

Table of Contents

(IJ-01) HOT DESKING, A MEASURE TO IMPROVE SPACE EFFICIENCY:.....	1
(IJ-02) NETWORK MONITORING SYSTEM	9
(IJ-03) SHAPE A CONSCIOUSNESS POWER AT THE WORKPLACE IN THE ORGANIZATION.....	16
(IJ-04) HOW TO MANAGE SCHOOL VIOLENCE	28
(IJ-05) INTERNATIONAL STUDENT SERVICES MANAGEMENT IN HIGHER EDUCATION.....	40
(IJ-06) ACHIEVING SUSTAINABLE GLOBAL INDUSTRIALIZATION THROUGH ADVANCED MANUFACTURING TECHNOLOGIES: A POST-COVID-19 CASE STUDY OF TESLA	51
(IJ-07) PUBLIC FINANCE CHOICE AND CITIZENS' INVOLVEMENT: THE RESOURCE CURSE OF LIBYA.....	65
(IJ-08) THE PIZZA ORGANIZATION (TPO).....	77
(IJ-09) TRAFFIC CONGESTION AND GRIDLOCK SOLUTION PROPOSAL USING SMART INTERSECTIONS	84
(IJ-10) STAY AHEAD OF THE PUCK: THE VALUE OF APPLYING A DATA DRIVEN PARADIGM IN DISRUPTED MARKETPLACES TO IMPROVE ROI THROUGH AN EVALUATION OF AMAZON PURCHASER SENTIMENT BEFORE AND DURING A GLOBAL PANDEMIC	97
(IJ-11) GENERATING MUSIC FOR MUSICAL SCENES: PRACTICE OF AIGC TECHNOLOGY IN MUSICAL CREATION FOR ENTREPRENEURSHIP	105

(IJ-01) Hot Desking, A Measure to Improve Space Efficiency: Communication Challenges Between Management and Staff In The Introduction And Implementation Of New Policies And Technologies

Hye young Cho

MBA graduate

J. Rob Handley

DBA MS (Assistant Professor of Leadership and Management), Alliant International University CSML

ABSTRACT

This case study observes problems that may arise when communication between management and employees is absent in introducing new technologies and policies. It suggests a starting point to find ways to improve them. As remote work was actively introduced due to the COVID-19 pandemic, companies began to think about efficient space operation. The globalization of business also required flexible management of local office space from the perspective of corporate financial management. In introducing new policies and technologies, sufficient investigations and studies were not conducted to obtain a common ground from employees, and the subject of communication was not clear. The various problems are described from the first-person perspective of Jamie, a new employee, to convey the employees' position on the case. Finally, a conclusion is presented on what kind of result the communication of the ex-post response method will bring.

WHERE TO SIT, JAMIE'S DILEMMA

‘5 minutes before closing. Please choose where you will sit today.’ This is a guided message from the UsiT App every morning during rush hour. However, Jamie is still hesitant to choose. About a month ago, after countless interviews and frustrations that felt endless, Jamie got a job at a

pharmaceutical company he coveted and received a very interesting guide. The firm informed that from March 1st, all seats will be selected on a first-come, first-served basis through the application every morning. Jamie was free to choose a position regardless of rank. At first, he was unaware of the discomfort that such freedom would bring.

EMPTY OFFICE BROUGHT HOT DESKING

Jamie works in a historical and solid pharmaceutical company with revenues exceeding \$20 billion, research laboratories in eight cities in six states, and plans to expand into two international laboratories during 2020. In the future, the market will be more closely globalized, and accordingly, within 10 years, it had a plan to expand the number of overseas branches to the number of trainees in the United States. It employed over 80,000 and operated 20 subsidiary companies and more than 76 lines of products.

It hit a huge, unprecedented turbulence, with the pandemic Covid 19 that occurred in early 2020. It literally became a ghost office. Everyone conducted meetings and worked online, and the speed and completeness of work flowed in a completely different aspect from the existing attendance system. The deficit only increased with time. As the middle of 2021 passed, the issue of the efficiency of the office space was raised. From a long-term perspective, in order to enable both the expansion of overseas branches after the pandemic, and the quality/quantity management of personnel in the United States, it was decided that there was no choice but to manage the space more efficiently in the local offices. Accordingly, what had been proposed was an application that allows one to freely select a place to work. The company intended to achieve flexible employment within free space management. (Constable, 2019)

VERTICAL HIERARCHY IN HORIZONTAL SPACE

The company's intention was to improve the efficiency of project progress as well as product quality through competition between departments. It was not easy to cooperate with each other among department heads. Moreover, the recent merger had intensified the competitive spirit in that atmosphere. After the merger with a small and medium-sized pharmaceutical company, Jamie's existing division was decommissioned and now works with new team members with various

backgrounds and specializations, and a boss from overseas. The scope and duration of projects and the rearrangement of team members are flexibly made from time to time, and only individuals at the manager level or higher know how each project is related to other departments. The operational system became the elephant in the room which reduced the efficiency of hot desking. If the contents of Jamie's experiment were leaked or shared at any level, it could poison his team and cause the entire project to ruin.

THE ELEPHANT IN THE ROOM

As 2020 began, things happened that companies could not have imagined. Due to Covid 19, all face-to-face spaces had been locked down, creating a ghost office where no one goes to work. Projects and sales that were planned for two years halted. Maintaining the office as it was, due to the steadily rising rent and management cost, brought a great financial blow. It was impossible to maintain the office as-is at a time when the figures for the number of people who can come to work, and the number of people who work remotely continue to fluctuate, and exchanges with overseas branches were rapidly increasing. To reduce costs and establish a long-term manpower management system, reform in space utilization was necessary.

March 2020 was the time for Jamie to go to the office and start his internship. However, due to the pandemic, everything had been changed to online, and he had been put on standby. After 1 year and 6 months of waiting with no end in sight, he was finally informed of his first commute. This was when he started using his first UsiT app. His team consisted of the boss Michelle, 2 senior researchers and 3 new recruits, including 5 teams of the same size in his department. When making a reservation through the app, he couldn't sit in the same seat repeatedly, so he thought of moving to a place where he could feel a different atmosphere every day.

On his first day of work, Jamie took a seat by the window. Michelle settled close to him, and she looked quite uneasy. Unlike Jamie's task, which required reporting on a given study and its results, manager-level employees had to frequently receive meetings and reports of various sizes. Michelle was doing the same kind of work in an open space instead of a private office that had disappeared. Jamie, seated near Michelle, could inevitably overhear the conversation she and her other

employees were having. He found it difficult to concentrate on his work. Due to the nature of the app, which doesn't allow you to book the same seat again, he had to choose a different seat each day. The next day, he sat down with one of the senior researchers on his team. He was quite satisfied with the fact that he was able to learn the job and get to know the direction of the project. However, he has to take another seat tomorrow. Suddenly, anxiety about uncertainty began to arise.

The organizational structure of the company operated in 5-6 teams that carry out similar projects in each department, and selects excellent results through competition amongst teams. Because of this, teams compete rather than cooperate, and this group characteristic contradicts the open sitting system. Jamie knew this structure all too well. So, when he sat down with the other teams, he was very careful not to leak project-related information or expose his work progress. The other team members acted in a similar manner. Every morning, Jamie has a lot of stress outside of work to deal with the elephant in the room by selecting a seat.

STAY OR MOVE

Employee dissatisfaction naturally increased. However, the company, in dire need of changes in its profit structure and manpower management, made the following suggestions. Equalize positions so that work can be performed in a form close to partnership and change the relationship between departments from a competitive structure to a cooperative one. The firm persuaded the employees that even if the number of projects is reduced, individual capabilities can be maximized through a horizontal position system. The managers strongly opposed it, and the opinions of other employees were largely divided. Jamie was at a crossroads. He has to choose whether to stay with the company; which is trying to make drastic changes that other companies don't, or move to another company that has a stable rank structure that everyone is familiar with.

REFERENCES

- Clark, P. (2022, JAN 29). *Financial Times*. Retrieved from ft.com:
<https://www.ft.com/content/06f5e384-e278-4c30-8215-085512c6820d>
- Constable, S. (2019, June 20). *Forbes*. Retrieved from forbes.com:
<https://www.forbes.com/sites/simonconstable/2019/06/20/how-hot-desking-will-kill-yourcompany/?sh=92d42b32e949>
- Stephen P Robbins, T. A. (2011). *Organizational Behavior*. New Jersey: Pearson.

