

ATILIM UNIVERSITY
GRADUATE SCHOOL OF SOCIAL SCIENCES
DEPARTMENT OF BUSINESS ADMINISTRATION
BUSINESS ADMINISTRATION DOCTORAL PROGRAMME

**THE VALUE ADDED BY DIGITAL TRANSFORMATION CRITERIA TO
INTELLECTUAL CAPITAL COMPONENTS:
NETWORK ANALYSIS ON ESENBOĞA AIRPORT**

Dissertation

Ayşe Aslı YILMAZ

Ankara-2022

ATILIM UNIVERSITY
GRADUATE SCHOOL OF SOCIAL SCIENCES
DEPARTMENT OF BUSINESS ADMINISTRATION
BUSINESS ADMINISTRATION PHD PROGRAMME

**THE VALUE ADDED BY DIGITAL TRANSFORMATION
CRITERIA TO INTELLECTUAL CAPITAL COMPONENTS:
NETWORK ANALYSIS ON ESENBOĞA AIRPORT**

Dissertation

Ayşe Ashı YILMAZ

Thesis Advisor

Assoc. Prof. Dr. Şule ERDEM TUZLUKAYA

Ankara-2022

ACCEPTANCE AND APPROVAL

This is to certify that this thesis titled “The Value Added by Digital Transformation Criteria to Intellectual Capital Components: Network Analysis on Esenboğa Airport” and prepared by Ayşe Aslı YILMAZ meets with the committee’s approval unanimously as Dissertation in the field of Business Administration following the successful defense conducted on 05/12/2022.

Prof. Dr. Yavuz ERCİL (Chair)

Prof. Dr. Erdem KIRKBEŞOĞLU (Member)

Assoc. Prof. Dr. Şule ERDEM TUZLUKAYA (Advisor)

Assoc. Prof. Dr. Ceyhan ÇİĞDEMOĞLU (Member)

Asst. Prof. Dr. Altan ÖZKİL (Member)

Assoc.Prof. Dr. Şule ERDEM TUZLUKAYA

Director

ETHICAL STATEMENT

I accept and acknowledge that I have prepared this thesis study, prepared in line with the Thesis Writing Guidelines of Atılım University Graduate School of Social Sciences.

- within the framework of academic and ethical rules.
- presented the information, documents, evaluations, and results in a way that meets the rules of scientific ethics and morality,
- I have referenced each work from which I have benefited while preparing my thesis, and that
- I hereby present a unique study.

I hereby also understand that I shall accept any loss of rights against my behalf in cases otherwise.

Ayşe Aslı Yılmaz

05/12/2022

ÖZ

YILMAZ, Ayşe Aslı. Dijital Dönüşüm Kriterlerinin Entelektüel Sermaye Bileşenlerine Kattığı Değer: Esenboğa Havalimanı'nda Ağ Analizi. Doktora Tezi, Ankara, 2022.

Örgütler sınırlarının ötesinde, gerekli kaynaklara erişim sağlamak için açık inovasyon taktiklerini ve modellerini benimseyerek korkusuzca hareket ederler. Açık inovasyonda “açık”, örgütsel örtük bilginin paylaşımını ifade eder. Değer odaklı stratejiler benimseyen örgütler, dijital dönüşümler ve Endüstri 5.0'a geçiş sürecinde teknolojiyi bir amaçtan çok bir araç olarak değerlendirerek veri merkezli davranmaya çalışırlar. Endüstri 5.0'ın sunduğu fırsatlarla dijital dönüşüm süreci, örgütsel çeviklik, örgütsel sürdürülebilirlik, örgütsel uyum ve değişkenliğe, belirsizliğe, karmaşıklığa hatta muğlaklığa karşı dayanıklılığa ulaşmak için örgütler tarafından üstlenilir.

Örgütler entelektüel sermaye değerlerini artırdıkça, geleceklerini güvence altına almayı başarırlar. Çünkü varlıklarını sürdürmek, değer üretmek, pazar paylarını ve pazar etkilerini büyütmek ve sürdürülebilir rekabet stratejileri ile büyümek amacıyla sürekli bir değişim ve gelişim döngüsü içindedirler. Bu durum en dikkat çekici şekilde havaalanlarında görülmektedir. Doğaları gereği en titiz şekilde ağ sistemi kuran havaalanları, havacılık sektörünün en kritik amiral gemileridir. Dijital dönüşümü, yenilikçi teknolojiyi ve teknolojik hareket tarzını her yönden takip eden örgütlerdir.

Araştırmanın amacı, ağların açıklayıcı gücünden yola çıkarak havalimanının dijital dönüşüm kriterleri ve entelektüel sermaye bileşenleri arasındaki etkileşimi analiz etmektir. Bu nedenle araştırma sorusu “Dijital dönüşüm kriterleri entelektüel sermayenin değerini nasıl artırıyor?” dur. Çalışma açık inovasyon stratejileri çerçevesinde, havalimanları dijital dönüşüm kriterleri ile havacılık paydaşlarının entelektüel sermaye bileşenleri arasındaki etkileşimin havalimanı terminal yönetimi ile iş birliği içinde örgütsel ağ analizi ile incelenmesi literatürde bir ilk olacaktır. Aynı zamanda grafik analizi ile elde edilen yerel olmayan merkezilik ölçütleri sonuçlarına göre en kritik, en belirgin, en güçlü, en önemli ve en prestijli düğümler ve paydaşlar belirlenmiştir. İlişkilendirilen ve tüm detaylarıyla değerlendirilen fonksiyon ve örgütler “karşılaştırma ve genelleştirme” tablosu ile açıklanmıştır.

Anahtar Sözcükler: Entellektüel Sermaye, Dijital Dönüşüm, Havaalanı Terminal Yönetimi, Ağ Analizi, Python Networkx

ABSTRACT

YILMAZ, Ayşe Aslı. The Value Added by Digital Transformation Criteria to Intellectual Capital Components: Network Analysis on Esenboğa Airport. PhD Thesis, Ankara, 2022.

Organizations act fearlessly beyond their borders, adopting open innovation tactics and models to gain access to necessary resources. In open innovation, “open” refers to the sharing of organizational tacit knowledge. Organizations that adopt value-oriented strategies try to act data-centric by considering technology as a tool rather than a goal in the process of digital transformation and transition to Industry 5.0. With the opportunities offered by Industry 5.0, the digital transformation process is undertaken by organizations to achieve organizational agility, organizational sustainability, organizational adaptation, and resilience to volatility, uncertainty, complexity, and even ambiguity.

As organizations increase their intellectual capital values, they succeed in securing their future. Because they are in a continuous cycle of change and development to maintain their existence, produce value, increase their market shares, and market effects, and grow with sustainable competitive strategies. This situation is most strikingly seen in airports. Airports, which, by their nature, establish the most detailed network system, are the most critical flagships of the aviation industry. They are organizations that follow digital transformation, disruptive technology, and technological movement in all aspects.

Based on the explanatory power of networks, the aim of the research is to analyze the interaction between the airport's digital transformation criteria and the intellectual capital components. Therefore, the research question is “How do digital transformation criteria increase the value of intellectual capital?” The study will be a first in the literature to examine the interaction between airports digital transformation criteria and the intellectual capital components of aviation stakeholders through organizational network analysis in cooperation with airport terminal management, within the framework of open innovation strategies. Furthermore, according to the results of non-local centrality measures enabled by graph analysis, the most critical, the most prominent, the strongest, the most important and the most prestigious nodes are determined. The functions and organizations that are associated and evaluated in detail are explained with the "comparison and overarching" chart.

Keywords: Intellectual Capital, Digital Transformation, Airport Terminal Management, Network Analysis, Python Networkx

APPRECIATION

In the course of writing my thesis, I would like to mention very important names who were with me on this journey. Firstly, I would like to express my deepest gratitude to my respected thesis advisor, Assoc.Prof. Şule ERDEM TUZLUKAYA, who has been with me from the very beginning of my Ph.D. adventure till now, encouraging me, teaching me, and providing me with all the knowledge she has. Secondly, I would like to thank with my deepest gratitude to the distinguished professor, Prof.Dr. Yavuz ERCİL, who I sought advice from him without hesitation throughout my thesis on the most significant and vital points in the literature review and methodology, as well as who spent a lot of time and effort to construct my thesis. Then, I would like to present my very truly appreciation to the distinguished professor, Assist.Prof.Dr. Altan ÖZKİL, who shared his invaluable experiences, provided insightful feedback and encouragement over the course of my thesis studies.

Additionally, I would like to thank Mr. Alp KARAYALÇIN, the Deputy General Manager of TAV Holding at Esenboğa Airport in Ankara, and other Esenboğa TAV Holding Subsidiaries Executive Managers who participated in the study for providing me with every chance to apply the methodology of my thesis.

As a last note, I would like to express my deepest gratitude to my husband, Mehmet, who has been there for me through thick and thin, showing me nothing but unconditional love, respect, and understanding. Please accept my heartfelt gratitude, Oğuzhan, my darling son, for the unending patience you have given me during my studies.

TABLE OF CONTENTS

ÖZ.....	i
ABSTRACT	ii
APPRECIATION	iii
TABLE OF CONTENTS.....	iv
INDEX OF TABLES	vii
INDEX OF FIGURES	viii
INDEX OF DIAGRAMS	ix
INDEX OF GRAPHS.....	xi
INTRODUCTION.....	1
CHAPTER 1: INTELLECTUAL CAPITAL	5
1.1 Intellectual Capital Components	11
1.1.1 Human capital.....	12
1.1.2 Structural capital.....	19
1.1.3 Relational capital	27
CHAPTER 2: AIRPORT DIGITAL TRANSFORMATION	33
2.1 Customer services	34
2.2 Lower operational cost	35
2.3 Increase employee productivity	37
2.4 Operations efficiency	37
2.5 Strengthen networks.....	38
2.6 Increase employee retention.....	40
CHAPTER 3: THE RELATIONSHIP BETWEEN DIGITAL TRANSFORMATION AND INTELLECTUAL CAPITAL	42
CHAPTER 4: METHODOLOGY	47
4.1 Methodology	47

4.1.1	Network Analysis	48
4.1.2	Network Analysis with Python NetworkX.....	50
4.2	Execution of The Study	51
4.2.1	TAV Airports.....	51
4.3	Analysis and Findings.....	57
4.3.1	Degree centrality	65
4.3.2	Closeness centrality	73
4.3.3	Eigenvector centrality.....	81
4.3.4	Betweenness centrality	85
4.3.5	Network graph	91
4.3.6	Modularity	113
4.3.7	Community detection	122
4.3.8	Vote-rank.....	130
CHAPTER 5: INTERPRETATION OF FINDINGS		151
REFERENCES.....		167
APPENDICES		Hata! Yer işareti tanımlanmamış.
Appendix 1:	Survey.....	182
Appendix 2:	Graph 1: Esenboğa TAV Hq Network Visualization	205
Appendix 3:	Graph 2: Network Visualization of Raw Data of Esenboğa TAV Finance Department.....	206
Appendix 4:	Graph 3: Network Visualization of Raw Data of Esenboğa TAV Logistics Department	207
Appendix 5:	Graph 4: Network Visualization of Raw Data of Esenboğa TAV Technologies	208
Appendix 6:	Graph 5: Network Visualization of Raw Data of Esenboğa PRIMECLASS	209

Appendix 7: Graph 6: Network Visualization of Raw Data of Esenboğa TAV Securities	210
Appendix 8: Graph 7: Network Visualization of Raw Data of Esenboğa HAVAŞ.....	211
Appendix 9: Graph 8: Network Visualization of Raw Data of SUM	212
TURNITIN REPORT	213
RESUME.....	218



INDEX OF TABLES

Table 1:	Demographic Information About Participants	54
Table 2:	TAV Hq's Modularity, Community Detection, and Vote Rank Distribution.....	94
Table 3:	Esenboğa TAV Finance Department modularity, community detection, and vote rank distribution	97
Table 4:	TAV Logistics department's modularity, community detection, and vote rank distribution.....	100
Table 5:	Esenboğa TAV Technologies modularity, community detection, and vote rank distribution.....	103
Table 6:	Esenboğa PRIMECLASS, Community Detection, and Vote Rank Distribution.....	106
Table 7:	Esenboğa TAV Securities' Modularity, Community Detection, and Vote Rank Distribution	109
Table 8:	Esenboğa HAVAŞ's Modularity, Community Detection and Vote Rank Distribution	112
Table 9:	Esenboğa TAV Holding Terminal Management 's Modularity, Community Detection, and Vote Rank Distribution	144
Table 10:	Comparison and Overarching	149
Table 11:	Out-link Nodes and Digital Transformation Funtions	157
Table 12:	In Link Nodes and Intellectual Capital Components	160

INDEX OF FIGURES

Figure 1: Process of organization value creating.....	10
Figure 2: Esenboğa TAV Hq-Raw Data Heatmap	58
Figure 3: Esenboğa TAV Finance Department-Raw Data Heatmap	59
Figure 4: Esenboğa TAV Logistic Department-Raw Data Heatmap	60
Figure 5: Esenboğa TAV Technologies- Raw Data Heatmap	61
Figure 6: Esenboğa PRIMECLASS -Raw Data Heatmap.....	62
Figure 7: Esenboğa TAV Security-Raw Data Heatmap	63
Figure 8: Esenboğa HAVAŞ-Raw Data Heatmap	64
Figure 9: Esenboğa SUM -Raw Data Heatmap	139



INDEX OF DIAGRAMS

Diagram 1:	Esenboğa TAV Hq -In&Out Link Normalized Degree Centrality	66
Diagram 2:	Esenboğa TAV Finance Department.-In&Out Link Normalized Degree Centrality	67
Diagram 3:	Esenboğa TAV Logistic Department.-In&Out Link Normalized Degree Centrality	68
Diagram 4:	Esenboğa TAV Technologies-In&Out Link Normalized Degree Centrality	69
Diagram 5:	Esenboğa PRIMECLASS-In&Out Link Normalized Degree Centrality	70
Diagram 6:	Esenboğa TAV Securities-In&Out Link Normalized Degree Centrality	71
Diagram 7:	Esenboğa HAVAŞ-In&Out Link Normalized Degree Centrality	72
Diagram 8:	Esenboğa TAV Hq-In&Out Link Normalized Closeness Centrality	74
Diagram 9:	Esenboğa TAV Finance-In&Out Link Normalized Closeness Centrality.....	75
Diagram 10:	Esenboğa TAV Logistic Department.- In&Out Link Normalized Closeness Centrality.....	76
Diagram 11:	Esenboğa TAV Technologies -In&Out Link Normalized Closeness Centrality.....	77
Diagram 12:	Esenboğa PRIMECLASS -In&Out Link Normalized Closeness Centrality.....	78
Diagram 13:	Esenboğa TAV Securities -In&Out Link Normalized Closeness Centrality.....	79
Diagram 14:	Esenboğa HAVAŞ -In&Out Link Normalized Closeness Centrality	80
Diagram 21:	Esenboğa TAV Hq- In&Out Link Normalized Eigenvector Centrality	82
Diagram 22:	Esenboğa TAV Finance- In&Out Link Normalized Eigenvector Centrality.....	82
Diagram 23:	Esenboğa TAV Logistic Department.- In&Out Link Normalized Eigenvector Centrality.....	83
Diagram 24:	Esenboğa TAV Technologies- In&Out Link Eigenvector Eigenvector Centrality.....	83
Diagram 25:	Esenboğa PRIMECLASS - In&Out Link Eigenvector Centrality	84
Diagram 26:	Esenboğa TAV Security - In&Out Link Eigenvector Centrality	84

Diagram 27:	Esenboğa HAVAŞ - In&Out Link Eigenvector Centrality	85
Diagram 28:	Esenboğa TAV Hq. Betweenness Centrality	86
Diagram 29:	Esenboğa TAV Finance Department. Betweenness Centrality	87
Diagram 30:	Esenboğa TAV Logistics Department. Betweenness centrality	88
Diagram 31:	Esenboğa TAV Technologies Betweenness Centrality.....	89
Diagram 32:	PRIMECLASS Betweenness Centrality	89
Diagram 33:	Esenboğa TAV Securities Betweenness Centrality	90
Diagram 34:	Esenboğa TAV Finance Department Betweenness Centrality	91
Diagram 35:	Esenboğa SUM-In&Out Link Normalized Degree Centrality	140
Diagram 36:	Esenboğa TAV Holding Terminal Management -In&Out Link Normalized Closeness Centrality.....	141
Diagram 37:	Esenboğa TAV Holding Terminal Management - In&Out Link Eigenvector Centrality.....	142
Diagram 38:	Esenboğa TAV Holding Terminal Management Betweenness Centrality.....	142

INDEX OF GRAPHS

Graph 1: Esenboğa TAV Hq Network Visualization	93
Graph 2: Network Visualization of Raw Data of Esenboğa TAV Finance Department.	96
Graph 3: Network Visualization of Raw Data of Esenboğa TAV Logistics Department.	99
Graph 4: Network Visualization of Raw Data of Esenboğa TAV Technologies.....	102
Graph 5: Network Visualization of Raw Data of Esenboğa PRIMECLASS.....	105
Graph 6: Network Visualization of Raw Data of Esenboğa TAV Securities	108
Graph 7: Network Visualization of Raw Data of Esenboğa HAVAŞ	111
Graph 8: Modularity Network of Esenboğa TAV Hq.....	115
Graph 9: Modularity Network of Esenboğa TAV Finance Department.....	116
Graph 10: Modularity Network of Esenboğa TAV Logistics Department	117
Graph 11: Modularity Network of Esenboğa TAV Technologies	118
Graph 12: Modularity Network of Esenboğa PRIMECLASS	119
Graph 13: Modularity Network of Esenboğa TAV Securities.....	120
Graph 14: Modularity Network of Esenboğa HAVAŞ.....	121
Graph 15: Community Detection Network of Esenboğa TAV Hq.....	123
Graph 16: Community Detection of Esenboğa TAV Finance Department.....	124
Graph 17: Community Detection of Esenboğa TAV Logistics Department	125
Graph 18: Community Detection Network of Esenboğa TAV Technologies	126
Graph 19: Community Detection Network of Esenboğa PRIMECLASS	127
Graph 20: Community Detection Network of Esenboğa TAV Securities	128
Graph 21: Community Detection Network of Esenboğa HAVAŞ	129
Graph 22: Vote-Rank Network of Esenboğa TAV Hq.....	131
Graph 23: Vote-Rank Network of TAV Finance Department.	132
Graph 24: Vote-Rank Network of TAV Logistics Department.....	133
Graph 25: Vote-Rank Network of Esenboğa TAV Technologies.....	134
Graph 26: Vote-Rank Network of Esenboğa PRIMECLASS	135
Graph 27: Vote-Rank Network of Esenboğa TAV Securities	136

Graph 28: Vote-Rank Network of Esenboğa HAVAŞ.....	137
Graph 29: Vote-Rank Network of Esenboğa TAV Holding Terminal Management	143
Graph 30: Modularity Network of Esenboğa TAV Hq.....	146
Graph 31: Community Detection Network of Esenboğa TAV Hq.....	147
Graph 32: Vote-Rank Network of Esenboğa TAV Hq.....	148



INTRODUCTION

Industry 4.0 and the digital transformation cause profound changes across all industries. Due to the profound change brought on by our era, capturing the age and assuring transformation for organizations play a crucial role in terms of organisational structure. It is necessary to ask the following questions to keep up with the technology, particularly when one is beginning the process of developing a road map for Industry 5.0: "What did Industry 4.0 mean, and what needs did the organisations meet?" Keeping up with the times necessitates answering these questions. What new demands gave birth to the development of Industry 5.0? (Wasono et al., 2022). With opportunities presented by Industry 5.0, digitalization brings value to not only to the societies but also to the organizations such as the welfare, higher quality, and retention of employees, boosting the feeling of belonging, improving the environment and sustainability. This value really contributes to the organisations' intellectual capital by making it more valuable.

Organizations join the restructuring process to catch up with the times, and they must continually supply the change, transformation, and development process brought about by restructuring, while also being prepared for unexpected and unique scenarios occurring from the environment. This situation brings about strategic thinking and change and makes it necessary. Thus, the concept of strategy is increasing its importance day by day. In this direction, the transformation in which technologies such as human and robot and artificial intelligence cooperate and which changes on a sectoral basis, points to a super smart society. The word smart added to all these concepts is based on the power attached by digitalization (How Do We Manage the Change Journey, 2020.)

In this study, which is set out to examine the effect of digital transformation criteria on intellectual capital components, the key point for an organization, and more specifically a company, is intellectual capital is revealed. Because Intellectual capital is the knowledge gained by managing the business relationship network.

As companies increase their intellectual capital accumulation, they succeed in securing their future. Because as economic competition increases and globalization, it becomes more difficult for businesses to maintain their current status and requires more labor. For this reason, it has become inevitable for companies to catch up with the era. Ultimately, the way to prevail in competitiveness, which these developments have made indispensable, is through a good strategic plan. However, the picture is not the same for

everyone. Every industry requires different strategies for digital transformation. With the development of the digital age, transformation activities in businesses need to be carried out rapidly. It is a matter of curiosity for managers how to realize digital transformation and how to implement a well-defined digital transformation strategy. Companies that make, implement, and measure strategic plans and execute their activities in line with the strategic plans and targets they have received will be less affected by the uncertainty situations they will encounter, or they will be able to quickly review their action plans and take new movements.

In the light of all these, the digital transformation strategies in the aviation sector are examined in the study, and the airports digital transformation criteria is created within the framework of the literature review. There are various reasons for choosing the aviation industry. In recent years, where competition has been increasing in the aviation sector, as in all sectors, productivity has become the most dominant and thoughtful issue.

While efficiency has traditionally been a success factor in the aviation industry, technical changes and efficiency are cited as two ways to improve it. With technical changes, a transformation towards the target of high output with low input usage is expressed in the sector, while it is emphasized that any airport terminal operator can reveal the ability of any airport terminal operator to provide the best production/output in its own operations.

These concepts, which are performance indicators in the traditional sense, are evaluated on different 'inputs' and 'outputs' in each period depending on the change and transformation in the industry. The aviation industry has had to adapt to Industry 4.0 and digitalization processes and is currently in the transition period for 5.0. In the aviation sector of Industry 4.0, such as navigation and baggage tracking at airports for passengers; For airport personnel, applications for ground (ramp) services for operations such as aircraft/baggage loading, passenger services for check-in, boarding operations, and cabin services for operations such as in-flight settlement service; while various applications have started to be developed for technical personnel, from aircraft production, maintenance and repair to operational processes, it is estimated that with the widespread use of all these applications, there will be an increase in efficiency and productivity in the processes for airlines and airports, especially in the intellectual capital of companies operating terminals.

In all areas, it is anticipated that above-mentioned scenario would continue to undergo drastic or progressive change. Organizations that embrace value-oriented strategies attempt to think and act data-centrally in digital transformations by viewing technology as a tool rather than a goal. Studies on the issue of how to construct the optimal digital transformation plan differ per industry.

People in modern life, which are attempting to adapt to the dizzying pace of technological development, embrace a "speed"-oriented lifestyle by decreasing distances. From this perspective, digital transformation activities are becoming particularly widespread in airports, which are deemed as "critical structures with limited resources and equity capital, it is difficult to accomplish this procedure. The question of "which way the information flow in the aviation industry will be maximised?" can be answered by identifying the sectoral players with diverse aims and cultures and analysing how their connections evolve within the framework of open innovation-required collaboration.

In the open innovation strategy, it is also vital to specify the intellectual capital components of the digital transformation process's stakeholders. Organizations are in a constant cycle of change and development in order to maintain their existence, create value, increase their market shares and market effects, and achieve growth through sustainable competitive strategies.

Based on the explanatory power of networks, the primary study topic is how to analyse informal connection networks that grow outside of the formal framework (contract-based) and how to ensure the establishment of the actual network structure. Parallel to the creation of the actual network structure in this research, the theoretical gaps in the definition of network externalities and the network effects will be clarified.

To understand the relationship between network structure and impact, it is critical in the study to describe the intellectual capital components of the sectoral players in detail and then identify their relationships. The organisational network analysis examines the relationship between the digital transformation criteria and the intellectual capital components of the stakeholders, identifies the missing components, and structures the network weaving.

Despite its vast complexity and dynamic nature, the network adapts in practice to new digital advancements. It will be analysed using six indicators to properly assess the organisational network-derived characteristics. Six concepts are used to explain what the

results of the analysis mean in organizational terms, as well as the interpretation of the value that digital transformation adds to intellectual capital. These concepts are integration, driving, driven, stability, criticality, and precarious. The main of this research is to examine the interaction between airports digital transformation criteria and the intellectual capital components of aviation stakeholders. Besides, cooperation with the airport terminal management, and to determine integration in business, to reveal value driver company in the relations based on digital transformation, to uncover driven intellectual capital components in the process of digital transformation are scrutinied. Moreover, interoperability of the organizations are explored to discover the most resilience and powerful company as well as the most capable company to cover structural hole in the networks with the stability characteristic, to determine the most critical considered as starting point application in the process of digital transformation and to reveal precarious components in the networks stance as flaneur.

Therefore, the research question is “How precisely do the digital transformation criteria increase the value of intellectual capital?”

Within the framework of open innovation strategies, it will be the first in the literature to analyse the interaction between airports digital transformation criteria and the intellectual capital components of aviation stakeholders in cooperation with the airport terminal management through network analysis.

CHAPTER 1: INTELLECTUAL CAPITAL

The term "intellectual capital" describes a special category of intangible assets. Companies can get an edge in a market by investing in these resources. It's not the same as monetary capital, which can be seen and counted. Intellectual capital refers to the value of a company's accumulated knowledge and experience. Due to the fact that research and development are the areas that entails more time and money are being invested on various field such as new patents, information technologies system development, staff training, and managerial experience etc. (Manzari et al. 2012).

Hereby, today's knowledge-based economy, intellectual capital is more important and a big contributor to economic success than the old-fashioned methods of the company. Companies place emphasises on intangible assets such as capabilities, knowlegde, and resources in order to foster growth in these areas, as well as the production of wealth and value (Bontis et al., 2000).

As the world approaches the second decade of the twenty-first century, the aviation sector has undergone irreversible transformations. Transformations are not in on direction, but in a comprehensive manner. Aviation sector is recognized as important infrastructure in transport industry because its shutdown or disruption can cause to a catastrophic problem for society. For that reason, the privatisation and alliences for instance, have happened globally in order to sustain sectoral efficiency (Ashford et al., 2011). Parallel to the privatisation of many of the large and medium sized airports such as international, national, or regional, there has been a substantial retreat of national governments from airport operation and even ownership (Cooke et al., 2021). All around the world, governments have repeatedly enacted competition rules in the areas of passenger, freight, and aircraft in both the aeronautical and non-aeronautical sides of airports (Große, 2019).

In most locations, deregulation has also led to the establishment of low-cost airlines with their own facilities and processing needs. To illustrate, the continued economic expansion of several of the continent's largest economies has resulted in a very rapid increase in passenger and cargo traffic at several Asian airports (Ashford et al., 2011). Since the 1980s, other significant changes have included the establishment of airline alliances (Meijer, 2020).

The factors discussed above have significantly altered how airlines want to profit from airports, necessitating alliance location for maximum financial profit. With the emergence of long-range, very high-capacity aircraft, airline equipment has also evolved (Graham, 2020). Changes in innovative technology have an impact on both capacity and cost, and changes in navigation, communication, approach, and ground guiding will undoubtedly affect the airport capacity. Smart Airports, for example, are designed to respond to and meet the control and management needs of airports that are increasingly confronted with issues caused by the high volume of commodities and people passing through them (Rajapaksha & Jayasuriya, 2020). With the International Air Transport Association's (IATA) support and encouragement, the proliferation of digitalization has facilitated computerised booking, ticketing, check-in, flight monitoring, and passenger management in terms of delays and cancellations (Cooke et al., 2021).

Blockchain, augmented reality, and machine learning products and solutions are enhancing the aviation sector's future in the Industry 5.0 transition process. (Große, 2019). While the aircraft supply chain is one of the primary use cases for blockchain in the aviation industry, it is believed that that the technology would benefit the industry if it was used to co-create efficient solutions that benefit not only industry participants but also end consumers (Ahmadian, 2019). Alternatively, e-documentation has been implemented in freight transportation to reduce paperwork. From ticketing to aircraft maintenance, the aviation sector has numerous data gathering points, resulting in multiple discrete databases. Moreover, the primary technological breakthroughs in drones and unmanned aerial vehicles, as well as the widespread expansion of usage, have already caused and will continue to cause the aviation laws and conditions to be rewritten in terms of the technology involved (Klaus et al., 2018). Along with the advantages of digitalization, it is well-known that it makes the system vulnerable to cyber threats and attacks. Aside from data duplication and inefficiency, there are also data security threats (Denning, 2018).

Airports are, therefore, by definition, true network systems, and the most critical flagship in the aviation sector. It includes a real network system, from all decision makers to the blue-collar employees, to provide the highest, fastest, safest, most secure, and most comfortable flight to all its customers on both the air and land sides, as well as the highest quality level of service. There is no room for error when flying. The entire system is,

therefore, based on a zero-mistake rationale. That is why all relationships and courses of action are obvious without hesitation (Graham, 2020).

Furthermore, airports must be operational to keep air travel running, which may help lessen the impact of a crisis and induce regional growth and development in every sense (Große, 2019). Time-sensitive transportation is of special relevance from the standpoint of protecting vital infrastructure. These modes of transportation aim to protect not only people, but also the environment, the economy, and cultural traditions. The planning and execution of a flight need an enormous network of cooperation and a complex set of regulations. How crucial this is regarding customer service, lower operational costs, increased employee productivity, operations efficiency, strengthening networks with stakeholders, and increasing employee retention reveals the intellectual perspective of the airport's operator. In this context, bringing up the topic of networks is relevant (Ahmadian, 2019).

In the context of the social sciences, the concept of network significance is critical to determining the true meaning of relationships. A network is "the collection of units that constitutes individuals, institutions, or nations and how, and in what aspects, the units are connected," with the network structure consisting of two fundamental nodes and a set of linkages between them (Van Duijn & Vermunt, 2006.) According to Wasserman and Faust (1994), "actors" are "individual, institutional, or collective social components". The actor is the "social label" for a person. Relationships, on the other hand, reveal the interdependence of the participants (Van Duijn & Vermunt, 2006). Organizations, according to Burt (1995), look for three types of capital: monetary, intangible, and relational. People have different skill sets and income levels. But the concept of a connection is important to everyone in a particular community.

Therefore, a network built on mutually beneficial contacts would be included in a management definition of organization. Establishing a relationship-based network via nonredundant connections is the first step in regulating the flow of data inside the network (Burt, 1995). Many distinct network architectures can develop from this central framework due to the broad variety of agents and connections that can be implemented. Choices on which actors and relationships to include are informed by the purpose and scope of the inquiry. (Baskıcı&Ercil, 2018). There are several perspectives from which to examine aviation. Aeronautical and non-aeronautical side might be examined both

separately and together. While economists may focus on the massive sums of money at stake, while technicians focus on the technological issues. Airports are extremely crucial for networking.

The aviation sector serves as a vital link between local communities and the rest of the globe. Customers view the aviation sector as one that facilitates travel to far-flung locations. The aviation sector encompasses all these things and more. When it comes to the design, production, and operation of aircraft, trust between individuals in different positions and departments is essential (Duijn & Vermunt, 2006). Market pressure, the need for efficiency and economy, and the priority placed on security all drive the actions of many of aviation sector. Additionally, as a growing sector limited by numerous constraints, all different stakeholders need to work together to maximize aviation operations in terms of quantity, optimal deployment of capacity, and quality by generating dependable and resilient air transportation in response to demand (Meijer, 2020).

The rise of organizational networking among stakeholders or subsidiaries has made it easier than ever to share data and information with others, both near and far within the open innovation perspective. Beyond the boundaries of the organizations, they act fearlessly to adopt open innovation tactics and models in order to gain access to the necessary resources. In open innovation, "open" refers the sharing of organizational tacit knowledge. This has led to more self-expression, increased organizational interaction, as well as raised nosiness. Despite the immense complexity and ever-changing nature of the network, it is nonetheless able to accommodate newly developed digital technologies (Lee et al., 2017).

By carefully implementing each function of intellectual capital components, the results of digital transformation are projected to provide value to more agile, sustainable, and airports with resilience and even airport terminal operations. It's clear that this impact is not linear at all. Integration, driven, driving, stability, critically, and precarious were the six key categories used to classify the algorithms that came from the study's resultant network, which was created to analyse the value contributed to the intellectual capital components by the digital transformation criteria (Linss & Fried, 2010).

Industry 4.0 and the digital transformation cause profound changes across all industries. Organizations are anticipated to continue drastic or slow adaptation to significant changes. Particularly, the digital disruption, which has become the focus of

several studies, manifests itself in every aspect of company. For example, during digital transformations and transitions to Industry 5.0, value-oriented companies try to embrace and act data-centrally by viewing technology as a tool rather than a goal. Owing to technical advancements and increased globalisation, the "knowledge-based" business climate in the world today is characterized by a high pace of change (Sousa & Rocha, 2019). Companies can't rely just on tangible assets to expand and compete in today's market. Thus, they do amendments their plans and policies accordingly.

Globalized, chaotic, unpredictable, ever-changing, and ever-increasingly competitive are all terms that have been used to describe the state of the current competitive environment. Intellectual property has emerged as a critical concept in this uncertainty for scholars, corporate executives, financial backers, and government regulators, among others (Bagdadli et al., 2021).

Companies operating in such a complicated environment need to innovate to prosper, be successful, and obtain advantages over their competitors. In today's highly competitive business world, innovation is crucial to a company's existence (Elberdin et al., 2018). The current market economy is primarily concerned with the appearance of direct financial revenue, but the expression of intangible capital is gaining ground as a component of the subject's market value. The representation of an organization's worth must now be more centred on the retention of key personnel and the utilisation of their experience and innovative skills for the promotion of image, brand, and the expansion of fundamental equity (Antošová & Csikosova, 2011).

The capital kinds that contribute to establishing the company's market value are depicted as figure 1.

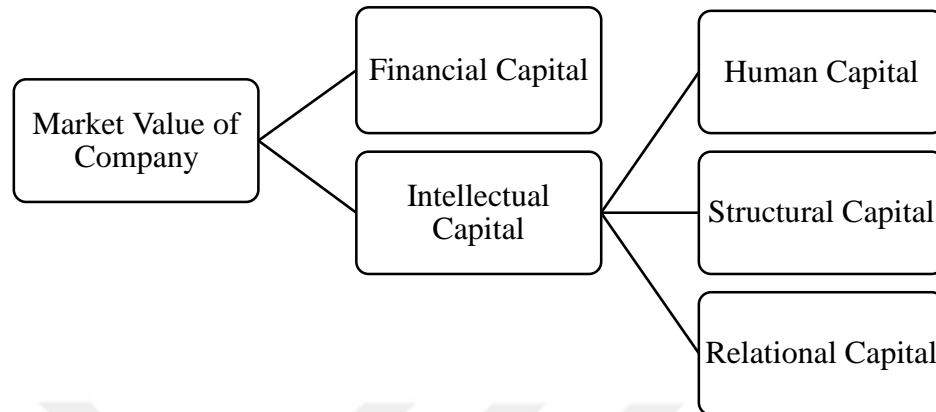


Figure 1: Process of organization value creating (Antošová, & Csikosova, 2011).

The market value of a company generates financial and intellectual capital. Financial capital consists of monetary assets in the form of cash and securities, while intellectual capital consists of organisational knowledge used to generate wealth. It might be knowledge stocks and flows in an organisation (Antošová, & Csikosova, 2011). Intellectual capital knowledge can be thought of as intangible resources that contribute to the quality of internal operations and provide additional value. In addition, these resources contain information about the value of relationships both within and outside of the company.

As mentioned, companies have two types of assets that need to be tracked and evaluated: tangible and intangible resources. A significant amount of a company's market value is made up of intangible assets that are not shown in financial records (Çalhan et al., 2020). There are several notions that are akin to intangible assets, and intellectual capital is one of them (Manzari et al. 2012). Numerous theoretical and empirical analyses have concluded that a company's competitive edge is founded on the specific blend of intellectual capital and physical investments that it employs. The sum of an organization's people, processes, and connections constitutes its intellectual capital. (Martín-de-Castro et al., 2011). Intangible assets include resources associated with the company's external connections, such as those with customers, suppliers, R&D partners, and so on. (Tichá,

2011). Thus, human, structural, and relational capital are combined to form intellectual capital.

1.1 Intellectual Capital Components

Human capital refers to a company's intangible assets, such as its employees' skills, expertise, and experience. Company with the capacity to uncover and develop human capital, which is essential for gaining a competitive edge, will be in a stronger position (Weatherly, 2003).

Structural capital is defined as an organization's in-house expertise. This includes organization's norms, systems, cultures, and databases. Some examples include the ability to adapt quickly to new situations, the availability of detailed documentation, the presence of a central repository of information, the widespread use of cutting-edge technological tools, and the insightfulness of the whole organization (Gogana, 2015).

Relational capital is defined as a company's ability to attract and retain customers, vendors, and research and development partners. Human and material resources are included, as well as the company's reputation in the eyes of its many stakeholders (including investors, creditors, consumers, and suppliers). Companies' increasing network of ties will allow the trust and communication vital to any effective plan and action as they evolve into extended businesses (Tichá, 2011).

Business plans require a company to invest in relationship capital since customers give constant, fast input on the features and benefits of the company's products and services. In fact, business plans entail not only relational capital but also intellectual capital. Some examples include public perception, customer loyalty, customer happiness, supplier connections, market dominance, bargaining leverage with financial institutions, and green initiatives (Lemon & Verhoef, 2016). Strategically significant core competences emerge when human, structural, and relational capital are combined with forethought and care (Doong et al., 2010). The situation in the aviation sector is identical to that which exists in companies operating in other fields. Airport terminals, air traffic control towers, hangars, security check points, passport controls, tranquil areas such as shopping center, hotels, restaurants, CIP lounges etc. are essential components in the formation of intellectual capital in conjunction with the airports, airline companies, air traffic routes, aircraft production, general aviation, environment, passenger, and freight traffic etc. in aviation sector.

1.1.1 Human capital

Human capital, defined as a company's accumulated knowledge and abilities, is its most valuable asset. "This is the money that rides the elevator home at night," remarked one prominent figure in the sector (Tichá, 2011). Human capital is crucial to the continued existence and success of every business (Doong et al., 2010). Human capital discovers and uncovers some competencies in the organizations. Human capital, as proposed by Kim et al. (2010) is defined as "the individual and collective competency of employees" and "focuses on the economic value of what individuals can generate". Indeed, the core of human capital is the effective management of knowledge. (Manzari et al., 2012). Some examples include the following: the ability to think creatively and independently; the ability to work effectively in teams; the ability to tolerate uncertainty; the ability to learn and adapt; the ability to retain knowledge; the ability to motivate and inspire employees; the ability to train and educate employee; the ability to share the experiences and lessons learned (Tichá, 2011).

As a result, in order to preserve their human capital, businesses must focus on challenges such as retaining knowledge employees and employee expertise. Human resource management is crucial to maximizing human capital. Wages, according to human capital theory and the conventional wage equation, are a direct result of one's degree of education, experience, and productivity in the workplace. Since employees' marginal product is affected by their stock of human capital, it seems reasonable that wages should reflect this (Manzari et al. 2012).

Human capital has several beneficial outcomes, including improved organisational performance, bolstered core competencies, expanded success, sustained competitive advantage, a favourable impact on financial results, sustainability, resilience, strategic rejuvenation, and a wellspring of creative ideas and solutions (Doong et al., 2010).

Knowledge management refers to "all the actions that employ knowledge to achieve organisational objectives," and knowledge management techniques are essential for upgrading an organization's knowledge base. The outcomes are more than the sum of the distinct outputs of each cooperating resource, and it is difficult, if not impossible, to pinpoint the exact source of competitive advantage, when human capital is integrated in the business (Barney & Wright, 1998). It is considered that a company's performance

goes down when one of its best employees leaves to work for a competitor (Groysberg & Lee, 2009), but studies show that when whole teams are stolen from one company, the impact is less severe (Groysberg et al., 2008; Campbell et al., 2014). Stewart (1997) has concluded that information is the single most important factor in the financial system and the key to attaining a competitive advantage in an increasingly globalized world..

Knowledge and skills

Intellectual capital is becoming more and more crucial to the success of enterprises. Intellectual capital is one example of an intangible assets that have become more valuable in today's information era. Most experts agree that human capital, which is a subset of intellectual capital, is the most valuable of these intangible assets (Martín-de-Castro et al., 2011).

Knowledge management refers to "all the actions that employ knowledge to achieve organisational objectives," and knowledge management techniques are essential for upgrading an organization's knowledge base. Knowledge management is an additional factor that will support skills and knowledge. Hansen et al. (1999) identified two distinct knowledge management techniques: coding and personalization. User-friendly electronic document management systems must be used for coding to properly retain and communicate knowledge. Businesses that employ a codification methodology improve their database of explicit knowledge and information technologies infrastructure (Manzari et al. 2012). Consequently, human and structural capital are seen as the result of a knowledge management strategy focused on the usage of codification. In contrast, customization focuses on a person-to-person approach, with social networks serving as the major vehicle for the dissemination of tacit information. Companies that implement a knowledge management approach that emphasises individualization experience improvements in relational capital. Thus, relational capital might be viewed as the result of a personalisation-based knowledge management strategy (Elberdin et al., 2018).

Work related experience

Work experience improves employee job-related achievements and is more occupational and industry-specific than firm-specific. Additionally, it promotes stability, a serious work attitude, mature perception, and a decrease in unfavourable work habits like absenteeism in the workforce (Uppal et al., 2014). According to human capital theory,

variations in work related experience are due to disparities in human capital endowments and other elements, such as the length of time spent in a given profession or sector (Mellander & Florida, 2014). Knowledge, abilities, and experience gained by an employee but retained by a company are all examples of human capital in terms of work related experience.

Competencies

Combinations of human, structural, and relational capital are most effective in generating core skills with high strategic weight (Tichá, 2011). Companies face a significant strategic problem from the presence of ambidexterity in their organizations. The term "knowledge management" is used to describe an organization's capacity to generate new knowledge to address knowledge gaps and deficiencies while also making effective use of and improving upon its existing knowledge assets to carry out its day-to-day operations and exploit current opportunities. Competencies are related with exploratory and exploitative learning (Sahni, 2019). The depth and breadth of an organization's existing knowledge pools strongly influence its ability to pursue both exploratory and exploitative learning at the same time. Knowledge turns into organizational wisdom and competencies accordingly.

The term "intellectual capital" is used to describe these forms of competencies. The first form of human capital is the intangible assets that are the knowledge, skills, and capacities of individual employees. Social capital, or the knowledge held inside communities and social networks, is considered as the second form. This might include, but is not limited to, the company's expertise and lessons learned. Competencies are included inside an organization's systems, structures, procedures, and processes is known as "organizational capital" the third dimension (Ali et al., 2022).

Vocational qualifications

Occupations and vocational qualifications are being created and eliminated as a result of macro level changes in the business sectoral market in fierce competitive environment. The conventional boundaries of disciplines, knowledge, and competency domains, which are crucial for the identification and characterization of limitations of credentials, are being challenged. The expansion of Industry 4.0 enables increased flexibility in the organisation of work and the employment of competent personnel; it

poses a threat to established national and institutionalised skill-building frameworks (Wheelahan et al., 2022).

The evolution of the workplace in terms of technology and organizational structure is the focus of Industrial 4.0 and its implications for employment, education, and qualifications. Others, focus on social decisions, institutional growth, and socioeconomic educational routes. The work-informatization dimension denotes a rise in the availability and consumption of data and information throughout work operations (Yang et al., 2021).

This may open new avenues for personal interaction and broaden the range of already-existing knowledge and abilities. Workplace digitization and other technological advancements tend to eliminate routine, low-skill tasks while simultaneously increasing the bar for competence in the processes that are still in place and are becoming more and more "humanised." The unequal elimination of low-skilled, regular jobs across all economic sectors is highlighted in scenarios that centre on the automated factory (Sahni, 2019).

These scenarios foresee a fundamental shift in the demand for capabilities and qualifications, accompanied by a significant increase in the degree of necessary competencies and qualifications. Work polarisation scenarios examine the macro-structural evolution of the labour force, claiming that improvements in Industry 4.0 reduce the relevance and demand for middle-level employment and credentials. As a result of such transformations, procedures and practises must evolve to incorporate new elements, such as a focus on processes and technology, communication and cooperation, networking, and data analytics. The ever-increasing requirement for a comprehensive understanding and awareness of the processes and technologies that drive work is a fundamental concern (Tütlys & Spöttl, 2021).

Employee engagement

The notion of employee engagement encourages workers to become more motivated, interested, and engaged in all phases of production, which should have a beneficial effect on the growth of labour productivity. This can only be achieved by cultivating an environment that encourages workers' passion for their jobs. It is believed that job satisfaction leads to workplace loyalty, which in turn increases staff engagement

and, eventually, product quality (Budriene & Diskiene, 2020). It is essential to differentiate "employee motivation" and "employee engagement." Engagement, as opposed to motivation, is thinking deeply about something and devoting a great deal of your energy to it, so that you do better (Bakker, 2011).

Emotional intelligence

Emotional intelligence has grown to the point where it threatens the stability of a society based on institutions established and maintained by and for its people. (Pokrovskaja et al., 2019). Emotions are emphasised for relevance in learning, relationship to "soft" or intangible abilities, as a mental reaction to every psychological, sensory, and cognitive event, and even in terms of people's behaviours and motives in action research (Zhang, 2021).

Including contextual, cultural, and human aspects, have contributed to the creation of ideas within the framework of knowledge management intangibles and intellectual capital and emotional intelligence. Intellectual capital is the intangible component of a person's cognitive capital that is most significant from a knowledge management perspective (Magna & Vergara, 2021).

Entrepreneurial spirit

The entrepreneurial spirit transforms dreamers into doers. It's an intrinsic curiosity about how they may leverage the intersection of their hobbies and business skills to enter the marketplace and improve the world by developing and selling their own products and services (Kendall et al., 2006)

Nonetheless, the capacity to think critically and draw meaning from one's own experiences is where resilience originates. Passion and beliefs are essential for company longevity. Resilience, if it is a skill, is best honed during times of plenty. People have a specific "entrepreneurial gene" or "DNA" that makes them more likely to take risks and explore possibilities, but we contend that entrepreneurialism is a taught behaviour modified by circumstance and intellect (Smith, 2013).

Emotions have a significant effect on one's cognitive abilities, which in turn are shaped by one's environment. Entrepreneurs' feelings tend to be pessimistic because of the high failure rate in the field. Since being an entrepreneur requires a person to be

resilient in the face of adversity and know how to deal with feelings of hopelessness (Usai et al., 2020).

Flexibility

Human resources flexibility is a dynamic trait that is essential for thriving in an environment with constant change. The ability to adapt human resources practises is seen as a key strength by companies and stakeholders. They developed a metric for human resources adaptability that includes competency, behaviour, and practises. Employees who can adapt their skill sets to new circumstances are better able to meet the demands of an organisation, whether through increased productivity or lower operating expenses (Smith, 2013).

Employees that exhibit behavioural flexibility might adapt to changing circumstances. How quickly and effectively the company's human resource practises might be modified and applied to a variety of situations, locations, or departments is considered significantly important. Employees, work, and the workplace may all benefit from more adaptability and agility (Patky & Pandey, 2020).

Employee loyalty

Employee loyalty is defined as "a deliberate commitment to serve the best interests of one's employer, even though doing so may necessitate sacrificing some element of one's self-interest beyond what one's legal and other moral duties require." Employee retention is critical for organisations. Increasing employee loyalty also reduces resignations and relocations (Murali et al., 2017).

To be loyal implies to have a strong commitment to one's employer that keeps them working even when it is not in their best financial interests. Employees' salaries, bonuses, and other benefits may motivate them to work hard for the company and stay loyal to it, making them a significant investment and resource for any organisation. As a result, it is costly to replace any worker, regardless of their position on the totem pole, because it is difficult to win over workers to cause (Rahimpour et al., 2020).

Employee satisfaction

Employee satisfaction at work include treating employees with respect, providing recognition and awards, offering generous benefits, and having upbeat managers not overloading employees with work indeed. Importance of decision making in achieving desirable corporate outcomes. However, components of the larger company dynamics, sometimes focusing on the financial component and other times on the organisational component. It is understood as a more holistic perspective, one that factors in the satisfaction of social actors as a key driver in the realisation of excellent business practises, by evaluating the linkages between performance and behaviour (Ayyagari & Lathabhavan, 2020).

The primary prerequisite for ensuring the company's growth, especially in terms of profitability and financial flows, is a better level of satisfaction among the employees and stakeholders. Simultaneously, increasing revenues and earnings successfully increase loyal consumer bases. Lower prices, improved quality, and lower sales prices all draw social participants to firms. A high rate of social actor retention can mitigate the effects of price regulations by guaranteeing that employees' earnings and other financial resources grow regardless (Torre et al., 2021).

Education

According to the human capital theory, education serves as an input to the production of commodities and services through the employment of labour (Murali et al., 2017). Physical capital production with ever-increasing productivities is primarily the result of new ideas, inventive thinking, and research, rather than simply because workers operating machines require the skills and dexterity gained through education and training. (Chattopadhyay, 2012).

So, education and training, and the subsequent development of skills, have an impact on both capital and labour in terms of their role in the production process. Additonally, it has the potential to effect positive change in the areas of economics and society (Murali et al., 2017). It's essential not just for economic progress in the limited sense, but for development in the broader sense as well. Health and nutrition, population growth, quality of life, informed participation in democratic and legal processes, rational community decision making by caring members of society, pursuit of values like equality,

fraternity, and liberty on personal and societal levels, and reduced corruption are all possible outcomes. Human capital is the ultimate source of a country's wealth, and its productive citizens (Chattopadhyay, 2012).

Creativity

Learning, transformation, innovation, and creative activities are all within the capabilities of the human mind, providing and guaranteeing the organization's success in the long run. Human capital is a phrase coined by the economist who first articulated the idea as follows: "consider all human talents, natural or acquired, qualities that are valuable and may be an investment increased." Human capital is the sum of an organization's human resources, including their knowledge, expertise, and intellect (Ashok & Arvind, 1993).

An organization's human capital is its most valuable asset, according to human capital theory. In a more restricted view, human capital is derived solely through conventional schooling and monetary gains from productivity (Ashok & Arvind, 1993). A company's most valuable resources are its employees, not its products. In order to achieve its objectives, innovative companies thoroughly assess their human resource requirements, and then recruit and hire imaginative individuals. Also, such companies organised effective strategies for evaluating employee performance and use incentives to encourage and promote original thinking among employees. Therefore, they find a way to balance an employee's long-term career ambitions with the company's long-term objectives (Galovská, 2015).

1.1.2 Structural capital

The second component of intellectual capital is structural (organisational) capital. The term "structural capital" refers to an organization's in-house expertise. It consists of standard operating procedures, systems, cultures, and databases used by an organisation. Examples include the ability to adapt and learn, the availability of documentation, the presence of a knowledge centre, and the widespread use of information technologies. Some of these may qualify as intellectual property rights that the company can lawfully claim as its own (Tichá, 2011).

It has been said that structural capital is an organization's "backbone." Technologies, innovations, data, publications, strategy and culture, structures and

systems, organisational routines, and processes, and so on, all have the potential to be replicated and shared. Knowledge production and management rely heavily on structural capital (Wang et al., 2014).

In addition to traditional forms of investment, structural capital also includes funds dedicated to processes and new ideas. Organizational assets such as systems, databases, and procedures are examples of structural capital. It's a term for the systems, both official and informal, that help a company make the most of its people resources (Marinelli et al., 2022).

Therefore, structural capital conditions and contains the deployment of human capital, and it also codifies the leftovers of human capital deployments as institutional memory. In contrast to human and relational capital, which are both tangible assets, structural capital refers to the institutional frameworks and cultural norms that facilitate and encourage their usage and growth (Karagiannis, 2008)

Organizational frameworks and norms for creative problem-solving and problem-setting are examples of structural capital. Considerations including the value of information retained, the flow of liquid cash, and the recording of overhead costs all factor in (Wang et al., 2014).

Structural capital is a company's inherent potential to convert the creativity, initiative, and hard work of its employees into tangible assets that may be used to generate profit. Accounting-based value and the revolving rate of accrued capital are two examples of the kinds of values created by an organization's structural capital. Structural capital, which was deeply ingrained in businesses, provided the framework upon which human capital could thrive (Tichá, 2011).

A company's innovation capital and customer capital will grow as a result of the company's ability to foster an environment where its people capital is fully used. Company culture, organisational structure, organisational learning, operational processes, and information systems are all examples of structural capital. The term "structural capital" is used to describe an organization's ability to store and draw upon a wide range of information for the benefit of its employees. Organizational success depends on the efforts of all its members, and structural capital provides the scaffolding that makes that success possible. The study was conducted by a group of researchers (Manzari et al., 2012).

The institutionalised knowledge and codified experience that an organization has ingrained in its structures, procedures, databases, patents, and other forms of documentation is referred to as "structural" or "organisational" capital. Thus, structural capital is a collection of institutional knowledge and experience that has been formally organised and conserved for future use. In light of this, it can be seen that structural capital plays a significant role in explaining why certain businesses are more successful than others. Still, there are constraints on how far organised and codified knowledge stores may be taken. Studies have indicated that businesses typically look for answers in a domain where they already have some level of expertise. Therefore, novel pursuits often conform to a local search pattern and are related to ongoing pursuits (Subramanian & Van de Vrande, 2019).

When companies rely too much on a single source of funding, they risk being mired in a narrow knowledge-growth trajectory that stunts their ability to adapt to new challenges. As the organisation becomes "entrapped" in a certain course of action and previous investments are seen as sunk costs, the possibility of abandoning the project decreases. Poorly performing projects may be kept on because of organisational politics, or because of economic and technological side-bets that make it difficult to abandon the selected path of action. Institutionalization and bureaucratic inertia might potentially be supporting the current path (Karagiannis, 2008).

Organizational culture

The "dynamic system of intangible resources and activities that support a company's sustainable competitive advantage" is one definition of intellectual capital. The word "intellectual capital" does not appear to adequately convey either the theoretical or the applied sides of the topic. In today's economy and knowledge-based society, intangible assets such as knowledge and the management of information and knowledge have emerged as the new driving forces behind economic growth. The value of an organization's intellectual capital may be calculated in a variety of ways, but the simplest technique is to deduct the market value of the company's assets from the total value of the assets. Various appraisal methods exist, but the one we'll be discussing today is one of the few that can accurately put a dollar amount on intangible assets like intellectual property (Linstead, 2001).

The organizational culture determines how people interact, the setting in which information is formed, their reluctance to certain changes, and, ultimately, how they share (or do not share) knowledge. When people talk about an organization's culture, they're referring to the common norms of thought, conduct, and understanding that exist within that group. These can be pictures, goods, clothes, buildings, and other artifacts that tangibly reflect the organization's culture, or symbols, tales, and myths that convey the culture and socialize people into the organization. The idea is differentiated from corporate culture in that it develops organically rather than being crafted by management (Băcilă & îtu, 2018).

Corporate Value

Intellectual capital, which lacks uniform categories, is often thought to encompass such sub-domains as human capital, structural capital, and relational capital since they all contribute to the creation of value for the organisation but are not always reflected in the statement of financial condition. Human capital, on the one hand, is made up of the employees' knowledge and experiences, which allow them to be imaginative. Structural capital, on the other hand, is made up of all the intangible assets of knowledge that an organisation has, such as its databases, systems, processes, procedures, routines, and culture, and which not only foster an environment where workers are motivated to generate and apply new knowledge, but are also permanently lost when workers leave for the day (Onuoha, 2021).

Social capital

Social capital is the networks of interactions between individuals who live and work in a society, allowing that society to function successfully. Capital denotes something of value that may be utilised to generate further capital. Stockpiles of goods and resources are instances of physical capital. Although it may be more difficult to define, social capital is equally important to the success of a business as other kinds of capital. In proportion to the amount and depth of a person's interpersonal relationships, his or her capacity to overcome hardship is lessened (Borgatti&Foster, 2003). Social capital varies considerably from other forms of capital in that it is based on networks of interpersonal relationships rather than the goods or abilities of a single person. In order

to emphasise its distinctiveness, social capital might be regarded a fourth kind of capital, in addition to financial, human, and material resources (Bowles & Gintis, 2004).

The structural dimension is the entirety of the impersonal arrangements of links between players in the network of interactions. Network configuration, which describes the pattern of links in terms of density, connectedness, and hierarchy, and the presence or absence of network relationships between players, are the most crucial aspects of this dimension. When people have common values, interpretations, and meaning systems, they may more easily learn from one another and exchange information. A person's ability to make sense of and interpret their environment is greatly aided by shared cultural norms and assumptions. The relationships between individuals, such as those based on trust and friendship, are the primary emphasis of the relational dimension. People's desire for sociability, approbation, and status are all met by their sustained personal connections. (Tamer et al., 2014)

Management philosophy

Management philosophy is necessary for every company that desires to be effective and accomplish its objectives. Without a person in a position of control, there would be organisational chaos with little structure and little to no concentration. Planning, organising, leading, and controlling are thought to be the four fundamental activities of management (Zukauskas et al., 2018).

Processes and Routines

Routine works show that even the most ordinary performances may have spontaneity, innovation, and motion. Another indication that the routines as entities approach relates to process is the focus on routines as organisational truces. What is meant by routine is a constantly repeated chain of work. In other words, routines include all types of standard procedures that serve the objective of establishing the organisation. A standard operating procedure or a proposed, envisioned version of it is not a routine. The adaptability of an organization's routines is essential to its success. (Howard & Rerup, 2017).

Formal processes

The objective of the formal procedure is to complete the designated duties. Both operational and administrative processes, which are subsets of formal procedures, have some commonalities between them. Both processes are made up of interconnected and interdependent sequences of events, which, when brought together, transform their respective inputs into outputs (Schepker et al., 2017). The fundamental distinction between the two may be seen in the characteristics of the information that they generate. In most cases, administrative processes are responsible for the generation of information and plans that are utilised by internal groups, whereas operational processes are responsible for the production of goods and services that are sold to external consumers. Because of this, the two are typically perceived to be separate and unconnected tasks, despite the fact that in most cases they need to be aligned with one another and provide support for one another for the organisation to work properly. (Schepker et al., 2017).

Tacit/informal routines

Recognizing the distinction between tacit and explicit information is one of the most crucial parts of any knowledge management. This refers to the extent to which information may be classified and preserved. Knowledge that is easily communicated through a formal language is referred to as explicit or codified knowledge, whereas knowledge that is difficult to formalise and express is referred to as tacit knowledge. In contrast to explicit information, tacit knowledge is either not verbalised or cannot be verbalised at all; it is intuitive and cannot be expressed (Khatun, 2018).

Unlike explicit information, which is easily digested, conveyed, and utilised, tacit knowledge is infamously difficult to articulate and organise clearly for others to learn from. Tacit knowledge is information that its bearers can utilise successfully but is difficult to explain to outsiders. This type of knowledge is difficult to imitate, and its possessors frequently lack the words to communicate it. In this regard, it is critical to emphasise that the distinction between explicit and tacit knowledge is not a false choice, but rather a continuum along which the two extremes can be found (Pérez-Luño et al., 2018).

One of the pillars on which new knowledge is built is the exchange of implicit and explicit information. In fact, because it is turned into fresh tacit or explicit information

that organisations may employ, tacit knowledge may be viewed as the seed of innovation. As a result, a company's innovation is often driven by tacit knowledge rather than explicit information (Pérez-Luño et al., 2018).

Management processes

It is fair to discuss management in increasingly innovative organisations that are moving away from traditional ways. Digital management explains how artificial intelligence is replacing the traditional management method. In the age of digital transformation, organizations are expected to innovate more agilely and more frequently. Innovation propels company growth and keeps companies ahead of their rivals. Innovation management aids in the development of new business models as well as the development of new goods, services, and technology for a changing market. Customer satisfaction and workforce engagement are also increased by proper innovation management (Kraus et al., 2021). However, employees' resistance to change is one of the main reasons why this is such a difficult process for decision-makers.

Intellectual property

Intellectual property refers to something that has been created intellectually. Inventions, works of literature and the arts, designs, and commercially used, names, and images as well as symbols are all examples. There are several forms of intellectual property, including patents, copyright, and trademarks, that are protected by law and allow their owners to make money or gain fame from their creations. By balancing the needs of innovators with those of the public at large, the intellectual property system aims to foster an atmosphere conducive to creative problem solving (Gerguri et al., 2013).

Brand names

Brands with strong images can influence customers' purchasing decisions and fetch a premium in the marketplace. The cornerstone of a brand's image is its name. While advertising may help to build the image associated with a brand name over time, brand managers recognise that a skillfully crafted and selected name can provide intrinsic and instant value to the business (Lee et al., 2018).

Aggregate innovation at the business level leads to game-changing economic growth and national wealth; this link has been extremely reliable in explaining previous

accomplishments and providing guidance for the future. Because of the benefits that innovation brings to businesses, incumbent enterprises become more competitive as a result. Innovation also contributes to resolving global problems like climate change and promoting sustainable development. (Leito & Baptista, 2018).

Codified knowledge

Knowledge may be implicit or overt. The difficult to explain tacit knowledge that results from firsthand knowledge and action is comprehended and used instinctively. It is often transmitted through highly participatory dialogue, story-telling, and shared experience. Contrarily, explicit knowledge may be expressed more accurately and explicitly. It may therefore be more readily defined, documented, transmitted, or communicated while being more abstract. Some believe that explicit knowledge is the most significant element of production in the knowledge economy and that it is playing an increasingly significant role in organisations. Imagine a company without computer software, product documentation, or procedure manuals (Zack, 1999).

Patents/copyrights

A patent is a sort of intellectual property that grants the owner the legal right to prevent others from creating, using, or selling an invention for a specific time in exchange for the publication of an enabling disclosure of the invention. Intangible assets, such as ideas and designs, are considered intellectual property. All concepts, images, symbols, words, and works of art fall under this category. It also includes downloadable digital assets like music and movies. Due to the intangible nature of intellectual property, it can be difficult to recoup if it is stolen. Take the hypothetical case of a person who has a brilliant concept for a brand-new product (Klinkert, 2012).

The concept of copyright arose at an era when intellectual works were more commonly published as books. This inherent physical barrier to illicit copying has been removed in today's information era when digital information can be duplicated simply and at low cost. Because of this, the copyright model's underlying idea must be reexamined. The goal of copyright legislation is to strike a balance between the interests of creators and those of consumers (Chattopadhyay, 2013).

Trade secret

A type of intellectual property known as a trade secret includes formulas, practises, procedures, designs, tools, patterns, or information compilations that have inherent economic value because they are not widely known or easily discoverable by others and that the owner takes reasonable precautions to keep secret (Lee et al., 2018).

1.1.3 Relational capital

One type of intellectual capital is known as relational capital. This type of capital refers to the benefits that accrue to a firm because of having strong external links with its customers, vendors, stakeholders, partners, research, and development collaborators, and so on. To put it another way, a company's relational capital is all it possesses because of the interactions it has had with its customers, suppliers, and other companies who collaborate on R&D. It is a mix of the human and structural capital of the organisation, as well as the beliefs and expectations of the many stakeholders in the company (Tichá, 2011).

Social capital may be defined as the knowledge and resources organisations have access to because of their membership in social networks. The emphasis of social capital is on information that is embedded in interorganizational relationships and networks, as opposed to human capital, which represents the knowledge, skills, and abilities intrinsic to people. According to earlier studies, a person's social capital determines his or her capacity to garner financial support for an organisation and improve its resource use. Moreover, social capital enhances the ability for both incremental and radical innovation in addition to product innovation (Manzari et al., 2012).

Formal Relationship

People in positions of authority typically adhere to the formal relationships, interactions that are based on contracts, and bureaucratic procedures of any bureaucracy. Formal relations preclude any kind of informal hierarchy. People might navigate the bureaucracy with the information and expertise they require to complete their responsibilities, but also by using those same skills to identify other routes. People who are familiar with the norms are also accustomed to how they might be bent or circumvented; they know who to contact in order to accomplish a desired result, and who and what to avoid if the alternative is bad. Such natural and understandable behaviour

frequently precedes the emergence of informal hierarchy. A bureaucratic organisation is made up of isolated bureaucrats that seldom contact with one another. Because of the strong barriers among strata, there is very little room for the formation of cliques that span multiple categories (Diefenbach & Sillince, 2011).

Informal relationships

Literature on the issue characterises the formal aspect of a partnership rather effectively. This is due to the fact that written contracts are physical. However, in order to find all potential facets of connections, it is vital to study their informal side as well. The comparatively low level of formalisation of commercial partnerships is sometimes attributed to the uncertainty that accompanies formal (contractual) linkages between distinct entities in business-to-business transactions. On the business-to-business sector, informal relationships involve personal contact between representatives of several companies (Ackermann & Eden, 2011). Business-to-business partnerships rely heavily on interpersonal ties. The form of personal interaction depends on the nature of business relationships, particularly the degree of mutual dependence and the level of collaboration. For instance, they play a crucial role in the case of a strategic business network, which consists of interconnected commercial organisations cooperating to achieve common objectives. Entities must establish informal interactions in order to meet one another's expectations and requirements. In the event of long-term collaboration, when a major portion of the formal (contractual) relationship's circumstances are established informally, informal partnerships are also of considerable significance (Fonfara et al., 2016).

Partnerships

Typically, a region-based partnership is intended to bring together all relevant parties who may contribute equally to the improvement of a particular condition. In the past two decades, hundreds of partnerships have been created throughout the world. Some of them survived just a little time, while others have been in operation for decades. Some focus on specific local objectives, whilst others strive to coordinate expansive policy areas across enormous regions where millions of people reside and work (Kinderis & Jucevicius, 2013). There are partnerships that are largely focused on business circles, as well as partnerships that are concerned with labour market or societal concerns.

Partnerships are formed for many reasons, and each has its own "life." Even if everything performs properly, it does so within a certain context: everytime the situation changes and new responsibilities are allocated to a partnership, the prerequisites for its success alter. Changing partners (or their involvement) and responsibilities is consequently one of the most challenging aspects of a partnership's existence (Seleim & Khalil, 2011).

Alliances

Strategic partnerships, joint ventures, patent licencing, transfer/sharing of knowledge and expertise in sales, consultation services, and the purchase of enterprises with complementary capabilities are the most common methods by which new information is gained. Since they are so difficult to replicate and frequently result from the synergistic efforts of several businesses, intangible assets are widely regarded as the sole resources capable of ensuring a company's continued competitiveness (Kinderis & Jucevicius, 2013).

Strategic partnerships and intellectual capital are two sources of more prolonged competitive advantage and with greater power to enhance organisational performance, on business strategies. For achieving its aims and objectives, a company relies on its intellectual capital, which consists of the intangible assets that enable the utilisation of its tangible economic and technological resources. Intellectual property is hard to value since it is not tangible in the traditional sense. However, it is crucial for businesses to be able to achieve long-term competitive advantages, therefore it is a key aspect in their success (Ferreira & Franco, 2017).

Brand image

Brand Image is how consumers perceive a brand. It may be described as the customers' view of the brand. Technologies, consumer confidence, brand reputation, business culture, and managerial expertise are all affects of brand image as intangible assets. Activities like advertising (marketing), distribution, research and development, human resource expenditures, and values from brand names, copyrights, franchises, future interests, licences, operating rights, patents, record masters, secret processes, trademarks, and trade names are also critical for brand image (Choong, 2008).

Trust

Trust is crucial to success in business partnerships. It is stated that a manager's character is an essential but often disregarded issue in the trust literature, despite its potential significance in the workplace. Integrative trust is structured along three dimensions: cognitive, emotional, and cognitive-affective trust. More recent empirical research has shown support for the idea that trust may have mental, emotional, and behavioural underpinnings. A statistically sound means of evaluating emotive, behavioural, cognitive, and social normative dimensions of trust in organisations, among others (McLoughlin et al., 2018).

Corporate reputation

A corporate reputation is perhaps its most important intangible asset. Companies might perish if they underestimate the value of their corporate reputation. A favourable corporate reputation is exceedingly tough for rivals to imitate or overcome and may have a significant influence on a company's bottom line. One of the keys to establishing and sustaining a positive corporate reputation is putting stakeholders at the forefront of the minds of decision makers (Taghian et al., 2015).

Corporate reputation is a factor that must be managed and cultivated. Most effective decision makers in the company do not attain their degree of success by listening to everything spoken by or about them. Sometimes going against the grain and taking chances proves to be the best course of action. Before a business can restore a damaged reputation or capitalise on a positive one, its decision-makers must have a thorough understanding of what a corporate reputation is and how it is generated (Abu-Alhaija et al., 2018).

Customer loyalty

Many companies see customer loyalty as a priceless intangible asset. Different theories have been proposed by marketing theorists to explain consumer loyalty. Many definitions of customer loyalty have evolved to suit a variety of different aims and settings. To illustrate, one definition of customer loyalty is one's feelings of passionate attachment to the customer loyalty object rather than repetitive business transactions (Beasley & Danesi, 2010).

Attitude loyalty is the propensity of customers to stick with the same vendor over time by making further purchases from that vendor. Customer loyalty is a deeply held commitment to repurchase or repatronize a preferred product and service consistently in the future, thus causing repetitive same-brand or same brand-set purchasing, despite situational influences and marketing efforts having the potential to cause switching behavior (Mascarenhas et al., 2018).

Customer engagement

Customer engagement refers to the process of continuously cultivating a relationship between a firm and a consumer that extends much beyond the scope of a single transaction. It is a deliberate and consistent method used by a firm to deliver value to every encounter with a client, with the goal of creating customer loyalty. It is a keyword that can refer to a broad variety of results, ranging from satisfied customers to repeat business. However, the acts are misleading because there is no assurance that a present customer won't transfer to a rival the next day because of them. It is possible for businesses to strengthen client loyalty to their brands by promoting customer engagement in both offline and online brand experiences. As a result, it is essential for a marketer to not only work toward increasing the desirability, attractiveness, and preferability of the brand to the customer, but also to do all in their power to maintain the consumer's interest in and engagement with the brand (Thorgrímsson et al., 2006).

There is an investment of the consumer's time, money, and energy into the brand when they shop for, use, and consume the product. This dedication is what ultimately leads to the level of involvement we admire. This expenditure would, of course, be subject to the individual customer and would thus vary widely. As a result, a marketer's actions should be aimed at persuading customers to invest emotional energy, financial resources, and moral obligations in the brand in question. It's a method used to construct, maintain, and defend bonds between people (Bansal, 2016).

Joint ventures

Joint ventures allow businesses to pool their resources in order to expand into untapped areas. Joint ventures might be the only option for entering markets that limit foreign ownership. Participants in a joint venture typically acquire ownership stakes in the enterprise. The size of these holdings can vary greatly, but defining who has authority

over certain aspects of management is critical if the investment is to succeed (Channon & Sammut, 2015).

Strategic partnerships are a lower level of involvement that may or may not include equal participation. There is usually a fair amount of failure in joint ventures. However, they also benefit from a variety of unique benefits. Legality, board and management structures, capital and equity management, financial rights, market rights of partners in various locations, and dispute resolution are all included in the scope of operations covered by joint venture agreements (Channon & Sammut, 2015).



CHAPTER 2: AIRPORT DIGITAL TRANSFORMATION

Technology is, without question, the biggest story in business today. The changing demographics will generate profound and enduring changes in the marketplace. These are substantial concerns, but technology is greater. Recent advancements in all things digital are reducing limitations and offering exciting new opportunities that touch everyone's lives and businesses (Westerman et al., 2014).

The evolution of the economy nowadays is defined by the permeation of new digital technologies into all fields of economic activity. This leads to the establishment of a new information environment for the interaction of economic entities utilising information and communication technologies, digital technologies, and big data technologies. This trend is known as "digitalization" and has already permeated both economic and social activities to a significant degree (Pirogova et al., 2020).

It has been determined that organisations are constructing new digital capabilities in three key areas: customer experience, operational procedures, and business models (Westerman et al., 2014). When it comes to the digital transformation at airports, it is not only about adopting technology; it also involves business change in a digital age. It involves improving procedures and services to provide passengers and consumers with a superior experience. A crucial starting point for comprehending the dynamics of the digital revolution and the production system of acceleration In addition to its own space, the firm must integrate numerous spaces regulated by a variety of distinct principles: consumers, rivals, complementors, social networks, and society (Bounfour, 2016).

For this reason, in the study, the digital transformation strategies of airports are detailed with five titles inspired by other perspectives that are not limited to only three (customer experience, operational procedures, and business models). The strategies determined by the companies in the digital transformation process vary on a sectoral basis. The situation is similar in the aviation sector. For this reason, there is no "to do list" for the digital transformation of airports. The most important reason for this is that each airport is unique according to terms of regional, environmental, social, and economic etc. In fact, the master plans, which reveal the long-term mission and vision of each airport, also change at each airport in the same way. In this study, airports that deal with digital transformation at every stage of operations and attract attention such as Marco Polo, Heathrow, Charle De Gaulle etc., were also investigated as open source. At the same time,

the literature was conducted. Therefore, 6 basic operations were achieved as a result. These are customer services, lower operational costs, operational efficiency, strengthened networks, and increased employee retention.

