant enough percentage of natives to allow for in-depth understanding of local culture, history, and context. It can also be an indicator that the region is attractive enough and has a strong enough local economy to retain talent. In the case of TC, the combined 34% of native leaders shows a healthy environment in terms of regional attractiveness and economy, and a significant concentration of native expertise and networks to affect influence and regional change. Altogether, this analysis yields an overall positive mix of leaders and influencers to lead the REDE into the future.

According to the literature, it is also important to weigh levels of involvement among leaders and influencers in different sectors, key types of collaborative activity in the ecosystem, as well as additional attributes that indicate level of commitment and willingness to engage. In the case of TC, the researcher chose to track 17 categories that relate to both needs within the REDE (As indicated in interviews), as well as drivers of change and ecosystem evolution in the literature as they relate to research questions. These categories include: National Experience or Exposure, Institutional Partnerships, Economic Development, Chambers of Commerce, Public-

Private-Partnerships (PPP), Company Retention and Growth, Fundraising, Workforce Development, Capital Source, Incubators and Accelerators, TECH Experience, International Experience or Exposure, Entrepreneurship and Startups, Workforce, Company Recruitment, Elected Officials, and service in the Military. The following Table 9 provides a detailed breakdown of the categories that participants chose to disclose in terms of their involvement and commitments within the ecosystem.

Table 7. Attributes and Involvement of the 50 Participants by Category

Category	Participant	Percentage	Ratio
National Experience/Exposure	33	66%	2 in 3
Institutional Partnerships	30	60%	3 in 5
Economic Development	24	48%	1 in 2
Chambers of Commerce	20	40%	2 in 5
Public-Private Partnerships (PPP)	20	40%	2 in 5
Company Retention and Growth	18	36%	1 in 3
Fundraising	18	36%	1 in 3
Workforce Development	17	34%	1 in 3
Capital Source	13	26%	1 in 4
Incubators and Accelerators	13	26%	1 in 4
TECH Experience	12	24%	1 in 4
International Experience/Exposure	12	24%	1 in 4
Entrepreneurship and Startups	12	24%	1 in 4
Workforce	10	20%	1 in 5
Company Recruitment	10	20%	1 in 5
Elected Officials	8	16%	1 in 6
Military	8	16%	1 in 6

While it is acknowledged that this does not represent a strictly accurate percentage of these categories (ie: Some leaders may not have mentioned all areas in which they are active or have commitments or experience), the fact that leaders chose to mention them and self-described as active and committed in these areas are strong indicators of the level of importance they see in undertaking these activities. In theory, the higher the percentage of leaders and influencers indicated, the better the chances of the REDE gaining traction in a given area. The more that are involved across all the categories, the better the chances of collective progress toward goals.

Notable positive indicators for the REDE include: A majority 66% of participants have national exposure to other ecosystems, cultures, and contacts and 60% are involved in institutional partnerships. Almost half, or 48% consider themselves involved in economic development. Forty percent are actively involved in chambers of commerce. And 40% indicate that they are involved in some form of public-private-partnership. These indicators show a relatively high level of collaboration already taking place in TC and a willingness to work across sectors. They also indicate that there is likely a significant percentage of regional leaders who would be open to a more interconnected and collaborative REDE. On the other hand, these percentages show that TC still has work to do in order to ensure that all regional leaders are informed, included, welcomed, and ushered into these important categories of involvement.

Categories that yielded lukewarm indicators include: Some 36% of participants indicated involvement in company retention and growth. Another 36% are involved in fundraising. And 34% self-identify as engaged in workforce development. These indicators show significant contributions being made by a significant percentage of REDE leaders. However, given the integral importance of these activities based on both literature and feedback during interviews, these numbers indicate overall lackluster levels of engagement and involvement in these areas.

Notable negative indicators for the REDE include: The availability and involvement of capital sources is low at 26%. This is a key component to ecosystem development. Only 26% identify as engaged or involved in regional incubators and accelerators. Twenty-four percent indicate that they have significant TECH industry experience. Nearly 24% have been involved or are currently involved in entrepreneurship and startups. A mere 20% indicated engagement in workforce. Only 20% are involved in company recruitment activities into the region. This represents an opportunity for a more robust and growing ecosystem. A total of 16% indicate current or past service in the military. While it is possible that some did not mention their service in the interview, this number seemed low considering the long military history in TC, and the importance of the defense industry. This is another area for possible follow-on research in order to better understand the connectivity and interaction between the military and the REDE.

Overall, these areas indicate that there are significant areas for improvement. The model suggests that structured mechanisms be put into place to help to boost inclusion, engagement, and involvement of regional leaders and influencers in these areas. It may also be advisable for the REDE to target folks for recruitment into new and existing positions for hire, with skill sets, Rolodex's, and experience related to these categories to relocate into the ecosystem.

One notable outlier, some 16% of those interviewed were elected officials. While 16% trends toward the bottom of the ranked list of categories by representation in Table 9, it is a high percentage and a positive indicator for the ecosystem given the nature of the model and the context of the study. This means that 8 elected officials from municipal, county, and state levels were interested and accessible to participate. As indicated earlier, several of these leaders were engaged in tough political campaigns for re-election during the time of interview. Based on these circumstances, the researcher considers this to be a very high representation.

TC is uniquely positioned compared to other counties due to the size, complexity, and distances involved (See Table 10). All of these attributes can serve to help or to hinder the development of a robust REDE depending on a number of factors. In general, it is positive to have significant resources and a variety of options available within the region for new residents to choose from. However, it is crucial that information be collected, updated, and distributed to both internal and external stakeholders in order to avoid slowing down decision-making and eventual buying decisions. The greater the complexity, the greater the need for good data collection and communication to interested parties at the time and place the info is needed. Overall, it is not clear that TC has done an adequate job in this area. Based on the experience of the researcher when seeking information to inform this study as well as feedback from interview participants, comprehensive and reliable information is difficult to come by in TC. This is true for both internal and external participants and may be a major obstacle to deal flow in the REDE.

Table 8. Indicators of Complexity in the Tarrant County Landscape

Complexity of the Tarrant County Landscape	
Cities	41
Economic Development Organizations	32
Chambers of Commerce	35
Independent School Districts (K-12)	20
Post-secondary Educational Institutions	21
Registered Public Charities (*as of 2016)	5,811
Sources: www.tarrantcounty.com and *www.thecnm.org	

Other important indicators include geography, political jurisdictions, and the representation of different parts of the county. Participants in the study represent (primary place of work or residence) a total of 31 of the 41 municipalities in TC, or 76% overall. Many represented or worked across all 41 municipalities and the majority lived in a different city than their place of employment. According to the Tarrant County website, TC ranks 1st in the state of

Texas for the greatest number of municipalities at 41. On one hand, this offers a great deal of variety for residents and newcomers alike. On the other hand, this can cause brand confusion for newcomers and for companies and talent considering the region for relocation.

In addition, TC has 32 active economic development organizations and 35 chambers of commerce. This indicates a significant amount of resources are being allocated to these efforts, which is a positive. However, the sheer number of entities can make it difficult to navigate the REDE for all participants, but most especially for newcomers and potential recruits. From an education perspective, TC has 20 independent school districts including some that are nationally recognized for quality and some that struggle to meet the national average in many areas of performance. There are 21 post-secondary institutions that run the gambit in terms of public vs. private, for-profit vs. non-profit, affordable vs. premium pricing, offerings, formats, and rankings against peer institutions. This variety provides a lot of options to meet the needs of learners of all areas and backgrounds. However, navigating such a complex landscape can prove to be a challenge, especially for those not living in the area, people unfamiliar with the region, first-time-in-college students, as well as people without access to Internet and reliable transportation.

TC is also unique regarding the landscape of civic society and the prevalence of public charities. According to the Center for Nonprofit Management, Tarrant County has 5,811 registered charities that constitute 25% of the charitable institutions in the 16 North Texas Counties they track and study in North Texas. In addition, the number of non-profit organizations in Tarrant County is growing rapidly (CNM, 2018). The sheer numbers indicate that TC has a robust environment for charitable giving and involvement. This could be a major asset to the REDE as growth and evolution of the region take place.

However, it also indicates that there is likely duplication of efforts and fragmentation across the numerous charities that could limit the ability of TC stakeholders to maximize the impact of charitable giving and charitable service. Similar to the other categories captured in this analysis, the REDE of TC is sizable and exceedingly complex compared to most counties. This could make it difficult for people providing these services (volunteers, donors, organizers, leaders, influencers, media outlets) as well as those receiving these services (people and organizations in need who would be recipients) to navigate the REDE and find what they are looking for. Again, the greater the size and complexity of the ecosystem, the more important it becomes to provide clear, robust, and easy to navigate information portals and outlets for end users. This is an area of major opportunity for immediate impact within the REDE.

Table 9. Distribution of Population by Large City in TC

Distribution of Population by Large City in TC			
Population of Tarrant County is 2.1M as of 2018			
#	City	Population	Percentage
1	Fort Worth	880,954	41.90%
TOP CITY		**880,954**	**41.90%**
2	Arlington	414,406	19.71%
3	Grand Prairie	200,370	9.53%
TOTAL TOP 3 CITIES		**1,495,729**	**71.14%**
4	Flower Mound	75,480	3.59%
5	NRH	73,378	3.49%
TOTAL TOP 5 CITIES		**1,644,587**	**78.22%**
6	Mansfield	68,121	3.24%
7	Euless	58,029	2.76%
8	Grapevine	54,665	2.60%
9	Bedford	52,773	2.51%
10	Keller	47,727	2.27%
TOTAL TOP 10 CITIES		**1,925,904**	**91.60%**
Sources: www.census.gov and www.statisticalatlas.com			

For additional context regarding the geography, distributions of population, and landscape of the REDE, see Table 11 above depicting the top 10 most populous cities in TC. This information is further evidence of the complexity and challenges faced in the region. First, it is notable that 92% of the population of the county lives in the top 10 cities. Just over 71% live in the top 3 cities. The dynamics underlying these numbers suggest that there are many small municipalities in the county, most likely formed based on historical needs of each community. An advantage could be that each small community provides a unique living or working experience based on this unique history. A potential drawback is that these cities have limited resources and could be duplicating many efforts, creating inefficiencies in the REDE.

Furthermore, there are multiple large population centers that compete for center of gravity in the region, most notably Fort Worth with 41.9% of the population, Arlington with 19.71%, and Grand Prairie with 9.53%. This dynamic of multiple population centers is further exacerbated when one considers that Arlington and Grand Prairie are adjacent cities with interconnected economies. Combined they make up almost 30% of the population of the county. This dynamic has potential to cause difficulties in regard to ecosystem building efforts, finding a central business district to rally around, branding both internally and externally, as well as competition for resources. A similar dynamic exists in Northeast Tarrant County and in the Southern portions of the county, both fast-growing and affluent areas where many smaller cities combine to create economic centers and political centers. On one hand, TC is fortunate to have so many robust municipal economies and clusters to draw from and to feed for strategic growth. On the other hand, it is unlikely that TC will reach the same level of branding prominence as other regions such as Dallas, Austin, Houston, and San Antonio until they can come together and

form a unified voice and brand under one umbrella. This subject is addressed in greater detail

and recommendations are provided in Chapter 5 of this study.

The researcher applied frameworks to analyze responses from each segment of regional

leaders and influencers who participated in the study. First, rankings were tabulated by sector

and segment, and then scores were ranked in each area of questioning to weigh similarities and

differences. Here is a recap of questions asked and the scoring system covered in Chapter 3.

Interview subjects were asked to rate each of the following areas on a scale of 1-5 (5 best):

A. How would you rate economic development in TC? (Circle: 1 2 3 4 5)

B. How would you rate the current workforce in TC? (Circle: 1 2 3 4 5)

C. How would you rate the importance of workforce in TC ED? (Circle: 1 2 3 4 5)

D. How would you rate workforce development in TC? (Circle: 1 2 3 4 5)

Table 10. Areas of Engagement and Influence as Expressed by Participants

Quad Helix Model	#	A	B	C	D	AVG	SCORE	OVERALL RANKING
GOVERNMENT	12	4.04	3.13	4.54	3.54	3.81	76%	1
CIVIC and NGO	10	3.25	3.45	4.70	3.20	3.65	73%	2
EDUCATION	14	3.60	3.40	4.30	3.10	3.60	72%	3
PRIVATE SECTOR	14	3.07	3.43	4.21	2.75	3.37	67%	4
TOTAL	50	3.49	3.35	4.44	3.15	3.61	73%	
Expanded Technopolis Wheel	#	A	B	C	D	AVG	SCORE	OVERALL RANKING
Federal Government	2	4.50	3.50	4.50	4.25	4.19	84%	1
State Government	2	4.50	3.50	4.75	3.75	4.13	83%	2
Teching Univerities	4	4.30	3.90	4.50	3.30	4.00	79%	3
Community Colleges	4	4.25	3.88	4.50	3.25	3.97	79%	4
CIVIC and NGO	10	3.25	3.45	4.70	3.20	3.65	73%	5
Local Government	8	3.78	2.89	4.56	3.22	3.61	72%	6
Startups	4	3.00	3.75	4.75	2.88	3.59	72%	7
Small Business	3	3.67	3.67	4.00	2.67	3.50	70%	8
Research Universities	6	3.17	3.33	4.33	3.08	3.48	70%	9
Large-scale Enterprise	3	3.00	3.33	3.67	3.33	3.33	67%	10
Large Corporations	4	2.75	3.00	4.25	2.25	3.06	61%	11
TOTAL	50	3.49	3.35	4.44	3.15	3.61	73%	

See Table 12 above for a detailed breakdown of the findings. On the left side of the

table, you will find the categories of sectors and segments in the study. In the center you will

find the scores pertaining to each question. On the right side of the table, you will find the ranking and overall scores. By cross-referencing questions with responses, the researcher is able to glean important information from the unique contributions of each stakeholder group.