TEACHING NOTE HOT DESKING, A MEASURE TO IMPROVE SPACE EFFICIENCY: COMMUNICATION CHALLENGES BETWEEN MANAGEMENT AND STAFF IN THE INTRODUCTION AND IMPLEMENTATION OF NEW POLICIES AND TECHNOLOGIES

ABSTRACT

The purpose of this teaching note is to identify and consider problems that arise when management's intentions and expectations for results are not sufficiently conveyed to employees, and to find ways to respond to them. In order to fully understand the position of both sides, a group role-play method of 3 or more people was applied, and a written report on the position was prepared before and after the discussion. Through this, it increases empathy for problems and helps efficient search for solutions.

THE FREEDOM DILEMMA: WHERE SHOULD I SIT TODAY?

SYNOPSIS

Employees' inconvenience and misunderstandings caused by the company's intentions, as well as a lack of effective communication.

Key Words: Communication, Organizational behavior

Suggested Audience: Undergraduates, Graduate Students, Executive Education

LEARNING OBJECTIVES

Students will recognize that there is a possibility of communication problems between labor and management that occur when the views of employees are not sufficiently considered.

Students will study how to communicate the purpose of a newly introduced policy and take into account the expected concerns of employees.

DISCUSSION QUESTIONS

1. What is the gap between the intentions of the company and the interests of the employees?

2. What steps should the management take to address these issues?
3. How should management communicate with employees easier and how should management activate the already introduced system?

PEDAGOGY

This case will be taught based on group behavior analysis by Stephen P Robbins and Timothy A Judge (Stephen P Robbins, 2011).

It is proposed to identify each side's position through a role-play method, and the students are divided into the company side and the employee side, and the analysis is performed through the following process. Forming public opinion based on the ratio is also an important factor, so the ratio between the company and the employees is 1:3. The total session is 2 sessions of 30 minutes each, and the student who was in the position of the company in the first session must change to the position of the employee in the next session. In the case of staff roles, when there are more than three people, at least one person must perform the role of manager. Rather than negotiating with the management, the point of this session is to fully explore the positions and limitations of each role.

Team meeting according to role, about 10 minutes

Set up Position

Set delivery method (Character build up)

REPRESENTATIVE SELECTION

In the case of more than three people, select one person who mainly negotiates, and have the rest support through additional remarks or add comments to the negotiator in writing.

DRAFT SCRIPT

The representative of each team starts a conversation about the relevant agenda, and each team member identifies, analyzes, and records the method and flow of the conversation, whether the intention is communicated, and also unexpected problems.

Check the problems found during the conversation, and analyze each element based on organizational behavior theory with the instructor. Discuss and organize solutions for more accurate and efficient communication and write a report.

DISCUSSION QUESTIONS AND SUGGESTED ANSWERS

1. What is the gap between the intentions of the company and the interests of the employees?

The company's intention was to promote space efficiency and exchange between employees. However, the lack of sufficient research with survey and persuasion effort caused strong dissatisfaction among the employees. Employees opposed that moving freely from one place to another regardless of rank causes work insecurity, invasion of privacy, and loss of concentration.

2. What steps should the management take to address these issues?

Sufficient research should be conducted with experts on whether the roles of related tasks and positions match the space. Departments and employees should be analyzed, and space arrangements should be reconstructed according to the group development stage suggested by organizational behavior theory.

Encoding: The company did not conduct sufficient research on whether the need and purpose of space reconstruction conflicted with the position of the employees. Also, the change could not be fully explained and persuaded by the employees.

Sending the message: There was no official explanation until right before the implementation of autonomous seats. Regarding this, it was difficult to identify the problem and provide feedback because it was unclear who are the ones actively communicating with the employees.

Decoding: Employees thought that the autonomous seating system created greater anxiety than freedom. A position without division in a company with ranks, worked as stress. However, no one actively raised a problem within the company.

3. How should management communicate with employees easier and how should management activate the already introduced system?

The company should first have listened to the views of its employees. At the same time as conducting organizational behavior-based research, it is necessary to establish a body that will receive feedback from a wider range of employees. Establish a subject and formulate it so that the problem is centralized to the control tower. After a countermeasure is in place, it is necessary to continue to persuade employees in a simpler and clearer way (visual media, etc.). In this process, it is necessary to balance and provide feedback so that the purpose of maximizing space efficiency and promoting communication is not essentially diluted.

EPILOGUE

The company established a department in charge and tried to actively collect employee feedback, but the effect was less than expected since the system had already been applied. Some manager-level employees who became dissatisfied and anxious about the horizontal rank system changed jobs. Jamie finds it more difficult than using a new system where everyone can play the role of both a regular employee and a manager and is preparing to change jobs along with his former boss. It's still a confusing freedom for everyone.

REFERENCES

Stephen P Robbins, T. A. (2011). *Organizational Behavior* . New Jersey: Pearson.

(IJ-02) Network Monitoring System

Dr. Shams Al Ajrawi

San Diego State University, 5500 Campanile Dr, San Diego CA 92182

Ali Rasouli

San Diego State University, 5500 Campanile Dr, San Diego CA 92182

David Kelble

San Diego State University, 5500 Campanile Dr, San Diego CA 92182

ABSTRACT

It is vital to the security and management of the network to have a network monitoring system in place.

Observation of network events is needed to provide a safe and reliable network. The goal of network monitoring is to secure and maintain the network. Despite this, many small and medium-sized businesses and organizations prefer to ignore this fact. Such companies cannot use the available network monitoring system because they lack the skills of professional network administrators. This avoidance would cost them a significant amount of money or even cause them to fail financially [4]. Due to its ease of use and ability to provide all the necessary functionalities for monitoring a network, the network monitoring proposed in this report will fix this problem. It would therefore be advantageous for users of the proposed system to be able to use it even if they are novices who have only rudimentary knowledge of computer applications. Hence, Small and Medium-Sized Businesses can use this application if they are not equipped with professional network administrators.

INTRODUCTION

A room-sized computer, which was invented many years ago, had a standalone processing unit that could perform some simple calculations. The first computer was invented more than 30 years

ago, and since then, computers have improved greatly. These days, the biggest challenge is connectivity for this technology. In recent years, almost every simple office has a plethora of machines, printers, scanners, server and so on. It is common practice for even personal computers to be connected to other computers, smart home systems, and such from a private place. Networks are responsible for providing the mentioned connectivity. The ease of communication, transferring, and connecting has been greatly facilitated by networks. The Internet has evolved from connecting a few computers through the years to connecting many computers through multiple networks due to advances in technology. Having a rich management system would be necessary for this complex network. Since the formation of the Internet, network management has become a necessity [5]. Monitoring and controlling how a network and its devices are connected is called network management. As part of network monitoring, devices in the network will be checked for connectivity, malicious activities will be checked and detected, and many other tasks will be handled, with the goal of providing a healthy network with high performance. Network management might not be a considerable issue for a small network, such as a home network. A high-performance and smooth network is, however, a priority for large organizations. An organization can lose even a large part of its profit and go bankrupt if they do not have good network management. Some organizations, such as banks, airlines, libraries, and so on, can be considered to have networks that are so complex that if they encountered problems with their network, they would not be able to provide services to the customers. Whenever an organization says it is going to provide services for its customers, they must keep their network up and running [1] [2]. Thus, nowadays, networks that are smooth and healthy are of utmost importance in organizations. Organizations need to manage their networks effectively in order to accomplish this goal.

DESCRIPTION OF THE PROJECT

A Network Monitoring System has been implemented for this project that monitors the network by issuing a ping command and logs the ping result and faults if any. A host's reachability on an IP network can be tested using this application. A specific IP address or host name is requested by the application over the network. Upon successful ping, a response is returned from the originating computer to the one that initiated the ping.

EXPERIMENTS

The Networking Monitoring System application is written in Visual Basic and it utilizes 3 windows forms. The first window form is the Main form which allows the user to input an IP address or a destination host name. See Figure 1. Window 2 is the log window which shows the ping results and errors/faults if any (Figure 2), and window 3 is the About window that shows the revision of application and credentials (Figure 3).