2.1 Customer services

The digital transition has several effects, one of which is the uncertainty of people's responsibilities in society. By role, we indicate the enterprise's place inside the productive system: customer, client, supplier, rival, etc. This job is traditionally defined within the value chain of the industry. However, with the advent of digital technology, the idea of a value chain—and, by extension, the concept of an industry—is challenged by the volatility of positions. These jobs were widely regarded as distinct, recognisable, and consistent during the period of mass production, particularly lean manufacturing (Bounfour, 2016).

As the number of passengers continues to increase rapidly and the demands and expectations of passengers and airlines continue to diversify, airports can no longer meet these expectations using conventional methods. Faced with the prospect of capital-intensive expansion projects that take years to complete, digital technologies can, at the very least, be used tactically to help airports extract the maximum value from their existing assets, particularly by enhancing passenger flows and bolstering the on-time performance that is so crucial to airlines and passengers (Little, 2020).

Airports operate primarily to assist in the efficient and secure processing of people and cargo, whether inbound, departing, in transit, or in transfer. In addition, they are crucial to the economic models of a variety of partner companies, including airlines (in various forms), baggage handlers, and other third-party service providers.

However, despite this shared objective, no two airports are identical; thus, their digital transformation needs, and priorities vary (Pirogova et al., 2020). For instance, for some, the appeal of digital may lie in delivering new "point" solutions to address short-term operational challenges, while for others, the goal may be to migrate to a completely different business or operating model (Little, 2020). <<A more subtle point can also be made about how digital should be used to improve airport branding.

In accordance with these diverse methods, airports display differing degrees of digital maturity. While the majority of airports interviewed for this study believed they

were transitioning away from the "new normal" of self-service and process efficiency (Airport 2.0) and toward the use of digital to optimise flow monitoring and passenger processing (Airport 3.0), this should not obscure important differences between airports that are on this journey (Little, 2020). These include disparities in technology expertise, the capacity to act on ensuing insights, and the airport's digital strategy's overall cohesion and emphasis. For instance, certain airports may be accustomed to proactively managing the customer experience based on insights gleaned from passenger flow monitoring (Pirogova et al., 2020).

Considering those explanations, several criteria have been attached to the capacity to manage customer services in the aviation industry in terms of digital transformation. These are the general conditions of carriage: general conditions of carriage for passengers and baggage, general conditions of carriage for cargo, data protection, handling of information requests, departure, pre-departure data and activities, transportation documents, customer interactions at the check-in, boarding passes, passports, visas, and security, boarding, and have a nice flight. These criteria were also used in the survey itemization as "digital transformation" criteria related to customer service in the study.

2.2 Lower operational cost

As operational costs are the expenses connected with the day-to-day maintenance and administration of a corporation, manufacturing enterprises have seen an unanticipated increase in operating costs, resulting in a decline in profitability (Chris, 2019). The decision of whether to act defensively or offensively is crucial for the company. When in defensive mode, businesses frequently leverage data and every other advantage they can conjure to prevent the demise of the old business model. In addition, aggressive operational cost reductions can free up capital and investment capacity to facilitate the transformation (Aagaard, 2019). Offensive play is also a choice. Companies can be pioneers in reimagining their industry's business strategy. By substituting a conventional product or service with a new digital offering, they can disrupt competitors or other sectors. They can utilise new digital business models to generate new revenue streams. They are able to change their model of value delivery and play a new position in the value chain. Furthermore, companies might search for chances to rethink their value propositions and serve their current clients in novel ways. The breadth might seem intimidating, but the practise is beneficial from a strategic standpoint (Ali et al., 2022).

It is not recommended to begin with technology. Consider how they may provide additional value to customers before considering how to offer this value profitably. Then, utilise the opportunities afforded by digital technology to assist businesses in reaching their goals in a more efficient, economical, and expedient manner. Companies get a competitive advantage by learning how other industries have handled comparable challenges or taken advantage of similar possibilities (Budriene & Diskiene, 2020). Cost reduction is a deliberate, proactive strategy to cut expenditures and a corrective function based on a continual process of cost and function analysis for more efficient application of production elements. A company's total operating costs consist of the cost of products sold, operational expenditures, and overhead charges. Operational income is calculated by deducting operating expenses from revenue and is displayed on a company's income statement (Chris, 2019). Whether or not changes will be made is less certain, but any adjustments will be made only if there is a sizable enough financial incentive to do so. However, it's likely that improvements in fuel efficiency will continue to be made at the same rate as in the past, between 1% and 2% every year. The combined use of technology, operations, and alternative fuels can reduce negative effects on the environment (Kazda & Caves, 2015).

Operating costs generally do not include capital outlays, but they can include many components of operating expenses such as labour, fuel, equipment, and delay costs for the aviation sector. Labor and fuel costs are the most significant expenditures incurred by enterprises in the aviation sector. Short-term labour expenditures are relatively stable; however, fuel prices can fluctuate significantly depending on the price of oil (Budriene & Diskiene, 2020). For this reason, experts will focus more on fuel prices in the foreseeable future. Two-thirds of the expenses of flying an aeroplane are constant, so fluctuations in fuel costs might cause a flight to be profitable or unprofitable, depending on the number of passengers. Historically, the airline sector has remained fiercely competitive, despite the fact that the business of transporting people across the country and the globe has become a vital element of human existence. The cost of air travel continues to decline. The Internet has also increased pricing transparency, hence diminishing profit margins (Beers, 2022).

2.3 Increase employee productivity

Improving employee productivity in the office can be difficult; the workplace has seen significant changes in the previous year, some of which may forever alter the way employees work (Swan et al. 2015). For many employees, adjusting to this method of work might be challenging. For decision-makers to increase employee productivity, they need to put in place a plan that motivates and encourages team members to give everything they do their all (Leblebici, 2012).

Currently, office productivity and employee morale are challenging. As a result of working from home, employees are vulnerable to countless distractions, and the lack of connection can be detrimental to employee productivity. Simply instructing staff to be more productive is ineffective. In the contemporary workplace, decision-makers must think proactively (Abbasi et al., 2022). Decision-makers must motivate people, demonstrate the advantages of productivity in the workplace, and steer them toward maximising productivity (Leblebici, 2012). The productivity of employees drives the success of a corporation (Swan et al. 2015).

The greater a company's success, the more efficient its personnel. Productive workers concentrate on the correct activities at the right moments (Leblebici, 2012). Motivation is essential not just for sustaining a company's bottom line but also for preserving dependability and consistency (Abbasi et al., 2022). Therefore, there is employee productivity in the aviation industry that progresses in parallel with that in other organizations. So, the digital transformation criteria also cover the ideas of performance monitoring, performance feedback, setting goals, and prosocial incentives.

2.4 Operations efficiency

Operational efficiency is determined by a wide range of factors. These variables are typically overlooked when companies examine their company strategy and procedures (Martic, 2019). However, if these factors are taken into account throughout the implementation of digital transformation, the organisation stands to benefit greatly. A company selects and educates its employees on an individual basis, taking into account their history, skills, and credentials. The company then makes an attempt to teach the employee its special procedures (Zou et al., 2022).

Each member of a team eventually finds their own unique set of shortcuts and ways of doing things, based on their experience and the needs of the team as a whole. But when a member of the team moves up the ranks or quits, they take their knowledge with them (Johnson & Lee, 2012). The company may benefit from some of these procedures. Some people might not like it. Still, the company will have to start over and spend time and money training the next person (Martic, 2019).

The enterprise can look for ways to automate tasks, provide checklists, and ensure that systems and software are available to team members to avoid redundant efforts and incomplete (Zou et al., 2022) or inaccurate information when digital transformation initiatives are planned to include a complete review of available systems, manual and offline processes, approval loops, training gaps, etc. (Johnson & Lee, 2012).

Businesses can rest assured that their processes, activities, and tasks will continue even if a key employee is absent due to leave, a job transfer, or a promotion, all because these measures have been incorporated into the digital transformation effort from the start. This method reduces the business's need to spend money on training while simultaneously increasing productivity (Gill, 2014). It guarantees that the business will not make any blunders and that no essential jobs will be overlooked. Gaining operational efficiency helps a company be more flexible and better positioned in the market. Data-driven initiatives help firms avoid surprises by revealing hidden patterns in their data, performance, and growth (Martic, 2019). By ensuring that systems, software solutions, and user acceptance of tools are in place across the workplace and that the business infrastructure enables timely alerts, collaboration, and other resource optimization and productivity elements, a company may increase its agility and hence its outcomes (Gill, 2014).

Due to the nature of the operations performed, the digital transformation criteria in the aviation industry are distinct from the organisational transformation requirements. Differentiating criteria include connectivity requirements, dispatches, efficient flight profiles (EFP), backup systems, on-time performance on schedules, and having an impact on intellectual capital components.

2.5 Strengthen networks

Digital transformation plays a vital role in encouraging organisational forms that enable value co-creation through the adoption of bridging information and

communications technology solutions, which can provide more chances to produce beneficial changes in the social and economic environment (Tham, 2018). Because digital technologies make it possible for participants to closely collaborate and coordinate with one another, the relationships that exist between the participants in a value network can be strengthened by utilising a platform to coordinate the exchanges that take place within a supply chain (Lubis, 2016).

In the so-called VUCA (Volatility, Uncertainty, Complexity, and Ambiguity) era, a high capacity for innovation and change is required. This profound shift necessitates new types of leadership and cooperation. In addition, it necessitates a high level of adaptability, self-organization, and self-management on the part of the business and its individuals. Consequently, ideas such as holacracy, collegial leadership, empowerment, and agile organisation are employed to replace hierarchical systems with heterarchical ones via self-organization and self-guidance (Burchardt & Maisch, 2019). Digital architectures have the potential to encourage the distribution of expertise, improve stakeholder coordination, and generate a wealth of data on consumer behaviour, orders, sales, and the location of both physical and digital objects. This provides managers with the information they need to make more informed decisions. Increasing numbers of conventional businesses are embracing the digital industry in order to remain competitive, ensure corporate sustainability, and seize the possibility for exponential expansion (Lubis, 2016). The digital revolution is creating new markets. Opportunities for exponential development and the introduction of innovative business models. Digital technologies have expanded enormously, and their use has become international (Tham, 2018).

Thanks to the widespread adoption of smart devices and the resulting access to information, social networks, and audiovisual entertainment, a substantial portion of the human population is now ubiquitously and continuously connected (Burchardt & Maisch, 2019). Accelerating digital technological advancement has normalised the usage of gadgets and apps leveraging cloud computing, big data analysis, blockchains, and artificial intelligence (Lubis, 2016).

Within the context of digital transformation and open innovation, it is evident that corporate interactions are indispensable. Particularly in the aviation sector, the most significant categories to examine are Liberalization – Privatization Trends: Change of Flight Network Structures, Increase in Airline Cooperation, The Rise of Low-Cost Airlines, The Growth of The Air Transport Sector and The Increase in Demand, Changes

in the Requirements and Needs of Passengers, Increasing Concerns About Security, Environmental Restrictions, Technological Innovations, The Effects of Changes, which are included in the study as digital transformation criteria criteria.

2.6 Increase employee retention

Employee retention has become a crucial aspect in a company's success. The dynamic nature of the profession has prompted rapid technical advancements. Today's business climate is characterised by the productivity concerns of corporate stakeholders, stricter government regulation, and enforcement (Elberdin et al., 2018). Traditional strategies for managing an organization's human content are insufficient due to workplace expectations and demands, and many firms are experimenting with digital transformation (Mignonac & Richebé, 2013).

The most recent success stories have demonstrated that the enhanced competitive stance of successful companies does not depend just on the strategies they employ, but rather, on the policies their leaders implement (Lelebici, 2012). Retention a productive work force is one of the highest concerns for organisational success in the current corporate environment (Gupta, 2004).

The employee's dissatisfaction may have significant ramifications for the business. Employee turnover may have a cascading impact on the organization's service quality, productivity, and overall performance. It is important to accomplish the goal of boosting the productivity of employees and the general efficiency of their actions (Mignonac & Richebé, 2013). Employee engagement plays the most significant role in solving the problem of enhancing employee productivity and performance, as well as the problem of employee retention in aviation sector (Tsareva & Boldyhanova, 2020). Therefore, Conducive Work Environment, Matching Expectations, Responsibilities, Rewards, Training and Development, Work-Life Balance are taken into consideration as digital transformation criteria.

Another point to be emphasized here is how to evaluate the impact of airports digital transformation criteria on intellectual capital components. As can be understood from the literature review, the point to be emphasized is that the effect of digital transformation criteria on intellectual capital components is remarkable. The question at hand is how to refer to the outcome of the nonlinear impact in the organisational environment of various businesses.

Some indicators are required to comprehend the value added to the intellectual capital components of the airports' digital transformation requirements as a consequence of the literature study. Matrix evaluation indicators are determined using research questions and proposals. The criteria for system and subsystem analyses were proposed by Baskici & Ercil in 2018. They stated that the aim of system analysis is to facilitate cooperative examination of present organisational challenges and preparation of decisions on future endeavours (Baskici & Ercil, 2018). A novel categorization approach based on a system matrix is proposed for system analysis. In contrast to current methodologies, the effect variables of a social system are not categorised into four or five groups, but rather are rated based on several criteria. The criteria include, for example, the driving factors as keys to system changes and the driven factors as possible markers of the effectiveness of the reform (Linss & Fried, 2010).

CHAPTER 3: THE RELATIONSHIP BETWEEN DIGITAL TRANSFORMATION AND INTELLECTUAL CAPITAL

Today's academic literature provides a detailed account of intellectual capital's origins and growth as a field of study and management practice (atıf gerekir bir kaç tane). When it was first proposed, intellectual capital focused on a company's intangible assets; however, as the concept has evolved and refined, the focus has shifted from businesses to nations, regions, and neighborhoods. (Bounfour & Edvinsson, 2005). Technological progress and globalization are distinct phenomena that have emerged as a result of the rapid rate of change. Intellectual capital is seen as such. To understand this phenomenon, it is necessary to understand both tangible and intangible assets. Organizations are thought to have two types of assets that must be measured. Tangible assets are documented in financial statements such as the balance sheet. Intangible assets, on the other hand, have monetary value despite the fact that they do not exist physically. Manzari et al. (2012) point out that intangible assets are very close to intellectual capital in terms of how much they add to the market value of an organization.

As can be understood, the actual market value is equal to the sum of financial capital and intellectual capital. Although the components of intellectual capital alteration with changing conditions, they are broadly classified as human, structural, and relational. (Bagdadli et al., 2021). Knowledge and skills, work-related experience, competencies, vocational qualifications, employee engagement, emotional intelligence, entrepreneurial spirit, flexibility, employee loyalty, employee satisfaction, education, and creativity are all components of intellectual capital. Management philosophy, organizational culture, social capital, processes and organizational routines, corporate value, intellectual property, brand names, patent knowledge, and trade secrets are all manifestations of intellectual capital. Intellectual capital is associated with subcomponents of relational capital such as formal relationships, informal relationships, social networks, partnerships, alliances, brand image, trust, corporate reputation, customer loyalty, customer engagement, licencing agreements, and joint ventures (Marr, 2008).

In terms of the relationships between digital transformation and intellectual capital, it is clear that digital transformation is required for businesses to stay competitive. The introduction of innovative digital technology into every facet of a society's commercial endeavours has become a defining characteristic of the current trajectory of

economic growth. This contributes to the creation of a new information environment for the interaction of economic entities based on the use of information and communication technologies, digital technologies, and big data technologies, all of which contribute to the creation of the new information environment. (Pirogova et al., 2020). This tendency, which is known as the "process of digitalization," has already made significant inroads not just into the operations of the economy but also into the processes of society.

The advent of digital technology has had a considerable influence on the progression of many parts of the economy, frequently resulting in profound shifts in the industry and can be defined as the emergence of new forms of activity carried out by economic organisations (Zhang et al., 2022). Data and other forms of digital information have evolved into a resource of strategic importance. Data collection and archiving are becoming increasingly important functions for a wide range of businesses and organizations. Artificial intelligence (AI), which is dependent on these components, enables technology to broaden and intensify the process of digital automation. (Cole, 2021). The most important aspect of digital automation is that it allows for less human involvement in production while also capitalising on the power of networks and data to increase the importance of machines. To put it another way, it enables the transition to more automated processes, reducing the amount of labour performed by humans (Zhang et al., 2022).

Without technological advancement, the development and application of digitalization tools is difficult at this time (Cole, 2021). The development of digital technologies focuses on two key areas: the restructuring and modernization of the institutional environment (i.e., the normative regulation of digital markets, digital manufacturing, digital retail, training employees with digital capabilities, etc.) and the development of technical infrastructure (i.e., e-data transmission networks, data centres, software services, etc.) that is the construction of which takes not only a substantial amount of labour but also a significant amount of resources (Pirogova et al., 2020).

The impact of digital technologies on intellectual capital occurs in two ways. First, certain types of jobs could vanish; a robot could simply replace an industrial worker. Second, digital technologies could change the nature of work by changing the mix of skills that are required in jobs (Fleming, 2019). In examining the impact of digital technologies on employment, it is important to analyse the categories of jobs and the specific skills that the jobs require. It is the coming together of outstanding ideas, people,

and challenges that creates new and useful things. To foster these synergies, Airbus, i.e., forms collaborations both internally and externally to foster a culture of innovation that can swiftly translate novel ideas into game-changing aeronautical breakthroughs. It is easy to see and adjust how we work with others (Innovation Ecosystem, 2021). Rather than focusing on jobs, it may be better to focus on the skills that will be valuable for workers in the future. All jobs require a set of skills, and the jobs that are most vulnerable have the greatest proportion of skills that digital technologies can perform better than humans (Cole, 2021). There is no doubt that advances in digital technologies are currently and will continue to disrupt labour markets.

Given the uncertainty about the evolution of the digital technologies, it is difficult to predict the specific skills that will become irrelevant. The existing evidence suggests that jobs that are routine and non-complementary with technology are at the highest risk of becoming obsolete (atıf gerekir, evidence diyorum). The government must implement policies now to prepare for the inevitable disruptions to employment caused by digital technologies in the future, as well as to mitigate the negative consequences that could worsen societal digital divides (Zhang et al., 2022). The decision makers may promote an information campaign that provides the employees with regular updates about the impacts of digital technologies. Besides, the government may also promote the development of human capital at all levels. Aside from the information campaign and the development of human capital, the government must promote policies that favor job creation, as well as strengthen social protection and support for the most vulnerable members of society who are displaced by the evolution of digital technologies (Faith et al., 2022).

In terms of intellectual capital components, the issue of the necessity of digital transformation and the applicability of the criteria that ensure digital transformation has become increasingly important in recent years. Because of the nature of the situation, it is extremely difficult, if not impossible, for an organization to meet all of its technological and innovative needs within its own borders (Yilmaz & Tuzlukaya, 2022). In organizations that follow digital transformation processes, decision makers resort to many ways to determine a roadmap.

At this juncture, one of the anticipated outcomes is to classify the nature of relationship that exists between digital transformation criteria and intellectual capital from an organizational standpoint. Mainly due to the fact that the influence of digital transformation on intellectual capital is relatively strong. However, the issue that emerges

is, in what way does this impact contribute to the organisation? At this time, six concepts- integration, driving, driven, stability, criticality and precarious-that were introduced by Linss and Fried (2010) and then refined and embodied by Baskici and Ercil (2018) are included in the picture.

Integration

It represents the extent to which the nodes and graphs as well as subsystems contribute to the system's integrity (Turnbull, 2018). A high degree of integration shows that the unit contributes significantly to the system's integrity and is able to build linkages with other units. A low degree suggests that the nodes or graphs are distinct and cannot build a link with other nodes or graphs. The minimal effective information ratio required for node cohesion in a community is defined as integration capability (Baskici & Ercil, 2018). This measurement enables the identification of subgroups within a system.

Driving

The driving impact of a node and graph is the activation of other nodes and graphs within the system. In other words, it indicates the node and graph shaping capacity. Active communication values are greater than passive communication values for nodes and graphs having this capability (Faith et al., 2022). A high number reflects the efficiency with which additional nodes and graphs are activated. For some applications, units with a high value of this value are desired for system-wide distribution.

Driven

It represents the degree to which one node and graph may be influenced by another. The passive communication values of nodes and graphs having this trait are exceptionally high. Insights into value provide crucial leads for identifying the sources of achieved achievements resulting from adopted methods. Because of the nodes' and graphs' passive side effects, driving is an inherent property. These are the nodes and graphs most influenced by the system's oblique connections (Leito & Baptista, 2018). It is the first part of the system to change, so it is also the first to show how the system oscillates.

Stability

The stability of any dynamic system is referred to as system stability. The stability described here is that the motion of the dynamic system occurs within the given range and magnitude and in the prescribed way. Stable systems generate predictable and consistent outcomes. The attainment of stability in excess of a given threshold may result in institutional rigidity. Institutional rigidity indicates that actors' responses to change are independent of its nature. Over time, the institution's integrity is likewise eroded. If the stability falls below a specific threshold, this indicates dynamism (Emmerik et al., 2016). Dynamic structures are those that are adaptable to change.

Criticality

The criticality of the nodes or graphs indicates their significance to the overall existence of the system. The criticality of a system is proportional to its sensitivity to change. The unit with the greatest degree of criticality is the most potent system-altering agent. A modification to this unit affects the entire system (Hütt et al., 2016).

Precarious

Precarious describes behaviour that is unstable. Predicting the behaviour of actors with a high degree of instability is somewhat challenging. Rather than the structure of the environment, it is the dynamics of the units' internal structure that dictates their instability. The low degree of instability reveals how close the actors are to interactions outside the system (Jong & Chung, 2010). Moreover, this condition demonstrates that the relevant actors are not receptive to external collaboration and may operate autonomously. If actors with a high hesitation value are honest, provide information, and have an attitude of explaining behavioural changes, they can serve as the system's starting point for change.

After examining the value added by the airports' digital transformation criteria to the intellectual capital components using network analysis algorithms, the most crucial, nearest, and notable nodes, as well as influencer nodes, in the whole network are identified using graph schematization.

Esenboa TAV Holding and subsidiaries are assessed in relation to the indicators provided in the scope of network analysis in the study's methodological sections. It is best to examine each indicator briefly and see if it can be used to respond to research question.

CHAPTER 4: METHODOLOGY

4.1 Methodology

In the methodology part of the thesis, an answer to the research question stated as a result of the survey conducted on the directors of Ankara Esenboğa TAV Holding and its subsidiaries was sought. "How effective are airports' digital transformation criteria on intellectual capital components?"

What is meant by "effect" here is the non-linear effect and how complex it is. In a study designed for TAV Holding to analyse the non-linear effect of airports' digital transformation criteria on intellectual capital components, one-on-one surveys and interviews were conducted with TAV Holding Head Office in Esenboğa, the logistics and finance departments affiliated with the Head Office, and TAV Technologies, TAV Security, HAVAS, and PRIMECLASS managers.

The functions and companies that are associated and evaluated above with all their details are explained one by one. During the research, the answer to the research question has been sought at every stage, and the effect of digital transformation criteria on intellectual capital components has been examined with directed edges and unilaterally as the study was designed. Although there is contrary way of studies in different sectors digital economy (Ordóñez & Edvinson, 2020) and smart education (Shahzad et al., 2014) etc., the situation in the aviation sector has been handled in this way.

The study is planned with a matrix consisting of 37 digital transformation criteria in the row under 6 main headings and 35 intellectual capital components under 3 main headings in the columns, designed with a network analysis setup. While the main headings covering all the details of the digital transformation criteria in the rows of the matrix are Customer Services, Lower Operational Cost, Increase Employee Productivity, Operations Efficiency, Strengthen Networks, and Increase Employee Retention, the intellectual capital components occupying the columns of the matrix are called Human Capital, Structural Capital, and Relational Capital.

First of all, the results of the interviews and surveys conducted with TAV Esenboğa Head Office and then with the TAV Holding Subsidiaries mentioned above were analysed in Python NetworkX, and the findings were interpreted and evaluated one by one.

As the Python NetworkX programming language allows for Degree Centrality, which is handled according to Freeman's Approach, analyses of Closeness Centrality, Eigenvector Centrality, and Betweenness Centrality are made, and details are shared in the Findings section. Furthermore, according to the survey results, modularity community detection of the network and digital flaneurs are discovered by using vote rank analysis to make various determinations. At this point, before analysing the findings, it is useful to briefly inform readers about all the algorithms required to analyse the resulting network.

4.1.1 Network Analysis

Starting the initial story of graph theory with descriptions of networks and graphs will be more descriptive. The primary article composed on graph theory was in 1736 by Leonhard Euler, who examined the issue of the Seven Bridges of Königsberg (presently Kaliningrad, Russia) and how to make them reachable through the town by going by each region of the town and crossing each bridge as it were once. Königsberg was a city with the waterway Pregel streaming through the town, creating two islands. Hence, the city and the islands were linked by seven bridges. He established a formula for an abstraction of the problem, eliminated redundancy in the facts, and focused on the land areas and the bridges connecting them. He found that this issue had no arrangement. Eulerian graphs are named after his title. His work, which gave birth to graph theory, is unequivocally associated with network analysis (Al-Taie & Kadry, 2017).

Network theory with graphs permits analysts to demonstrate hypotheses and conclude testable articulations. It delineates a structure as a show of a framework that comprises actors (nodes and vertices) and the ties (edges) among them. A graph may be a numerical object that describes connections between things. It could be a structure for demonstrating information. It consists of hubs that represent objects and edges that connect one vertex to another. Graph theory offers the devices required to portray and visualise social compositions that comprise three or more on-screen characters. This is motivated by a contemporary understanding of social composition, in which ties speak to both human activity and the setting for human activity. Graphs have ended up omnipresent in computing as they can illustrate distinctive sorts of real-world relations: companions in a social network, site pages, cells in a neural network, and so on. (Cordella

& Hesse, 2015). It might be helpful to discuss the different types of graph theory that were used in the study at this point.

Types of graphs

The types of graphs in graph theory may vary in accordance with the relationship between nodes. The most common are “undirected”, “directed” and “weighted”

1. Undirected graph: An undirected graph is one with undirected edges. These graphs are used to display symmetric links. For instance, the act of shaking hands between two individuals (or nodes in a network) creates the impression that the relationship is reciprocal (undirected).

2. Directed graph: A directed graph, also known as a digraph, is a graph with directed edges. If we suppose, for instance, that Barbara knows Lisa, but the contrary is untrue, we can more clearly grasp this idea. Relationships between bosses and employees are seen to be asymmetrical. This can be represented as a directed edge from Barbara to Lisa in terms of graph theory. Another example is wireless networking, where if messages can only be transmitted in one way, the link between two separate nodes can be asymmetric (Al-Taie, & Kadry, 2017).

3. Weighted graph: A weighted graph is one with real values assigned to the edges as edge weights. Depending on how that graph will be used, edge weights may reflect ideas like connection cost, length, capacity, similarity, distance, etc. The weight of the graph is determined by adding the weights assigned to all of its edges. Weak links between two people are defined as low-frequency communication that requires little to no personal time and effort to sustain. Although such a model of communication can occasionally be crucial because the information that is passed is typically novel and comes from a different point of view, it means that they are desynchronized in what they hear and when they receive it (Al-Taie & Kadry, 2017).

Investigating social systems using networks and graph theory is known as "network analysis." It combines several methods for examining network structures with theories intended to explain the underlying dynamics and patterns seen in these systems. It is a naturally interdisciplinary field that began by combining social psychology, statistics, and graph theory. A network's very central nodes play a crucial role by acting as hubs for various network dynamics. However, the meaning and significance of

centrality may vary from situation to situation and apply to various centrality measurements (Goldenberg, 2019). Degree Centrality, Closeness Centrality, Betweenness Centrality, Eigenvector Centrality

4.1.2 Network Analysis with Python NetworkX

NetworkX is a free, open-source software package written in the Python programming language that may be used to generate and manipulate large networks as well as investigate their structure, dynamics, and functions. It's not a piece of software but rather a computational network modelling tool. It has the ability to read into existing networks, store and analyse them, create new networks, construct models of networks, and even draw them. Python's NetworkX provides a memory graph database toolset.

Working memory on the machine executing our system is directly related to the quantity of work that can be done. Increasing the machine's memory size or decreasing the amount of data can both boost performance. Although NetworkX is not the best choice for large-scale problems that need to be solved quickly, it is an excellent tool for analysing networks in the real world. It employs conventional graph algorithms; it has a rich collection of native reading and writing formats; and most of the fundamental algorithms are based on exceptionally fast legacy code.

NetworkX has many graphs generator functions and facilities to read and write graphs in many formats, like edgelist, adjlist, gml, graphml, pajek, etc. It is easy to install and use on the main platforms, and its online documentation is thorough and up-to-date. It is well-suited for representing networks of various types, including classic graphs, random graphs, and synthetic networks.

It is more common for network analysts to frame their methods as characterizations of centrality than of power. Each method (degree, closeness, and betweenness) describes nodes and edges in terms of how far they are from the "centre" of the action in a network, albeit this term is defined differently depending on the method used. Measures of centrality, rather than measures of power, are a more accurate method to characterise network techniques. For instance, in the case of degree centrality, the number of direct connections to other users is taken into account. As the name implies, closeness centrality evaluates a user's proximity to the network's other participants. An individual's "betweenness centrality" indicates how crucial they are as a connector

between various nodes in the network. According to eigenvector centrality, a key user is one who is connected to other key users in the network.

4.2 Execution of The Study

The research was carried out in collaboration with TAV Holding, the Esenboğa Airport Terminal Operator, and aimed to assess the contribution of digital transformation criteria to the intellectual capital components of airports. In the beginning, it is helpful to provide a quick overview of TAV Holding's organisational structure.

4.2.1 TAV Airports

TAV Airports is an industry success story penned by experts with a wealth of knowledge, insight, and imagination. Back in 1997, the business was founded to build and run Istanbul Atatürk Airport, one of the earliest BOT projects ever undertaken. This endeavour has become the first tangible step in TAV's success story while also portraying the modern image of Turkey. With their expertise, exceptional workforce, and cutting-edge technology, TAV has become a household name in airport management throughout the world. The corporation restructured in 2006 to better achieve its objectives, rebranding its "operations" and "construction" divisions as TAV Airports Holding and TAV Construction, respectively. After the restructuring, in February 2007, TAV Airports was offered to the public as an IPO. Groupe ADP acquired a controlling interest in TAV Airports in May 2012 (TAV Airports, 2022).

TAV Airports is an integral component of Groupe ADP, the industry's premier airport management platform. The Turkish airports of Antalya, Ankara Esenboğa, Izmir Adnan Menderes, Milas-Bodrum, and Gazipaşa-Alanya are all run by the same business. TAV also manages airports in Almaty, Kazakhstan; Tbilisi and Batumi, Georgia; Monastir and Enfidha-Hammamet, Tunisia; Skopje and Ohrid, Macedonia; Medina, Saudi Arabia; and Zagreb, Croatia; all of which are located outside of Turkey. Through its subsidiaries, TAV is involved in the duty-free, food and beverage, ground handling, information technology, private security, and administration of commercial sectors of airports. TAV is responsible for the operation of the commercial portions of Riga Airport in Latvia, including the duty-free shop, restaurants, and other services. The Istanbul Stock Exchange is where the company's stock is traded (TAV Airports, 2022).

Ankara Esenboğa Airport TAV Holding Head Office

In 2006, operations began at Esenboğa Airport, the gateway to Ankara, the capital and second-largest city of Turkey. The airport's new and contemporary terminal building has both the domestic and international terminals. The Esenboğa International Airport was given the title of "Europe's Best Airport" by the Airports Council International (ACI) Europe (Airport Council International) (Esenboğairports, 2022)

TAV Technologies

TAV Airports' sister company, TAV Technologies, offers comprehensive IT services at over 30 airports across 12 countries. More than 40 aviation-related IT solutions have been created by TAV Technologies' research and development facility. The firm, which has been around since 2005, first catered to the aviation industry but has now branched out into healthcare, manufacturing, and building. TAV Technologies' professional personnel excelled at digital innovation, smart airport solutions, and cyber security (TAV Technologies | Aviation Industry's Leading Technology Company, 2022).

PRIMECLASS

When it comes to the hospitality industry, TAV Operation Services is right up there with the best of them. In addition to its existing presence in 20 countries, it also manages 65 lounges and offers a variety of premium passenger services. TAV OS operates as a wholly owned subsidiary of TAV Airports Holding, which is traded on the Turkish Stock Exchange. TAV Airports oversees running 15 airports in 8 different countries. Its main investor is ADP Group, which is traded on the French Stock Exchange.

PRIMECLASS offers a plethora of services to ensure that its customers have a pleasant and privileged travel experience, including a unique help service at the airports before and after flights supplied by a team of trained professionals. PRIMECLASS offers a comfortable trip for those who don't want to worry about missing their connection or losing track of time. PRIMECLASS passengers are greeted upon arrival, provided with assistance at check-in and passport transactions, escorted to and from departure gates, welcomed on their return flight, assisted with visa transactions, given priority at passport control, and assisted in meeting with greeters (PRIMECLASS, 2022).

HAVAŞ

TAV Airports's wholly owned subsidiary HAVAŞ provides comprehensive ground handling services at 32 locations in Turkey, Latvia, and Croatia. Established in 1958 as USAŞ it is Turkey's go-to name in ground transportation. TAV has owned 100% of the firm since 2012, when it purchased the remaining shares. They have warehousing facilities in the airports of Istanbul, Ankara, Izmir, and Antalya. HAVAŞ also provides airport shuttle services in 19 different cities around Turkey. Turkish Ground Services (TGS) was founded in 2010 as a joint venture between HAVAŞ and Turkish Airlines to provide ground services at nine airports in Turkey (HAVAŞ, 2022)

TAV Private Security

TAV Private Security Services Inc., which was founded in 2006 alongside Ankara-Esenboğa, Alanya-Gazipaşa, and Milas-Bodrum Airports, provides security services to these locations. Security services for airlines have been provided by TAV Security since 2012, when the company obtained a C-License in accordance with the SHY-22 Airports Ground Handling Services Regulation. TAV Security saw a need for its expertise in civil aviation security to be applied to other sectors, and so it began overseeing the safety of a wide range of buildings, from schools and hospitals to industries and shopping centres and even private homes. TAV Security, with its around 4,000 personnel and its knowledge and disciplined approach to customer service and security concepts, has become a valuable brand within the scope of Turkey's Private Security Law No. 5188 (TAV Security Website, 2022).

C-level decision makers and executives in the aviation industry were identified as the intended audience for the research on airport terminal operators, and the study itself was tailored to appeal to that group.

First, consultations were held with the Deputy General Manager of Esenboğa TAV Holding to develop a strategy for the work to be accomplished within the framework of the business plan. In accordance with the approvals from the Atılım University Ethics Committee and the Esenboğa TAV Holding Board of Directors, all participants were given a thorough explanation of the study and asked to sign a "voluntary participation" form before the study began.

The survey is designed on the effect of all sub-factors of airport digital transformation criteria obtained from the literature on all sub-criteria that constitute the intellectual capital components one by one. Accordingly, the network structure and nonlocal centrality measures obtained by graph analysis are examined.

In the interview, which is prepared to be performed at the same time, the general demographic information of the participants and the general business functioning information are learned with the intention of contributing to the analysis results. Since all of the participants are executive managers, the survey is designed to be a minimum of one and a half hours and a maximum of two hours for each participant in order not to take up too much of their time. The interviews started with a brief introduction and a quick briefing about the work. Afterwards, the participants gave information about their professional background and job responsibilities.

A great deal of information regarding the interview and the analysis of the survey was obtained through conversations with the managers. Below Table 1 depicts Demographic Information About Participants.

Table 1: Demographic Information About Participants

Company and Subsidiaries	Position	Experience	Education	Gender	Age Range	Participants
TAV Esenboğa Head Office	TAV ESB Deputy General Manager	More than 10 years	Master	Male	40-45	Interview 3
TAV Esenboğa Logistics Department	TAV ESB Logistics Manager	More than 10 years	Bachelor	Male	40-45	Interview 2
TAV Esenboğa Head Office Finance Department	TAV ESB Finance Manager	More than 10 years	Bachelor	Male	40-45	Interview 4
TAV Technologies	TAV Technologies IT Assistant Manager	More than 8 years	Master	Male	30-35	Interview 1
PRIME CLASS	Prime class Manager	More than 10 years	Bachelor	Female	40-45	Interview 5
TAV Securities	TAV Securities Manager	More than 10 years	Bachelor	Male	40-45	Interview 6
HAVAŞ	HAVAŞ Manager	More than 10 years	Bachelor	Male	40-45	Interview 7

Survey research is a quantitative method that uses self-report measurements on a specific population. In this research, the survey is privatized only on the terminal operation at Esenboğa Airport. This method's adaptability makes it useful for investigating a wide range of theoretical and practical concerns. Therefore, the analysis is based on the criteria of digital transformation in the aviation industry. Intellectual capital components serve as the study's independent variables. Survey Form is attached as appendix 1. In the survey form, each line expresses the effect of the criteria (benefits of the Digital Transformation Criterion) on the components of intellectual capital. An example of this scope and its meaning are given below.

“A line (7) filled as follows; “In the digital transformation process; “General Conditions of Carriage for Passenger and Baggage”, which is determined as the sub-criterion of “Customer Service”, which is one of the digital transformation criteria, will be interpreted as “too much” in terms of its impact on the intellectual capital component, the human capital sub-component, “Work related experience”.

This is an example of a filled-out row (7): To illustrate the point, consider the following: "In the digital transformation process; "General Conditions of Carriage for Passenger and Baggage," determined as the sub-criterion of "Customer Service," one of the digital transformation criteria, has a "too much" effect on the intellectual capital component, the human capital sub-component, "Work-related experience."

1: Equal 3: Slightly more 5: Much 7: too much 9: Extremely much 2, 4, 6, 8: Middle Point

General Conditions of Carriage for Passenger and Baggage	9	8	7	6	5	4	3	2	1	Work related experience
---	---	---	----------	---	---	---	---	---	---	--------------------------------

A total of 15 days were spent doing the interviews with each participant, during which time an average of 1 hour and 30 minutes was spent on each interview. Using Python X (Network Analysis in Python), the collected data was analysed, and the results were interpreted.

Python is a high-level, interpreted programming language with a focus on making code easy to read and understand. Python provides pure syntax, variable-length fonts, a consistently robust virtual social network, extensive records, and many different libraries, alternatives to the standard programming model, expressionistic qualities, and rapid

prototyping. In order to create, manipulate, and investigate the structure, dynamics, and functions of complex networks, the Python module NetworkX is available.

System software for highly interconnected networks offers graph, digraph, and multigraph data structures, as well as a number of common graph algorithms, network structure and analysis metrics, and graph, digraph, and multigraph generators. Similar to how nodes may be anything (text, pictures, XML documents), edges are similarly flexible (e.g., weights, time series). Licensed under the BSD 3-clause open-source agreement, this software has been thoroughly tested, with over 90% code coverage. Python's most notable extra benefits are its rapid prototyping speed, its low learning curve, and its platform independence (NetworkX, NetworkX Documentation, 2022).

The findings obtained from the Networkx analysis were designed separately for each participant. Thanks to NetworkX analysis, nonlocal centrality measures results can be obtained and analyzed easily. In this study, degree centrality, closeness centrality, eigenvector centrality, and betweenness centrality algorithms were determined as in-link, out-link, and normalized. Additionally, fast greedy community, modularity detection and vote rank analyses were made with weighting, and nodes with digital flaneurs were detected.

What the analysis obtained means in organisational terms and the interpretation of the value that digital transformation adds to intellectual capital are explained in detail in the conclusion section with six indicators such as integration, driving, driving, stability, criticality, and precarious.

The aggregate results from each analysis are presented below with the corresponding title. Moreover, this part contains diagrams, tables, figures, and graphs displaying the data's findings. Within the scope of the research, a total of 8 distinct networks were examined, including 7 networks that were developed with the same organisational logic but varied in the firms that they represent, and 1 network in which the survey findings of all companies were reviewed collectively. To emphasize, at the outset of the research project, each participant was asked questions that were contained inside the same matrix. The matrix has 37 rows, and there are 35 columns total. In all, there are 72 nodes and 1272 edges each network, which has a directional and weighted structure.

NetworkX is a network analysis and visualisation tool. Affiliations information, such as weighted, link and attributions are frequently connected with network nodes. In this study, the colour of a node is based on its affiliations. The node coloring is created by writing Python NetworkX colormap function syntax according to affiliates. The colours and sizes of nodes vary according to nonlocal centrality by numeric measures such as degree centrality, closeness centrality etc.

Data clusters in a sample can be characterised by certain factors, and these variables can be isolated with the assistance of this visual representation of the data matrix. In this study, there is from 1 to 9 sequence depicted by the study's hierarchical numbering. Participants are not given the option of selecting 0. Since node identifiers can also be declared as "0" when no connection exists between two nodes.

4.3 Analysis and Findings

A heatmap is used to depict the raw data obtained. It is also known as a "fake-coloured picture," since the data values are converted to a different colour scale. The use of heat maps enables us to see groups of samples and features at the same time.

A data matrix's rows and columns are first subjected to a hierarchical clustering procedure. According to the hierarchical clustering result, the columns and rows of the data matrix are rearranged to bring together observations with comparable characteristics. In the information matrix, the "high" and "low" value clusters are next to one another. After the data matrix is shown and a colour scheme is applied for the visualisation, the final product is complete.

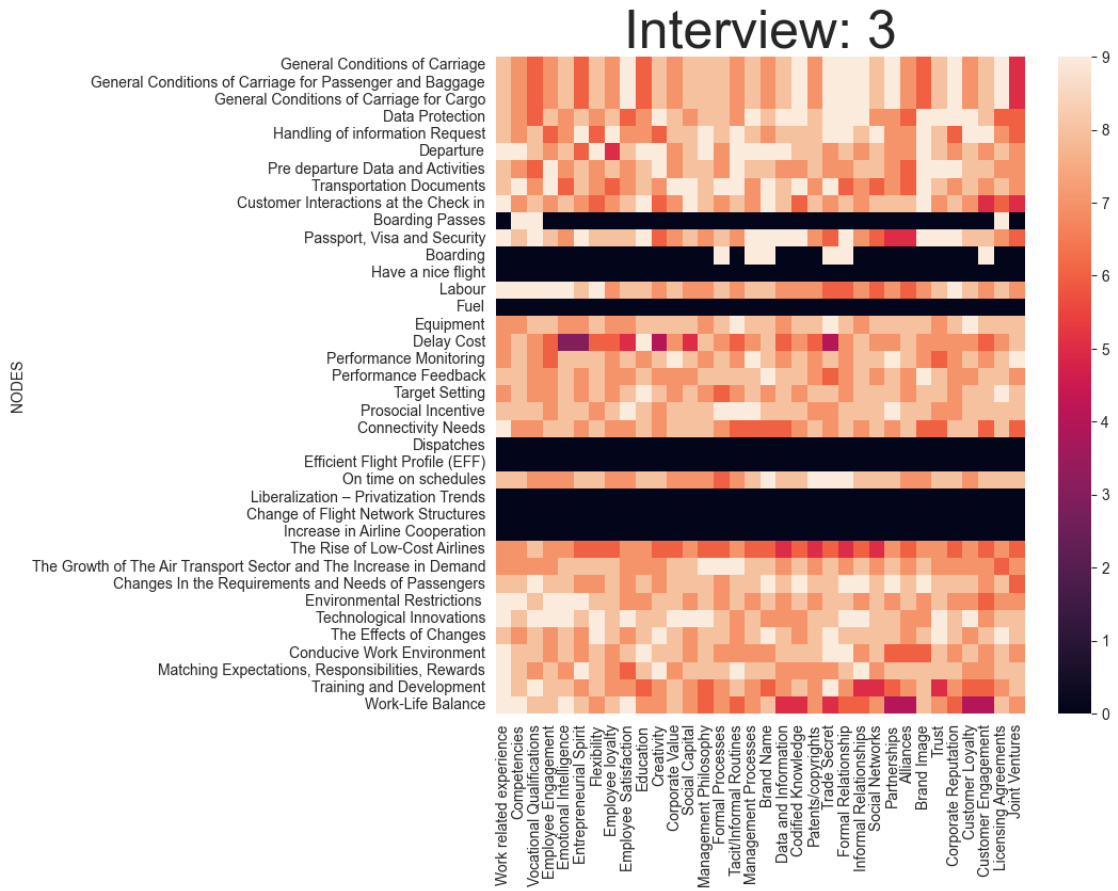


Figure 2: Esenboğa TAV Hq-Raw Data Heatmap

The heatmap (figure 2), based on the survey scores of Esenboğa TAV Head Office, clearly shows that the provided complete responses to all questions. Moreover, the non-relevance between digital transformation requirements and intellectual capital components was given a score of 0, since the black areas were deemed to be “out the scope of responsibility and duty”. Thus, the participant did not submit a score of 0 as weight for this study. In the NetworkX algorithm, the value 0 is used to denote nodes that are not connected to one another.

Esenboğa TAV Finance Department

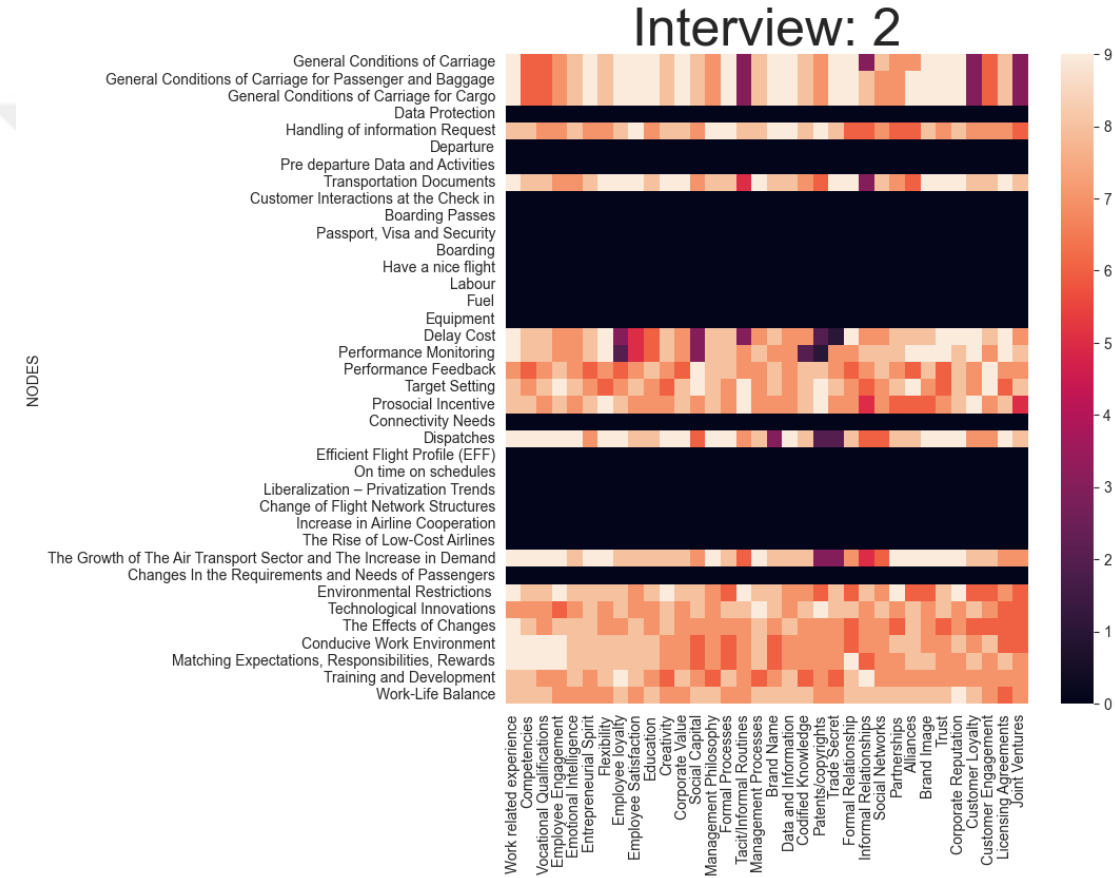


Figure 3: Esenboğa TAV Finance Department-Raw Data Heatmap

The heatmap (figure 3), based on the survey scores of Esenboğa TAV Finance Department, clearly shows that the provided complete responses to all questions. Moreover, the non-relevance between digital transformation requirements and intellectual capital components was given a score of 0, since the black areas were deemed to be “out the scope of responsibility and duty”. Thus, the participant did not submit a

score of 0 as weight for this study. In the NetworkX algorithm, the value 0 is used to denote nodes that are not connected to one another.

Esenboğa TAV Logistics Department

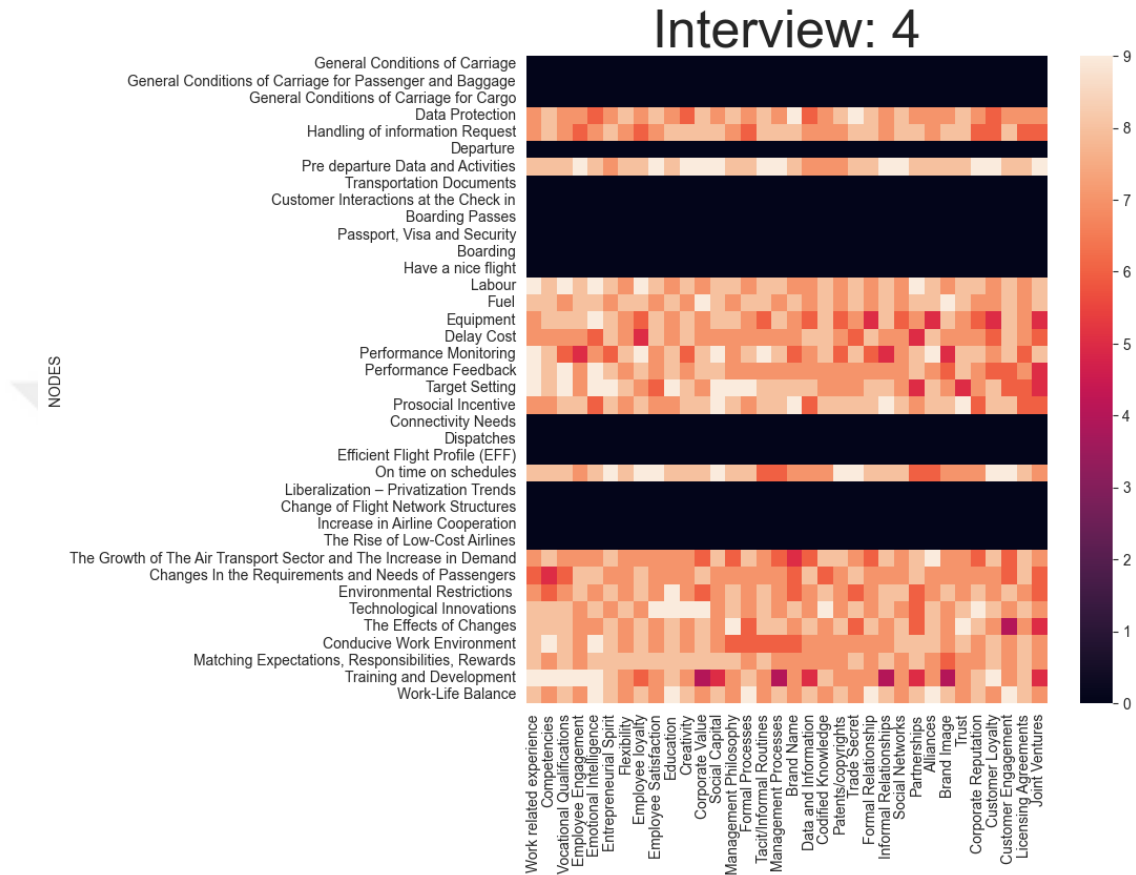


Figure 4: Esenboğa TAV Logistic Department-Raw Data Heatmap

The heatmap (figure 4), based on the survey scores of Esenboğa TAV Logistics Department, clearly shows that the provided complete responses to all questions. Moreover, the non-relevance between digital transformation requirements and intellectual capital components was given a score of 0, since the black areas were deemed to be “out the scope of responsibility and duty”. Thus, the participant did not submit a score of 0 as weight for this study. In the NetworkX algorithm, the value 0 is used to denote nodes that are not connected to one another.

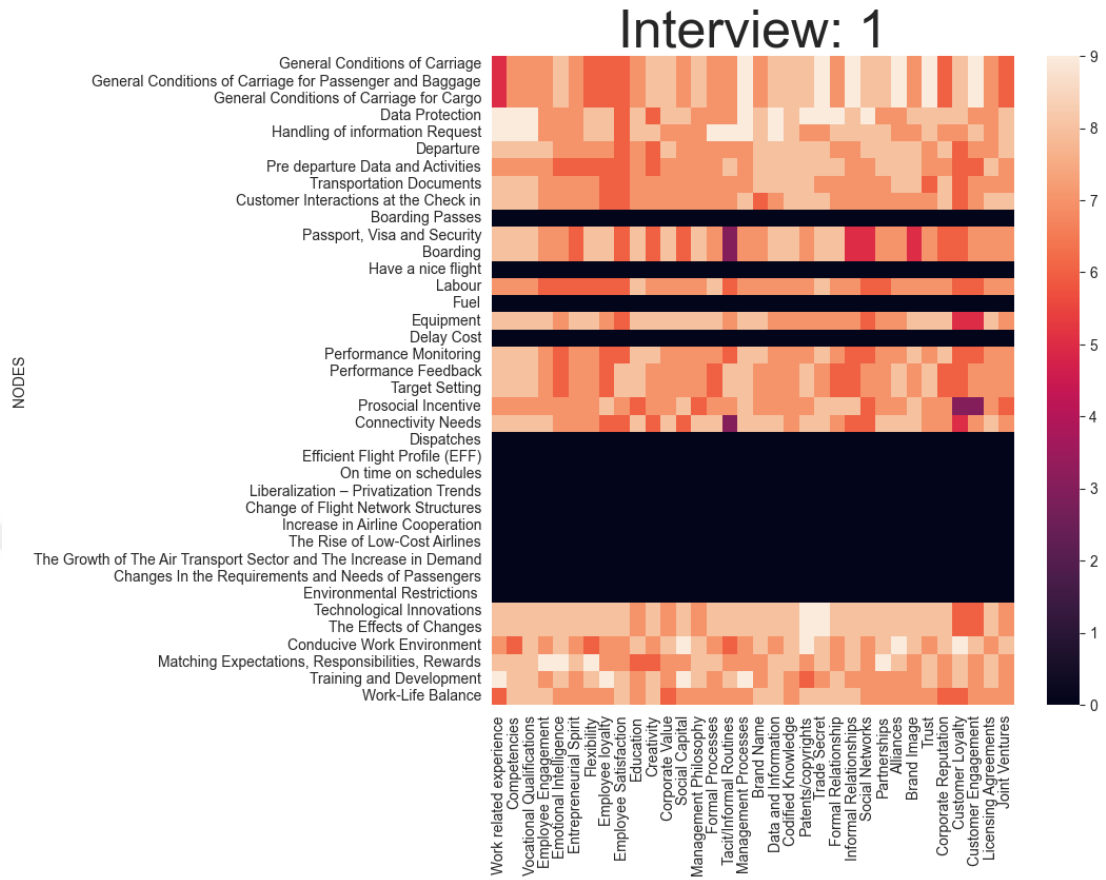


Figure 5: Esenboğa TAV Technologies- Raw Data Heatmap

The heatmap (figure 5), based on the survey scores of Esenboğa TAV Technologies, clearly shows that the provided complete responses to all questions. Moreover, the non-relevance between digital transformation requirements and intellectual capital components was given a score of 0, since the black areas were deemed to be “out the scope of responsibility and duty”. Thus, the participant did not submit a score of 0 as weight for this study. In the NetworkX algorithm, the value 0 is used to denote nodes that are not connected to one another.

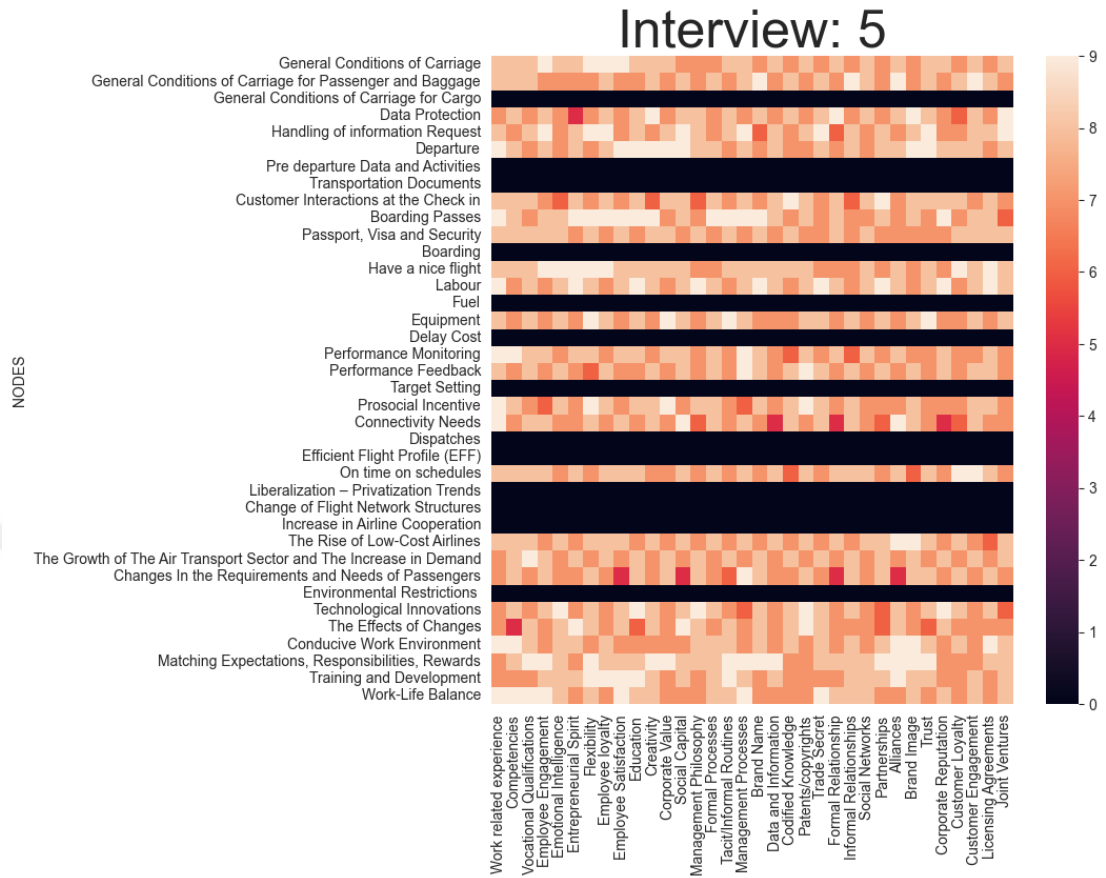


Figure 6: Esenboğa PRIMECLASS -Raw Data Heatmap

The heatmap (figure 6), based on the survey scores of Esenboğa TAV PRIMECLASS, clearly shows that the provided complete responses to all questions. Moreover, the non-relevance between digital transformation requirements and intellectual capital components was given a score of 0, since the black areas were deemed to be “out the scope of responsibility and duty”. Thus, the participant did not submit a score of 0 as weight for this study. In the NetworkX algorithm, the value 0 is used to denote nodes that are not connected to one another.

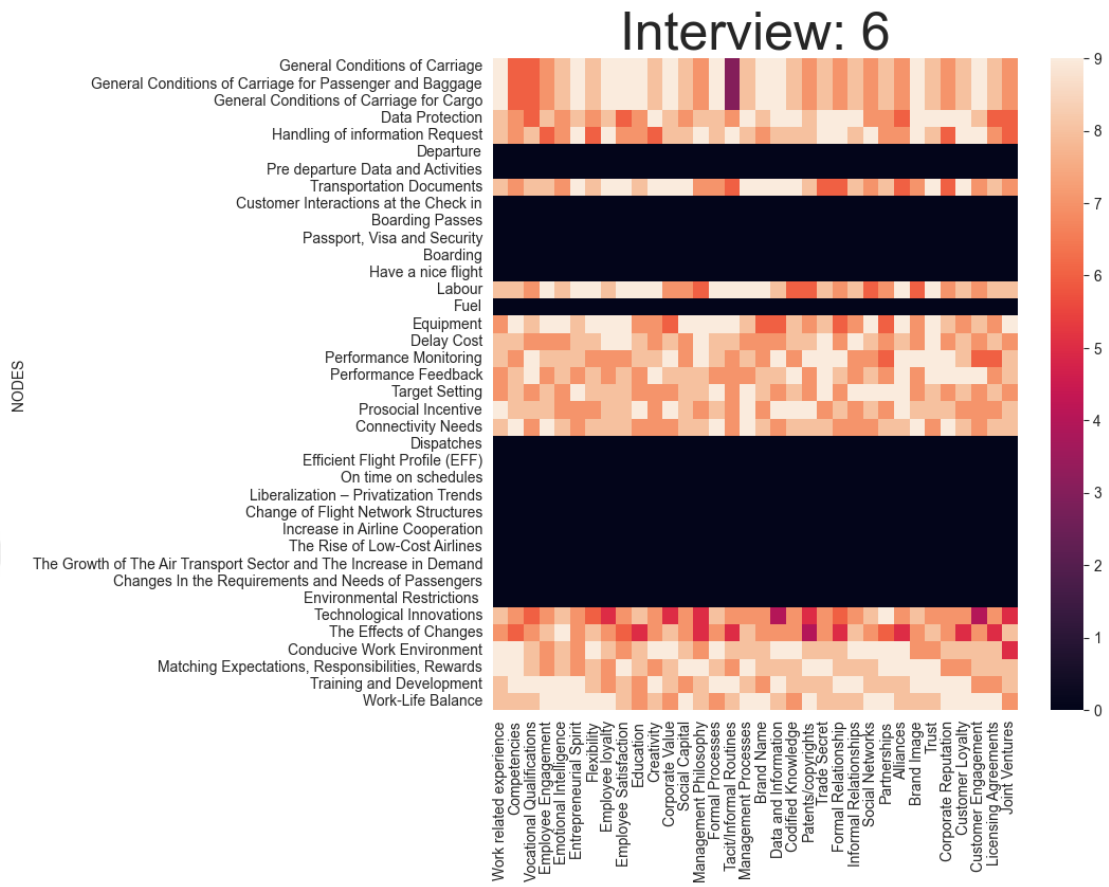


Figure 7: Esenboğa TAV Security-Raw Data Heatmap

The heatmap (figure 7), based on the survey scores of Esenboğa TAV Security, clearly shows that the provided complete responses to all questions. Moreover, the non-relevance between digital transformation requirements and intellectual capital components was given a score of 0, since the black areas were deemed to be “out the scope of responsibility and duty”. Thus, the participant did not submit a score of 0 as weight for this study. In the NetworkX algorithm, the value 0 is used to denote nodes that are not connected to one another.

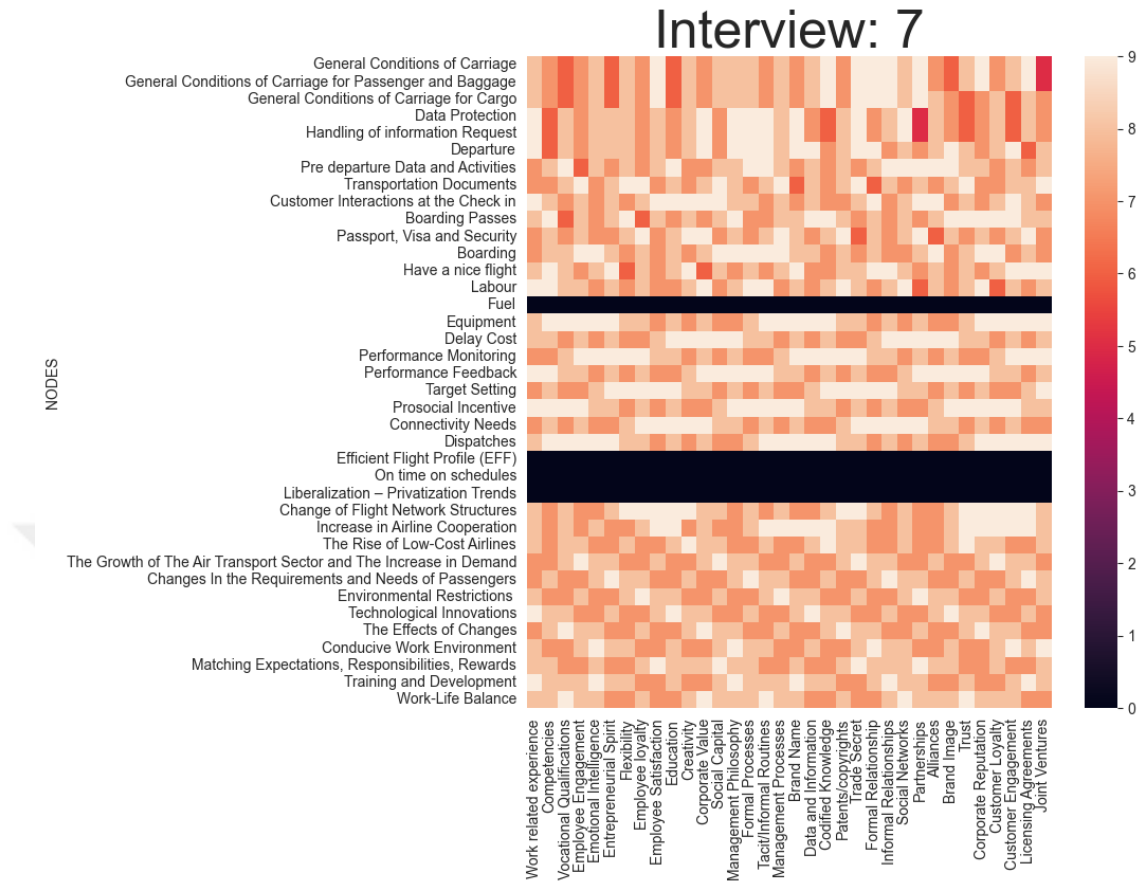


Figure 8: Esenboğa HAVAŞ-Raw Data Heatmap

The heatmap (figure 8), based on the survey scores of Esenboğa HAVAŞ, clearly shows that the provided complete responses to all questions. Moreover, the non-relevance between digital transformation requirements and intellectual capital components was given a score of 0, since the black areas were deemed to be “out the scope of responsibility and duty”. Thus, the participant did not submit a score of 0 as weight for this study. In the NetworkX algorithm, the value 0 is used to denote nodes that are not connected to one another.

As seen in figure 2–8, all participants acting as corporate decision-makers evaluated the impact of each airport digital transformation criterion on the intellectual capital component of the firm in a non-linear manner.

Consequently, the network nodes that deviated from digital transformation requirements to intellectual capital components are allocated weighted and directed

linkages. As seen by the survey responses, all respondents have declared "out of scope" for all business processes that fall outside of their specialised and direct areas of responsibility for the digital transformation of airports.

Nodes with a score of 0 in this survey are considered unrelated. This is also depicted in black on the heatmap. When the weight assigned to associated nodes is numbered from one to nine, the lightest colour becomes nine and the darkest colour becomes one.

4.3.1 Degree centrality

The number of relationships an actor has with others is one of the first measures of centrality. According to the social position qualifier, the term "popularity" really becomes more concrete. The number of connections a node has in a graph is referred to as its "degrees." (Gençer, 2017) In a 1979 article, Freeman provided a critical and insightful analysis of centrality. By looking back at previous studies, primarily in sociology, he was able to narrow it down to three main perspectives: The degree to which a site (or edge) is central to the rest of the graph depends on three factors: (1) its connectedness via immediate edge connections to other sites; (2) the frequency with which a graph part falls on relevant (perhaps shortest) paths between all pairs of other sites; and (3) its proximity to other parts of the graph (measured by an average distance to the sites of the graph). Centrality indices are commonly used to identify individuals who play a significant role in a given context (Borgatti & Everett, 2006).

There are a wide variety of actor-level indices of centrality that can be used to describe the roles and relationships between individuals in networks. There are unique theoretical foundations for degree, closeness, and betweenness centralities, all of which were first introduced in Freeman's (1978) fundamental study.

The betweenness centrality measure highlights the players through whom most of the remainder of the network is interconnected, whereas the degree centrality measure indicates the total number of ties (Iacobucci et al., 2019). For directed networks in which relationships have a source and a target rather than reciprocal connections, there are two-degree measures: in-degree and out-degree. In-degree is the number of connections at a vertex that point inward. Out-degree is the number of connections that radiate outward from a vertex. Outside of social network analysis, the idea of "centrality" is used to undirected lines whereas "prestige" is applied to directional lines. The concept of prestige

is referred to as "influence" for outgoing lines and "support" for incoming lines (Gürsakal, 2009).

The network comprises 72 nodes and 1272 edges, and its topology is directed and weighted. In the diagrams, the first 37 nodes to the left of the red line show the digital transformation criteria (source), and the 35 nodes to the right of the red line show the intellectual capital criteria (target).

Esenboğa TAV Head Office

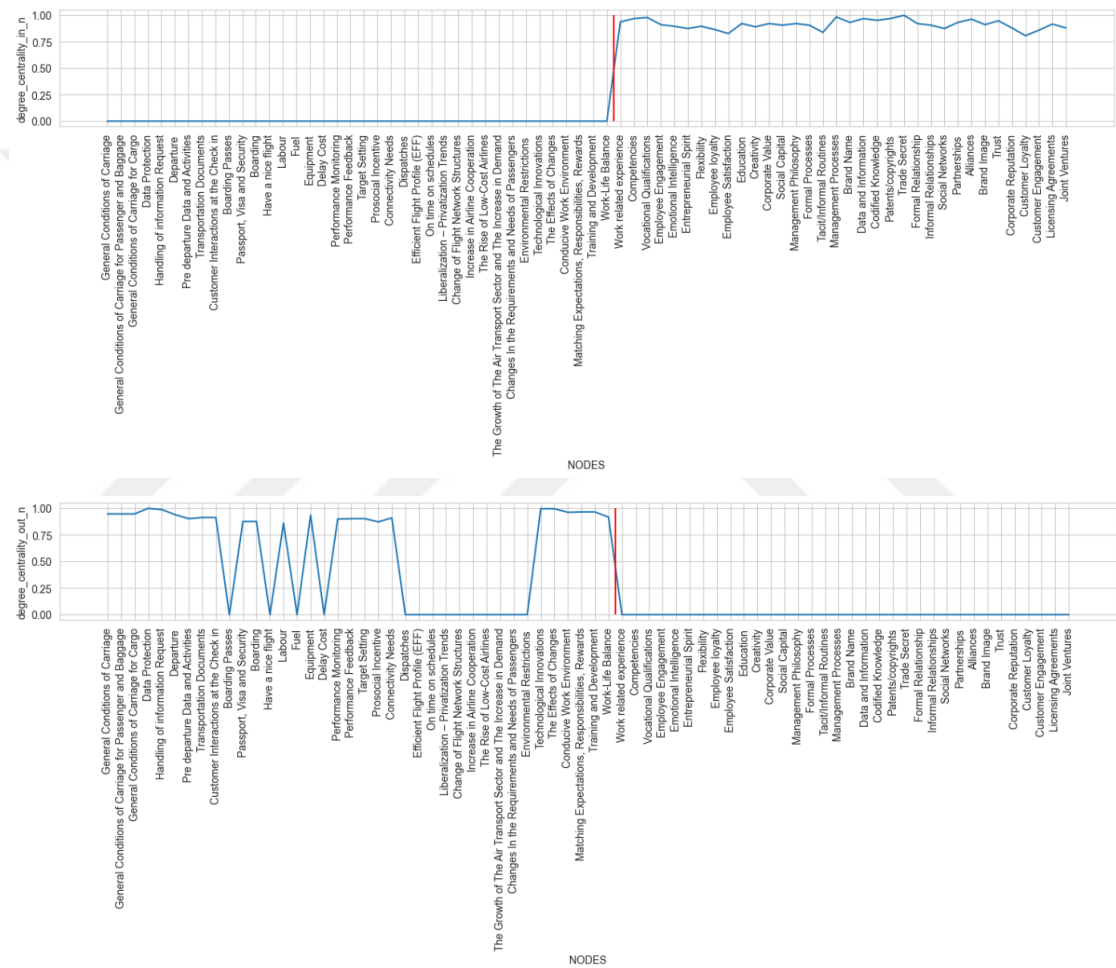


Diagram 1: Esenboğa TAV Hq -In&Out Link Normalized Degree Centrality

According to the Esenboğa TAV Head Office survey results, "Data Protection" resulted as the most remarkable node of out-degree, while "Trade Secret" emerged as the most important node of in-degree (Diagram 1). Thus, in terms of centrality, "Data Protection" is seen as an influencer, whereas "Trade Secret" is regarded as a supported, according to the results of this study. "Data protection" is a digital transformation criterion associated with "customer service." Similarly, "trade secret" is an element of structural

capital. The "Customer Service" component is the most influential for TAV Head Offices, while the "Structural Capital" component is the most supported.