In the triple/quad helix model, participants from the government sector scored the REDE the highest overall, then the Civic Organizations, then Education, and last the Private Sector. These differences could be explained by the relative bias of government, civic organizations, and education as service providers in focus areas of the study (All ranked the REDE 70+%) while the private sector could be viewed as the primary service recipients in the model (Ranked the REDE at 67%). In any case, these numbers indicate that there are significant differences in how each sector views REDE performance in each area measured and overall. This could indicate the need for greater tracking, reporting, communication, and feedback across sectors in the REDE.

Overall scores range from 3.81 out of 5 (76%) to 3.37 out of 5 (67%). The total average score across all areas of ranking was 3.61 out of 5 (73%). These scores indicate a "good but not great" outlook and performance for TC according to participants.

Among the four areas ranked by participants in Table 12, the importance of workforce in the successful economic development of TC ranked highest at 4.44 out of 5 (89%). They rated economic development a distant 2nd at 3.49 out of 5 (70%). Then came their rating of the current workforce at 3.35 out of 5 (67%). And they rated workforce development last at 3.15 out of 5 (63%). One important key learning from the research and feedback from participants regarding their ranking of TC workforce development was notable. According to participants, TC has a lot of resources and capacity for workforce development. Overall, they gave praise in this area and several noted that is why they ranked this category as highly as they did. However, many participants commented that they did not feel as if the REDE of TC is doing a good job of

proactively engaging stakeholders in the marketplace to fully utilize the resources and capacity available for workforce development. In short, TC has the wherewithal, but not the connectivity or engagement needed to make the most of these assets to impact the ecosystem at the level it could be. This is a missed opportunity and a major area of improvement for consideration. More will be shared on this subject along with recommendations in Chapter 5 of this study.

The application of the Technopolis Wheel yielded even more significant findings in regard to differences in the outlook and rankings of performance by influencer group and by topic. Federal and state government participants ranked the REDE of TC very highly at 80+%. This significantly higher rating could be explained by the "bird's eye" view of these stakeholders and their ability to compare TC with other parts of the state or country. This would be valid considering the fact that TC outperforms most counties across the US and many across the state. This is especially true when comparing broad-based macro indicators such as GDP, employment, and growth. However, it could also indicate a lack of connectivity and a need for greater depth of understanding and available data on the REDE as experienced by those within the region.

Another indicator of note is that teaching universities and community colleges, while they ranked slightly lower, were still very positive in their rankings in comparison with other influencer groups. This could be explained by the same bias of the service provider as explained earlier in this section. It could also indicate a fundamental disconnect between the primary workforce development entities in the region with the stakeholders they serve. Either way, it could be an opportunity for dialogue and information sharing across influencer groups. More will be provided on this subject along with recommendations in Chapter 5 of this study.

Influencer groups that ranked the REDE outlook and performance as "just OK" include civic organizations, local government, startups, small business, and research universities. This

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indicates that these stakeholders are being served fairly well, but not very well. A number of important gaps and opportunities were identified in the interviews that will be addressed in greater detail along with recommendations in Chapter 5 of this study.

Ranking REDE outlook and performance lowest by a significant measure were leaders and influencers from large-scale enterprises and large corporations within the region. This, again, could be in part due to the fact that these stakeholders are arguably the primary recipients of these services, ie: economic development, workforce, and workforce development. It could also be explained in part by the fact that these organizations have scale, scope, and resources that provide them options to look elsewhere and compare what they experience locally with what they experience or see others experience in other markets. It is the suggestion of the researcher that this should serve as a major red flag for the REDE that major employers, both current and potential recruits to the region, are not fully satisfied. They see significant opportunities for improvement and there could be a risk of atrophy and missed opportunity if concerns are not addressed and the level of service is not improved. More will be provided on this subject along with recommendations in Chapter 5 of this study.

Overall, this analysis indicates that regional leaders and influencers believe that the REDE of TC has a positive outlook and is performing pretty well. However, it also indicates that there are major gaps and opportunities to improve, and several that may be in acute need of being addressed in the short term. Given the rate of growth expected over the coming decade and changing demographics, it is likely that existing challenges will be exacerbated over time and that the window of opportunity is relatively brief to address these challenges before they become much more significant hindrances or barriers to REDE optimization and growth.

Leaders suggest that if emerging challenges are deliberately addressed head-on and inclusively as a community, there is a good chance that the Tarrant County REDE could successfully overcome those challenges in order to gain competitive advantage as a region. If successful, this could help to ensure that the REDE of TC is able to sustain economic growth and perhaps even become more competitive regionally, globally, and into the future.

As detailed in Chapter 5 of this study, it is the goal of this researcher to utilize the findings from this research as a starting point and foundation to guide collaboration and research on follow-on topics (listed at the end of this study). This research will serve to inform collaborative leadership in the County. It is the hope of the researcher that leaders will embrace the findings of this report as a starting point for discussion in the REDE, then lead their spheres of influence to engage in the methodology provided. As indicated in the model, progress begins when leaders and influencers begin to partner with one another to engage more and more members of the community, initiate a dialogue, listen and learn, and unite across sectors to work toward a common set of goals and objectives. The researcher urges leaders and influencers to take action in their organizations and as a community. Iterate through the process as many times as it takes to form a critical mass of stakeholders who are bought into the mission and vision to build, bolster, and celebrate the REDE of Tarrant County, Texas, as a global example in the marketplace. Measure, learn, and improve over time. Document and celebrate wins along the way to inform and inspire even more people to get involved. This approach is in keeping with other successful REDE's as discussed earlier in the study and a detailed step-by-step and theoretical underpinning is provided in the next section of the study for ease of implementation.

Chapter 5 - Conclusions and Recommendations

This chapter consists of conclusions and insights from the research as well as a number of recommendations for consideration. The conclusions provided in this section reflect lessons learned from the global dialogue with interview participants. They are the summary takeaways after 50 conversations, extensive coding, and analysis. It is the goal of the researcher to provide practical, actionable suggestions that can be utilized by Tarrant County (TC) leaders and influencers to facilitate dialogue and align initiatives for positive impact on gaps and opportunities identified in research. Recommendations are based on a combination of findings from the literature, statistical data, and inputs from interview participants. Where possible, suggestions reflect leading practices as identified during research. The tools and frameworks identified in earlier chapters of this study are also applied to TC for additional insights.

The Case and Context of Tarrant County, Texas

Tarrant County is situated in North Central Texas and is the primary population center for the Western half of the Dallas-Fort Worth Metroplex (DFW) (See Figure 8) with an estimated 2.2 million residents in the county in 2021 (US Census Bureau, 2021).

The competitive environment of the county is characterized by two large cities, Fort Worth with a population approaching 1 million and Arlington approaching 500,000 (US Census Bureau, 2021). As mentioned earlier in this study, there are an additional 39 other municipalities for a total of 41 (See Table 11). As already discussed, this creates a uniquely complex environment that is rich in people, resources, and initiatives, but struggling to avoid fragmentation and duplication of efforts.

As the county continues to grow and adjust to greater diversity and outside ways of thinking, it is likely that a more cohesive regional strategy will emerge. It is just a matter of

time. The greater question that will be considered in the following recommendations is how quickly and efficiently the region can come together to seize opportunities and avoid major pitfalls associated with rapid growth. While this study provides a good overview based on input from 50 regional leaders and influencers, the researcher acknowledges that further research is needed to develop a comprehensive plan to address these challenges. This study is a starting point for that conversation in the region and hopefully the first of a series of studies.

Figure 8. Map and Brief Overview of Tarrant County, Texas

(TC, 2021; North Texas Commission, 2021; North Central Texas Council of Governments, 2019)
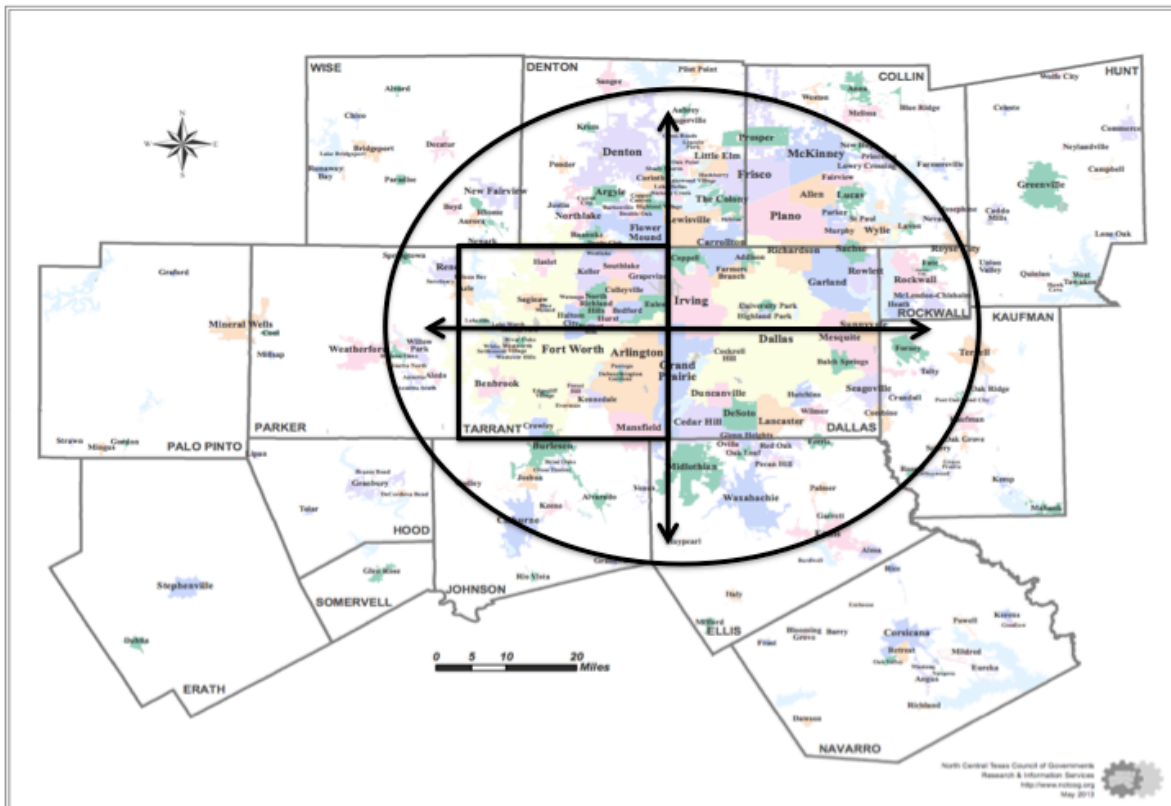
Key characteristics of the Tarrant County REDE
The population of TC is estimated at 2.2 million in 2021.
The population of the DFW Metroplex is 7.5 million.
It is the fastest growing metro area in the US at 1 person every 4 minutes.
Growth is expected to accelerate and lead the US over the coming decade.

Geography

TC occupies the highlighted square just left of center in the drawing above. The North-South line represents the primary traffic flow along Interstate 35. The East-West line represents the primary traffic flow along Interstates 20 and 30. Growth has been predominantly along these major routes over the last decade and is expected to continue along these routes. However, as these areas develop, growth is expanding in the Northwest, Northeast, Southwest, and Southeast corners of the county and surrounding counties that were previously rural. The large oval depicts the majority of the population growth and development even though the map shows all counties currently considered to be part of the DFW Metro area. There are several predictions that the area in the Northeast part of the county between DFW Airport and Alliance Airport will become the future center of the Metroplex in decades to come due to growth patterns, available land, and transportation hubs. While this is yet to be seen, the growth taking place is visible and undeniable. In any case, the county is poised to look and feel very differently in years to come.