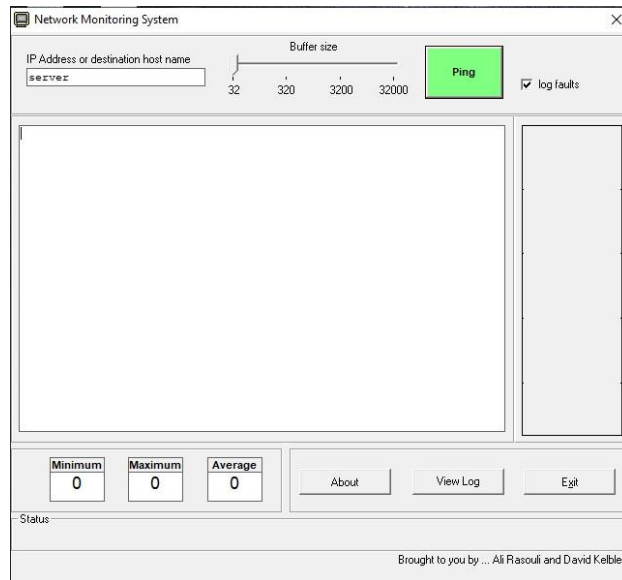


Figure 1: Main window

The user has the option to choose from 4 different buffer sizes (32, 320, 3200 and 32000 bytes). The application allows the user to select if fault logging is enabled or not. If enabled, all faults will be logged on the local hard drive. Once an IP address or the destination hostname is entered, the user will click on the Ping button. The application then tries to ping the IP/hostname. In the center of the window, the application shows the ping in process, while on the right-hand side box it shows a bar graph of how fast the ping is being returned. Also, in the lower part of the application, the ping process is shown in 3 different boxes as Minimum, Maximum and Average. See Figure 2.

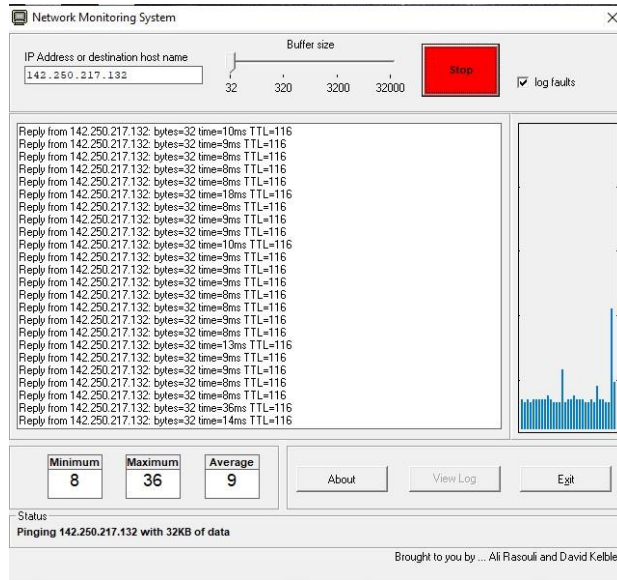


Figure 2: Ping in process

If successful, it would then log the result in a text file that is saved locally. If the ping fails it would then document the result into the fault log file. The user can click on the “View Log” button in the lower right part of the main window to display the “log” window. The “log” window then shows the ping result on the left part of the window and the error result on the right-hand side. The user can clear both log files by clicking on the “Delete log” button on the lower left-hand side of the “log” window. The user can close the application by clicking on the “Exit” button on the main window.

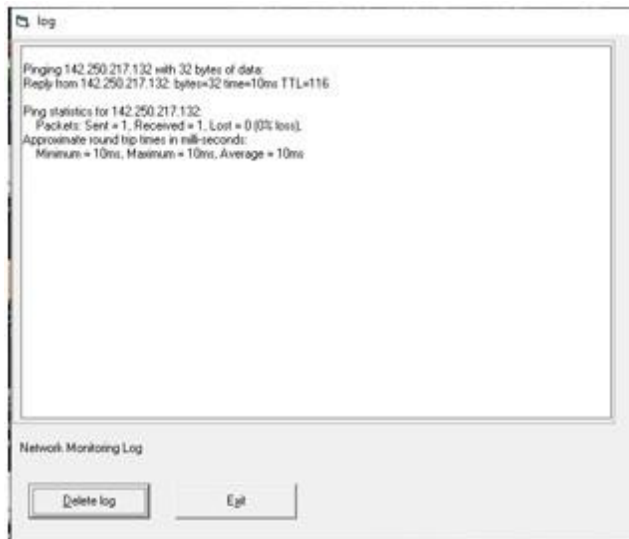


Figure 3a: Log Window



Figure 3b: Log Window

By clicking on the “About” button on the main window, the user can display the general information about the application and the credentials

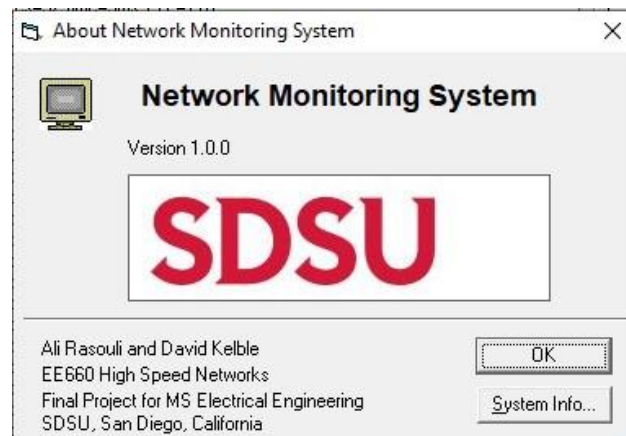


Figure 4: About window

SIMILAR WORKS

The next part of the article reviews similar network monitoring applications to that proposed here. The following softwares will be discussed in detail, along with their pros and cons, in order to provide some familiarity with them.

All manuscripts must be in English.

1. *Wireshark*

This article will describe how Wireshark can be used to monitor and analyze networks with its simple and intuitive interface. This is a popular and comprehensive tool that gives users the ability to easily analyze packets, Voice over Internet Protocol (VoIP) analysis, traffic monitoring, and a great deal more using Wireshark." By capturing packets in your network, this application allows you to analyze them and save them the way you want. Both the advantages and disadvantages of this tool can be found in the following list. The cost-free nature of the software, the fact that it is open-source, and the fact that it can run on any operating system can all be considered as some of its strengths. Even though this packet analyzer is an amazing tool, it has a difficult-to-use interface. Moreover, Wireshark requires that you have a comprehensive knowledge of Protocol Control Protocol/Internet Protocol (TCP/IP).

2. Spiceworks

Spiceworks is also a popular network monitoring tool.

Monitoring events in the network is possible with this tool. A feature of this tool is that it analyzes network performance and bandwidth. With this software, the administrator can control network configurations as it comes with an in-built server. Furthermore, Spiceworks gives administrators access to information about connected devices and to their data, as well as their accounts. Moreover, administrators could answer any requests for network administration from the workstations. Despite Spiceworks being one of the most powerful and simplest network monitoring systems around, you cannot run it on Linux based operating systems. Spiceworks also lacks the ability to grant its users the ability to control the network and the user can only view the network activity on the monitored network [3].

CONCLUSION

By conducting this study, various concepts related to this work, including network monitoring, remote access, and other systems related tools, had been explored. Additionally, we compared our developed tools with the existing tools that had been used previously in this field, and investigated similar works that were done previously. A simplified network monitoring system was developed within the scope of this project. All the existing network monitoring tools on the market, if they don't work using command line structures, have complicated user interfaces based on the research done prior to choosing this topic. Because of this fact, the existing tools are not designed for beginners and are meant for expert users who have a strong understanding of networks. The primary objective of this project was to provide a network monitoring system that is easy to use. Aside from these purposes, the proposed system's main focus is on the networking security and management aspects as well as monitoring user behavior. The admin of a user will have the ability to control the security of the entire network through monitoring and sniffing packets. This project implements a network monitoring system that is capable of being used by novice computer users as well as students. This creates the possibility of using the application for educational and training purposes. It is possible to keep adding more features to this application in the future, such as generating statistical reports on the results of the monitoring and transferring data, which can be done by using File Transferring Protocol (FTP), so as to support the future improvement of the

application. Furthermore, the application, which was originally intended to be run on windows operating system, may also be written in another programming language so that it can be used on devices other than Windows operating system.

REFERENCES

Gordon Fyodor Loyd, (2008), Nmap Network Scanning: The Official Nmap Project Guide to Network Discovery and Security.

Stephen, P., Olejniczak & Kirby, B., (2007), Asterisk for Dummies, chapter 10.

Malay Kumar Kundu, Durga Prasad Mohapatra, (2014) Advanced Computing, Networking and Informatics- Volume 1: Advanced Computing and Informatics.

Nikolas Mitrou, Kimon Kontovasilis, George Rouskas, Ilias Iliadis, Lazaros, (2004), NETWORKING 2004: Networking Technologies, Services, and Protocols; Performance of Computer and Communication Networks

Easley, D. & Jon Kleinberg, (2010), Networks, Crowds, and Markets: Reasoning About a Highly Connected World.