Esenboğa TAV Finance Department.

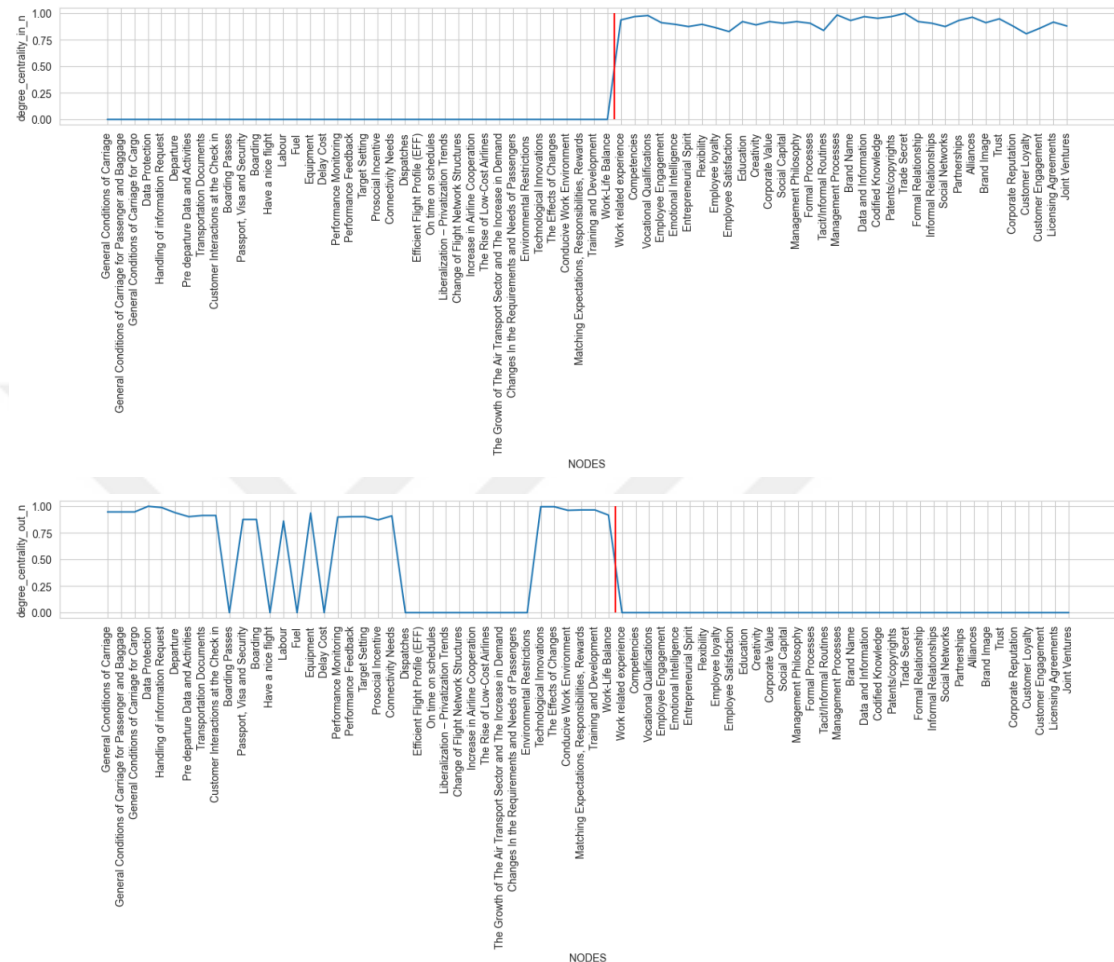


Diagram 2: Esenboğa TAV Finance Department-In&Out Link Normalized Degree Centrality

According to the Esenboğa TAV Finance Department survey results, "technological innovations" resulted as the most remarkable node of out-degree, while "management processes" emerged as the most important node of in-degree (Diagram -2). Thus, in terms of centrality, "technological innovations" is seen as an influencer, whereas "management processes" is regarded as a supported, according to the results of this study. "Technological innovations" is a digital transformation criterion associated with "strengthen networks." Similarly, "management process" is an element of structural capital. The "strengthen networks" component is the most influential for TAV Head Offices, while the "structural capital" component is the most supported.

Esenboğa TAV Logistics Department.

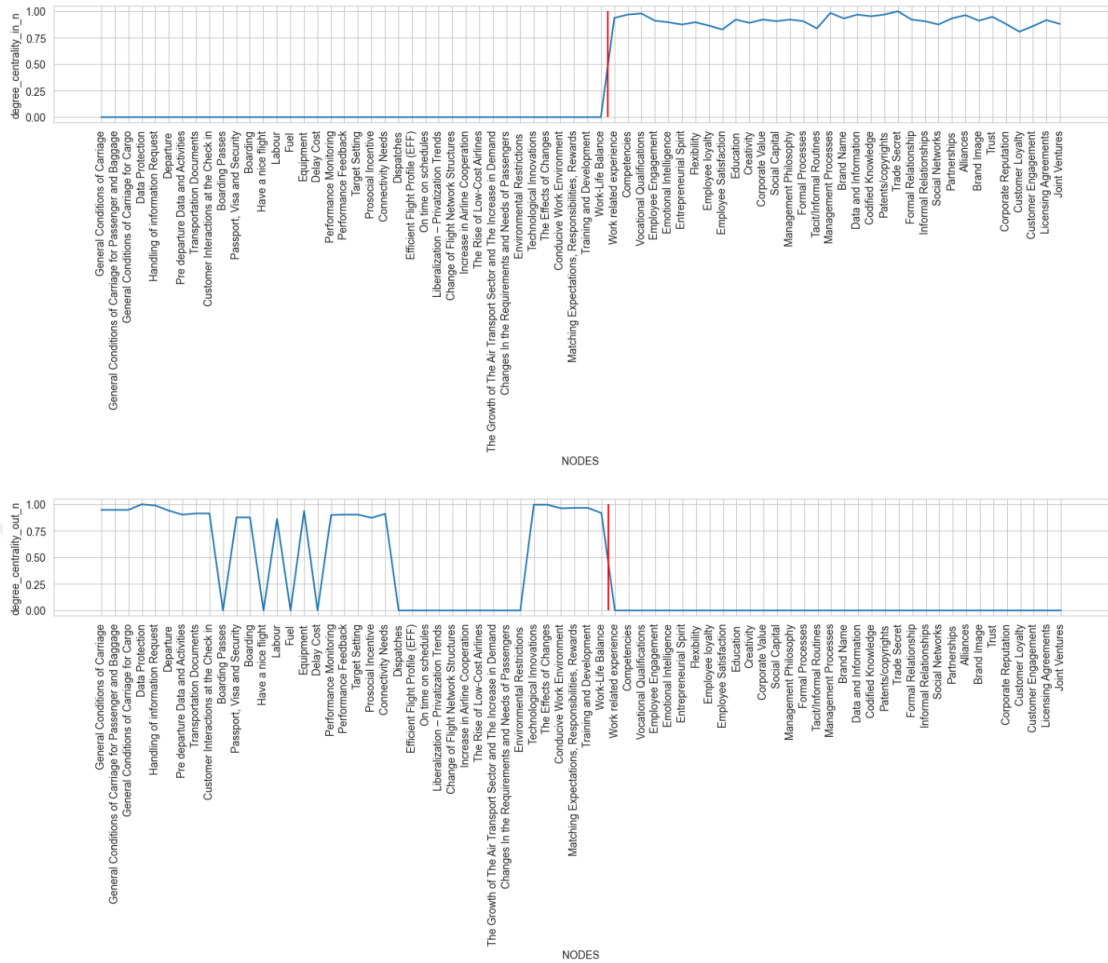


Diagram 3: Esenboğa TAV Logistic Department-In&Out Link Normalized Degree Centrality

According to the Esenboğa TAV Logistics Department survey results, "technological innovations" resulted as the most remarkable node of out-degree, while "management processes" emerged as the most important node of in-degree (Diagram -3). Thus, in terms of centrality, "technological innovations" is seen as an influencer, whereas "management processes" is regarded as a supported, according to the results of this study. "Technological innovations" is a digital transformation criterion associated with "strengthen networks." Similarly, "management processes" is an element of structural capital. The "strengthen networks" component is the most influential for TAV Logistics Department, while the "Structural Capital" component is the most supported.

Esenboğa TAV Technologies

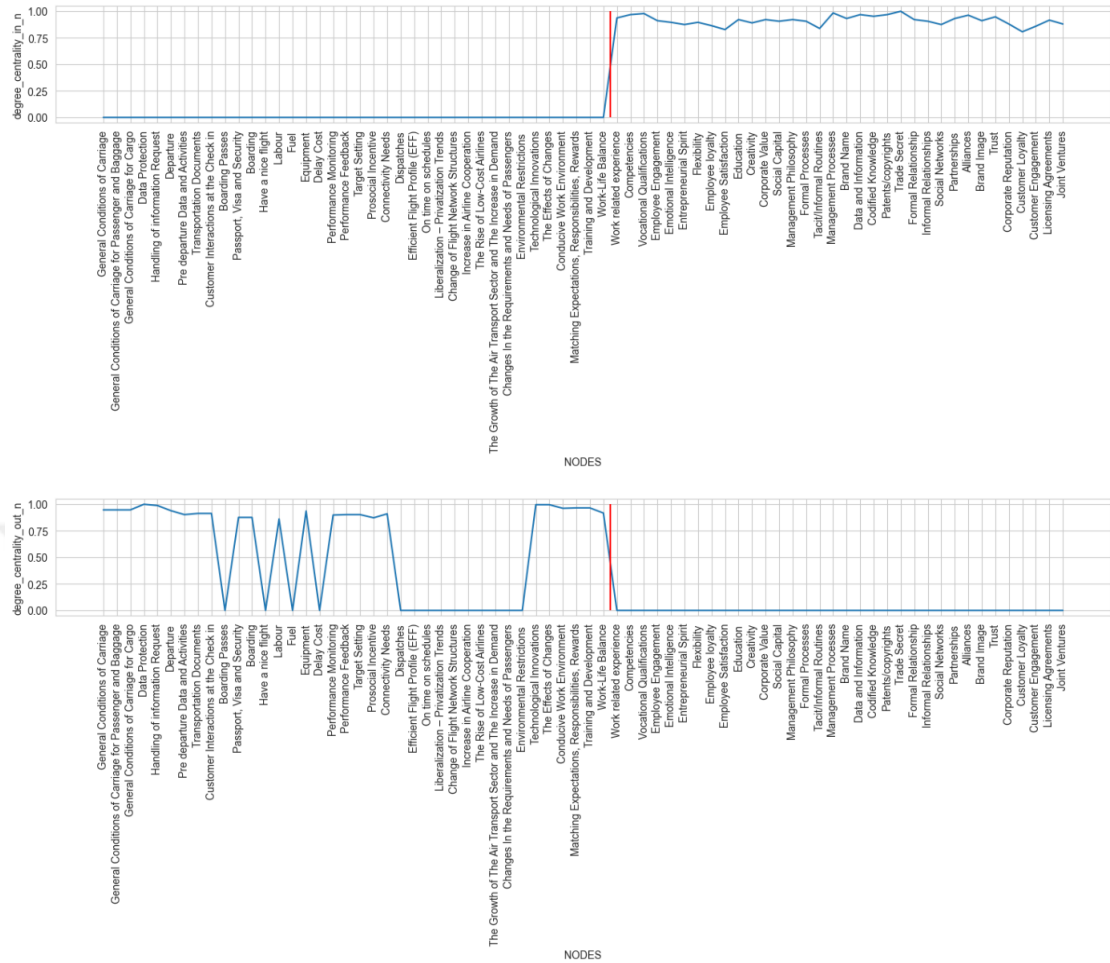


Diagram 4: Esenboğa TAV Technologies-In&Out Link Normalized Degree Centrality

According to the Esenboğa TAV Technologies survey results, "technological innovations" resulted as the most remarkable node of out-degree, while "codified knowledge" emerged as the most important node of in-degree (Diagram-4). Thus, in terms of centrality, "technological innovations" is seen as an influencer, whereas "codified knowledge" is regarded as a supported, according to the results of this study. "Technological innovations" is a digital transformation criterion associated with "strengthen networks." Similarly, "codified knowledge" is an element of structural capital. The "strengthen networks" component is the most influential for TAV Technologies, while the "structural capital" component is the most supported.

Esenboğa PRIMECLASS

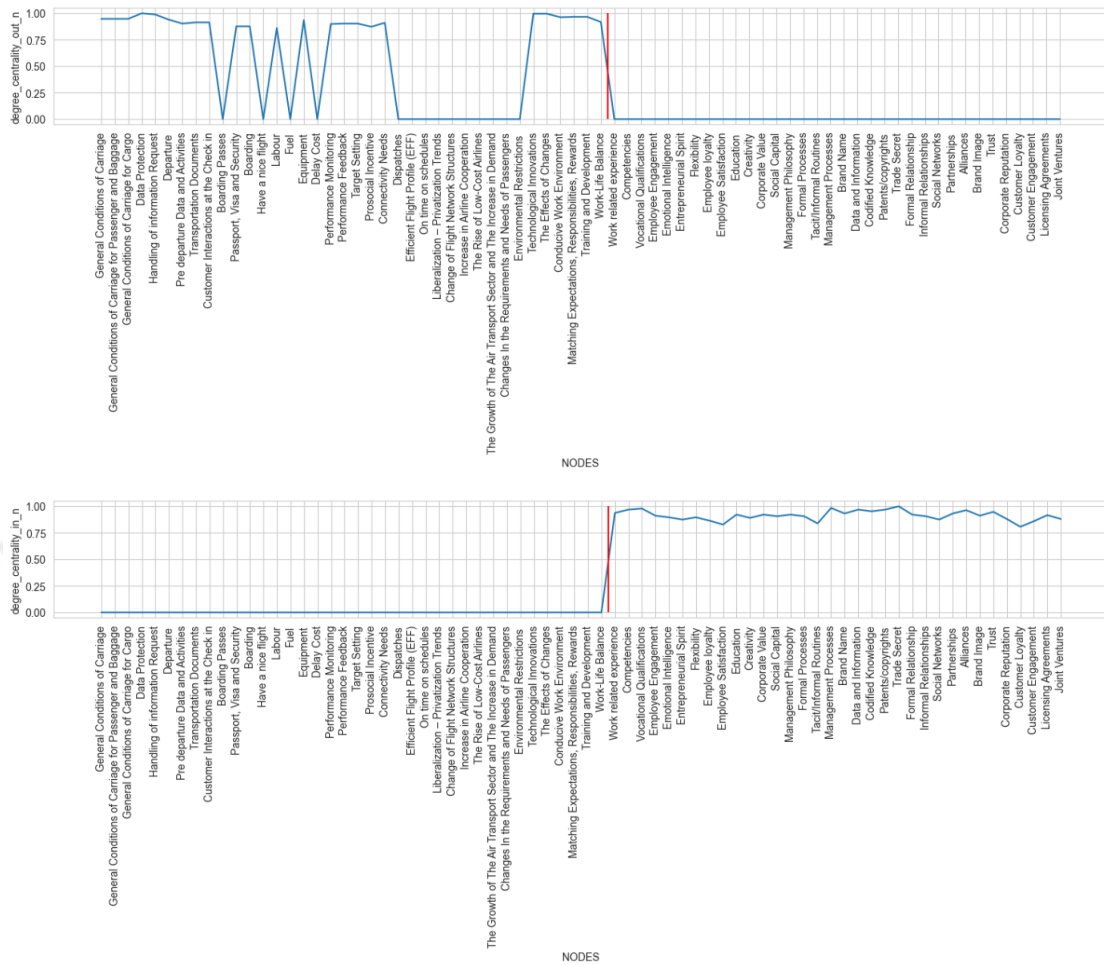


Diagram 5: Esenboğa PRIMECLASS-In&Out Link Normalized Degree Centrality

According to the Esenboğa PRIMECLASS survey results, "effects of change" resulted as the most remarkable node of out-degree, while "competencies" emerged as the most important node of in-degree (Diagram 5). Thus, in terms of centrality, "effects of change" is seen as an influencer, whereas "competencies" is regarded as a supported, according to the results of this study. "Effects of change" is a digital transformation criterion associated with "strengthen networks." Similarly, "competencies" is an element of human capital. The "strengthen networks" component is the most influential for PRIMECLASS, while the "Human Capital" component is the most supported.

Esenboğa TAV Securities

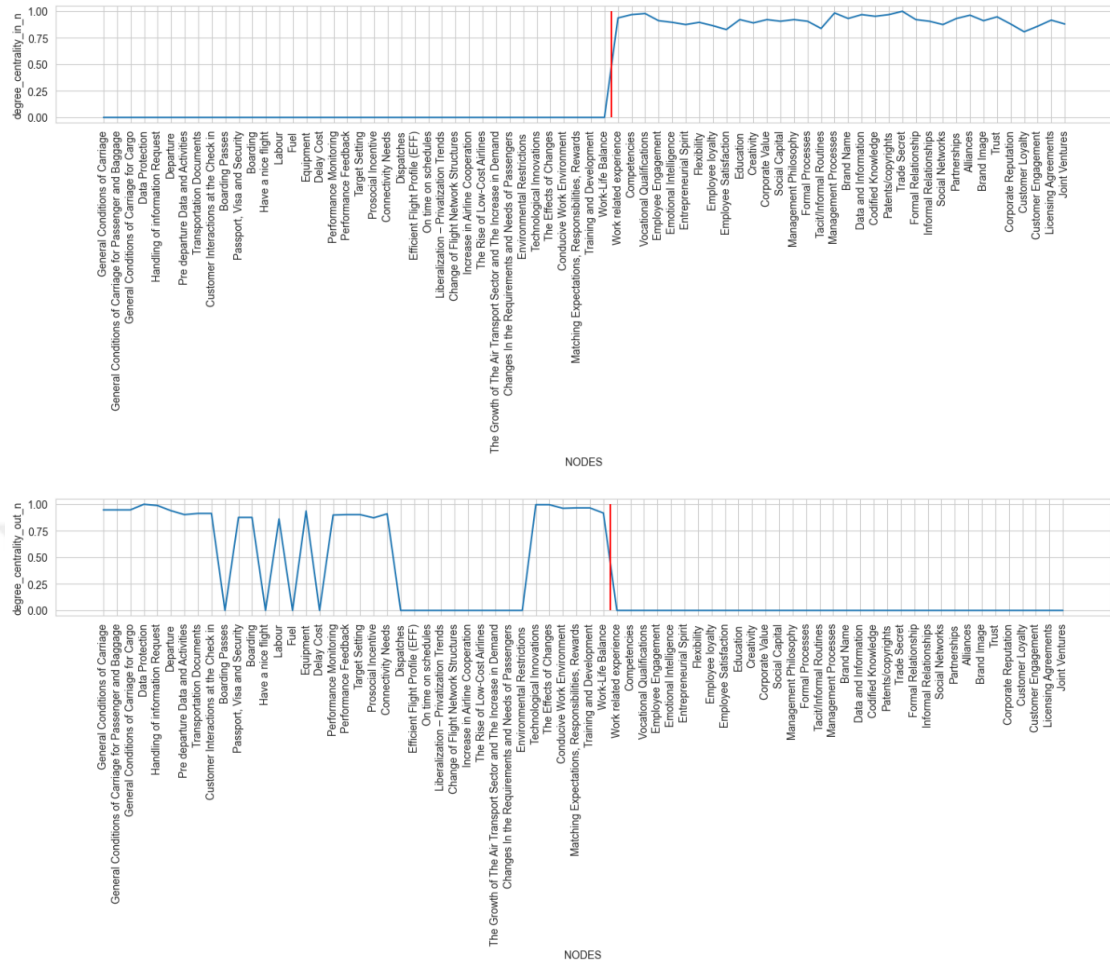


Diagram 6: Esenboğa TAV Securities-In&Out Link Normalized Degree Centrality

According to the Esenboğa TAV Securities survey results, "Data Protection" resulted as the most remarkable node of out-degree, while "vocational qualifications" emerged as the most important node of in-degree (Diagram-6). Thus, in terms of centrality, "Data Protection" is seen as an influencer, whereas "vocational qualifications" is regarded as a supported, according to the results of this study. "Data protection" is a digital transformation criterion associated with "customer service." Similarly, "vocational qualifications" is an element of human capital. The "Data Protection" component is the most influential for TAV securities, while the "Human Capital" component will be the most supported.

Esenboğa HAVAŞ

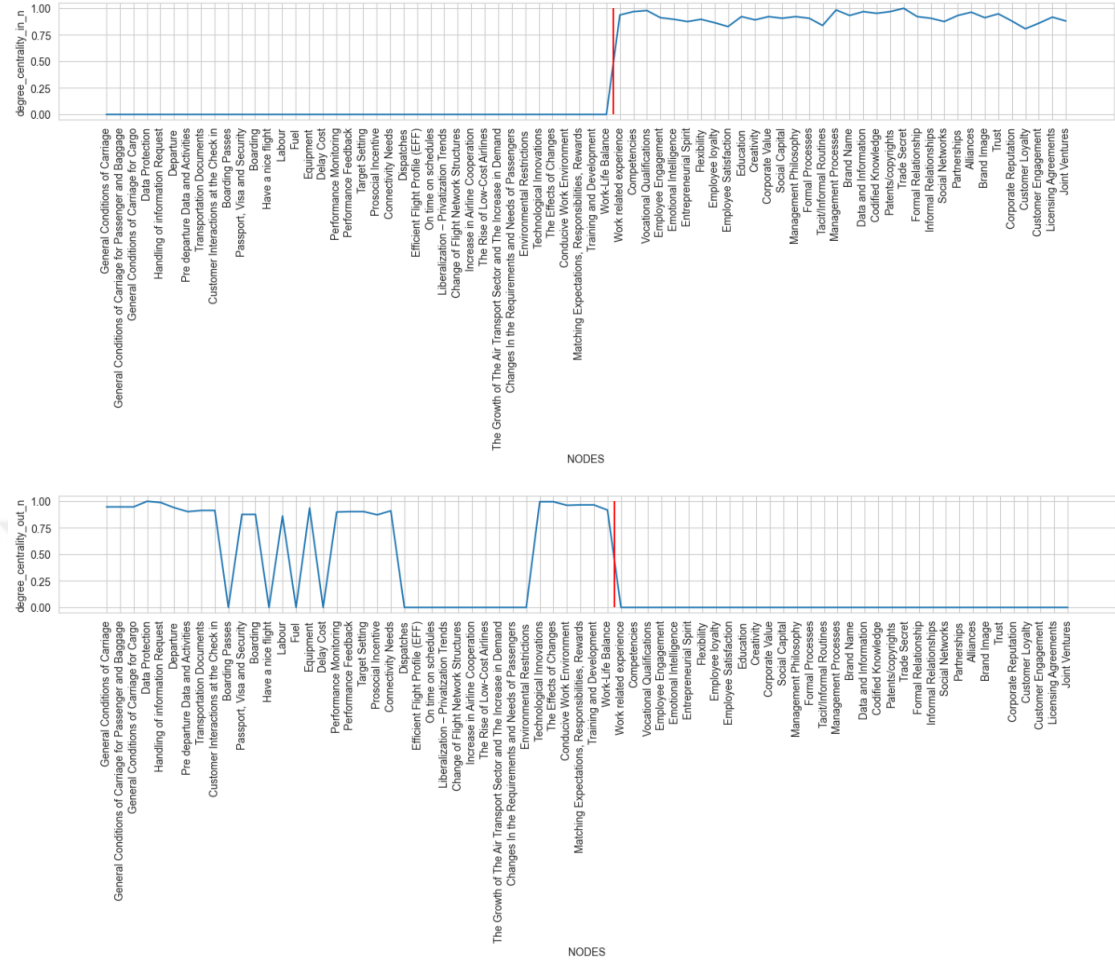


Diagram 7: Esenboğa HAVAŞ-In&Out Link Normalized Degree Centrality

According to the Esenboğa HAVAŞ survey results, "Data Protection" resulted as the most remarkable node of out-degree, while "management process" emerged as the most important node of in-degree (Diagram 7). Thus, in terms of centrality, "Data Protection" is seen as an influencer, whereas "management process" is regarded as a supported, according to the results of this study. "Data protection" is a digital transformation criterion associated with "customer service." Similarly, "management processes" is an element of structural capital. The "Customer Service" component is the most influential for HAVAŞ, while the "Structural Capital" component is the most supported.

4.3.2 Closeness centrality

One definition of centrality is the degree to which other actors are connected to a certain actor. The shortest of the paths between two nodes is called geodesy, meaning "bird fly distance". The total geodesic distance from a node to every other node in the network. Path lengths are calculated to show how easy or difficult it is to go from one node to another in a network. If the actor is proximal to the rest of the actors in the network, it may be crucial. The average shortest distance to all other nodes that can be reached from a given node is its closeness centrality. The degree to which a node is connected to every other node in the network is measured by its "closeness centrality." This is determined by taking the mean of the distances travelled by the shortest paths from each node to all other nodes in the network (Golbeck, 2013).

Because a node's ability to receive information from and transmit information to other nodes in a network depends in part on how close the node is to those other nodes, a concept known as "closeness centrality" is crucial to comprehending how information moves through networks. Horizon of observability theory claims that individuals in social networks have very little insight into what is happening beyond a distance of two nodes. The inverse of centrality, closeness centrality can be thought of as a measure of the degree to which two nodes in a network are connected to one another, with larger values indicating less connectivity and smaller values indicating greater connectivity (Gençer, 2017).

The average shortest distance to all other nodes that can be reached from a given node is its closeness centrality. The degree to which a node is connected to every other node in the network is measured by its "closeness centrality." It's determined by taking the mean of the distances travelled by the shortest paths connecting the node in question to all of the other nodes in the network. Moreover, the closeness centrality score is required to be normalized so that it can be used to compare networks of different sized.

In conclusion, it is the degree to which a node is directly or indirectly connected to other nodes in the network. The closeness of a node shows its ability to access information and its connectivity to other nodes in the network. A high degree of centrality is not required for a node to have a high degree of closeness.

Esenboğa TAV Head Office

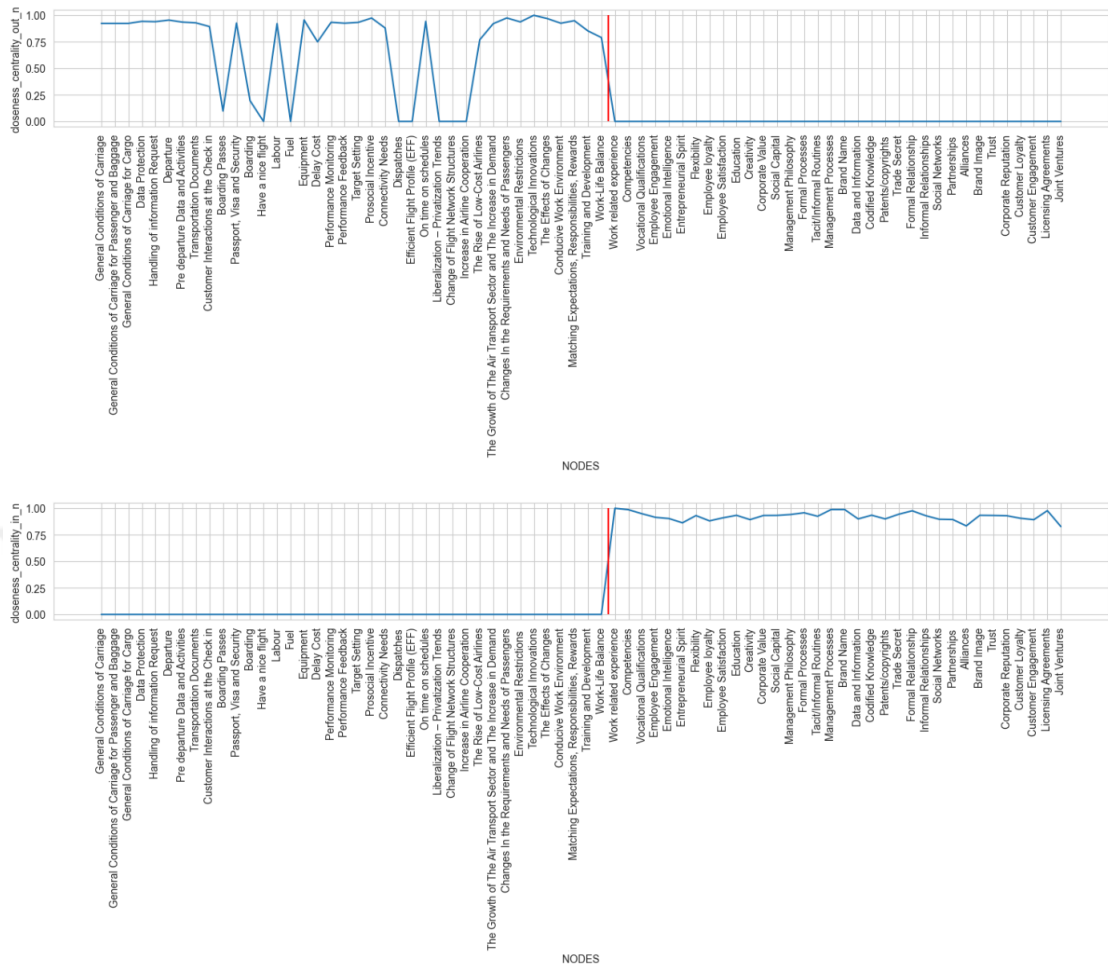


Diagram 8: Esenboğa TAV Hq-In&Out Link Normalized Closeness Centrality

According to the Esenboğa TAV Head Office closeness centrality statistics, the most central node is “Work related experience” according to in-link, and “Technological Innovations” according to out-link. Consideration is given to the distances between each node in a network. According to the closeness centrality computed by joining the network, in-link “#36 Work related experience” is the hub of network #32 Technological Innovations” for out-link. In other words, the effect of the digital transformation criteria on the intellectual capital is detailed below. When it is referred as “Work-related experience in influence at the centre of this network and “Technological Innovations” in support to other NODEs. Other centrality can transfer considerably more rapidly than position-holding nodes since they have the quickest routes to knowledge. Thus, they have the benefit of rapidly disseminating information inside the network. While the most central node in out-link is the "Strengthen Networks" criterion, the most central node in in-link is the "human capital" component.

Esenboğa TAV Finance Department

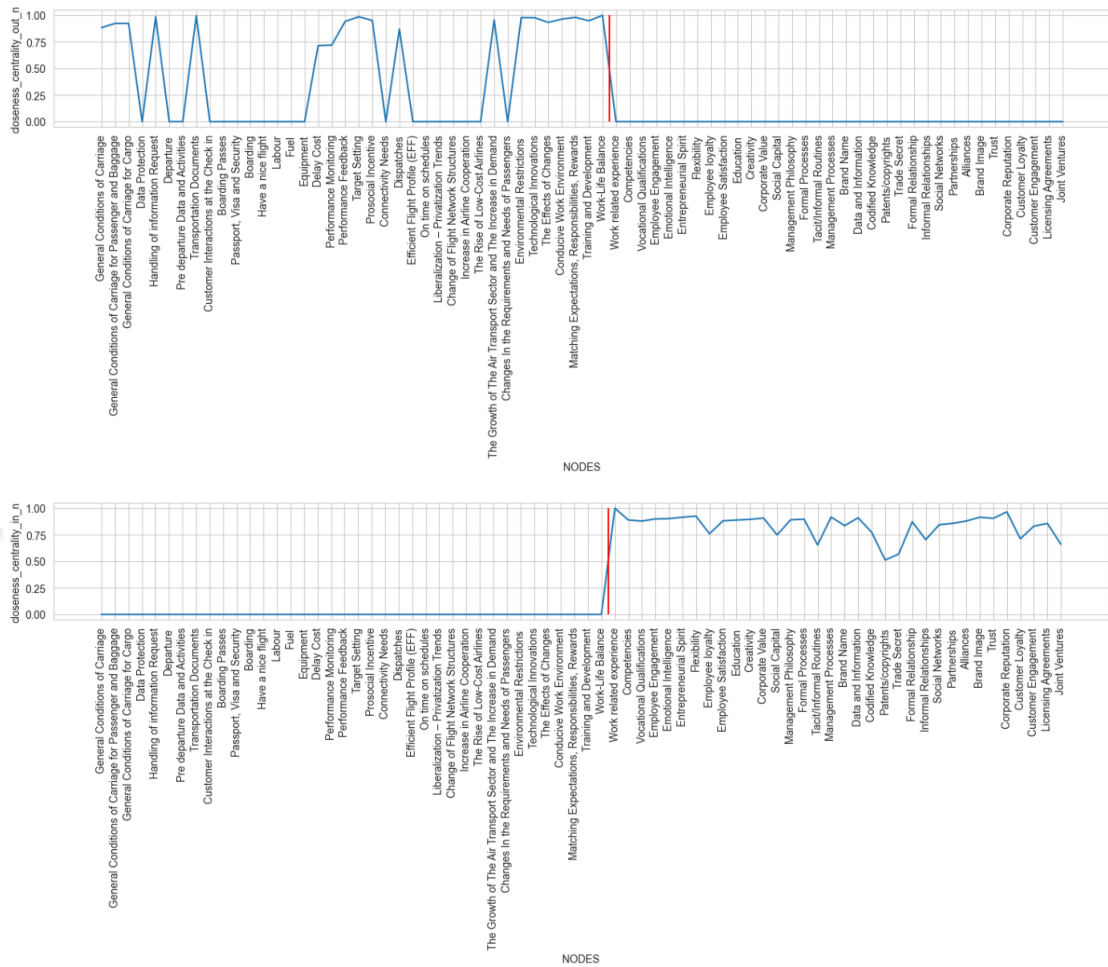


Diagram 9: Esenboğa TAV Finance-In&Out Link Normalized Closeness Centrality

According to the Esenboğa TAV Finance Department closeness centrality statistics, the most central node is “Work related experience” according to in-link, and “Work Life Balance” according to out-link. Consideration is given to the distances between each node in a network. According to the closeness centrality computed by joining the network, in-link “#36 Work related experience” is the hub of network “#37 Work Life Balance” for out-link. So, the effect of the digital transformation criteria on the intellectual capital is detailed. When it is referred as “Work-related experience in influence at the centre of this network and “Work Life Balance” in support to other nodes. Other centrality can transfer considerably more rapidly than position-holding nodes since they have the quickest routes to knowledge. Thus, they have the benefit of rapidly disseminating information inside the network. While the most central node in out-link is the "Increase Employee Retention" criterion, the most central node in in-link is the "human capital" component.

Esenboğa TAV Logistics Department

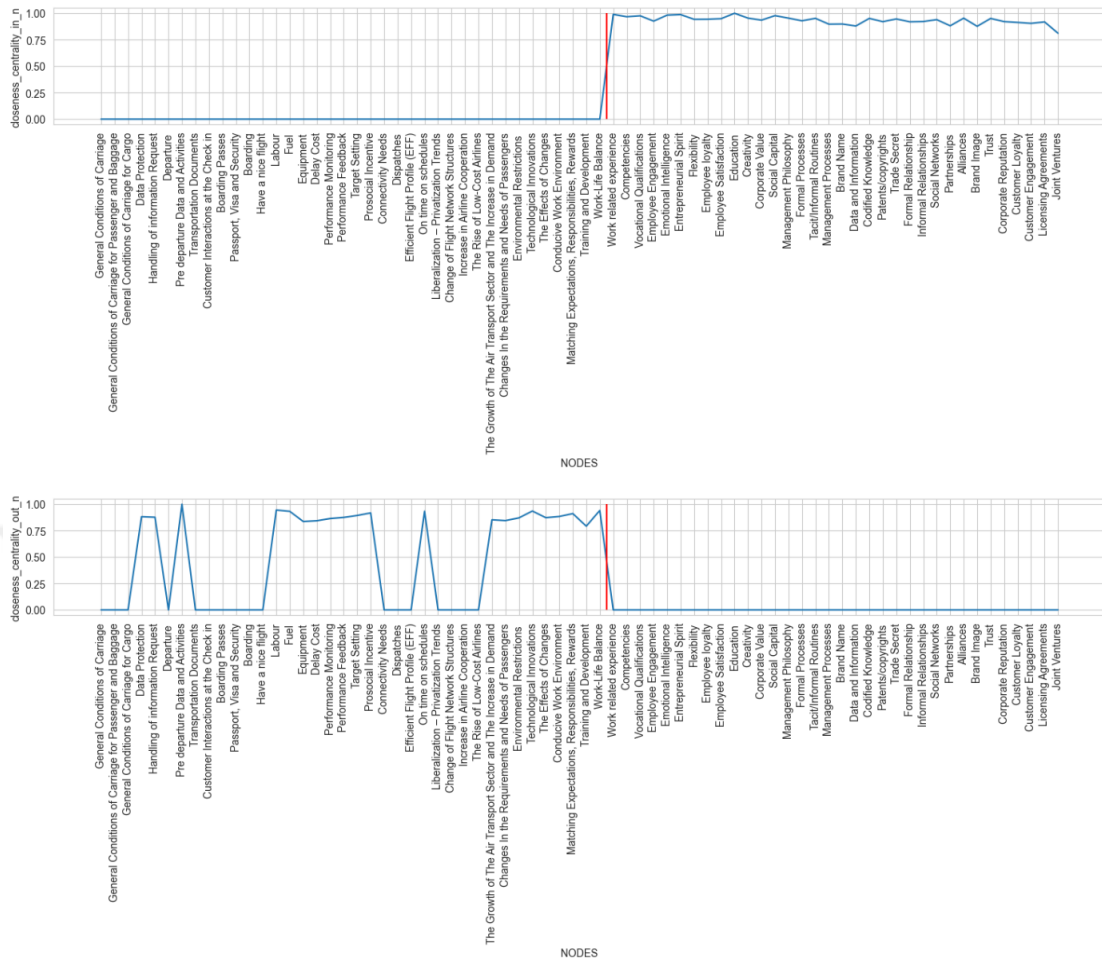


Diagram 10: Esenboğa TAV Logistic Department- In&Out Link Normalized Closeness Centrality

According to the Esenboğa TAV Logistics Department closeness centrality statistics, the most central node is “education” according to in-link, and “Pre departure Data and Activities” according to out-link. Consideration is given to the distances between each node in a network. According to the closeness centrality computed by joining the network, in-link “#47 education” is the hub of network “#6 Pre departure Data and Activities” for out-link. So, the effect of the digital transformation criteria on the intellectual capital is detailed. When it is referred as “education” in influence at the centre of this network and “Pre departure Data and Activities” in support to other nodes. Other centrality can transfer considerably more rapidly than position-holding nodes since they have the quickest routes to knowledge. Thus, they have the benefit of rapidly disseminating information inside the network. While the most central node in out-link is the “Customer Services” criterion, the most central node in in-link is the “human capital” component.

Esenboğa TAV Technologies

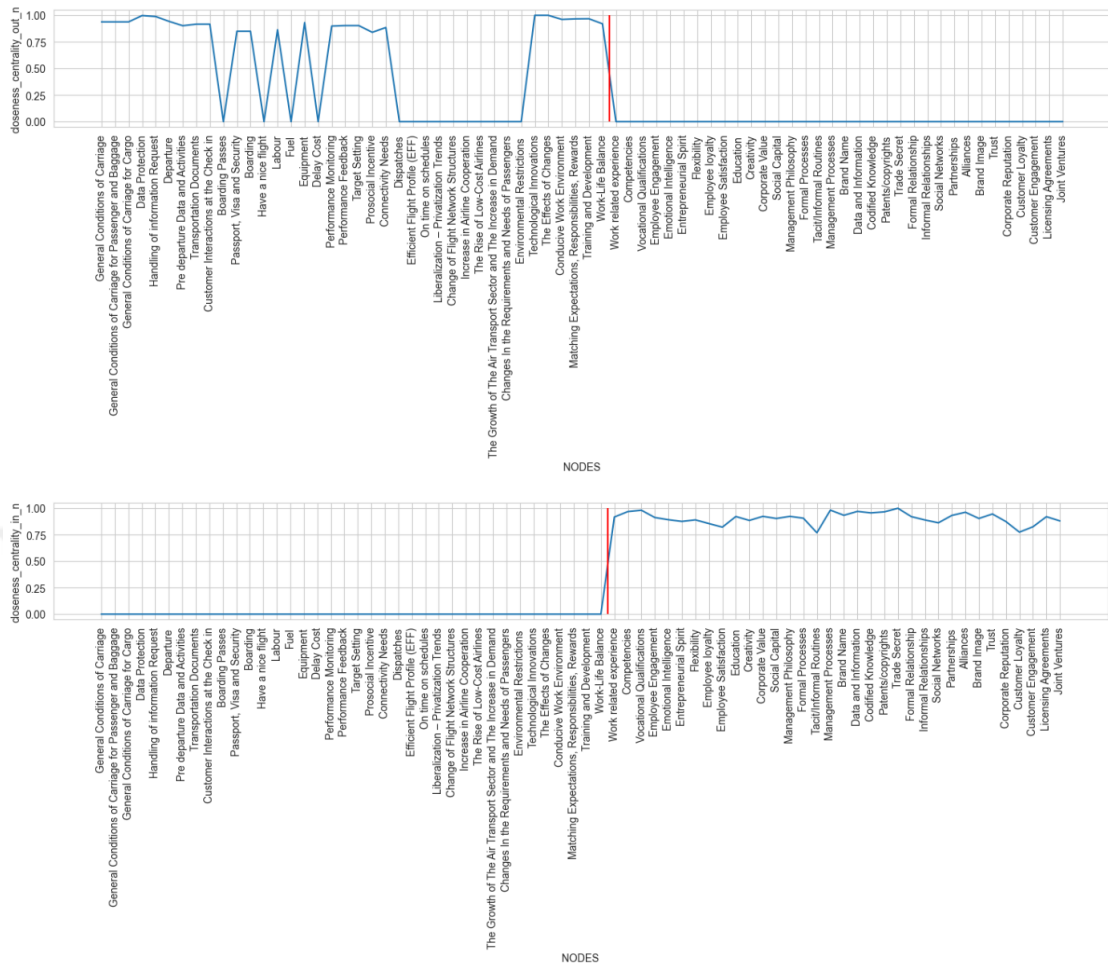


Diagram 11: Esenboğa TAV Technologies -In&Out Link Normalized Closeness Centrality

According to the Esenboğa TAV Technologies closeness centrality statistics, the most central node is “trade secret” according to in-link, and “Technological Innovations” according to out-link. Consideration is given to the distances between each node in a network. According to the closeness centrality computed by joining the network, in-link “#59 trade secret” is the hub of network “#32 Technological Innovations” for out-link. So, the effect of the digital transformation criteria on the intellectual capital is detailed. When it is referred as “trade secret” in influence at the centre of this network and “Technological Innovations” in support to other nodes. Other centrality can transfer considerably more rapidly than position-holding nodes since they have the quickest routes to knowledge. Thus, they have the benefit of rapidly disseminating information inside the network. While the most central node in out-link is the "Strengthen Networks" criterion, the most central node in in-link is the "Structural Capital" component.

Esenboğa PRIMECLASS

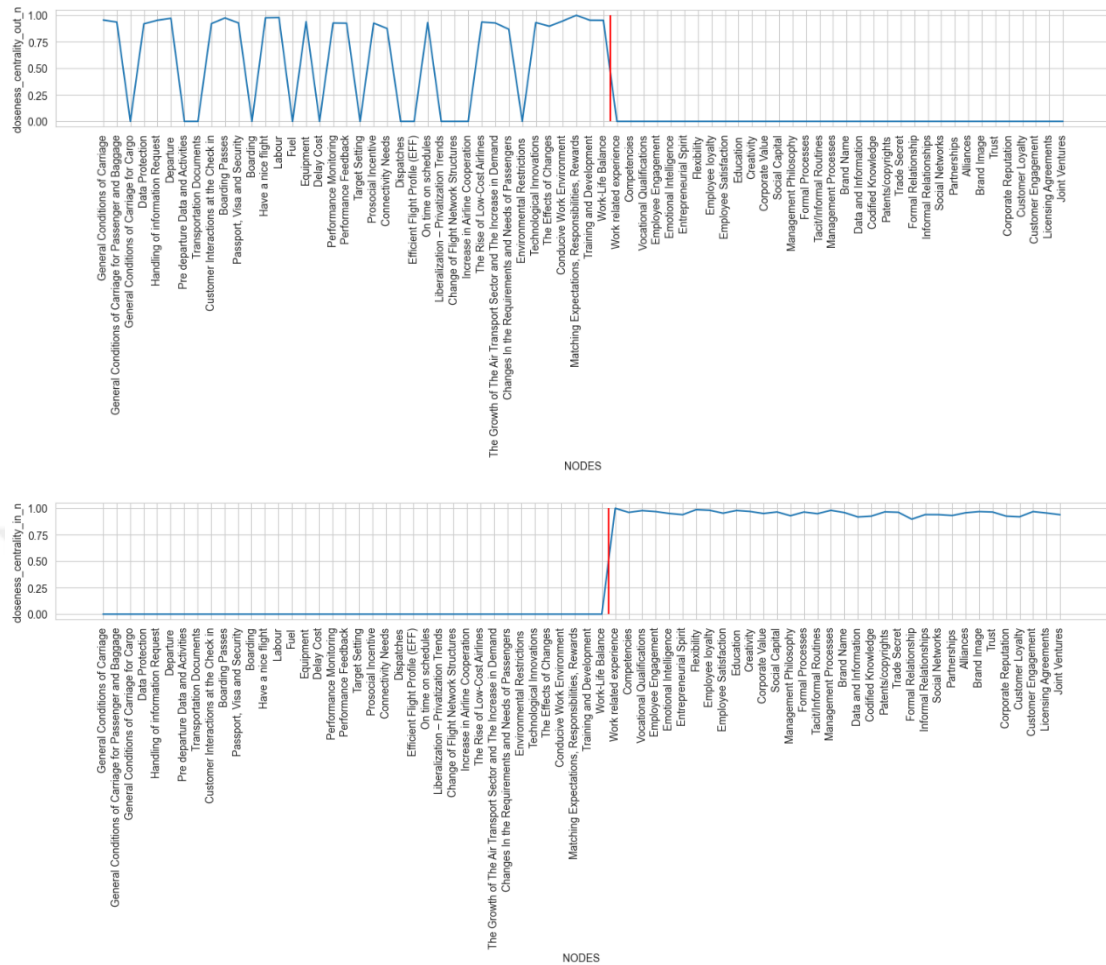


Diagram 12: Esenboğa PRIMECLASS -In&Out Link Normalized Closeness Centrality

According to the Esenboğa PRIMECLASS closeness centrality statistics, the most central node is “Work related experience” according to in-link, and “Matching Expectations, Responsibilities, Rewards” according to out-link. Consideration is given to the distances between each node in a network. According to the closeness centrality computed by joining the network, in-link “#38 Work related experience” is the hub of network “#35 Matching Expectations, Responsibilities, Rewards” for out-link. So, the effect of the digital transformation criteria on the intellectual capital is detailed. When it is referred as “Work related experience” in influence at the centre of this network and “atching Expectations, Responsibilities, Rewards” in support to other nodes. Other centrality can transfer considerably more rapidly than position-holding nodes since they have the quickest routes to knowledge. Thus, they have the benefit of rapidly disseminating information inside the network. While the most central node in out-link is

the "Increase Employee Retention" criterion, the most central node in in-link is the "Human Capital" component.

Esenboğa TAV Securities

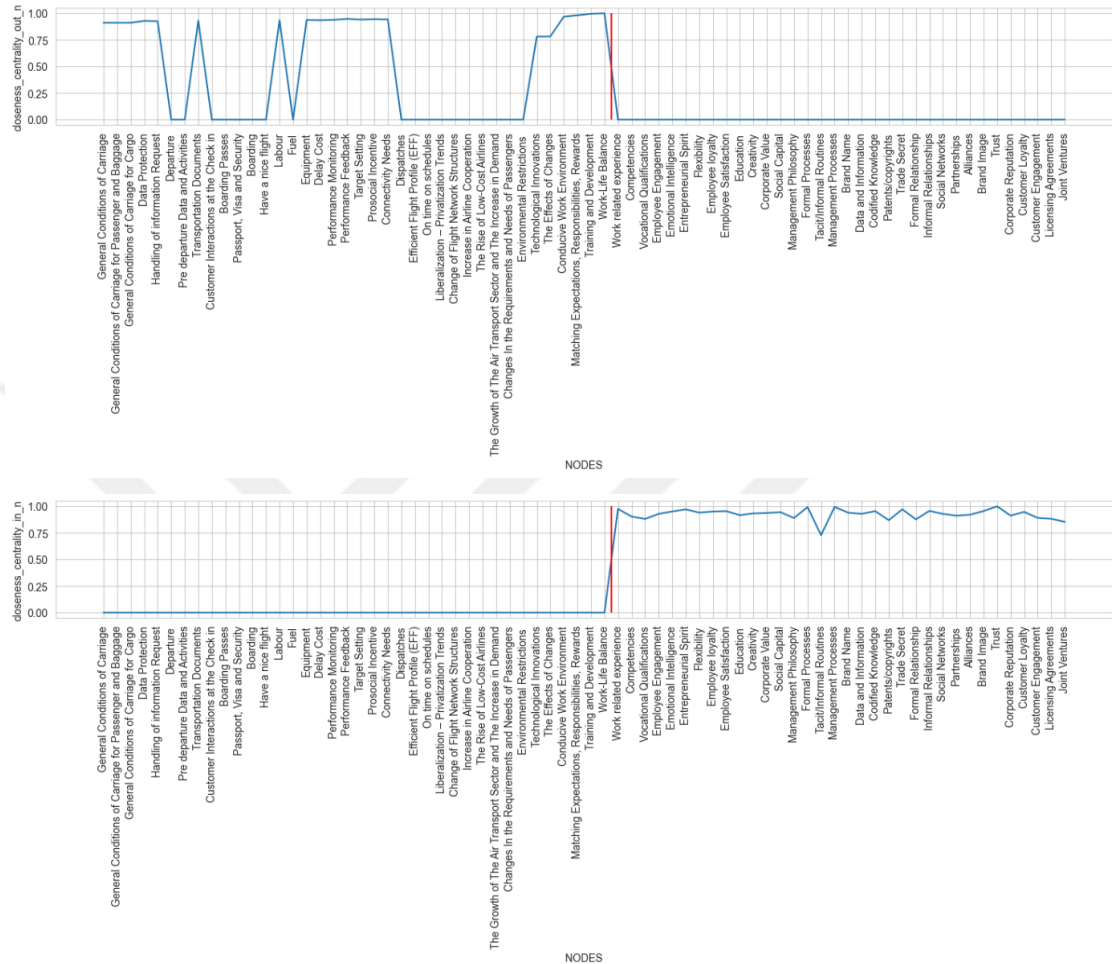


Diagram 13: Esenboğa TAV Securities -In&Out Link Normalized Closeness Centrality

According to the Esenboğa TAV Securities closeness centrality statistics, the most central node is “Trust” according to in-link, and “Work Life Balance” according to out-link. Consideration is given to the distances between each node in a network. According to the closeness centrality computed by joining the network, in-link “#66 Trust” is the hub of network “#37 Work Life Balance” for out-link. So, the effect of the digital tranformation criteria on the intellectual capital is detailed. When it is referred as “Trust” in influence at the centre of this network and “Work Life Balance” in support to other nodes. Other centrality can transfer considerably more rapidly than position-holding nodes since they have the quickest routes to knowledge. Thus, they have the benefit of rapidly disseminating information inside the network. While the most central node in

out-link is the "Increase Employee Retention" criterion, the most central node in in-link is the "Relational Capital" component.

Esenboğa HAVAŞ

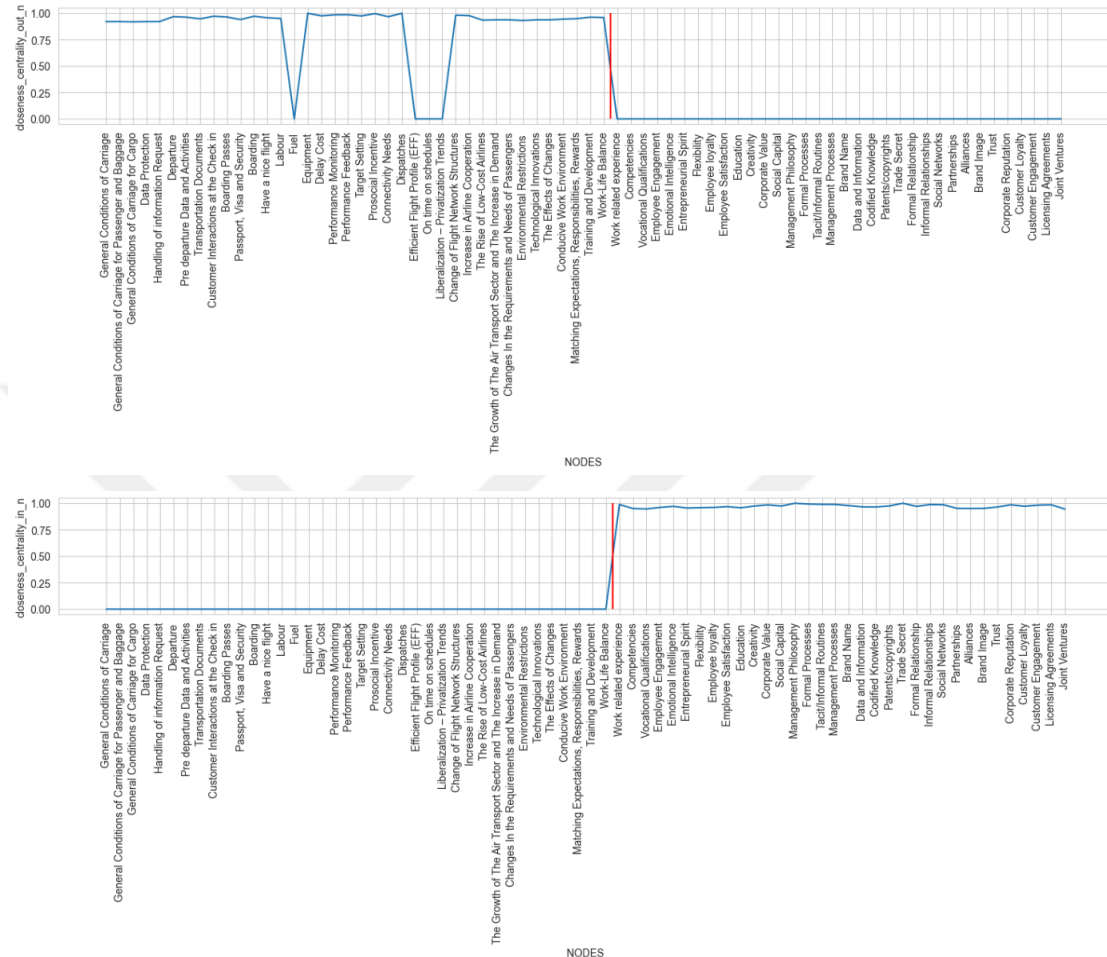


Diagram 14: Esenboğa HAVAŞ -In&Out Link Normalized Closeness Centrality

According to the Esenboğa HAVAŞ closeness centrality statistics, the most central node is “trade secret” according to in-link, and “Equipment” according to out-link. Consideration is given to the distances between each node in a network. According to the closeness centrality computed by joining the network, in-link “#59 trade secret” is the hub of network "#15 Equipment” for out-link. So, the effect of the digital transformation criteria on the intellectual capital is detailed. When it is referred as “trade secret” in influence at the centre of this network and “Equipment” in support to other nodes. Other centrality can transfer considerably more rapidly than position-holding nodes since they have the quickest routes to knowledge. Thus, they have the benefit of rapidly disseminating information inside the network. While the most central node in

out-link is the "Customer Services" criterion, the most central node in in-link is the "Structural Capital" component.

4.3.3 Eigenvector centrality

Eigenvector centrality identifies the significant user as the one who is linked to other significant users in the network. For a more nuanced look at centrality, consider eigenvector centrality. Vertex with few connections could have a high eigenvector centrality if their connections all go to highly connected vertices. With eigenvector centrality, some edges are more valuable to connect to than others, and the value of a connection can vary (Pfeffer, 2014).

How important a given node is to the overall network structure can be quantified using eigenvector centrality. All the nodes in the network are given relative scores based on the idea that a node's score benefits more from links to higher-scoring nodes than to links to lower-scoring ones. This metric assesses how strongly linked a given node is to other nodes. The eigenvector centrality index shows how the relative importance of different nodes in a network change depending on the type of link between them (Gürsakal, 2009).

If it is only looked at measures of a network's centrality, betweenness, or closeness, it might be as well not even notice some people exist. But if it turns out they know some powerful people, they could really make a difference. While remaining covert, they are able to leverage the influence of their connections to accomplish their goals. To determine eigenvector centrality, it has to be first determined the largest eigenvalue in the pairwise adjacency matrix of the graph, and then select the eigenvector corresponding to that eigenvalue (Al-Taie & Kadry 2017).

An individual node's contribution to the network's eigenvector centrality is greater if it has a smaller but higher quality link count than if it has a larger but lower quality link count. The eigenvector centrality of the node with high value added and many average connections (Gürsakal, 2009). In summary, a node's importance depends not only on the number of its neighbours, but also on the number of its influential neighbours. That is, the most prestigious node is discovered.

Esenboğa TAV Head Office

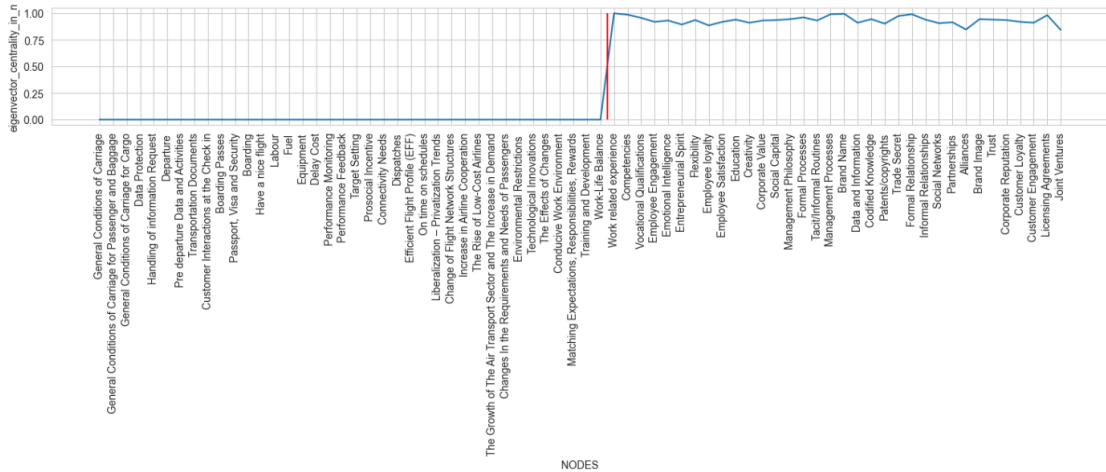


Diagram 21: Esenboğa TAV Hq- In&Out Link Normalized Eigenvector Centrality

Since the eigenvalue is determined only according to the edge coming to the node, the most prestigious node from the Esenboğa TAV Head Office results according to the in-link is “work related experience”.

Esenboğa TAV Finance Department

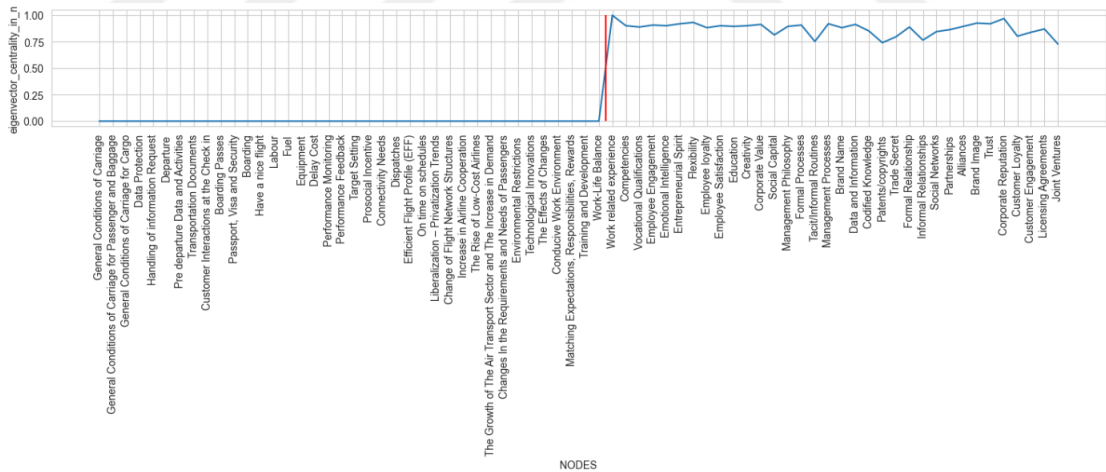


Diagram 22: Esenboğa TAV Finance- In&Out Link Normalized Eigenvector Centrality

Since the eigenvalue is determined only according to the edge coming to the node, the most prestigious node from the Esenboğa TAV Finance results according to the in-link is “work related experience”.

Esenboğa TAV Logistics Department

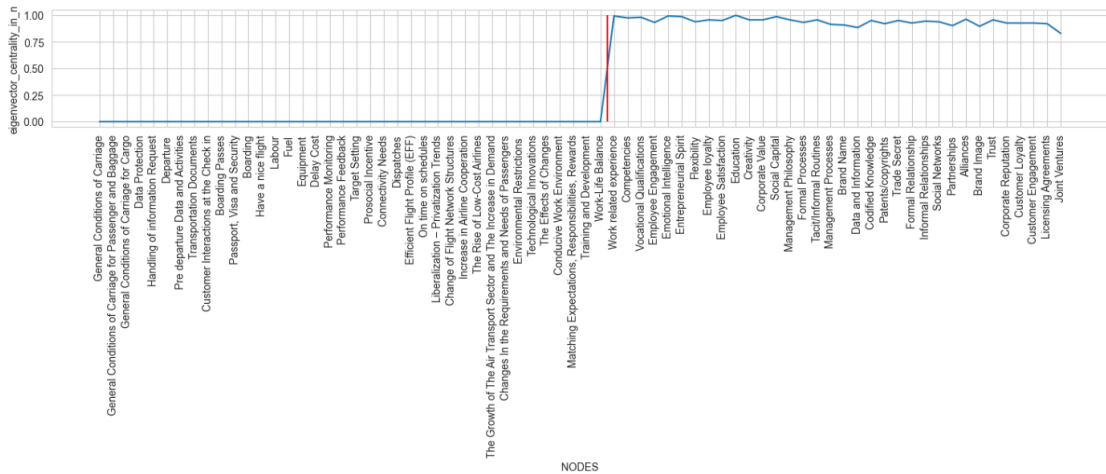


Diagram 23: Esenboğa TAV Logistic Department- In&Out Link Normalized Eigenvector Centrality

Since the eigenvalue is determined only according to the edge coming to the node, the most prestigious node from the Esenboğa TAV Logistic department results according to the in-link is “Education”.

Esenboğa TAV Technologies

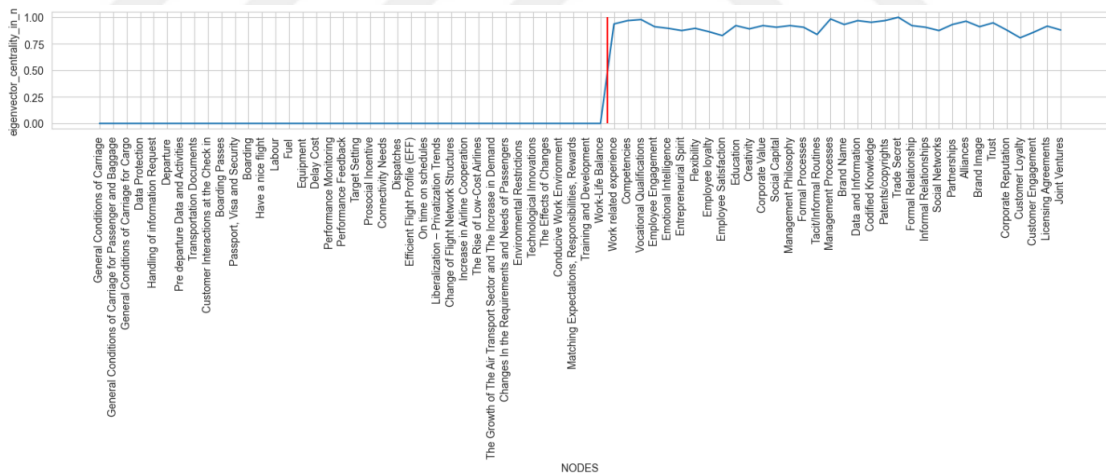


Diagram 24: Esenboğa TAV Technologies- In&Out Link Eigenvector Eigenvector Centrality

Since the eigenvalue is determined only according to the edge coming to the node, the most prestigious node from the Esenboğa TAV Technologies results according to the in-link is “Trade Secret”.

Esenboğa PRIMECLASS

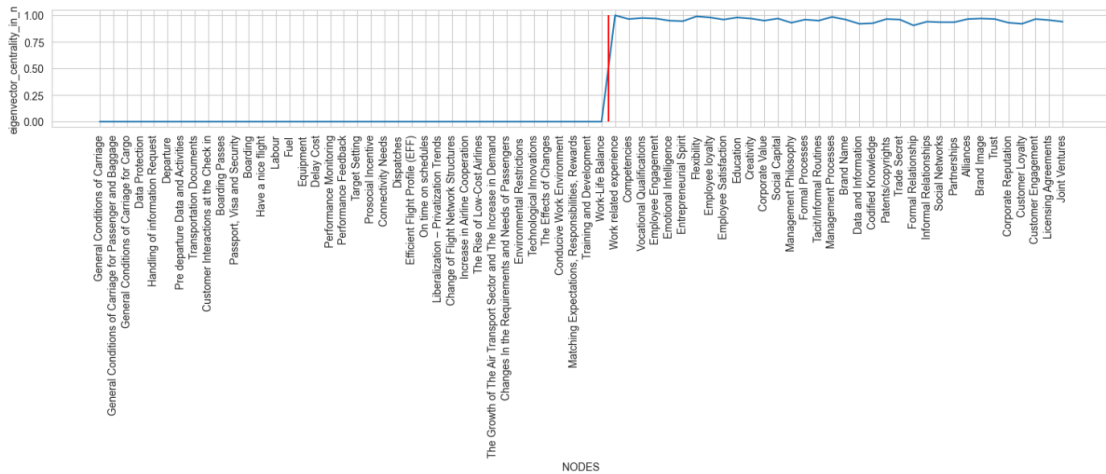


Diagram 25: Esenboğa PRIMECLASS - In&Out Link Eigenvector Centrality

Since the eigenvalue is determined only according to the edge coming to the node, the most prestigious node from the Esenboğa PRIMECLASS results according to the in-link is “Work related experience”.

Esenboğa TAV Securities

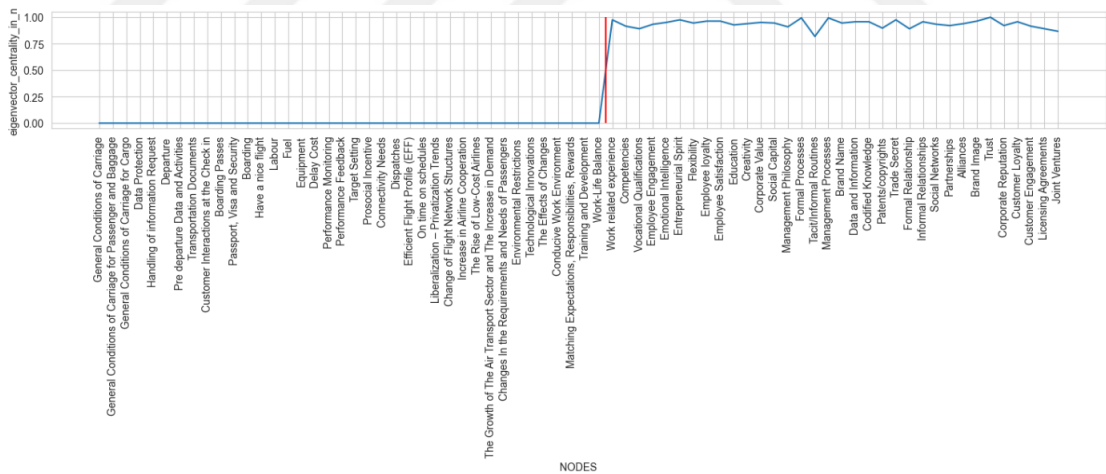


Diagram 26: Esenboğa TAV Security - In&Out Link Eigenvector Centrality

Since the eigenvalue is determined only according to the edge coming to the node, the most prestigious node from the Esenboğa TAV Security results according to the in-link is “Trust”.

Esenboğa HAVAŞ

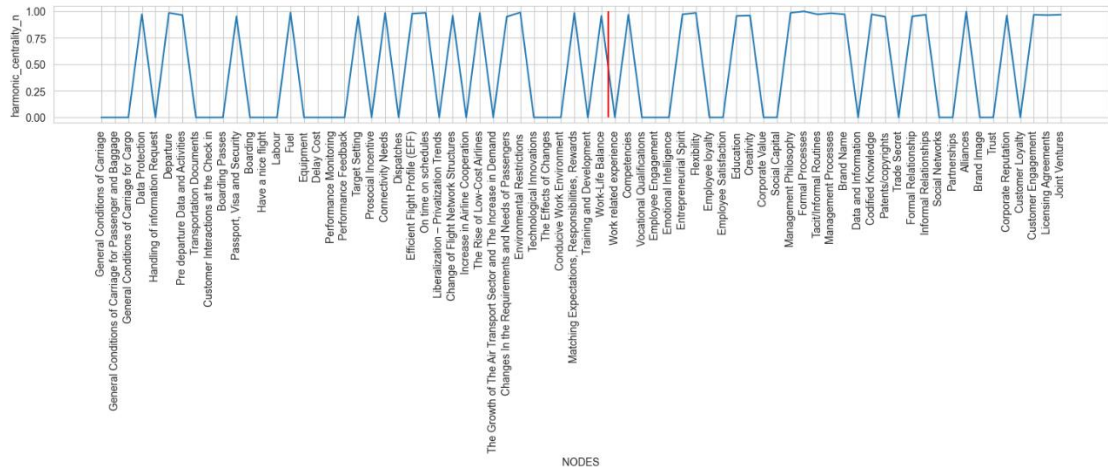


Diagram 27: Esenboğa HAVAŞ - In&Out Link Eigenvector Centrality

Since the eigenvalue is determined only according to the edge coming to the node, the most prestigious node from the Esenboğa HAVAŞ results according to the in-link is “Trade Secret”.

4.3.4 Betweenness centrality

Betweenness centrality refers to an actor's significance as a link between several networks within the network theory. It represents the number of times an actor needs to pass across a specific actor to reach another actor. Because they serve as significant hubs connecting numerous people and groups, nodes with high betweenness centrality exert tremendous influence over the flow of information. Betweenness centrality identifies which nodes are likely information channels and can be used to predict how a graph would fragment when nodes are removed (Borgatti, 2005).

In a similar vein, it's a technique for pinpointing individuals who serve as bridges (also known as boundary spanners) between isolated parts of a graph. This measure focuses on the importance that an actor might obtain being in the middle of social communications of a network and to what extent in a society he/she is needed as a link in the chain of connections (Borgatti, 2005).

As a result of their command over the flow of information between nodes in the network, vertices with high betweenness centrality have considerable sway in the organization. – They are able to view the messages as they move along, and they may receive compensation for conveying the information to the next person. As a result, they

have a great deal of authority, as the breakdown of communication would result in their dismissal. The betweenness of two vertices in a graph is a measurement of how essential those vertices are to the graph. The purpose of analysing someone's betweenness is to discover the degree to which they are in a transitional or connecting role between two or more other people (Betweenness Centrality, 2022).

While degree and closeness centralities are based on the concept of the person's reachability, betweenness centrality, on the other hand, relies on the idea that a person is more important if he/she is more intermediary in the network. This measure is based on the notion of geodesics, which means that an actor can become more important in the network if he/she is situated on the geodesics between many pairs of actors in the network. Nodes that occur on many shortest paths between other nodes in the graph have a high betweenness centrality score (Al-Taie & Kadry 2017). Betweenness centrality considers the node with the highest number of shortest paths between pairs of nodes (that run through that node) as the most important individual in a network. The measure of centrality is interpreted as the power of an organization. Betweenness centrality measure is typically linked to critical mass. Targeting those with high betweenness centralities in the network is a good strategy for launching a successful innovation. It indicates how effective a node is in controlling the flow of information in the network.