Culture and History

The culture of Tarrant County is often described as more laid back than the rest of the DFW Metroplex and is known for a friendly, traditional, family-oriented vibe. Historically, Fort Worth is known as "Cowtown" due to the integral role it played in the cattle industry and the movement of cattle North along the Chisholm Trail and by way of rail to various parts of the country. This is still a big part of the local identity and evidence of this unique history can be observed in local tourist sites, annual events, and attractions. Fort Worth has accumulated significant wealth from oil and gas and other industries that bring a reputation for affluence and old school ways of doing things. Fort Worth has a number of exclusive clubs, high end shopping, and entertainment fitting this level of affluence, attracting shoppers and visitors from

across the region. Fort Worth is known globally for the arts and is home to world-class museums, the Cliburn Competition, an award winning Zoo, top-rated Sister Cities programs, award winning Botanical Gardens, and Dickies Arena, a newly constructed entertainment complex named after the local company. Tarrant County College (TCC) is the local comprehensive community college, serving approximately 100,000 unique learners per year (TCC, 2021). Universities include Texas Christian University (TCU) and Texas Wesleyan University, both private schools, as well as Texas A&M Law, and Tarleton State University, both state schools. In addition, the University of North Texas Health Science Center does around USD$50 million annually in medical research (UNTHSC, 2021) and recently launched a new medical school in conjunction with TCU. There is a variety of private trade schools.

Arlington, the county's second largest city, has become nationally known for professional sports teams (Dallas Cowboys, Texas Rangers, etc.) as well as a national leader in the e-Sports industry. The city is home to UT Arlington, the largest university in the University of Texas system in terms of total student body with more than 60,000 between online and on campus. UTA recently gained Carnegie R1 status as a premier research university and does USD$117 million in research each year (UTA, 2021). Arlington was also recently selected to host the National Medal of Honor Museum to become a local attraction in honor of military veterans.

While there is a history of collaboration around major projects such as infrastructure, DFW airport, etc., these cities have largely developed on their own and created identities for themselves from an ED and WF perspective. The same is also true for other areas of the county.

The DFW Metroplex

According to the North Texas Commission (NTC), DFW has a population of 7.5 million people and is growing at a rate of 1 new person every 4 minutes. This astonishing rate of growth

is expected to accelerate in the coming years and DFW is predicted to remain the fastest growing metro area for at least another decade (NTC, 2021). The DFW region consists of 13 counties and 150 cities over 9,000 square miles with a Workforce (WF) of 4 million people. DFW is home of the fourth busiest airport in the world, DFW, and 24 Fortune 500 company headquarters. There are 33 colleges and universities, 113 school districts, and 58 public charter schools. DFW represents the fourth largest economy in the US by GDP and exports over $19 Billion dollars in merchandise each year (NTC, 2021). The shear immensity of the land mass, complexity of the ecosystem, and number of sub ecosystems in DFW are staggering. This can be overwhelming to those conducting business, buying a home, or exploring opportunities to invest.

Industry Clusters and Major Employers in TC

Major industries in TC include: 1. Aerospace, Aviation, and Defense, 2. Medical Services, Medical Innovation, and Life Sciences Research, 3. Transportation, Supply Chain, Warehousing, and Logistics, 4. Traditional Oil and Gas, Next Generation Oil and Gas, and Alternative and Renewable Energy, 5. The Internet of Things (IoT), Electrification, E-Mobility, and E-Infrastructure, 6. Real Estate, Construction, and Development, 7. Insurance and Banking, 8. Sports and e-Sports, 9. Creative Industries, Museums and Fine Art, Music and Performing Arts, Culinary Arts, and Entertainment, 10. Agriculture, 11. Education, 12. Hotels and Hospitality, 13. Manufacturing, and 14. Services and Retail.

This list is informed by a combination of the information provided by the Tarrant County website and updated to include a number of emerging industries and industry segments that were shared by participants. Overall, this shows a robust and diverse economy that is likely to be resilient in economic cycles. It also shows a mix of traditional established industries as well as a number of emerging industries that are more future facing. These are positive characteristics that

bode well for TC. However, marketplace rationalization and shake out in some industries is likely as part of the transition. It will be interesting to see how TC can manage coming changes.

Notable absences include Computer Science and Information Technology, Software, Hardware, Network Technologies, Web-based Businesses and many other categories of technology (TECH) and knowledge-based industries. These gaps were a major topic of concern during interviews with mixed opinions on how to best go about building these industries in the county. However, there was a strong majority consensus that they are needed in TC and that ED and workforce development (WFD) efforts should make them a priority moving forward.

Major employers in TC include: Alcon, AMR Corp., Arlington ISD, Bell, Birdville ISD, Burlington Northern Santa Fe (BNSF) Railroad, Cook Children's Health Care System, D.R. Horton, Fort Worth ISD, The City of Fort Worth, JP Morgan Chase, JPS Health Network, Lockheed Martin Corp., Naval Air Station Fort Worth Joint Reserve Base, Plaza Medical Center of Fort Worth (HCA), SBC, Tarrant County, Texas, Health Resources, and the University of Texas at Arlington (UTA). This mix of companies reflects the business culture in the region as traditional and established. It also reflects the concern expressed above that there are not a lot of high technology companies (TECH) on the list, especially in information services, web-based businesses, and software. There is hope among leaders and influencers that TECH companies can be recruited and developed around existing and emerging industry clusters. This strategy is being pursued by a number of entities in the region with some success. Many are optimistic.

Questions leaders are currently asking: How long will it take? How successful will this strategy be at developing a critical mass of TECH companies in the county? Can this strategy begin to shift the image and brand from an old-school town with traditional industries to a

leading-edge marketplace of talent, TECH, and entrepreneurship? Much of what is suggested in

the following conclusions and recommendations is meant to inform this discussion.

TC By the Numbers: Gaps and Opportunities

The following section uses data from the US Census Bureau to analyze key aspects of the

REDE of TC. All statistics are from the US Census Bureau unless otherwise indicated. See

Table 13 for a deeper look at TC by the numbers that reveals several regional opportunities.

Table 11. Tarrant County by the Numbers: Opportunities for ED, WF, and WFD

Area of Highlight	Tarrant County by the Numbers: Gaps and Opportunities	Tarrant County, Texas
Population and Diversity		
Growth	Population estimates, July 1, 2019, (V2019)	2,102,515
Growth	Population estimates base, April 1, 2010, (V2019)	1,810,664
Future WF	Persons under 18 years, percent	26.00%
Transfer of Knowledge	Persons 65 years and over, percent	11.60%
Diversity	Black or African American alone, percent	17.90%
Diversity	Asian alone, percent	5.80%
Growing Demographic	Hispanic or Latino, percent	29.50%
Diversity	White alone, not Hispanic or Latino, percent	45.30%
WF Oportunity	Veterans, 2015-2019	108,329
Global WF	Foreign born persons, percent, 2015-2019	16.10%
Housing		
Growth	Housing units, July 1, 2019, (V2019)	791,743
Home Ownership	Owner-occupied housing unit rate, 2015-2019	60.50%
Cost of Living	Median value of owner-occupied housing units, 2015-2019	$188,500
Growth	Building permits, 2019	16,983
Growth	Households, 2015-2019	708,252
Stability/Growth	Living in same house 1 year ago, percent of persons age 1 year+, 2015-2019	83.80%
Multi-lingual	Language other than English spoken at home, percent of persons age 5 years+, 2015-2019	29.00%
Education		
Digital Divide	Households with a computer, percent, 2015-2019	94.40%
Digital Divide	Households with a broadband Internet subscription, percent, 2015-2019	86.90%
Educational Attainment	High school graduate or higher, percent of persons age 25 years+, 2015-2019	86.10%
Educational Attainment	Bachelor's degree or higher, percent of persons age 25 years+, 2015-2019	32.30%
Workforce, Health Insurance, and Earnings		
Diversity	With a disability, under age 65 years, percent, 2015-2019	7.30%
Poverty/Health	Persons without health insurance, under age 65 years, percent	19.00%
WF	In civilian labor force, total, percent of population age 16 years+, 2015-2019	68.00%
WF	In civilian labor force, female, percent of population age 16 years+, 2015-2019	61.10%
Commutes/Traffic/Mobility	Mean travel time to work (minutes), workers age 16 years+, 2015-2019	27.4
Earnings	Median household income (in 2019 dollars), 2015-2019	$67,700
Earnings	Per capita income in past 12 months (in 2019 dollars), 2015-2019	$33,292
Poverty	Persons in poverty, percent	10.20%
Employers and Employment		
ED/WF	Total employer establishments, 2019	43,417
WF	Total employment, 2019	822,823
Stability/Growth	Total employment, percent change, 2018-2019	2.20%
ED/WF	Total nonemployer establishments, 2018	186,406
ED/WF	All firms, 2012	173,389
Entrepreneurship	Men-owned firms, 2012	89,352
Entrepreneurship	Women-owned firms, 2012	66,250
Entrepreneurship	Minority-owned firms, 2012	71,133
Entrepreneurship	Veteran-owned firms, 2012	16,470
Pop. Density	Population per square mile, 2010	2,094.70
Land Mass	Land area in square miles, 2010	863.61
FIPS Code	FIPS Code	"48439"
Source: US Census Bureau **Note:** Numbers are PreCOVID. Unless indicated, populations in analysis are rounded to nearest 1000 for ease of reading.		

Population and Diversity

There has been a significant population change in TC of almost 300,000 people over the last 10 years. Populations are also rapidly diversifying. There is a global influx of cultures, languages, and skillsets. Rate of growth is expected to accelerate over the next 10 years to approach 3 million people in TC, designated one of the fastest growing regions in the US. It is notable that almost 550,000 are youth (Future workforce) and 244,000 are senior citizens (Experienced workforce). Some 620,000 are Hispanic, 376,000 are African American, 122,000 are Asian, and 339,000 are foreign born. In addition, 108,000 are military veterans. These populations offer major opportunities for WFD in the REDE of TC (US Census Bureau, 2019).

Housing

Cost of living is relatively low with an average home price under USD$200,000. However, the availability and proximity of affordable housing that is close to places of employment is a major challenge in TC due to rising costs in the population centers and more desirable areas where companies choose to locate. This has forced workers to move farther and farther out and resulted in increased costs, time commitments, and hassle. A healthy 1,272,000 residents own their homes, an indicator of economic resilience and financial stability. However, 831,000 do not own a home, an opportunity for improvement. Building permits approached 17,000 in 2019, a sign of rapid growth and a booming real estate development industry. And 336,000 residents moved households in 2019, an indicator of growth (US Census Bureau, 2019).

Diversity continues to increase in numbers and variety. There are 610,000 people living in households that speak languages other than English at home, primarily Spanish and Vietnamese, though many other languages are spoken in the region (US Census Bureau, 2019). These residents often choose to locate their homes and businesses in proximity to diasporas who

speak the same languages. This allows for convenience in terms of adequate products, services, and culturally aligned activities. The county could do a better job of bridging these communities and promoting unity across languages, cultures, and neighborhoods. Leaders pointed out that these families could be better served to help them enter and advance in the WF as employees, business owners, investors, and mentors. There is also an opportunity for engagement with their home countries for ED and cultural exchange. These represent major opportunities for ED, WF, and WFD in TC that could open new doors for the region both internally and externally.

Education

TC is rich in educational institutions as already discussed in earlier sections. Overall, there was a consensus among participants that there is sufficient capacity to meet the education and training needs of the county. However, there was also a majority consensus that the capacity is underutilized and sometimes difficult to navigate, engage, and utilize. These concerns are addressed in the recommendations section of this study. Major education challenges include a digital divide for 103,718 households without Internet access. This represents a significant percentage of current and future WF at a significant disadvantage. A troubling 292,000 people 25 years of age or older do not have a high school diploma, and 680,000 do not have a bachelor's degree (US Census Bureau, 2019). These statistics offer opportunities for immediate impact if TC can increase both digital access and educational attainment. Positive impacts could include lower poverty rates, higher graduation rates, higher earnings on average, increased WF, enhanced ED, and lower crime rates, all of which lead to higher quality of life for residents.

Workforce, Health Insurance, and Earnings

Statistics paint a mixed picture for the current state of the WF, health insurance, and earnings in TC. The current actively employed workforce consists of 1,430,000 people, 872,000

of them females. Earnings per household average USD$67,700 and per capita USD$33,300.

The average commute in TC is 27.4 miles with an average commute time of 30-45 minutes each

way (US Census Bureau, 2019). This is evidence that the WF is willing to travel to find work

and that roads are good enough to accommodate traffic at this time so people can get to work.