(IJ-03) Shape a Consciousness power at the workplace in the Organization

*Rinal Patel*¹

California School of Management and Leadership, Alliant International University, San Diego

*Dr. Cory Scott*²

California School of Management and Leadership, Alliant International University, San Diego

ABSTRACT

This article is about Spiritual Leadership and employees' work performance in Organizations. This article examines the relationship between spiritual Leadership and employee work performance and organizational output through a comprehensive literature review. The article identifies several critical spiritual leadership aspects, including vision, hope, faith, and altruistic love. Spiritual Leadership is described as a leadership style that incorporates a sense of purpose and meaning, values-based motivation, and a focus on employee well-being. By emphasizing employees' spiritual and emotional well-being, leaders can create a more supportive work environment that enhances work performance, commitment, and organizational output. The article found that leaders who exhibit spiritual Leadership are more likely to create a positive work environment, foster a sense of community, and encourage employees to work together towards common goals. Additionally, spiritual Leadership promotes ethical behavior, increasing trust and commitment to the organization. The article concludes that spiritual Leadership can be a valuable strategy for organizations seeking to improve organizational output and employee work performance. It recommends that organizations invest in developing spiritual leadership capabilities among their leaders and employees.

¹ Author

² Supervisor

INTRODUCTION

In this article, Spiritual Leadership is the main point of the study. It is regarded as an intrinsic motivator that makes individuals feel motivated, alive, hopeful, and energized in harmony with their selves and connected with their work. There are many different opinions on what Spiritual Leadership is. A spiritual leader is different as the concept prequalifies this facet of Leadership, placing it within spirituality. Spiritual Leadership is a leadership style based on values and beliefs that prioritize the well-being of individuals and communities over personal gain or achievement. Spiritual Leadership comprises the values, attitudes, and behaviors that one must adopt in intrinsically motivating oneself and others so that both have a sense of spiritual survival through calling. The membership—i.e., they experience meaning in their lives, have a sense of making a difference, and feel understood and appreciated (Fry et al., 2005). A sense of being understood and appreciated is largely a matter of interrelationship and connection through social interaction and, thus, membership (Fry, 2003). Spiritual Leadership is necessary for a learning organization's transformation and continued success. Spiritual Leadership taps into the fundamental needs of both leader and follower for spiritual survival, so they become more organizationally committed and productive (Fry, 2003; pg.694). Spiritual Leadership is a leadership style rooted in the principles of spirituality. It aims to create a work environment fostering employees' personal growth, well-being, and a sense of purpose. This type of Leadership is not focused only on achieving organizational goals and financial success. However, it seeks to inspire and motivate employees to connect with their values, beliefs, and inner selves. Fry et al. (2011) have found that; the relationship between spiritual Leadership to calling and membership is positive and significant; calling and membership fully mediate the relationship between spiritual Leadership and organizational commitment. Spiritual Leadership can significantly impact an individual's work life by providing a sense of purpose, meaning, and direction. Leaders who integrate spiritual principles and practices into their work can create a more positive and fulfilling workplace culture, improve employee engagement and productivity, and enhance the overall well-being of their team members. Spiritual Leadership is more about responsibilities and relationships. While it is an amazing spiritual gift, many wonder whether they have it. Spiritual Leadership motivates members of an organization in a working environment based on goodness as a principle of life and ethics and founded on love; it uses hope and belief to reach its objective (Fairholm, 1996). Spiritual

Leadership is believed to be a solution to the current leadership crisis due to the decline in human values due to ethical professional and ethical behavior (Samul, 2020). Spiritual leadership aims to create vision and value congruence across the strategic, empowered team and individual levels, ultimately fostering higher organizational commitment and productivity (Yusuf & Tahir, 2011). Spiritual Leadership at the workplace where leaders from any walk of life can share ideas, seek insight, offer guidance, and encourage each other through the trials they inevitably experience. According to Pfeffer (2010), workplace spirituality meets the four fundamental needs of people at work: meaningful work that permits progress and development; a feeling of purpose; being connected to other colleagues and having positive social interactions with them, and having integration in life, living in harmony one's essential nature. Spirituality in the workplace begins with acknowledging that people have both an inner and outer life and that the nourishment of the inner life can lead to a more meaningful and productive outer life. The leader is 'the one who makes something into something itself,' making the Organization entire real Organization. Spiritual Leadership is beneficial in understanding the link between the universal integrity of individuals, especially their chance of experiencing their inner values at work, and positive organizational outputs resulting from this integrity. Harmony at work is based on the belief that people know each other in commonality, and they also know that there is a relationship between the inner self of each one and the inner self of others (Milliman et al., 2003). Spirituality in the workplace is about the self-understanding of workers as spiritual beings whose souls are at work; about the experience of a sense of purpose and meaning at work, experience a feeling of being connected with others and with their community at work. By focusing on the well-being of their employees, spiritual leaders can create a more supportive and inclusive work environment that encourages personal and professional growth. They can also inspire their team members to align their work with their values and beliefs, increasing their motivation and commitment. Another definition, Spiritual Leadership, is rooted in an intrinsic motivation model that comprises vision, hope/faith, and altruistic love to motivate subordinates by enhancing their spiritual well-being (Chen et al., 2012). Altruistic love is a sense of wholeness, harmony, and well-being resulting from caring and appreciation for oneself and others. Personal outcomes of altruistic love include pleasure, peace, and serenity. These definitions mainly point to the inspiring influence which conducts leaders and employees to a particular purpose. This inspiring power gives meaning and purpose to their life and gives awareness of what they are doing at the workplace. According to these definitions, spirituality in

people's lives is stimulant and survival. Spiritual Leadership helps identify and align employees' values with a clear purpose. Employees would be able to demonstrate a high level of truthfulness. Employees could also understand and influence the "true cause."

In recent years, many organizations have recognized the benefits of incorporating meditation and mindfulness practices in the workplace and have established meditation spaces or rooms to promote employee well-being and productivity. Spirituality in the workplace can help build a solid organizational culture that attracts and retains top talent by emphasizing the importance of integrity, honesty, trust, and respect. Spiritual leaders prioritize ethical behavior and social responsibility; they encourage others to follow suit, creating a culture of trust and respect. According to Van der Walt and de Klerk (2014), workplace spirituality has gained vital importance in past years in field research work, which generates trust among employees. Many organizations have implemented meditation spaces or introduced meditation sessions for their employees. Some examples of organizations that have implemented mindfulness programs or have a mindful space in their organization include HBO, General Mills, Intel, Aetna, Target, Yahoo, Green Mountain Coffee Roasters, NASA, and Google. The tech giant Google offers employees a program called "Search Inside Yourself," which focuses on emotional intelligence and mindfulness to help more than 500 employees to the relaxation room to meditate and practice meditation without ever leaving the office. Yahoo! has been implementing several initiatives to reduce employee stress over the past few years, yet one of their biggest success stories has to do with meditation. The company's official office has several meditation rooms where employees can take a break, enjoy some peace, and engage in their meditation practices. HBO company was one of the first in its field to offer its team members access to resources promoting mental health. Free yoga and meditation classes are offered to employees needing a much-needed mental break. NASA, Enlisted the services of Kurtis Lee Thomas, a leading corporate mindfulness trainer, to teach "Powerful Breathwork Biohacking" to their Scientists and employees at NASA's JPL. These are just a few examples, and many other organizations have implemented mindfulness practices in various forms, such as meditation breaks, workshops, or incorporating mindfulness into their corporate values.

In summary, spiritual Leadership is a leadership style focused on personal and collective growth, ethical conduct, and community building. It is a values-driven approach that seeks to inspire and empower others to lead fulfilling lives and contribute to the greater good.

PREVIOUS STUDIES

Research on the relationship between spiritual Leadership and organizational and employee growth has grown recently. There has been some research on the relationship between spiritual Leadership and organizational growth. Another study by Shalley, Lu, and Zhou (2011) examined the relationship between spiritual Leadership and creativity in a technology firm. The study found that spiritual Leadership was positively associated with employee creativity and that this relationship was mediated by intrinsic motivation and psychological empowerment. A study by Fry, Vitucci, and Cedillo (2005) found that spiritual Leadership positively related to organizational growth in 134 Mexican organizations. In a study by Giacalone and Jurkiewicz (2003), the authors found that spiritual Leadership was positively related to employee job satisfaction, which in turn was related to organizational growth. In a study by Wong and Siu (2005), the authors found that the role of cultural spirituality can have implications for organizations that aim to promote the well-being and motivation of their employees. Cultural spirituality can be important to an employee's identity and sense of meaning. Organizations that recognize and support employees' cultural and spiritual beliefs may see benefits such as increased engagement, job satisfaction, and psychological well-being. Additionally, organizations that promote a culture of respect and inclusivity towards diverse cultural and spiritual backgrounds may have a more positive and supportive work environment for all employees. In a study by Mitroff and Denton (1999), the authors argued that spiritual Leadership was essential for creating a sense of meaning and purpose in organizations, which could contribute to organizational growth.