Esenboğa TAV Head Office

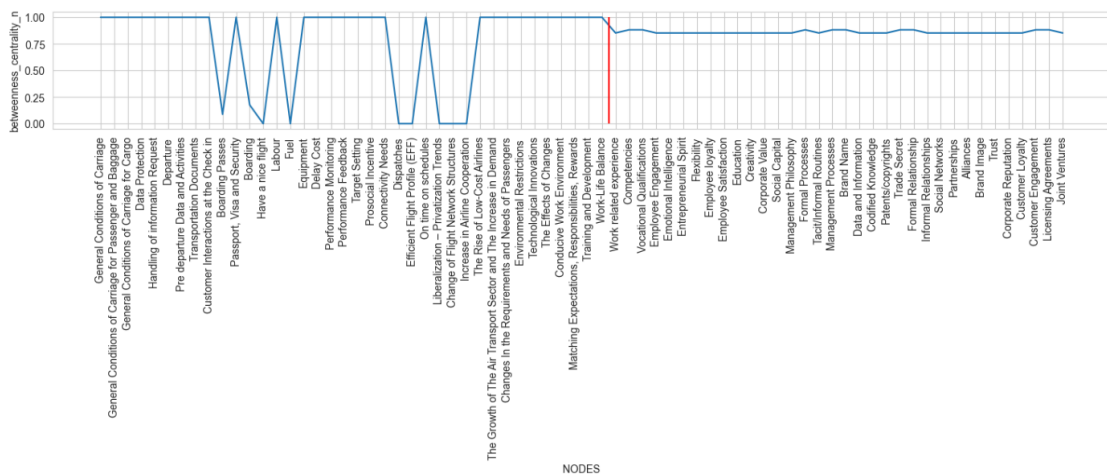


Diagram 28: Esenboğa TAV Hq. Betweenness centrality

According to the findings of Esenboğa TAV Head Office., the network nodes with the greatest betweenness measurements are 0#General Conditions of Carriage, 1#General Conditions of Carriage for Passenger and Baggage, 2#General Conditions of Carriage for

Cargo, 3#Data Protection, 4#Handling of information Request, 5#Departure, 6#Pre departure Data and Activities, 7#Transportation Documents, 8#Customer Interactions at the Check in, 10#Passport, Visa and Security, 13#Labour, 15#Equipment, 16#Delay Cost, 17#Performance Monitoring, 18#Performance Feedback, 19#Target Setting, 20#Prosocial Incentive, 21#Connectivity Needs, 24#On time on schedules, 28#The Rise of Low-Cost Airlines, 29#The Growth of The Air Transport Sector and The Increase in Demand, 30#Changes In the Requirements and Needs of Passengers, 31#Environmental Restrictions, 32#Technological Innovations,33#The Effects of Changes, 34#Conductive Work Environment, 35#Matching Expectations, Responsibilities, Rewards, 36#Training and Development, 37#Work-Life Balance. These are the most key players in the information flow.

Esenboğa TAV Finance Department.

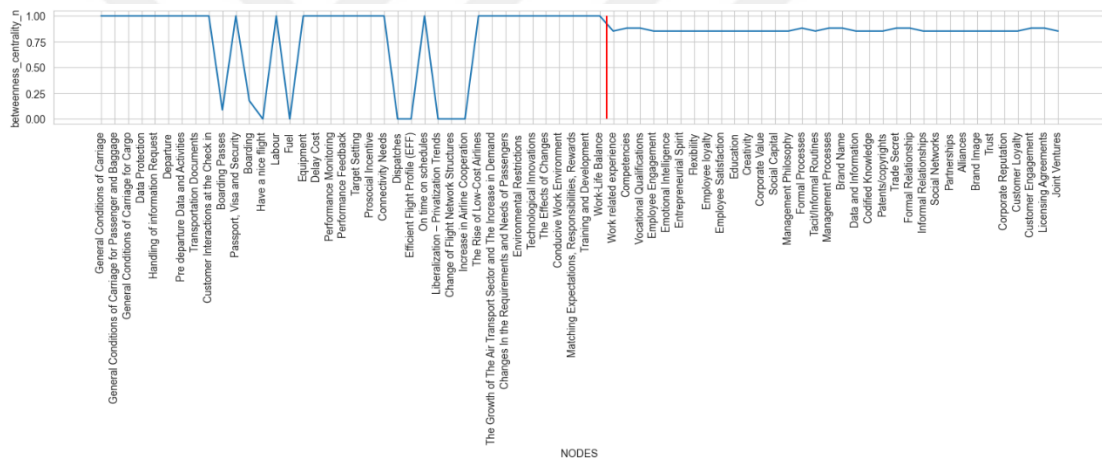


Diagram 29: Esenboğa TAV Finance Department Betweenness centrality

According to the findings of Esenboğa TAV Finance Department, the network nodes with the greatest betweenness measurements are 0#General Conditions of Carriage, 1#General Conditions of Carriage for Passenger and Baggage, 2#General Conditions of Carriage for Cargo, 4#Handling of information Request, 7#Transportation Documents, 16#Delay Cost, 17#Performance Monitoring,18#Performance Feedback, 19#Target Setting, 20#Prosocial Incentive, 22#Dispatches, 29#The Growth of The Air Transport Sector and The Increase in Demand, 31#Environmental Restrictions, 32#Technological Innovations, 33#The Effects of Changes, 34#Conductive Work Environment, 35#Matching Expectations, Responsibilities, Rewards, 36#Training and Development, 37#Work-Life Balance. These are the most key players in the information flow.

Esenboğa TAV Logistics Department.

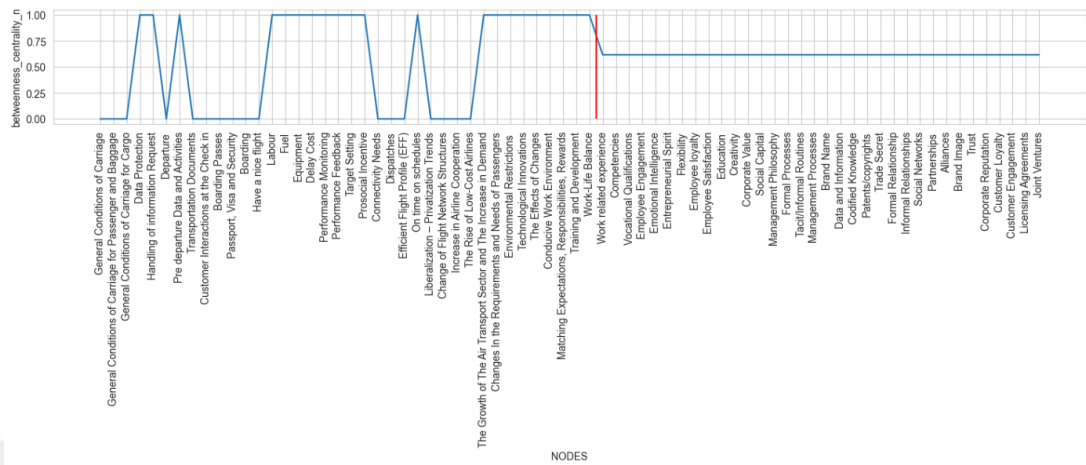


Diagram 30: Esenboğa TAV Logistics Department Betweenness centrality

According to the findings of Esenboğa TAV Logistic Department., the network nodes with the greatest betweenness measurements are 3#Data Protection, 4#Handling of information Request, 6#Pre departure Data and Activities,13#Labour, 14#Fuel, 15#Equipment, 16#Delay Cost, 17#Performance Monitoring, 18#Performance Feedback, 19#Target Setting, 20#Prosocial Incentive, 24#On time on schedules, 29#The Growth of The Air Transport Sector and The Increase in Demand, 30#Changes in the Requirements and Needs of Passengers, 31#Environmental Restrictions, 32#Technological Innovations, 33#The Effects of Changes, 34#Conducive Work Environment, 35#Matching Expectations, Responsibilities, Rewards, 36#Training and Development, 37#Work-Life Balance These are the most key players in the information flow.

Esenboğa TAV Technologies

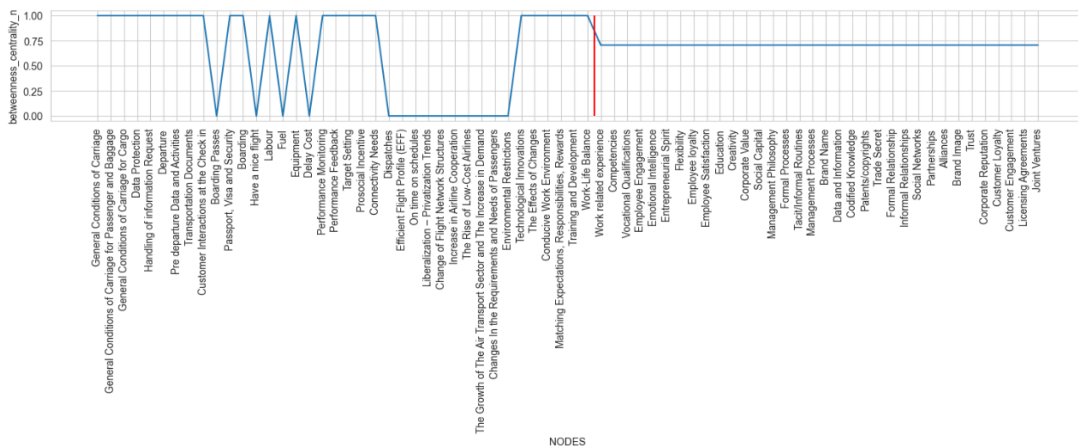


Diagram 31: Esenboğa TAV Technologies Betweenness centrality

According to the findings of Esenboğa TAV Technologies, the network nodes with the greatest betweenness measurements are 0#General Conditions of Carriage,1#General Conditions of Carriage for Passenger and Baggage, 2#General Conditions of Carriage for Cargo, 3#Data Protection, 4#Handling of information Request,5#Departure,6#Pre departure Data and Activities,7#Transportation Documents, 8#Customer Interactions at the Check in, 10#Passport, Visa and Security, 11#Boarding, 13#Labour, 15#Equipment, 17#Performance Monitoring, 18#Performance Feedback, 19#Target Setting, 20#Prosocial Incentive, 21#Connectivity Needs, 32#Technological Innovations, 33#The Effects of Changes, 34#Conducive Work Environment, 35#Matching Expectations, Responsibilities, Rewards, 36#Training and Development, 37#Work-Life Balance. These are the most key players in the information flow.

PRIMECLASS

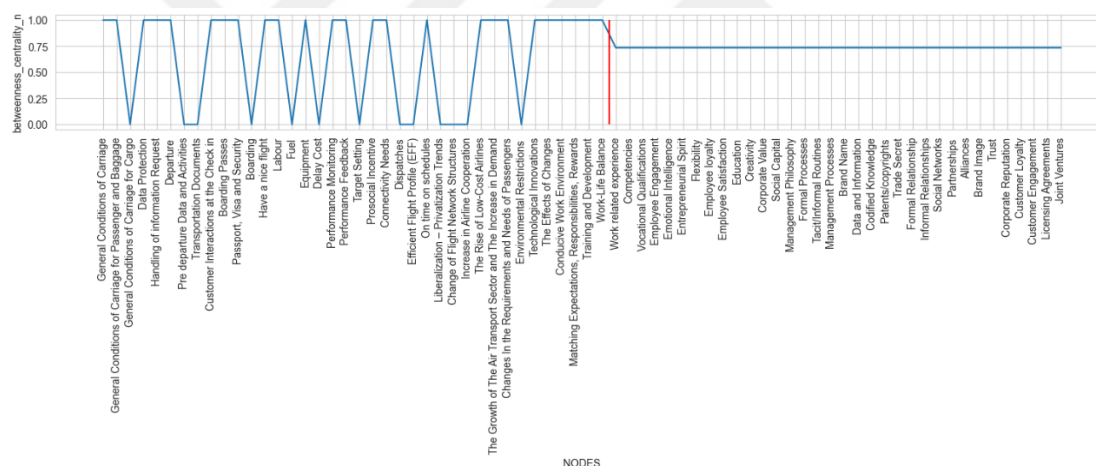


Diagram 32: PRIMECLASS Betweenness centrality

According to the findings of Esenboğa PRIMECLASS, the network nodes with the greatest betweenness measurements are 0#General Conditions of Carriage, 1#General Conditions of Carriage for Passenger and Baggage, 3#Data Protection, 4#Handling of information Request, 5#Departure, 8#Customer Interactions at the Check in, 9#Boarding Passes, 10#Passport, Visa and Security, 12#Have a nice flight, 13#Labour, 15#Equipment, 17#Performance Monitoring, 18#Performance Feedback, 20#Prosocial Incentive, 21#Connectivity Needs, 24#On time on schedules, 28#The Rise of Low-Cost Airlines, 29#The Growth of The Air Transport Sector and The Increase in Demand, 30#Changes In the Requirements and Needs of Passengers, 32#Technological

Innovations, 33#The Effects of Changes, 34#Conducive Work Environment, 35#Matching Expectations, Responsibilities, Rewards,36#Training and Development, 37#Work-Life Balance. These are the most key players in the information flow.

TAV Securities

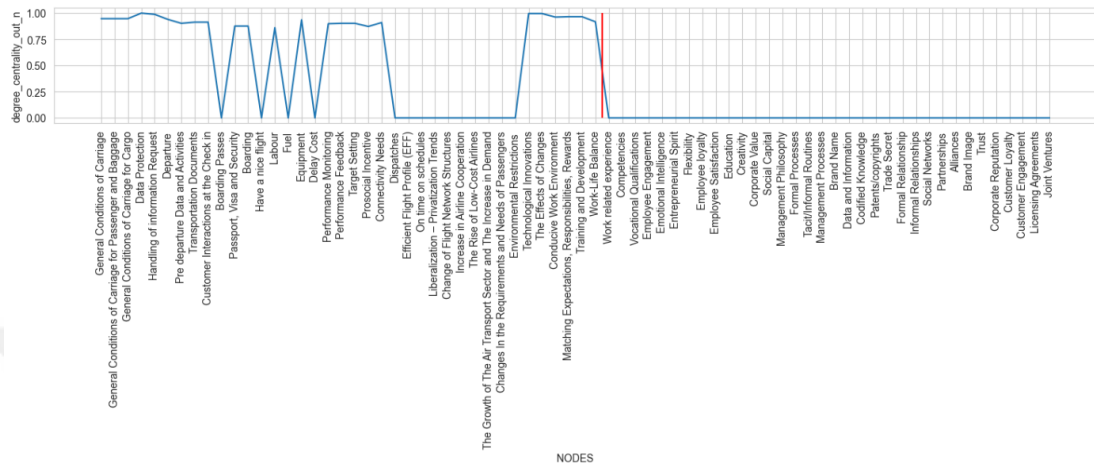


Diagram 33: Esenboğa TAV Securities Betweenness centrality

According to the findings of Esenboğa TAV Securities, the network nodes with the greatest betweenness measurements are 0#General Conditions of Carriage, 1#General Conditions of Carriage for Passenger and Baggage, 2#General Conditions of Carriage for Cargo, 3#Data Protection, 4#Handling of information Request,7#Transportation Documents, 13#Labour, 15#Equipment, 16#Delay Cost, 17#Performance Monitoring, 18#Performance Feedback, 19#Target Setting, 20#Prosocial Incentive, 21#Connectivity Needs, 32#Technological Innovations, 33#The Effects of Changes, 34#Conducive Work Environment, 35#Matching Expectations, Responsibilities, Rewards, 36#Training and Development, 37#Work-Life Balance

Esenboğa HAVAS

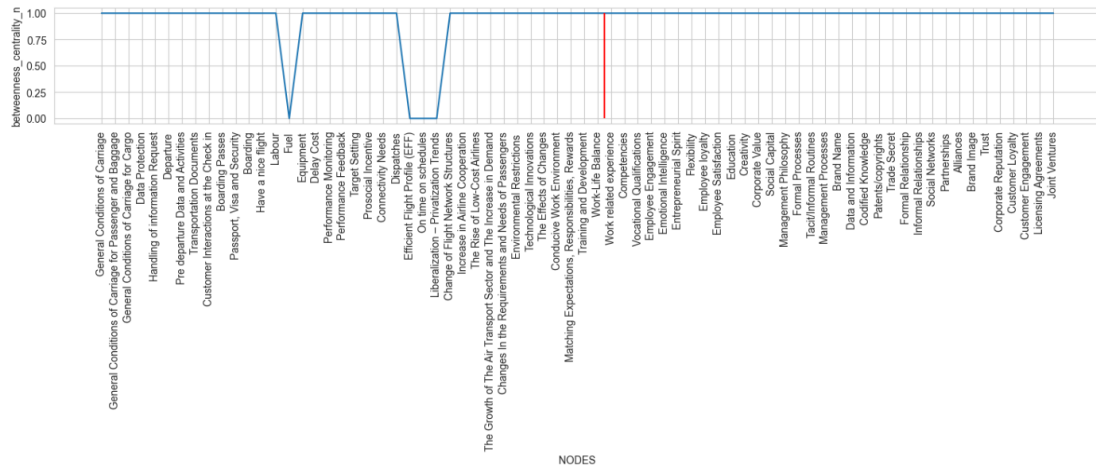


Diagram 34: Esenboğa TAV Finance Department Betweenness centrality

According to the Esenboğa HAVAS results, all nodes except 14#Fuel, 23#Efficient Flight Profile (EFF), 24# On time on schedules, 25#Liberalization – Privatization Trends have the highest betweenness measures in the network. These are nodes that are highly passive and uninterested in the information flow. TAV Holding and each of its subsidiaries have a tight network in terms of density, according to Betweenness. Each corporation is considered to be powerful in terms of how digital transformation criteria affects intellectual capital since there is a notion called “POWER” that can be quantified by comparisons, but HAVAS is the most powerful.

4.3.5 Network graph

Network Graph provides the visualisation and analysis of the relationships between entities, where an item may be a person, an event, a transaction, a car, or any other type of object. Entities are represented as nodes, and the linkages between them indicate the relationships between them. A network graph is a useful tool for answering issues about the identification and comprehension of how and whether items are related.

Network (knowledge) graphs describe a collection of interconnected items structured by linking and semantic information into contexts. They develop a data integration and analysis framework. This capability can give more context for measurements recorded by a network system. By utilising these graphs, you may improve your comprehension of the data. Therefore, the entire structure of Network is

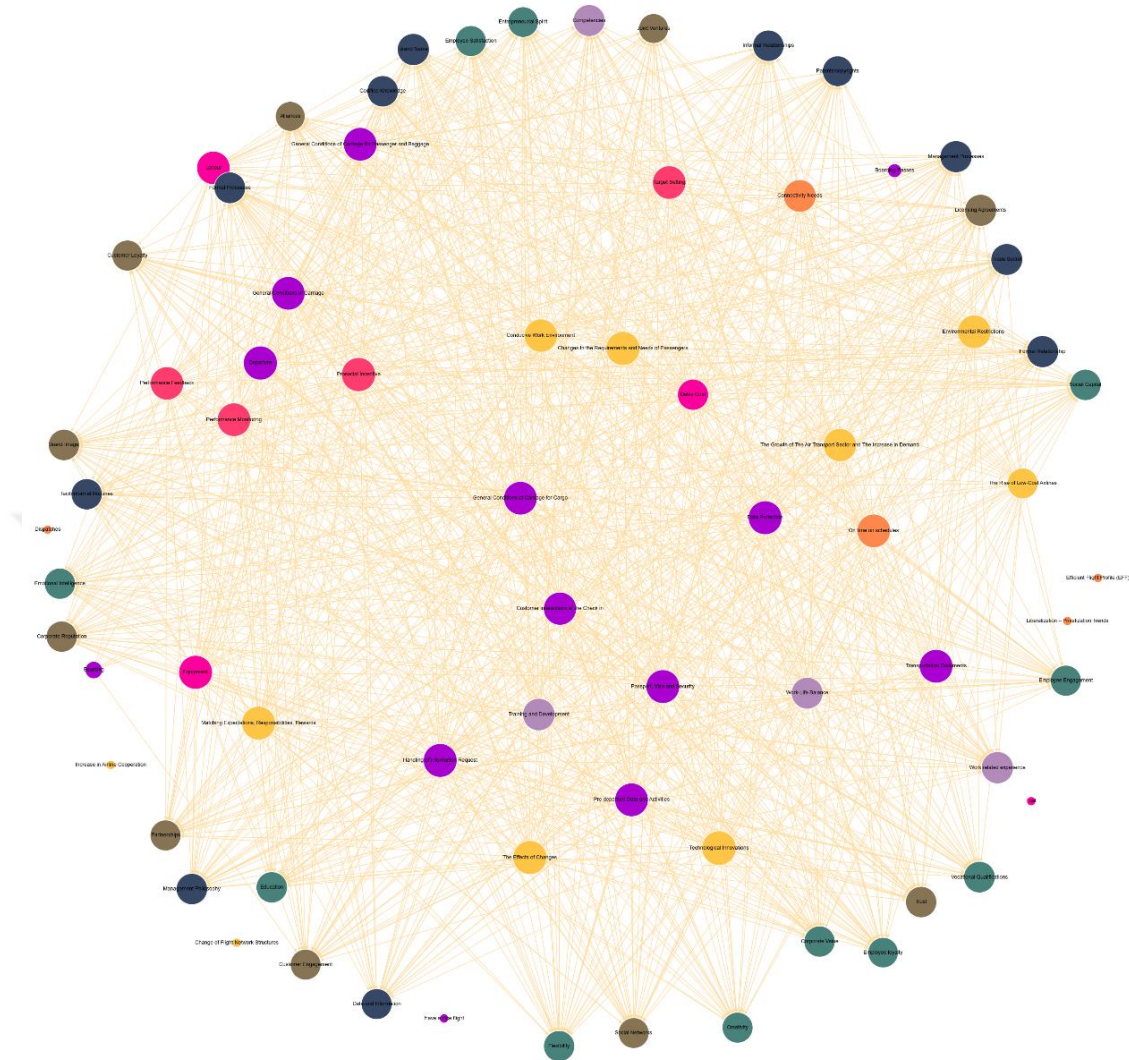
comprehended by measuring characteristics such as connectedness, density, distribution, and clustering.

Intelligence analysis (e.g., one individual is an acquaintance of a suspect or known criminal), fraud detection (e.g., many persons used the same social security number), and many others benefit greatly from network graphs. NetworkX offers data structures and storage mechanisms for graphs. All NetworkX graph types let (hashable) Python objects to be used as nodes, and any Python object can be assigned to an edge attribute.

The network graph of the non-linear relational influence of airport digital transformation criteria on intellectual capital components from the standpoint of each decision maker is explored in this section.



Esenboğa TAV Head Office



Graph 1: Esenboğa TAV Hq Network Visualization

Examining the network analysis of the Esenboğa TAV Head Office reveals that it is directed, as seen in graph 1 (The legible version of graph is in the appendix 1). The source nodes are more centrally positioned, whereas the destination nodes are more peripherally located. Both, because this is a weighted network, it can be observed that the influencer and support nodes, which are also significant and crucial, are larger. Nodes that have no relationships or are classified as flaneurs are similarly located on the periphery and are extremely tiny. When the network is shown, it can be observed that nearly all nodes have a very one-directional, dense, and tightly coupled interaction with one another. This also suggests that the network is quite resilient.

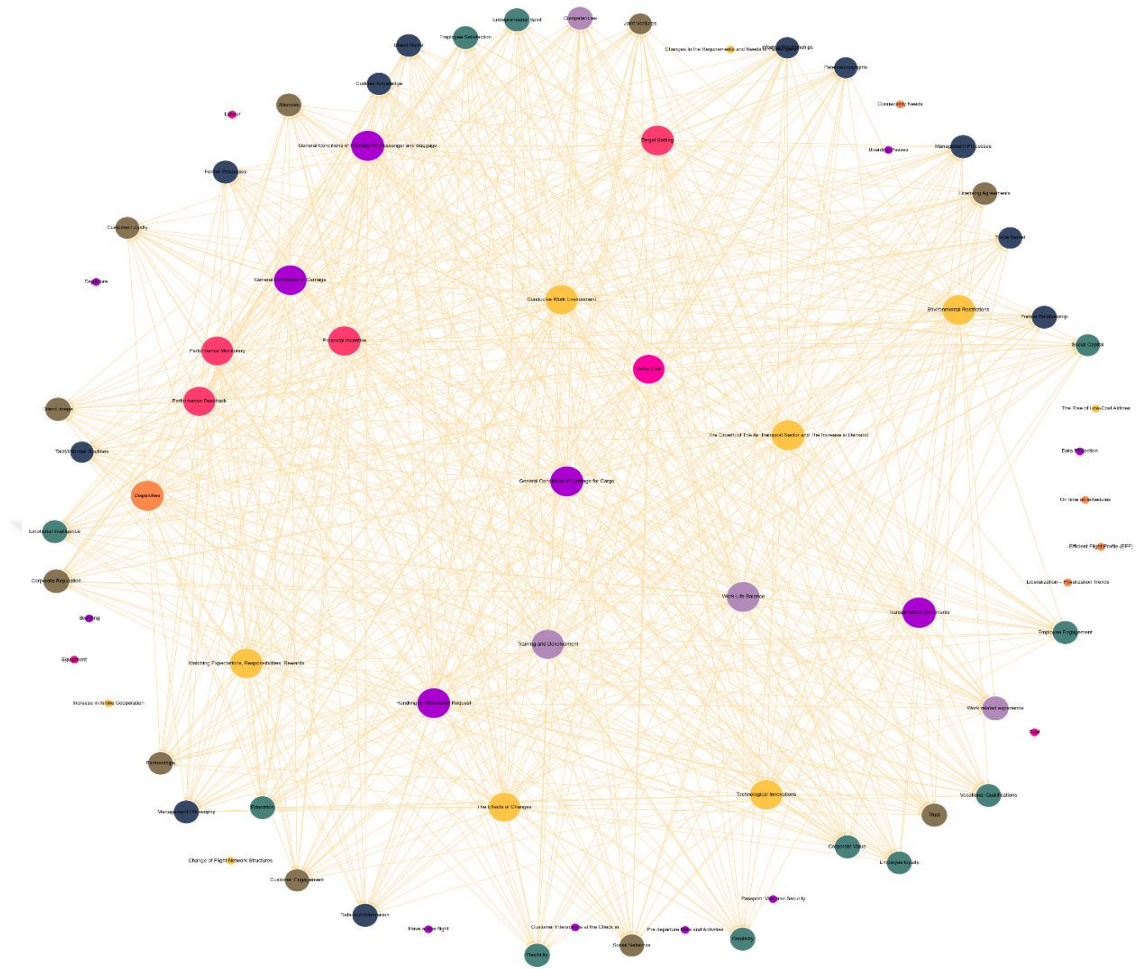
Table 2: TAV Hq's Modularity, Community Detection, and Vote Rank Distribution

	Unnamed: 0	modularity	community_detection	vote_rank
0	General Conditions of Carriage	3	12	1
1	General Conditions of Carriage for Passenger and Baggage	3	12	1
2	General Conditions of Carriage for Cargo	3	12	1
3	Data Protection	3	10	1
4	Handling of information Request	1	10	1
5	Departure	1	11	1
6	Pre departure Data and Activities	1	10	1
7	Transportation Documents	1	10	1
8	Customer Interactions at the Check in	1	12	1
9	Boarding Passes	2	1	0
10	Passport, Visa and Security	2	10	1
11	Boarding	3	2	0
12	Have a nice flight	4	3	0
13	Labour	2	1	1
14	Fuel	5	4	0
15	Equipment	1	11	1
16	Delay Cost	1	12	1
17	Performance Monitoring	2	12	1
18	Performance Feedback	1	10	0
19	Target Setting	1	11	0
20	Prosocial Incentive	1	12	0
21	Connectivity Needs	2	12	0
22	Dispatches	6	5	0
23	Efficient Flight Profile (EFF)	7	6	0
24	On time on schedules	3	11	0
25	Liberalization – Privatization Trends	8	7	0
26	Change of Flight Network Structures	9	8	0
27	Increase in Airline Cooperation	10	9	0
28	The Rise of Low-Cost Airlines	2	1	0
29	The Growth of The Air Transport Sector and The Increase in Demand	1	10	0
30	Changes In the Requirements and Needs of Passengers	1	12	0
31	Environmental Restrictions	2	1	0
32	Technological Innovations	2	1	0
33	The Effects of Changes	3	11	0
34	Conducive Work Environment	2	11	0
35	Matching Expectations, Responsibilities, Rewards	1	11	0
36	Training and Development	2	1	0
37	Work-Life Balance	2	1	0
38	Work related experience	2	1	0
39	Competencies	2	1	0
40	Vocational Qualifications	2	1	0
41	Employee Engagement	2	1	0
42	Emotional Intelligence	2	1	0
43	Entrepreneurial Spirit	2	10	0
44	Flexibility	2	11	0
45	Employee loyalty	2	10	0

46	Employee Satisfaction	2	12	0
47	Education	1	11	0
48	Creativity	3	11	0
49	Corporate Value	2	1	0
50	Social Capital	1	12	0
51	Management Philosophy	1	10	0
52	Formal Processes	3	2	0
53	Tacit/Informal Routines	1	10	0
54	Management Processes	3	2	0
55	Brand Name	3	2	0
56	Data and Information	1	10	0
57	Codified Knowledge	3	10	0
58	Patents/copyrights	1	11	0
59	Trade Secret	3	2	0
60	Formal Relationship	3	2	0
61	Informal Relationships	1	12	0
62	Social Networks	1	12	0
63	Partnerships	1	12	0
64	Alliances	1	12	0
65	Brand Image	1	10	0
66	Trust	3	10	0
67	Corporate Reputation	3	12	0
68	Customer Loyalty	1	10	0
69	Customer Engagement	3	2	0
70	Licensing Agreements	2	1	0
71	Joint Ventures	2	11	0

TAV Head Office’s modularity, community detection, and vote rank are detailed in Table 2. The network has a sophisticated topology, as shown in Table 2, which will be discussed in further depth in the following sections.

Esenboğa TAV Finance Department



Graph 2: Network Visualization of Raw Data of Esenboğa TAV Finance Department

Examining the network analysis of the Esenboğa TAV Finance Department reveals that it is directed, as seen in graph 2 (The legible version of graph is in the appendix 2). The source nodes are more centrally positioned, whereas the destination nodes are more peripherally located. Both, because this is a weighted network, it can be observed that the influencer and support nodes, which are also significant and crucial, are larger. Nodes that have no relationships or are classified as flaneurs are similarly located on the periphery and are extremely tiny. When the network is shown, it can be observed that nearly all nodes have a very one-directional, dense, and tightly coupled interaction with one another. This also suggests that the network is quite resilient.

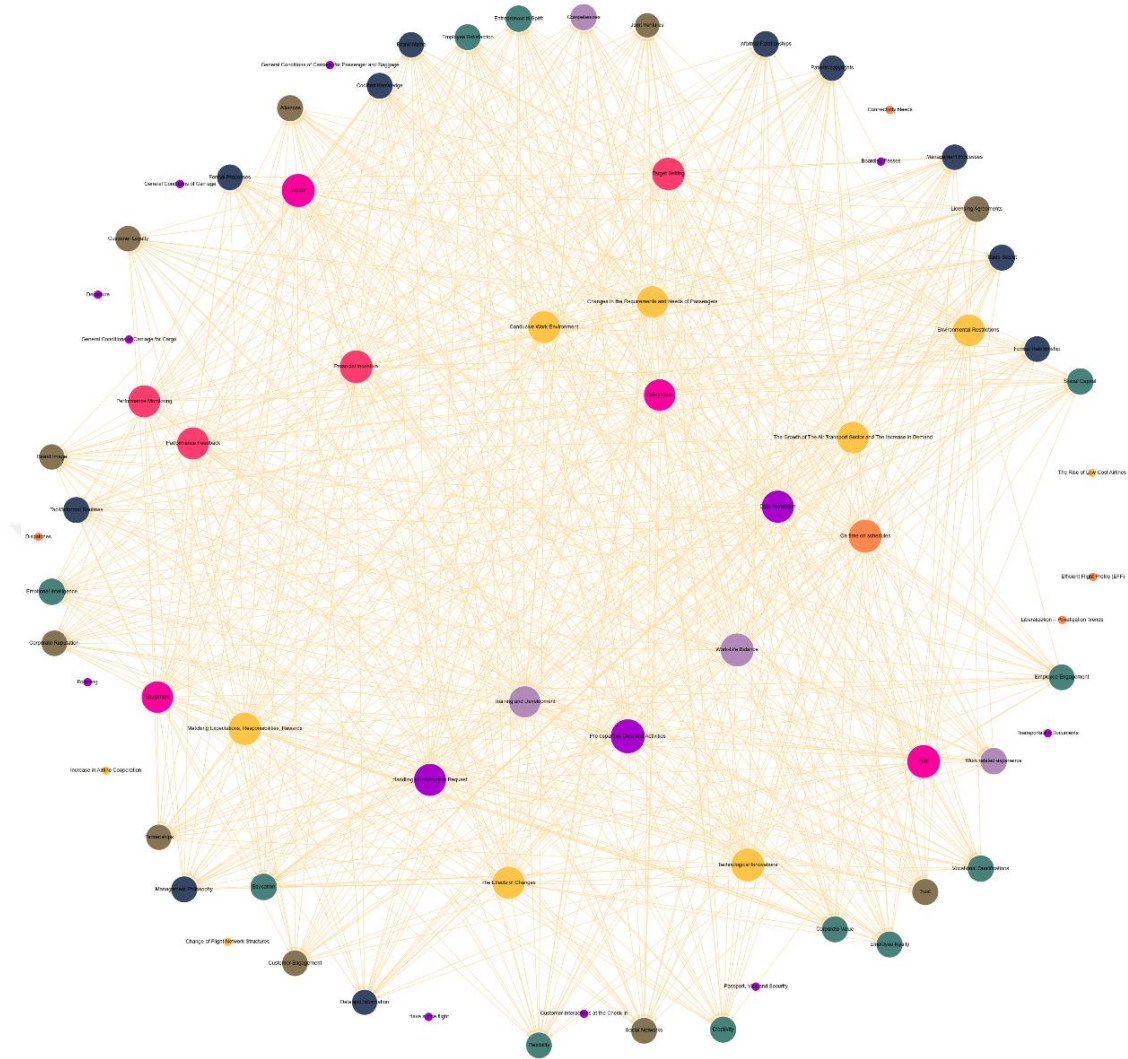
Table 3: Esenboğa TAV Finance Department modularity, community detection, and vote rank distribution

	Unnamed: 0	modularity	community_detection	vote_rank
0	General Conditions of Carriage	3	22	1
1	General Conditions of Carriage for Passenger and Baggage	3	22	1
2	General Conditions of Carriage for Cargo	3	22	1
3	Data Protection	4	1	0
4	Handling of information Request	2	22	1
5	Departure	5	2	0
6	Pre departure Data and Activities	6	3	0
7	Transportation Documents	3	24	1
8	Customer Interactions at the Check in	7	4	0
9	Boarding Passes	8	5	0
10	Passport, Visa and Security	9	6	0
11	Boarding	10	7	0
12	Have a nice flight	11	8	0
13	Labour	12	9	0
14	Fuel	13	10	0
15	Equipment	14	11	0
16	Delay Cost	1	24	1
17	Performance Monitoring	1	24	1
18	Performance Feedback	2	22	1
19	Target Setting	2	22	1
20	Prosocial Incentive	2	20	0
21	Connectivity Needs	15	12	0
22	Dispatches	1	24	0
23	Efficient Flight Profile (EFF)	16	13	0
24	On time on schedules	17	14	0
25	Liberalization – Privatization Trends	18	15	0
26	Change of Flight Network Structures	19	16	0
27	Increase in Airline Cooperation	20	17	0
28	The Rise of Low-Cost Airlines	21	18	0
29	The Growth of The Air Transport Sector and The Increase in Demand	1	21	0
30	Changes In the Requirements and Needs of Passengers	22	19	0
31	Environmental Restrictions	2	20	0
32	Technological Innovations	2	22	0
33	The Effects of Changes	2	21	0
34	Conducive Work Environment	1	21	0
35	Matching Expectations, Responsibilities, Rewards	1	21	0
36	Training and Development	1	23	0
37	Work-Life Balance	2	22	0
38	Work related experience	1	24	0
39	Competencies	1	21	0
40	Vocational Qualifications	1	21	0
41	Employee Engagement	1	21	0
42	Emotional Intelligence	1	21	0

43	Entrepreneurial Spirit	3	21	0
44	Flexibility	1	24	0
45	Employee loyalty	3	22	0
46	Employee Satisfaction	3	22	0
47	Education	3	22	0
48	Creativity	3	24	0
49	Corporate Value	3	24	0
50	Social Capital	2	22	0
51	Management Philosophy	2	24	0
52	Formal Processes	1	22	0
53	Tacit/Informal Routines	2	20	0
54	Management Processes	3	21	0
55	Brand Name	2	22	0
56	Data and Information	3	22	0
57	Codified Knowledge	2	22	0
58	Patents/copyrights	2	22	0
59	Trade Secret	2	22	0
60	Formal Relationship	1	24	0
61	Informal Relationships	1	23	0
62	Social Networks	2	22	0
63	Partnerships	1	24	0
64	Alliances	1	21	0
65	Brand Image	1	24	0
66	Trust	1	24	0
67	Corporate Reputation	3	24	0
68	Customer Loyalty	2	24	0
69	Customer Engagement	2	24	0
70	Licensing Agreements	1	24	0
71	Joint Ventures	1	24	0

TAV Finance department modularity, community detection, and vote rank are detailed in Table 3. The network has a sophisticated topology, as shown in Table 3, which will be discussed in further depth in the following sections.

Esenboğa TAV Logistics Department



Graph 3: Network Visualization of Raw Data of Esenboğa TAV Logistics Department

Examining the network analysis of the Esenboğa TAV Logistics Department reveals that it is directed, as seen in Graph 3 (The legible version of graph is in the appendix 3). The source nodes are more centrally positioned, whereas the destination nodes are more peripherally located. Both, because this is a weighted network, it can be observed that the influencer and support nodes, which are also significant and crucial, are larger. Nodes that have no relationships or are classified as flaneurs are similarly located on the periphery and are extremely tiny. When the network is shown, it can be observed that nearly all nodes have a very one-directional, dense, and tightly coupled interaction with one another. This also suggests that the network is quite resilient.

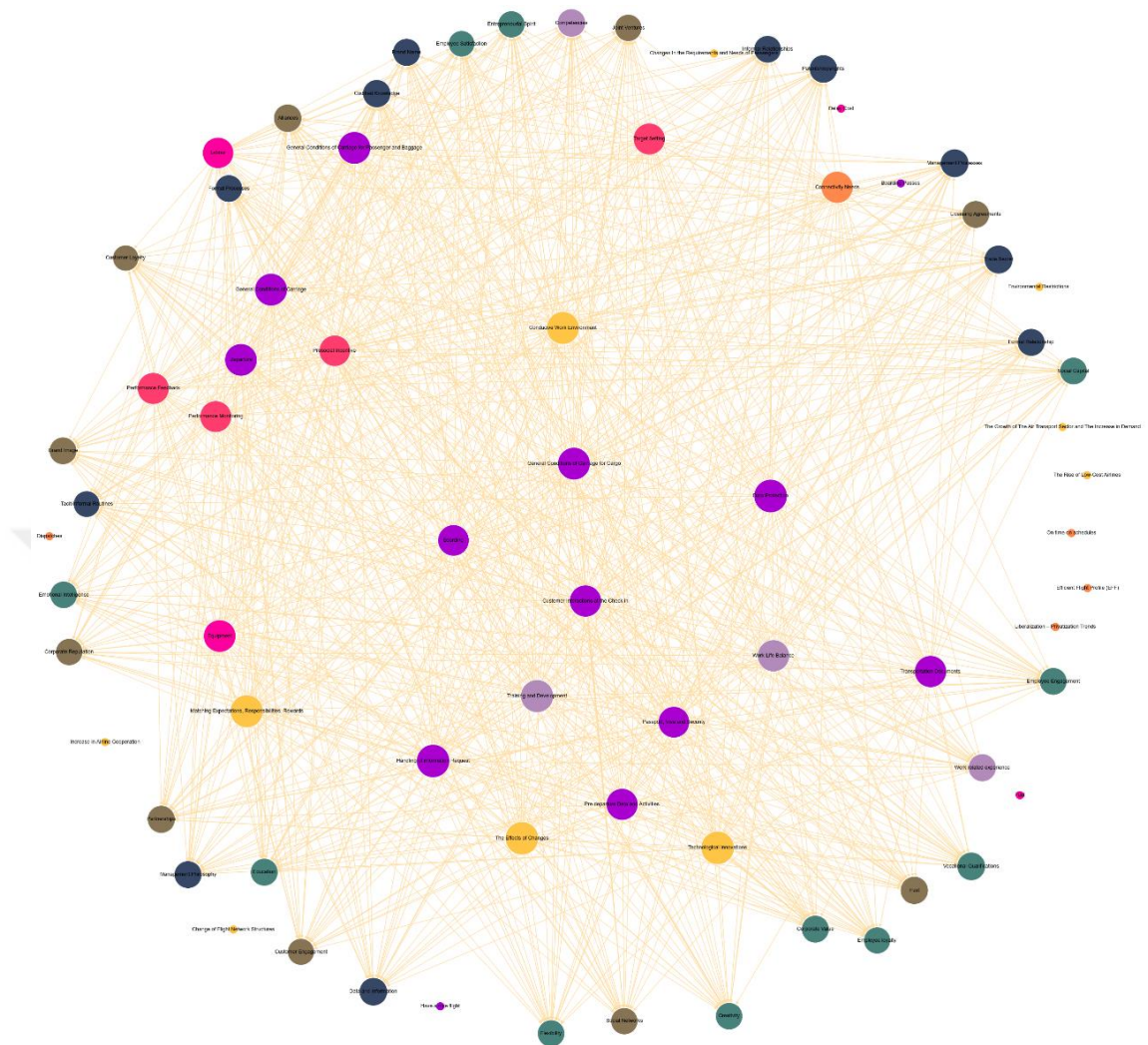
Table 4: TAV Logistics department's modularity, community detection, and vote rank distribution

	Unnamed: 0	modularity	community_detection	vote_rank
0	General Conditions of Carriage	6	1	0
1	General Conditions of Carriage for Passenger and Baggage	7	2	0
2	General Conditions of Carriage for Cargo	8	3	0
3	Data Protection	1	22	1
4	Handling of information Request	1	22	1
5	Departure	9	4	0
6	Pre departure Data and Activities	1	22	1
7	Transportation Documents	10	5	0
8	Customer Interactions at the Check in	11	6	0
9	Boarding Passes	12	7	0
10	Passport, Visa and Security	13	8	0
11	Boarding	14	9	0
12	Have a nice flight	15	10	0
13	Labour	2	11	1
14	Fuel	1	11	1
15	Equipment	2	22	1
16	Delay Cost	3	15	1
17	Performance Monitoring	4	11	1
18	Performance Feedback	2	21	1
19	Target Setting	2	21	1
20	Prosocial Incentive	1	22	0
21	Connectivity Needs	16	12	0
22	Dispatches	17	13	0
23	Efficient Flight Profile (EFF)	18	14	0
24	On time on schedules	3	15	0
25	Liberalization – Privatization Trends	19	16	0
26	Change of Flight Network Structures	20	17	0
27	Increase in Airline Cooperation	21	18	0
28	The Rise of Low-Cost Airlines	22	19	0
29	The Growth of The Air Transport Sector and The Increase in Demand	4	11	0
30	Changes In the Requirements and Needs of Passengers	3	11	0
31	Environmental Restrictions	5	22	0
32	Technological Innovations	1	20	0
33	The Effects of Changes	5	22	0
34	Conducive Work Environment	2	21	0
35	Matching Expectations, Responsibilities, Rewards	4	11	0
36	Training and Development	2	21	0
37	Work-Life Balance	3	15	0
38	Work related experience	2	21	0
39	Competencies	2	21	0
40	Vocational Qualifications	2	21	0

41	Employee Engagement	2	22	0
42	Emotional Intelligence	2	21	0
43	Entrepreneurial Spirit	2	21	0
44	Flexibility	4	11	0
45	Employee loyalty	4	11	0
46	Employee Satisfaction	3	15	0
47	Education	5	21	0
48	Creativity	3	20	0
49	Corporate Value	1	22	0
50	Social Capital	4	11	0
51	Management Philosophy	5	22	0
52	Formal Processes	3	15	0
53	Tacit/Informal Routines	1	22	0
54	Management Processes	1	22	0
55	Brand Name	1	22	0
56	Data and Information	3	15	0
57	Codified Knowledge	4	20	0
58	Patents/copyrights	3	15	0
59	Trade Secret	1	11	0
60	Formal Relationship	3	15	0
61	Informal Relationships	1	22	0
62	Social Networks	1	22	0
63	Partnerships	4	11	0
64	Alliances	4	11	0
65	Brand Image	1	22	0
66	Trust	1	22	0
67	Corporate Reputation	5	20	0
68	Customer Loyalty	2	21	0
69	Customer Engagement	3	15	0
70	Licensing Agreements	3	15	0
71	Joint Ventures	1	11	0

TAV Logistics department’s modularity, community detection, and vote rank are detailed in Table 4. The network has a sophisticated topology, as shown in Table 4, which will be discussed in further depth in the following sections.

Esenboğa TAV Technologies



Graph 4: Network Visualization of Raw Data of Esenboğa TAV Technologies

Examining the network analysis of the Esenboğa TAV Technologies department reveals that it is directed, as seen in Graph 4 (The legible version of graph is in the appendix 4). The source nodes are more centrally positioned, whereas the destination nodes are more peripherally located. Both, because this is a weighted network, it can be observed that the influencer and support nodes, which are also significant and crucial, are larger. Nodes that have no relationships or are classified as flaneurs are similarly located on the periphery and are extremely tiny. When the network is shown, it can be observed that nearly all nodes have a very one-directional, dense, and tightly coupled interaction with one another. This also suggests that the network is quite resilient.

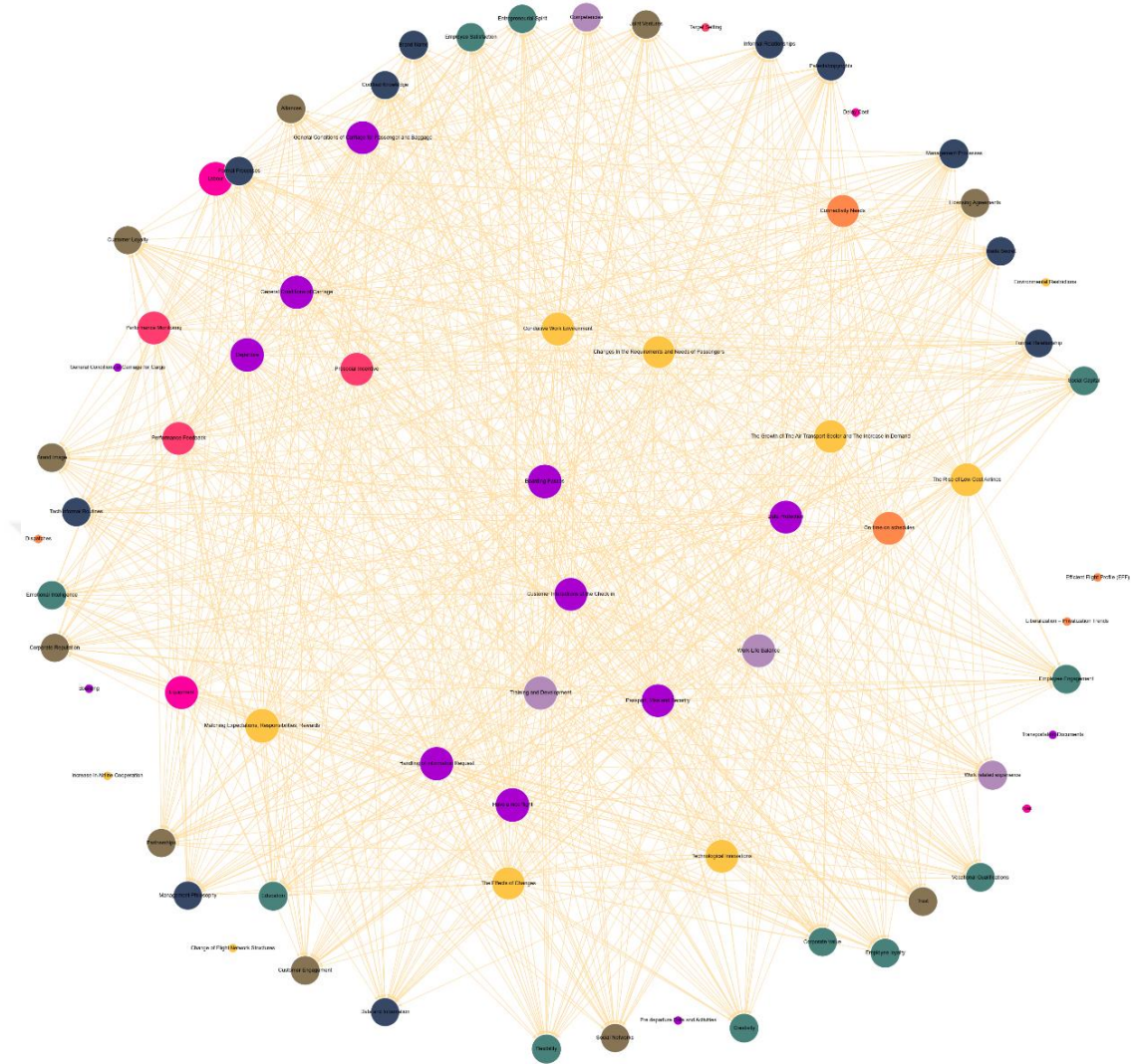
Table 5: Esenboğa TAV Technologies modularity, community detection, and vote rank distribution

	Unnamed: 0	modularity	community_detection	vote_rank
0	General Conditions of Carriage	3	1	1
1	General Conditions of Carriage for Passenger and Baggage	3	1	1
2	General Conditions of Carriage for Cargo	3	1	1
3	Data Protection	1	18	1
4	Handling of information Request	1	18	1
5	Departure	2	19	1
6	Pre departure Data and Activities	2	7	1
7	Transportation Documents	2	7	1
8	Customer Interactions at the Check in	1	2	1
9	Boarding Passes	4	3	0
10	Passport, Visa and Security	2	18	1
11	Boarding	2	18	1
12	Have a nice flight	5	4	0
13	Labour	1	7	1
14	Fuel	6	5	0
15	Equipment	1	7	0
16	Delay Cost	7	6	0
17	Performance Monitoring	1	7	0
18	Performance Feedback	2	20	0
19	Target Setting	2	20	0
20	Prosocial Incentive	1	18	0
21	Connectivity Needs	2	7	0
22	Dispatches	8	8	0
23	Efficient Flight Profile (EFF)	9	9	0
24	On time on schedules	10	10	0
25	Liberalization – Privatization Trends	11	11	0
26	Change of Flight Network Structures	12	12	0
27	Increase in Airline Cooperation	13	13	0
28	The Rise of Low-Cost Airlines	14	14	0
29	The Growth of The Air Transport Sector and The Increase in Demand	15	15	0
30	Changes In the Requirements and Needs of Passengers	16	16	0
31	Environmental Restrictions	17	17	0
32	Technological Innovations	1	20	0
33	The Effects of Changes	1	20	0
34	Conducive Work Environment	3	1	0
35	Matching Expectations, Responsibilities, Rewards	3	19	0
36	Training and Development	1	18	0
37	Work-Life Balance	2	20	0
38	Work related experience	1	18	0
39	Competencies	2	18	0
40	Vocational Qualifications	2	18	0
41	Employee Engagement	2	19	0
42	Emotional Intelligence	3	1	0

43	Entrepreneurial Spirit	1	20	0
44	Flexibility	1	18	0
45	Employee loyalty	1	18	0
46	Employee Satisfaction	2	20	0
47	Education	2	7	0
48	Creativity	1	20	0
49	Corporate Value	3	1	0
50	Social Capital	1	18	0
51	Management Philosophy	3	1	0
52	Formal Processes	1	7	0
53	Tacit/Informal Routines	1	20	0
54	Management Processes	1	1	0
55	Brand Name	2	7	0
56	Data and Information	2	18	0
57	Codified Knowledge	3	1	0
58	Patents/copyrights	2	20	0
59	Trade Secret	3	1	0
60	Formal Relationship	1	18	0
61	Informal Relationships	3	1	0
62	Social Networks	3	1	0
63	Partnerships	3	19	0
64	Alliances	3	1	0
65	Brand Image	1	7	0
66	Trust	3	1	0
67	Corporate Reputation	1	7	0
68	Customer Loyalty	3	1	0
69	Customer Engagement	3	1	0
70	Licensing Agreements	2	7	0
71	Joint Ventures	2	2	0

Esenboğa TAV Technologies' modularity, community detection, and vote rank are detailed in Table 5. The network has a sophisticated topology, as shown in Table 5, which will be discussed in further depth in the following sections.

Esenboğa PRIMECLASS



Graph 5: Network Visualization of Raw Data of Esenboğa PRIMECLASS

Examining the network analysis of the Esenboğa PRIMECLASS department reveals that it is directed, as seen in Graph5 (The legible version of graph is in the appendix5). The source nodes are more centrally positioned, whereas the destination nodes are more peripherally located. Both, because this is a weighted network, it can be observed that the influencer and support nodes, which are also significant and crucial, are larger. Nodes that have no relationships or are classified as flaneurs are similarly located on the periphery and are extremely tiny. When the network is shown, it can be observed that nearly all nodes have a very one-directional, dense, and tightly coupled interaction with one another. This also suggests that the network is quite resilient.

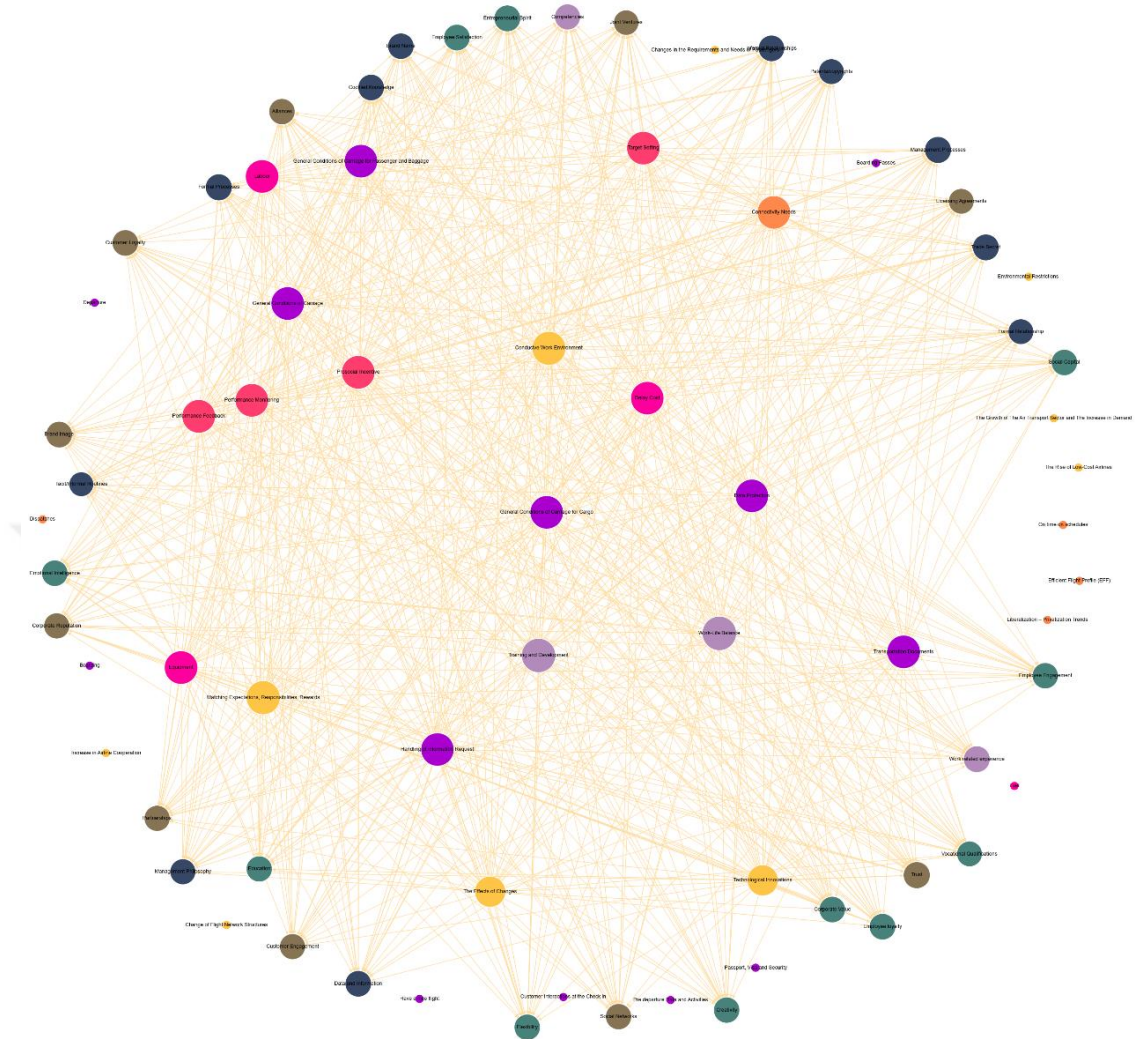
Table 6: Esenboğa PRIMECLASS, Community Detection, and Vote Rank Distribution

	Unnamed: 0	modularity	community_detection	vote_rank
0	General Conditions of Carriage	1	19	1
1	General Conditions of Carriage for Passenger and Baggage	2	1	1
2	General Conditions of Carriage for Cargo	4	2	0
3	Data Protection	1	19	1
4	Handling of information Request	3	7	1
5	Departure	3	18	1
6	Pre departure Data and Activities	5	3	0
7	Transportation Documents	6	4	0
8	Customer Interactions at the Check in	2	7	1
9	Boarding Passes	1	7	1
10	Passport, Visa and Security	1	19	1
11	Boarding	7	5	0
12	Have a nice flight	2	12	1
13	Labour	3	17	1
14	Fuel	8	6	0
15	Equipment	3	7	1
16	Delay Cost	9	8	0
17	Performance Monitoring	3	19	1
18	Performance Feedback	2	1	0
19	Target Setting	10	9	0
20	Prosocial Incentive	3	18	0
21	Connectivity Needs	2	20	0
22	Dispatches	11	10	0
23	Efficient Flight Profile (EFF)	12	11	0
24	On time on schedules	2	12	0
25	Liberalization – Privatization Trends	13	13	0
26	Change of Flight Network Structures	14	14	0
27	Increase in Airline Cooperation	15	15	0
28	The Rise of Low-Cost Airlines	1	7	0
29	The Growth of The Air Transport Sector and The Increase in Demand	3	1	0
30	Changes In the Requirements and Needs of Passengers	3	7	0
31	Environmental Restrictions	16	16	0
32	Technological Innovations	2	17	0
33	The Effects of Changes	2	20	0
34	Conducive Work Environment	2	12	0
35	Matching Expectations, Responsibilities, Rewards	1	7	0
36	Training and Development	1	7	0
37	Work-Life Balance	1	19	0
38	Work related experience	3	18	0
39	Competencies	1	19	0
40	Vocational Qualifications	3	1	0
41	Employee Engagement	1	19	0
42	Emotional Intelligence	1	17	0

43	Entrepreneurial Spirit	2	12	0
44	Flexibility	1	7	0
45	Employee loyalty	1	7	0
46	Employee Satisfaction	1	19	0
47	Education	3	17	0
48	Creativity	1	18	0
49	Corporate Value	3	18	0
50	Social Capital	2	20	0
51	Management Philosophy	3	17	0
52	Formal Processes	2	7	0
53	Tacit/Informal Routines	1	7	0
54	Management Processes	3	7	0
55	Brand Name	2	1	0
56	Data and Information	1	7	0
57	Codified Knowledge	2	1	0
58	Patents/copyrights	2	20	0
59	Trade Secret	3	20	0
60	Formal Relationship	1	19	0
61	Informal Relationships	2	1	0
62	Social Networks	1	19	0
63	Partnerships	3	7	0
64	Alliances	2	20	0
65	Brand Image	1	7	0
66	Trust	3	7	0
67	Corporate Reputation	3	17	0
68	Customer Loyalty	2	12	0
69	Customer Engagement	2	1	0
70	Licensing Agreements	2	12	0
71	Joint Ventures	1	19	0

Esenboğa PRIMECLASS modularity, community detection, and vote rank are detailed in Table 6. The network has a sophisticated topology, as shown in Table 6, which will be discussed in further depth in the following sections.

Esenboğa TAV Securities



Graph 6: Network Visualization of Raw Data of Esenboğa TAV Securities

Examining the network analysis of the Esenboğa TAV Securities department reveals that it is directed, as seen in Graph 6 (The legible version of graph is in the appendix 4). The source nodes are more centrally positioned, whereas the destination nodes are more peripherally located. Both, because this is a weighted network, it can be observed that the influencer and support nodes, which are also significant and crucial, are larger. Nodes that have no relationships or are classified as flaneurs are similarly located on the periphery and are extremely tiny. When the network is shown, it can be observed that nearly all nodes have a very one-directional, dense, and tightly coupled interaction with one another. This also suggests that the network is quite resilient.

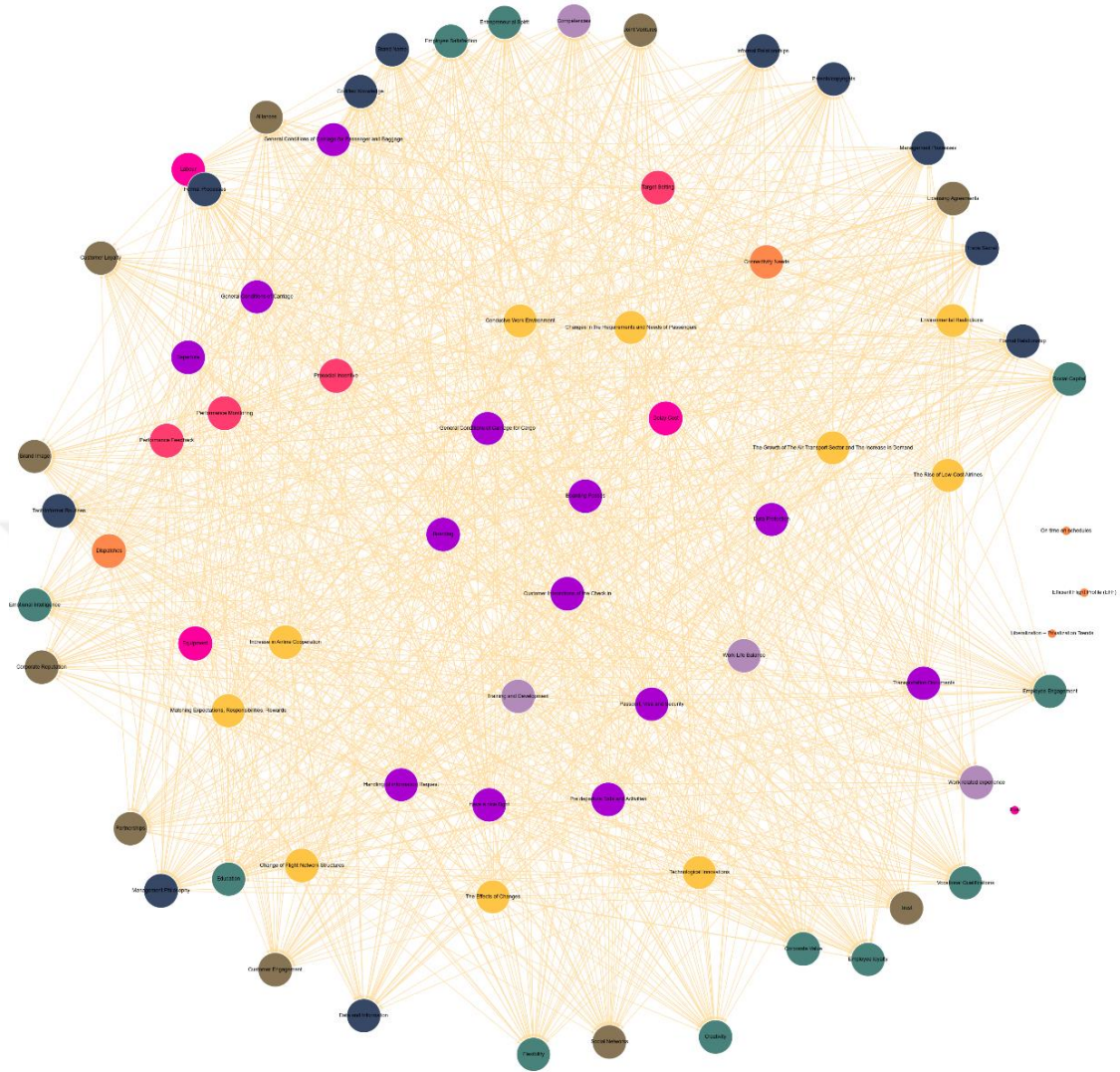
Table 7: Esenboğa TAV Securities' Modularity, Community Detection, and Vote Rank Distribution

Unnamed: 0	modularity	community_detection	vote_rank	
0	General Conditions of Carriage	3	20	1
1	General Conditions of Carriage for Passenger and Baggage	3	20	1
2	General Conditions of Carriage for Cargo	3	20	1
3	Data Protection	1	9	1
4	Handling of information Request	2	22	1
5	Departure	5	1	0
6	Pre departure Data and Activities	6	2	0
7	Transportation Documents	3	21	1
8	Customer Interactions at the Check in	7	3	0
9	Boarding Passes	8	4	0
10	Passport, Visa and Security	9	5	0
11	Boarding	10	6	0
12	Have a nice flight	11	7	0
13	Labour	2	21	1
14	Fuel	12	8	0
15	Equipment	2	21	1
16	Delay Cost	2	22	1
17	Performance Monitoring	1	9	1
18	Performance Feedback	1	9	0
19	Target Setting	2	22	0
20	Prosocial Incentive	1	9	0
21	Connectivity Needs	4	21	0
22	Dispatches	13	10	0
23	Efficient Flight Profile (EFF)	14	11	0
24	On time on schedules	15	12	0
25	Liberalization – Privatization Trends	16	13	0
26	Change of Flight Network Structures	17	14	0
27	Increase in Airline Cooperation	18	15	0
28	The Rise of Low-Cost Airlines	19	16	0
29	The Growth of The Air Transport Sector and The Increase in Demand	20	17	0
30	Changes In the Requirements and Needs of Passengers	21	18	0
31	Environmental Restrictions	22	19	0
32	Technological Innovations	3	20	0
33	The Effects of Changes	4	21	0
34	Conducive Work Environment	1	9	0
35	Matching Expectations, Responsibilities, Rewards	2	21	0
36	Training and Development	1	9	0
37	Work-Life Balance	4	22	0
38	Work related experience	3	20	0
39	Competencies	2	21	0
40	Vocational Qualifications	1	9	0
41	Employee Engagement	4	21	0
42	Emotional Intelligence	4	21	0

43	Entrepreneurial Spirit	3	20	0
44	Flexibility	4	21	0
45	Employee loyalty	2	22	0
46	Employee Satisfaction	2	20	0
47	Education	3	20	0
48	Creativity	1	9	0
49	Corporate Value	1	9	0
50	Social Capital	3	21	0
51	Management Philosophy	2	22	0
52	Formal Processes	3	20	0
53	Tacit/Informal Routines	2	22	0
54	Management Processes	4	21	0
55	Brand Name	3	20	0
56	Data and Information	1	9	0
57	Codified Knowledge	1	9	0
58	Patents/copyrights	1	9	0
59	Trade Secret	2	22	0
60	Formal Relationship	1	9	0
61	Informal Relationships	2	22	0
62	Social Networks	2	22	0
63	Partnerships	3	20	0
64	Alliances	2	9	0
65	Brand Image	1	20	0
66	Trust	2	21	0
67	Corporate Reputation	1	9	0
68	Customer Loyalty	1	22	0
69	Customer Engagement	3	20	0
70	Licensing Agreements	3	20	0
71	Joint Ventures	4	21	0

Esenboğa TAV Securities' modularity, community detection, and vote rank are detailed in Table 7. The network has a sophisticated topology, as shown in Table 7, which will be discussed in further depth in the following sections.

Esenboğa HAVAŞ



Graph 7: Network Visualization of Raw Data of Esenboğa HAVAŞ

Examining the network analysis of the Esenboğa HAVAŞ department reveals that it is directed, as seen in Graph 7 (The legible version of graph is in the appendix 7). The source nodes are more centrally positioned, whereas the destination nodes are more peripherally located. Both, because this is a weighted network, it can be observed that the influencer and support nodes, which are also significant and crucial, are larger. Nodes that have no relationships or are classified as flaneurs are similarly located on the periphery and are extremely tiny. When the network is shown, it can be observed that nearly all nodes have a very one-directional, dense, and tightly coupled interaction with one another. This also suggests that the network is quite resilient.

Table 8: Esenboğa HAVAŞ's Modularity, Community Detection and Vote Rank Distribution

Unnamed: 0	modularity	community_detection	vote_rank	
0	General Conditions of Carriage	2	8	1
1	General Conditions of Carriage for Passenger and Baggage	2	8	1
2	General Conditions of Carriage for Cargo	2	8	1
3	Data Protection	3	7	1
4	Handling of information Request	3	7	1
5	Departure	1	7	1
6	Pre departure Data and Activities	2	7	1
7	Transportation Documents	4	5	1
8	Customer Interactions at the Check in	2	8	1
9	Boarding Passes	1	9	1
10	Passport, Visa and Security	4	5	1
11	Boarding	3	5	1
12	Have a nice flight	1	9	1
13	Labour	3	7	1
14	Fuel	5	1	0
15	Equipment	1	9	1
16	Delay Cost	2	7	1
17	Performance Monitoring	1	9	1
18	Performance Feedback	3	7	0
19	Target Setting	2	8	0
20	Prosocial Incentive	1	9	0
21	Connectivity Needs	2	8	0
22	Dispatches	1	9	0
23	Efficient Flight Profile (EFF)	6	2	0
24	On time on schedules	7	3	0
25	Liberalization – Privatization Trends	8	4	0
26	Change of Flight Network Structures	1	6	0
27	Increase in Airline Cooperation	1	9	0
28	The Rise of Low-Cost Airlines	1	6	0
29	The Growth of The Air Transport Sector and The Increase in Demand	3	8	0
30	Changes In the Requirements and Needs of Passengers	1	9	0
31	Environmental Restrictions	4	5	0
32	Technological Innovations	1	7	0
33	The Effects of Changes	3	6	0
34	Conducive Work Environment	1	9	0
35	Matching Expectations, Responsibilities, Rewards	2	8	0
36	Training and Development	1	9	0
37	Work-Life Balance	3	7	0
38	Work related experience	1	7	0
39	Competencies	1	9	0
40	Vocational Qualifications	3	7	0
41	Employee Engagement	3	5	0
42	Emotional Intelligence	1	9	0

43	Entrepreneurial Spirit	1	9	0
44	Flexibility	2	5	0
45	Employee loyalty	4	5	0
46	Employee Satisfaction	2	8	0
47	Education	1	5	0
48	Creativity	2	8	0
49	Corporate Value	3	7	0
50	Social Capital	2	8	0
51	Management Philosophy	3	7	0
52	Formal Processes	3	7	0
53	Tacit/Informal Routines	3	7	0
54	Management Processes	4	5	0
55	Brand Name	1	9	0
56	Data and Information	1	9	0
57	Codified Knowledge	2	9	0
58	Patents/copyrights	3	6	0
59	Trade Secret	2	8	0
60	Formal Relationship	2	8	0
61	Informal Relationships	2	8	0
62	Social Networks	2	7	0
63	Partnerships	2	8	0
64	Alliances	2	7	0
65	Brand Image	1	7	0
66	Trust	1	6	0
67	Corporate Reputation	1	6	0
68	Customer Loyalty	1	9	0
69	Customer Engagement	1	9	0
70	Licensing Agreements	1	9	0
71	Joint Ventures	1	9	0

Esenboğa TAV Securities' modularity, community detection, and vote rank are detailed in Table 8. The network has a sophisticated topology, as shown in Table 8, which will be discussed in further depth in the following sections.