However, roads and infrastructure are struggling to keep up with growth, travel time is

increasing, and in some cases, workers are unable to make such long commutes due to a lack of

dependable and affordable transportation options. Some 400,000 people are without health

insurance coverage, negatively impacting productivity, health, and quality of life. More than

153,000 people are disabled, an opportunity for WFD in the county (US Census Bureau, 2019).

A massive 215,000 people live in poverty in TC (US Census Bureau, 2019). This

number is staggeringly high and was shared as a major priority for improvement by many leaders

and influencers. Examples were provided to illustrate how the poverty rates have negatively

affected employer relocation decisions in the past and contributed to companies choosing other

locations. Several leaders cited crime, costs borne by the county in all areas of social services, as

well as humanitarian heartbreak as additional reasons to address poverty in TC. Overall, this

may be the most impactful opportunity for transformation of the REDE in the coming decade.

Employers and Employment

There are 43,000 employers and 823,000 employees in TC. Only 2.2% of the population

changed employment in 2019. Of course, this was pre-COVID and data is yet to become

available for 2020. These numbers are expected to increase significantly for that year, and then

return to a similar rate in 2021 and beyond. There is a diversity of business ownership that bodes

well for the entrepreneurial scene and for the development of communities of business owners as

mentors and advisors if these people can be successfully engaged and included in ecosystem

activities. Of 173,000 total firms, 66,000 are female owned, 71,000 are minority owned, and

veterans own 16,000 (US Census Bureau, 2019). It is recommended that programs and outreach

be undertaken to learn from these business owners and rally them to help lead ED, WF, and

WFD efforts in TC. Their involvement would be integral to successful community engagement.

With over 2,000 square miles of land and only 863 people per square mile (US Census

Bureau, 2019), TC is fortunate to have significant land available for additional development.

This is a competitive advantage and should be stewarded carefully for maximum positive impact

both short and long-term. The need for more strategic use of land moving forward was a concern

voiced by many of participants. It was also discussed as an opportunity to address housing.

As growth continues to accelerate, it will be a challenge to be selective as companies seek

relocation and development. This may be one of the most important long-term impacts that

current ED efforts will have. As some participants pointed out, once raw land is gone, it is gone.

Several leaders gave examples of how other cities and regions had rushed to develop land

quickly in past decades and later came to regret their hasty and haphazard approaches. It was

also stated that it is much more expensive to redevelop or repurpose land and real estate assets

once development has taken place. It was suggested that it would be much more efficient and

effective to slow down the process, discuss and evaluate regional goals and priorities, set targets

as a region, and become highly selective in terms of recruitment and development.

Overall, this paints a mixed picture for the REDE of TC. However, it also paints a fairly

clear picture of where the greatest needs are for the investment of time, money, resources, and

leadership to positively move the needle for the REDE longer-term. Where TC is doing well, it

is doing very well. However, where it is struggling, it is really struggling. This could be a

blessing in disguise if leaders can rally around these issues and pool resources to address them.

Table 12. Summary Takeaways from 50 Regional Leaders and Influencers in TC

Summary Takeaway: This is a "Good to Great" moment of opportunity in Tarrant County history.

Tarrant County is doing well as a region. The overwhelming majority have a positive outlook. However, many point out that rapid growth brings rapid change. Some suggest that it will require a significant shift of time, budget, and leadership capital to begin to function regionally while continuing   to prosper locally. Several advocate for proactive leaership in order to capitalize on potential benefits and outpace potential drawbacks of change due to rapid growth. Several opportunities are identified that could benefit the region short and long-term. The economy is outperforming peer cities in many categories and the regional economy is stronger than many similarly sized metro areas on average. While this is good news, a similar majority felt there were major gaps and opportunities on the horizon that require deliberate collective action to address. If not, many expressed concern that the window of opportunity could close. Examples shared to illustrate how difficult it could become to recover after the fact.

TOP 3 Overarching Themes fo the REDE

Growth: Pros, cons, and how to lead and manage such rapid growth for the best future.
Resilience: COVID 19 and winter storm show resilience and ability to work together in TC.
Connecting the Dots: TC has ingredients, but needs to bring them together to succeed.

TOP 3 Areas of Convergence in the REDE

Love of the Region: Expression of strong love for the region was consistent. Only 2 did not.
Work Ethic: Leaders are not afraid to roll up their sleeves and commit to getting things done.
Strong Stewards: Committed to lead the county in the right direction in this time of change.

TOP 3 Areas of Divergence in the REDE

Best Approach for Impact: Hyper-local and Local vs. Regional and Statewide Strategies
Branding and Marketing: How to brand and market the region both internally and externally.
Changing of the Guard: Great "shift change" taking place and how to lead the change.

TOP 3 Gaps in the REDE

Risk Capital: Need for influx of capital for investment in high-growth ventures.
Business and Innovation Incubators and Accelerators: Not enough to service population.
Regional Platforms: Need county-wide platforms for engagement and collaboration.

TOP 3 Opportunities for the REDE

Eradicate Poverty: County-wide need to engage, empower, and overcome poverty.
Break Down Silos: Need greater involvment, exchange, partnerships, and collaboration.
Shared Vision: Need a vision for impact that unites and compells the region into action.

TOP 3 Economic Development Topics for the REDE

Strategic Recruitment: Need for strategic selection and engagement of potential recruits.
Who to Call for What Need: Need single points of contact (PoC) for county-wide WF and ED.
Competetive Advantage: Need Action Plan to create competetive advantage for Tarrant County.

TOP 3 Emerging Themes for the REDE

Proactive Culture: Strong desire to move from reactive to proactive as a culture and community.
Rapid Response: Need shift from discussion to decisive rapid action to address identified needs.
Better Tell Our Story: Need to tell the rich story of TC historically, currently, and vision for future.

TOP 3 Future Themes for the REDE

All Things Science and Technology: Newly designated R1 universities, R&D, science, & technology.
All Things Diverse and Cosmopolitan: New reality = FW 1M, TC 2.5M, DFW 7.5M people & growing
All Things Global: New ties and exchange globally as market expands, gloablizes, and matures.

NOTE: Themes and topics represent contributions from structured interviews with 50 leaders and influencers in Tarrant County. A populated R.E.D.E. Dashboard and Balanced Scorecard based on findings is provided. The goal is to accurately report inputs from leaders for use as a starting point to spur dialogue, vision casting, alignment, and collaborative action in the region.

Major Takeaways from the Research

The following sections identify and discuss major takeaways from the 50 interviews. The researcher describes an overall positive outlook for TC along with a high level of onus on leaders to lead deliberately and collaboratively as they navigate changes and set the course for the future.

Summary Takeaway

This is a "Good to Great" moment of opportunity in Tarrant County history. In his book Good to Great: Why some companies take the leap and others don't, Jim Collins describes how very few organizations that do "well" are able to dig deep and do "great". According to Collins, this is because they are too comfortable where they are to invest what it takes to transcend the plateau of doing well, step up, and reach their full potential. However, he also cites examples of companies that defied the odds through deliberate leadership and vision to make the grade (Collins, 2001). Tarrant County is doing well as a region. The overwhelming majority of regional leaders and influencers have a positive outlook. However, many point out that rapid growth brings rapid change. Some suggest that it will require a significant shift of time, budget, and leadership to capitalize on benefits and outpace drawbacks of rapid growth.

The county economy is outperforming peers in many categories. The regional economy is stronger than many similarly sized metro areas. While this is good news, the majority felt there were major gaps and opportunities on the horizon that require deliberate collective action to address. If not, many expressed concerns that windows of opportunity could close. Examples were shared to illustrate how difficult it could become to recover as a region if emerging challenges remain unaddressed, left to fester, and must be dealt with after the fact. In short, an ounce of prevention is worth a pound of cure. TC is better off investing what is needed to align interests now as growth is taking place, rather than wait. It is therefore the conclusion of the

researcher that a healthy balance between local and countywide interests needs to be a major topic of consideration in the days to come for the REDE of TC to reach its full potential.

TOP 3 Overarching Themes in the REDE

Growth: Pros, cons, and how to effectively lead and manage such rapid growth for the best future outcomes were major themes throughout the research. Many leaders shared concerns that the growth could manage the region if the region does not manage the growth. Almost all of those interviewed expressed a recognition that there are many big opportunities available in the coming season for the region that are new and exciting collective goals to shoot for. Some touted recent wins and projected growth into the future as evidence that TC is doing well.

However, a similar percentage expressed that the unrelenting growth could be distracting leaders and influencers from focusing and investing in bigger opportunities for the region that lead to a more robust ecosystem that sustains growth into the emerging high tech economy of the future. Many in this second group encouraged a coming together, alignment, and increased focus on shared experiences across various populations within the county. Growth is a driver of many pros and cons that will require proactive, collaborative, and focused leadership to address.

Resilience: There was a lot of timely discussion of recent events such as COVID 19 and a severe winter storm that exposed major weaknesses in the power grid, emergency preparedness, as well as food security. Overall, the message was that TC fared better than many similar regions, not unscathed, but grateful for the resilience and close-knit nature of this community. Several shared how the county came together in extraordinary ways to address community needs during difficult circumstances. It was suggested that the community could build upon lessons learned, newly formed entities, and strengthened relationships as leaders in order to fill any gaps needed to be successful and seize available opportunities to improve and enhance quality of life in the county.

Overall, the sentiment was positive and optimistic, and people felt that TC is even stronger and more resilient as a result of these trying times. Both gaps and opportunities were discussed in order to overcome challenges faced and increase resilience in preparation for future challenges, ie: How to better address needs, how to get more people engaged in these efforts, and how to seize the opportunities at hand. It was clearly forefront of mind that the opportunity to take the REDE of TC to the level of nationally competitive is available for the taking and it is the duty of leaders and influencers to step up and help the region reach its full potential.

Connecting the Dots: Sentiments shared were overwhelmingly positive in terms of the availability of resources, strength of the economy given recent events, and a sense that almost all the needed ingredients are already present to take to take the REDE of TC to the level of globally competitive and globally leading in several areas. Many examples were provided and suggestions made in regard to connecting people, projects, and ideas in the region.

The majority of participants expressed a belief that TC can achieve the goals currently laid out and much more if leaders unite and put their minds to it. A large percentage openly predicted that the community "will" come together and achieve regional goals more effectively in the future. Some predicted that TC would be the center of the DFW Metroplex in the future. A small percentage predicted that TC is well positioned to become the most sought after regional economy to live/work/play in Texas within the next decade. However, almost all participants, even the most confident in the future of the region, stressed the importance of bringing the fragmented communities and networks together through communication, collaboration, and participation in shared goals and initiatives. This was a consistent underlying theme.

TOP 3 Areas of Convergence in the REDE

The top areas of convergence observed by the researcher were all related to predominant leadership traits and culture in the REDE. First, almost all of the leaders expressed a strong love of the county and a sense that this is a special place to live and work. Only 2 of 50 openly expressed dissatisfaction with TC as a place to live and work and cited other regions as more desirable. While many had aspects they'd like to see improve, most felt glad to live in TC.

Another leadership trait that was readily observable among leaders and influencers is a strong work ethic and commitment to the community that goes beyond a paycheck or a job title. As evidenced by the high response rate, generosity of time and spirit, as well as openness to discuss both strengths and weaknesses in the region, participants demonstrated a willingness to engage in dialogue, consider ideas and alternative points of view, and work hard to implement the best ideas once they are identified and agreed upon. It was the feeling of the researcher that this group of leaders is more prepared than most to roll up their sleeves and get things done.

Last, but not least, participants in this study showed a strong sense of stewardship as leaders of the region. They expressed a sense of responsibility to do their level best to lead the county in the right direction even if the challenges are great, or if hurdles appear along the way. Out of 50, very few did not make direct statements to support this commitment and only two shared thoughts of moving on to other regions, or exiting their role as leaders in the community. This strong resolve may be just what is needed to succeed in the years ahead.

TOP 3 Areas of Divergence in the REDE

Hyper-local (neighborhood or city) and Local (county) vs. Regional (DFW) and Statewide (TX): There was significant divergence on how to effectively balance the interests and opportunities within the county with the interests and opportunities within individual cities, neighborhoods,

communities, and industries. Inputs ranged from "no need to manage it, it will shake itself out" to "it is imperative that we come together and form a unified vision, voice, and actions".

The field was split on the question that often came up in conversation, whether the county should begin functioning under countywide leadership, or whether Fort Worth and/or Arlington should take the lead and others fall in to support the more recognizable brands of the larger cities. There was a wide range of perspectives ranging from optimistic to skeptical on the current level of collaboration, especially between larger cities and smaller cities. There was appetite for greater collaboration and a call to "play nicer and invite more people to the table".