One study that did examine the relationship between spiritual Leadership and employee growth was conducted by Fry, Latham, Clinebell, and Krahnke (2017). The study used a survey to collect data from 410 employees across various industries in the United States. The survey included measures of spiritual Leadership, employee engagement, organizational commitment, and employee growth. The results of the study showed that spiritual Leadership was positively

associated with employee growth, as well as with employee engagement and organizational commitment. The researchers suggest that this is because spiritual leaders create a sense of purpose and meaning for their followers, which can lead to increased motivation and personal growth. Spiritual Leadership is grounded in the leader's spiritual beliefs and values and involves motivating and inspiring employees to work towards a shared vision and common goals. While there has been some research on the effects of spiritual Leadership on employee outcomes, such as work performance and organizational outcomes, there needs to be more research on the relationship between spiritual Leadership and organizational growth. One study by Fry, Latham, and Clinebell (2012) examined the impact of spiritual Leadership on organizational and employee outcomes in a non-profit healthcare organization. The study found that spiritual Leadership was positively associated with organizational commitment, job satisfaction, and the overall well-being of employees. Furthermore, the study found that spiritual Leadership was positively associated with organizational performance, as measured by financial indicators and patient satisfaction. Fry, Matherly, and Ouimet (2010) conducted a study to investigate the effects of spiritual Leadership on organizational commitment, job satisfaction, and work engagement. They found that spiritual Leadership positively influenced all three variables and that perceptions of meaningful work and a sense of community within the organization partially mediated these relationships. Another study by Afsar et al. (2016) examined the impact of spiritual Leadership on employees' work outcomes in the healthcare sector. The study found that spiritual Leadership positively affects employees' job satisfaction and engagement. The researchers also found that spiritual Leadership was associated with higher levels of patient satisfaction, which suggests that spiritual leaders can positively impact employees and organizational performance.

Spiritual Leadership is a leadership approach that emphasizes leaders' ethical, moral, and spiritual values and the development of a sense of higher purpose and meaning among employees. Spiritual Leadership is an approach to Leadership that emphasizes the importance of creating a workplace culture based on meaningful purpose, interconnectedness, and service to others. Research conducted by Giacalone and Jurkiewicz (2003) examined the impact of spiritual Leadership on organizational culture in a manufacturing firm. The study found that spiritual Leadership was positively associated with a culture of trust, respect, and integrity and that this culture was associated with improved organizational performance. Spiritual Leadership involves inspiring and

empowering employees to align their values with the organization's vision and creating a sense of community and shared purpose among all stakeholders. Previous studies have examined the impact of spiritual Leadership on the growth and well-being of both organizations and employees. There has been some research on spiritual Leadership's impact on employees' work performance, organizational growth, and employee satisfaction. One study published in the *Journal of Leadership & Organizational Studies* in 2012 examined the relationship between spiritual Leadership and organizational performance in 97 small businesses in the United States. The study found that spiritual Leadership positively relates to financial and non-financial organizational performance measures, such as sales growth, employee satisfaction, and customer loyalty. The spiritual leadership style incorporates the leader's spirituality and values into their leadership approach. This type of Leadership promotes a sense of community, purpose, and values among employees. Benefiel (2005) explored the impact of spiritual Leadership on employee creativity, innovation, and problem-solving. The study found that spiritual leadership practices such as vision, altruistic love, and hope positively related to employee creativity and problem-solving. Spiritual Leadership has also been linked to a more positive workplace culture. Research has shown that leaders who incorporate spiritual values into their leadership style create a more supportive, ethical behavior, and collaborative work environment. Jurkiewicz and Giacalone (2004) examined the relationship between spiritual Leadership and ethical behavior in the workplace. They found that spiritual leadership practices, such as vision and values, were positively related to ethical behavior and a sense of community among employees. These studies suggest that spiritual leaders can positively impact organizational and employee growth by fostering meaningful work, a sense of community, creativity and innovation, well-being, and ethical behavior. In addition, employees who work in organizations with a robust spiritual culture tend to be more engaged, committed, and productive.

RECOMMENDATION

Developing spirituality in an organization can be a deeply personal and subjective process, as everyone's spiritual beliefs and practices are unique. Every organization must promote mindfulness practices and meditation spaces to help individuals develop a sense of inner peace and calmness, leading to a greater sense of spirituality at the workplace. Workplace meditation practices

encourage regular reflection and introspection and create opportunities for employees to take time out of their workday to focus on personal growth and development. The organization must encourage employees to participate in charitable causes and community service projects. It can foster a connection to a larger purpose and allow employees to give back to others. Building community within the organization can help employees feel connected to a larger purpose and can be achieved through team-building activities, social events, or community service projects. Developing spirituality through Spiritual Leadership within an organization is an ongoing process that requires patience, dedication, and a commitment to personal growth and development. Implementing these recommendations helps build a more spiritually centered culture that benefits the individual leaders, employees, and the organization's growth.

CONCLUSION

In conclusion, leadership practices require a deep commitment and willingness to invest in employee development and engagement. Additionally, spiritual Leadership's effects may take time to manifest and require ongoing efforts to sustain. Spiritual Leadership emphasizes integrity, trust, and respect; spiritual leaders can create a positive work environment that fosters employee engagement, commitment, and creativity. Spiritual Leadership can also help employees find meaning and purpose in their work, leading to greater job satisfaction and fulfillment. Spiritual Leadership can also promote ethical behavior and a focus on values that can guide decision-making and behavior within the organization. Driscoll (1978) explained the effectiveness of trust and involvement in decision-making to predict satisfaction. Spiritual Leadership can be helpful for organizations seeking to enhance employee performance and overall success. This helps build trust and credibility with stakeholders, including customers, investors, and the community. By focusing on values that promote personal and organizational growth, spiritual Leadership can create a positive work culture that benefits the employees and the organization. Overall, organizations that prioritize spiritual Leadership and create a workplace culture that supports the spiritual needs of employees can benefit from increased productivity, engagement, and overall success. Milliman, Czaplewski, and Ferguson (2003) explored that providing workers with explicit direction will lead them to be more creative. However, it is essential to note that spiritual Leadership should be implemented in a way that is respectful and inclusive of diverse beliefs and backgrounds and

considers each employee's unique needs and preferences. Organizations that adopt spiritual Leadership as a guiding philosophy can benefit from a more engaged and motivated workforce, higher levels of organizational performance, and a more robust ethical and social profile. By nurturing the spiritual dimension of work, leaders can create a prosperous but meaningful and fulfilling workplace for their employees and organization.

REFERENCES

- Afsar, B., & Rehman, M. (2015). The relationship between workplace spirituality and innovative work behavior: The mediating role of perceived person–Organization fit. *Journal of Management, Spirituality & Religion*, 12, 329–353.
- Afsar, B., Badir, Y., & Kiani, U. S. (2016). "Linking spiritual leadership and employee pro-environmental behavior: The influence of workplace spirituality, intrinsic motivation, and environmental passion." *Journal of Environmental Psychology*, 45, 79-88. doi: 10.1016/j.jenvp.2015.11.001
- Benefiel, M. (2005). "The second half of the journey: Spiritual leadership for organizational transformation." *The Leadership Quarterly*, 16(5), 723-747. doi: 10.1016/j.leaqua.2005.07.008.
- Bodla, M. A., & Ali, H. (2012). Workplace spirituality: A spiritual audit of banking executives in Pakistan. *African Journal of Business Management*, 6(11), 3888–3897. <https://doi.org/10.5897/AJBM10.1242>.
- Bodla, M. A., Ali, H., & Danish, R. Q. (2013). Role of spiritual leaders in enhancing employee's performance. *Journal of Basic and Applied Scientific Research*, 3(3), 117–122.