4.3.6 Modularity

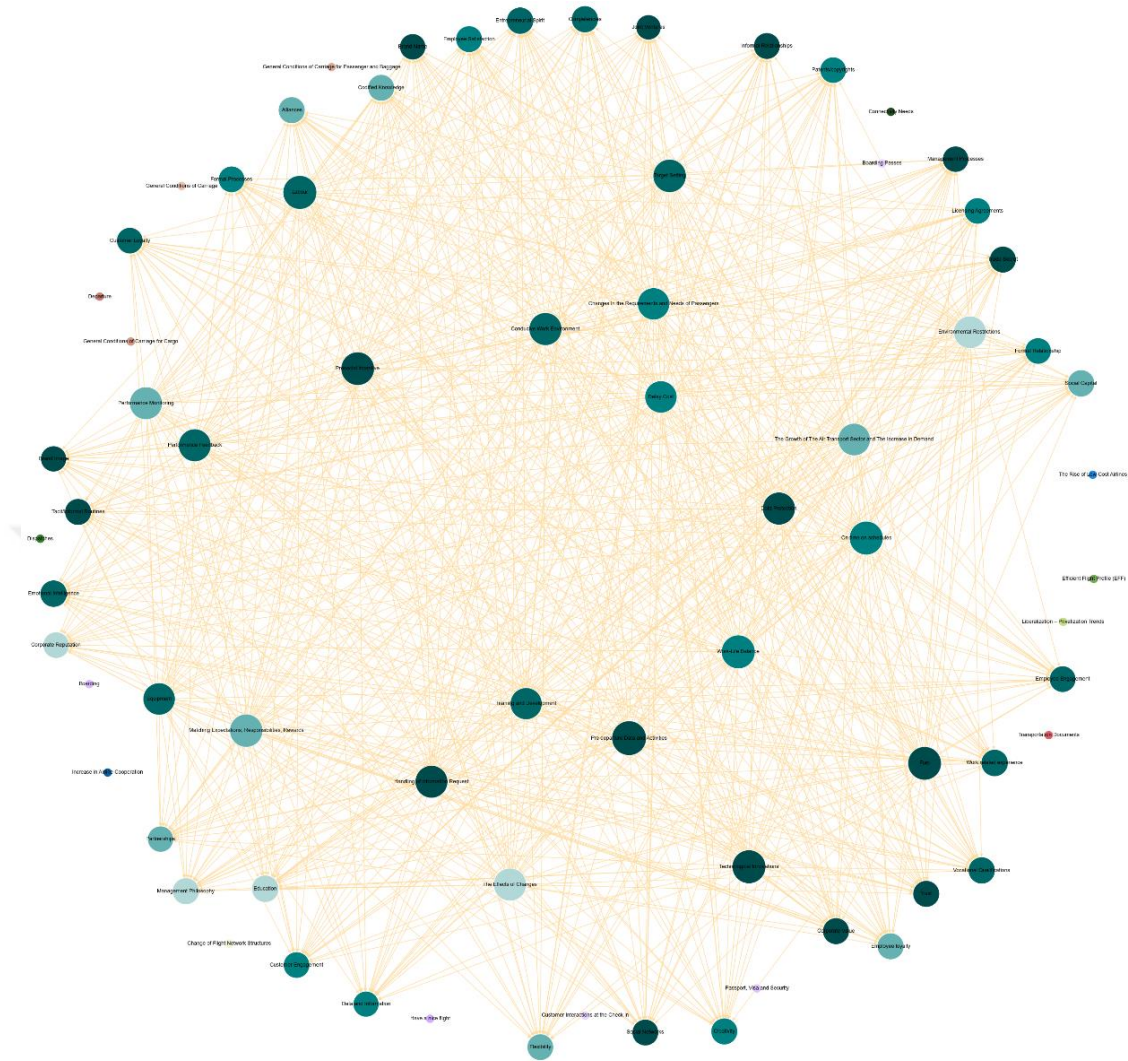
The most common method is known as "modularity." It made an effort to gain a fundamental comprehension of the clustering process. There are two phases to this method. The first strategy is divisive, and it entails gradually thinning out the network until individual neighbourhoods are exposed. When an edge is deleted, the betweenness scores are recalculated in the second phase, redefinition. These steps are repeated again and over again until the highest possible global modularity score is achieved. The end

result is a collection of highly interconnected but locally disconnected subnetworks of nodes (Al-Taie & Kadry 2017).

The modularity of a network or graph is a measure of the effectiveness of partitioning the network into smaller subnetworks, or "modules." Connectivity between nodes in different modules is low in highly modular networks, but high inside each module. Biological, chemical, and societal networks, as well as computational, metabolic, and regulatory networks, are all discovered to naturally cluster into smaller networks, called communities or modules. One of the open questions in the field of network science concerns how to identify and characterize this community structure. Improving the quality function, or modularity, over all the potential subnetworks in a network is a powerful strategy. Expression of modularity in terms of eigenvectors of a characteristic matrix for the network (the modularity matrix) leads to a spectral algorithm for community discovery that produces clearly higher quality results than competing approaches in shorter running durations (Newman, 2006).

Graph modularity quantifies the concentration of connections within a given grouping of nodes. High modularity graphs tend to contain numerous connections inside a community but few connecting it to others. The technique checks if each node's modularity score would improve if it switched communities to one of its neighbours. To comprehend modularity, one must comprehend homophily and assortativity. Homophily is a notion utilised in research of social network analysis. In social networks, when individuals select their connections, they favour those who have similar characteristics, such as gender, age, social standing, educational status, income, nationality, language, and religion. It's comparable to picking nodes with similar attributes and characteristics. Assortativity is also utilised regularly in the disciplines of ecology and epidemiology. Homophily and selectivity imply that connections are clustered among nodes with comparable qualities. Modularity, on the other hand, results in homophily and selectivity. Modularity is a metric for measuring the network grouping that happens. Mathematically, however, all three measurements are calculated identically (Akal, 2014).

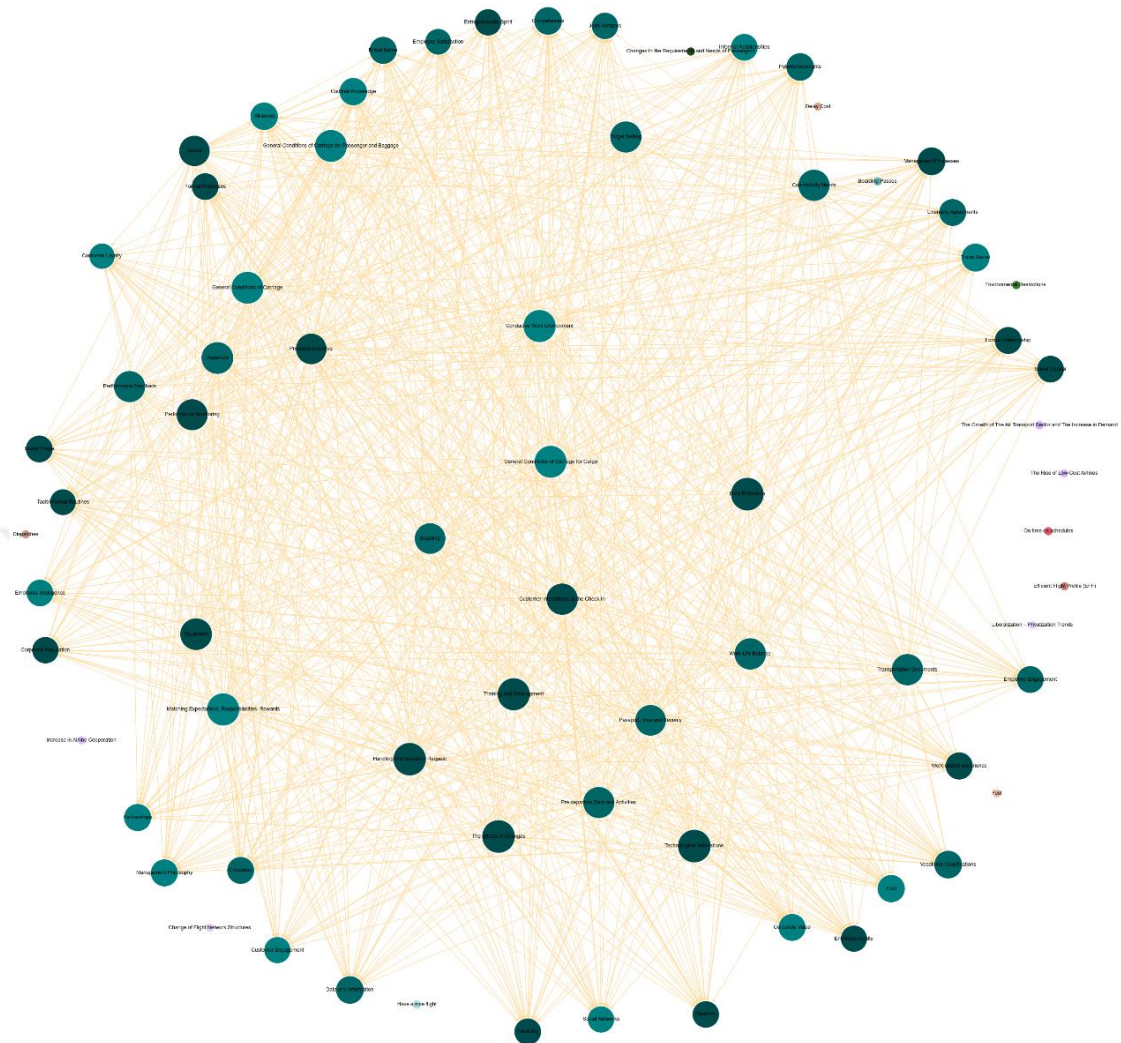
Esenboğa TAV Logistics Department.



Graph 10: Modularity Network of Esenboğa TAV Logistics Department

Gathering under 6 titles of digital transformation criteria in this network is an attribute in terms of source nodes. Likewise, gathering under the 3 main headings of intellectual capital components is defined as a separate target attribute. As seen Graph 10, in the TAV Logistics Department analysis, all 72 nodes had 22 different modularises according to these attributes and their weighting and orientation. While the most modularity was 1 with 22 nodes, 1 node in from4 to 22 each became modular.

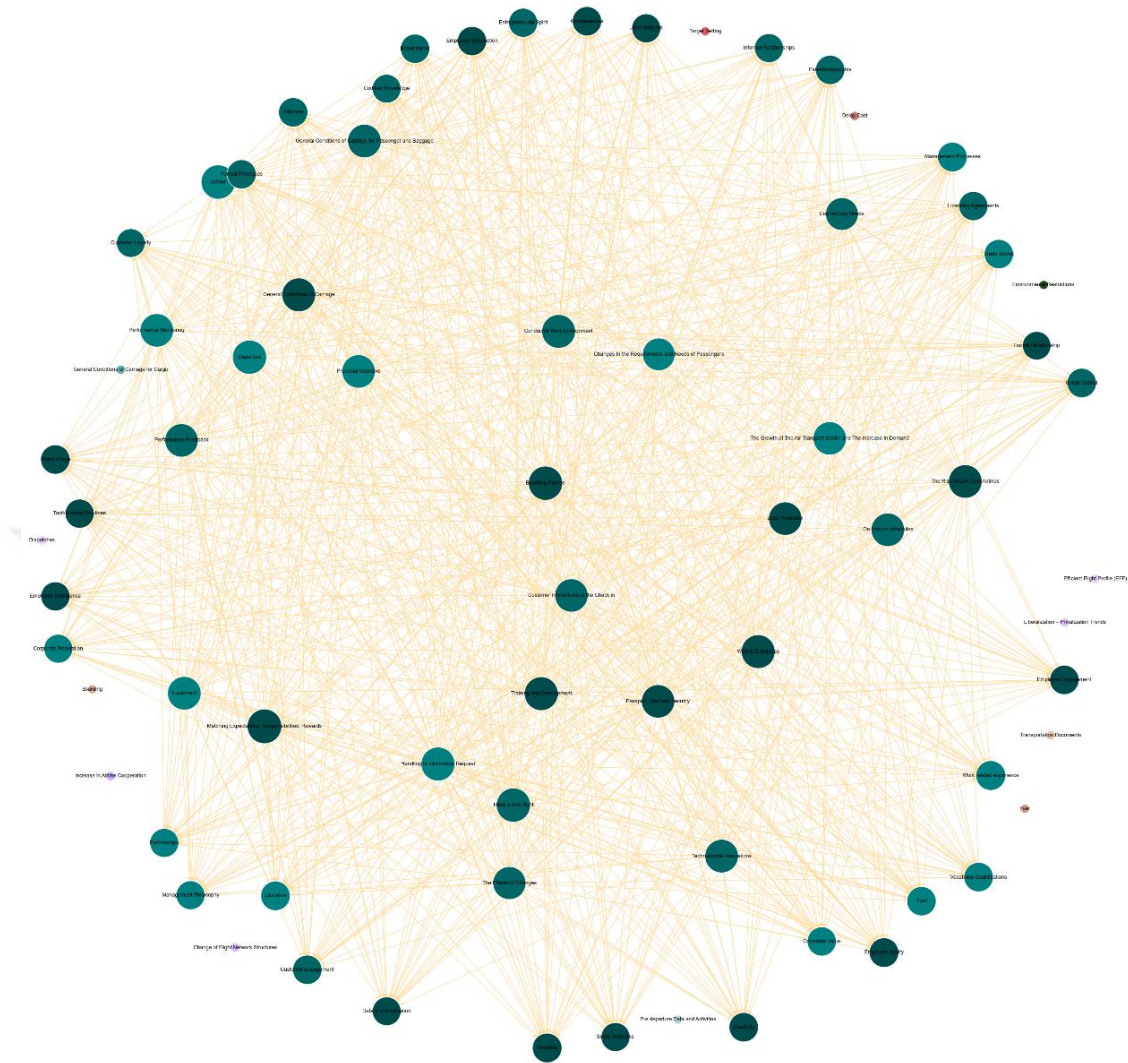
Esenboğa TAV Technologies



Graph 11: Modularity Network of Esenboğa TAV Technologies

Gathering under 6 titles of digital transformation criteria in this network is an attribute in terms of source nodes. Likewise, gathering under the 3 main headings of intellectual capital components is defined as a separate target attribute. As seen Graph 11, in the Esenboğa TAV Technologies analysis, all 72 nodes had 17 different modularises according to these attributes and their weighting and orientation. While the most modularity was 1 with 22 nodes, 1 node in from4 to 17 each became modular

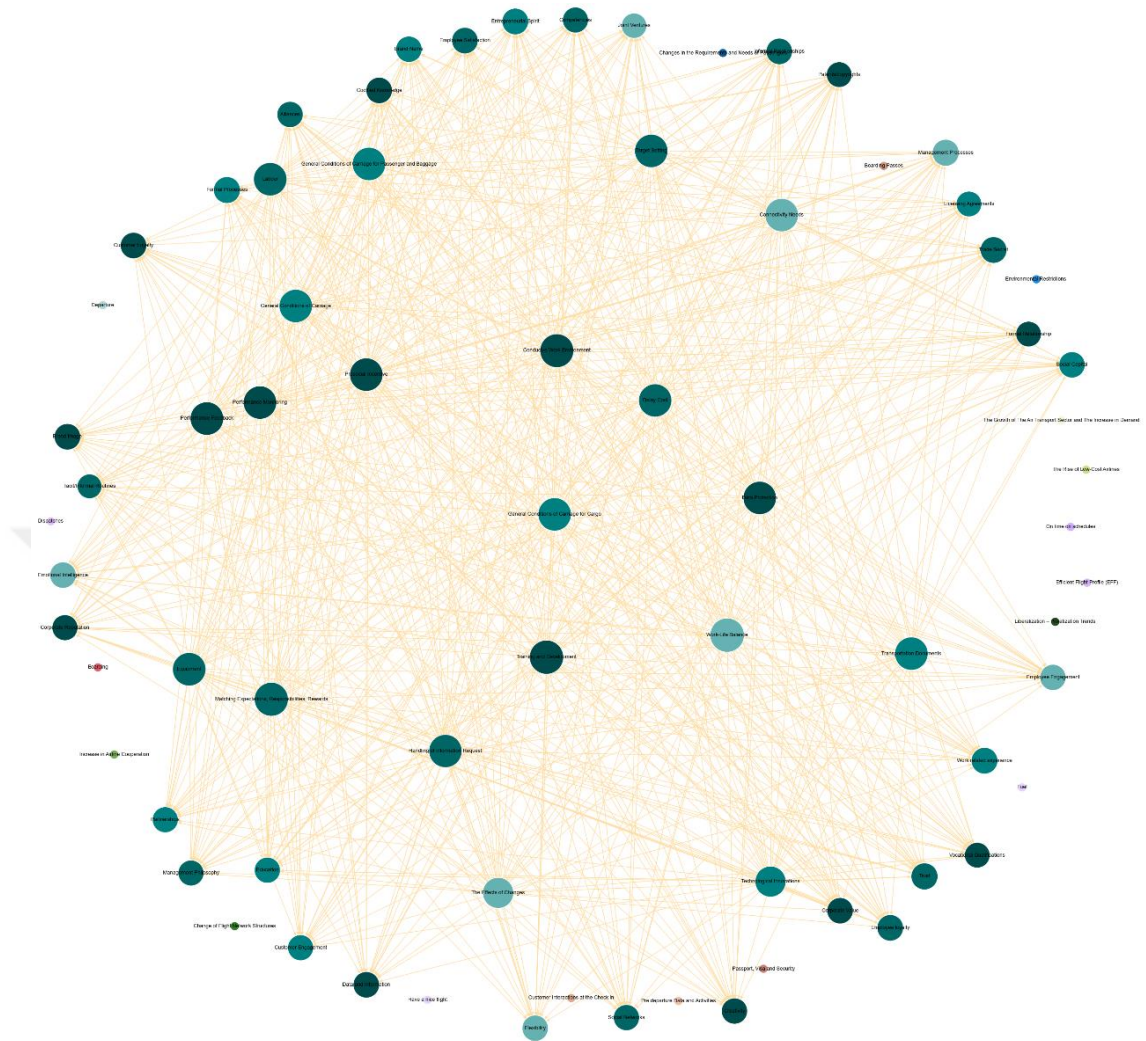
Esenboğa PRIMECLASS



Graph 12: Modularity Network of Esenboğa PRIMECLASS

Gathering under 6 titles of digital transformation criteria in this network is an attribute in terms of source nodes. Likewise, gathering under the 3 main headings of intellectual capital components is defined as a separate target attribute. As seen Graph 12, in the Esenboğa PRIMECLASS analysis, all 72 nodes had 16 different modularises according to these attributes and their weighting and orientation. While the most modularity was 1 with 21 nodes, 1 node in from 5 to 16 each became modular.

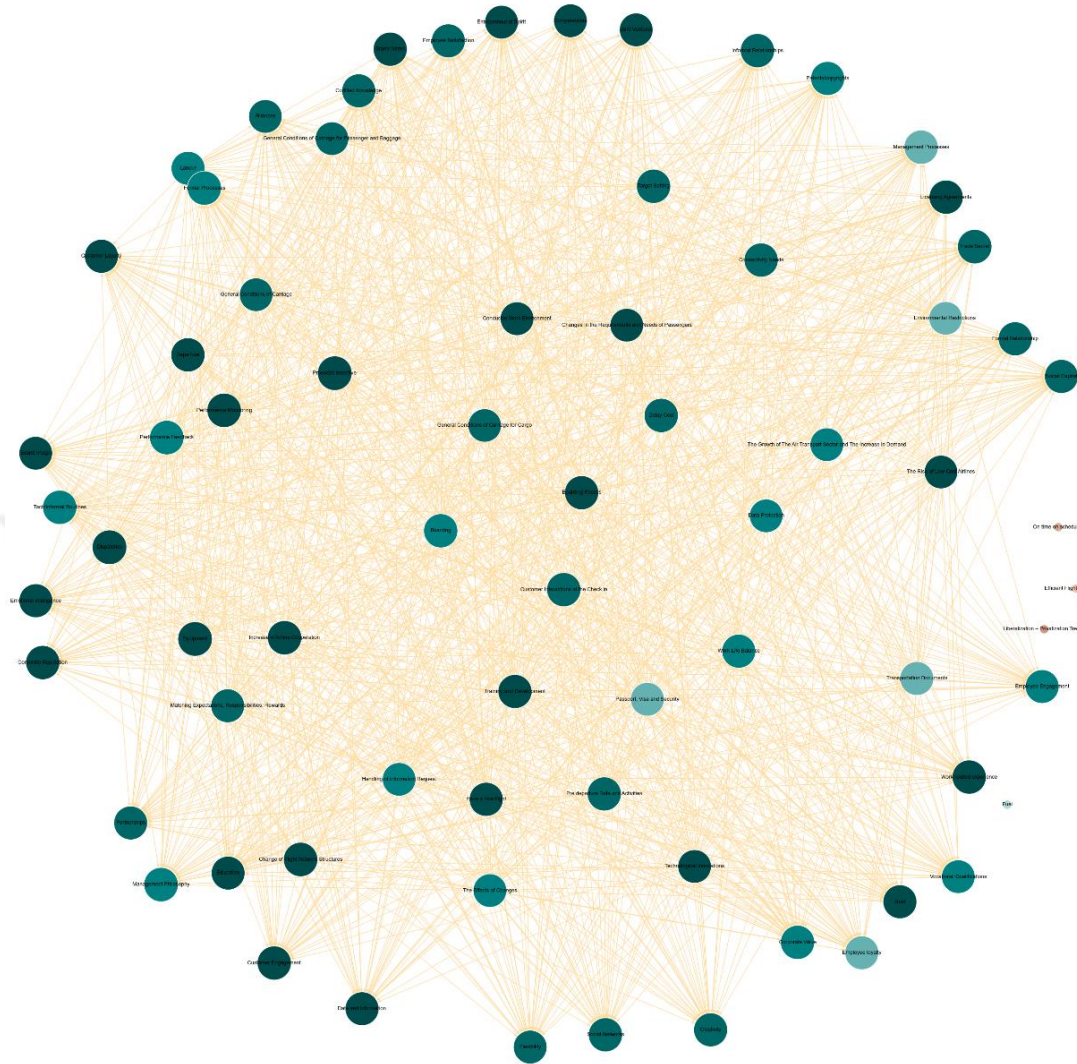
Esenboğa TAV Securities



Graph 13: Modularity Network of Esenboğa TAV Securities

Gathering under 6 titles of digital transformation criteria in this network is an attribute in terms of source nodes. Likewise, gathering under the 3 main headings of intellectual capital components is defined as a separate target attribute. As seen Graph 13, in the Esenboğa TAV Securities analysis, all 72 nodes had 22 different modularises according to these attributes and their weighting and orientation. While the most modularity was 1 with 16 nodes, 1 node in from 5 to 22 each became modular

Esenboğa HAVAŞ



Graph 14: Modularity Network of Esenboğa HAVAŞ

Gathering under 6 titles of digital transformation criteria in this network is an attribute in terms of source nodes. Likewise, gathering under the 3 main headings of intellectual capital components is defined as a separate target attribute. As seen Graph 14, in the Esenboğa TAV Securities analysis, all 72 nodes had 8 different modularises according to these attributes and their weighting and orientation. While the most modularity was 1 with 26 nodes, 1 node in from 5 to 22 each became modular.

4.3.7 Community detection

This community exists in a subgraph of the network in which the links between nodes are stronger among themselves than to the rest of the world. Scientists and researchers have recently become interested in the challenge of discovering communities in networks, defined as a collection of interconnected nodes in which most of the connections are made between nodes within the same cluster and only a small fraction of the connections is made between nodes in different clusters.

The spectral bisection algorithm (which relies on the properties of the spectrum of the Laplacian matrix) and the Kernighan-Lin Algorithm (which was one of the earliest approaches proposed and is still frequently used, albeit typically in conjunction with other methods) are just two examples of the many algorithms that have been proposed for community detection. The concept relies on the standard practice of physically separating individual components of electronic systems onto individual boards.

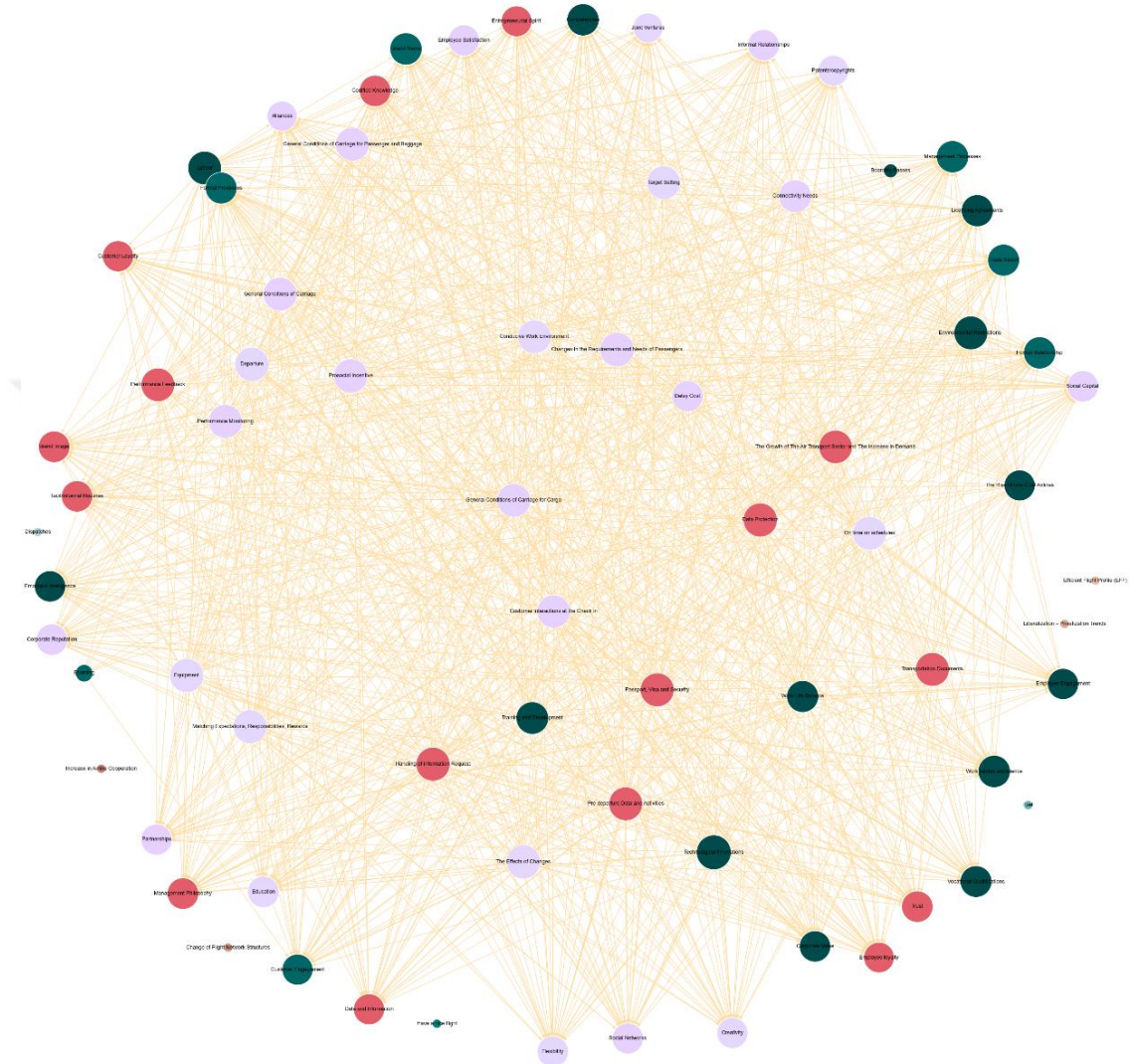
The geometric algorithm, level-structure partitioning, and multilevel algorithms are three other common approaches to graph partitioning. To detect communities, nodes in a graph must have comparable qualities and/or functions so that they can be grouped together (Fortunato & Castellano, 2008).

There are many connections between the nodes in such groupings, but less between the nodes in other groups. Community detection (also known as graph clustering) is the process of identifying groups of nodes (clusters) that share a high number of internal edges but few or no external ones. Applications of community detection include the modelling of large-scale internet networks and the analysis of the social dynamics within businesses. There are typically far more links between nodes within a community than there are between communities in many networks. High intra-community connectivity and low extra-community connectivity characterize a community (Fortunato, 2010).

The purpose of community detection in sociology is to identify clusters of people sharing similar social connections. For this task, a plethora of algorithms have been presented. Divisive algorithms, aggregative algorithms, and optimization algorithms are the three broad groups into which they fall. Finding clusters of similar nodes in a network does not necessitate that these clusters be completely disconnected from one another. Instead, "overlapping communities" are encouraged as a way for groups to share members. It's worth noting that detecting communities can be done in both static and

dynamic forms (a phenomenon known as temporal community detection), in which groups change over time in tandem with their members. (Natalie et al., 2020).

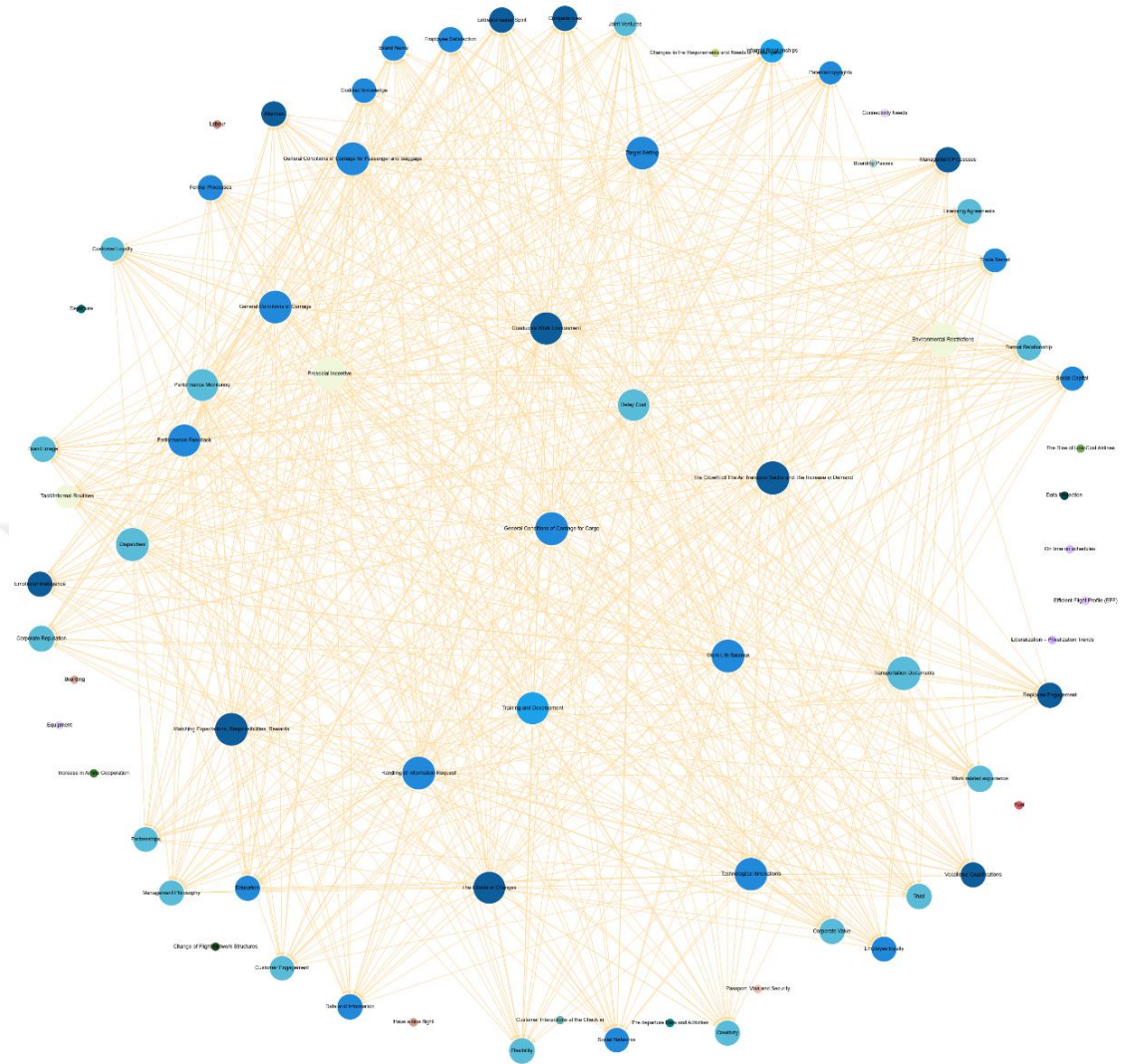
Esenboğa TAV Head Office



Graph 15: Community Detection Network of Esenboğa TAV Hq

In the Esenboğa TAV Head Offices analysis, 12 communities were detected in correlation with all 72 nodes and 1272 edges as seen graph 15. The significance of this community detection stems from the fact that a community may be a subset of the entire network that has extremely comparable properties. Individuals or nodes in the same community are connected to one another more densely than those in different communities. Individuals are related because they know each other or they share common qualities, hence it can be claimed that if they live in the same community, they have more comparable and common features.

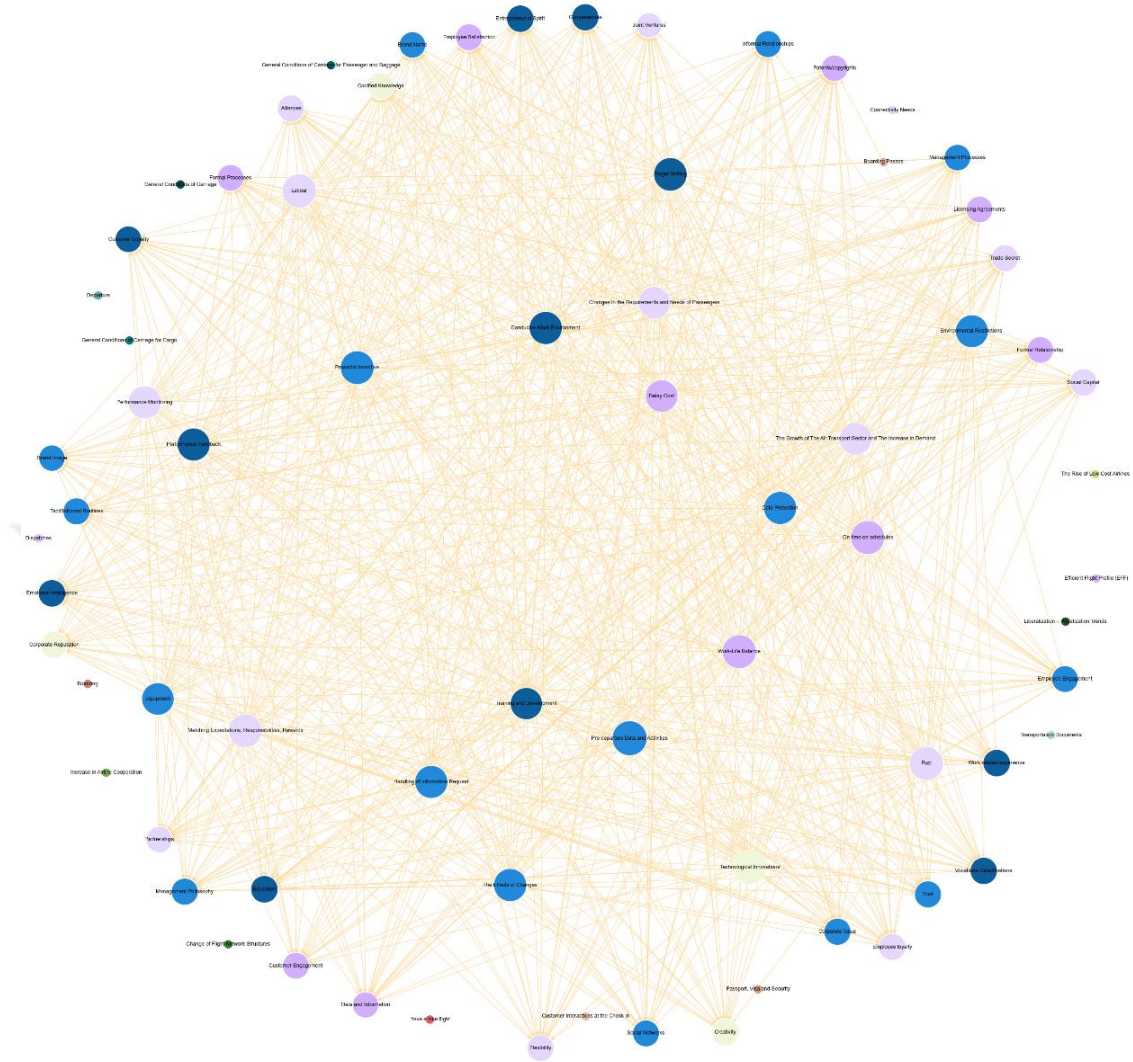
Esenboğa TAV Finance Department



Graph 16: Community Detection of Esenboğa TAV Finance Department

In the Esenboğa TAV Finance Department analysis, 24 communities were detected in correlation with all 72 nodes and 1272 edges as seen graph 16 those in the same community are of the same color. The significance of this community detection stems from the fact that a community may be a subset of the entire network that has extremely comparable properties. Individuals or nodes in the same community are connected to one another more densely than those in different communities. Individuals are related because they know each other or they share common qualities, hence it can be claimed that if they live in the same community, they have more comparable and common features.

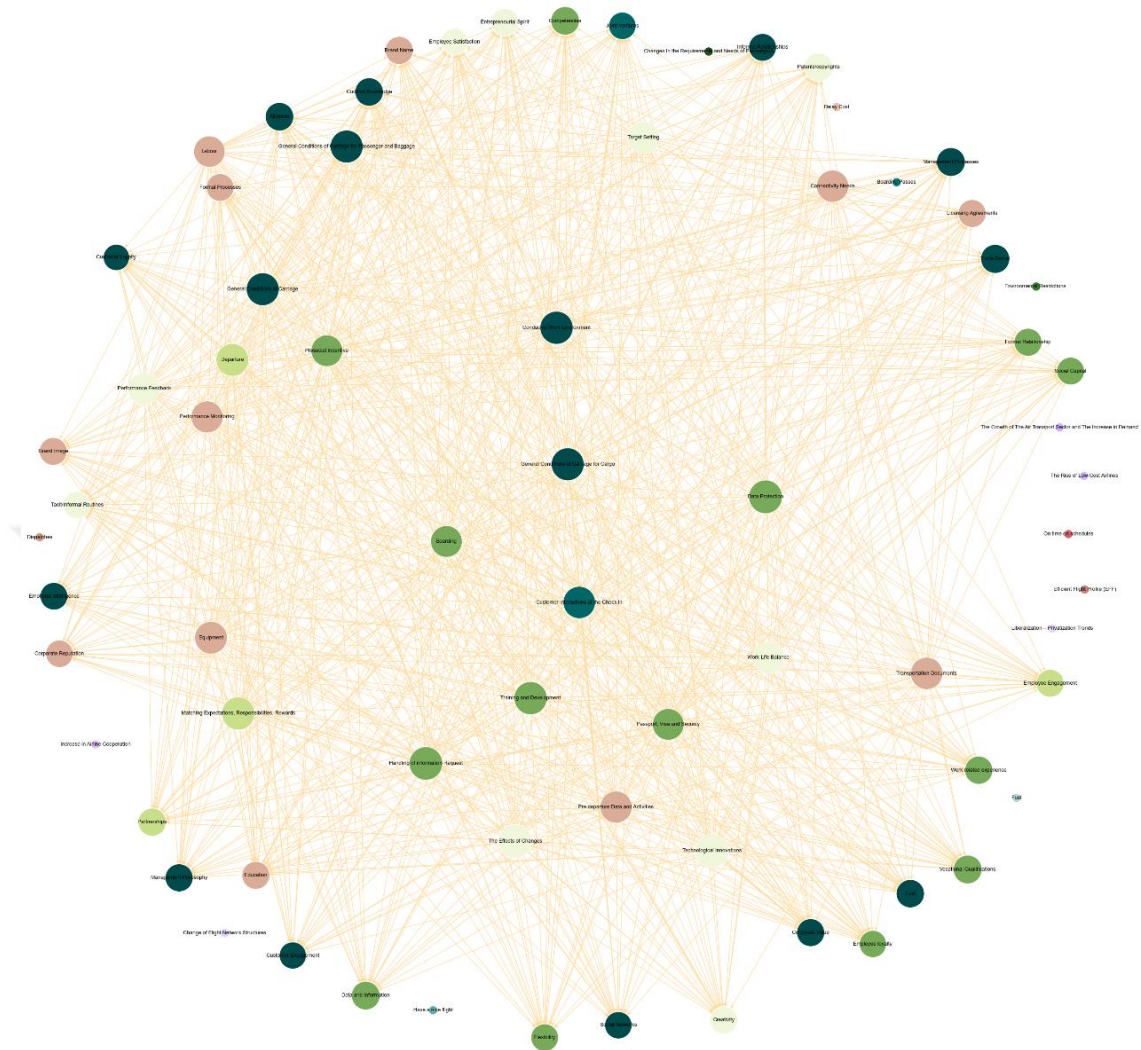
Esenboğa TAV Logistics Department



Graph 17: Community Detection of Esenboğa TAV Logistics Department

In the Esenboğa TAV Logistics Department analysis, 22 communities were detected in correlation with all 72 nodes and 1272 edges as seen graph 17 those in the same community are of the same color. The significance of this community detection stems from the fact that a community may be a subset of the entire network that has extremely comparable properties. Individuals or nodes in the same community are connected to one another more densely than those in different communities. Individuals are related because they know each other or they share common qualities, hence it can be claimed that if they live in the same community, they have more comparable and common features.

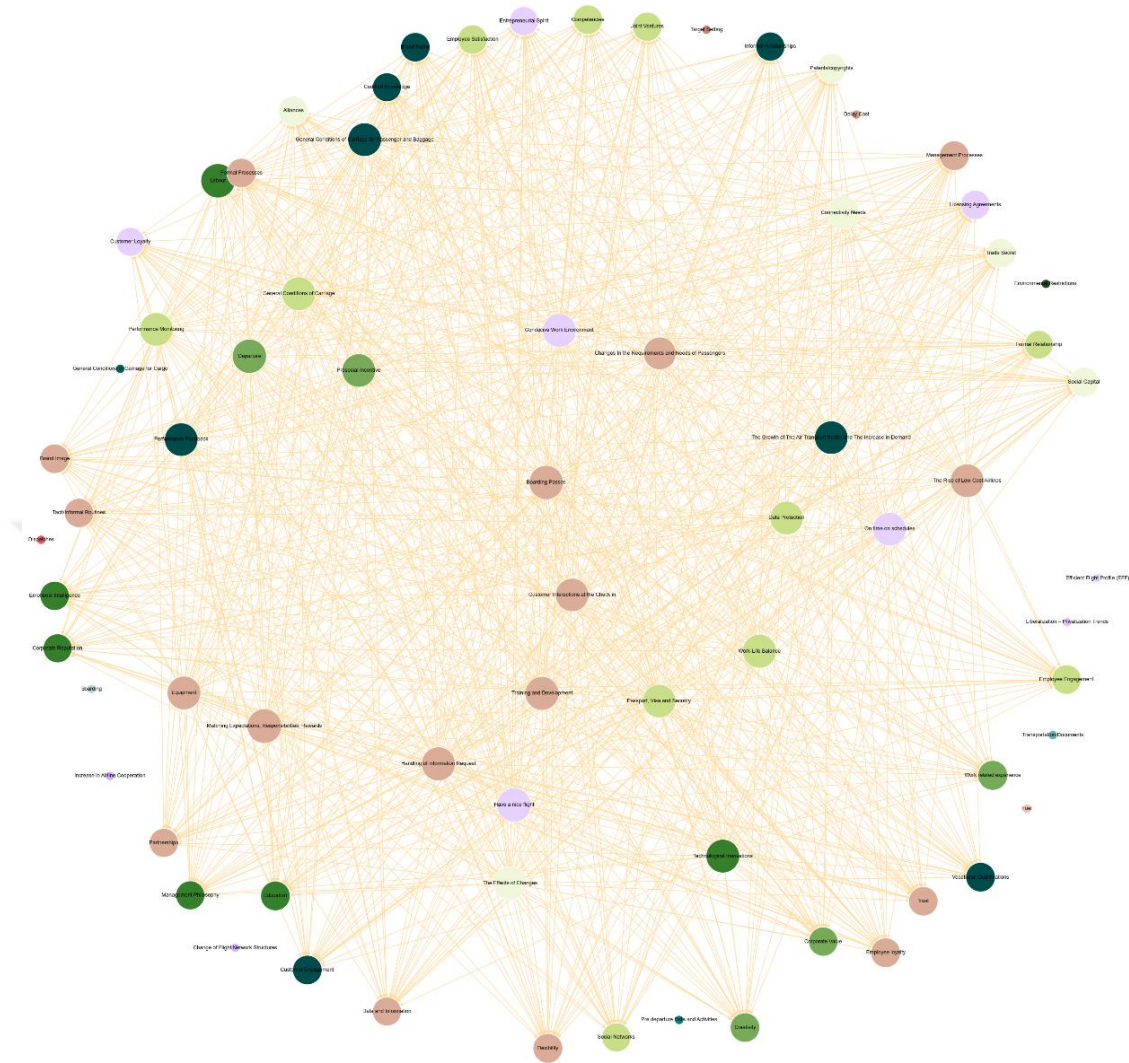
Esenboğa TAV Technologies



Graph 18: Community Detection Network of Esenboğa TAV Technologies

In the Esenboğa TAV Technologies analysis, 20 communities were detected in correlation with all 72 nodes and 1272 edges as seen graph 18 those in the same community are of the same color. The significance of this community detection stems from the fact that a community may be a subset of the entire network that has extremely comparable properties. Individuals or nodes in the same community are connected to one another more densely than those in different communities. Individuals are related because they know each other or they share common qualities, hence it can be claimed that if they live in the same community, they have more comparable and common features.

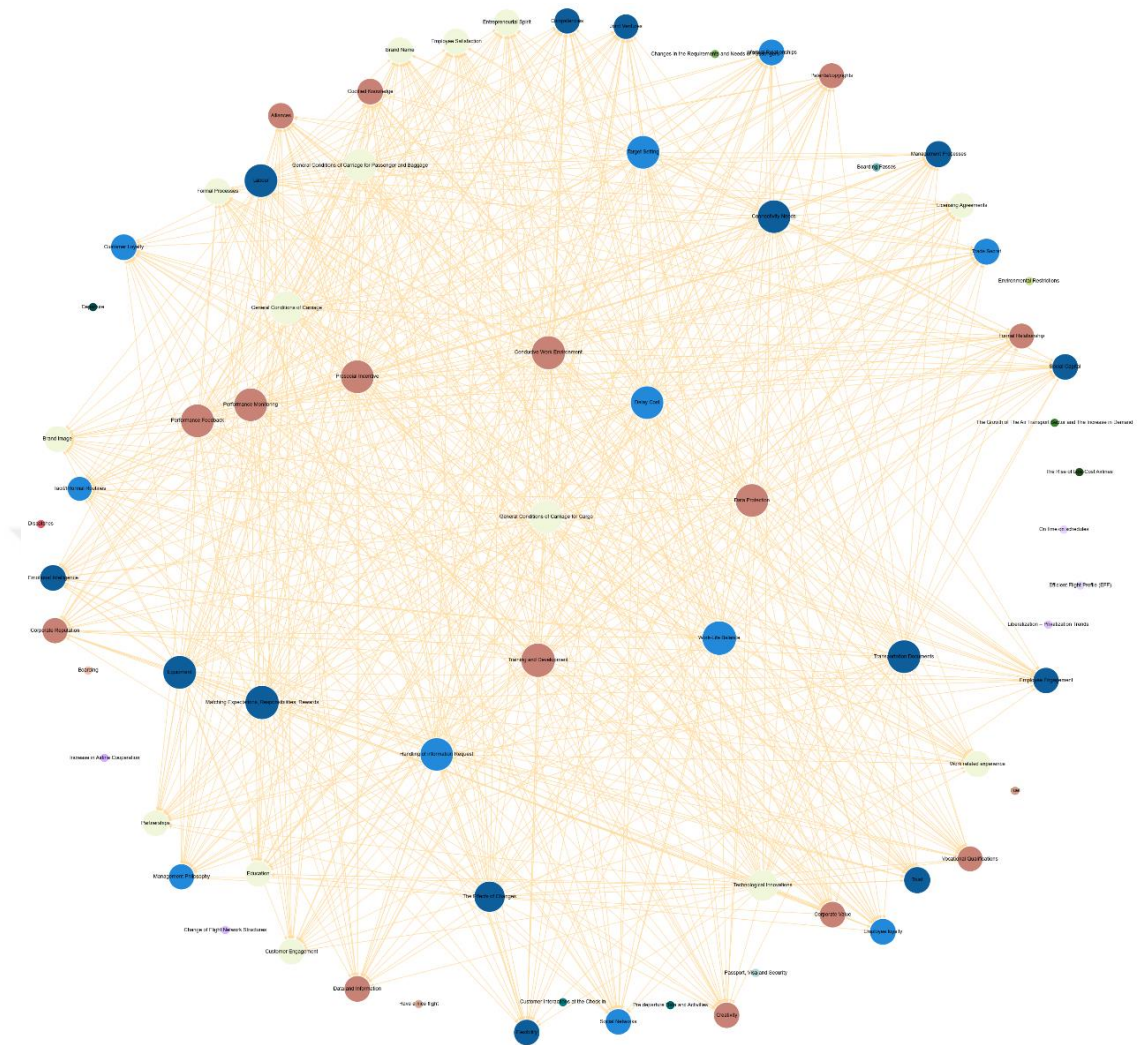
Esenboğa PRIMECLASS



Graph 19: Community Detection Network of Esenboğa PRIMECLASS

In the Esenboğa PRIMECLASS analysis, 20 communities were detected in correlation with all 72 nodes and 1272 edges as seen graph 19 those in the same community are of the same color. The significance of this community detection stems from the fact that a community may be a subset of the entire network that has extremely comparable properties. Individuals or nodes in the same community are connected to one another more densely than those in different communities. Individuals are related because they know each other or they share common qualities, hence it can be claimed that if they live in the same community, they have more comparable and common features.

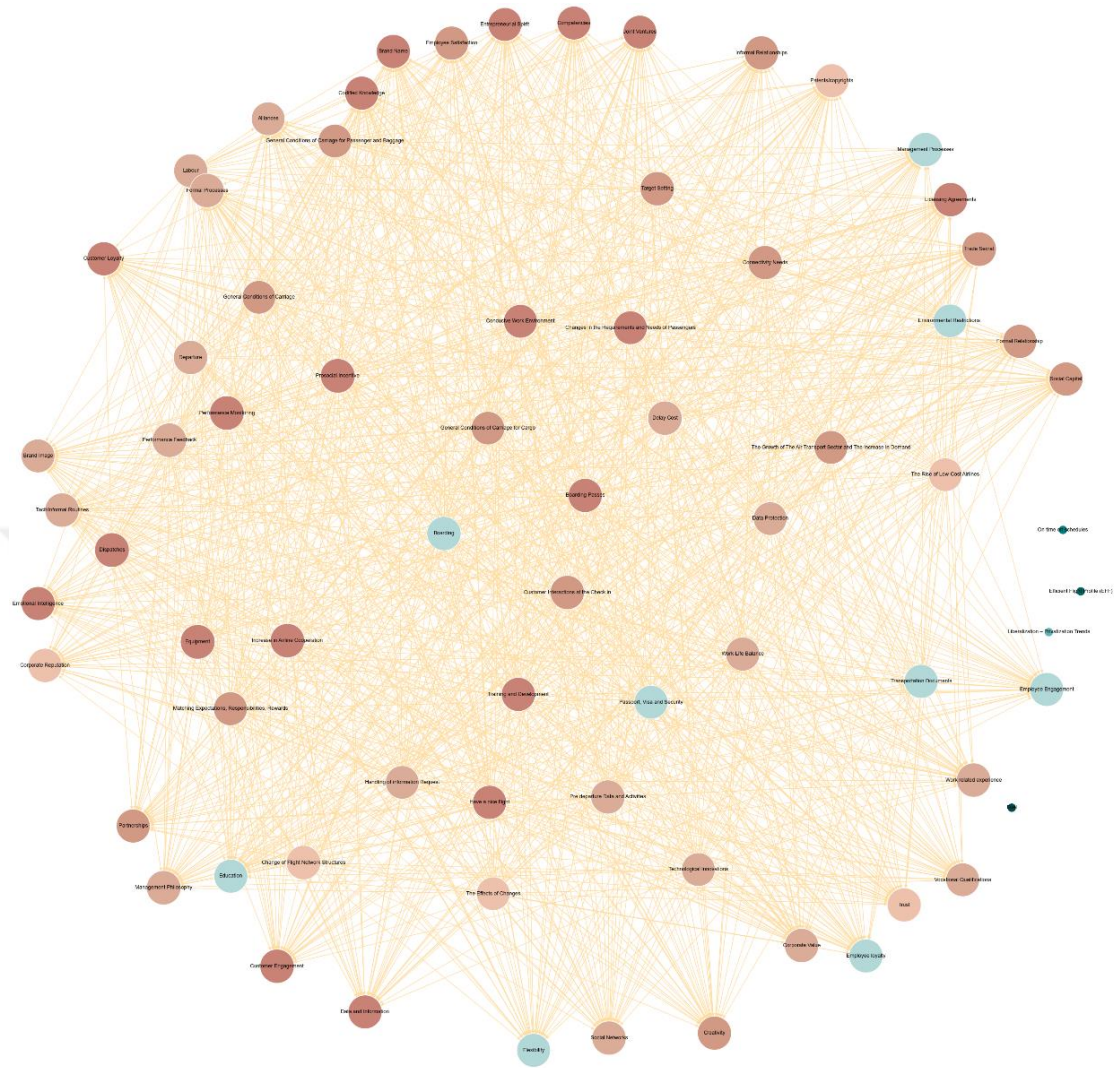
Esenboğa TAV Securities



Graph 20: Community Detection Network of Esenboğa TAV Securities

In the Esenboğa TAV Securities analysis, 22 communities were detected in correlation with all 72 nodes and 1272 edges as seen graph 20 those in the same community are of the same color. The significance of this community detection stems from the fact that a community may be a subset of the entire network that has extremely comparable properties. Individuals or nodes in the same community are connected to one another more densely than those in different communities. Individuals are related because they know each other or they share common qualities, hence it can be claimed that if they live in the same community, they have more comparable and common features

Esenboğa HAVAŞ



Graph 21: Community Detection Network of Esenboğa HAVAŞ

In the Esenboğa HAVAŞ analysis, 22 communities were detected in correlation with all 72 nodes and 1272 edges as seen graph 21 those in the same community are of the same color. The significance of this community detection stems from the fact that a community may be a subset of the entire network that has extremely comparable properties. Individuals or nodes in the same community are connected to one another more densely than those in different communities. Individuals are related because they know each other or they share common qualities, hence it can be claimed that if they live in the same community, they have more comparable and common features.

4.3.8 Vote-rank

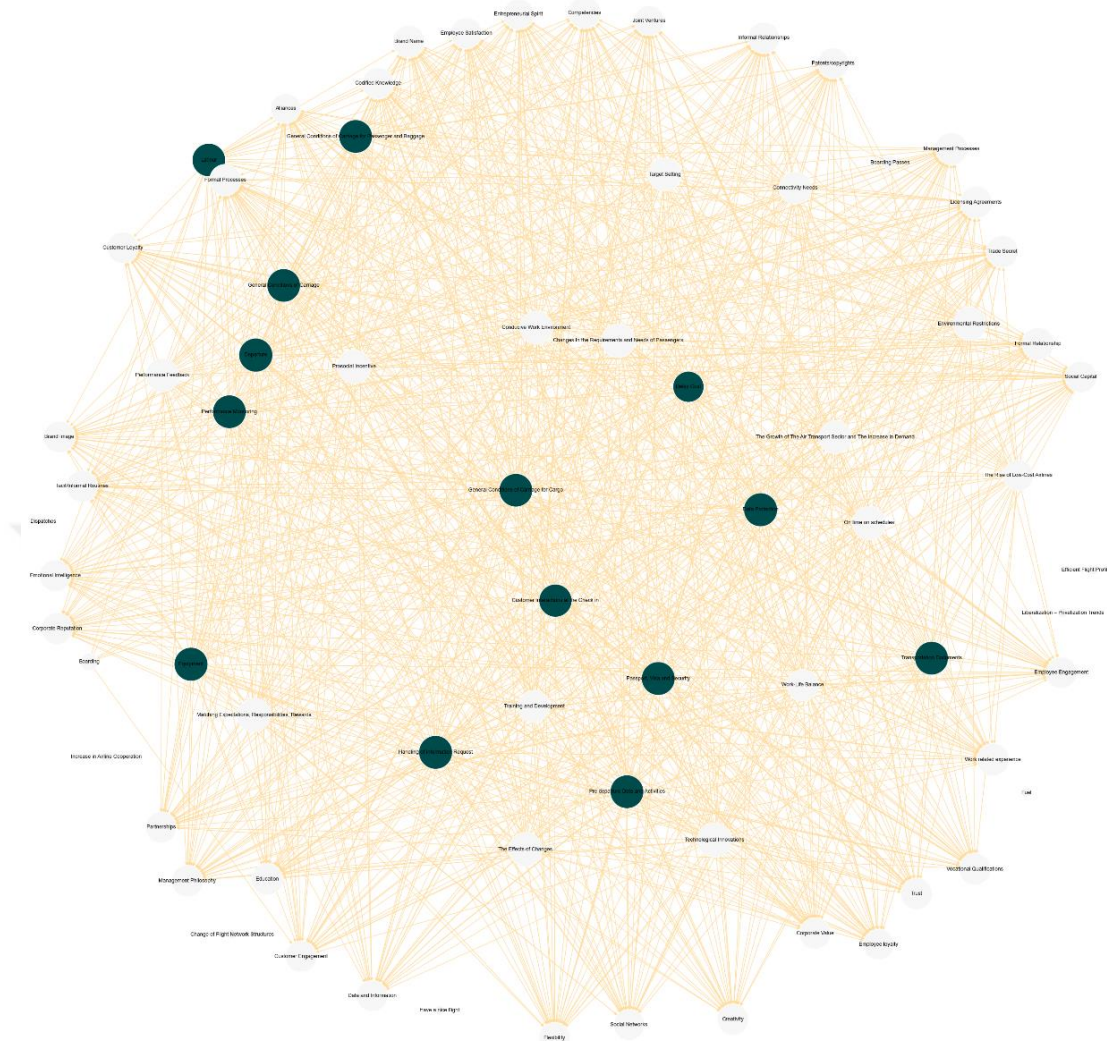
One of the most important aspects in how quickly information travels through a network is the choice of "seeds." Prior to picking further seeds, the proposed technique recomputes adaptive rankings using the Vote-Rank algorithm for each seed individually. Vote-Rank takes both active and inactive nodes into consideration, whereas Recomputation just leverages information on infections inside the network. Thus, within regions that have not yet been infected, only nodes with a higher potential for propagation as seeds may be selected. We studied the effect of recomputation frequency on the final result and compared the findings from the static Vote-Rank algorithm to the proposed dynamic algorithm (Pazura et al., 2020).

Vote-Rank is an algorithm that rates possible seed candidates based on the number of votes they've gotten from neighbouring nodes, grouping those with the highest rankings together and increasing their distance from other seeds to reduce overlap and maximise distance between them.

Using sophisticated seed selection procedures, specific nodes, called as seeds, are utilised to initiate the propagation of information. Choosing the initial set of nodes in a problem involving impact maximisation presents several challenges and potential solutions. The basic purpose is to select a batch of seeds with a high probability of igniting the spread and rousing the neighbours.

Early attempts emphasised degree-based heuristics and associated measures of centrality, such as proximity and eigenvector centrality. The greedy technique performs significantly better than simple heuristics and produces near-optimal results. To improve its computing performance for application in larger networks, further effort was expended. Earlier methods depended solely on initial seed selection, omitting any intermediate processes. Sequential seeding, seeding timing, and adaptive seeding are alternate planting strategies that let just a fraction of the seeds to be planted initially. The main method is to avoid planting seeds at nodes that have a high likelihood of being naturally activated by their neighbours. As the study continued, it became evident that the network's topology, entropy-based centrality, and effective degree all influence the success of sequential seeding (Pazura et al., 2020).

Esenboğa TAV Head Office



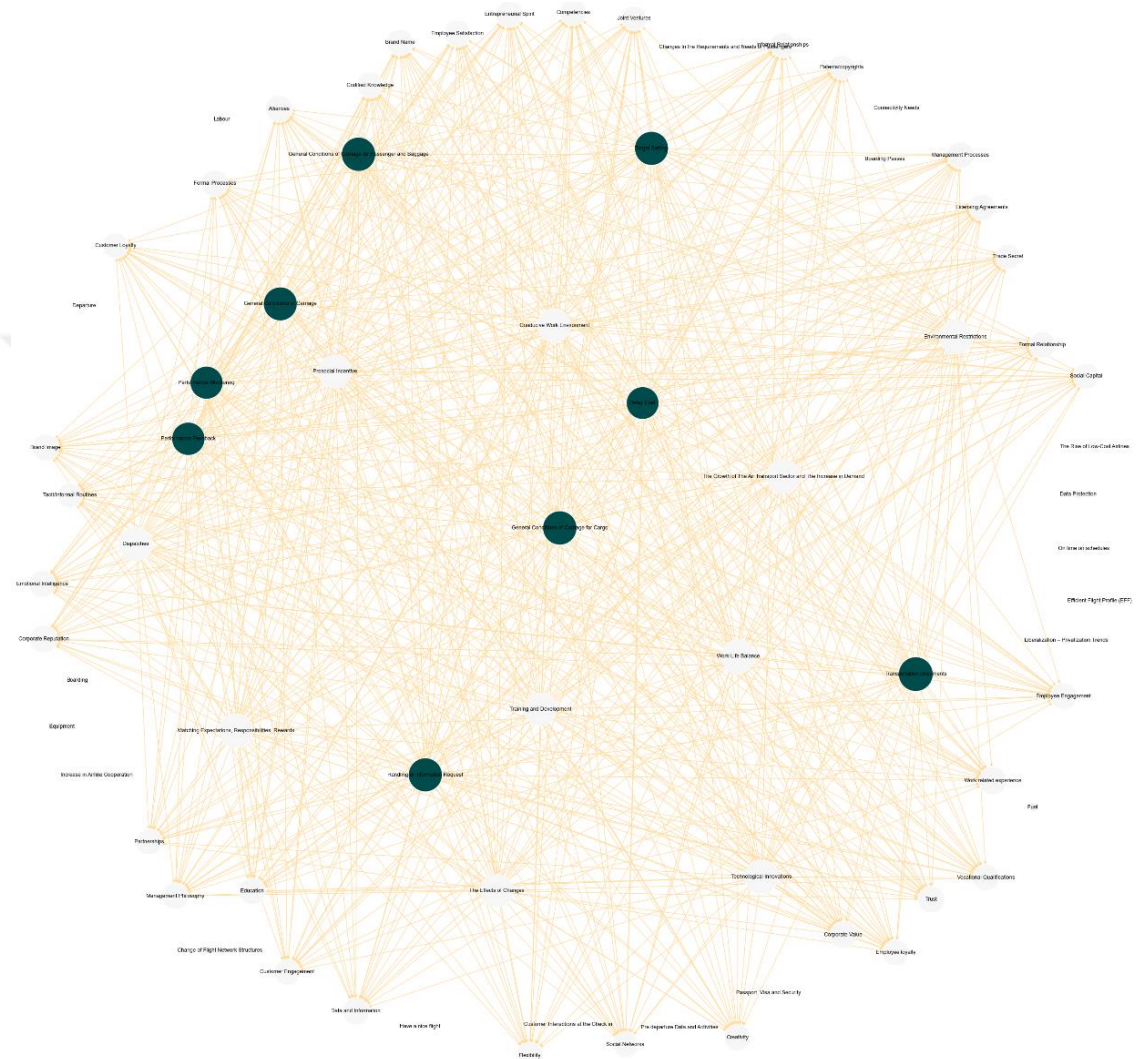
Graph 22: Vote-Rank Network of Esenboğa TAV Hq

The main goal is to analyse the effects of seed selection for sequential seeding with the use of dynamic rankings generated with the Vote-Rank algorithm. According to TAV Hq analysis, seeds are 0#General Conditions of Carriage,1#General Conditions of Carriage for Passenger and Baggage, 2#General Conditions of Carriage for Cargo, 3#Data Protection, 4#Handling of information Request, 5#Departure, 6#Pre departure Data and Activities, 7#Transportation Documents, 8#Customer Interactions at the Check in, 10#Passport, Visa and Security, 13#Labour, 15#Equipment, 16#Delay Cost, 17#Performance Monitoring.

As seen Graph 22, network nodes are ranked once at the beginning of the process and seeds are selected according to their rank. Together with ongoing spreading processes within network changes, nodes with high potential for seeding at the beginning may no

longer be effective. Only active nodes are eligible to cast a vote. The outcomes indicated the performance of the suggested method with a resurrection mode when further seeding happens after a process has improved.

Esenboğa TAV Finance Department



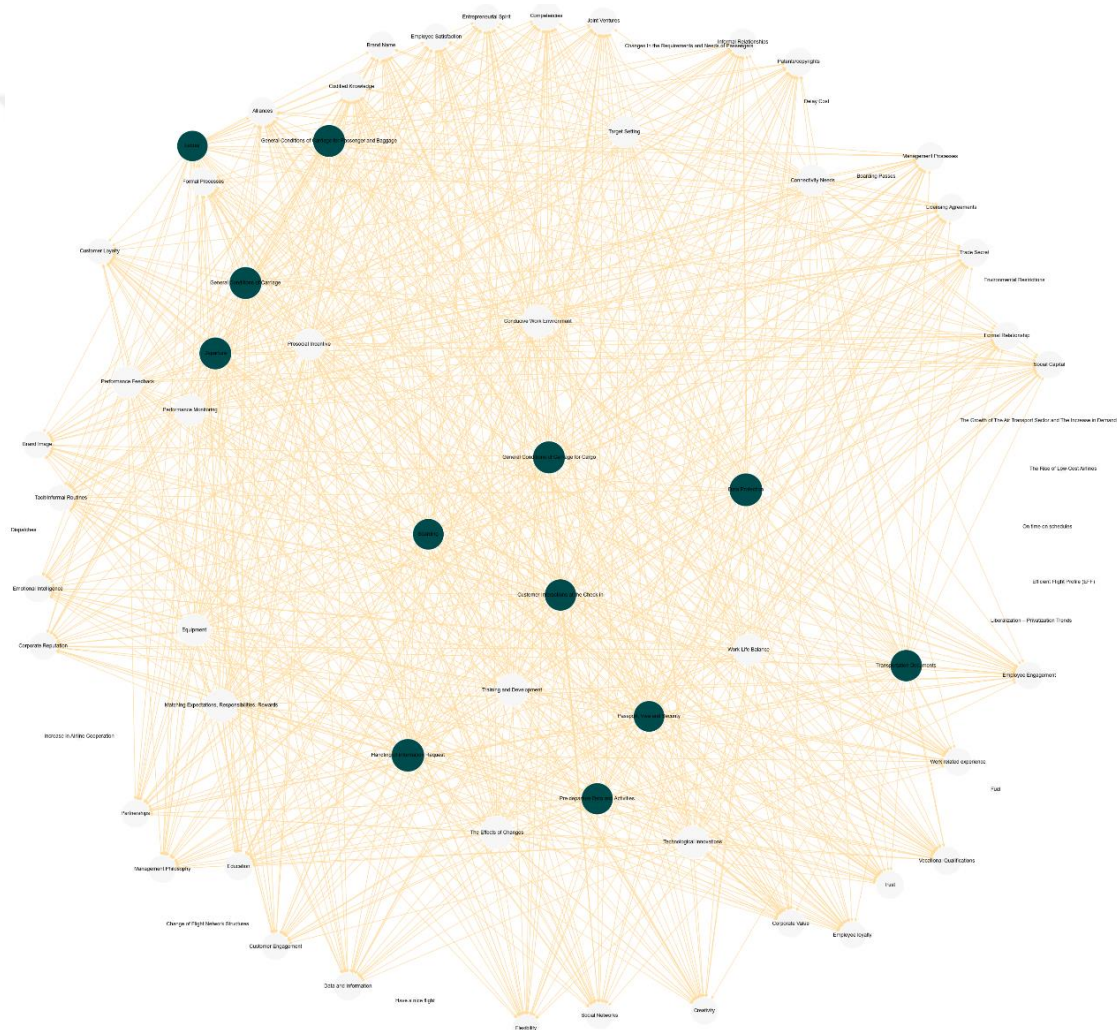
Graph 23: Vote-Rank Network of TAV Finance Department

The main goal is to analyse the effects of seed selection for sequential seeding with the use of dynamic rankings generated with the Vote-Rank algorithm. According to TAV Finance Department analysis, seeds are 1#General Conditions of Carriage for Passenger and Baggage, 2#General Conditions of Carriage for Cargo, 4#Handling of information Request, 7#Transportation Documents, 16#Delay Cost, 17#Performance Monitoring, 18# Performance Feedback, 19#Target Setting.

Feedback,19#Target Setting.

As seen Graph 24, network nodes are ranked once at the beginning of the process and seeds are selected according to their rank. Together with ongoing spreading processes within network changes, nodes with high potential for seeding at the beginning may no longer be effective. Only active nodes are eligible to cast a vote. The outcomes indicated the performance of the suggested method with a resurrection mode when further seeding happens after a process has improved.

Esenboğa TAV Technologies



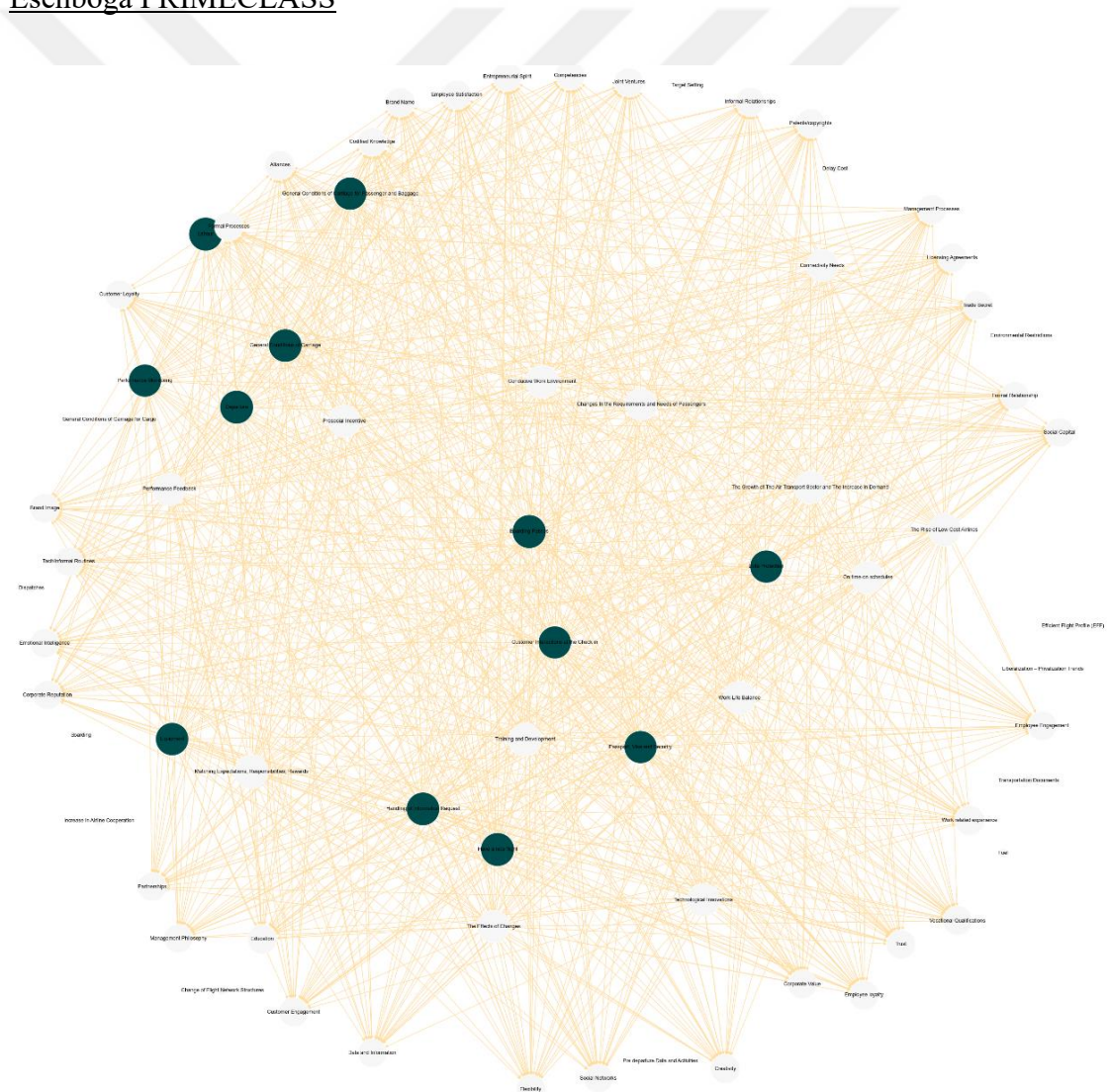
Graph 25: Vote-Rank Network of Esenboğa TAV Technologies

The main goal is to analyse the effects of seed selection for sequential seeding with the use of dynamic rankings generated with the Vote-Rank algorithm. According to TAV technologies analysis, seeds are 0#General Conditions of Carriage,1#General Conditions of Carriage for Passenger and Baggage, 2#General Conditions of Carriage for

Cargo, 3#Data Protection, 4#Handling of information Request, 4#Handling of information Request 5#Departure, 6#Pre departure Data and Activities, 7#Transportation Documents, 8#Customer Interactions at the Check in, 10#Passport, Visa and Security,11# Boarding, 13#Labour,15#Equipment, 16#Delay Cost, 17#Performance Monitoring.