Many examples were provided on the history, current state, and future outlook of the relationships between Fort Worth, Arlington, and Dallas. Almost all stakeholders harbored some hope that Fort Worth and Arlington would come together in unified leadership of the county. However, many expressed doubts that the two cities would be willing to sacrifice their own agendas for the greater good. A few said they were cautiously optimistic. A couple of them were bullish and confident that it was only a matter of time before the two cities came together.

Overall, sentiments toward possible collaborations with Dallas were ambivalent. Some cited examples of Dallas having been difficult to work with in the past. Other shared examples of recent successes. A few people did mention the need for greater collaborations with Dallas and surrounding counties. An even smaller group mentioned the need for greater engagement and exchange with other regional economies in the state. The majority seemed to think it best to focus on getting TC up to speed first, and then leveraging that momentum to engage externally.

Branding and Marketing: There was wide agreement on the need to rebrand and market TC more effectively. However, there was not agreement on how to best go about branding and marketing the region both internally and externally. Some want to shake it up and try new themes, images,

and strategies. Others consider themselves stewards and protectors of the existing brand, image, and traditions surrounding them. This second group is open to some incremental change, but not in favor of any major changes. There is also an inherent struggle between the diverse younger demographics that constitute growth in the region vs. the more established and older community that led the history of the region to where it is today. All seemed to agree on the need to unify.

The birthing pains of change are beginning to surface and there is a great deal of discussion and even consternation on how best to minimize those pains and manage the ones we do experience. Discussions about the possibility of FW becoming a bedroom community to Dallas have surfaced after a recent article headline. Some editorials have implied that FW is known for commuters driving into Dallas, inexpensive land, low-wage labor, and being open to receive companies for relocation that other regions in the state do not want. While the validity of these claims is up for debate, participants expressed considerable concern that this image and the difficulties associated with it could become an entrenched reality if not addressed. Competing visions for the future are being debated in the current elections and how to best address and brand growth-related challenges in TC will likely remain a leading topic into the coming decade.

Changing of the Guard: As most Americans are aware, there is a great "shift change" taking place in the US over the next decade that will see a large percentage of the WF retiring and taking their expertise, knowledge, and values with them. Several leaders expressed a need for greater interaction between generations in order to begin transferring that knowledge and wisdom prior to the departure of these leaders. There were calls for increased engagement opportunities across generations, mentorship programs, and knowledge exchange in key areas.

Simultaneously, there is a sense of optimism shared by some about the freshness of perspective that new blood in leadership roles will bring. There is a strong sense among some

participants, especially in FW, that the "old guard" has had a tight grip on the region for a long time and that the county has been slow to evolve as a result. Challenges voiced include what was described as "stuffy" atmosphere at some events, a tight-knit and difficult to engage establishment, risk-averse culture, and a lack of diversity and inclusion. Others touted the leadership of the "old guard" as visionary and highly successful in decades past and cited established wealthy families in FW as linchpins to successful transition of the REDE to become globally competitive. While perspectives vary, all agreed that big change is at hand in TC.

TOP 3 Economic Development Topics in the REDE

As stated in previous sections, leaders were happy overall with the success of ED efforts in the county, especially given the rapid growth and limited resources and budgets dedicated to meet these needs. Many gave kudos to those leading these efforts in the past and present of the county and hailed these leaders as integral to bringing the region this far. However, they also shared a need for more selective and strategic selection of companies moving here. There were mentions of too many low-wage industrial companies and not enough high-wage technology firms. It was suggested that TC ED professionals work together to identify key industry clusters and begin branding FW and TC as leaders in those areas. It was suggested that communities build programs focused on these clusters and proactively develop ecosystems around them.

Several expressed the need for a clear single point of contact for each area of ED as well as WF and WFD. It was shared that the central contact for each area needs to be a person or entity that the community can rally behind and trust. The contact also needs to be someone who is accessible, understands the depth and breadth of what each city and industry in the county have to offer, and will work tirelessly to broker relationships, deals, and longer-term growth for

all cities, not just one or two. It was acknowledged that this will require a special skillset and in-depth knowledge of the region, as well as strong trusting relationships in order to succeed.

There is also a desire to develop offerings in the county that entice the right kinds of companies and the right talent to the region. Suggestions of possible ways to help bring this about include: The formation of one or more Economic Development Corporations (EDC) with taxing authority to help raise funds to sweeten incentives and get the best companies to come and invest here. There were several proposed ideas around the use of locally earmarked funds for investment including incentives or grants (even if small) to help tip the scales in favor of TC and to demonstrate commitment to startups, potential businesses, and talented recruits.

Another suggestion was that TC undertake a concerted effort to garner greater state and federal support through advocacy, policy, and targeted applications for funding. A few also mentioned the exploration of possibilities for foreign direct investment (FDI) into the region in areas of alignment with local goals and initiatives. This was mentioned as a strong possibility for the future as the market matures. Several expressed the need for a county-wide ED effort.

TOP 3 Workforce Topics in the REDE

Many expressed a major need to do a better job of helping motivate the disenfranchised to take part in the education and training available and help students who graduate to get jobs. TC is fortunate to have ample people to train and lots of programs to offer them. However, the region is struggling to connect the two. Suggestions to improve in this area include: Educational institutions should spend more time engaging and connecting people and opportunities, the creation of a quarterly or annual Tarrant County-wide Career Fair, and hire dedicated people just for the important function of connecting talent with resources and opportunities in the community. It was suggested that TC should seek to attain 100% employment after graduation.

If not, trained talent is left on the sidelines. Suggestions include: Many jobs are not listed in want ads, so work with local business owners to find out what jobs are out there and recruit the talent to fill them. Teach students/workers how to market themselves to get jobs as part of their education. Form countywide committees of business owners and educators in each industry to proactively develop the WF of the future. Develop more convenient and faster moving mechanisms to develop and deploy new skills training for industry-specific roles.

There is an acute need for faster and more responsive program development. Leaders indicated that it is very hard to know whom to call at local institutions that can actually help. This was mentioned most often in relation to the community college, described as slow to get things done. Leaders attend lots of meetings and things sound positive, but it can take months or years to get a program up and running and most businesses can't wait that long. Some indicated that non-credit programs have come together fairly quickly in some cases, but even that varied widely based on location and institution, and is only a short-term fix for growth industries.

Several cited turnover and constant change in some higher education institutions. This tends to diminish trust after several people come and go. Some educators shared frustration that they do not always feel empowered to meet needs. Most participants indicated they felt TC has lots of capacity to educate, lots of schools, and lots of resources. However, they also cited a lack of proactive leadership to engage, follow through, and meet emerging needs in the community. Several mentioned that different levels of education are not working together efficiently, causing major challenges. The consensus: TC needs to bring engagement up and better utilize capacity.

The greatest challenge mentioned with the local workforce is a lack of marketable soft skills, people skills, teamwork, and the ability to carry on a conversation and act appropriately in a business setting. Suggestions include: Applied learning opportunities for all students at

multiple stages of the education process, ie: Internships, externships, apprenticeships, work while in school opportunities, etc. This is an area in dire need of better education and training. It is crucial that students gain exposure to the workplace so they can see what it is like and learn to meet expectations. Many graduates are disconnected when they enter the workforce. They struggle to adjust and some exit the workplace traumatized and don't return. This has a long-term economic effect and devastating short-term psychological effects that could be avoided.

TOP 3 Gaps in the REDE

<u>Capital for Investment in High-Growth Ventures</u>: Many said there is a lack of available and engaged risk capital in TC including angel investors, angel groups, venture capital of all shapes and sizes, and later stage private equity. Risk capital is crucial to regional growth in technology and high-growth firms (Fried & Hisrich, 1988). It is acknowledged that Cowtown Angels and Bios Partners were mentioned most often as filling important needs, but most believed that additional risk capital firms were necessary to meet local needs and to develop a robust ecosystem. Specific areas of need identified: Targeted funding for startups, key growth initiatives for existing businesses, and earmarked funds to enhance recruitment opportunities.

<u>Business and Innovation Incubators and Accelerators</u>: Many said there is a lack of highly targeted organizations and programs to fuel growth, specifically in the form of business and innovation incubators and accelerators of all shapes and sizes to address all populations, geographies, and industries. It was suggested that TC make a concerted effort to increase the number of incubators and accelerators in the county to address the needs of specific populations, industries, and communities. In particular, a targeted accelerator to coalesce resources, talent, and capital around best opportunities such as industry clusters, high potential entrepreneurs, etc.

Regional (County-wide) Platforms: Many said there is a lack of countywide platforms for communication, information sharing, engagement, and collaboration. This could include events, organizations (existing or new), media reporting, storytelling, planning, workshops, roundtables, social events, and region-wide initiatives to address identified gaps and opportunities. Two existing organizations that were mentioned include the North Texas Commission and the North Central Texas Council of Governments. Both were highly regarded by those involved, but did not seem to be well known to many participants. This indicates an opportunity to share information and educate people on these organizations with the goal of greater involvement.

TOP 3 Opportunities for the REDE

Overcome Entrenched Poverty: This was identified as one of the, if not the, greatest opportunity to transform the county. There is a strong appetite to affect change and eradicate poverty in TC.

Break Down Silos: Participants acknowledged that silos are hindering performance in the REDE and many expressed a strong appetite to break them down. Various ideas were shared to help hasten these changes including: 1. Regularly scheduled social gatherings large and small with a focus on regional collaboration and building the REDE, 2. Structured exchange programs between organizations, people, and projects that allow stakeholders to learn about one another, forge relationships, and develop rapport, and 3. A concerted effort to champion more strategic partnerships and collaborative agreements between entities within the county, but also with other similar organizations across the state and country. These initiatives would allow for real-world experience and relationship building that would later pay dividends. In the case of exchange and collaboration with outside regions, it would lead to a deeper understanding of the strengths of each region and operational advantages that could be brought back to the team here in the region.

Shared Vision and Goals: Several leaders expressed the power of shared vision to motivate and align fragmented parties into one unified effort. Many expressed a need for greater cohesion around countywide issues. Additional needs were expressed for increased collaboration across diverse geographic, demographic, and psychographic lines in TC. Those in favor of these efforts expressed a need to invest resources into better understanding the needs of the community and rapidly identifying and deploying plans to address those needs, not just as cities, but as a county.

TOP 3 Emerging Themes

A Little Less Talk, A Lot More Action: Most leaders indicated that TC had made great progress in recent years and that "everyone is aware" of the gaps and opportunities to build the REDE because there have been many meetings. This is much better than even five years ago. However, it was consistently shared that there has been "lots of talk" and "not enough action". Some attributed this to "old school" leaders in TC, some to the laidback traditional culture, and others to a lack of initiative and willingness to take a risk. In any case, there is an emerging call to action on longstanding goals for progress. Several are no longer willing to wait on consensus and said they would act alone if needed to get things done. Others believe a critical mass is forming to overcome analysis paralysis and begin to take action after getting past COVID.

A Need to Move More Quickly to Address Needs: There is a strong desire among many participants to shift from a slow-moving reactive culture to an agile, fast-moving, and proactive culture. Some cited the fact that the amount of funding and personnel dedicated to workforce and economic development have not kept up with the rapid growth the county has experienced. This has stretched resources thinly and limited the ability of these crucial functions to act as strategically as would be optimal. Others believe it is a cultural remnant that will require time and examples being set by other leaders who are willing to move quickly and efficiently to make

decisions, deploy resources, and commit time and leadership capital to a worthy cause. It was suggested that this will "give others permission" to step up and take action as leaders.

A Need to do a Better Job of Telling Our Story: A story is worth a thousand words. It captures the imagination and helps people to see what is possible. The overwhelming majority of participants shared some examples that demonstrated a need to tell a better story in regard to TC historically, currently, and our vision for the future. The question was who should take the lead.

TC needs to share and celebrate wins. It was noted that TC lacks publications like Dallas Innovates and regional champions like the DEC (Dallas Entrepreneur Center) and the Dallas Regional Chamber to help regularly create content to document, curate, and share the story of all the good things already happening throughout the county. It was also discussed that the examples that are held up in TC are often part of a small social and political elite that does not adequately represent the whole story, only a part of it. It was suggested by many that if TC can find ways to tell the stories of small, medium, and large wins as they take place, that it would help achieve the goal of creating an extensive, searchable, curated body of work that feeds the REDE.

TOP 3 Takeaways for the Future

Given the conversations, ideas, and suggestions shared in this study, the researcher suggests that the future topics that will capture the imagination of the REDE of TC will include:

All Things Science and Technology: It will become increasingly important to get in front of the rapid technological change taking place and leverage TECH as a competitive advantage for the future of the region. This trend will cascade across households, schools, and businesses.

All Things Diverse and Cosmopolitan: The sheer numbers and diversity of newcomers will drive this change as they arrive from all parts of the world bringing their cultures, values, and skillsets

to TC. It is a natural progression and outgrowth of the long-standing strengths of the region including the arts, culture, and global trade. It can also become a major competitive advantage.