- Chen C.Y., Li C.I. (2013). Assessing the spiritual leadership effectiveness: The contribution of follower's self-concept and preliminary tests for the moderation of culture and managerial position. Doi 10.1016/moderating004.
- Chen, C.Y., Yang, C.F. (2012). The Impact of Spiritual Leadership on Organizational Citizenship Behavior: A Multi-Sample Analysis. *J Bus Ethics* 105, 107–114.
- Driscoll, J. W. (1978). trust and participation in organizational decision making as predictors of satisfaction. *Academy of Management Journal*, 21, 44–56.10.2307/25566.
- Fairholm, G. (1996). Spiritual Leadership: Fulfilling whole self needs at work. *Leadership & Organization Development Journal*, 17(5), 11–36.
- Fry, L. W. (2003). Toward a theory of spiritual Leadership. *The Leadership Quarterly*, 14(6), 693–727. <https://doi.org/10.1016/j.leaqua.2003.09.001>.
- Fry, L. W., & Cohen, M. P. (2009). Spiritual Leadership as a paradigm for organizational transformation and recovery from extended work hours cultures. *Journal of Business Ethics*, 84(2), 265–278. <https://doi.org/10.1007/s10551-008-9695-2>.
- Fry, L. W., & Slocum, J. W., Jr. (2008). Maximizing the triple bottom line through spiritual Leadership. *Organizational Dynamics*, 37(1), 86–96.
- Fry, L. W., Hannah, S. T., Noel, M., & Walumbwa, F. O. (2011). RETRACTED: Impact of Spiritual Leadership on unit performance. *The Leadership Quarterly*, 22(2)Spiritual0. <https://doi.org/10.1016/j.leaqua.2011.02.002>.
- Fry, L. W., Latham, J. R., & Clinebell, S. K. (2012). "Spiritual leadership as a model for performance excellence: A study of Baldrige award recipients." *Journal of Management, Spirituality & Religion*, 9(2), 189-208. doi 10.1080/14766086.2012.669108.

Fry, L. W., Latham, J. R., Clinebell, S K., & Krahnke, K. (2017). "Spiritual leadership as a model for performance excellence: A study of Baldrige award recipients." *Journal of Management, Spirituality & Religion*, 14(2), 93-118. doi 10.1080/14766086.2016.1277679.

Fry, L. W., Matherly, L. L., & Ouimet, J. (2010). "The promotion of spirit at work: A model of spiritual leadership." *Journal of Managerial Psychology*, 25(4), 315-336. doi 10.1108/02683941011032166.

Fry, L. W., Vitucci, S., & Cedillo, M. (200). "Spiritual leadership and army transformation: Theory, measurement, and establishing a baseline." *The Leadership Quarterly*, 16(5), 835-862. doi: 10.1016/j.leaqua.2005.07.003.

Giacalone, R. A., & Jurkiewicz, C. L. (2003). "Handbook of workplace spirituality and organizational performance." ME Sharpe.

https://www.bloomberg.com/press-releases/2022-11-07/why-companies-like-nike-and-nasa-are-using-the-science-of-breathwork-to-motivate-employees?utm_source=website&utm_medium=share&utm_campaign=copy.

Jincy Lype. (2021). Sublime coves of well-being within offices: Meditation Chambers by Office of Things. <https://www.stirworld.com/see-features-sublime-coves-of-wellbeing-within-offices-meditation-chambers-by-office-of-things>.

Jurkiewicz, C. L., & Giacalone, R. A. (2004). "A values framework for measuring the impact of workplace spirituality on organizational performance." *Journal of Business Ethics*, 49(2), 129-142. doi: 10.1023/B: BUSI.0000015876.31007. f.

Kimberly Schaufenbuel. (2015). Why Google, Target, and General Mills Are Investing in Mindfulness. <https://hbr.org/2015/12/why-google-target-and-general-mills-are-investing-in-mindfulness>.

- Milliman, J., Czaplewski, A., & Ferguson, J. (2003). Workplace spirituality and employee work attitudes, an exploratory empirical assessment. *Journal of Organizational Change Management*, 16(4), 426-447.
- Mitroff, I. I., & Denton, E. A. (1999). "A study of spirituality in the workplace." *Sloan Management Review*, 40(4), 83-92.
- Pei-Ru-Keh. (2022). Meditation chambers at Google HQ offer a blueprint for office well-being. <https://www.wallpaper.com/design/google-office-meditation-rooms>.
- Pfeffer, J. (2010). Business and the spirit: Management practices that sustain values. In R. A. Giacalone, & C. L. Jurkiewicz (Eds.), *Handbook of workplace spirituality and organizational performance* (pp. 27–43). New York: M.E. Sharpe.
- Samul, J. (2020). Spiritual Leadership: Meaning in the sustainable workplace. *Sustainability (Switzerland)*, 12(1). <https://doi.org/10.3390/su12010267>
- Shalley, C. E., Lu, L., & Zhou, J. (2011). "Social exchange and innovation: The case of leader-member exchange (LMX) and employee creativity." *Journal of Organizational Behavior*, 32(6), 698-712. doi 10.1002/job.695.
- Van der Walt, F., & de Klerk, J. J. (2014). Workplace spirituality and job satisfaction. *International Review of Psychiatry*, 26, 379–389. [10.3109/09540261.2014.908826](https://doi.org/10.3109/09540261.2014.908826).
- Wong, P. T., & Siu, A. M. (2005). "The role of cultural spirituality in cultivating hope among Chinese and non-Chinese cancer patients." *Journal of Psychosocial Oncology*, 23(2-3), 109-124. doi: 10.1300/J077v23n02_08.
- Yusof, J. M., & Tahir, I. M. (2011). Spirituality leadership and job satisfaction. A proposed conceptual framework. *Information Management and business review*, 2(6), 239-245.

(IJ-04) How to Manage School Violence

Junqiao Xiao

EdD, JD, DBA, Esq.

Legal Counsel, Midland Credit Management, Encore Capital Group

Part-time Faculty, School of Business and Economics, National University

Adjunct Professor, California Miramar University

Adjunct Professor, Alliant International University

ABSTRACT

School violence is a serious management topic in contemporary educational systems globally, so this paper will briefly discuss some educational management programs to reduce school violence, which include (1) Peer-Led Program: The Peaceful Schools Project, (2) Psychosocial and Psycho-educational Program: The Social Emotional Learning and Cognitive Behavioral Therapy Program, and (3) Special Programs: The Youth Relationships Project and the Expect Respect Project. However, due to the limitation of the literature review and research in the market, this paper has some limitations in research. The goal of this paper is to lead leaders to rethink, speculate, manage, practice, and reduce school violence.

INTRODUCTION

According to Henry (2009), to examine school violence, one needs to rethink violence in contemporary society. The analysis of school violence can be conducted on physical violence causing pain or death; material loss or damage; psychological fear or depression; a reduction in social status; and moral or ethical worries. The educational system has a responsibility to reduce violence at schools. Effective, innovative programs must be instituted in order to control or manage school violence.

Greene (2005) described that school violence contains violent and aggressive behaviors during school-based activities which impacted community, district, and nationwide levels. On a larger scale, a rapid increase in evaluation research described that a wide range of actual violence was in school. Fortunately, innovative programs on reducing school violence developed programs to handle those problems, such as Peer-Led Programs, Psychosocial and Psycho-educational Programs, and Special Programs.

Educational leaders, educators, students, and parents have become aware of violence at school currently (Leary, Kowalski, Smith, & Phillips, 2003). Exploring and discussing the effectiveness of mentioned different types of innovative programs are valuable in decreasing school violence from K-12 to higher education. The first innovative program is the Peer-Led Program: the Peaceful Schools Project, which provides valuable methods derived from research on controlling school violence in a decade. Psychosocial and Psycho-educational Program: the Social Emotional Learning and Cognitive Behavioral Therapy Program is the second innovative program that introduced appropriate concepts to avoid school violence and was applied in hundreds of schools. The last of the three is the Special Programs: The Youth Relationships Project and the Expect Respect Project, which utilize qualitative and quantitative methods to analyze the study results on reducing school violence.

PEER-LED PROGRAM: THE PEACEFUL SCHOOLS PROJECT

Positive youth development programs contain many objectives, which are: to promote societal, emotional, intellectual, behavior, ethical capability, and connection; foster resilience, autonomy, spirituality, self-efficacy, optimistic personality, and confidence; and provide an appreciation for positive performance and chances for involvement (Catalano, Berglund, Ryan, Lonczak, & Hawkins, 2004).

Twemlow, Fonagy, and Sacco (2004) conducted an innovative program for reducing elementary school violence in the United States, called the Peaceful Schools Project. This program consisted of four major components of action, which were: (1) a project of constructive environment that encouraged and built thinking and communication in the classroom for all students and educators;

(2) a plan of classroom administration that paid attention to modify and understand problems rather than punishing students' behavior; (3) a program of physical education that was considered with self-defense and self-protect skills from the martial arts because basic martial arts skills help students protect themselves and others; and (4) motivated schools to provide mentorship for students, which provided additional restraint and character building to students to refine their conflict resolution.