As seen Graph 25, network nodes are ranked once at the beginning of the process and seeds are selected according to their rank. Together with ongoing spreading processes within network changes, nodes with high potential for seeding at the beginning may no longer be effective. Only active nodes are eligible to cast a vote. The outcomes indicated the performance of the suggested method with a resurrection mode when further seeding happens after a process has improved.

Esenboğa PRIMECLASS



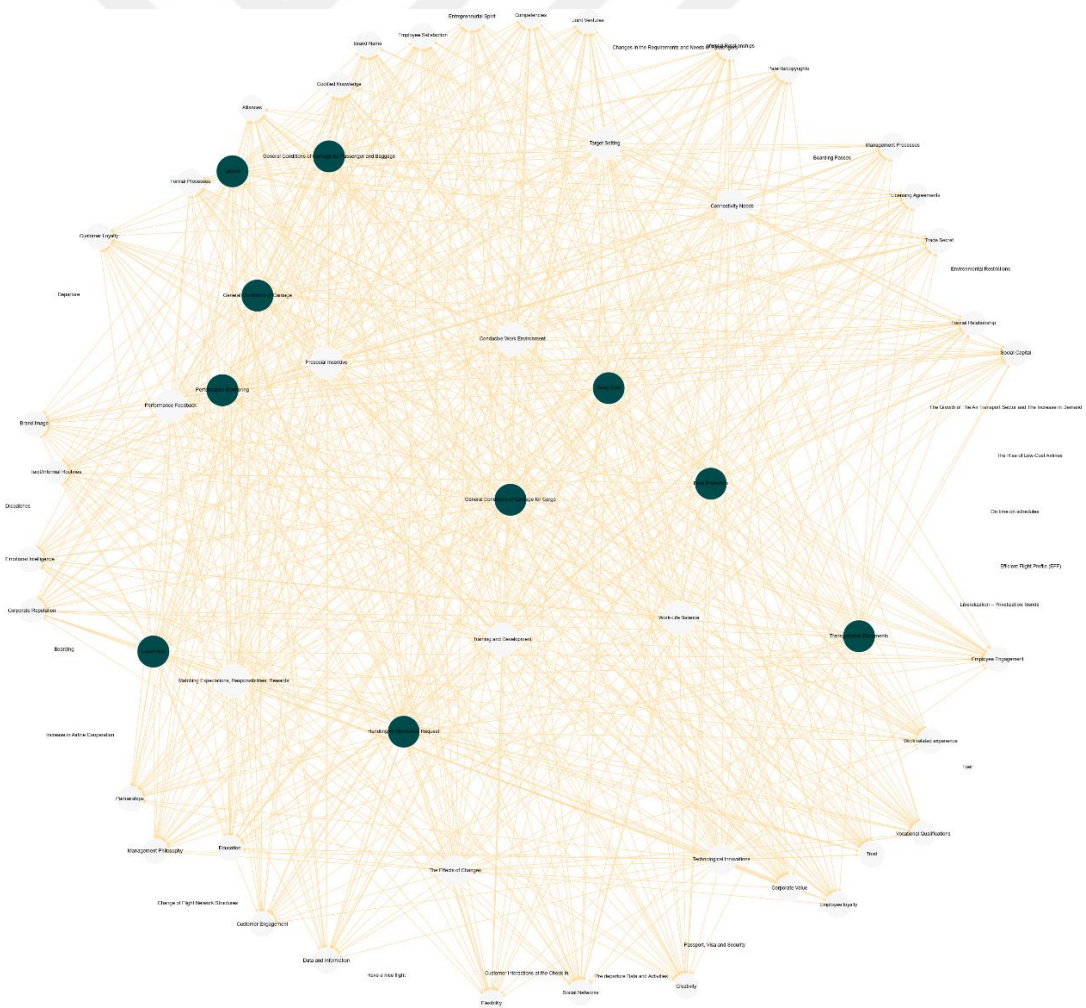
Graph 26: Vote-Rank Network of Esenboğa PRIMECLASS

The main goal is to analyse the effects of seed selection for sequential seeding

with the use of dynamic rankings generated with the Vote-Rank algorithm. According to PRIMECLASS analysis, seeds are 0#General Conditions of Carriage,1#General Conditions of Carriage for Passenger and Baggage, 3#Data Protection, 4#Handling of information Request, 5#Departure, 8#Customer Interactions at the Check in, 9#Boarding Passes,10#Passport, Visa and Security,12#Have a nice flight, 13#Labour, 15#Equipment, 17#Performance Monitoring.

As seen Graph 26, network nodes are ranked once at the beginning of the process and seeds are selected according to their rank. Together with ongoing spreading processes within network changes, nodes with high potential for seeding at the beginning may no longer be effective. Only active nodes are eligible to cast a vote. The outcomes indicated the performance of the suggested method with a resurrection mode when further seeding happens after a process has improved.

Esenboğa TAV Securities

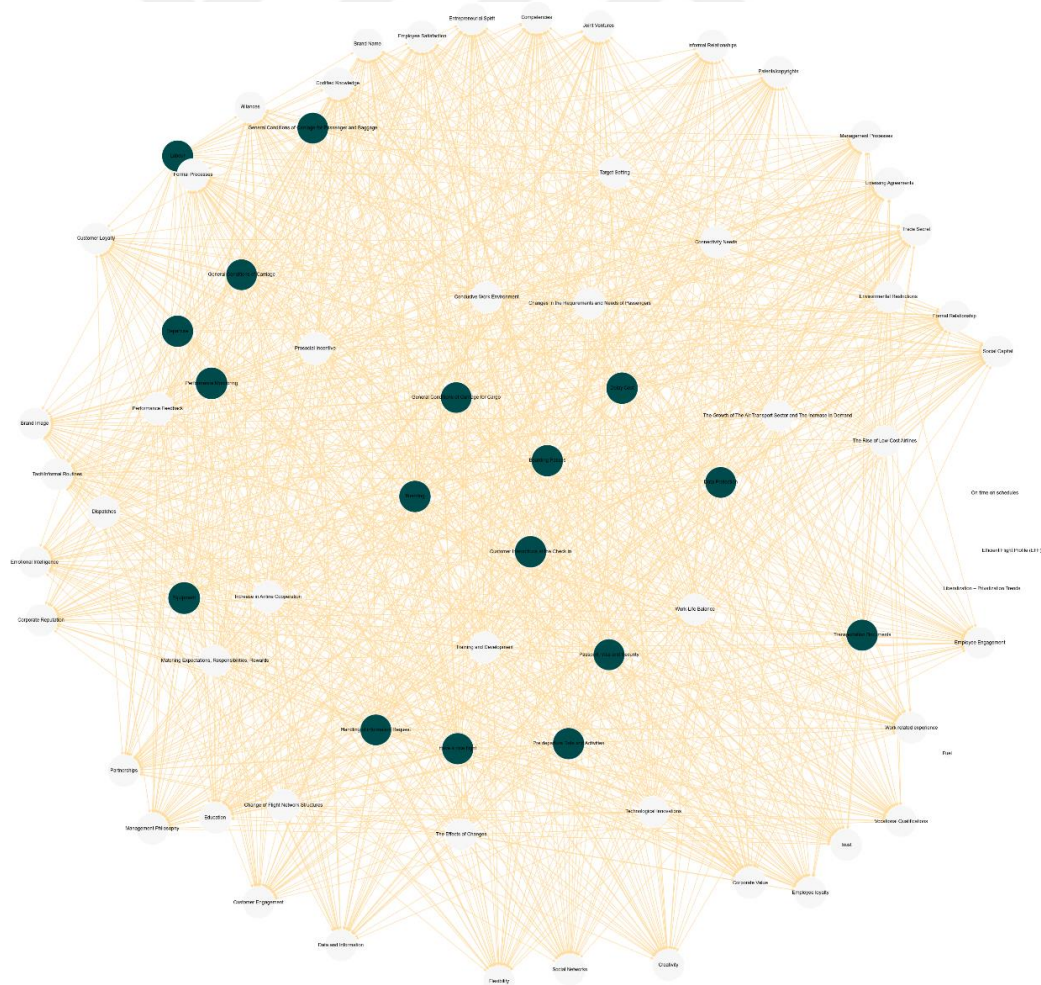


Graph 27: Vote-Rank Network of Esenboğa TAV Securities

The main goal is to analyse the effects of seed selection for sequential seeding with the use of dynamic rankings generated with the Vote-Rank algorithm. According to Esenboğa TAV Securities analysis, seeds are 0#General Conditions of Carriage,1#General Conditions of Carriage for Passenger and Baggage, 2#General Conditions of Carriage for Cargo, 3#Data Protection, 4#Handling of information Request, 7#Transportation Documents, 13#Labour, 15#Equipment, 16#Delay Cost, 17#Performance Monitoring.

As seen Graph 27, network nodes are ranked once at the beginning of the process and seeds are selected according to their rank. Together with ongoing spreading processes within network changes, nodes with high potential for seeding at the beginning may no longer be effective. Only active nodes are eligible to cast a vote. The outcomes indicated the performance of the suggested method with a resurrection mode when further seeding happens after a process has improved.

Esenboğa HAVAS



Graph 28: Vote-Rank Network of Esenboğa HAVAS

The main goal is to analyse the effects of seed selection for sequential seeding with the use of dynamic rankings generated with the Vote-Rank algorithm. According to Esenboğa HAVAŞ analysis, seeds are 1#General Conditions of Carriage for Passenger and Baggage, 2#General Conditions of Carriage for Cargo, 3#Data Protection, 4#Handling of information Request, 5#Departure, 6#Pre departure Data and Activities, 7#Transportation Documents, 8#Customer Interactions at the Check in, Boarding Passes,10#Passport, Visa and Security,11#Boarding, 12#Have a nice flight, 13#Labour, 15#Equipment,16#Delay Cost, 17#Performance Monitoring.

As seen Graph 28, network nodes are ranked once at the beginning of the process and seeds are selected according to their rank. Together with ongoing spreading processes within network changes, nodes with high potential for seeding at the beginning may no longer be effective. Only active nodes are eligible to cast a vote. The outcomes indicated the performance of the suggested method with a resurrection mode when further seeding happens after a process has improved.

In the research, which was undertaken with the cooperation of TAV Holding and its subsidiaries, all network analyses were examined in depth, and the results were documented.

Since every participant in the study is a senior management inside their own organisation, they each represent their own company in the findings. Due to this, each company is evaluated independently. Finally, all the data gathered from each company is reanalyzed, and conclusions are drawn regarding the functioning of TAV Holding Esenboga Airport Terminal Management. Accordingly, a summary of the acquired findings follows.

The heatmap of the findings obtained by analyzing all the data is presented in figure 8. The heatmap based on the survey scores all collected data clearly shows all participant complete responses to all questions. However, as stated before, the participants did not answer the questions outside their field of work. Therefore, the non-relevance between digital transformation requirements and intellectual capital components was given a score of 0, since the black areas were deemed to be “out the scope of responsibility and duty”. Thus, the participant did not submit a score of 0 as weight for this study. In the NetworkX algorithm, the value 0 is used to denote nodes that are not connected to one another. As seen, the nodes, 23#Efficient Flight Profile (EFF) and

25#Liberalization/Privatization Trends belonging to the digital transformation criteria are not related to any of the intellectual capital nodes. These were evaluated outside the scope of TAV Holding's duties and responsibilities.

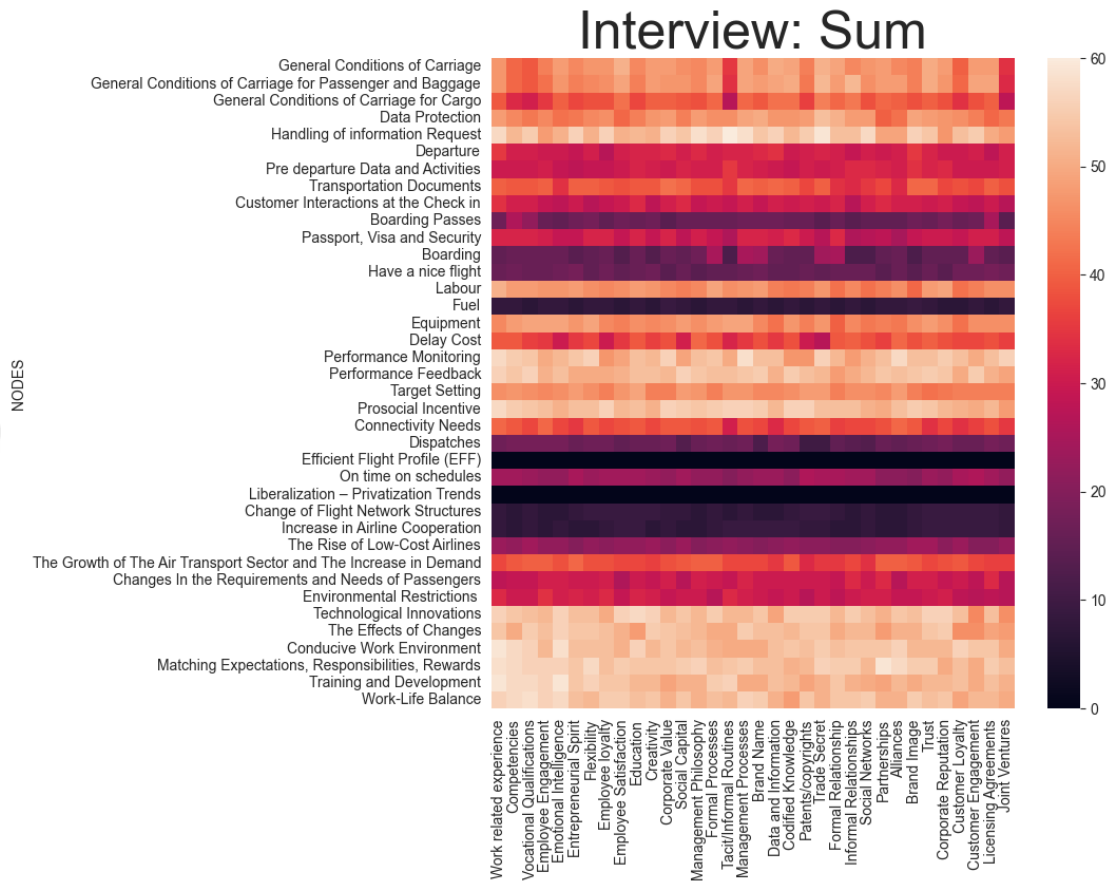


Figure 9: Esenboğa SUM -Raw Data Heatmap

When it comes to degree centrality, when all the data that was gathered from the firms is taken into consideration, the nodes that stand out the most remarkable from in-degree is “59#Trade Secret” and the most important node from out degree is “3# Data Protection” respectively, according to the rankings for in degree and out degree as seen Diagram 35.

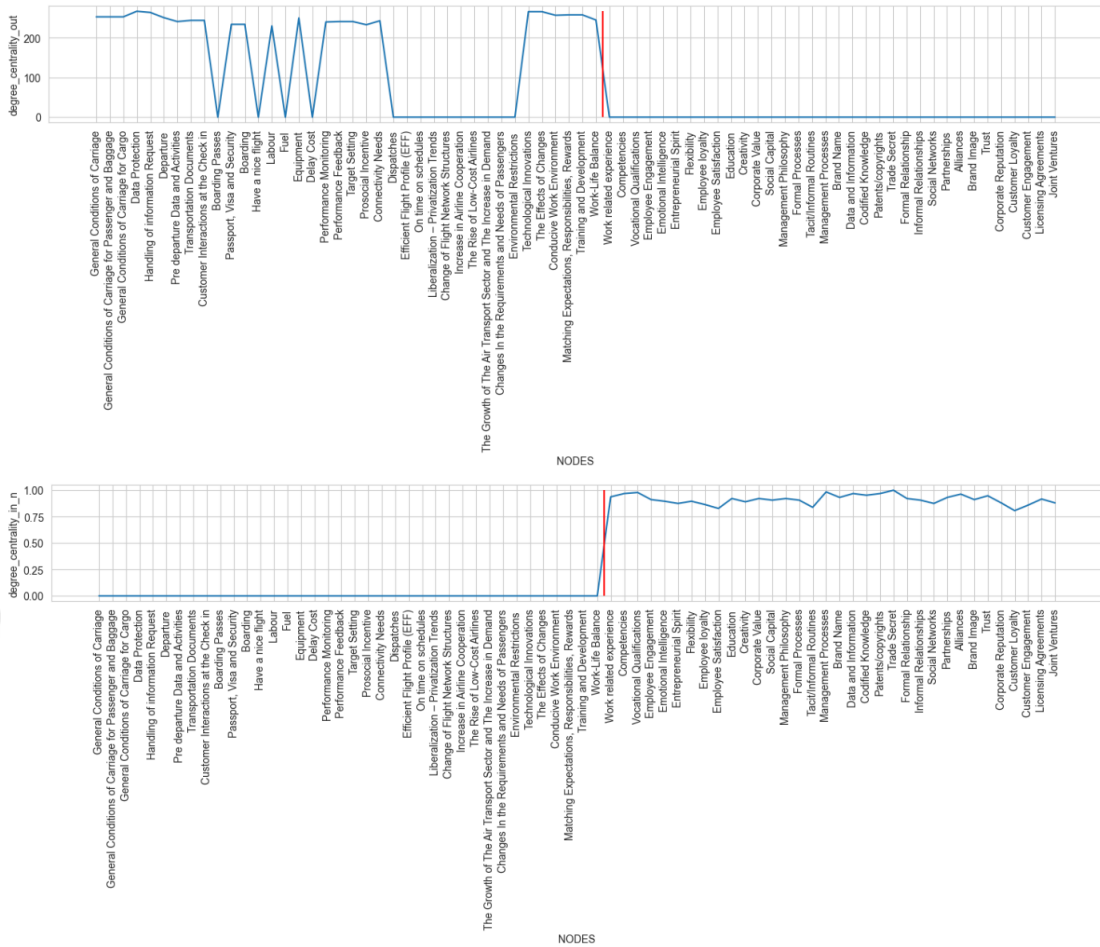


Diagram 35: Esenboğa SUM-In&Out Link Normalized Degree Centrality

Thus, in terms of centrality, "Data Protection" is seen as an influencer, whereas "trade secret" is regarded as a supported, according to the results of this study. "Data protection" is a digital transformation criterion associated with "customer service." Similarly, "trade secret" is an element of structural capital. The "Customer Service" component is the most influential for Esenboğa TAV Holding Terminal Management while the "Structural Capital" component is the most supported.

Regarding closeness centrality statistics, as all the data that was gathered from the companies is taken into consideration, the most central node is "Trust" according to in-link, and "Matching Expectations, Responsibilities, Rewards" according to out-link. Consideration is given to the distances between each node in a network. According to the closeness centrality computed by joining the network, in-link "66#Trust" is the hub of network 35#Matching Expectations, Responsibilities, Rewards Technological Innovations" for out-link.

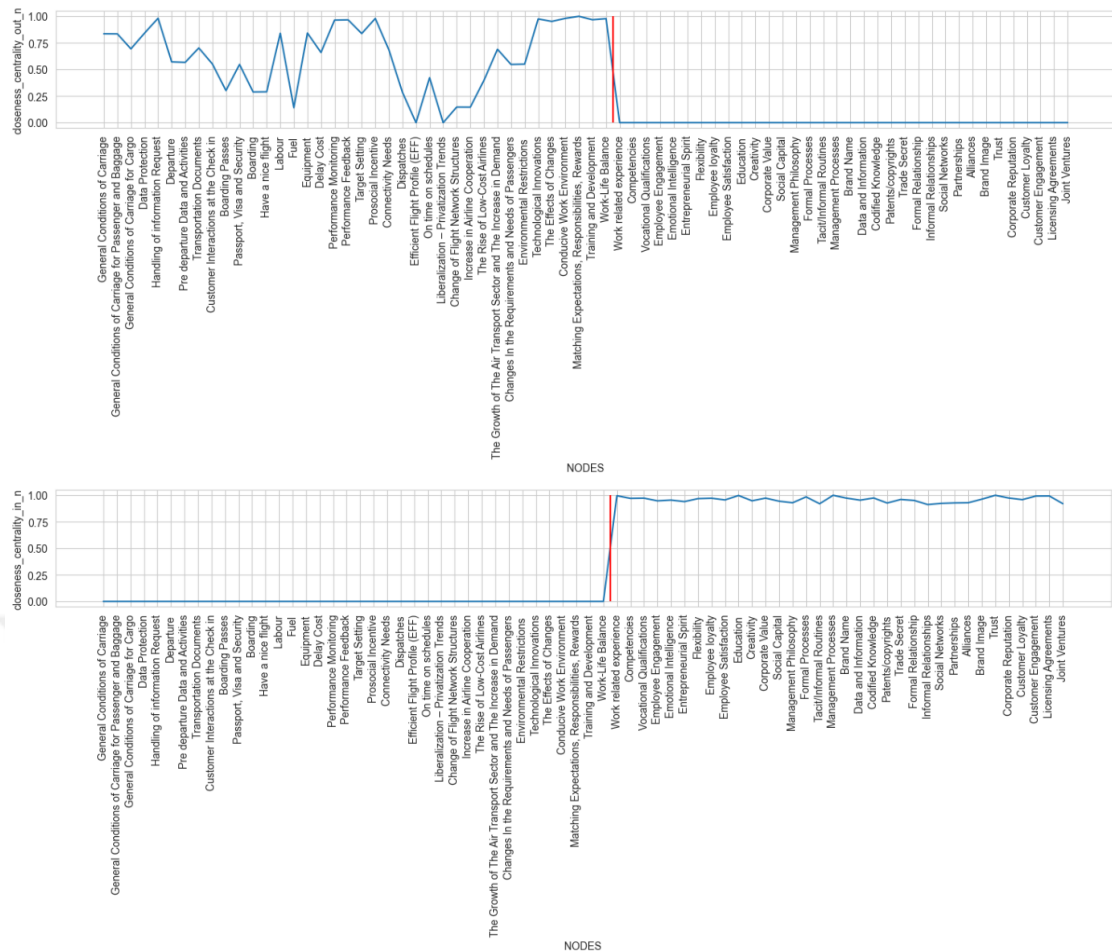


Diagram 36: Esenboğa TAV Holding Terminal Management -In&Out Link Normalized Closeness Centrality

In other words, the effect of the digital transformation criteria on the intellectual capital is detailed below. When it is referred as “Trust” in influence at the centre of this network and “Matching Expectations, Responsibilities, Rewards” in support to other NODEs. In other words, centrality can transfer considerably more rapidly than position-holding nodes since they have the quickest routes to knowledge. Thus, they have the benefit of rapidly disseminating information inside the network. While the most central node in out-link is the "Increase Employee Retention" criterion, the most central node in in-link is the "relational capital" component.

An individual node's contribution to the network's eigenvector centrality is greater if it has a smaller but higher quality link count than if it has a larger but lower quality link count. The eigenvector centrality of the node with high value added and many average connections. a node's importance depends not only on the number of its neighbours, but also on the number of its influential neighbours. That is, the most prestigious node is discovered.

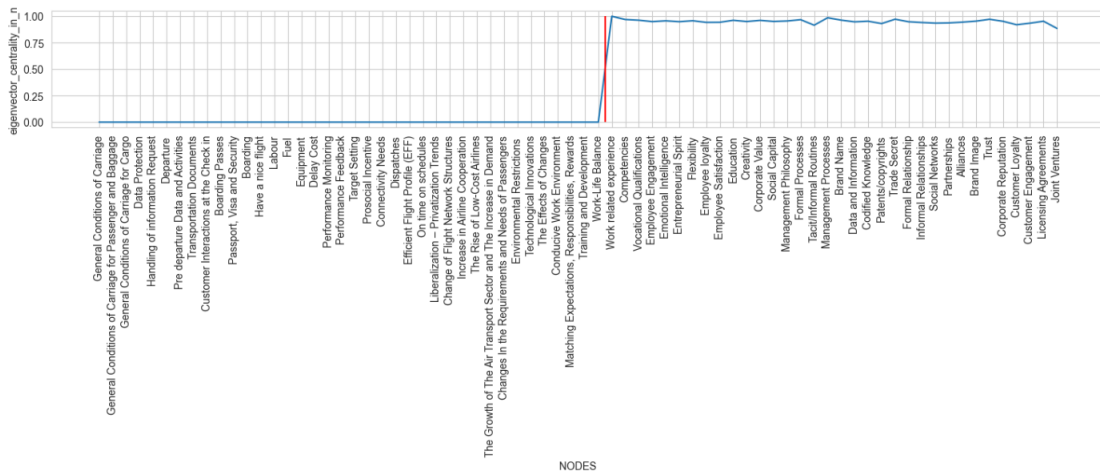


Diagram 37: Esenboğa TAV Holding Terminal Management - In&Out Link Eigenvector Centrality

Due to the fact that the eigenvalue is determined only according to the edge coming to the node, the most prestigious node from the Esenboğa TAV Holding Terminal Management results according to the in-link is “Work related experience” as seen diagram 38.

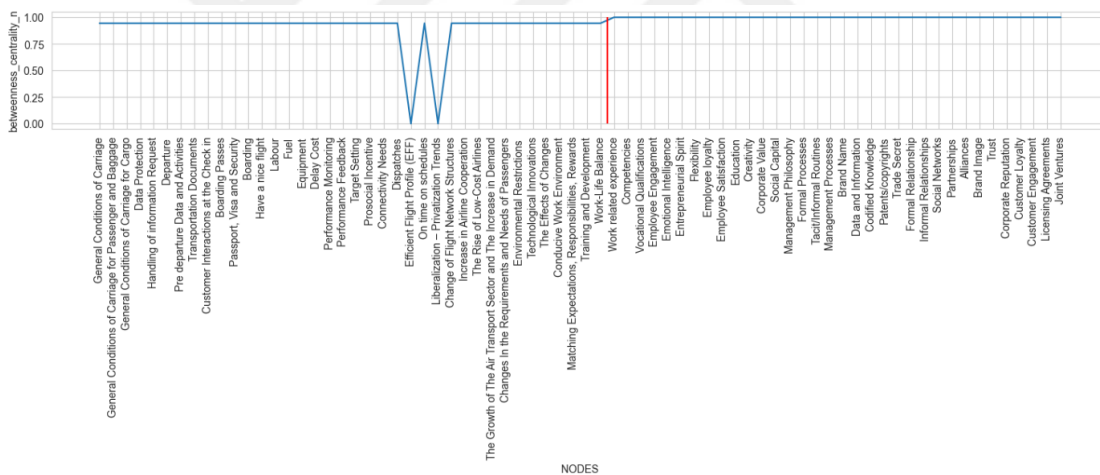
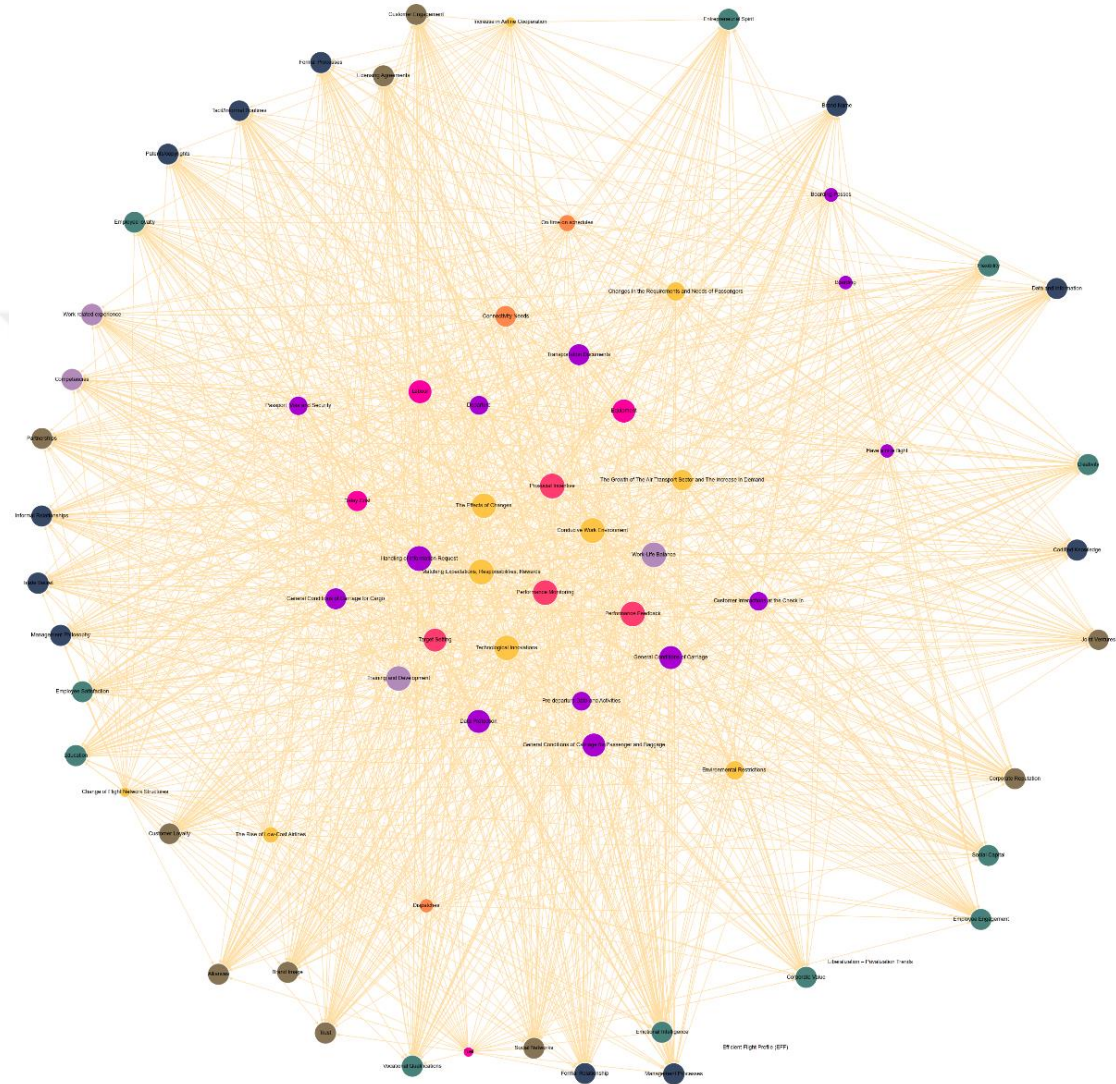


Diagram 38: Esenboğa TAV Holding Terminal Management Betweenness centrality

Regarding betweenness centrality statistics, as all the data that was gathered from the companies is taken into consideration, the network nodes with the greatest betweenness measurements are 38#Work related experience, 39#Competencies, 40#Vocational Qualifications, 41#Employee Engagement, 42#Emotional Intelligence, 43#Entrepreneurial Spirit, 44#Flexibility, 45#Employee loyalty, 46#Employee Satisfaction, 47#Education, 48#Creativity, 49#Corporate Value, 50#Social Capital, 51#Management Philosophy, 52#Formal Processes, 53#Tacit/Informal Routines, 54#Management Processes, 55#Brand Name, 56#Data and Information, 57#Codified

Knowledge, 58#Patents/copyrights, 59#Trade Secret, 60#Formal Relationship, 61#Informal Relationships, 62#Social Networks, 63#Partnerships, 64#Alliances, 65#Brand Image, 66#Trust, 67#Corporate Reputation, 68#Customer Loyalty, 69#Customer Engagement, 70#Licensing Agreements, 71#Joint Ventures. These are the most key players in the information flow.



Graph 29: Vote-Rank Network of Esenboğa TAV Holding Terminal Management

Examining the network analysis of the Esenboğa TAV Holding Terminal Management reveals that it is directed, as seen in graph 29 (The legible version of graph is in the appendix 8). The source nodes are more centrally positioned, whereas the destination nodes are more peripherally located. Both, because this is a weighted network, it can be observed that the influencer and support nodes, which are also significant and crucial, are larger. Nodes that have no relationships or are classified as flaneurs are similarly located on the periphery and are extremely tiny. When the network is shown, it

can be observed that nearly all nodes have a very one-directional, dense, and tightly coupled interaction with one another. This also suggests that the network is quite resilient.

Table 9: Esenboğa TAV Holding Terminal Management 's Modularity, Community Detection, and Vote Rank Distribution

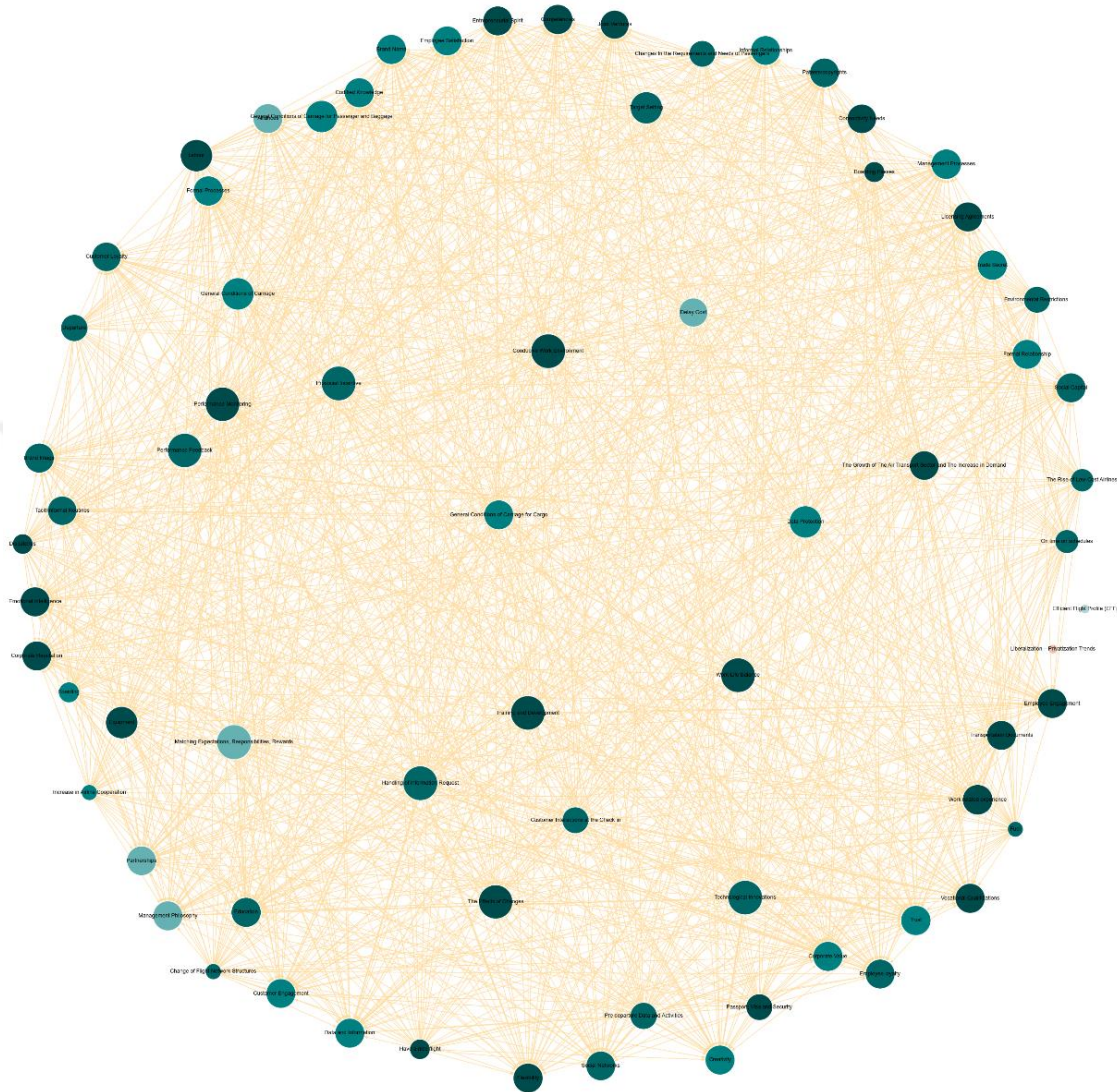
	Unnamed: 0	modularity	community_detection	vote_rank
0	General Conditions of Carriage	3	2	1
1	General Conditions of Carriage for Passenger and Baggage	3	2	1
2	General Conditions of Carriage for Cargo	3	2	1
3	Data Protection	3	2	1
4	Handling of information Request	2	5	1
5	Departure	2	5	1
6	Pre departure Data and Activities	2	5	1
7	Transportation Documents	1	7	1
8	Customer Interactions at the Check in	2	5	1
9	Boarding Passes	1	1	1
10	Passport, Visa and Security	1	1	1
11	Boarding	3	2	1
12	Have a nice flight	1	1	1
13	Labour	1	7	1
14	Fuel	2	5	1
15	Equipment	1	7	1
16	Delay Cost	4	6	1
17	Performance Monitoring	1	7	0
18	Performance Feedback	2	5	0
19	Target Setting	2	5	0
20	Prosocial Incentive	2	5	0
21	Connectivity Needs	1	6	0
22	Dispatches	1	1	0
23	Efficient Flight Profile (EFF)	5	3	0
24	On time on schedules	2	2	0
25	Liberalization – Privatization Trends	6	4	0
26	Change of Flight Network Structures	2	7	0
27	Increase in Airline Cooperation	3	2	0
28	The Rise of Low-Cost Airlines	2	5	0
29	The Growth of The Air Transport Sector and The Increase in Demand	1	6	0
30	Changes In the Requirements and Needs of Passengers	2	6	0
31	Environmental Restrictions	2	1	0
32	Technological Innovations	2	5	0
33	The Effects of Changes	1	7	0
34	Conducive Work Environment	1	1	0
35	Matching Expectations, Responsibilities, Rewards	4	6	0
36	Training and Development	1	1	0
37	Work-Life Balance	1	1	0

38	Work related experience	1	1	0
39	Competencies	1	1	0
40	Vocational Qualifications	1	1	0
41	Employee Engagement	1	1	0
42	Emotional Intelligence	1	1	0
43	Entrepreneurial Spirit	1	7	0
44	Flexibility	1	7	0
45	Employee loyalty	2	1	0
46	Employee Satisfaction	3	2	0
47	Education	2	5	0
48	Creativity	3	7	0
49	Corporate Value	3	7	0
50	Social Capital	2	5	0
51	Management Philosophy	4	6	0
52	Formal Processes	3	2	0
53	Tacit/Informal Routines	2	5	0
54	Management Processes	3	2	0
55	Brand Name	3	2	0
56	Data and Information	3	2	0
57	Codified Knowledge	3	2	0
58	Patents/copyrights	2	5	0
59	Trade Secret	3	2	0
60	Formal Relationship	3	2	0
61	Informal Relationships	3	2	0
62	Social Networks	2	5	0
63	Partnerships	4	6	0
64	Alliances	4	6	0
65	Brand Image	2	5	0
66	Trust	3	2	0
67	Corporate Reputation	1	7	0
68	Customer Loyalty	2	1	0
69	Customer Engagement	3	2	0
70	Licensing Agreements	1	1	0
71	Joint Ventures	1	7	0

Esenboğa TAV Holding Terminal Management’s modularity, community detection, and vote rank are detailed in Table 9. The network has a sophisticated topology, as shown in Table 9, which will be discussed in further depth in the following sections.

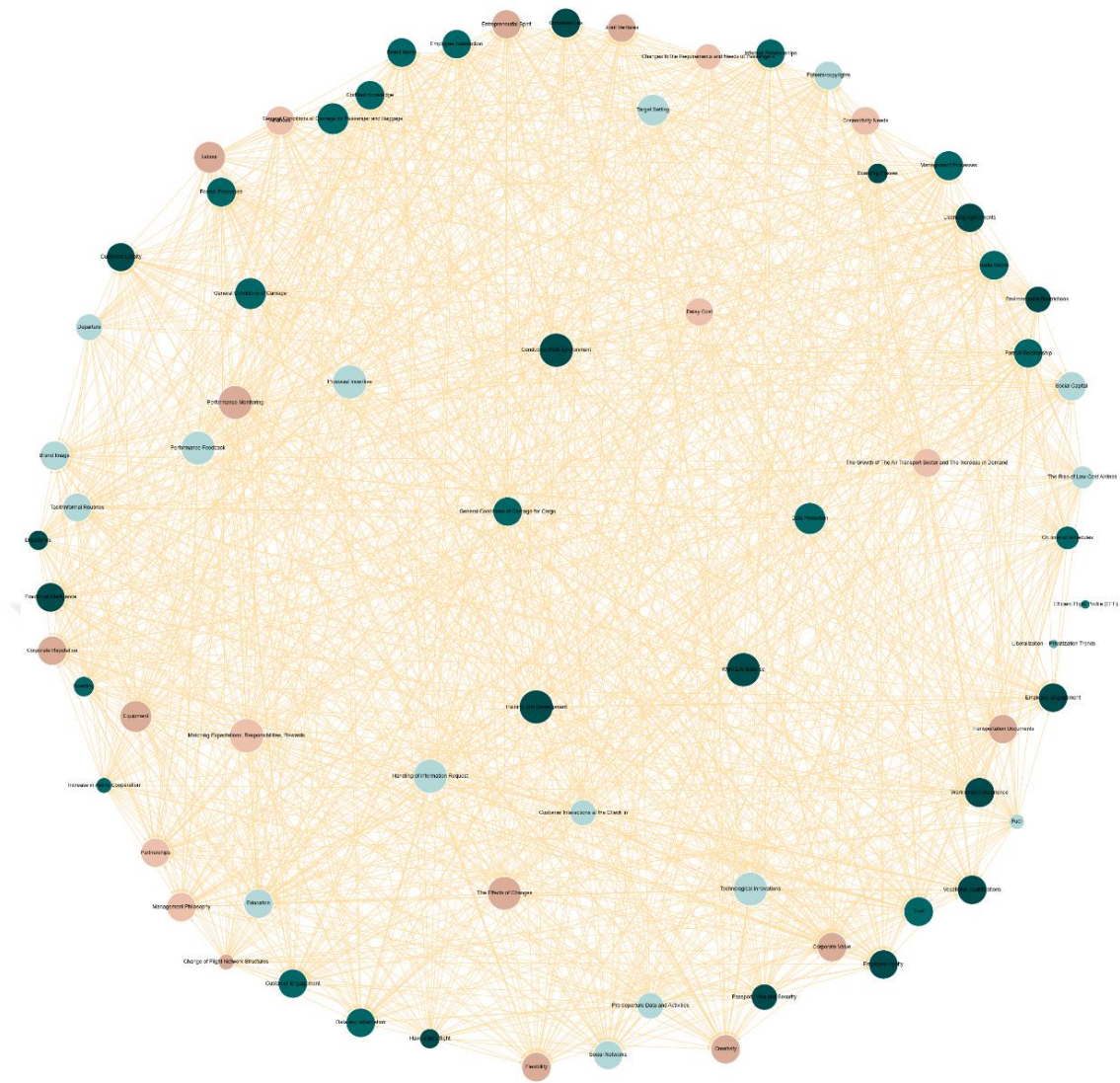
As a result of processing micro dynamics, nodes become tightly connected groups by increasing the relationships between them. This pattern comes from the way small systems have changed over time and become more specialised. It is impossible for the components of crowded systems to adapt and evolve in a way that is compatible with one

another. As a result, all systems contain groups that are highly specialised in a particular function and have positive business relationships. The phenomenon of small worlds is the name given to this pattern. (Gencer, 2017)



Graph 30: Modularity Network of Esenboğa TAV Hq,

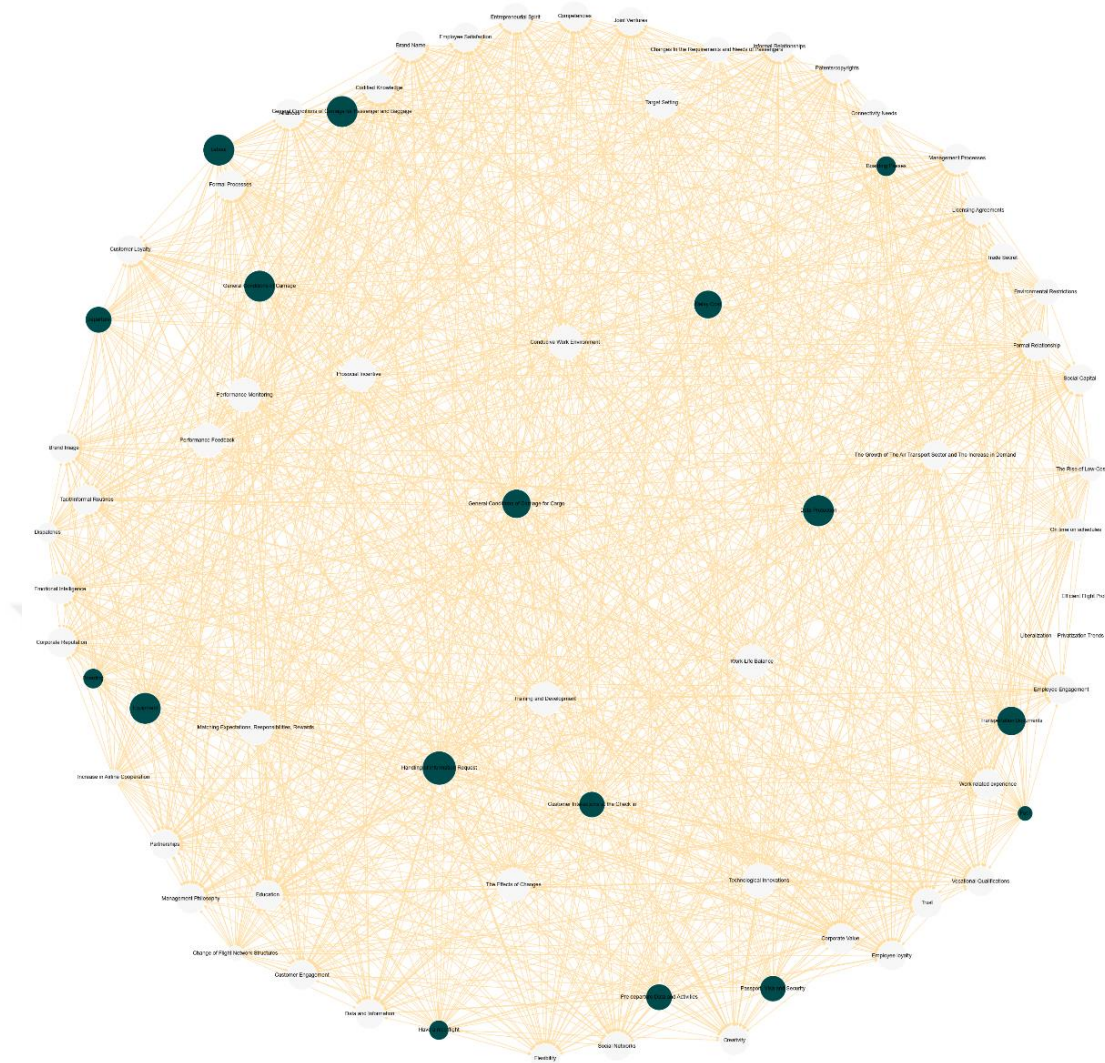
In light of the aforementioned, gathering under 6 titles of digital transformation criteria in this network Esenboğa TAV Holding Terminal Management are the attributes in terms of source nodes. Likewise, gathering under the 3 main headings of intellectual capital components is defined as a separate target attribute. As seen Graph 30, in the Esenboğa TAV Holding Terminal Management analysis, all 72 nodes had 6 different modularises according to these attributes and their weighting and orientation. While the most modularity was 1 with 24 nodes, 2 with 22 nodes, 3 with 19, 4 with 5. From the rest 2 nodes, each separate between 5 and 6 modular as seen graph 30.



Graph 31: Community Detection Network of Esenboğa TAV Holding Terminal

In the Management analysis, 7 communities were detected in correlation with all 72 nodes and 1272 edges as seen graph 31. The significance of this community detection stems from the fact that a community may be a subset of the entire network that has extremely comparable properties. Individuals or nodes in the same community are connected to one another more densely than those in different communities. Individuals are related because they know each other or they share common qualities, hence it can be claimed that if they live in the same community, they have more comparable and common features.

The main goal is to analyse the effects of seed selection for sequential seeding with the use of dynamic rankings generated with the Vote-Rank algorithm.



Graph 32: Vote-Rank Network of Esenboğa TAV Holding Terminal Management

According to TAV Holding Terminal Management analysis, seeds are 0#General Conditions of Carriage, 1#General Conditions of Carriage for Passenger and Baggage, 2#General Conditions of Carriage for Cargo, 3#Data Protection, 4#Handling of information Request, 5#Departure, 6#Pre departure Data and Activities, 7#Transportation Documents, 8#Customer Interactions at the Check in, 9#Boarding Passes, 10#Passport, Visa and Security, 11#Boarding, 12#Have a nice flight, 13#Labour, 14#Fuel, 15#Equipment, 16#Delay Cost.

As seen Graph 32, network nodes are ranked once at the beginning of the process and seeds are selected according to their rank. Together with ongoing spreading processes within network changes, nodes with high potential for seeding at the beginning may no longer be effective. Only active nodes are eligible to cast a vote. The outcomes indicated

the performance of the suggested method with a resurrection mode when further seeding happens after a process has improved.

Table 10: Comparison and Overarching

COMPARISON AND OVERARCHING					
Nonlocal Centrality Measures	Global	Local		Open Innovation Strategies (Dynamic Capabilities & Prominent Features)	
		In-Link	Out-Link	Organization	Function
Degree Centrality	-Power -Prestige -Importance -Structural Holes	Resilience		STABILITY	
Eigenvector Centrality	-Popularity -Prestigious	-Popularity -Prestigious	---		DRIVEN
Closeness Centrality	-The most central	Support	Influence		DRIVEN DRIVING
Betweenness Centrality	- Significance	Agile		STABILITY	
Modularity Community Detection	-Sub graphs -Sub graphs	Clustering according to weighted link Clustering according to link and attributions		INTEGRATION	
Vote-Rank and Network Flaneurs	-Seed Selection	Good seed or not			CRITICALLY vs. PRECARIOUS

Nonlocal centrality measures are compared both globally and locally accordingly. In this direction, open innovation strategies and dynamic capabilities overarching is interpreted as seen Table 10. According to the results of non-local measures enabled by graph analysis, the most critical, the most prominent, the strongest, the most important and the most prestigious nodes are determined.

The interpretation of this determined nodes is as in the "comparison and overarching" chart shown in Table 10. Within the framework of open innovation strategies, the interpretation by comparison and overarching of dynamic capabilities, prominent features and nonlocal centrality measures is shaped by the findings obtained from the literature. So, with this feature, it is thought that the "comparison and overarching" chart will make an important contribution to the literature. The functions and companies that are associated and evaluated above with all their details are explained

one by one. During the research, the answer to the research question has been sought at every stage, and the effect of digital transformation criteria on intellectual capital components has been examined with directed edges and unilaterally as the study was designed.



CHAPTER 5: INTERPRETATION OF FINDINGS

In the aviation sector and airport terminal management in particular, relationships with subsidiaries and stakeholders are formally organised in a well-defined (usually hierarchical) structure, with clear guidelines about how to interact with each other, as well as clear procedures and channels to use. In whatever form of relationship, each partner serves a certain purpose, and only in exceptional situations do they stray from that role (López-Fernández, 2006). From the micro to the macro level, all players, partners, stakeholders, and subsidiaries work together to ensure the company's future. The first aim for the participants in the large network that has emerged is to assure interoperability and efficient utilisation of all capabilities within the open innovation framework. While there is a linear or even super linear flow in innovative projects in networks that are based on the transfer and sharing of information, the duties, responsibilities, opportunities, and rights of the actors in the network are non-linear.

Industry 4.0 and industry 5.0. the aviation sector, which is experiencing a transition between, is the flagship of a rapidly changing era. Industry 5.0, which has accelerated especially due to the COVID-19 pandemic, has also attracted the attention of Eurocontrol. Eurocontrol has updated the developments related to the European aviation sector between the years 2022-2028 and deciphered the possible the best and the worst-case scenarios. Air traffic trends, macroeconomics, ticket prices, fuel prices, tension between Russia and Ukraine are at the forefront of the headlines (Eurocontrol, 2022). The air traffic density was behind the base scenario forecasts until June 2019 compared to June 2022. Moreover, ticket prices, January-August 2022 prices increased by 5% compared to the same period in 2019. Jet fuel prices increased by 47%. Jet fuel prices are one of the most important cost items of the aviation sector. Additionally, the occupation of Ukraine has shifted the mass migration and population balance towards Southeastern Europe.

As can be seen, VUCA (Volatility, Uncertainty, Complexity, and Ambiguity) is just that. In the aviation sector, there are intense relationships with stakeholders in every field and at every time. Especially in unexpected, crisis moments, quick impact solutions instead of long-term solutions happen with the network consisting of stakeholders. This situation gives the organization agility resilience and makes it more sustainable. As a result, it not only increases the intellectual capital of the aviation industry as a whole, but

also of each individual organisation, depending on how actively they participate. Although digital transformation is not currently referred to as a component of intellectual capital in the literature, the value that it adds to not only the total intellectual capital of the organisation but also the human, structural, and relational components of intellectual capital individually is quite high. This is because digital transformation improves all three of these aspects of intellectual capital.

In the study aiming to understand the value added by the digitalization to intellectual capital in the airport terminal management, with network analysis, the close ties between TAV Holding, the terminal operator at Ankara Esenboga Airport, and its subsidiaries is comprehended. This interoperability is developed without the concept of place and time and transform the crisis into an opportunity by using open innovative approaches in the face of uncertain, vulnerable, ambiguity circumstances. It is clear from the algorithmic findings mentioned earlier chapter that it is observed that the organizational structure of Esenboğa TAV Holding and its Subsidiaries in its original establishment was in the form of formal contracted based, decentralized, and horizontal as well as a hierarchical structure among the head offices and its sub-branches exists. In network analysis, if the actors that make up the networks have the same relationships, structural equivalence emerges (Burt, 2011). A network with power is more useful than two structurally equivalent networks.

Moreover, the strength of a bond and the bond between nodes depends on contact frequency and proximity dimensions (Burt, 2011). It is possible to see the power of the network structure between TAV Holding and its subsidiaries by considering both the direct and indirect ties between all units. Therefore, the added value provided by the airport digital transformation periods to the intellectual capital of TAV Holding, in particular at Esenboğa Airport, is also very related to understanding the day. In this context, the relations in the network formed between TAV Holding and its subsidiaries mediate the definition of characteristics such as power, equivalence, and necessity. At this point, the formation of relations has been examined in three groups (Von Tunzelman, 2004): Functional, Source and Geography.

In functional relations, there are functions for the founding purpose of the organization based on the connections. In essence, the ties that make up the entire network are built on these functions (Von Tunzelman, 2004). Functional relations developed among TAV Holding and its subsidiaries based on the digital transformation criteria

evolve with the main heading of customer services, lower operational cost, increase employee productivity, operations efficiency, and increase employee retention. Thus, it would be extremely misleading to describe functionality only with the top-down information flow required by either contract base relations or hierarchical internal structure. This is due to the fact that a well-established, highly experienced, and successful organisation, such as TAV Holding, must reconsider its intellectual capital components in order to adapt to change, be driven, be sustainable, and increase its value in the developing technological age, which is full of unknowns and uncertainties.

The second way of defining network relationships is resources. Access to all the organization's resources is made possible due to the emergence of the network. The most crucial feature is the organization's relationships to the resources it needs to execute its tasks and operations. In fact, the basic logic consists of a straightforward input-output connection (Von Tunzelman, 2004). Airports must take an interest on human resources and personnel management, intelligence and technological innovations, terminal operations planning and issues, financial, public communications, environmental, engineering/technical, commercial (Neufville et al., 2013). At this point, there are many facts that can be qualified as a source in airports. Considering the air side and the land side as two separate components in the same whole, they are expected to be in relation to serve a common purpose on both sides. The most important resource is data and information as well. Each of the airports digital transformation criteria has an emphasis on creating a resource-oriented relationship on the human, structure and relationship components that contain individual organizational resources and constitute the intellectual capital components.

Data is the most common source in all functions from passenger satisfaction to air traffic density, from high-speed and increased capacity aircraft to maintenance and even from weather conditions to environmental conditions. Defining the network for the flow of data in relationships is very meaningful in organizations that develop open innovative relationships such as TAV Holding and its subsidiaries. As can be understood from the findings of the study, the contribution of the digital transformation criteria to the intellectual capital components among TAV Holding and its subsidiaries has also evolved positively on the basis of the flow of data.

Finally, another type of association is by geography. In the real sense, the interactions of relations are defined in different geographies (von Tunzelman, 2004).

Although the geographical distribution in the aviation sector is expressed as local, national, and global, in the study, which affects the impact of the digital transformation criteria developed among TAV Holding and its subsidiaries on the intellectual capital components, the relationship network is analysed as a whole only in the Ankara location.

When TAV Holding and its subsidiaries are accepted as a whole, it is seen that the network that emerged as a result of the matrix analysis designed in the study, TAV Holding and subsidiaries are connected as socio-technical systems, and the business relations of the TAV head offices and subsidiaries are defined on the basis of functionality and influence. Relationships in socio-technical systems are necessary relations that develop based on formal relations and contract based on nature. In fact, it is the official, bureaucratic side of relations.

At this point, the dynamics of the network emerges. These dynamics are essentially as graph theory offer us comprehending the overall structure, understanding the topology of the network, and solving the complex structure including nodes and edges (Baskici & Ercil, 2018) It is possible to map the interaction of the network analysis system, which is defined within the framework of dynamically progressive dimensions by its nature, with some indicators with Graph Theory. Interpretation of the findings obtained in the study is explained according to six basic criteris developed by Linss and Fried (2010). Integration, Driving, Driven, Stability, Critically, Precarious (Baskici & Ercil, 2018).

As a result of the literature review, some indicators are necessary to appreciate the value provided to the intellectual capital components of airports' digital transformation requirements. Indicators for matrix evaluation are established utilising research questions and suggestions. Baskci&Ercil (2018) proposed the criteria for system and subsystem assessments. According to them, the purpose of system analysis is to assist the collaborative study of current organisational difficulties and the preparation of future endeavour decisions. For system analysis, a unique classification strategy based on a system matrix is presented.

In contrast to existing techniques, the influence factors of a social system are not categorised into four or five categories, but rather ranked according to several criteria. The criteria include, for instance, the driving variables as the keys to system

improvements and the driven elements as potential indicators of the transformation's efficacy.

After assessing the value added by the airports' digital transformation criteria to the intellectual capital components using network analysis algorithms, the most significant, nearby, and prominent nodes is determined using graph schematization. Answering the research issue requires determining which of Esenboğa TAV Holding and its subsidiaries participating in the study is more Integration, Driving, Driven, Stability, Critically, and Precarious according to the most significant nodes.

Esenboğa TAV Holding and its subsidiaries are evaluated based on the network analysis indicators supplied in the study's methodology parts. Ideal would be a quick examination of what each indication signifies and whether it may serve as a response to proposals.

Integration

Integration represents the extent to which the nodes and graphs as well as subsystems contribute to the system's integrity. Modularity, community detection in the network are the structural solutions that fully describe integration in network analysis. When the outcomes of each participant are evaluated independently within the context of the digital transition to intellectual capital, detection status owing to weighting and attributional modularity as well as community relations might arise. This makes it easier to examine each company's integration position.

According to the findings of community identification and modularity, the TAV Head Office is the firm with the highest degree of integration among the participants. Customer Services, Lower Operational Cost, Increase Employee Productivity, Operations Efficiency, Strengthen Networks, and Increase Employee Retention are the primary headings for the digital transformation of airports that entails to behave as subsystems by virtue of attribute relationships and weighted edges. A high degree of integration shows that the communities contribute significantly to the system's integrity and is able to build linkages with other communities.

Moreover, when all research data is considered, Esenboga TAV Terminal management has the highest level of integration among all companies. For Esenboga TAV Terminal Management, integration refers to the process of one firm acquiring

another and integrating their operations and functions. It can occur by merger, purchase, or takeover. For this reason, Esenboga TAV Terminal management follows a horizontal integration with other companies of varying sizes and offering a range of products and services undergo integration in the same industry.

Driving

The driving impact of a node and graph is the activation of other nodes and graphs within the system. In other words, it indicates the node and graph shaping capacity. Active communication values are greater than passive communication values for nodes and graphs having this capability. In the analysis, the driving characteristics of the node is determined by in degree closeness and eigenvector centrality. Due to a node's ability to receive information from and transmit information to other nodes depend on the nodes being either or influential node to comprehending how information moves through networks.

In driving characteristic of the network is interpreted according to out-link closeness and eigenvector centrality. Because out-link nodes function as trigger and influence position pursuant to closeness centrality. As for the eigenvector centrality assistance to driving feature, a node's importance depends not only on the number of its neighbours, but also on the number of its influential neighbours. Meanly, the most prestigious node is discovered by eigenvector. Accordingly, the nodes and attributes that reveal the driving feature of the companies are shon chart 3 as follows.

Table 11: Out-link Nodes and Digital Transformation Functions

	The Most Prestigious Node (Influence To Other Nodes)	The Most Central Function (Influence To Other functions)	Interpretation
TAV Head Office	Technological Innovations	Strengthen Networks	
Esenboğa TAV Finance Department	Work Life Balance	Increase Employee Retention	where the digital transformation should begin in conjunction with the effective concepts in decision making such as agility, strategic alignment, culture, structure, and human in order to add value to company's intellectual capital.
Esenboğa TAV Logistic Department	Pre departure Data and Activities	Increase Employee Retention	
Esenboğa TAV Technologies	Technological Innovations	Strengthen Networks	
Esenboğa PRIMECLASS	Matching Expectations, Responsibilities, Rewards	Increase Employee Retention	
Esenboğa TAV Security	Work Life Balance	Increase Employee Retention	
Esenboğa HAVAŞ	Equipment	Customer Services	
Esenboğa TAV Terminal Management	Matching Expectations, Responsibilities, Rewards	Increase Employee Retention	

According to TAV Head Office, the most prestigious the out-link node is “Technological Innovations”. This node is considered in support to other nodes. The most central node out-link is in the "Strengthen Networks" attribution. Therefore, “Strengthen Networks” is where the digital transformation should begin in conjunction with the effective concepts in decision making such as agility, strategic alignment, culture, structure and human in order to add value to company's intellectual capital.

According to Esenboğa TAV Finance Department, the most prestigious the out-link node is “Work Life Balance”. This node is considered in support to other nodes. The most central node out-link is in the "Increase Employee Retention" attribution. Therefore, “Increase Employee Retention” is where the digital transformation should begin in conjunction with the effective concepts in decision making such as agility, strategic alignment, culture, structure, and human in order to add value to company's intellectual capital.

According to Esenboğa TAV Logistic Department, the most prestigious the out-link node is “Pre departure Data and Activities”. This node is considered in support to other nodes. The most central node out-link is in the "Increase Employee Retention" attribution. Therefore, “Increase Employee Retention” is where the digital transformation should begin in conjunction with the effective concepts in decision making such as agility, strategic alignment, culture, structure and human in order to add value to company’s intellectual capital.

As can be observed from the outcomes of Esenboğa TAV's head office and its affiliated sub-departments, strategies for digital transformation should be initiated independently. This is because they are responsible for different key areas of a company.

According to Esenboğa TAV Technologies, the most prestigious the out-link node is “Technological Innovations”. This node is considered in support to other nodes. The most central node out-link is in the "Strengthen Networks" attribution. Therefore, “Strengthen Networks” is where the digital transformation should begin in conjunction with the effective concepts in decision making such as agility, strategic alignment, culture, structure, and human in order to add value to company’s intellectual capital.

According to Esenboğa PRIMECLASS, the most prestigious the out-link node is “Matching Expectations, Responsibilities, Rewards”. This node is considered in support to other nodes. The most central node out-link is in the "Increase Employee Retention" attribution. Therefore, “Increase Employee Retention” is where the digital transformation should begin in conjunction with the effective concepts in decision making such as agility, strategic alignment, culture, structure, and human in order to add value to company’s intellectual capital.

According to Esenboğa TAV Security, the most prestigious the out-link node is “Work Life Balance”. This node is considered in support to other nodes. The most central node out-link is in the "Increase Employee Retention" attribution. Therefore, “Increase Employee Retention” is where the digital transformation should begin in conjunction with the effective concepts in decision making such as agility, strategic alignment, culture, structure, and human in order to add value to company’s intellectual capital.

According to Esenboğa HAVAŞ, the most prestigious the out-link node is “Equipment”. This node is considered in support to other nodes. The most central node out-link is in the "Customer Services" attribution. Therefore, “Customer Services” is

where the digital transformation should begin in conjunction with the effective concepts in decision making such as agility, strategic alignment, culture, structure, and human in order to add value to company's intellectual capital.

According to the Esenboğa TAV Terminal Management, the most prestigious the out-link node is "Matching Expectations, Responsibilities, Rewards". This node is considered in support to other nodes. The most central node out-link is in the "Increase Employee Retention" attribution. Therefore, "Increase Employee Retention" is where the digital transformation should begin in conjunction with the effective concepts in decision making such as agility, strategic alignment, culture, structure, and human in order to add value to company's intellectual capital. Starting from the "Increase Employee Retention" is the best way to kick off digital transformation strategies.

Driven

The fundamental power of analytics rests in its potential to assist leaders in making more informed, effective, and intelligent business decisions. This is the value of being an intelligence and/or data-driven organisation. Driven organization convert analytics into a fundamental competence while encouraging a culture of data-driven decision-making by incorporating data, analysis, and reasoning into the organization's decision-making processes. As a result, firms embed analytics throughout the company and have access to the analytical insights required to address difficult business challenges (Becoming an Insight Driven Organization, 2015).

Driven represents the degree to which one node may be influenced by another. The passive communication values of nodes having this trait are exceptionally high. Insights into value provide crucial leads for identifying the sources of achieved achievements resulting from adopted methods. Because of the nodes' passive side effects, driving is an inherent property. These are the nodes and graphs most influenced by the system's oblique connections. It is the first part of the system to change, so it is also the first to show how the system oscillates (Leito & Baptista, 2018). In the analysis, the driven characteristic of the node is determined by in link in degree closeness and eigenvector centrality as seen Table 12.

Table 12: In Link Nodes and Intellectual Capital Components

	The Most Prestigious Node (support)	The Most Prestigious Components (support)	Interpretation
TAV Head Office	Work-related Experience	Human Capital	The dissemination of knowledge and the innovative applications in the company in the most effective way is to be planned.
Esenboğa TAV Finance Department	Work-related Experience	Human Capital	
Esenboğa TAV Logistic Department	Education	Human Capital	
Esenboğa TAV Technologies	Trade secret	Structural Capital	It has the benefit of rapidly disseminating of digital
Esenboğa PRIMECLASS	Work-related Experience	Human Capital	transformation affects inside the network.
Esenboğa TAV Security	Trust	Relational Capital	After analysing all of the obtained data, it is found that digital transformation adds value to relational capital.
Esenboğa HAVAŞ	Trade Secret	Structural Capital	
Esenboğa TAV Terminal Management	Trust	Relational Capital	

According to TAV Head Office, the node “Work-related experience in influence at the centre of this network. The most central node in in-link is the "human capital" component. Since the eigenvalue is determined only according to the edge coming to the node, the most prestigious node from the Esenboğa TAV Head Office results according to the in-link is “work related experience”. As a result, the impact of digital transformation on “human capital” is quite high. The dissemination of knowledge and the innovative applications in the company in the most effective way is to be planned on the “work related experience”. It has the benefit of rapidly disseminating of digital transformation affects inside the network.

According to the Esenboğa TAV Finance Department the node “Work-related experience” in influence at the centre of this network. The most central node in in-link is the "human capital" component. Since the eigenvalue is determined only according to the edge coming to the node, the most prestigious node from the Esenboğa TAV Finance Department results according to the in-link is “work related experience”. As a result, the impact of digital transformation on “human capital” is quite high. The dissemination of

knowledge and the innovative applications in the company in the most effective way is to be planned on the “work related experience”. It has the benefit of rapidly disseminating of digital transformation affects inside the network.

According to the Esenboğa TAV Logistic Department, the node “Education” in influence at the centre of this network. The most central node in in-link is the "human capital" component. Since the eigenvalue is determined only according to the edge coming to the node, the most prestigious node from the Esenboğa TAV Logistic Department results according to the in-link is “education”. As a result, the impact of digital transformation on “human capital” is quite high. The dissemination of knowledge and the innovative applications in the company in the most effective way is to be planned on the “education”. It has the benefit of rapidly disseminating of digital transformation affects inside the network.

As can be observed from the outcomes of Esenboğa TAV's head office and its affiliated sub-departments, digital transformation offers the most value to “human capital”. Thus, a properly working organizational system has been observed among them.

According to the Esenboğa TAV Technologies, the node “trade secret” in influence at the centre of this network. The most central node in in-link is the "Structural Capital" component. Since the eigenvalue is determined only according to the edge coming to the node, the most prestigious node from the Esenboğa TAV Technologies results according to the in-link is “trade secret”. As a result, the impact of digital transformation on “Structural Capital” is quite high. The dissemination of knowledge and the innovative applications in the company in the most effective way is to be planned on the “trade secret”. It has the benefit of rapidly disseminating of digital transformation affects inside the network.

According to the Esenboğa PRIMECLASS the node “Work-related experience” in influence at the centre of this network. The most central node in in-link is the "human capital" component. Since the eigenvalue is determined only according to the edge coming to the node, the most prestigious node from the Esenboğa PRIMECLASS results according to the in-link is “work related experience”. As a result, the impact of digital transformation on “human capital” is quite high. The dissemination of knowledge and the innovative applications in the company in the most effective way is to be planned on the

“work related experience”. It has the benefit of rapidly disseminating of digital transformation affects inside the network.

According to the Esenboğa TAV Security the node “Trust” in influence at the centre of this network. The most central node in in-link is the "Relational Capital" component. Since the eigenvalue is determined only according to the edge coming to the node, the most prestigious node from the Esenboğa TAV Security results according to the in-link is “Trust”. As a result, the impact of digital transformation on “Relational Capital” is quite high. The dissemination of knowledge and the innovative applications in the company in the most effective way is to be planned on the “Trust”. It has the benefit of rapidly disseminating of digital transformation affects inside the network.

According to the Esenboğa HAVAŞ, the node “trade secret” in influence at the centre of this network. The most central node in in-link is the "Structural Capital" component. Since the eigenvalue is determined only according to the edge coming to the node, the most prestigious node from the Esenboğa HAVAŞ results according to the in-link is “trade secret”. As a result, the impact of digital transformation on “Structural Capital” is quite high. The dissemination of knowledge and the innovative applications in the company in the most effective way is to be planned on the “trade secret”. It has the benefit of rapidly disseminating of digital transformation affects inside the network.

As can be shown, according to the findings of the subsidiary compnaies, digital transformation will provide the highest value to “structural capital” in intellectual capital components.

According to the Esenboğa TAV Terminal Management the node “Trust” in influence at the centre of this network. The most central node in in-link is the "Relational Capital" component. Since the eigenvalue is determined only according to the edge coming to the node, the most prestigious node from the Esenboğa TAV Terminal Management results according to the in-link is “Trust”. As a result, the impact of digital transformation on “Relational Capital” is quite high. The dissemination of knowledge and the innovative applications in the company in the most effective way is to be planned on the “Trust”. It has the benefit of rapidly disseminating of digital transformation affects inside the network. After analysing all of the obtained data, it is found that digital transformation adds value to relationship capital. It is completely consistent with the nature of the connection between the TAV holding and its subsidiaries. Additionally, this

guarantees that roles and responsibilities for making and executing crucial decisions are obvious because of the complex organisational relations and functions broken down into manageable portions.

Stability

The stability of any dynamic system is referred to as system stability. The stability described here is that the motion of the dynamic system occurs within the given range and magnitude and in the prescribed way. Stable systems generate predictable and consistent outcomes. Dynamic structures are those that are adaptable to change. Stability is measured by betweenness centrality. The company with the highest number of nodes in the study was HAVAŞ. This shows that HAVAŞ is a stable company. The attainment of stability in excess of a given threshold result in institutional rigidity. Therefore, HAVAŞ is expected to be agile and resilient to withstand abrupt and drastic change. During times of disruptive change in the workplace, a foundation of organisational stability gives employee with a sense of confidence, security, and optimism, enabling them to remain professional, behave sensibly, and adapt efficiently (To Build an Agile Team, Commit to Organizational Stability, 2020).