All Things Global: The future is global and interconnected. As the population, industries, and markets mature in TC, so will the global mindset and the global scale of companies, initiatives, and partnerships. This will be a major step forward for TC to open many doors for growth and impact. Mechanisms could also be developed to help connect the dots between companies, their suppliers, partners, investors, and WF. Last, but not least, the researcher suggests a study to map existing global connections through employers, government, Rotary, Sister Cities, educational exchanges, and similar programs to grow networks and map them back to and engage the REDE.

As an example, Austin went through this shift in the ten years leading up to the explosion of growth and global notoriety it now enjoys as a city. Much of this growth can be attributed to initiatives early on that helped forge global relationships, foster the exchange of goods, services, and cultures, as well as provide a means to co-create new ventures through shared knowledge, creativity, and investment (Weisbrod & Weisbrod, 1997). TC can learn from this example.

Creating and Deploying a R.E.D.E. Dashboard and Balanced Scorecard

As discussed in Chapters 1 and 3, takeaways from the research were used to create a custom R.E.D.E. Dashboard and Balanced Scorecard for use as a starting point for dialogue within the REDE (See Table 15 below). Categories, weights, and criteria are subject to change.

Organizing Committees and Working Groups

As mentioned in the notes section of the instrument, practitioners are encouraged to form working groups to address each category of the dashboard that include leaders and influencers from all sectors and segments of the REDE as defined by the Triple/Quad Helix of Innovation (Etzkowitz, 1997; Kimatu, 2016) as well as the Technopolis Wheel of Influencers

Table 13. The R.E.D.E. Dashboard and Balanced Scorecard for Regional Impact

Score	Weighting	Area of Contribution
The R.E.D.E. DASHBOARD **A Customizable Balanced Scorecard for Regional Economic Development Ecosystems (REDE's)**	
Score	**Weighting**	**Area of Contribution**
20.0%		**Human Capital**
	20.0%	Education (Degrees and Transfers)
	20.0%	Training and Workforce (Certifications, Certificates, and Professional Development)
	20.0%	Pre-K to 14 (EDU Efficacy at Each Level, Workforce Prep, and Advancement)
	20.0%	Employment (Interview Skills, Placement, Satisfaction, Retention, Advancement)
	10.0%	Community (Applied Learning, Collaboration, Resources, Participation, Sense of Belonging, Personal Enrichment)
	10.0%	Alumni Engagement (Networking, Fundraising, Mentorship, Hiring, Volunteering, Lifelong Learning)
	100.0%	
20.0%		**Economic Development (Strategic Approach to Regional Growth)**
	20.0%	Value-aligned, Targeted, Efficient, and Strategic Recruitment
	20.0%	Retention and Growth of Existing Firms of All Sizes (Startups, Small Business, SME's, LSE's, MNC's, M&A)
	20.0%	Organic Growth (Entrepreneurship, Startups, R&D, Expansion)
	10.0%	Quality of Life (Education, Health, Security, Lifetime Earning, Social Mobility, Wealth Creation, Sense of Belonging)
	10.0%	Collaborations Across Communities, Utilization of Community Assets, Events, and Activities
	10.0%	Cost of Living and Workforce Access to Affordable Childcare, Housing, Healthcare, Transportation, and Education
	10.0%	Arts, Music, Entertainment, Food, and Culture
	100.0%	
20.0%		**Collaborative Leadership (Key Influencer Partnerships and Programs)**
	10.0%	K-12 Districts
	10.0%	Community Colleges, Technical Colleges, and Trade Schools
	10.0%	Teaching Universities and Research Universities
	10.0%	Large Corporations (MNC's and LES's)
	10.0%	Emerging Companies (Startups and Growth Firms)
	10.0%	CIVIC Orgs, NGO's, and Support Groups (R&D Labs, Investors, Entrepreneurs, Chambers of Commerce, EDC's, Professional Orgs, Incubators, Accelerators, Industry Clusters, NGO's)
	10.0%	Federal Government
	10.0%	State Government
	10.0%	Local Government
	10.0%	Capital (Banking, Public-Private Partnerships, Philanthropy, and Risk Capital)
	100.0%	
10.0%		**Stages of innovation**
	20.0%	Basic Research (Scientific Discovery)
	20.0%	Translational Research (Technological Discovery)
	20.0%	Applied Research (Using Science and Technology to Solve a Problem)
	20.0%	Product and Service Development (Creating Products and Services for Sale)
	20.0%	Product Lifecycles (Sales, Marketing, Improvements, New Markets, Follow-on Ideas)
	100.0%	
10.0%		**Stages of Entrepreneurship**
	10.0%	Ideation, Refinement of Ideas, and Project Selection
	10.0%	Business Planning, Market Research, and Forming a Strategy
	10.0%	Startup Focused Collaborative Events and Activities, Showcases, Contests, Competitions, Startup Networking, Interconnectivity Among Players
	50.0%	Deployment of Capital in All Categories (Pre-Seed, Seed, Angel, VC, PE), Targeted Community Investment, Fund Raising, and Friend Raising
	10.0%	Company Lifecycle Management: Launch, Growth, Sustainability, Exit
	10.0%	Mergers, Acquisitions (M&A), and Strategic Partnerships
	100.0%	
20.0%		**Vision Casting and Communications**
	25.0%	Needs Assessment: How well do we know and understand the needs of all stakeholders? By population, geography, etc?
	25.0%	Project Leadership and Execution: Planning, assembling, and depoying resources for maximum impact.
	25.0%	Targeted Studies, Storytelling, Journalism, Communications, Documentation, Curation, so the story can be told.
	25.0%	Response Rates and Impact: Timeliness to Address Indentified Needs, Immediate Resolution, Level of Impact Over Time
	100.0%	
100.0%	**Total Score**	**NOTE:** The R.E.D.E Dashboard provides an easy to follow methodology for structured dialogue that leads to a process for the community as a whole to form committees or groups to speak into, measure, and address each area. The current balanced scorecard is meant to serve as a starting point for community engagement, organization, and leadership teams seeking to imbed the community (All influencer groups identified on the expanded Technopolis Wheel plus any the community would like to add to fit locality and goals) more deeply into innovation, entrepreneurship, and economic development activities in the region. It is expected that communities will adjust categories, weights, and other details as need to fit the local context.

(Smilor, Gibson, & Kozmetsky, 1989; Gibson & Butler, 2013). From Table 15, these committees would include: Human Capital, Economic Development, Collaborative Leadership, Stages of Innovation, Stages of Entrepreneurship, and Vision Casting and Communications.

Organizers may choose to expand the number of working groups to be more granular and focused in areas that warrant a greater level of detail. The dashboard could also be monitored and championed by a singular group when appropriate. This is a matter of time, people, resources, and level of urgency. In cases where resources are plentiful and an impact is needed in a short timeframe, it may be more expedient to assign someone to each subcategory to engage more quickly, monitor more closely, and proactively champion progress in a given area.

Just as the researcher demonstrated in this study by adding community colleges and teaching universities to the wheel in order to reflect the current reality of the REDE in TC, encourage stakeholders to consider whether the current categories are sufficient and relevant to fit the goals and make-up of the REDE. Adjust the instrument to fit your needs.

Setting Project Goals, Milestones, and Deliverables for Each Category

The first major task of the working committees is to meet and decide on goals, metrics, and deliverables for the category or categories for which they are responsible. The researcher suggests a one-year time horizon with quarterly milestones and deliverables. This will of course depend on many factors including the nature of the assignment, alignment with the overall effort, and decisions made by the organizers. The most important thing is that a plan is drafted that includes a reasonable amount of time to achieve stated goals and a clear path to get there.

Defining Mechanisms, Metrics, and Processes to Meet Goals and Objectives

Once project parameters have been established, working groups are encouraged to employ the Technopolis Innovation Model 2.0 (See Figure 9 below) as a quick and easy means

to organize and track your efforts. Working Groups should include members from each group

and all should be encouraged to divide labor and assume responsibility for his or her areas.

Figure 9. Technopolis Innovation Model 2.0

The Technopolis Innovation Model 2.0 is an adapted and expanded version of the previous 1.0 version (Gibson and Butler, 2013) to include Regional Facilitators and Anchor Partners and defined roles for each group of actors in the model. This expanded version grew out of presentations, workshops, and practical application in ecosystem development in several countries by the researcher in 2013 and 2014. Recommendations included in this study utilize this 2.0 version of the model to inform leaders and influencers on next steps and serve as a guide for roles and influencers in the regional economic development ecosystem.

To begin, do not wait until all member profiles are available, just assign roles in the best

way you can and get the ball rolling. If there are gaps in the model, members are encouraged to

recruit leaders and influencers from the REDE to fill the necessary roles. Anchor partners in

particular can take some time to identify and engage since they are the catalysts and primary

champions that invest time, money, and leadership capital as needed to make the mechanism

successful. All members are encouraged to step up and be catalysts in their area, and all who have the resources and ability to be the anchor partner for the mechanism should be encouraged, celebrated, and supported by the rest of the team. Anchor partners are the glue that binds.

Choosing a mechanism is normally pretty easy if you have the right people involved in the working group. Mechanisms for REDE impact can include a wide variety of initiatives and can be as simple as an intake form or application process to funnel people into a program, or as involved as a software development project to create new tools to address needs in the ecosystem. Common examples include programs and initiatives such as: A Business Plan Competition, Pitch Contest, Innovation Challenge, Training and Certification Program, Group Trip, Site Visit, Exchange Program, Internship, Externship, Apprenticeship, Summer Job, Temporary Assignment, Collaborative Project, Joint Venture, Consulting Engagement, Mentorship Program, Peer-to-Peer Interaction, Conference, Event, and much more. The goal is to utilize the breadth and depth of knowledge in the group of diverse contributors to zero in on mechanisms that fit the goals and have a high chance of success. Pick one and get started.

The number and magnitude of mechanisms a working group should deploy depends heavily on the unique circumstances of the group and of the overall initiative. The simple way to look at it is that your working group has been empowered and entrusted to lead your area of the REDE because you are trusted leaders and influencers in the region. Each of you fills a knowledge gap and a specific division of labor on the team. Simply put your heads together and come up with the most feasible plan that is likely to meet your stated goals, then execute the model and plan and learn as you go. Do not fail to follow your meeting schedule, milestones, or to report out and discuss metrics. Lean into the model and allow it to be fun and easy.

Try to avoid over thinking every detail or getting caught up in a critique of the model or of one another. Instead, use it as a jumping off point and make it your own in order to accomplish the goals set out for the team. You will be astonished how effective this methodology can be at bringing together diverse teams to impact the REDE quickly and efficiently. It is also very effective at building relationships across sectors. It is likely that it will take between one and three iterations of the model for your team to get comfortable using it, so don't be afraid to jump in quickly, get rolling, then learn and pivot as needed. The goal is to facilitate rapid alignment and the focus of time and resources for impact. Be patient and work the model a few times before giving up or casting judgment. You may be surprised at the results.

**Figure 10. Three Types of Entrepreneurship in the REDE**

Encouraging an Entrepreneurial Mindset for All Influencers in the REDE

Encourage an entrepreneurial mindset and approach for all members of the team regardless of title, position, level of seniority, industry, or sector. In the Technopolis Innovation

Model, Gibson and Butler state that all participants in an ecosystem can and should be entrepreneurial in their pursuit of goals and positive impact. They define three different categories of entrepreneurship including: Technology Entrepreneurship, Civic Entrepreneurship, and Social Entrepreneurship, each to address different important societal needs in unique and powerful ways (See Figure 10 above). According to Gibson and Butler, the sharing of knowledge, skills, and approaches across these three categories of entrepreneurship can lead to innovation through knowledge exchange (KTTA) and can save significant time and resources.