According to Twemlow et al. (2004), an effective program was needed and had been presented for several decades. The Peaceful Schools Project began in three Midwestern city elementary schools. Currently, the program serves thousands of students in several school districts under the Peaceful Schools Project and effectively reduces school violence. The Peaceful Schools Project started with a challenge because it was hard to control violence in elementary schools. Young students appreciated being more responsible to take care of themselves and others, such as unpredicted conflict resolution by peers instead of asking for assistance from parents or educators. Additionally, young students are influenced by intricate psychological identification with educational leaders and educators (Twemlow, Fonagy, & Sacco, 2004).

Johnson (2009) mentioned that school violence relates to the school's social environment, educational policies on violence, classroom and school culture, students' academic achievement, and relationships among schoolmates, classmates, and educators. Lowering school violence rate was related to positive relationships between students and educators, students accepting rules as fair and adhering to them, schools focusing on students' comprehension in academic performance, and providing a comforting and peaceful environment. Overall, the Peaceful School Project plays a significant role in anti-violence in school movements, as it emphasizes on the atmosphere of the school and could change the mind of the violent student's unconscious.

PSYCHOSOCIAL AND PSYCHO-EDUCATIONAL PROGRAM: THE SOCIAL EMOTIONAL LEARNING AND COGNITIVE BEHAVIORAL THERAPY PROGRAM

Violence disturbs young students aged 10 to 25 in Chicago schools. More than one thousand school-aged youth were shot, and 20% of them were killed in 2010. In the same year, government officers, educational administrators, and public setting leaders joined together to create an innovative Social Emotional Learning and Cognitive Behavioral Therapy Program to reduce violence at schools.

The Illinois State Board of Education and the Illinois Children's Mental Health Partnership joined together to create statewide Social Emotional Learning standards to educate all levels of students In 2004. Additionally, the Chicago Department of Family and Support Services used Social Emotional Learning martial and strategy to run the One Summer Chicago program to reduce violence by youth. It started in 2011 to serve 2,800 young students. The goal is to continue to coordinate with other programs city-wide to offer over 140,000 openings for students in total (Davis et al., 2011).

In 2010, a new model was proven to improve social-emotional abilities with Cognitive Behavioral Therapy that helps students handle conflict resolution and self-discipline strategies. Students frequently participating in psychosocial and psycho-educational programs have fewer behavioral problems and less depression. The cognitive Behavioral Therapy model was used in the Becoming a Man program at 15 Chicago Public Schools and in Cognitive Behavioral Intervention for Trauma in Schools from 2009 to 2010. Some strategies of Cognitive Behavioral Therapy are helpful for public schools, such as the "Anger Coping" strategy for third to eighth-grade students and the "Think First" strategy for older students because it pays attention to increasing abilities of anger management (Davis et al., 2011).

Violence at school is a problem of contemporary public health worldwide. Farmer, Estell, and Hutchins (2007) described academic, behavioral, and social domains within the school climate that might cause conflict and violence among students. Worldwide strategies for educators exist to

solve students' problems, including providing academic and social assistance, giving positive feedback on students' personal development, and coordinating services to adjust students' multiple needs and problems.

Furthermore, four steps should be considered for reducing school violence, including measuring school violence, recognizing the causes of school violence, discovering plans to decrease danger, and supporting useful strategies in plans (Haegerich & Dahlberg, 2011). In addition, some recommendations for educational administrators to prevent violence at school included school policies to maintain students' behavior, forbidden violence on campus, and contact with parents when the violence happens (Stueve et al., 2006).

Flannery, Wester, and Singer (2004) asserted that school leaders and counselors should consider the influence of violence occurring at schools might impact students' academic performance, behavior, and mental health. School violence was found indifferent to the following factors: in urban or cosmopolitan locations, gender, age groups, ethnic groups, and educational levels. It occurred unpredictably. School programs and policies should address involvements with victims and perpetrators. In addition, staff and educators should pay attention to students who threaten, fight, are aggressive, and are violent to others in the school. The psychological theory supports the speculation that rejecting society may be related to violence (Leary et al, 2003).

Several qualitative and quantitative research studies from K-12 students have shown that the Social Emotional Learning program positively affects students, including improved attitudes toward self, others, and school. It also enhanced behavioral adjustments by increased healthy social interaction and decreased interruptive behavior; effects last at least for six months after learning, and impressive 11-percentile gain in academic performance. (Durlak, Weissberg, Dymnicki, Taylor, & Schelling, 2011)

SPECIAL PROGRAMS: THE YOUTH RELATIONSHIPS PROJECT AND THE EXPECT RESPECT PROJECT

According to Crooks, Wolfe, Hughes, Jaffe, and Chiodo (2008), schools taught students how to use the “three R’s” – reading, writing, and arithmetic skills in the academic arena. However, the Fourth R (for Relationships) grew out in the Youth Relationships Project, which is a dating violence prevention project for young students with a family background of mistreatment and violence. The purpose was to support teenagers in developing confident characteristics in socialization by providing basic information, building skills, and assisting the participants to be involved in community service.

The Youth Relationships Project successfully represents changes in attitudes toward violent behaviors and violent relationships at schools. Fourth “R” pays attention to improving healthy relationships, solving problems and conflicts, and reducing violence (such as dating violence, group violence, harassment, and bullying). The first Youth Relationships Project was implemented in a few schools in Southwestern Ontario. From 2004 to 2005, the program was refined based on the feedback of educators and students. After several years of effort, it was implemented in over 350 schools across Canada in 2008 (Crooks, Wolfe, Hughes, Jaffe, & Chiodo, 2008).

There are several aspects of school-based violence prevention. First, school violence causes psychological and physical harm or damage directly to younger generations. Some useful and applicable innovation programs have the potential to decrease such negative impacts and influences on students. Second, it is tremendously challenging to recover from or alleviate the damage after violence develops a deep-rooted pattern. Third, the educational system must provide a safe climate for students to become knowledgeable (Crooks et al., 2008).

School environment is a significant concern in considering school violence because adult observation decreases as students transfer from elementary to middle school. Therefore, general violence in school is related to not only school problems such as unsatisfied academic achievement, but also a combination of other non-academic factors, including attention by peers or educators,

disability, cultural differences, race, and sexual orientation (Swearer, Espelage, Vaillancourt, & Hymel, 2010).

The Expect Respect Project is another innovative violence prevention program sponsored by the Centers for Disease Control and was developed by Safe Place, which is a violence prevention school-based counseling service in central Texas. Additionally, the Expect Respect Project was established to teach students, parents, staff, and educational leaders of healthy and respectful behaviors and to avoid violent behaviors. The educational involvement highlighted applicable strategies for replying to unsuitable behaviors (Meraviglia, Becker, Rosenbluth, Sanchez, & Robertson, 2003).

The Expect Respect Project was designed to support students who are partaking in school violence. It contains five elements, including curriculum, staff education, parent training, support services, and educational policy improvement. The curriculum focused on educating students to reduce their participation in school violence. Furthermore, educational leaders, educators, and staff were required to attend training to avoid school violence (Meraviglia et al., 2003).

Moreover, school leaders were encouraged to improve educational policies to prevent violence. Parents were invited to participate in some training on handling school violence, and newsletters were sent to the parents each semester. The staff in the school monitored the learning environment, controlled students' behaviors, and reported school violence immediately. Additionally, specialized training was delivered for school counselors, and all counselors received resources and materials for school anti-violence (Meraviglia et al., 2003).

Overall, research illustrated that the Expect Respect Project had been a success, with healthy conflict resolution manners and behaviors raised over the period of the intervention for 144 participants. The program has been proven effective in reducing violent behavior. However, the study confesses that it has yet profoundly reformed the concept and belief of violence as a means of gaining power, for that kind of mindset is tied to male gender norms. Though researchers did not discuss further this failure to alter the mindset, it is possible that gaining power and control is not a necessary motive in the environment of studies. No follow-up data shows that if the result persists after the study concluded (Ball et al, 2012).

SUMMARY OF FINDINGS

A successful anti-violence innovative program at school needs to teach students and educators how to create successful programs that reduce school violence. However, educational leaders cannot ignore global political and economic reasons that can cause school violence. Debarbieux (2003) claimed that school violence had become a worldwide concern in the contemporary educational system. This phenomenon caused public attention, and led to many anti-violence educational programs and policies developed in schools. Ttofi and Farrington (2010) discovered that four functional measurements had been adopted in assessing the efficiency of anti-violence programs, which are: (1) experiment randomization, (2) before and after comparisons of the use of innovative violence programs, (3) comparisons with other intervention-control, and (4) different age groups compared in schools.