At the same time the measure of centrality is interpreted as the power of an organization. For this reason, HAVAŞ is most powerful company among the subsidiaries. The most “stable” and “powerful” company in the digital transformation process is HAVAŞ. In here, being powerful indicates “resilience”.

When it comes to the Esenboga TAV Terminal Management, with the highest value of degree centrality, the valued nodes are known to cover to structural holes during the digital transformation. Additionally, indicates how effective a node is in controlling the flow of information in the network. So, Esenboga TAV Terminal Management has a competency for controlling the flow of information. During the digital transition, the valuable nodes of the Esenboga TAV Terminal Management with the highest degree centrality are known to cover “structural holes”. Also displays how effective a node is in controlling the information flow in the network. Therefore, Esenboga TAV Terminal Management has the highest ability to regulate the flow of information during the digital transformation. Esenboga TAV Terminal Management develops the ability to close the structural holes in the digital transformation process.

Criticality

The criticality of the nodes or graphs indicates their significance to the overall existence of the system. The criticality of a system is proportional to its sensitivity to change. The unit with the greatest degree of criticality is the most potent system-altering agent. A modification to this unit affects the entire system (Hütt et al., 2016).

The critical characteristics of the companies are determined by the vote rank analysis. According to the results of all participants participating in the research, the component of the digital transformation criteria that gives the most added value to intellectual capital is “customer services”. As being a micro dynamic, “Customer services” is so critical that it become tightly connected groups by increasing the relationships between them in the digital transformation. As a result, with the “customer services”, all networks contain groups that are highly specialised in a particular function and have positive business relationships in terms of digital transformation. With the stress and pressures of modern air travel, airport customer service is an important part of creating a great passenger experience. Airport terminal management authorities collaborate with other airport experts to ensure operations operate smoothly while enhancing the passenger trip, from airport queue management solutions to traffic control and parking. In the digital transformation process, the customer service service is the component that will add the most value to the intellectual capital.

Precarious

Precarious describes behaviour that is unstable. Predicting the behaviour of actors with a high degree of instability is somewhat challenging. Rather than the structure of the environment, it is the dynamics of the units' internal structure that dictates their instability. The low degree of instability reveals how close the actors are to interactions outside the system (Jong & Chung, 2010).

Moreover, this condition demonstrates that the relevant actors are not receptive to external collaboration and may operate autonomously. If actors with a high hesitation value are honest, provide information, and have an attitude of explaining behavioural changes, they can serve as the system's starting point for change. The results of all the companies participating in the research revealed two nodes “Efficient Flight Profile (EFP)” and “Liberalization – Privatization Trends” precarious in general. Both of the

nodes that were described do not enter any of the firms' fields of activity directly in any way. They do not contribute to the value of intellectual capital, particularly in regard to the consequences of digital transformation.

The purpose of the research is to analyse the interaction between the airport's digital transformation criteria and the intellectual capital components of aviation stakeholders in cooperation with the airport terminal management. Within frame of the purpose, in the research, integration in business is determine, value driver company in the relations based on dijital transformation is revealed, driven intellectual capital components in the process of digital transformation is uncovered, the most resilience and powerful company is discovered, the most capable company to cover structural hole is revealed in the networks with the stability charateristic, the most critical consired as starting point implementation in the process of digital transformation is determined and precarious components in the networks stance as flaneur is revealed

As conclusion, according to the results of non-local measures enabled by graph analysis, the most critical, the most prominent, the strongest, the most important and the most prestigious nodes are determined. The interpretation of this determined nodes is as in the "comparison and overarching" table shown in chart 2. The functions and companies that are associated and evaluated above with all their details are explained one by one. During the research, the answer to the research question has been sought at every stage, and the effect of digital transformation criteria on intellectual capital components has been examined with directed egdes and unilaterally as the study was designed. Although there is contrary way of studies in different sectors, the situation in the aviation sector has been handled in this way. Furthermore, within the framework of open innovation strategies, the interpretation by comparison and overarching of dynamic capabilities, prominent features and nonlocal centrality measures is shaped by the findings obtained from the literature. So, with this feature, it is thought that the "comparison and overarching" chart will make an important contribution to the literature.

In the light of the findings obtained in the research that started with the question "How precisely do the digital transformation criteria increase the value of intellectual capital?", it is seen that the digital transformation in the aviation sector in the transition to Industry 5.0 added so much value to the intellectual capital of the airports that it became a component of the intellectual capital. When it comes to the limitations of the research, due to the deeply rooted and institutional nature of TAV Holding, the most important

limitation is the necessities for long procedures (receiving corporate permissions, ethical committee decision etc.) in accessing information. The second limitation is the execution of the interview. Because the survey is designed for the decision makers at the strategic level, the pre-interview appointments took time, and the interviews were conducted in a certain time period (approximately 1,5 hour per).

For the future study recommendations, it has been seen that knowledge is the most important resource in a developing network in the open innovative framework in this study. The resource dependency theory considers an organization as an open system continuously exchanging material and information with its environment, encompassing “every event in the world which has any effect on the activities or outcomes of the organization” (Pfeffer & Salancik, 1978, p.) It is understood that the flow of information required by digital transformation spread through which functions and attributions among all these companies within the framework of resource dependency theory. It was also seen how it empowered intellectual capital. In future studies, the core competencies of each company will be compared and their weights on each other will be examined.

REFERENCES

- Aagaard, A. (2019). Digital Business Models Driving Transformation and Innovation: *Driving Transformation and Innovation*. 10.1007/978-3-319-96902-2.
- Abbasi, M., Ishfaq, U.& Tahireen, U. (2022). *Impact of Job Satisfaction on Employee Performance: Mediating Role of Motivation*.
- Abu-Alhaija, A., Nerina, R., Hashim, H.& Jaharuddin, N. (2018). Determinants of Customer Loyalty: *A Review and Future Directions*. Australian Journal of Basic and Applied Sciences. 12. 106-111. 10.22587/ajbas.2018.12.7.17.
- Ackermann, F. & Eden, C. (2011). Strategic Management of Stakeholders: *Theory and Practice*. *Long Range Planning*. 44. 179-196. 10.1016/j.lrp.2010.08.001.
- Ahmadian, S. (2019). Strategic Management in Aviation Sector: *Research on Flight Training Organizations In Turkey*. 69-81. 10.15405/epsbs.2019.10.02.7.
- AKAL, Ş. (2014). Gerçek ve Model Ağların Karakteristik Özelliklerinin Karşılaştırılması - *Comparison Of Characteristics Of Real And Modelled Networks*. Öneri Dergisi. 11. 251. 10.14783/od.v11i41.5000011416.
- Ali, M., Shujahat, M., Ali, Z., Kianto, A., Wang, M. & Bontis, N. (2022). The neglected role of *knowledge assets interplay in the pursuit of organisational ambidexterity*. Technovation. 114. 102452. 10.1016/j.technovation.2021.102452.
- Al-Taie, M.Z., Kadry, S. (2017). Theoretical Concepts of Network Analysis. In: Python for Graph and Network Analysis. *Advanced Information and Knowledge Processing*. Springer, Cham. https://doi.org/10.1007/978-3-319-53004-8_1
- Antošová, M.& Csikosova, A. (2011). *Intellectual Capital in Context of Knowledge Management*. 10.5772/19186.
- Ashford, N., Mumayiz, S. & Wright, P. (2011). Airport Engineering: *Planning, Design, and Development of 21st Century Airports*, Fourth Edition. 10.1002/9780470950074.ch17.
- Ashok, K. G. & Arvind, S. (1993) Managing Human Resources for Innovation and Creativity, *Research-Technology Management*, 36:3, 41-48, DOI: 10.1080/08956308.1993.11670902
- Ayyagari, M.S.& Lathabhavan, R. (2020). A Study on *Employee Satisfaction and Organizational Commitment*.

- Băcilă, M. L., & Țițu, M. A. (2018). Structural Capital and Organizational Culture—An Approach Regarding the Development of Valuable Intellectual Capital. *Review Of General Management*, 28(2).
- Bagdadli, S., Gianecchini, M., Andresen, M., Cotton, R., Kaše, R., Lazarova, M., Smale, A., Bosak, J., Briscoe, J., Chudzikowski, K., Dello Russo, S. & Reichel, A. (2021). Human Capital Development Practices and Career Success: *The moderating role of country development and income inequality*. *Journal of Organizational Behavior*. 42. 429-447. 10.1002/job.2506.
- Bansal, R. (2016). Customer Engagement – A Literature Review. *Global International Research Thoughts* ISSN: 2347-8861. 2. 15-20.
- Barney, J. B., & Wright, P. M. (1998). On Becoming a Strategic Partner: *The Role of Human Resources in Gaining Competitive Advantage*. *Human Resource Management*, 37,31-46.[http://dx.doi.org/10.1002/\(SICI\)1099](http://dx.doi.org/10.1002/(SICI)1099)
- Baskici, C. & Ercil, Y. (2018). Örgütlerin Ağ Perspektifinden Kurumsal Yapı Analizi. *Press Academia Procedia*, 7 (1), 335-338.DOI: 10.17261/Pressacademia. 2018.910
- Baskici, C., Ercil, Y. (2018). Corporate structure analysis of organizations from network perspective. *Research Journal of Business and Management (RJBM)*, V.5(3), p.231-237
- Beasley, R. & Danesi, M. (2010). *Persuasive Signs: The Semiotics of Advertising*. 10.1515/9783110888003.
- Becoming an Insight Driven Organization. (2015). Deloitte Canada. Retrieved November 19, 2022, from <https://www2.deloitte.com/ca/en/pages/deloitte-analytics/articles/becoming-an-insight-driven-organization.html>
- Beers B., (2022) “Which Major Expenses Affect Airline Companies?,” Investopedia (Investopedia, October 14, 2022), <https://www.investopedia.com/ask/answers/040715/what-are-major-expenses-affect-companies-airline-industry.asp>.
- Betweenness Centrality. (2022). Betweenness Centrality. Retrieved November 3, 2022, from <https://www.sci.unich.it/~francesco/teaching/network/betweenness.html>.
- Blondel, V. & Guillaume, J., Lambiotte, R. & Lefebvre, E. (2008). *Fast Unfolding of Communities in Large Networks*. *Journal of Statistical Mechanics Theory and Experiment*. 2008. 10.1088/1742-5468/2008/10/P10008.

- Borgatti, S. (2005). Centrality and Network Flow. *Social Networks*. 27. 55-71. 10.1016/j.socnet.2004.11.008.
- Borgatti, S.P & Foster, P.C. (2003). A network paradigm in organizational research: A review and typology. *Journal of Management*, 29 (6) :991-1013.
- Bounfour, A. (2016). Acceluction: Stakes, *Opportunities and Risks*. In: *Digital Futures, Digital Transformation. Progress in IS*. Springer, Cham. https://doi.org/10.1007/978-3-319-23279-9_8
- Bowles, S.&Gintis, S. (2002). "*Social Capital and Community Governance*". The Economic Journal. 112 (483): 419–436.
- Budriene, D. & Diskiene, D. (2020). Employee Engagement: Types, Levels and Relationship with Practice Of HRM. *Malaysian E Commerce Journal*. 4. 42-47. 10.26480/mecj.02.2020.42.47.
- Burchardt, C., & Maisch, B. (2019). Digitalization needs a cultural change – examples of applying *Agility and Open Innovation to drive the digital transformation*. *Procedia CIRP*, 84, 112–117. <https://doi.org/10.1016/j.procir.2019.05.009>
- Burt, S. R. (2011). *Neighbor networks: competitive advantage local and personal*. USA: Oxford University Press
- Çalhan, Ö., Akdağ, G. & Oter, Z. (2020). Intellectual Capital. 10.5038/9781732127562.
- Channon, D.& Sammut-Bonnici, T. (2015). *Joint Ventures*. 10.1002/9781118785317.weom120048.
- Chattopadhyay, S. (2012). The Human Capital Approach to Education. 10.1093/acprof:oso/9780198082255.003.0002.
- Chattopadhyay, S. (2013). Intellectual Property Rights in Digital Environment.
- Chen, H., Mehra, A., Tasselli, S. & Borgatti, S. (2022). Network Dynamics and Organizations: *A Review and Research Agenda*. *Journal of Management*. 10.1177/01492063211063218.
- Choong, K. K. (2008). Intellectual Capital: Definitions, Categorization and Reporting Models. *Journal of Intellectual Capital*. 9. 609-638. 10.1108/ 14691930810913186.
- Chris B. M., (2019). Operating Cost Definition Corporate Finance & Accounting
- Cole, M. (2021). Digital automation and the future of work. European Parliament.

- Cooke, S.J., Venturelli, P., Twardek, W.M. (2021) Technological innovations in the recreational fishing sector: *implications for fisheries management and policy*. *Rev Fish Biol Fisheries* 31, 253–288 (2021). <https://doi.org/10.1007/s11160-021-09643-1>
- Cordella, A. & Hesse, J. (2015). E-government in the Making: An Actor Network Perspective. *Transforming Government: People, Process and Policy*. 9. 104-125. 10.1108/TG-02-2014-0006.
- Delery, J.& Roumpi, D. (2017). Strategic human resource management, human capital, and competitive advantage: *is the field going in circles?* *Human Resource Management Journal*. 27. 1-21. 10.1111/1748-8583.12137.
- Díaz-Fernández, M., López-Cabrales, A.&Valle-Cabrera, R.(2014): A contingent approach to the role of human capital and competencies on firm strategy, *BRQ Business Research Quarterly*, ISSN 2340-9436, Elsevier España, Barcelona, Vol. 17, Iss. 3, pp. 205-222, <https://doi.org/10.1016/j.brq.2014.01.002>
- Diefenbach, T. & Sillince, J. (2011). Formal and Informal Hierarchy in Different Types of Organization. *Organization Studies*. 32. 1515-1537. 10.1177/0170840611421254. Download as .RIS
- Elacio, Alexen & Balazon, Francis & Lacatan, Luisito. (2020). *Digital Transformation in Managing Employee Retention* using Agile and C4.5 Algorithm.
- Elberdin M. B., Sáenz J., Kianto A., (2018) "Knowledge management strategies, intellectual capital, and innovation performance: a comparison between high- and low-tech firms", *Journal of Knowledge Management*, <https://doi.org/10.1108/Jknowledge Management-04-2017-0150>.
- Eurocontrol,2022-2028. (2022, October 17). 2022-2028 | EUROCONTROL. Retrieved November 18, 2022, from <https://www.eurocontrol.int/publication/eurocontrol-forecast-update-2022-2028>
- Emmerik, R., Ducharme, S., Amado, A. & Hamill, J. (2016). *Comparing dynamical systems concepts and techniques for biomechanical analysis*. *Journal of Sport and Health Science*. 5. 1-11. 10.1016/j.jshs.2016.01.013.
- Faith, B., Hernandez, K. and Beecher, J. (2022), *IDS Policy Briefing 202*, Brighton: Institute of Development Studies

- Ferreira, A. & Franco, M. (2017). Strategic alliances, intellectual capital and organisational performance in technology-based SMEs: is there really a connection? *International Journal of Business and Globalisation*. 18. 130. 10.1504/IJBG.2017.081024.
- Fleming, P. (2019). Robots and Organization Studies: Why Robots Might Not Want to Steal Your Job. *Organization Studies*, 40(1), 23–38. <https://doi.org/10.1177/0170840618765568>.
- Fonfara, K., Deszczyński, B. & Dymitrowski, A.(2016). Informal Relationships in the Company Internationalization Process - *Concept and Empirical Evidence*.
- Fortunato S., (2010) “Community detection in graphs”, *Physics Reports*, 486(3-5):75-174.
- Fortunato, S. & Castellano, C. (2008). Community Structure in Graphs. *Encyclopedia of Complexity and System Science*. 10.1007/978-0-387-30440-3_76.
- Galovská, M. (2015). Human Capital and Potential to Increase its Creativity. *Creative and Knowledge Society*. 5. 1-11. 10.1515/cks-2015-0008.
- Gençer, M. (2017). Sosyal Ağ Analizi Yöntemlerine Bir Bakış. *Yıldız Social Science Review*,3(2),19-34. Retrieved from <https://dergipark.org.tr/tr/pub/yssr/issue/33542/334638>
- Gerguri, S. R.G. & Ramadani, V. (2013). Innovation Strategies and *Competitive Advantages*.
- Gill, A., Singh, M., Mathur, N., H.& Mand, H. (2014). The Impact of Operational Efficiency on the Future Performance of Indian Manufacturing Firms. *International Journal of Economics and Finance*. 6. 10.5539/ijef.v6n10p259.
- Golbeck J. (2013). *Analyzing the Social Web* (1st. ed.). Morgan Kaufmann Publishers Inc., San Francisco, CA, USA.
- Goldenberg, D. (2019). *Social Network Analysis: From Graph Theory to Applications with Python*. 10.13140/RG.2.2.36809.77925/2.
- Graham P. A. (2020). Airport privatisation: A successful journey?. *Journal of air transportmanagement*, 89,101930.<https://doi.org/10.1016/j.jairtraman.2020.101930>

- Gupta, S. (2004). Employee Retention. *SSRN Electronic Journal*.
<https://doi.org/10.2139/ssrn.640430>
- Harenberg, S., Bello, G., Gjeltrema, L., Ranshous, S., Harlalka, J., Seay, R., Padmanabhan, K. and Samatova, N., (2014), *Community detection in large-scale networks: a survey and empirical evaluation*. *WIRES Comput Stat*, 6: 426- 439.
- Harmonic Centrality - Neo4j Graph Data Science. (2022). Neo4j Graph Data Platform. Retrieved November 2, 2022, from <https://neo4j.com/docs/graph-data-science/2.2/algorithms/harmonic-centrality/>
- Havaş. (2022). Havaş. Retrieved November 4, 2022, from <https://havas.net/>
- Hernaus, T., (2011). The Process-Based Face of Organizations.
- Howard-Grenville, J.& Rerup, C. (2017). A Process Perspective on Organizational Routines.
- How do we manage the change journey? (2020). McKinsey & Company. Retrieved November 19, 2022, from <https://www.mckinsey.com/capabilities/people-and-organizational-performance/our-insights/how-do-we-manage-the-change-journey>
- Hütt, Marc-Thorsten & Jain, Mitul & Hilgetag, Claus & Lesne, Annick. (2012). Stochastic Resonance in Discrete Excitable Dynamics on Graphs. *Chaos, Solitons & Fractals*. 45. 611-618. 10.1016/j.chaos.2011.12.011.
- Iacobucci, D., McBride, R., Popovich, D. and Rouziou, M., (2019). In Social Network Analysis, Which Centrality Index Should I Use? Theoretical Differences and Empirical Similarities among Top Centralities. *Journal of Methods and Measurement in the Social Sciences*, Vol. 8, No. 2, 72-99, 2017, Available at SSRN: <https://ssrn.com/abstract=3425975> or <http://dx.doi.org/10.2139/ssrn.3425975>
- Johnson, Andrew & Lee, Chia-Yen. (2012). Operational Efficiency. 10.1201/b15964-5.
- Jong K. C&Chung-in M.(2010), Understanding Northeast Asian regional dynamics: inventory checking and new discourses on power, interest, and identity, *International Relations of the Asia-Pacific*, Volume 10, Issue 2, May 2010, Pages 343–372, <https://doi.org/10.1093/irap/lcq003>

- Karagiannis, Dimitris & Waldner, Florian & Stoeger, Anita & Nemetz, Martin. (2008). A Knowledge Management Approach for Structural Capital. 5345. 135-146. 10.1007/978-3-540-89447-6_14.
- Khatun, Ayesha. (2018). *Sharing tacit knowledge: The essence of knowledge management*. 10.4018/978-1-5225-3725-0.ch004.
- Kinderis, Remigijus & Jucevicius, Giedrius. (2013). *STRATEGIC ALLIANCES – THEIR DEFINITION AND FORMATION*. *Latgale National Economy Research*. 1. 106. 10.17770/Iner2013voll.5.1155.
- Klaus, N., Maier, R., & Haas, O. (2018). Knowledge Management in Digital Change. In Progress in IS. Springer
- Klein, D. (2010). Centrality measure in graphs. *Journal of Mathematical Chemistry*. 47. 1209-1223. 10.1007/s10910-009-9635-0.
- Klinkert, Friedrich (2012). The Misappropriation of Trade Secrets in Germany and U.S. Discovery Aid. MIPLC Lecture Series. p. 7. Archived from the original on June 8, 2012. Retrieved May 6, 2012.
- Kraus, S., Durst, S. & Ferreira, J.J., Veiga, Pedro, Kailer, N. & Weinmann, A. (2021). Digital transformation in business and management research: *An overview of the current status quo*. *International Journal of Information Management*. 63. 10.1016/j.ijinfomgt.2021.102466.
- Leblebici, D. (2012). Impact of workplace quality on employee's productivity: *Case study of a bank in Turkey*. *Journal of Business, Economics and Finance*. 1.
- Lee, M., Yun, J., Pyka, A., Won, D., Kodama, F., Schiuma, G., Park, H., Jeon, J. Park, K., Id, K., Jung, K., Yan, M., Lee, S. & Zhao, X. (2018). How to Respond to the Fourth Industrial Revolution, or the Second Information Technology Revolution? *Dynamic New Combinations between Technology, Market, and Society through Open Innovation*. *Journal of Open Innovation: Technology, Market, and Complexity*. 4. 10.3390/joitmc4030021.
- Leitão, J. & Baptista, J. (2018). Intellectual Capital Assets and Brand Value of English Football Clubs. *International Journal of Sport Management and Marketing*. 1. 10.1504/IJSMM.2018.10012990.

- Lemon, K. N., & Verhoef, P. C. (2016). Understanding Customer Experience Throughout the Customer Journey. *Journal of Marketing*, 80(6), 69–96. <https://doi.org/10.1509/jm.15.0420>
- Linss, V. & Fried, A. (2010). The ADVIAN® classification - A new classification approach for the rating of impact factors. *Technological Forecasting and Social Change*. 77. 110-119. 10.1016/j.techfore.2009.05.002.
- Linstead, Stephen. (2001). Organizational Culture. 10.1016/B0-08-043076-7/04225-X.
- Little.A.D. (2020). Airport digital transformation from operational performance to strategic opportunity. *Amadeus Research Report*. <https://www.adlittle.com/en>
- López-Fernández, L., Robles, G., Gonzalez-Barahona, J. M., & Herraiz, I. (2006). Applying Social Network Analysis Techniques to Community-Driven Libre Software Projects. *International Journal of Information Technology and Web Engineering*, 1(3), 27–48. <https://doi.org/10.4018/jitwe.2006070103>
- Lubis, T. M. (2016). Digital Technologies and New Spectrum: The (Future) Use of the 700 Mhz Frequency Band in the European Union Framework. *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.2872837>
- Magna, O.& Vergara, P. (2021). The Emotional Capital and Intellectual Capital of people through operational models and multivariate techniques. *trilogía Ciencia Tecnología Sociedad*. 34. 10-61.
- Manzari, M., Kazemi, M., Nazemi, S.& Pooya, A. (2012). Intellectual Capital: Concepts, Components, and Indicators: *A Literature Review*.
- Marinelli, L., Bartoloni, S., Pascucci, F., Gregori, G.L. and Farina Briamonte, M. (2022), "Genesis of an innovation-based entrepreneurial ecosystem: exploring the role of intellectual capital", *Journal of Intellectual Capital*, Vol. ahead-of-print No. ahead-of-print. <https://doi.org/10.1108/JIC-09-2021-0264>
- Marr, B. (2008) Impacting Future Value: How to Manage your Intellectual Capital. *Management Accounting Guideline (MAG) Jointly Published by CMA, AICPA, andCIMA*.<http://www.journalofaccountancy.com/content/dam/jofa/archive/issues/2008/09/mag-intcapital-eng.pdf>
- Martic, K., (2019, November 12). Digital Transformation (DX): Best Practices for Driving Change. Haiilo. Retrieved November 14, 2022, from

<https://haiilo.com/blog/digital-transformation-dx-best-practices-for-driving-change/>

- Martín-de-Castro, G., Delgado-Verde, M., López-Sáez, P. & Navas-López, J. E. (2011). Towards ‘An Intellectual Capital-Based View of the Firm’: *Origins and Nature*. *Journal of Business Ethics* 98 (4):649-662.
- Mascarenhas, O.A., Kesavan, R. & Bernacchi, M. (2006), Lasting customer loyalty: a total customer experience approach, *Journal of Consumer Marketing*, Vol. 23 No. 7, pp. 397-405. <https://doi.org/10.1108/07363760610712939>
- Massaro, M. (2015). Where there is a will there is a way. *Journal of Intellectual Capital*.
- Mcknight, D. & Chervany, Norman. (1996). The Meanings of Trust.
- McLoughlin D., Salun M., Özsoy E., Carroll R., Zaslavska K. & Uslu, O. (2018). Trust within organisations: A cross-cultural research on the role of character perception. *Yorum-Yönetim-Yöntem Uluslararası Yönetim-Ekonomi ve Felsefe Dergisi*
- Mellander C., Florida R. (2014) The Rise of Skills: Human Capital, the Creative Class, and Regional Development. In: *Fischer M., Nijkamp P. (eds) Handbook of Regional Science*. Springer, Berlin, Heidelberg. https://doi.org/10.1007/978-3-642-23430-9_18.
- Mignonac, K. & Richebé, N. (2013). ‘No strings attached?’: How attribution of disinterested support affects employee retention. *Human Resource Management Journal*. 23. 10.1111/j.1748-8583.2012.00195.x.
- Miller, T. (2017). Explanation in Artificial Intelligence: Insights from the Social Sciences. *Artificial Intelligence*. 267. 10.1016/j.artint.2018.07.007.
- Murali, S., Poddar, A. & Seema, A. (2017). Employee Loyalty, Organizational Performance & Performance Evaluation – A Critical Survey. *IOSR Journal of Business and Management (IOSR-JBM)*. 19. 00-00.
- Natalie R. Smith, Paul N. Zivich, Leah M. Frerichs, James Moody, Allison E. Aiello, (2020) “A Guide for Choosing Community Detection Algorithms in Social Network Studies: *The Question Alignment Approach*”, *American Journal of Preventive Medicine*, 59(4): 597-605.

- NetworkX — NetworkX documentation. (2022). *NetworkX — NetworkX Documentation*. Retrieved November 4, 2022, from <https://networkx.org/>
- Neufville, R., Amedeo R.O., Peter P. B., & Reynolds T. (2013). *Airport Systems: Planning, Design, and Management*. 2nd ed. *New York: McGraw-Hill Education*. <https://www.accessengineeringlibrary.com/content/book/9780071770583>
- Newman M. E. (2006). Modularity and community structure in networks. *Proceedings of the National Academy of Sciences of the United States of America*, 103(23), 8577–8582. <https://doi.org/10.1073/pnas.0601602103>
- Omotoso, A. & Musa, S. (2019). Social Networking. *International Journal of Trend in Scientific Research and Development*. Volume-3. 126-128. 10.31142/ijtsrd21657.
- Onuoha, N.E. (2021), "Does structural capital count in human capital-corporate financial performance relationship? Evidence from deposit money banks in Nigeria", *Measuring Business Excellence*, Vol. ahead-of-print No. ahead-of-print. <https://doi.org/10.1108/MBE-03-2021-0041>
- Ordóñez de, Pablos P., & Edvinsson, L. (Eds.). (2020). *Intellectual Capital in the Digital Economy* (1st ed.). Routledge. <https://doi.org/10.4324/9780429285882>
- Patky, J., & Pandey, S. K. (2020). Does Flexibility in Human Resource Practices Increase Innovation? *Mediating Role of Intellectual Capital*. *South Asian Journal of Human Resources Management*, 7(2), 257–275. <https://doi.org/10.1177/2322093720934243>
- Pazura, P., Bortko, K., Jankowski, J., Michalski, R. (2020). A Dynamic Vote-Rank Based Approach for Effective Sequential Initialization of Information Spreading Processes Within Complex Networks. *In: et al. Computational Science – ICCS 2020. ICCS 2020. Lecture Notes in Computer Science* (), vol 12137. Springer, Cham. https://doi.org/10.1007/978-3-030-50371-0_47.
- Pérez-Luño, A., Vidal, J.& Valle, R. (2018). The role of tacit knowledge in connecting knowledge exchange and combination with innovation. *Technology Analysis & Strategic Management*. 31. 1-13. 10.1080/09537325.2018.1492712.
- Pfeffer, J. (2014). Book Review: *Social Network Analysis with Applications*. *Connections*, 34(1). <https://doi.org/10.17266/34.1.11>

- Pirogova, O., Plotnikov, V., Makarov, I. & Grafov, A. (2020). The impact of digitalization on the *Intellectual capital formation and use* (case of service enterprises). E3S Web of Conferences. 217. 06009. 10.1051/e3sconf/202021706009.
- Pokrovskaja, N. N., Snisarenko, S. N., Safronova, J. S., & Brazevich, D. S. (2019). Analysis of emotional intelligence for the intellectual capital growth. *Planning And Teaching Engineering Staff For The Industrial And Economic Complex Of The Region*, 90-93. doi: 10.17816/PTES26311
- Pozzi F. A., Fersini E., Messina E., & Liu B. (2016). *Sentiment Analysis in Social Networks* (1st. ed.). Morgan Kaufmann Publishers Inc., San Francisco, CA, USA.
- PRIMECLASS. (2022).PRIMECLASS. Retrieved November 4, 2022, from <http://www.primeclass.com.tr/en/Pages/TAV%20PrimeClass-.aspx>
- Rahimpour, K., Shirouyehzad, H., Asadpour, M. & Karbasian, M. (2020), "A PCA-DEA method for organizational performance evaluation based on intellectual capital and employee loyalty: A case study", *Journal of Modelling in Management*, Vol. 15 No. 4, pp. 1479-1513. <https://doi.org/10.1108/JM2-03-2019-0060>
- Rajapaksha, Aruna & Jayasuriya, Nisha. (2020). Smart Airport: A Review on Future of the Airport Operation. *Global Journal of Management and Business Research*. 20. 10.34257/GJMBRAVOL20IS3PG25.
- Rimmer, M. (2018). Elon Musk's Open Innovation: *Tesla, Intellectual Property, and Climate Change: The Paris Agreement and Climate Justice*. 10.1007/978-981-13-2155-9_19.
- Ropes, D. (2014). Intergenerational learning in organizations. An effective way to stimulate older employee learning and development. *Development and Learning in Organizations: An International Journal*. 28. 10.1108/DLO-10-2013-0078.
- Sahni, J. (2019). Investigating The Status Of Employee Engagement In An Emerging Economy: Case Of India. *Economic And Social Development (Book of Proceedings)*, 42nd International Scientific Conference on Economic and Social Development.
- Schepker, D., Nyberg, A., Ulrich, M. & Wright, Patrick. (2017). Planning for Future Leadership: Procedural Rationality, Formalized Succession Processes, and CEO

- influence in Chief Executive Officer Succession Planning*. Academy of Management Journal. 61. amj. 2016.0071. 10.5465/amj.2016.0071.
- Seleim, A. & Khalil, O. (2011). Understanding the knowledge management-intellectual capital relationship: *A two-way analysis*. *Journal of Intellectual Capital*. 12. 586-614. 10.1108/14691931111181742.
- Shahzad, U., Fareed, Z., Zulfiqar, B., Shahzad, F., Hafiz, S. & Latif, Shahid. (2014). The Impact of Intellectual Capital on the Performance of Universities. *European Journal of Contemporary Education*. 10. 273-280. 10.13187/ejced.2014.10.273.
- Smith, J. (2013, October 22). How To Keep Your Entrepreneurial Spirit Alive as The Company You Work for Grows. *Forbes*. Retrieved November 16, 2022, from <https://www.forbes.com/sites/jacquelynsmith/2013/10/22/how-to-keep-your-entrepreneurial-spirit-alive-as-the-company-you-work-for-grows/>
- Subramanian, AM, Van de Vrande, V. (2019) The role of intellectual capital in new product development: Can it become a liability? *J Oper Manag*. 2019; 65: 517– 535. <https://doi.org/10.1002/joom.1045>
- Stewart, T. (1997). Intellectual capital: The new wealth of organizations. *Performance Improvement*. 37. 56 - 59. 10.1002/pfi.4140370713.
- Swan, A., Mohd YUNOS, M., Utaberta, N., Mohd Ariffin, N., Ismail, N. & Ismail, S. (2015). Achieving A Conducive Working Environment. *Research Journal of Fisheries And Hydrobiology*. 10. 108-111.
- Taghian, M., D'Souza, C. & Polonsky, M. (2015). A stakeholder approach to corporate social responsibility, reputation, and business performance. *Social Responsibility Journal*. 11. 340-363. 10.1108/SRJ-06-2012-0068.
- Tamer, I., Dereli, B., & Sağlam, M. (2014). Unorthodox Forms of Capital in Organizations: Positive Psychological Capital, Intellectual Capital and Social Capital. *Procedia - Social and Behavioral Sciences*. 152. 10.1016/j.sbspro.2014.09.351.
- TAV Airports. (2022). TAV Airports. Retrieved November 4, 2022, from <https://tavhavalimanlari.com.tr/en-EN/about-tav/pages/history>
- TAV Security Website. (2022). TAV Security Website. Retrieved November 4, 2022, from <https://tavguvenlik.com/en-EN/about/history>

- TAV Technologies | Aviation Industry's Leading Technology Company. (2022). *TAV Technologies*. Retrieved November 4, 2022, from <https://tavtechnologies.aero>
- Tham, J. (2018). Digital Technologies and the Future of Employment. *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.3296213>
- Thorgrímsson, O., Thorsteinsdóttir, S. & Guðnadóttir, A. (2006). *Licence Agreement*.
- Tichá, I. (2011). Exploring Intellectual Capital Through Social Network Analysis: A *Conceptual Framework*. *Acta Univ. Agric. Et Silv. Mendel. Brun.*, LIX, No. 2, pp. 361–364
- To Build an Agile Team, Commit to Organizational Stability. (2020, April 7). *Harvard Business Review*. Retrieved November 19, 2022, from <https://hbr.org/2020/04/to-build-an-agile-team-commit-to-organizational-stability>
- Torre, C., Tommasetti, A. and Maione, G. (2021), "Technology usage, intellectual capital, firm performance and employee satisfaction: *the accountants' idea*", *The TQM Journal*, Vol. 33 No. 3, pp. 545-567. <https://doi.org/10.1108/TQM-04-2020-0070>
- Treiblmaier, H. & Beck, R. (2019). *Business Transformation through Blockchain: Volume I*. 10.1007/978-3-319-98911-2.
- Tsareva, N. A., & Boldyhanova, V. A. (2020). *Educating the Concepts of Retention Factor of a Company with the Case of Employee Engagement Level Increase*. *Propósitos Y Representaciones*, 8(3). <https://doi.org/10.20511/pyr2020.v8n3.515>
- Turnbull, L., Hütt, MT., & Ioannides, A.A. (2018). *Connectivity and complex systems: learning from a multi-disciplinary perspective*. *Appl Netw Sci* 3, 11 (2018). <https://doi.org/10.1007/s41109-018-0067-2>
- Tütlys, V. & Spöttl, G. (2021), "Disruption of qualifications in manufacturing: challenges and prospects", *European Journal of Training and Development*, Vol. ahead-of-print No. ahead-of-print. <https://doi.org/10.1108/EJTD-07-2020-0121>
- Uppal, N., Mishra, S. K., & Vohra, N. (2014). Prior Related Work Experience and Job Performance: Role of personality. *International Journal of Selection and Assessment*, 22(1), 39–51. <https://doi.org/10.1111/IJSA.12055>

- Usai, A., Orlando, B. & Mazzoleni, A. (2020), "Happiness as a driver of entrepreneurial initiative and innovation capital", *Journal of Intellectual Capital*, Vol. 21 No. 6, pp. 1229-1255. <https://doi.org/10.1108/JIC-11-2019-0250>
- Van Duijn, M. A. J., & Vermunt, J. K. (2006, January). What Is Special About Social Network Analysis? *Methodology*, 2(1), 2–6. <https://doi.org/10.1027/1614-2241.2.1.2>
- Von Tunzelmann, N. (2004). Network alignment in the catching-up economies of Europe. (Ed) McGowan F., Slavo R., & von Tunzelmann N., *The emerging industrial structure of the wider Europe* (ss. 24-40). Routledge.
- Wang, Zhining & Wang, Nianxin & Liang, Huigang. (2014). Knowledge sharing, intellectual capital and firm performance. *Management Decision*. 52. 10.1108/MD-02-2013-0064.
- Weatherly, Leslie. (2003). Human Capital— The Elusive Asset Measuring and Managing Human Capital: *A Strategic Imperative for HR*.
- West, W. F. & Cheon, O. (2019) The Allocation of Excepted Political Positions: *What and Whose Executive Priorities Do They Serve?*, *Congress & the Presidency*, 46:3, 446-470, DOI: 10.1080/07343469.2019.1616334
- West, W. F. (2004). Formal Procedures, Informal Processes, Accountability, and Responsiveness in Bureaucratic Policy Making: *An Institutional Policy Analysis*. *Public Administration Review*, 64(1), 66–80. <http://www.jstor.org/stable/3542627>
- Westerman, G., Bonnet, D., & McAfee, A. (2014, October 14). *Leading Digital*. In *Turning Technology into Business Transformation*.
- What is Harmonic Centrality? [Graph Theory]. (2020, July 28). YouTube. Retrieved November 2, 2022, from <https://www.youtube.com/watch?v=0Hyj1q5MGIE>
- Wheelahan, L., Moodie, G. Gig qualifications for the gig economy: micro-credentials and the ‘hungry mile’. *High Educ* 83, 1279–1295 (2022). <https://doi.org/10.1007/s10734-021-00742-3>
- Wasono, L.W., Mihardjo, Sasmoko, & Alamsyah, F. (2022). Boosting the Firm Transformation in Industry 5.0: Experience-Agility Innovation Model. *International Journal of Recent Technology and Engineering*.

- Yang, F., Gu, S. Industry 4.0, a revolution that requires technology and national strategies. *Complex Intell. Syst.* 7, 1311–1325 (2021). <https://doi.org/10.1007/s40747-020-00267-9>
- Zack, M. H. (1999). Managing Codified Knowledge. *Sloan Management Review*, 40, 45-58.
- Zhang J, Zhao W, Cheng B, Li A, Wang Y, Yang N, Tian Y. (2022). The Impact of Digital Economy on the Economic Growth and the Development Strategies in the post-COVID-19 Era: Evidence From Countries Along the "Belt and Road". *Front Public Health*. 2022 May 9;10:856142. doi: 10.3389/fpubh.2022.856142. PMID: 35669751; PMCID: PMC9164196.
- Zinoviev, D. (2017). *Complex Network Analysis* in Python. Recognize → Construct → Visualize → Analyze → Interpret.
- Zukauskas, P., Vveinhardt, J.& Andriukaitienė, R. (2018). *Philosophy and Paradigm of Scientific Research*. 10.5772/intechopen.70628.
- Zuo, L. & Li, H. & Gao, H. & Zhu, M. (2022). The Sustainable Efficiency Improvement of Internet Companies under the Background of Digital Transformation. *Sustainability*. 14. 5600. 10.3390/su14095600.

Appendix 1: Survey

SURVEY											
	DIGITAL TRANSFORMATION CRITERIA	SCALE									INTELLECTUAL CAPITAL
1	General Conditions of Carriage	9	8	7	6	5	4	3	2	1	Work related experience
		9	8	7	6	5	4	3	2	1	Competencies
		9	8	7	6	5	4	3	2	1	Vocational Qualifications
		9	8	7	6	5	4	3	2	1	Employee Engagement
		9	8	7	6	5	4	3	2	1	Emotional Intelligence
		9	8	7	6	5	4	3	2	1	Entrepreneurial Spirit
		9	8	7	6	5	4	3	2	1	Flexibility
		9	8	7	6	5	4	3	2	1	Employee loyalty
		9	8	7	6	5	4	3	2	1	Employee Satisfaction
		9	8	7	6	5	4	3	2	1	Education
		9	8	7	6	5	4	3	2	1	Creativity
		9	8	7	6	5	4	3	2	1	Corporate Value
		9	8	7	6	5	4	3	2	1	Social Capital
		9	8	7	6	5	4	3	2	1	Management Philosophy
		9	8	7	6	5	4	3	2	1	Formal Processes
		9	8	7	6	5	4	3	2	1	Tacit/Informal Routines
		9	8	7	6	5	4	3	2	1	Management Processes
		9	8	7	6	5	4	3	2	1	Brand Name
		9	8	7	6	5	4	3	2	1	Data and Information
		9	8	7	6	5	4	3	2	1	Codified Knowledge
		9	8	7	6	5	4	3	2	1	Patents/copyrights
		9	8	7	6	5	4	3	2	1	Trade Secret
		9	8	7	6	5	4	3	2	1	Formal Relationship
		9	8	7	6	5	4	3	2	1	Informal Relationships
		9	8	7	6	5	4	3	2	1	Social Networks
		9	8	7	6	5	4	3	2	1	Partnerships
		9	8	7	6	5	4	3	2	1	Alliances
		9	8	7	6	5	4	3	2	1	Brand Image
		9	8	7	6	5	4	3	2	1	Trust
		9	8	7	6	5	4	3	2	1	Corporate Reputation
		9	8	7	6	5	4	3	2	1	Customer Loyalty
		9	8	7	6	5	4	3	2	1	Customer Engagement
		9	8	7	6	5	4	3	2	1	Licensing Agreements
		9	8	7	6	5	4	3	2	1	Joint Ventures
2	General Conditions of Carriage for Passenger and Baggage	9	8	7	6	5	4	3	2	1	Work related experience
		9	8	7	6	5	4	3	2	1	Competencies
		9	8	7	6	5	4	3	2	1	Vocational Qualifications
		9	8	7	6	5	4	3	2	1	Employee Engagement
		9	8	7	6	5	4	3	2	1	Emotional Intelligence
		9	8	7	6	5	4	3	2	1	Entrepreneurial Spirit
		9	8	7	6	5	4	3	2	1	Flexibility
		9	8	7	6	5	4	3	2	1	Employee loyalty
		9	8	7	6	5	4	3	2	1	Employee Satisfaction
		9	8	7	6	5	4	3	2	1	Education
		9	8	7	6	5	4	3	2	1	Creativity
		9	8	7	6	5	4	3	2	1	Corporate Value
		9	8	7	6	5	4	3	2	1	Social Capital
		9	8	7	6	5	4	3	2	1	Management Philosophy
		9	8	7	6	5	4	3	2	1	Formal Processes
		9	8	7	6	5	4	3	2	1	Tacit/Informal Routines
		9	8	7	6	5	4	3	2	1	Management Processes
		9	8	7	6	5	4	3	2	1	Brand Name
		9	8	7	6	5	4	3	2	1	Data and Information

3	General Conditions of Carriage for Cargo	9	8	7	6	5	4	3	2	1	Codified Knowledge
		9	8	7	6	5	4	3	2	1	Patents/copyrights
		9	8	7	6	5	4	3	2	1	Trade Secret
		9	8	7	6	5	4	3	2	1	Formal Relationship
		9	8	7	6	5	4	3	2	1	Informal Relationships
		9	8	7	6	5	4	3	2	1	Social Networks
		9	8	7	6	5	4	3	2	1	Partnerships
		9	8	7	6	5	4	3	2	1	Alliances
		9	8	7	6	5	4	3	2	1	Brand Image
		9	8	7	6	5	4	3	2	1	Trust
		9	8	7	6	5	4	3	2	1	Corporate Reputation
		9	8	7	6	5	4	3	2	1	Customer Loyalty
		9	8	7	6	5	4	3	2	1	Customer Engagement
		9	8	7	6	5	4	3	2	1	Licensing Agreements
		9	8	7	6	5	4	3	2	1	Joint Ventures
		9	8	7	6	5	4	3	2	1	Work related experience
		9	8	7	6	5	4	3	2	1	Competencies
		9	8	7	6	5	4	3	2	1	Vocational Qualifications
		9	8	7	6	5	4	3	2	1	Employee Engagement
		9	8	7	6	5	4	3	2	1	Emotional Intelligence
		9	8	7	6	5	4	3	2	1	Entrepreneurial Spirit
		9	8	7	6	5	4	3	2	1	Flexibility
		9	8	7	6	5	4	3	2	1	Employee loyalty
		9	8	7	6	5	4	3	2	1	Employee Satisfaction
		9	8	7	6	5	4	3	2	1	Education
		9	8	7	6	5	4	3	2	1	Creativity
		9	8	7	6	5	4	3	2	1	Corporate Value
		9	8	7	6	5	4	3	2	1	Social Capital
		9	8	7	6	5	4	3	2	1	Management Philosophy
9	8	7	6	5	4	3	2	1	Formal Processes		
9	8	7	6	5	4	3	2	1	Tacit/Informal Routines		
9	8	7	6	5	4	3	2	1	Management Processes		
9	8	7	6	5	4	3	2	1	Brand Name		
9	8	7	6	5	4	3	2	1	Data and Information		
9	8	7	6	5	4	3	2	1	Codified Knowledge		
9	8	7	6	5	4	3	2	1	Patents/copyrights		
9	8	7	6	5	4	3	2	1	Trade Secret		
9	8	7	6	5	4	3	2	1	Formal Relationship		
9	8	7	6	5	4	3	2	1	Informal Relationships		
9	8	7	6	5	4	3	2	1	Social Networks		
9	8	7	6	5	4	3	2	1	Partnerships		
9	8	7	6	5	4	3	2	1	Alliances		
9	8	7	6	5	4	3	2	1	Brand Image		
9	8	7	6	5	4	3	2	1	Trust		
9	8	7	6	5	4	3	2	1	Corporate Reputation		
9	8	7	6	5	4	3	2	1	Customer Loyalty		
9	8	7	6	5	4	3	2	1	Customer Engagement		
9	8	7	6	5	4	3	2	1	Licensing Agreements		
9	8	7	6	5	4	3	2	1	Joint Ventures		
4	Data Protection	9	8	7	6	5	4	3	2	1	Work related experience
		9	8	7	6	5	4	3	2	1	Competencies
		9	8	7	6	5	4	3	2	1	Vocational Qualifications
		9	8	7	6	5	4	3	2	1	Employee Engagement
		9	8	7	6	5	4	3	2	1	Emotional Intelligence
		9	8	7	6	5	4	3	2	1	Entrepreneurial Spirit
		9	8	7	6	5	4	3	2	1	Flexibility
		9	8	7	6	5	4	3	2	1	Employee loyalty
9	8	7	6	5	4	3	2	1	Employee Satisfaction		

		9	8	7	6	5	4	3	2	1	Education
		9	8	7	6	5	4	3	2	1	Creativity
		9	8	7	6	5	4	3	2	1	Corporate Value
		9	8	7	6	5	4	3	2	1	Social Capital
		9	8	7	6	5	4	3	2	1	Management Philosophy
		9	8	7	6	5	4	3	2	1	Formal Processes
		9	8	7	6	5	4	3	2	1	Tacit/Informal Routines
		9	8	7	6	5	4	3	2	1	Management Processes
		9	8	7	6	5	4	3	2	1	Brand Name
		9	8	7	6	5	4	3	2	1	Data and Information
		9	8	7	6	5	4	3	2	1	Codified Knowledge
		9	8	7	6	5	4	3	2	1	Patents/copyrights
		9	8	7	6	5	4	3	2	1	Trade Secret
		9	8	7	6	5	4	3	2	1	Formal Relationship
		9	8	7	6	5	4	3	2	1	Informal Relationships
		9	8	7	6	5	4	3	2	1	Social Networks
		9	8	7	6	5	4	3	2	1	Partnerships
		9	8	7	6	5	4	3	2	1	Alliances
		9	8	7	6	5	4	3	2	1	Brand Image
		9	8	7	6	5	4	3	2	1	Trust
		9	8	7	6	5	4	3	2	1	Corporate Reputation
		9	8	7	6	5	4	3	2	1	Customer Loyalty
		9	8	7	6	5	4	3	2	1	Customer Engagement
		9	8	7	6	5	4	3	2	1	Licensing Agreements
		9	8	7	6	5	4	3	2	1	Joint Ventures
5	Handling of information Request	9	8	7	6	5	4	3	2	1	Work related experience
		9	8	7	6	5	4	3	2	1	Competencies
		9	8	7	6	5	4	3	2	1	Vocational Qualifications
		9	8	7	6	5	4	3	2	1	Employee Engagement
		9	8	7	6	5	4	3	2	1	Emotional Intelligence
		9	8	7	6	5	4	3	2	1	Entrepreneurial Spirit
		9	8	7	6	5	4	3	2	1	Flexibility
		9	8	7	6	5	4	3	2	1	Employee loyalty
		9	8	7	6	5	4	3	2	1	Employee Satisfaction
		9	8	7	6	5	4	3	2	1	Education
		9	8	7	6	5	4	3	2	1	Creativity
		9	8	7	6	5	4	3	2	1	Corporate Value
		9	8	7	6	5	4	3	2	1	Social Capital
		9	8	7	6	5	4	3	2	1	Management Philosophy
		9	8	7	6	5	4	3	2	1	Formal Processes
		9	8	7	6	5	4	3	2	1	Tacit/Informal Routines
		9	8	7	6	5	4	3	2	1	Management Processes
		9	8	7	6	5	4	3	2	1	Brand Name
		9	8	7	6	5	4	3	2	1	Data and Information
		9	8	7	6	5	4	3	2	1	Codified Knowledge
		9	8	7	6	5	4	3	2	1	Patents/copyrights
		9	8	7	6	5	4	3	2	1	Trade Secret
		9	8	7	6	5	4	3	2	1	Formal Relationship
		9	8	7	6	5	4	3	2	1	Informal Relationships
		9	8	7	6	5	4	3	2	1	Social Networks
		9	8	7	6	5	4	3	2	1	Partnerships
		9	8	7	6	5	4	3	2	1	Alliances
		9	8	7	6	5	4	3	2	1	Brand Image
		9	8	7	6	5	4	3	2	1	Trust
		9	8	7	6	5	4	3	2	1	Corporate Reputation
		9	8	7	6	5	4	3	2	1	Customer Loyalty
		9	8	7	6	5	4	3	2	1	Customer Engagement
		9	8	7	6	5	4	3	2	1	Licensing Agreements

6	Departure	9	8	7	6	5	4	3	2	1	Joint Ventures
		9	8	7	6	5	4	3	2	1	Work related experience
		9	8	7	6	5	4	3	2	1	Competencies
		9	8	7	6	5	4	3	2	1	Vocational Qualifications
		9	8	7	6	5	4	3	2	1	Employee Engagement
		9	8	7	6	5	4	3	2	1	Emotional Intelligence
		9	8	7	6	5	4	3	2	1	Entrepreneurial Spirit
		9	8	7	6	5	4	3	2	1	Flexibility
		9	8	7	6	5	4	3	2	1	Employee loyalty
		9	8	7	6	5	4	3	2	1	Employee Satisfaction
		9	8	7	6	5	4	3	2	1	Education
		9	8	7	6	5	4	3	2	1	Creativity
		9	8	7	6	5	4	3	2	1	Corporate Value
		9	8	7	6	5	4	3	2	1	Social Capital
		9	8	7	6	5	4	3	2	1	Management Philosophy
		9	8	7	6	5	4	3	2	1	Formal Processes
		9	8	7	6	5	4	3	2	1	Tacit/Informal Routines
		9	8	7	6	5	4	3	2	1	Management Processes
		9	8	7	6	5	4	3	2	1	Brand Name
		9	8	7	6	5	4	3	2	1	Data and Information
		9	8	7	6	5	4	3	2	1	Codified Knowledge
		9	8	7	6	5	4	3	2	1	Patents/copyrights
		9	8	7	6	5	4	3	2	1	Trade Secret
		9	8	7	6	5	4	3	2	1	Formal Relationship
		9	8	7	6	5	4	3	2	1	Informal Relationships
		9	8	7	6	5	4	3	2	1	Social Networks
		9	8	7	6	5	4	3	2	1	Partnerships
		9	8	7	6	5	4	3	2	1	Alliances
		9	8	7	6	5	4	3	2	1	Brand Image
		9	8	7	6	5	4	3	2	1	Trust
		9	8	7	6	5	4	3	2	1	Corporate Reputation
		9	8	7	6	5	4	3	2	1	Customer Loyalty
		9	8	7	6	5	4	3	2	1	Customer Engagement
9	8	7	6	5	4	3	2	1	Licensing Agreements		
7	Pre departure Data and Activities	9	8	7	6	5	4	3	2	1	Joint Ventures
		9	8	7	6	5	4	3	2	1	Work related experience
		9	8	7	6	5	4	3	2	1	Competencies
		9	8	7	6	5	4	3	2	1	Vocational Qualifications
		9	8	7	6	5	4	3	2	1	Employee Engagement
		9	8	7	6	5	4	3	2	1	Emotional Intelligence
		9	8	7	6	5	4	3	2	1	Entrepreneurial Spirit
		9	8	7	6	5	4	3	2	1	Flexibility
		9	8	7	6	5	4	3	2	1	Employee loyalty
		9	8	7	6	5	4	3	2	1	Employee Satisfaction
		9	8	7	6	5	4	3	2	1	Education
		9	8	7	6	5	4	3	2	1	Creativity
		9	8	7	6	5	4	3	2	1	Corporate Value
		9	8	7	6	5	4	3	2	1	Social Capital
		9	8	7	6	5	4	3	2	1	Management Philosophy
		9	8	7	6	5	4	3	2	1	Formal Processes
		9	8	7	6	5	4	3	2	1	Tacit/Informal Routines
		9	8	7	6	5	4	3	2	1	Management Processes
		9	8	7	6	5	4	3	2	1	Brand Name
		9	8	7	6	5	4	3	2	1	Data and Information
9	8	7	6	5	4	3	2	1	Codified Knowledge		
9	8	7	6	5	4	3	2	1	Patents/copyrights		
9	8	7	6	5	4	3	2	1	Trade Secret		
9	8	7	6	5	4	3	2	1	Formal Relationship		

		9	8	7	6	5	4	3	2	1	Informal Relationships		
		9	8	7	6	5	4	3	2	1	Social Networks		
		9	8	7	6	5	4	3	2	1	Partnerships		
		9	8	7	6	5	4	3	2	1	Alliances		
		9	8	7	6	5	4	3	2	1	Brand Image		
		9	8	7	6	5	4	3	2	1	Trust		
		9	8	7	6	5	4	3	2	1	Corporate Reputation		
		9	8	7	6	5	4	3	2	1	Customer Loyalty		
		9	8	7	6	5	4	3	2	1	Customer Engagement		
		9	8	7	6	5	4	3	2	1	Licensing Agreements		
		9	8	7	6	5	4	3	2	1	Joint Ventures		
		8	Transportation Documents	9	8	7	6	5	4	3	2	1	Work related experience
				9	8	7	6	5	4	3	2	1	Competencies
				9	8	7	6	5	4	3	2	1	Vocational Qualifications
				9	8	7	6	5	4	3	2	1	Employee Engagement
				9	8	7	6	5	4	3	2	1	Emotional Intelligence
				9	8	7	6	5	4	3	2	1	Entrepreneurial Spirit
				9	8	7	6	5	4	3	2	1	Flexibility
				9	8	7	6	5	4	3	2	1	Employee loyalty
				9	8	7	6	5	4	3	2	1	Employee Satisfaction
				9	8	7	6	5	4	3	2	1	Education
				9	8	7	6	5	4	3	2	1	Creativity
				9	8	7	6	5	4	3	2	1	Corporate Value
9	8			7	6	5	4	3	2	1	Social Capital		
9	8			7	6	5	4	3	2	1	Management Philosophy		
9	8			7	6	5	4	3	2	1	Formal Processes		
9	8			7	6	5	4	3	2	1	Tacit/Informal Routines		
9	8			7	6	5	4	3	2	1	Management Processes		
9	8			7	6	5	4	3	2	1	Brand Name		
9	8			7	6	5	4	3	2	1	Data and Information		
9	8			7	6	5	4	3	2	1	Codified Knowledge		
9	8			7	6	5	4	3	2	1	Patents/copyrights		
9	8			7	6	5	4	3	2	1	Trade Secret		
9	8			7	6	5	4	3	2	1	Formal Relationship		
9	8			7	6	5	4	3	2	1	Informal Relationships		
9	8			7	6	5	4	3	2	1	Social Networks		
9	8			7	6	5	4	3	2	1	Partnerships		
9	8			7	6	5	4	3	2	1	Alliances		
9	8			7	6	5	4	3	2	1	Brand Image		
9	8			7	6	5	4	3	2	1	Trust		
9	8			7	6	5	4	3	2	1	Corporate Reputation		
9	8			7	6	5	4	3	2	1	Customer Loyalty		
9	8			7	6	5	4	3	2	1	Customer Engagement		
9	8			7	6	5	4	3	2	1	Licensing Agreements		
9	8	7	6	5	4	3	2	1	Joint Ventures				
9	Customer Interactions at the Check in	9	8	7	6	5	4	3	2	1	Work related experience		
		9	8	7	6	5	4	3	2	1	Competencies		
		9	8	7	6	5	4	3	2	1	Vocational Qualifications		
		9	8	7	6	5	4	3	2	1	Employee Engagement		
		9	8	7	6	5	4	3	2	1	Emotional Intelligence		
		9	8	7	6	5	4	3	2	1	Entrepreneurial Spirit		
		9	8	7	6	5	4	3	2	1	Flexibility		
		9	8	7	6	5	4	3	2	1	Employee loyalty		
		9	8	7	6	5	4	3	2	1	Employee Satisfaction		
		9	8	7	6	5	4	3	2	1	Education		
		9	8	7	6	5	4	3	2	1	Creativity		
		9	8	7	6	5	4	3	2	1	Corporate Value		
		9	8	7	6	5	4	3	2	1	Social Capital		

		9	8	7	6	5	4	3	2	1	Management Philosophy
		9	8	7	6	5	4	3	2	1	Formal Processes
		9	8	7	6	5	4	3	2	1	Tacit/Informal Routines
		9	8	7	6	5	4	3	2	1	Management Processes
		9	8	7	6	5	4	3	2	1	Brand Name
		9	8	7	6	5	4	3	2	1	Data and Information
		9	8	7	6	5	4	3	2	1	Codified Knowledge
		9	8	7	6	5	4	3	2	1	Patents/copyrights
		9	8	7	6	5	4	3	2	1	Trade Secret
		9	8	7	6	5	4	3	2	1	Formal Relationship
		9	8	7	6	5	4	3	2	1	Informal Relationships
		9	8	7	6	5	4	3	2	1	Social Networks
		9	8	7	6	5	4	3	2	1	Partnerships
		9	8	7	6	5	4	3	2	1	Alliances
		9	8	7	6	5	4	3	2	1	Brand Image
		9	8	7	6	5	4	3	2	1	Trust
		9	8	7	6	5	4	3	2	1	Corporate Reputation
		9	8	7	6	5	4	3	2	1	Customer Loyalty
		9	8	7	6	5	4	3	2	1	Customer Engagement
		9	8	7	6	5	4	3	2	1	Licensing Agreements
		9	8	7	6	5	4	3	2	1	Joint Ventures
		9	8	7	6	5	4	3	2	1	Work related experience
		9	8	7	6	5	4	3	2	1	Competencies
		9	8	7	6	5	4	3	2	1	Vocational Qualifications
		9	8	7	6	5	4	3	2	1	Employee Engagement
		9	8	7	6	5	4	3	2	1	Emotional Intelligence
		9	8	7	6	5	4	3	2	1	Entrepreneurial Spirit
		9	8	7	6	5	4	3	2	1	Flexibility
		9	8	7	6	5	4	3	2	1	Employee loyalty
		9	8	7	6	5	4	3	2	1	Employee Satisfaction
		9	8	7	6	5	4	3	2	1	Education
		9	8	7	6	5	4	3	2	1	Creativity
		9	8	7	6	5	4	3	2	1	Corporate Value
		9	8	7	6	5	4	3	2	1	Social Capital
		9	8	7	6	5	4	3	2	1	Management Philosophy
		9	8	7	6	5	4	3	2	1	Formal Processes
		9	8	7	6	5	4	3	2	1	Tacit/Informal Routines
		9	8	7	6	5	4	3	2	1	Management Processes
		9	8	7	6	5	4	3	2	1	Brand Name
		9	8	7	6	5	4	3	2	1	Data and Information
		9	8	7	6	5	4	3	2	1	Codified Knowledge
		9	8	7	6	5	4	3	2	1	Patents/copyrights
		9	8	7	6	5	4	3	2	1	Trade Secret
		9	8	7	6	5	4	3	2	1	Formal Relationship
		9	8	7	6	5	4	3	2	1	Informal Relationships
		9	8	7	6	5	4	3	2	1	Social Networks
		9	8	7	6	5	4	3	2	1	Partnerships
		9	8	7	6	5	4	3	2	1	Alliances
		9	8	7	6	5	4	3	2	1	Brand Image
		9	8	7	6	5	4	3	2	1	Trust
		9	8	7	6	5	4	3	2	1	Corporate Reputation
		9	8	7	6	5	4	3	2	1	Customer Loyalty
		9	8	7	6	5	4	3	2	1	Customer Engagement
		9	8	7	6	5	4	3	2	1	Licensing Agreements
		9	8	7	6	5	4	3	2	1	Joint Ventures
10	Boarding Passes	9	8	7	6	5	4	3	2	1	Work related experience
		9	8	7	6	5	4	3	2	1	Competencies
		9	8	7	6	5	4	3	2	1	Vocational Qualifications
		9	8	7	6	5	4	3	2	1	Employee Engagement
		9	8	7	6	5	4	3	2	1	Emotional Intelligence
		9	8	7	6	5	4	3	2	1	Entrepreneurial Spirit
		9	8	7	6	5	4	3	2	1	Flexibility
		9	8	7	6	5	4	3	2	1	Employee loyalty
		9	8	7	6	5	4	3	2	1	Employee Satisfaction
		9	8	7	6	5	4	3	2	1	Education
		9	8	7	6	5	4	3	2	1	Creativity
		9	8	7	6	5	4	3	2	1	Corporate Value
		9	8	7	6	5	4	3	2	1	Social Capital
		9	8	7	6	5	4	3	2	1	Management Philosophy
		9	8	7	6	5	4	3	2	1	Formal Processes
		9	8	7	6	5	4	3	2	1	Tacit/Informal Routines
		9	8	7	6	5	4	3	2	1	Management Processes
		9	8	7	6	5	4	3	2	1	Brand Name
		9	8	7	6	5	4	3	2	1	Data and Information
		9	8	7	6	5	4	3	2	1	Codified Knowledge
		9	8	7	6	5	4	3	2	1	Patents/copyrights
		9	8	7	6	5	4	3	2	1	Trade Secret
		9	8	7	6	5	4	3	2	1	Formal Relationship
		9	8	7	6	5	4	3	2	1	Informal Relationships
		9	8	7	6	5	4	3	2	1	Social Networks
		9	8	7	6	5	4	3	2	1	Partnerships
		9	8	7	6	5	4	3	2	1	Alliances
		9	8	7	6	5	4	3	2	1	Brand Image
		9	8	7	6	5	4	3	2	1	Trust
		9	8	7	6	5	4	3	2	1	Corporate Reputation
		9	8	7	6	5	4	3	2	1	Customer Loyalty
		9	8	7	6	5	4	3	2	1	Customer Engagement
		9	8	7	6	5	4	3	2	1	Licensing Agreements
		9	8	7	6	5	4	3	2	1	Joint Ventures
11	Passport, Visa and Security	9	8	7	6	5	4	3	2	1	Work related experience
		9	8	7	6	5	4	3	2	1	Competencies
		9	8	7	6	5	4	3	2	1	Vocational Qualifications

12	Boarding	9	8	7	6	5	4	3	2	1	Employee Engagement
		9	8	7	6	5	4	3	2	1	Emotional Intelligence
		9	8	7	6	5	4	3	2	1	Entrepreneurial Spirit
		9	8	7	6	5	4	3	2	1	Flexibility
		9	8	7	6	5	4	3	2	1	Employee loyalty
		9	8	7	6	5	4	3	2	1	Employee Satisfaction
		9	8	7	6	5	4	3	2	1	Education
		9	8	7	6	5	4	3	2	1	Creativity
		9	8	7	6	5	4	3	2	1	Corporate Value
		9	8	7	6	5	4	3	2	1	Social Capital
		9	8	7	6	5	4	3	2	1	Management Philosophy
		9	8	7	6	5	4	3	2	1	Formal Processes
		9	8	7	6	5	4	3	2	1	Tacit/Informal Routines
		9	8	7	6	5	4	3	2	1	Management Processes
		9	8	7	6	5	4	3	2	1	Brand Name
		9	8	7	6	5	4	3	2	1	Data and Information
		9	8	7	6	5	4	3	2	1	Codified Knowledge
		9	8	7	6	5	4	3	2	1	Patents/copyrights
		9	8	7	6	5	4	3	2	1	Trade Secret
		9	8	7	6	5	4	3	2	1	Formal Relationship
		9	8	7	6	5	4	3	2	1	Informal Relationships
		9	8	7	6	5	4	3	2	1	Social Networks
		9	8	7	6	5	4	3	2	1	Partnerships
		9	8	7	6	5	4	3	2	1	Alliances
		9	8	7	6	5	4	3	2	1	Brand Image
		9	8	7	6	5	4	3	2	1	Trust
		9	8	7	6	5	4	3	2	1	Corporate Reputation
		9	8	7	6	5	4	3	2	1	Customer Loyalty
		9	8	7	6	5	4	3	2	1	Customer Engagement
		9	8	7	6	5	4	3	2	1	Licensing Agreements
		9	8	7	6	5	4	3	2	1	Joint Ventures
		9	8	7	6	5	4	3	2	1	Work related experience
		9	8	7	6	5	4	3	2	1	Competencies
		9	8	7	6	5	4	3	2	1	Vocational Qualifications
		9	8	7	6	5	4	3	2	1	Employee Engagement
		9	8	7	6	5	4	3	2	1	Emotional Intelligence
		9	8	7	6	5	4	3	2	1	Entrepreneurial Spirit
		9	8	7	6	5	4	3	2	1	Flexibility
		9	8	7	6	5	4	3	2	1	Employee loyalty
		9	8	7	6	5	4	3	2	1	Employee Satisfaction
		9	8	7	6	5	4	3	2	1	Education
		9	8	7	6	5	4	3	2	1	Creativity
		9	8	7	6	5	4	3	2	1	Corporate Value
		9	8	7	6	5	4	3	2	1	Social Capital
		9	8	7	6	5	4	3	2	1	Management Philosophy
		9	8	7	6	5	4	3	2	1	Formal Processes
		9	8	7	6	5	4	3	2	1	Tacit/Informal Routines
		9	8	7	6	5	4	3	2	1	Management Processes
		9	8	7	6	5	4	3	2	1	Brand Name
		9	8	7	6	5	4	3	2	1	Data and Information
		9	8	7	6	5	4	3	2	1	Codified Knowledge
		9	8	7	6	5	4	3	2	1	Patents/copyrights
9	8	7	6	5	4	3	2	1	Trade Secret		
9	8	7	6	5	4	3	2	1	Formal Relationship		
9	8	7	6	5	4	3	2	1	Informal Relationships		
9	8	7	6	5	4	3	2	1	Social Networks		
9	8	7	6	5	4	3	2	1	Partnerships		
9	8	7	6	5	4	3	2	1	Alliances		

		9	8	7	6	5	4	3	2	1	Brand Image
		9	8	7	6	5	4	3	2	1	Trust
		9	8	7	6	5	4	3	2	1	Corporate Reputation
		9	8	7	6	5	4	3	2	1	Customer Loyalty
		9	8	7	6	5	4	3	2	1	Customer Engagement
		9	8	7	6	5	4	3	2	1	Licensing Agreements
		9	8	7	6	5	4	3	2	1	Joint Ventures
13	Have a nice flight	9	8	7	6	5	4	3	2	1	Work related experience
		9	8	7	6	5	4	3	2	1	Competencies
		9	8	7	6	5	4	3	2	1	Vocational Qualifications
		9	8	7	6	5	4	3	2	1	Employee Engagement
		9	8	7	6	5	4	3	2	1	Emotional Intelligence
		9	8	7	6	5	4	3	2	1	Entrepreneurial Spirit
		9	8	7	6	5	4	3	2	1	Flexibility
		9	8	7	6	5	4	3	2	1	Employee loyalty
		9	8	7	6	5	4	3	2	1	Employee Satisfaction
		9	8	7	6	5	4	3	2	1	Education
		9	8	7	6	5	4	3	2	1	Creativity
		9	8	7	6	5	4	3	2	1	Corporate Value
		9	8	7	6	5	4	3	2	1	Social Capital
		9	8	7	6	5	4	3	2	1	Management Philosophy
		9	8	7	6	5	4	3	2	1	Formal Processes
		9	8	7	6	5	4	3	2	1	Tacit/Informal Routines
		9	8	7	6	5	4	3	2	1	Management Processes
		9	8	7	6	5	4	3	2	1	Brand Name
		9	8	7	6	5	4	3	2	1	Data and Information
		9	8	7	6	5	4	3	2	1	Codified Knowledge
		9	8	7	6	5	4	3	2	1	Patents/copyrights
		9	8	7	6	5	4	3	2	1	Trade Secret
		9	8	7	6	5	4	3	2	1	Formal Relationship
		9	8	7	6	5	4	3	2	1	Informal Relationships
		9	8	7	6	5	4	3	2	1	Social Networks
		9	8	7	6	5	4	3	2	1	Partnerships
		9	8	7	6	5	4	3	2	1	Alliances
		9	8	7	6	5	4	3	2	1	Brand Image
		9	8	7	6	5	4	3	2	1	Trust
		9	8	7	6	5	4	3	2	1	Corporate Reputation
		9	8	7	6	5	4	3	2	1	Customer Loyalty
		9	8	7	6	5	4	3	2	1	Customer Engagement
		9	8	7	6	5	4	3	2	1	Licensing Agreements
9	8	7	6	5	4	3	2	1	Joint Ventures		
14	Labour	9	8	7	6	5	4	3	2	1	Work related experience
		9	8	7	6	5	4	3	2	1	Competencies
		9	8	7	6	5	4	3	2	1	Vocational Qualifications
		9	8	7	6	5	4	3	2	1	Employee Engagement
		9	8	7	6	5	4	3	2	1	Emotional Intelligence
		9	8	7	6	5	4	3	2	1	Entrepreneurial Spirit
		9	8	7	6	5	4	3	2	1	Flexibility
		9	8	7	6	5	4	3	2	1	Employee loyalty
		9	8	7	6	5	4	3	2	1	Employee Satisfaction
		9	8	7	6	5	4	3	2	1	Education
		9	8	7	6	5	4	3	2	1	Creativity
		9	8	7	6	5	4	3	2	1	Corporate Value
		9	8	7	6	5	4	3	2	1	Social Capital
		9	8	7	6	5	4	3	2	1	Management Philosophy
		9	8	7	6	5	4	3	2	1	Formal Processes
9	8	7	6	5	4	3	2	1	Tacit/Informal Routines		
9	8	7	6	5	4	3	2	1	Management Processes		