Figure 11. The Sweet Spot for Regional Economic Development Ecosystems (REDE's)
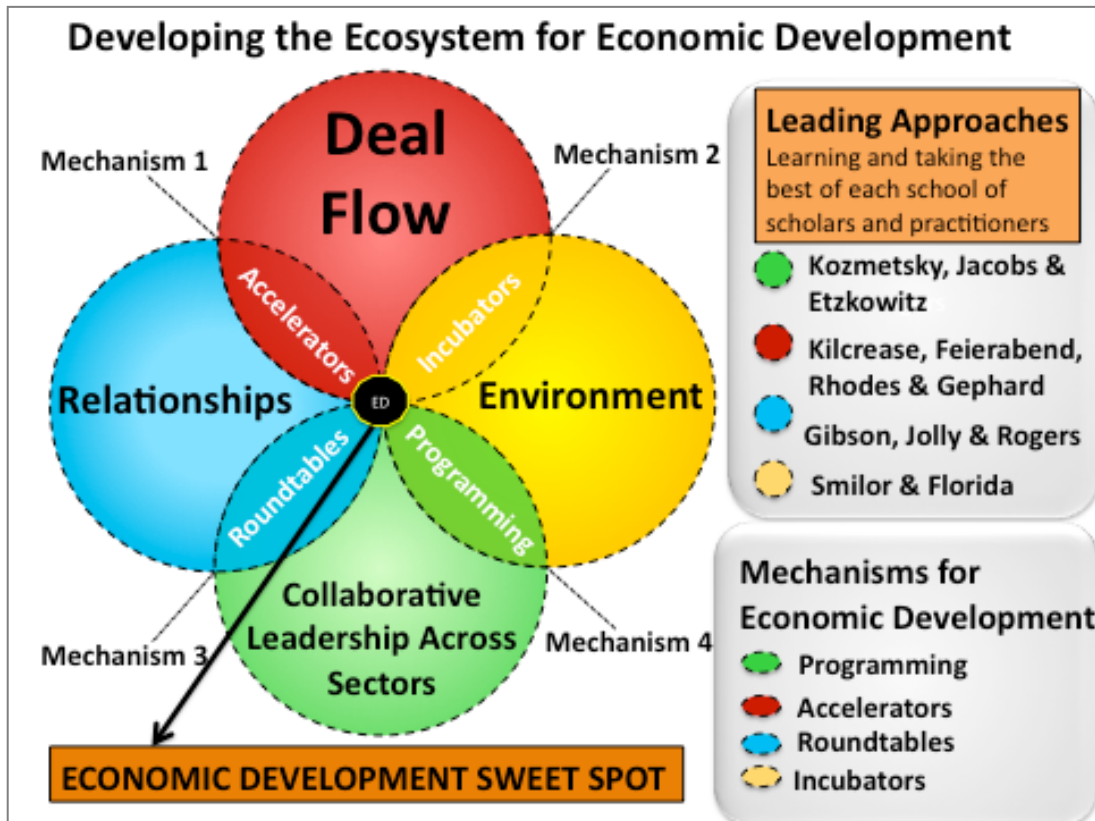
Finding the Sweet Spot for REDE Optimization

As a final set of recommendations, the researcher provides a model to illustrate how to bring together the leading approaches from each of the select scholars discussed in Chapter 2

with findings from data and analysis presented in Chapter 4, and the R.E.D.E. Dashboard and methodology presented in Chapter 5 (See Figure 11 above). First, the researcher presents four areas of importance in the REDE to develop a healthy set of relationships, trust, support, and deal flow among stakeholders: Environment, Collaborative Leadership, Relationships (trust), and Deal flow (throughput using the model). Intermediaries are vital to success (Zhang & Li, 2010).

Overlaps between the four categories correlate with the history and development of regional ecosystem literature and best practices over time. Each mechanism grew out of the research and has been proven effective in successful REDE's around the world. These mechanisms include: Accelerators, Incubators, Roundtables, and Programming. All four were identified in primary research as an area of need and in the literature as effective in helping companies to succeed (O'shea, Farny, & Hakala, 2019; Parry, 2014). This framework provides an easy to follow and easy to understand theoretical underpinning for the leadership, organization, funding, and launch of these mechanisms to meet stated needs within the REDE.

Innovation Through Leadership Across Sectors

Kozmetsky (1985;1989) emphasizes the importance of collaborative leadership across sectors. In his view, outstanding leaders in key sectors come together and focus resources as well as social, political, and financial capital to bring about innovation (Kozmetsky, 1985). They do this by developing, attracting, and growing highly trained, skilled, creative populations of talent. Effective leaders work together across sectors to unleash business ideas through support systems, mentorship, strategic deployment of government funding and assets, and the development of top-notch education and training capacity for the region. All of these activities lead to the ultimate goal of creating deal flow and a community of actively engaged and informed risk capital in the region to invest early, harvest major returns, and reinvest dividends to create wealth.

Relationships (trust)

Gibson (1989; 2005) emphasizes how major influencers actively develop relationships and build trust with each collaboration they take part in, leading to larger and more strategically aligned investments over time, and eventually to the execution of major deals for growth of the ecosystem. Close ties, coupled with hard earned wins, lead to longer lasting and more meaningful partnerships that stand the test of time. This approach encourages greater activity between influencers and deliberate actions to foster trust. It also touts relationships as the primary means to develop resilience and elasticity in the ecosystem.

Environment

Smilor (1986; 1989) emphasizes an environment that is attractive enough to attract and retain talent, investment, and enterprise. Attributes of an attractive environment include low cost and high yield elements that make it a good place to live and do business, ie: Business-friendly (low hassle), critical mass of talent and resources (tipping point), low cost of living, available housing, safety, fun for all ages, people friendly, especially appealing to young (18-34) creative talent and experienced mid-career (35-45) leaders, family-friendly, easy to work in, good transportation, good infrastructure, good schools, as well as convenient variety of retail and amenities nearby. This view also emphasizes the importance of a catalyzing person, entity, or event in the environment to galvanize influencers and leaders toward a common goal. As he describes it, the catalyst phenomenon serves to unite people in vision and inspire them to believe the vision is possible to achieve. As a result, they take risks, sacrifice, and work together to succeed. Each small win is a spark that leads to a flame. Environmental elements feed the flame.

In successful ecosystems, the final and most important environmental factor is the catalyst that puts a major win on display that gets people excited and fans the flames into a

roaring fire. This environmental approach begs the questions: What crucial elements are missing in the REDE?, What small wins can be brought about or celebrated?, and What or who can serve as a catalyst? In the case of TC, this study serves as a good first step toward finding answers.

Deal flow (throughput using the model)

Feierabend, Rhodes, and Gephardt (2018) emphasize deal flow as the most important element in ecosystem development and sustainability. In their view, the development and optimization of deal flow is the secret sauce of ecosystems. While their view is in alignment with the importance of collaborative leadership, relationships with high trust, and environment, they argue that these elements are meaningless and ineffective if no deals are struck to create throughput in the model. The more that collaborative partners "exercise those muscles," the better they become at identifying opportunities, committing to collaborations, and striking deals.

Throughput creates shared experiences that teach and grow individuals, teams, and partners to work together more effectively in the REDE. By focusing on the deal and increasing throughput, people get better and better at their role in the ecosystem. Even failures yield dividends of shared knowledge, relationships, and of activity that can eventually lead to follow-on deals, as Gibson (2005) and Kozmetsky (1985) point out. Overall, this raises the capacity of people, organizations, partnerships, sectors, industry clusters, and ultimately the entire REDE. Deal flow is highly visible and observable by others in the ecosystem, so it inspires and demonstrates to others that deals are possible. Eventually, successful deals lead to successful exits and wealth creation. This, as Smilor would describe it, has the potential to serve as a catalyzing event that galvanizes the ecosystem for growth and inspires a generation to action.

Key elements to successful deal flow optimization in the ecosystem include: 1.The foundation of clear goals and metrics for quality of life (community) and economic development

(economy), 2.Definition and ownership of crucial roles and responsibilities in the ecosystem that facilitate and champion deals to fruition and rally proactive collaborative leadership across sectors to sustain and scale deal flow efforts over time, 3.Global connectivity and relationships to share knowledge, combine efforts to innovate, and engage capital sources and founding teams to facilitate and accelerate deal flow, and 4. Investment of time, money, and mentorship in all levels of business and education by leaders of all sectors in the ecosystem. The ultimate goal is to shift institutions toward an internal and external customer service model, and away from traditional silos and academic convention. The desired result is a strong culture of discovering and meeting customer needs among academic institutions, stakeholders, and partners across sectors.

Four Mechanisms for Deal Flow Optimization

As mentioned in the previous section, overlaps between the four categories correlate with the history and development of regional ecosystem literature and best practices over time. Each mechanism grew out of the research and has been proven to be effective in successful REDE's around the world. These mechanisms for REDE enhancement and growth include: Accelerators, Incubators, Roundtables, and Programming. Each serves an integral purpose in the REDE.

Incubators: Deal Flow and Environment to Scout Opportunities

Incubators and accelerators are defined in Chapter 1. In short, incubators provide a safe low-cost environment with lots of life support for early-stage ventures. They bring together the intersection of the environment and deal flow to identify high potential ideas and early-stage ventures, and then bring the elements together to help them succeed. This can also include "idea incubators" and "talent incubators" such as maker spaces, co-working spaces, etc.

Accelerators: Deal Flow and Relationships to Help Companies Gain Traction

Accelerators tend to focus on companies in later stages of development who are trying to gain traction in the marketplace through fundraising, product development, market development, and team development. They live at the intersection of deal flow and relationships as they bring people together to get initial deals done and help the company gain traction in the marketplace. Typical phases in the company lifecycle when accelerators can be a big help include fundraising and deployment of funds to meet strategic objectives, product development and deployment, initial sales, scaling up the venture, global startup and expansion activities, and in some rare cases, later stage R&D, M&A, or company turnarounds. Incubators and accelerators give founders the community support and the confidence they need to face major challenges and overcome them to be successful. While TC has a couple of incubators in existence that are having a positive impact on the REDE, they do not have sufficient capacity to serve a population of 2.2 million. It is therefore crucial that additional incubators and accelerators be developed that focus on populations of founders in need of their services. This can include location, industry, community, culture, areas of interest, faith, stage of development, and other categories. It is the recommendation of the researcher that TC leaders and influencers set about to foster the launch and successful growth of targeted incubators and accelerators to better serve TC.

Roundtables: Relationships and Collaborative Leadership of Initiatives

In the context of this model, roundtables include any gathering, event, or organization that brings diverse stakeholders together who have a common interest and commitment to developing a robust ecosystem. As mentioned, the more diverse the better. Optimally, this would include leaders and influencers across sectors as selected for this study. However, it could include a host of different groups under a range of circumstances. The goal is to foster dialogue,

relationships, and alignment toward a common vision. The desired outcome is organic growth of the ecosystem as influencers band together to solve a problem or address an unmet need.

Programming: Collaborative Leadership and Environment to Grow Capacity

Programming is defined in the model as any scheduled activity that adds to and enhances the calendar of events for the betterment and growth of capacity in the ecosystem. This can include anything from training and certifications, to workshops and demos, to contests and competitions, to galas, conventions, meetups, and social events. The goal here is to provide a variety of activities that spur interest, equip and empower stakeholders, and allow people to come together, engage, and share knowledge and experience. Activities should be frequent enough and diverse enough to meet needs as they are identified. All programming for the REDE should be readily accessible and easy to track and attend across all organizations, networks, and sectors in the REDE to foster cross-pollination and collaboration. Based on feedback from leaders and influencers, all four mechanisms are in need of enhancement in TC and all can be organized using the tools provided. This is a low-hanging opportunity for immediate impact.

Collaborating with Strong Values that Unite People to a Common Cause

This model has a strong bias for action, real-time information sharing, decision-making, collaborative planning, team execution, and skin in the game. Each of these elements is crucial for successful deployment. It is the recommendation of the researcher that all stakeholders be invited to discuss and agree on these operating values as a starting point to implementation.

•**One learns by doing in the REDE:** Don't endlessly plan or talk about innovation. Define it, dedicate resources, and begin proactively seeking to make it happen.

•**Proactively transfer knowledge between entities and people:** Identify intelligence needs, encourage a culture of transparency, and provide mechanisms for shared information.

•**Each successful funding or exit event attracts more talent and capital:** Scout deals and proactively bring people together who have the interest, time, and resources to execute.

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•**Success breeds greater success**: Make every effort to help founding teams to succeed, existing businesses grow, and large firms to double down on investments to thrive and grow. Document and tell the story of small wins, celebrate, and build upon them as you go.

•**Self-selecting teams yield the best results**: Don't overly pre-engineer or force inclusion of all stakeholders in the REDE. Instead, focus on commitment, skills, and knowledge. Some opt out, others opt in. Work with the willing. Document progress and let it speak for itself.

•**Set people free to do their best work**: Bring people together. Provide leadership, targeted resources, and ongoing accountability. Step back and turn them loose to accomplish goals.

High Growth Companies as a Strategy and Focus for the REDE

The greatest single driver of growth in the US economy since World War II has been the systematic investment of the US government in education, research, and economic development coupled with free market activities to capitalize on these investments. This is consistent with findings in the literature that fast-growing new firms, not new firms in general, accounted for most of the new high-wage job creation by small and medium enterprises in advanced countries (Wong, Ho, & Autio, 2005). Many well-meaning ecosystem proponents get this wrong. Not to say that small low-growth and slow-growth businesses are not valuable contributors. Instead, it indicates that one successful high-growth business will have an exponentially higher impact on the ecosystem with significantly higher returns on investment. In other words, high growth firms behave differently at each stage of the lifecycle and can be a better bang for the buck over time.

As technologies become more sophisticated and more ubiquitous, the need for these investments will continue to increase. Without them, it is questionable whether the US economy can continue to compete on the world stage. Even worse, there is a good chance that the US economy would collapse as we currently know it without significant ongoing investment from the public sector in the areas of infrastructure and science and technology R&D. The key to this success is that the public sector should be deliberate about investing in areas that are required for economic growth, but that fall outside of the core expertise or the risk profile of the private

sector. In other words, don't duplicate or over-regulate what the private sector already does well, rather, do what the private sector needs but is unable to do on their own (Mazzucato, 2015). The researcher recommends this approach in TC. Focus on high-growth companies for impact. Find the areas of need that can't be served in the existing marketplace and invest to get them over those hurdles. This is by far the most efficient and effective approach according to the literature.

Making the Shift from Traditional ED to Ecosystem Strategies for ED

Economic Development (ED): According to Feldman (2016), "Economic Development (ED) is the expansion of capacities that contribute to the advancement of society through the realization of individual, firm, and community potential. Economic Development is measured by a sustained increase in prosperity and quality of life through innovation, lowered transaction costs, and the utilization of capabilities towards the responsible production and diffusion of goods and services" (Feldman, et al, 2016). The question to be considered therefore is whether or not current traditional approaches are yielding the best results in terms of increased prosperity and quality of life. Based on the research, there is a strong case for the employment of long-term collaborative approaches with highly strategic areas of focus (Barbier, 1987). There is also a strong case to be made based on feedback from interview participants, that TC is doing well, but could be doing much better by working as a county to leverage resources and relationships.

Figure 12. Traditional Strategies for Economic Development (ED)

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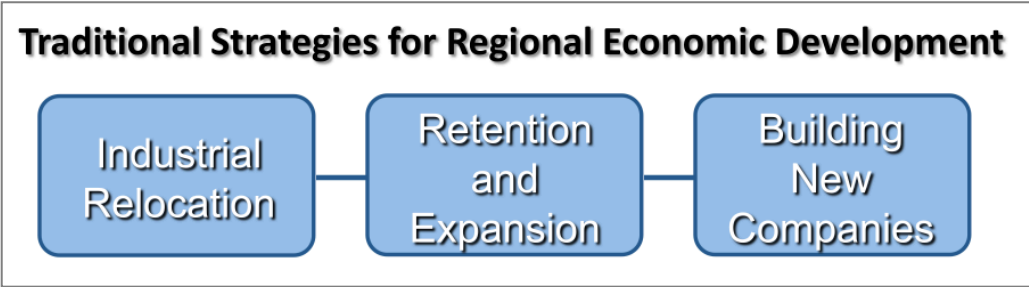
Leading practices globally suggest that traditional approaches to ED, while still helpful in some cases, should not be the central thrust in the new knowledge economy. Instead, ecosystem approaches have emerged that focus on collaboration across sectors, strategic partnerships, and targeted investment for maximum impact (Mazzucato, 2015). "Economic Development requires effective institutions grounded in norms of openness, tolerance for risk, appreciation for diversity, and confidence in the realization of mutual gain for the public and the private sector." (Feldman, et al, 2016). It therefore behooves TC to foster these cultural elements in the REDE for maximum positive impact in the region, and rally behind leaders who celebrate this mindset.

Figure 13. REDE Strategies for Economic Development (ED)

Studies show that the sustained deliberate focus of regions on ED can have a significant impact on measures for prosperity and quality of life (EDA, 2018). Common indicators of successful ED include job growth, wage growth, increased wealth, greater numbers and increased success of companies, and increased tax revenues within a region. These indicators must be paired with improved factors of quality of life over time such as health, security, sense

of belonging and well-being, educational attainment, social mobility, and financial prosperity within the region (EDA, 2018). Perhaps it is time to weigh all of these metrics in TC?

All of these factors are measurable over time, however, not all are measured in all ecosystems. In TC, they are measured by different groups and organizations. Metrics and measures vary greatly depending on the goals, culture, and role of the measuring institution or entity. It is the recommendation of the researcher that TC leaders come together to measure current practices in each of these factors listed above. It is recommended that a REDE strategy be deployed through a series of mechanisms and measured by the same set of factors. The key is sustained measurement, collaboration, and openness to learn. Use the findings to inform, adjust, and optimize WFD and ED in the region. Then go with the approach that yields the best results.

Suggestions for Follow-on Research

During the course of the last two years, the researcher has observed opportunities and been suggested a number of potential follow-on studies that fell outside the scope of this study, but would shed additional light on the subject matter addressed in some meaningful way. See a representative list of potential areas for future study below for consideration:

- TC Case Study: Apply the Triple Helix of Innovation - Circulatory System framework to map and measure the flow of people, ideas, and innovations; Offer recommendations.
- REDE work-from-home employees, home-based businesses, trends, and consequences.
- Map industry clusters including value chain, deal flow, and supporting relationships.
- Measure impact of REDE events and map effects on ED, WF, and Industry Clusters.
- Track where top TC graduates are going, interview, celebrate, offer incentives to stay.
- Research lines of research labs (UTA, UTD, UNTHSC, etc.) and write a report.
- Interview innovators and researchers and identify case studies for development.
- Chronicle the history and impact of Lockheed Martin and the military complex in TC.
- Measure economic and QoL impacts that research is having and can have in the region.

- Near Southside Case Study: Impoverished neighborhood to place making in 1 decade.

- Arlington Sports Complex Case Study: Leadership from conception to fruition.

- REDE Collaboration Case Study: Identify and research successful collaborations in TC.

- Map recent success stories in WF and ED and tell the human stories behind them.

- Poverty in TC Case Study: Human stories of impact and potential pathways out.

- Map history and key inflection points of successful enterprise in TC over each decade.

- Identify case studies for deep dive interviews and tell the story from idea to fruition.

- Map M&A successes from a financial perspective to understand capital and deal flows.

- Map education exchanges, Sister Cities, Rotary, and industry clusters to find overlap.

- Tell success stories (exits) as examples to inspire the next generation of founders in TC.

- Tech FW Case Study: Research the history, genealogy, partners, and impact on REDE.

- Alliance, Bell, and Hillwood Case Study: The future of unmanned vehicles in TC.

- Chronicle history of how Alliance and Hillwood came about and their impact on TC.

- Study the changing demographics in TC and feature stories of positive impact.

- Chronical the emergence and growth of entrepreneurship as a community priority in TC.

- Map leadership across sectors and tell the story of the "great shift change" in TC.

- Study changing landscape of urban and rural counties in DFW and effects on the REDE.

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Appendix A - Instruments for Data Collection and Analysis

Assessment Tool for Ecosystem Engagement (Letter and Interview Protocol)

Doctor of Education (Ed.D.)
Adult Learning and Leadership
Kansas State University

Interviewer **Name: Eli D. Mercer, Ed.D. Candidate**
Interview Date, Time, Location:
Interviewee **Name, Position, Organization:**

Brief Description of the Study: *This study is being conducted to shed light on workforce in the regional economic development ecosystem (REDE). To closely examine and learn from a real-world example, the Tarrant County REDE will be the focus of this case study. Between 25 and 50 targeted regional leaders and influencers will be interviewed to gain their knowledge, experience, and insights.*

Thank you for agreeing to be interviewed and included in this study as a key leader and influencers in the Tarrant County ecosystem. A combination of two innovation ecosystem segmentation models (Etzkowitz, 2001) and (Smilor, Gibson, & Kozmetsky, 1989) were used to identify, segment, and select interview subjects based on roles and influence regionally.

I will research, observe, and interview each of the carefully selected mix of diverse regional leaders and influencers from government, education, and the private sector. Most interviews will take between 20 minutes and an hour and can be conducted in person, by phone, or by Zoom. The average interview will take around 45 minutes. The following questions will be asked to explore the unique experiences of interview subjects, their vision for the future, and their outlook on Tarrant County and workforce in the REDE. Answers will be coded, compared, and contrasted between roles and influencer groups to gain insights.

I will take notes during the interview for inclusion in the data set for analysis. Specific individual answers will remain anonymous. If referenced in the study at all, interview subject profiles will be referred to by title, role, and institution only. Interview participants will be acknowledged and thanked you as a group, but individual names will not appear as part of the not in the findings of the study.

The final report will be shared with interview subjects with gratitude once completed. Thank you again for your leadership, service to community, and taking part in this study.

Sincerely,

Eli D. Mercer
Doctor of Education (Ed. D.) Candidate
Adult Learning and Leadership
Kansas State University
Topic: The Role of Workforce in Regional Economic Development: A Case Study of Tarrant County, Texas

Interview Protocol

Research Question: *What is the role of Workforce in the REDE?*

Goal – "To explore the role of workforce in the regional economic development ecosystem (REDE) by observing and learning from the real-world case study of Tarrant County, Texas."

Questions:

1. Tell me about your background and what role you play in the REDE, in regional economic development (ED), and in the Workforce (WF) in Tarrant County (TC)?

2. What is your experience with the workforce in TC to date and how would you describe the outlook for TC ED in the years ahead?

3. What WF and ED resources have helped and what WF and ED resources were lacking?

4. Any particular success stories or challenges in WF and regional ED you'd like to share and any examples of specific impact (positive or negative) of WF on regional ED in TC?

5. How are we doing in the area of company recruitment to TC and how has the state of our WF affected performance in this area of regional ED? Examples?

6. How are we doing in the area of company retention and growth in TC and how has the state of our WF affected performance in this area of regional ED? Examples?

7. How are we doing in the area of entrepreneurship or organic growth in TC and how has the state of our WF affected performance in this area of regional ED? Examples?

8. How are we doing in the area of institutional partnerships and global ecosystem development in TC and how has the state of our WF affected performance in this area of regional ED? Examples?

9. Ask Interview subject to rate each of the following areas on a scale of 1-5 (5 best):

   A. How would you rate economic development in TC? (Circle: 1 2 3 4 5)

   B. How would you rate the current workforce in TC? (Circle: 1 2 3 4 5)

   C. How would you rate the importance of workforce in TC ED? (Circle: 1 2 3 4 5)

   D. How would you rate workforce development in TC? (Circle: 1 2 3 4 5)

10. What one thing would have an immediate positive impact on ED in TC and why?

__Wrap-up__: End with an open dialogue and open input opportunity for the interview subject.
- Ask for any recommended additional primary and secondary sources.
- Offer to include any additional insights the subject would like to share.
- Genuinely thank the individual for participating in the interview.
- Assure him or her of confidentiality and share future follow up/research opportunities, if any.

Data Grid (Matrix): Coding, Categorizing, and Analyzing Responses

Data Grid: Inteview resposes from TC leaders	Economic Declopment	Workforce	Community College	Universities	Regional Connectors	Local Government	State Government	National Government	Corporations	Emerging Companies	Startups	Areas of Convergance	Areas of Divergance	Key Learnings
Key Intelligence Questions (KIQ's)														
1. Tell me about your background and what role you play in regional economic development (ED) and Workforce (WF) in Tarrant County (TC)?														
2. What is your experience with the workforce in TC to date and how would you describe the outlook for TC ED in the years ahead?														
3. What WF and ED resources have helped and what WF and ED resources were lacking?														
4. Any particular success stories or challenges in WF and regional ED you'd like to share and any examples of specific impact (positive or negative) of WF on regional ED in TC?														
5. How are we doing in the area of company recruitment to TC and how has the state of our WF affected performance in this area of regional ED? Examples?														
6. How are we doing in the area of company retention and growth in TC and how has the state of our WF affected performance in this area of regional ED? Examples?														
7. How are we doing in the area of entrepreneurship or organic growth in TC and how has the state of our WF affected performance in this area of regional ED? Examples?														
8. How are we doing in the area of institutional partnerships and global ecosystem development in TC and how has the state of our WF affected performance in this area of regional ED? Examples?														
9. Ask Interview subject to rate each of the following areas on a scale of 1-5 (5 best): A. How would you rate Economic Development in TC? (Circle: 1 2 3 4 5) B. How would you rate the current workforce in Tarrant County? (Circle: 1 2 3 4 5) C. How would you rate the level of importance of Workforce in TC ED? (Circle: 1 2 3 4 5) D. How would you rate workforce development in TC? (Circle: 1 2 3 4 5)														
10. What one thing would have an immediate positive impact on ED in TC and why?														

NOTE: This data grid design was informed by the literature (Smilor, Gibson, & Kozmetsky, 1989; Gibson & Butler, 2003; Roueche, Baker, & Rose, 1997; Boggs, 1994, 2011; AACC, 2006, 2011, 2014; AASCU, 2014). The questions are intended to serve as a starting point for discussion to be informed and adjusted as a result of ongoing primary and secondary research including interviews, data collection, and analysis.