		9	8	7	6	5	4	3	2	1	Brand Name
		9	8	7	6	5	4	3	2	1	Data and Information
		9	8	7	6	5	4	3	2	1	Codified Knowledge
		9	8	7	6	5	4	3	2	1	Patents/copyrights
		9	8	7	6	5	4	3	2	1	Trade Secret
		9	8	7	6	5	4	3	2	1	Formal Relationship
		9	8	7	6	5	4	3	2	1	Informal Relationships
		9	8	7	6	5	4	3	2	1	Social Networks
		9	8	7	6	5	4	3	2	1	Partnerships
		9	8	7	6	5	4	3	2	1	Alliances
		9	8	7	6	5	4	3	2	1	Brand Image
		9	8	7	6	5	4	3	2	1	Trust
		9	8	7	6	5	4	3	2	1	Corporate Reputation
		9	8	7	6	5	4	3	2	1	Customer Loyalty
		9	8	7	6	5	4	3	2	1	Customer Engagement
		9	8	7	6	5	4	3	2	1	Licensing Agreements
		9	8	7	6	5	4	3	2	1	Joint Ventures
15	Fuel	9	8	7	6	5	4	3	2	1	Work related experience
		9	8	7	6	5	4	3	2	1	Competencies
		9	8	7	6	5	4	3	2	1	Vocational Qualifications
		9	8	7	6	5	4	3	2	1	Employee Engagement
		9	8	7	6	5	4	3	2	1	Emotional Intelligence
		9	8	7	6	5	4	3	2	1	Entrepreneurial Spirit
		9	8	7	6	5	4	3	2	1	Flexibility
		9	8	7	6	5	4	3	2	1	Employee loyalty
		9	8	7	6	5	4	3	2	1	Employee Satisfaction
		9	8	7	6	5	4	3	2	1	Education
		9	8	7	6	5	4	3	2	1	Creativity
		9	8	7	6	5	4	3	2	1	Corporate Value
		9	8	7	6	5	4	3	2	1	Social Capital
		9	8	7	6	5	4	3	2	1	Management Philosophy
		9	8	7	6	5	4	3	2	1	Formal Processes
		9	8	7	6	5	4	3	2	1	Tacit/Informal Routines
		9	8	7	6	5	4	3	2	1	Management Processes
		9	8	7	6	5	4	3	2	1	Brand Name
		9	8	7	6	5	4	3	2	1	Data and Information
		9	8	7	6	5	4	3	2	1	Codified Knowledge
		9	8	7	6	5	4	3	2	1	Patents/copyrights
		9	8	7	6	5	4	3	2	1	Trade Secret
		9	8	7	6	5	4	3	2	1	Formal Relationship
		9	8	7	6	5	4	3	2	1	Informal Relationships
		9	8	7	6	5	4	3	2	1	Social Networks
		9	8	7	6	5	4	3	2	1	Partnerships
		9	8	7	6	5	4	3	2	1	Alliances
		9	8	7	6	5	4	3	2	1	Brand Image
		9	8	7	6	5	4	3	2	1	Trust
		9	8	7	6	5	4	3	2	1	Corporate Reputation
		9	8	7	6	5	4	3	2	1	Customer Loyalty
		9	8	7	6	5	4	3	2	1	Customer Engagement
		9	8	7	6	5	4	3	2	1	Licensing Agreements
		9	8	7	6	5	4	3	2	1	Joint Ventures
16	Equipment	9	8	7	6	5	4	3	2	1	Work related experience
		9	8	7	6	5	4	3	2	1	Competencies
		9	8	7	6	5	4	3	2	1	Vocational Qualifications
		9	8	7	6	5	4	3	2	1	Employee Engagement
		9	8	7	6	5	4	3	2	1	Emotional Intelligence
		9	8	7	6	5	4	3	2	1	Entrepreneurial Spirit
		9	8	7	6	5	4	3	2	1	Flexibility

		9	8	7	6	5	4	3	2	1	Employee loyalty
		9	8	7	6	5	4	3	2	1	Employee Satisfaction
		9	8	7	6	5	4	3	2	1	Education
		9	8	7	6	5	4	3	2	1	Creativity
		9	8	7	6	5	4	3	2	1	Corporate Value
		9	8	7	6	5	4	3	2	1	Social Capital
		9	8	7	6	5	4	3	2	1	Management Philosophy
		9	8	7	6	5	4	3	2	1	Formal Processes
		9	8	7	6	5	4	3	2	1	Tacit/Informal Routines
		9	8	7	6	5	4	3	2	1	Management Processes
		9	8	7	6	5	4	3	2	1	Brand Name
		9	8	7	6	5	4	3	2	1	Data and Information
		9	8	7	6	5	4	3	2	1	Codified Knowledge
		9	8	7	6	5	4	3	2	1	Patents/copyrights
		9	8	7	6	5	4	3	2	1	Trade Secret
		9	8	7	6	5	4	3	2	1	Formal Relationship
		9	8	7	6	5	4	3	2	1	Informal Relationships
		9	8	7	6	5	4	3	2	1	Social Networks
		9	8	7	6	5	4	3	2	1	Partnerships
		9	8	7	6	5	4	3	2	1	Alliances
		9	8	7	6	5	4	3	2	1	Brand Image
		9	8	7	6	5	4	3	2	1	Trust
		9	8	7	6	5	4	3	2	1	Corporate Reputation
		9	8	7	6	5	4	3	2	1	Customer Loyalty
		9	8	7	6	5	4	3	2	1	Customer Engagement
		9	8	7	6	5	4	3	2	1	Licensing Agreements
		9	8	7	6	5	4	3	2	1	Joint Ventures
17	Delay Cost	9	8	7	6	5	4	3	2	1	Work related experience
		9	8	7	6	5	4	3	2	1	Competencies
		9	8	7	6	5	4	3	2	1	Vocational Qualifications
		9	8	7	6	5	4	3	2	1	Employee Engagement
		9	8	7	6	5	4	3	2	1	Emotional Intelligence
		9	8	7	6	5	4	3	2	1	Entrepreneurial Spirit
		9	8	7	6	5	4	3	2	1	Flexibility
		9	8	7	6	5	4	3	2	1	Employee loyalty
		9	8	7	6	5	4	3	2	1	Employee Satisfaction
		9	8	7	6	5	4	3	2	1	Education
		9	8	7	6	5	4	3	2	1	Creativity
		9	8	7	6	5	4	3	2	1	Corporate Value
		9	8	7	6	5	4	3	2	1	Social Capital
		9	8	7	6	5	4	3	2	1	Management Philosophy
		9	8	7	6	5	4	3	2	1	Formal Processes
		9	8	7	6	5	4	3	2	1	Tacit/Informal Routines
		9	8	7	6	5	4	3	2	1	Management Processes
		9	8	7	6	5	4	3	2	1	Brand Name
		9	8	7	6	5	4	3	2	1	Data and Information
		9	8	7	6	5	4	3	2	1	Codified Knowledge
		9	8	7	6	5	4	3	2	1	Patents/copyrights
		9	8	7	6	5	4	3	2	1	Trade Secret
		9	8	7	6	5	4	3	2	1	Formal Relationship
		9	8	7	6	5	4	3	2	1	Informal Relationships
		9	8	7	6	5	4	3	2	1	Social Networks
		9	8	7	6	5	4	3	2	1	Partnerships
		9	8	7	6	5	4	3	2	1	Alliances
		9	8	7	6	5	4	3	2	1	Brand Image
		9	8	7	6	5	4	3	2	1	Trust
		9	8	7	6	5	4	3	2	1	Corporate Reputation
		9	8	7	6	5	4	3	2	1	Customer Loyalty

		9	8	7	6	5	4	3	2	1	Customer Engagement
		9	8	7	6	5	4	3	2	1	Licensing Agreements
		9	8	7	6	5	4	3	2	1	Joint Ventures
18	Performance Monitoring	9	8	7	6	5	4	3	2	1	Work related experience
		9	8	7	6	5	4	3	2	1	Competencies
		9	8	7	6	5	4	3	2	1	Vocational Qualifications
		9	8	7	6	5	4	3	2	1	Employee Engagement
		9	8	7	6	5	4	3	2	1	Emotional Intelligence
		9	8	7	6	5	4	3	2	1	Entrepreneurial Spirit
		9	8	7	6	5	4	3	2	1	Flexibility
		9	8	7	6	5	4	3	2	1	Employee loyalty
		9	8	7	6	5	4	3	2	1	Employee Satisfaction
		9	8	7	6	5	4	3	2	1	Education
		9	8	7	6	5	4	3	2	1	Creativity
		9	8	7	6	5	4	3	2	1	Corporate Value
		9	8	7	6	5	4	3	2	1	Social Capital
		9	8	7	6	5	4	3	2	1	Management Philosophy
		9	8	7	6	5	4	3	2	1	Formal Processes
		9	8	7	6	5	4	3	2	1	Tacit/Informal Routines
		9	8	7	6	5	4	3	2	1	Management Processes
		9	8	7	6	5	4	3	2	1	Brand Name
		9	8	7	6	5	4	3	2	1	Data and Information
		9	8	7	6	5	4	3	2	1	Codified Knowledge
		9	8	7	6	5	4	3	2	1	Patents/copyrights
		9	8	7	6	5	4	3	2	1	Trade Secret
		9	8	7	6	5	4	3	2	1	Formal Relationship
		9	8	7	6	5	4	3	2	1	Informal Relationships
		9	8	7	6	5	4	3	2	1	Social Networks
		9	8	7	6	5	4	3	2	1	Partnerships
		9	8	7	6	5	4	3	2	1	Alliances
		9	8	7	6	5	4	3	2	1	Brand Image
		9	8	7	6	5	4	3	2	1	Trust
		9	8	7	6	5	4	3	2	1	Corporate Reputation
		9	8	7	6	5	4	3	2	1	Customer Loyalty
		9	8	7	6	5	4	3	2	1	Customer Engagement
		9	8	7	6	5	4	3	2	1	Licensing Agreements
9	8	7	6	5	4	3	2	1	Joint Ventures		
19	Performance Feedback	9	8	7	6	5	4	3	2	1	Work related experience
		9	8	7	6	5	4	3	2	1	Competencies
		9	8	7	6	5	4	3	2	1	Vocational Qualifications
		9	8	7	6	5	4	3	2	1	Employee Engagement
		9	8	7	6	5	4	3	2	1	Emotional Intelligence
		9	8	7	6	5	4	3	2	1	Entrepreneurial Spirit
		9	8	7	6	5	4	3	2	1	Flexibility
		9	8	7	6	5	4	3	2	1	Employee loyalty
		9	8	7	6	5	4	3	2	1	Employee Satisfaction
		9	8	7	6	5	4	3	2	1	Education
		9	8	7	6	5	4	3	2	1	Creativity
		9	8	7	6	5	4	3	2	1	Corporate Value
		9	8	7	6	5	4	3	2	1	Social Capital
		9	8	7	6	5	4	3	2	1	Management Philosophy
		9	8	7	6	5	4	3	2	1	Formal Processes
		9	8	7	6	5	4	3	2	1	Tacit/Informal Routines
		9	8	7	6	5	4	3	2	1	Management Processes
		9	8	7	6	5	4	3	2	1	Brand Name
		9	8	7	6	5	4	3	2	1	Data and Information
		9	8	7	6	5	4	3	2	1	Codified Knowledge
9	8	7	6	5	4	3	2	1	Patents/copyrights		

		9	8	7	6	5	4	3	2	1	Trade Secret
		9	8	7	6	5	4	3	2	1	Formal Relationship
		9	8	7	6	5	4	3	2	1	Informal Relationships
		9	8	7	6	5	4	3	2	1	Social Networks
		9	8	7	6	5	4	3	2	1	Partnerships
		9	8	7	6	5	4	3	2	1	Alliances
		9	8	7	6	5	4	3	2	1	Brand Image
		9	8	7	6	5	4	3	2	1	Trust
		9	8	7	6	5	4	3	2	1	Corporate Reputation
		9	8	7	6	5	4	3	2	1	Customer Loyalty
		9	8	7	6	5	4	3	2	1	Customer Engagement
		9	8	7	6	5	4	3	2	1	Licensing Agreements
		9	8	7	6	5	4	3	2	1	Joint Ventures
20	Target Setting	9	8	7	6	5	4	3	2	1	Work related experience
		9	8	7	6	5	4	3	2	1	Competencies
		9	8	7	6	5	4	3	2	1	Vocational Qualifications
		9	8	7	6	5	4	3	2	1	Employee Engagement
		9	8	7	6	5	4	3	2	1	Emotional Intelligence
		9	8	7	6	5	4	3	2	1	Entrepreneurial Spirit
		9	8	7	6	5	4	3	2	1	Flexibility
		9	8	7	6	5	4	3	2	1	Employee loyalty
		9	8	7	6	5	4	3	2	1	Employee Satisfaction
		9	8	7	6	5	4	3	2	1	Education
		9	8	7	6	5	4	3	2	1	Creativity
		9	8	7	6	5	4	3	2	1	Corporate Value
		9	8	7	6	5	4	3	2	1	Social Capital
		9	8	7	6	5	4	3	2	1	Management Philosophy
		9	8	7	6	5	4	3	2	1	Formal Processes
		9	8	7	6	5	4	3	2	1	Tacit/Informal Routines
		9	8	7	6	5	4	3	2	1	Management Processes
		9	8	7	6	5	4	3	2	1	Brand Name
		9	8	7	6	5	4	3	2	1	Data and Information
		9	8	7	6	5	4	3	2	1	Codified Knowledge
		9	8	7	6	5	4	3	2	1	Patents/copyrights
		9	8	7	6	5	4	3	2	1	Trade Secret
		9	8	7	6	5	4	3	2	1	Formal Relationship
		9	8	7	6	5	4	3	2	1	Informal Relationships
		9	8	7	6	5	4	3	2	1	Social Networks
		9	8	7	6	5	4	3	2	1	Partnerships
		9	8	7	6	5	4	3	2	1	Alliances
		9	8	7	6	5	4	3	2	1	Brand Image
		9	8	7	6	5	4	3	2	1	Trust
		9	8	7	6	5	4	3	2	1	Corporate Reputation
		9	8	7	6	5	4	3	2	1	Customer Loyalty
		9	8	7	6	5	4	3	2	1	Customer Engagement
		9	8	7	6	5	4	3	2	1	Licensing Agreements
		9	8	7	6	5	4	3	2	1	Joint Ventures
21	Prosocial Incentive	9	8	7	6	5	4	3	2	1	Work related experience
		9	8	7	6	5	4	3	2	1	Competencies
		9	8	7	6	5	4	3	2	1	Vocational Qualifications
		9	8	7	6	5	4	3	2	1	Employee Engagement
		9	8	7	6	5	4	3	2	1	Emotional Intelligence
		9	8	7	6	5	4	3	2	1	Entrepreneurial Spirit
		9	8	7	6	5	4	3	2	1	Flexibility
		9	8	7	6	5	4	3	2	1	Employee loyalty
		9	8	7	6	5	4	3	2	1	Employee Satisfaction
		9	8	7	6	5	4	3	2	1	Education
		9	8	7	6	5	4	3	2	1	Creativity

		9	8	7	6	5	4	3	2	1	Corporate Value
		9	8	7	6	5	4	3	2	1	Social Capital
		9	8	7	6	5	4	3	2	1	Management Philosophy
		9	8	7	6	5	4	3	2	1	Formal Processes
		9	8	7	6	5	4	3	2	1	Tacit/Informal Routines
		9	8	7	6	5	4	3	2	1	Management Processes
		9	8	7	6	5	4	3	2	1	Brand Name
		9	8	7	6	5	4	3	2	1	Data and Information
		9	8	7	6	5	4	3	2	1	Codified Knowledge
		9	8	7	6	5	4	3	2	1	Patents/copyrights
		9	8	7	6	5	4	3	2	1	Trade Secret
		9	8	7	6	5	4	3	2	1	Formal Relationship
		9	8	7	6	5	4	3	2	1	Informal Relationships
		9	8	7	6	5	4	3	2	1	Social Networks
		9	8	7	6	5	4	3	2	1	Partnerships
		9	8	7	6	5	4	3	2	1	Alliances
		9	8	7	6	5	4	3	2	1	Brand Image
		9	8	7	6	5	4	3	2	1	Trust
		9	8	7	6	5	4	3	2	1	Corporate Reputation
		9	8	7	6	5	4	3	2	1	Customer Loyalty
		9	8	7	6	5	4	3	2	1	Customer Engagement
		9	8	7	6	5	4	3	2	1	Licensing Agreements
		9	8	7	6	5	4	3	2	1	Joint Ventures
22	Connectivity Needs	9	8	7	6	5	4	3	2	1	Work related experience
		9	8	7	6	5	4	3	2	1	Competencies
		9	8	7	6	5	4	3	2	1	Vocational Qualifications
		9	8	7	6	5	4	3	2	1	Employee Engagement
		9	8	7	6	5	4	3	2	1	Emotional Intelligence
		9	8	7	6	5	4	3	2	1	Entrepreneurial Spirit
		9	8	7	6	5	4	3	2	1	Flexibility
		9	8	7	6	5	4	3	2	1	Employee loyalty
		9	8	7	6	5	4	3	2	1	Employee Satisfaction
		9	8	7	6	5	4	3	2	1	Education
		9	8	7	6	5	4	3	2	1	Creativity
		9	8	7	6	5	4	3	2	1	Corporate Value
		9	8	7	6	5	4	3	2	1	Social Capital
		9	8	7	6	5	4	3	2	1	Management Philosophy
		9	8	7	6	5	4	3	2	1	Formal Processes
		9	8	7	6	5	4	3	2	1	Tacit/Informal Routines
		9	8	7	6	5	4	3	2	1	Management Processes
		9	8	7	6	5	4	3	2	1	Brand Name
		9	8	7	6	5	4	3	2	1	Data and Information
		9	8	7	6	5	4	3	2	1	Codified Knowledge
		9	8	7	6	5	4	3	2	1	Patents/copyrights
		9	8	7	6	5	4	3	2	1	Trade Secret
		9	8	7	6	5	4	3	2	1	Formal Relationship
		9	8	7	6	5	4	3	2	1	Informal Relationships
		9	8	7	6	5	4	3	2	1	Social Networks
		9	8	7	6	5	4	3	2	1	Partnerships
		9	8	7	6	5	4	3	2	1	Alliances
		9	8	7	6	5	4	3	2	1	Brand Image
		9	8	7	6	5	4	3	2	1	Trust
		9	8	7	6	5	4	3	2	1	Corporate Reputation
		9	8	7	6	5	4	3	2	1	Customer Loyalty
		9	8	7	6	5	4	3	2	1	Customer Engagement
		9	8	7	6	5	4	3	2	1	Licensing Agreements
		9	8	7	6	5	4	3	2	1	Joint Ventures

23	Dispatches	9	8	7	6	5	4	3	2	1	Work related experience
		9	8	7	6	5	4	3	2	1	Competencies
		9	8	7	6	5	4	3	2	1	Vocational Qualifications
		9	8	7	6	5	4	3	2	1	Employee Engagement
		9	8	7	6	5	4	3	2	1	Emotional Intelligence
		9	8	7	6	5	4	3	2	1	Entrepreneurial Spirit
		9	8	7	6	5	4	3	2	1	Flexibility
		9	8	7	6	5	4	3	2	1	Employee loyalty
		9	8	7	6	5	4	3	2	1	Employee Satisfaction
		9	8	7	6	5	4	3	2	1	Education
		9	8	7	6	5	4	3	2	1	Creativity
		9	8	7	6	5	4	3	2	1	Corporate Value
		9	8	7	6	5	4	3	2	1	Social Capital
		9	8	7	6	5	4	3	2	1	Management Philosophy
		9	8	7	6	5	4	3	2	1	Formal Processes
		9	8	7	6	5	4	3	2	1	Tacit/Informal Routines
		9	8	7	6	5	4	3	2	1	Management Processes
		9	8	7	6	5	4	3	2	1	Brand Name
		9	8	7	6	5	4	3	2	1	Data and Information
		9	8	7	6	5	4	3	2	1	Codified Knowledge
		9	8	7	6	5	4	3	2	1	Patents/copyrights
		9	8	7	6	5	4	3	2	1	Trade Secret
		9	8	7	6	5	4	3	2	1	Formal Relationship
		9	8	7	6	5	4	3	2	1	Informal Relationships
		9	8	7	6	5	4	3	2	1	Social Networks
		9	8	7	6	5	4	3	2	1	Partnerships
		9	8	7	6	5	4	3	2	1	Alliances
		9	8	7	6	5	4	3	2	1	Brand Image
		9	8	7	6	5	4	3	2	1	Trust
		9	8	7	6	5	4	3	2	1	Corporate Reputation
		9	8	7	6	5	4	3	2	1	Customer Loyalty
		9	8	7	6	5	4	3	2	1	Customer Engagement
		9	8	7	6	5	4	3	2	1	Licensing Agreements
9	8	7	6	5	4	3	2	1	Joint Ventures		
24	Efficient Flight Profile (EFF)	9	8	7	6	5	4	3	2	1	Work related experience
		9	8	7	6	5	4	3	2	1	Competencies
		9	8	7	6	5	4	3	2	1	Vocational Qualifications
		9	8	7	6	5	4	3	2	1	Employee Engagement
		9	8	7	6	5	4	3	2	1	Emotional Intelligence
		9	8	7	6	5	4	3	2	1	Entrepreneurial Spirit
		9	8	7	6	5	4	3	2	1	Flexibility
		9	8	7	6	5	4	3	2	1	Employee loyalty
		9	8	7	6	5	4	3	2	1	Employee Satisfaction
		9	8	7	6	5	4	3	2	1	Education
		9	8	7	6	5	4	3	2	1	Creativity
		9	8	7	6	5	4	3	2	1	Corporate Value
		9	8	7	6	5	4	3	2	1	Social Capital
		9	8	7	6	5	4	3	2	1	Management Philosophy
		9	8	7	6	5	4	3	2	1	Formal Processes
		9	8	7	6	5	4	3	2	1	Tacit/Informal Routines
		9	8	7	6	5	4	3	2	1	Management Processes
		9	8	7	6	5	4	3	2	1	Brand Name
		9	8	7	6	5	4	3	2	1	Data and Information
		9	8	7	6	5	4	3	2	1	Codified Knowledge
		9	8	7	6	5	4	3	2	1	Patents/copyrights
9	8	7	6	5	4	3	2	1	Trade Secret		
9	8	7	6	5	4	3	2	1	Formal Relationship		
9	8	7	6	5	4	3	2	1	Informal Relationships		

		9	8	7	6	5	4	3	2	1	Social Networks
		9	8	7	6	5	4	3	2	1	Partnerships
		9	8	7	6	5	4	3	2	1	Alliances
		9	8	7	6	5	4	3	2	1	Brand Image
		9	8	7	6	5	4	3	2	1	Trust
		9	8	7	6	5	4	3	2	1	Corporate Reputation
		9	8	7	6	5	4	3	2	1	Customer Loyalty
		9	8	7	6	5	4	3	2	1	Customer Engagement
		9	8	7	6	5	4	3	2	1	Licensing Agreements
		9	8	7	6	5	4	3	2	1	Joint Ventures
25	On time on schedules	9	8	7	6	5	4	3	2	1	Work related experience
		9	8	7	6	5	4	3	2	1	Competencies
		9	8	7	6	5	4	3	2	1	Vocational Qualifications
		9	8	7	6	5	4	3	2	1	Employee Engagement
		9	8	7	6	5	4	3	2	1	Emotional Intelligence
		9	8	7	6	5	4	3	2	1	Entrepreneurial Spirit
		9	8	7	6	5	4	3	2	1	Flexibility
		9	8	7	6	5	4	3	2	1	Employee loyalty
		9	8	7	6	5	4	3	2	1	Employee Satisfaction
		9	8	7	6	5	4	3	2	1	Education
		9	8	7	6	5	4	3	2	1	Creativity
		9	8	7	6	5	4	3	2	1	Corporate Value
		9	8	7	6	5	4	3	2	1	Social Capital
		9	8	7	6	5	4	3	2	1	Management Philosophy
		9	8	7	6	5	4	3	2	1	Formal Processes
		9	8	7	6	5	4	3	2	1	Tacit/Informal Routines
		9	8	7	6	5	4	3	2	1	Management Processes
		9	8	7	6	5	4	3	2	1	Brand Name
		9	8	7	6	5	4	3	2	1	Data and Information
		9	8	7	6	5	4	3	2	1	Codified Knowledge
		9	8	7	6	5	4	3	2	1	Patents/copyrights
		9	8	7	6	5	4	3	2	1	Trade Secret
		9	8	7	6	5	4	3	2	1	Formal Relationship
		9	8	7	6	5	4	3	2	1	Informal Relationships
		9	8	7	6	5	4	3	2	1	Social Networks
		9	8	7	6	5	4	3	2	1	Partnerships
		9	8	7	6	5	4	3	2	1	Alliances
		9	8	7	6	5	4	3	2	1	Brand Image
		9	8	7	6	5	4	3	2	1	Trust
		9	8	7	6	5	4	3	2	1	Corporate Reputation
		9	8	7	6	5	4	3	2	1	Customer Loyalty
		9	8	7	6	5	4	3	2	1	Customer Engagement
9	8	7	6	5	4	3	2	1	Licensing Agreements		
9	8	7	6	5	4	3	2	1	Joint Ventures		
26	Liberalization – Privatization Trends	9	8	7	6	5	4	3	2	1	Work related experience
		9	8	7	6	5	4	3	2	1	Competencies
		9	8	7	6	5	4	3	2	1	Vocational Qualifications
		9	8	7	6	5	4	3	2	1	Employee Engagement
		9	8	7	6	5	4	3	2	1	Emotional Intelligence
		9	8	7	6	5	4	3	2	1	Entrepreneurial Spirit
		9	8	7	6	5	4	3	2	1	Flexibility
		9	8	7	6	5	4	3	2	1	Employee loyalty
		9	8	7	6	5	4	3	2	1	Employee Satisfaction
		9	8	7	6	5	4	3	2	1	Education
		9	8	7	6	5	4	3	2	1	Creativity
		9	8	7	6	5	4	3	2	1	Corporate Value
		9	8	7	6	5	4	3	2	1	Social Capital
		9	8	7	6	5	4	3	2	1	Management Philosophy

27	Change of Flight Network Structures	9	8	7	6	5	4	3	2	1	Formal Processes
		9	8	7	6	5	4	3	2	1	Tacit/Informal Routines
		9	8	7	6	5	4	3	2	1	Management Processes
		9	8	7	6	5	4	3	2	1	Brand Name
		9	8	7	6	5	4	3	2	1	Data and Information
		9	8	7	6	5	4	3	2	1	Codified Knowledge
		9	8	7	6	5	4	3	2	1	Patents/copyrights
		9	8	7	6	5	4	3	2	1	Trade Secret
		9	8	7	6	5	4	3	2	1	Formal Relationship
		9	8	7	6	5	4	3	2	1	Informal Relationships
		9	8	7	6	5	4	3	2	1	Social Networks
		9	8	7	6	5	4	3	2	1	Partnerships
		9	8	7	6	5	4	3	2	1	Alliances
		9	8	7	6	5	4	3	2	1	Brand Image
		9	8	7	6	5	4	3	2	1	Trust
		9	8	7	6	5	4	3	2	1	Corporate Reputation
		9	8	7	6	5	4	3	2	1	Customer Loyalty
		9	8	7	6	5	4	3	2	1	Customer Engagement
		9	8	7	6	5	4	3	2	1	Licensing Agreements
		9	8	7	6	5	4	3	2	1	Joint Ventures
		9	8	7	6	5	4	3	2	1	Work related experience
		9	8	7	6	5	4	3	2	1	Competencies
		9	8	7	6	5	4	3	2	1	Vocational Qualifications
		9	8	7	6	5	4	3	2	1	Employee Engagement
		9	8	7	6	5	4	3	2	1	Emotional Intelligence
		9	8	7	6	5	4	3	2	1	Entrepreneurial Spirit
		9	8	7	6	5	4	3	2	1	Flexibility
		9	8	7	6	5	4	3	2	1	Employee loyalty
		9	8	7	6	5	4	3	2	1	Employee Satisfaction
		9	8	7	6	5	4	3	2	1	Education
		9	8	7	6	5	4	3	2	1	Creativity
		9	8	7	6	5	4	3	2	1	Corporate Value
		9	8	7	6	5	4	3	2	1	Social Capital
		9	8	7	6	5	4	3	2	1	Management Philosophy
		9	8	7	6	5	4	3	2	1	Formal Processes
		9	8	7	6	5	4	3	2	1	Tacit/Informal Routines
9	8	7	6	5	4	3	2	1	Management Processes		
9	8	7	6	5	4	3	2	1	Brand Name		
9	8	7	6	5	4	3	2	1	Data and Information		
9	8	7	6	5	4	3	2	1	Codified Knowledge		
9	8	7	6	5	4	3	2	1	Patents/copyrights		
9	8	7	6	5	4	3	2	1	Trade Secret		
9	8	7	6	5	4	3	2	1	Formal Relationship		
9	8	7	6	5	4	3	2	1	Informal Relationships		
9	8	7	6	5	4	3	2	1	Social Networks		
9	8	7	6	5	4	3	2	1	Partnerships		
9	8	7	6	5	4	3	2	1	Alliances		
9	8	7	6	5	4	3	2	1	Brand Image		
9	8	7	6	5	4	3	2	1	Trust		
9	8	7	6	5	4	3	2	1	Corporate Reputation		
9	8	7	6	5	4	3	2	1	Customer Loyalty		
9	8	7	6	5	4	3	2	1	Customer Engagement		
9	8	7	6	5	4	3	2	1	Licensing Agreements		
9	8	7	6	5	4	3	2	1	Joint Ventures		
28	Increase in Airline Cooperation	9	8	7	6	5	4	3	2	1	Work related experience
		9	8	7	6	5	4	3	2	1	Competencies
		9	8	7	6	5	4	3	2	1	Vocational Qualifications
		9	8	7	6	5	4	3	2	1	Employee Engagement

		9	8	7	6	5	4	3	2	1	Emotional Intelligence
		9	8	7	6	5	4	3	2	1	Entrepreneurial Spirit
		9	8	7	6	5	4	3	2	1	Flexibility
		9	8	7	6	5	4	3	2	1	Employee loyalty
		9	8	7	6	5	4	3	2	1	Employee Satisfaction
		9	8	7	6	5	4	3	2	1	Education
		9	8	7	6	5	4	3	2	1	Creativity
		9	8	7	6	5	4	3	2	1	Corporate Value
		9	8	7	6	5	4	3	2	1	Social Capital
		9	8	7	6	5	4	3	2	1	Management Philosophy
		9	8	7	6	5	4	3	2	1	Formal Processes
		9	8	7	6	5	4	3	2	1	Tacit/Informal Routines
		9	8	7	6	5	4	3	2	1	Management Processes
		9	8	7	6	5	4	3	2	1	Brand Name
		9	8	7	6	5	4	3	2	1	Data and Information
		9	8	7	6	5	4	3	2	1	Codified Knowledge
		9	8	7	6	5	4	3	2	1	Patents/copyrights
		9	8	7	6	5	4	3	2	1	Trade Secret
		9	8	7	6	5	4	3	2	1	Formal Relationship
		9	8	7	6	5	4	3	2	1	Informal Relationships
		9	8	7	6	5	4	3	2	1	Social Networks
		9	8	7	6	5	4	3	2	1	Partnerships
		9	8	7	6	5	4	3	2	1	Alliances
		9	8	7	6	5	4	3	2	1	Brand Image
		9	8	7	6	5	4	3	2	1	Trust
		9	8	7	6	5	4	3	2	1	Corporate Reputation
		9	8	7	6	5	4	3	2	1	Customer Loyalty
		9	8	7	6	5	4	3	2	1	Customer Engagement
		9	8	7	6	5	4	3	2	1	Licensing Agreements
		9	8	7	6	5	4	3	2	1	Joint Ventures
29	The Rise of Low-Cost Airlines	9	8	7	6	5	4	3	2	1	Work related experience
		9	8	7	6	5	4	3	2	1	Competencies
		9	8	7	6	5	4	3	2	1	Vocational Qualifications
		9	8	7	6	5	4	3	2	1	Employee Engagement
		9	8	7	6	5	4	3	2	1	Emotional Intelligence
		9	8	7	6	5	4	3	2	1	Entrepreneurial Spirit
		9	8	7	6	5	4	3	2	1	Flexibility
		9	8	7	6	5	4	3	2	1	Employee loyalty
		9	8	7	6	5	4	3	2	1	Employee Satisfaction
		9	8	7	6	5	4	3	2	1	Education
		9	8	7	6	5	4	3	2	1	Creativity
		9	8	7	6	5	4	3	2	1	Corporate Value
		9	8	7	6	5	4	3	2	1	Social Capital
		9	8	7	6	5	4	3	2	1	Management Philosophy
		9	8	7	6	5	4	3	2	1	Formal Processes
		9	8	7	6	5	4	3	2	1	Tacit/Informal Routines
		9	8	7	6	5	4	3	2	1	Management Processes
		9	8	7	6	5	4	3	2	1	Brand Name
		9	8	7	6	5	4	3	2	1	Data and Information
		9	8	7	6	5	4	3	2	1	Codified Knowledge
		9	8	7	6	5	4	3	2	1	Patents/copyrights
		9	8	7	6	5	4	3	2	1	Trade Secret
		9	8	7	6	5	4	3	2	1	Formal Relationship
		9	8	7	6	5	4	3	2	1	Informal Relationships
		9	8	7	6	5	4	3	2	1	Social Networks
		9	8	7	6	5	4	3	2	1	Partnerships
		9	8	7	6	5	4	3	2	1	Alliances
		9	8	7	6	5	4	3	2	1	Brand Image

30	The Growth of The Air Transport Sector and The Increase in Demand	9	8	7	6	5	4	3	2	1	Trust
		9	8	7	6	5	4	3	2	1	Corporate Reputation
		9	8	7	6	5	4	3	2	1	Customer Loyalty
		9	8	7	6	5	4	3	2	1	Customer Engagement
		9	8	7	6	5	4	3	2	1	Licensing Agreements
		9	8	7	6	5	4	3	2	1	Joint Ventures
		9	8	7	6	5	4	3	2	1	Work related experience
		9	8	7	6	5	4	3	2	1	Competencies
		9	8	7	6	5	4	3	2	1	Vocational Qualifications
		9	8	7	6	5	4	3	2	1	Employee Engagement
		9	8	7	6	5	4	3	2	1	Emotional Intelligence
		9	8	7	6	5	4	3	2	1	Entrepreneurial Spirit
		9	8	7	6	5	4	3	2	1	Flexibility
		9	8	7	6	5	4	3	2	1	Employee loyalty
		9	8	7	6	5	4	3	2	1	Employee Satisfaction
		9	8	7	6	5	4	3	2	1	Education
		9	8	7	6	5	4	3	2	1	Creativity
		9	8	7	6	5	4	3	2	1	Corporate Value
		9	8	7	6	5	4	3	2	1	Social Capital
		9	8	7	6	5	4	3	2	1	Management Philosophy
		9	8	7	6	5	4	3	2	1	Formal Processes
		9	8	7	6	5	4	3	2	1	Tacit/Informal Routines
		9	8	7	6	5	4	3	2	1	Management Processes
		9	8	7	6	5	4	3	2	1	Brand Name
		9	8	7	6	5	4	3	2	1	Data and Information
		9	8	7	6	5	4	3	2	1	Codified Knowledge
		9	8	7	6	5	4	3	2	1	Patents/copyrights
		9	8	7	6	5	4	3	2	1	Trade Secret
		9	8	7	6	5	4	3	2	1	Formal Relationship
		9	8	7	6	5	4	3	2	1	Informal Relationships
9	8	7	6	5	4	3	2	1	Social Networks		
9	8	7	6	5	4	3	2	1	Partnerships		
9	8	7	6	5	4	3	2	1	Alliances		
9	8	7	6	5	4	3	2	1	Brand Image		
9	8	7	6	5	4	3	2	1	Trust		
9	8	7	6	5	4	3	2	1	Corporate Reputation		
9	8	7	6	5	4	3	2	1	Customer Loyalty		
9	8	7	6	5	4	3	2	1	Customer Engagement		
9	8	7	6	5	4	3	2	1	Licensing Agreements		
9	8	7	6	5	4	3	2	1	Joint Ventures		
31	Changes In the Requirements and Needs of Passengers	9	8	7	6	5	4	3	2	1	Work related experience
		9	8	7	6	5	4	3	2	1	Competencies
		9	8	7	6	5	4	3	2	1	Vocational Qualifications
		9	8	7	6	5	4	3	2	1	Employee Engagement
		9	8	7	6	5	4	3	2	1	Emotional Intelligence
		9	8	7	6	5	4	3	2	1	Entrepreneurial Spirit
		9	8	7	6	5	4	3	2	1	Flexibility
		9	8	7	6	5	4	3	2	1	Employee loyalty
		9	8	7	6	5	4	3	2	1	Employee Satisfaction
		9	8	7	6	5	4	3	2	1	Education
		9	8	7	6	5	4	3	2	1	Creativity
		9	8	7	6	5	4	3	2	1	Corporate Value
		9	8	7	6	5	4	3	2	1	Social Capital
		9	8	7	6	5	4	3	2	1	Management Philosophy
		9	8	7	6	5	4	3	2	1	Formal Processes
		9	8	7	6	5	4	3	2	1	Tacit/Informal Routines
9	8	7	6	5	4	3	2	1	Management Processes		
9	8	7	6	5	4	3	2	1	Brand Name		

		9	8	7	6	5	4	3	2	1	Data and Information
		9	8	7	6	5	4	3	2	1	Codified Knowledge
		9	8	7	6	5	4	3	2	1	Patents/copyrights
		9	8	7	6	5	4	3	2	1	Trade Secret
		9	8	7	6	5	4	3	2	1	Formal Relationship
		9	8	7	6	5	4	3	2	1	Informal Relationships
		9	8	7	6	5	4	3	2	1	Social Networks
		9	8	7	6	5	4	3	2	1	Partnerships
		9	8	7	6	5	4	3	2	1	Alliances
		9	8	7	6	5	4	3	2	1	Brand Image
		9	8	7	6	5	4	3	2	1	Trust
		9	8	7	6	5	4	3	2	1	Corporate Reputation
		9	8	7	6	5	4	3	2	1	Customer Loyalty
		9	8	7	6	5	4	3	2	1	Customer Engagement
		9	8	7	6	5	4	3	2	1	Licensing Agreements
		9	8	7	6	5	4	3	2	1	Joint Ventures
32	Environmental Restrictions	9	8	7	6	5	4	3	2	1	Work related experience
		9	8	7	6	5	4	3	2	1	Competencies
		9	8	7	6	5	4	3	2	1	Vocational Qualifications
		9	8	7	6	5	4	3	2	1	Employee Engagement
		9	8	7	6	5	4	3	2	1	Emotional Intelligence
		9	8	7	6	5	4	3	2	1	Entrepreneurial Spirit
		9	8	7	6	5	4	3	2	1	Flexibility
		9	8	7	6	5	4	3	2	1	Employee loyalty
		9	8	7	6	5	4	3	2	1	Employee Satisfaction
		9	8	7	6	5	4	3	2	1	Education
		9	8	7	6	5	4	3	2	1	Creativity
		9	8	7	6	5	4	3	2	1	Corporate Value
		9	8	7	6	5	4	3	2	1	Social Capital
		9	8	7	6	5	4	3	2	1	Management Philosophy
		9	8	7	6	5	4	3	2	1	Formal Processes
		9	8	7	6	5	4	3	2	1	Tacit/Informal Routines
		9	8	7	6	5	4	3	2	1	Management Processes
		9	8	7	6	5	4	3	2	1	Brand Name
		9	8	7	6	5	4	3	2	1	Data and Information
		9	8	7	6	5	4	3	2	1	Codified Knowledge
		9	8	7	6	5	4	3	2	1	Patents/copyrights
		9	8	7	6	5	4	3	2	1	Trade Secret
		9	8	7	6	5	4	3	2	1	Formal Relationship
		9	8	7	6	5	4	3	2	1	Informal Relationships
		9	8	7	6	5	4	3	2	1	Social Networks
		9	8	7	6	5	4	3	2	1	Partnerships
		9	8	7	6	5	4	3	2	1	Alliances
		9	8	7	6	5	4	3	2	1	Brand Image
9	8	7	6	5	4	3	2	1	Trust		
9	8	7	6	5	4	3	2	1	Corporate Reputation		
9	8	7	6	5	4	3	2	1	Customer Loyalty		
9	8	7	6	5	4	3	2	1	Customer Engagement		
9	8	7	6	5	4	3	2	1	Licensing Agreements		
9	8	7	6	5	4	3	2	1	Joint Ventures		
33	Technological Innovations	9	8	7	6	5	4	3	2	1	Work related experience
		9	8	7	6	5	4	3	2	1	Competencies
		9	8	7	6	5	4	3	2	1	Vocational Qualifications
		9	8	7	6	5	4	3	2	1	Employee Engagement
		9	8	7	6	5	4	3	2	1	Emotional Intelligence
		9	8	7	6	5	4	3	2	1	Entrepreneurial Spirit
		9	8	7	6	5	4	3	2	1	Flexibility
9	8	7	6	5	4	3	2	1	Employee loyalty		

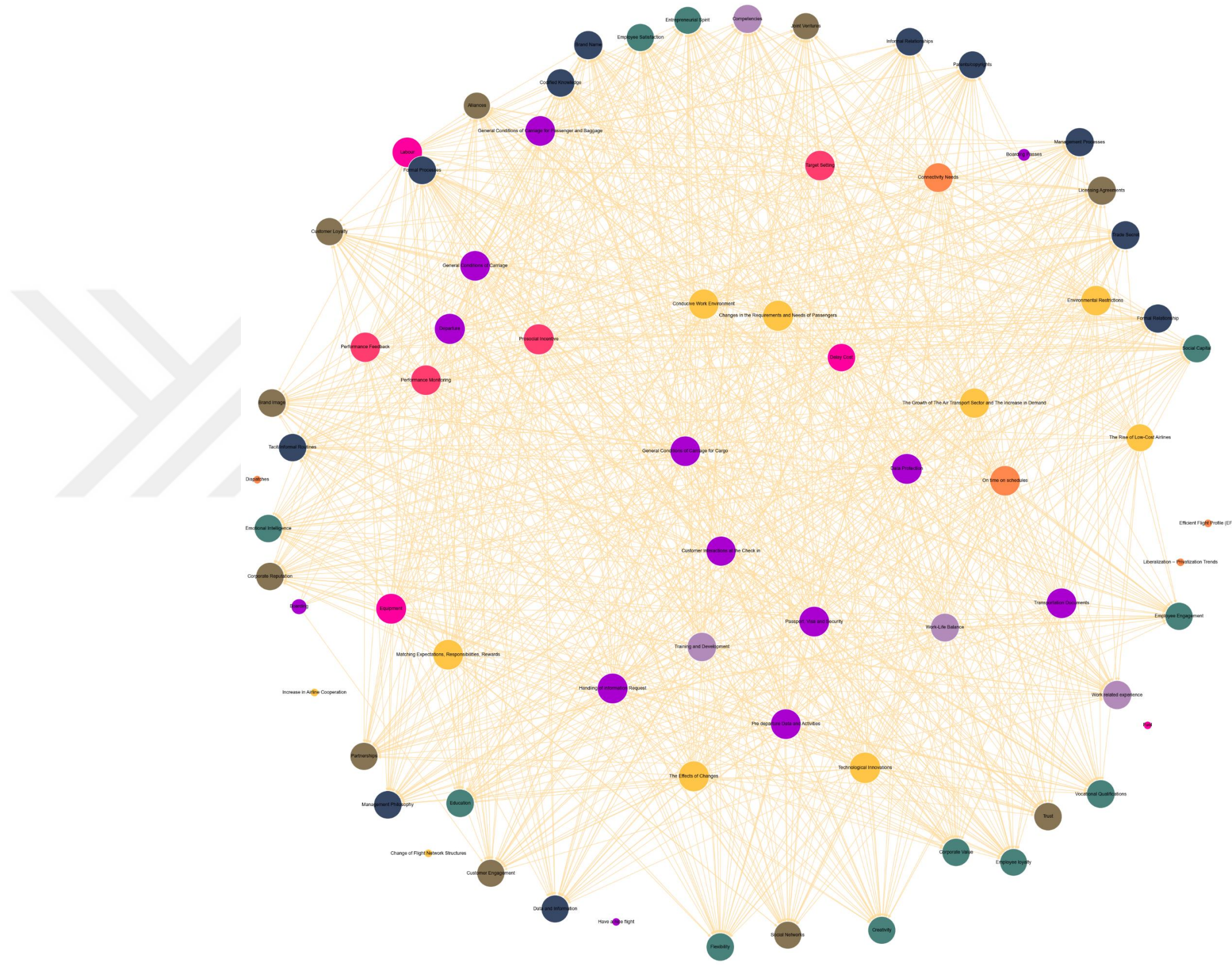
34	The Effects of Changes	9	8	7	6	5	4	3	2	1	Employee Satisfaction
		9	8	7	6	5	4	3	2	1	Education
		9	8	7	6	5	4	3	2	1	Creativity
		9	8	7	6	5	4	3	2	1	Corporate Value
		9	8	7	6	5	4	3	2	1	Social Capital
		9	8	7	6	5	4	3	2	1	Management Philosophy
		9	8	7	6	5	4	3	2	1	Formal Processes
		9	8	7	6	5	4	3	2	1	Tacit/Informal Routines
		9	8	7	6	5	4	3	2	1	Management Processes
		9	8	7	6	5	4	3	2	1	Brand Name
		9	8	7	6	5	4	3	2	1	Data and Information
		9	8	7	6	5	4	3	2	1	Codified Knowledge
		9	8	7	6	5	4	3	2	1	Patents/copyrights
		9	8	7	6	5	4	3	2	1	Trade Secret
		9	8	7	6	5	4	3	2	1	Formal Relationship
		9	8	7	6	5	4	3	2	1	Informal Relationships
		9	8	7	6	5	4	3	2	1	Social Networks
		9	8	7	6	5	4	3	2	1	Partnerships
		9	8	7	6	5	4	3	2	1	Alliances
		9	8	7	6	5	4	3	2	1	Brand Image
		9	8	7	6	5	4	3	2	1	Trust
		9	8	7	6	5	4	3	2	1	Corporate Reputation
		9	8	7	6	5	4	3	2	1	Customer Loyalty
		9	8	7	6	5	4	3	2	1	Customer Engagement
		9	8	7	6	5	4	3	2	1	Licensing Agreements
		9	8	7	6	5	4	3	2	1	Joint Ventures
		9	8	7	6	5	4	3	2	1	Work related experience
		9	8	7	6	5	4	3	2	1	Competencies
		9	8	7	6	5	4	3	2	1	Vocational Qualifications
		9	8	7	6	5	4	3	2	1	Employee Engagement
		9	8	7	6	5	4	3	2	1	Emotional Intelligence
		9	8	7	6	5	4	3	2	1	Entrepreneurial Spirit
		9	8	7	6	5	4	3	2	1	Flexibility
		9	8	7	6	5	4	3	2	1	Employee loyalty
		9	8	7	6	5	4	3	2	1	Employee Satisfaction
		9	8	7	6	5	4	3	2	1	Education
		9	8	7	6	5	4	3	2	1	Creativity
		9	8	7	6	5	4	3	2	1	Corporate Value
		9	8	7	6	5	4	3	2	1	Social Capital
		9	8	7	6	5	4	3	2	1	Management Philosophy
		9	8	7	6	5	4	3	2	1	Formal Processes
		9	8	7	6	5	4	3	2	1	Tacit/Informal Routines
		9	8	7	6	5	4	3	2	1	Management Processes
		9	8	7	6	5	4	3	2	1	Brand Name
		9	8	7	6	5	4	3	2	1	Data and Information
9	8	7	6	5	4	3	2	1	Codified Knowledge		
9	8	7	6	5	4	3	2	1	Patents/copyrights		
9	8	7	6	5	4	3	2	1	Trade Secret		
9	8	7	6	5	4	3	2	1	Formal Relationship		
9	8	7	6	5	4	3	2	1	Informal Relationships		
9	8	7	6	5	4	3	2	1	Social Networks		
9	8	7	6	5	4	3	2	1	Partnerships		
9	8	7	6	5	4	3	2	1	Alliances		
9	8	7	6	5	4	3	2	1	Brand Image		
9	8	7	6	5	4	3	2	1	Trust		
9	8	7	6	5	4	3	2	1	Corporate Reputation		
9	8	7	6	5	4	3	2	1	Customer Loyalty		
9	8	7	6	5	4	3	2	1	Customer Engagement		

		9	8	7	6	5	4	3	2	1	Licensing Agreements
		9	8	7	6	5	4	3	2	1	Joint Ventures
35	Conducive Work Environment	9	8	7	6	5	4	3	2	1	Work related experience
		9	8	7	6	5	4	3	2	1	Competencies
		9	8	7	6	5	4	3	2	1	Vocational Qualifications
		9	8	7	6	5	4	3	2	1	Employee Engagement
		9	8	7	6	5	4	3	2	1	Emotional Intelligence
		9	8	7	6	5	4	3	2	1	Entrepreneurial Spirit
		9	8	7	6	5	4	3	2	1	Flexibility
		9	8	7	6	5	4	3	2	1	Employee loyalty
		9	8	7	6	5	4	3	2	1	Employee Satisfaction
		9	8	7	6	5	4	3	2	1	Education
		9	8	7	6	5	4	3	2	1	Creativity
		9	8	7	6	5	4	3	2	1	Corporate Value
		9	8	7	6	5	4	3	2	1	Social Capital
		9	8	7	6	5	4	3	2	1	Management Philosophy
		9	8	7	6	5	4	3	2	1	Formal Processes
		9	8	7	6	5	4	3	2	1	Tacit/Informal Routines
		9	8	7	6	5	4	3	2	1	Management Processes
		9	8	7	6	5	4	3	2	1	Brand Name
		9	8	7	6	5	4	3	2	1	Data and Information
		9	8	7	6	5	4	3	2	1	Codified Knowledge
		9	8	7	6	5	4	3	2	1	Patents/copyrights
		9	8	7	6	5	4	3	2	1	Trade Secret
		9	8	7	6	5	4	3	2	1	Formal Relationship
		9	8	7	6	5	4	3	2	1	Informal Relationships
		9	8	7	6	5	4	3	2	1	Social Networks
		9	8	7	6	5	4	3	2	1	Partnerships
		9	8	7	6	5	4	3	2	1	Alliances
		9	8	7	6	5	4	3	2	1	Brand Image
		9	8	7	6	5	4	3	2	1	Trust
		9	8	7	6	5	4	3	2	1	Corporate Reputation
		9	8	7	6	5	4	3	2	1	Customer Loyalty
		9	8	7	6	5	4	3	2	1	Customer Engagement
9	8	7	6	5	4	3	2	1	Licensing Agreements		
9	8	7	6	5	4	3	2	1	Joint Ventures		
36	Matching Expectations, Responsibilities, Rewards	9	8	7	6	5	4	3	2	1	Work related experience
		9	8	7	6	5	4	3	2	1	Competencies
		9	8	7	6	5	4	3	2	1	Vocational Qualifications
		9	8	7	6	5	4	3	2	1	Employee Engagement
		9	8	7	6	5	4	3	2	1	Emotional Intelligence
		9	8	7	6	5	4	3	2	1	Entrepreneurial Spirit
		9	8	7	6	5	4	3	2	1	Flexibility
		9	8	7	6	5	4	3	2	1	Employee loyalty
		9	8	7	6	5	4	3	2	1	Employee Satisfaction
		9	8	7	6	5	4	3	2	1	Education
		9	8	7	6	5	4	3	2	1	Creativity
		9	8	7	6	5	4	3	2	1	Corporate Value
		9	8	7	6	5	4	3	2	1	Social Capital
		9	8	7	6	5	4	3	2	1	Management Philosophy
		9	8	7	6	5	4	3	2	1	Formal Processes
		9	8	7	6	5	4	3	2	1	Tacit/Informal Routines
		9	8	7	6	5	4	3	2	1	Management Processes
		9	8	7	6	5	4	3	2	1	Brand Name
		9	8	7	6	5	4	3	2	1	Data and Information
		9	8	7	6	5	4	3	2	1	Codified Knowledge
9	8	7	6	5	4	3	2	1	Patents/copyrights		
9	8	7	6	5	4	3	2	1	Trade Secret		

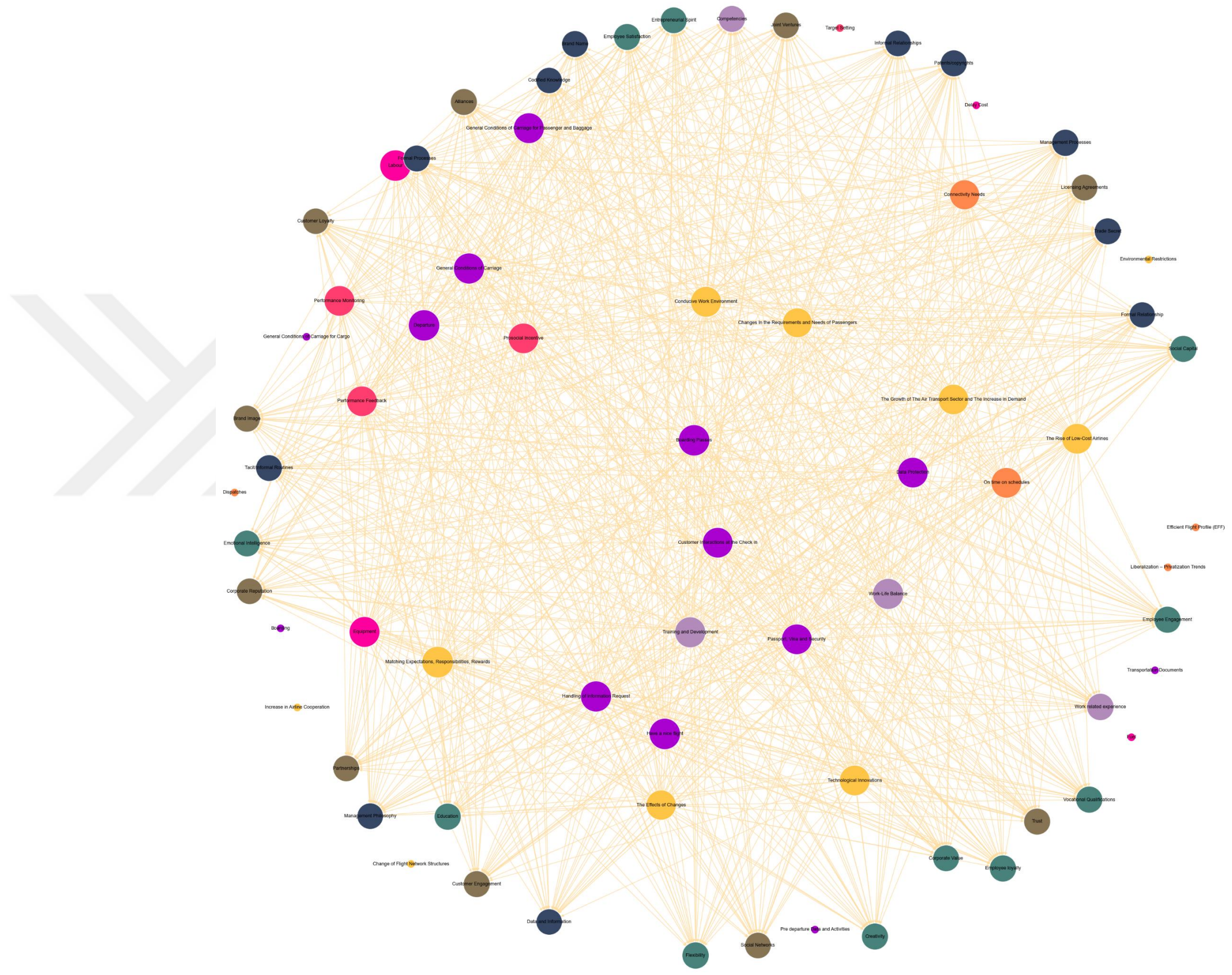
		9	8	7	6	5	4	3	2	1	Formal Relationship
		9	8	7	6	5	4	3	2	1	Informal Relationships
		9	8	7	6	5	4	3	2	1	Social Networks
		9	8	7	6	5	4	3	2	1	Partnerships
		9	8	7	6	5	4	3	2	1	Alliances
		9	8	7	6	5	4	3	2	1	Brand Image
		9	8	7	6	5	4	3	2	1	Trust
		9	8	7	6	5	4	3	2	1	Corporate Reputation
		9	8	7	6	5	4	3	2	1	Customer Loyalty
		9	8	7	6	5	4	3	2	1	Customer Engagement
		9	8	7	6	5	4	3	2	1	Licensing Agreements
		9	8	7	6	5	4	3	2	1	Joint Ventures
37	Training and Development	9	8	7	6	5	4	3	2	1	Work related experience
		9	8	7	6	5	4	3	2	1	Competencies
		9	8	7	6	5	4	3	2	1	Vocational Qualifications
		9	8	7	6	5	4	3	2	1	Employee Engagement
		9	8	7	6	5	4	3	2	1	Emotional Intelligence
		9	8	7	6	5	4	3	2	1	Entrepreneurial Spirit
		9	8	7	6	5	4	3	2	1	Flexibility
		9	8	7	6	5	4	3	2	1	Employee loyalty
		9	8	7	6	5	4	3	2	1	Employee Satisfaction
		9	8	7	6	5	4	3	2	1	Education
		9	8	7	6	5	4	3	2	1	Creativity
		9	8	7	6	5	4	3	2	1	Corporate Value
		9	8	7	6	5	4	3	2	1	Social Capital
		9	8	7	6	5	4	3	2	1	Management Philosophy
		9	8	7	6	5	4	3	2	1	Formal Processes
		9	8	7	6	5	4	3	2	1	Tacit/Informal Routines
		9	8	7	6	5	4	3	2	1	Management Processes
		9	8	7	6	5	4	3	2	1	Brand Name
		9	8	7	6	5	4	3	2	1	Data and Information
		9	8	7	6	5	4	3	2	1	Codified Knowledge
		9	8	7	6	5	4	3	2	1	Patents/copyrights
		9	8	7	6	5	4	3	2	1	Trade Secret
		9	8	7	6	5	4	3	2	1	Formal Relationship
		9	8	7	6	5	4	3	2	1	Informal Relationships
		9	8	7	6	5	4	3	2	1	Social Networks
		9	8	7	6	5	4	3	2	1	Partnerships
		9	8	7	6	5	4	3	2	1	Alliances
		9	8	7	6	5	4	3	2	1	Brand Image
		9	8	7	6	5	4	3	2	1	Trust
		9	8	7	6	5	4	3	2	1	Corporate Reputation
		9	8	7	6	5	4	3	2	1	Customer Loyalty
		9	8	7	6	5	4	3	2	1	Customer Engagement
9	8	7	6	5	4	3	2	1	Licensing Agreements		
9	8	7	6	5	4	3	2	1	Joint Ventures		
38	Work-Life Balance	9	8	7	6	5	4	3	2	1	Work related experience
		9	8	7	6	5	4	3	2	1	Competencies
		9	8	7	6	5	4	3	2	1	Vocational Qualifications
		9	8	7	6	5	4	3	2	1	Employee Engagement
		9	8	7	6	5	4	3	2	1	Emotional Intelligence
		9	8	7	6	5	4	3	2	1	Entrepreneurial Spirit
		9	8	7	6	5	4	3	2	1	Flexibility
		9	8	7	6	5	4	3	2	1	Employee loyalty
		9	8	7	6	5	4	3	2	1	Employee Satisfaction
		9	8	7	6	5	4	3	2	1	Education
		9	8	7	6	5	4	3	2	1	Creativity
		9	8	7	6	5	4	3	2	1	Corporate Value

9	8	7	6	5	4	3	2	1	Social Capital
9	8	7	6	5	4	3	2	1	Management Philosophy
9	8	7	6	5	4	3	2	1	Formal Processes
9	8	7	6	5	4	3	2	1	Tacit/Informal Routines
9	8	7	6	5	4	3	2	1	Management Processes
9	8	7	6	5	4	3	2	1	Brand Name
9	8	7	6	5	4	3	2	1	Data and Information
9	8	7	6	5	4	3	2	1	Codified Knowledge
9	8	7	6	5	4	3	2	1	Patents/copyrights
9	8	7	6	5	4	3	2	1	Trade Secret
9	8	7	6	5	4	3	2	1	Formal Relationship
9	8	7	6	5	4	3	2	1	Informal Relationships
9	8	7	6	5	4	3	2	1	Social Networks
9	8	7	6	5	4	3	2	1	Partnerships
9	8	7	6	5	4	3	2	1	Alliances
9	8	7	6	5	4	3	2	1	Brand Image
9	8	7	6	5	4	3	2	1	Trust
9	8	7	6	5	4	3	2	1	Corporate Reputation
9	8	7	6	5	4	3	2	1	Customer Loyalty
9	8	7	6	5	4	3	2	1	Customer Engagement
9	8	7	6	5	4	3	2	1	Licensing Agreements
9	8	7	6	5	4	3	2	1	Joint Ventures

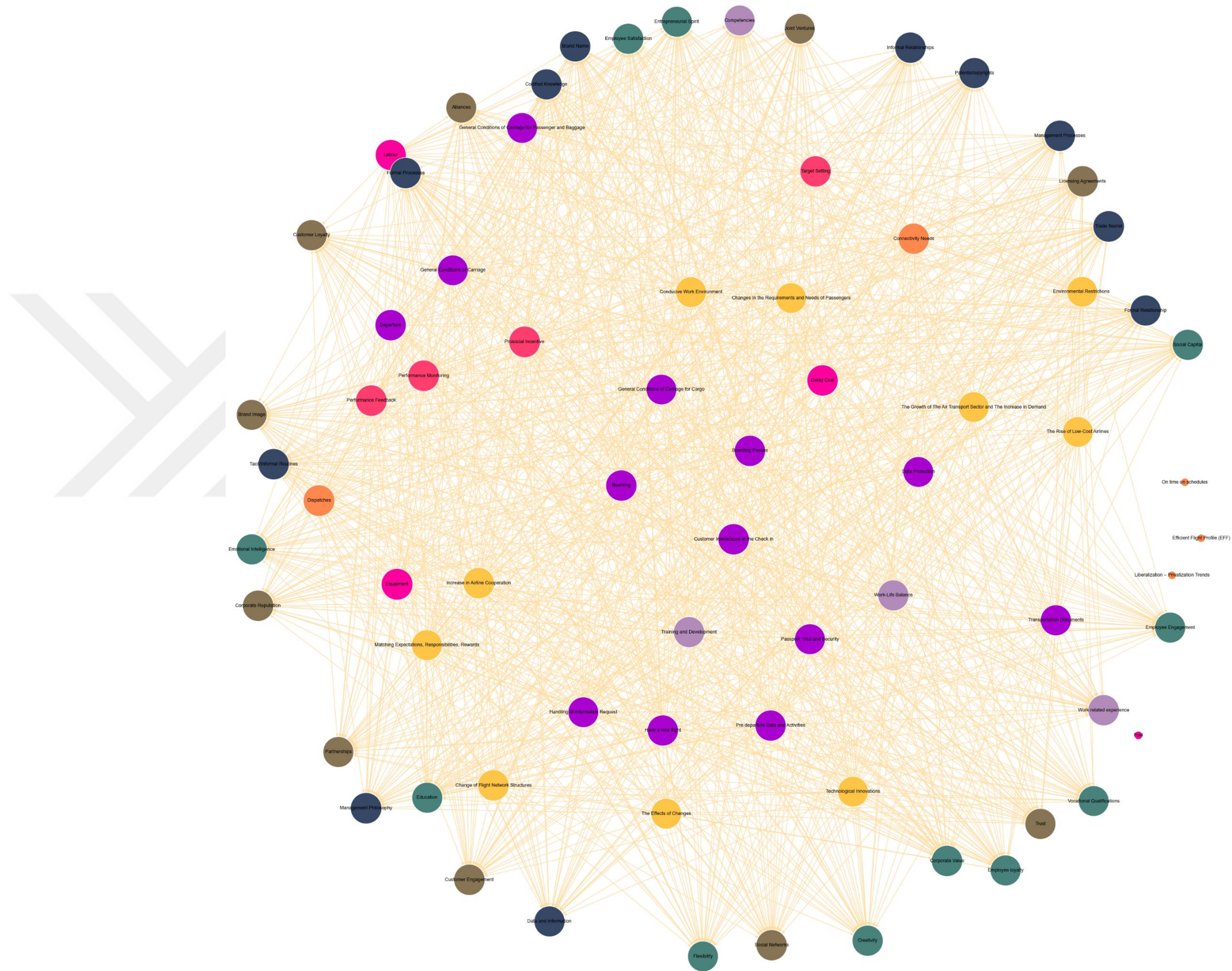
Appendix 2: Graph 1: Esenboğa TAV Hq Network Visualization



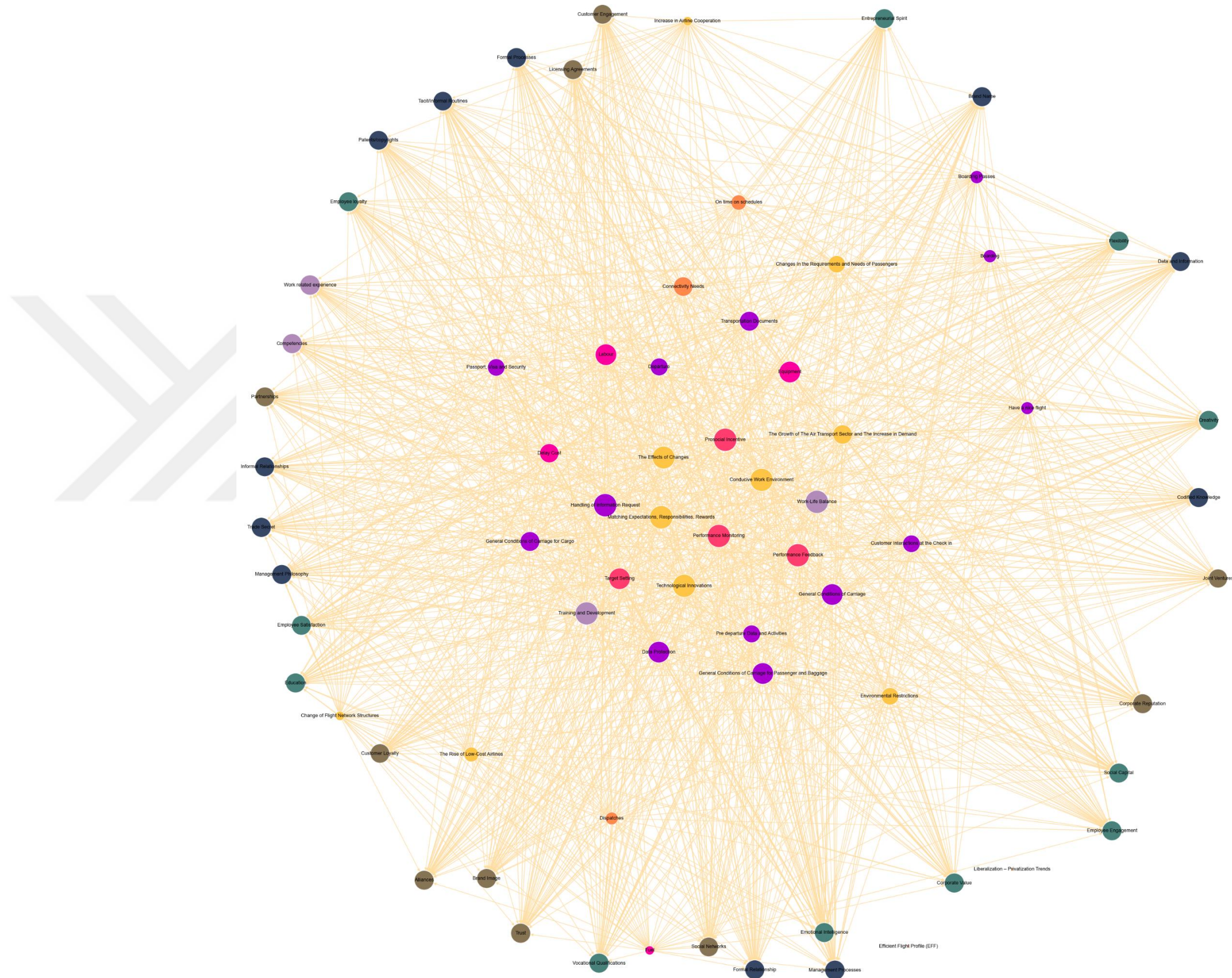
Appendix 6: Graph 5: Network Visualization of Raw Data of Esenboğa PRIMECLASS



Appendix 8: Graph 7: Network Visualization of Raw Data of Esenboğa HAVAŞ



Appendix 9: Graph 8: Network Visualization of Raw Data of SUM



TURNITIN REPORT

AYŞE ASLI YILMAZ, 183169200005

ORJİNALLİK RAPORU

% 2	% 1	% 1	% 1
BENZERLİK ENDEKSİ	İNTERNET KAYNAKLARI	YAYINLAR	ÖĞRENCİ ÖDEVLERİ

BİRİNCİL KAYNAKLAR

1	www.atilim.edu.tr İnternet Kaynağı	<% 1
2	www.researchgate.net İnternet Kaynağı	<% 1
3	www2.deloitte.com İnternet Kaynağı	<% 1
4	Ayşe Asli Yılmaz, Şule Erdem Tuzlukaya. "chapter 3 Knowledge Flows Through Unbounded Innovation", IGI Global, 2022 Yayın	<% 1
5	Submitted to S.P. Jain Institute of Management and Research, Mumbai Öğrenci Ödevi	<% 1
6	acikbilim.yok.gov.tr İnternet Kaynağı	<% 1
7	Submitted to Middlesex University Öğrenci Ödevi	<% 1
8	etd.lib.metu.edu.tr İnternet Kaynağı	<% 1

9	docplayer.net Internet Kaynađı	<% 1
10	Submitted to Heriot-Watt University Öđrenci Ödevi	<% 1
11	psasir.upm.edu.my Internet Kaynađı	<% 1
12	Submitted to Anglia Ruskin University Öđrenci Ödevi	<% 1
13	Nikolay Dmitriev, Andrey Zaytsev. "Intellectual Capital Management in Industry: Focusing on Superprofit", 3rd International Scientific Conference on Innovations in Digital Economy, 2021 Yayın	<% 1
14	Submitted to University of Brighton Öđrenci Ödevi	<% 1
15	Submitted to University of Wales central institutions Öđrenci Ödevi	<% 1
16	www.dept.aoe.vt.edu Internet Kaynađı	<% 1
17	www.isres.org Internet Kaynađı	<% 1
18	doczz.biz.tr Internet Kaynađı	<% 1

- 19 hf.asbu.edu.tr
Internet Kaynađı <% 1
-
- 20 www.conference.ase.ro
Internet Kaynađı <% 1
-
- 21 "Knowledge Management in Organizations",
Springer Science and Business Media LLC,
2018
Yayın <% 1
-
- 22 search.trdizin.gov.tr
Internet Kaynađı <% 1
-
- 23 www.yumpu.com
Internet Kaynađı <% 1
-
- 24 "A Civil-Military Response to Hybrid Threats",
Springer Science and Business Media LLC,
2018
Yayın <% 1
-
- 25 "Social Network Analysis", Wiley, 2022
Yayın <% 1
-
- 26 "Tourism, Culture and Heritage in a Smart
Economy", Springer Science and Business
Media LLC, 2017
Yayın <% 1
-
- 27 A. V. Olisaeva. "Technological development of
Russia: HR policy, digital transformation,
Industry 4.0", 2019: Proceedings of 2019 XVIII
Russian Scientific and Practical Conference on <% 1

Planning and Teaching Engineering Staff for
the Industrial and Economic Complex of the
Region, 2019

Yayın

28	d-nb.info Internet Kaynađı	<% 1
29	docs.wixstatic.com Internet Kaynađı	<% 1
30	es.scribd.com Internet Kaynađı	<% 1
31	etheses.whiterose.ac.uk Internet Kaynađı	<% 1
32	journals.sagepub.com Internet Kaynađı	<% 1
33	ualresearchonline.arts.ac.uk Internet Kaynađı	<% 1
34	www.cyprus-study.com Internet Kaynađı	<% 1
35	www.emerald.com Internet Kaynađı	<% 1
36	Advances in Spatial Science, 2013. Yayın	<% 1
37	Submitted to University of Witwatersrand Öđrenci Ödevi	<% 1

Alıntılarını ıkart zerinde
Bibliyografyayı ıkart zerinde

Eşleşmeleri ıkar Kapat

RESUME

Full Name: Ayşe Ashı YILMAZ

Educational Status:

Degree	Major	University	Year
Undergraduate Degree	Systems Enginnering	Military Academy	1999-2003
Master Degree	Management and Organization	İnönü University	2007-2009

Work Experience:

Workplace	Position	Year
Turkish Armed Forces	Officer (Retired)	2003-2021

Foreign Languages: English.

Publications:

Articles:

Yilmaz, A. A., & Tuzlukaya, S. E. (2022). Competency Trap in Organizational Learning: Turkish E-Government Gateway Application During the COVID-19 Pandemic. *International Journal of Electronic Government Research (IJEGR)*, 18(1), 1-13. <http://doi.org/10.4018/IJEGR.288068>

Yilmaz, A.A.&Tuzlukaya,S.(2022), The Relations Between Intellectual Capital and Digital Transformation: A Bibliometric Analysis, *International Journal of Innovation Science(IJIS)*, IJIS-08-2022-0145,(Manuscript is Accepted)

Book Chapters:

Yilmaz, A. A., & Tuzlukaya, Ş. E. (2022). Knowledge Flows Through Unbounded Innovation. In T. Merlo (Ed.), *Understanding, Implementing, and Evaluating Knowledge Management in Business Settings* (pp. 42-56). IGI Global. <https://doi.org/10.4018/978-1-6684-4431-3.ch003>

Yilmaz, A. A., Hafizoglu, M., & Tuzlukaya, S. E. (2022). How Agile Are the Organizations Against Cyber Threats?. In T. Merlo (Ed.), *Understanding, Implementing, and Evaluating Knowledge Management in Business Settings* (pp. 132-150). IGI Global. <https://doi.org/10.4018/978-1-6684-4431-3.ch007>

Congress Presentations:

Yilmaz, A.A.&Tuzlukaya,S.(2022), The Relations Between Intellectual Capital and Digital Transformation: A Bibliometric Analysis, *ISPGAYA International Congress on Multidimensional Sustainability: Transitions and Convergences*, September, Porto, Portugal

Date: 05.12.2022