Pais (2012) stated that education had an exclusive responsibility to educate our younger generations to avoid violence and to negotiate with conflicts. School settings offer safety in the learning environment and promote non-violence. Male students were more prone to taking part in physical violence, and female students more often engaged in verbal harassment of peer perpetrators. Some beneficial recommendations for students to avoid school violence are as follows: endorse innovative programs to address violence at school; provide legislation assistance, ensure students have enough counseling services and resources; increase parents' consciousness and participation of anti-violence innovative programs; encourage responsible behavior and manner; and reinforce worldwide collaboration and evidence-based investigation to end violence against students.

Greene (2005) explained that to avoid violence in a school setting, school officials need to promote effective plans, moral programs, prevention strategies and policies, multi-level evaluations, and realistic school-based guidelines. Additionally, Bilchik (2007) remarked that a well-trained team to improve school safety was necessary. School officials should recognize that school-based anti-violence innovative programs affect students' behavior. Innovative programs should maintain the leadership to scaffold public attention on reducing youth violence.

Educational leaders, staff, parents, and the general public settings require correctly knowing the nature and background of problems, and then they could successfully conquer violence happening in the K-12 American school system. On the other hand, it was hard to estimate the possibility of violence in school settings. Reasonably, a design that briefly summarizes how to avoid violence in the school system accessible to students (Robers, Zhang, Truman, & Snyder, 2012).

Developing safe schools through purposeful preparation and well-organized structure is significant. This procedure starts with violence prevention plans with the help of school safety team leaders, including educational policymakers, faculty, staff, parents, and students. Educational leaders need to put efforts in recognizing various needs, selecting possibilities, supporting the community, maintaining a peaceful campus, training staff to be observant and replying to students' needs before resulting in unhealthy behaviors, and coordinating successful services. Three fundamental anti-violence components should be considered, they are problem identification and analysis, communication, and prevention strategies evaluation (Furlong, Felix, Sharkey, & Larson, 2005). Programs that have evidence of their effectiveness have been mentioned above, such as Peer-Led Program: the Peaceful Schools Project, Psychosocial and Psycho-educational Program: the Social Emotional Learning and Cognitive Behavioral Therapy Program, and Special Programs: the Youth Relationships Project and the Expect Respect Project.

REFERENCES

- Ball, B., Tharp, A. T., Noonan, R. K., Valle, L. A., Hamburger, M. E., & Rosenbluth, B. (2012). Expect respect support groups: preliminary evaluation of a dating violence prevention program for at-risk youth. *Violence against Women, 18*: 746-762.
<https://doi.org/10.1177/1077801212455188>.
- Bilchik, S. (2007). The importance of universal school-based programs in preventing violent and aggressive behavior. *American Journal of Preventive Medication, 33*(2): 101-103.

- Catalano, R. F., Berglund, M. L., Ryan, J. A. M., Lonczak, H. S. & Hawkins, J. D. (2004). Development programs positive youth development in the united states: Research findings on evaluations of positive youth. *The ANNALS of the American Academy of Political and Social Science*, 591: 98-124. <https://doi.org/10.1177/0002716203260102>.
- Crooks, C.V., Wolfe, D. A., Hughes, R., Jaffe, P. G., & Chiodo, D. (2008). Development, evaluation and national implementation of a school-based program to reduce violence and related risk behaviors: Lessons from the fourth R. *Institute for the Prevention of Crime Review*, 2: 109-135.
- Davis, F., Chou, J., Fernández, A., Patterson, J., White, M., Larkin, C., Smith, L. (2011). *National forum on youth violence prevention: City of Chicago youth violence prevention plan*. Chicago Police Department CompStat.
- Debarbieux, E. (2003). School violence and globalization. *Journal of Educational Administration*, 41(6): 582-602.
- Durlak, J. A., Weissberg, R. P., Dymnicki, A. B., Taylor, R. D., & Schelling, K. B. (2011). The impact of enhancing students' social and emotional learning: a meta-analysis of school-based universal interventions. *Child Development*, 82(1), 405-432. <https://doi.org/10.1111/j.1467-8624.2010.01564.x>.
- Farmer, T. W., Farmer, E. M. Z., Estell, D. B., & Hutchins, B. C. (2007). The developmental dynamics of aggression and the prevention of school violence. *Journal of Emotional and Behavioral Disorders*, 15(4): 197-208.
- Flannery, D. J., Wester, K. L., & Singer, M. I. (2004). Impact of exposure to violence in school on child and adolescent mental health and behavior. *Journal of Community Psychology*, 32(5), 559–573.

- Greene, M.B. (2005). Reducing violence and aggression in schools. *Trauma, Violence, and Abuse*, 6(3): 236-253. <https://doi.org/10.1177/1524838005277406>.
- Haegerich, T. M. & Dahlberg, L. L. (2011). Violence as a public health risk. *American Journal of Lifestyle Medicine*, 5(5), 392-406. <https://doi.org/10.1177/1559827611409127>.
- Henry, S. (2009). School violence beyond columbine a complex problem in need of an interdisciplinary analysis. *American Behavioral Scientist*, 52(9): 1246-1265.
- Johnson, S. L. (2009). Improving the school environment to reduce school violence: a review of the literature. *Journal of School Health*, 79(10), 451-465.
- Leary, M. R., Kowalski, R. M., Smith, L. & Phillips, S. (2003). Teasing, rejection, and violence: Case studies of the school shootings. *Aggressive Behavior*, 29: 202-214.
- Meraviglia, M. G., Becker, H., Rosenbluth, B., Sanchez, E. & Robertson, T. (2003). The expect respect project creating a positive elementary school climate. *Journal of Interpersonal Violence*, 18(11), 1347-1360. <https://doi.org/10.1177/0886260503257457>
- Furlong, M. J., Felix, E. D., Sharkey, J. D., & Larson, J. (2005). Preventing school violence: A plan for safe and engaging schools. *Student Counseling*, 9: 11-15.
- Pais, M. S. (2012). *Tackling violence in schools: A global perspective bridging the gap between standards and practice*. Office of the Special Representative of the Secretary General on Violence against Children.
- Robers, S., Zhang, J., Truman, J., & Snyder, T. D. (2012). *Indicators of school crime and safety: 2011*. The National Center for Education Statistics & The Bureau of Justice Statistics.

Swearer, S. M., Espelage, D. L., Vaillancourt, T., & Hymel, S. (2010). What can be done about school bullying? Linking research to educational practice. *Educational Researcher*, 39(1): 38–47. <https://doi.org/10.3102/0013189X09357622>.

Stueve, A., Dash, K., O'Donnell, L., Tehranifar, P., Wilson-Simmons, R., Slaby, R.G., & Link, B. G. (2006). Rethinking the bystander role in school violence prevention. *Health Promote Practice*, 7: 117-124. <https://doi.org/10.1177/1524839905278454>.

Ttofi, M. M. & Farrington, D. P. (2010). Effectiveness of school-based programs to reduce bullying: A systematic and meta-analytic review. *Journal of Experimental Criminology*, 7: 27–56. <https://doi.org/10.1007/s11292-010-9109-1>

Twemlow, S.W., Fonagy, P., & Sacco F. C. (2004). The role of the bystander in the social architecture of bullying and violence in schools and communities. *New York Academy of Sciences*, 1036: 215–232. <https://doi.org/10.1196/annals.1330.014>.

(IJ-05) International Student Services Management in Higher Education

Junqiao Xiao

EdD, JD, DBA, Esq.

Legal Counsel, Midland Credit Management, Encore Capital Group

Part-time Faculty, School of Business and Economics, National University

Adjunct Professor, California Miramar University

Adjunct Professor, Alliant International University

ABSTRACT

International student services management is a very important issue. It pointedly underscores the economic importance of international students to institutions and the failure of institutions to provide the kinds of support that would be most helpful to international student success. Thus, international student services management will become a popular topic in contemporary educational systems globally for recent decades, so this paper will briefly discuss some insights and thoughts about how to support international students and how to manage international student services, which include (1) communication, (2) multicultural understanding, and (3) academic performances comprehension. However, due to the limitation of the literature review and research in the market, this paper has some limitations in the research. The goal of this paper is to lead leaders to rethink, speculate, practice, and effectively manage international student services.

INTRODUCTION

The international student is defined as a student who is not an immigrant, refugee, or citizen of the United States enrolled in an institution of higher education, holding an F-1 student visa with temporary status in the United States, who will return to their own countries or lands, upon this completion of their study (Verbik & Lasanowski, 2007). Verbik and Lasanowski (2007) asserted that higher educational institutions in the United States host more international students than any other country, with around a 22% share of the global student market. In response, a higher educational institution in the United States is considered a valuable investment for international

students worldwide because of the multicultural environment, high-quality academics, and a famous “brand” of visibility in the global market.

In this situation, student services for international students are of tremendous significant concern in the higher educational institutions in the United States. Nilsson, Berkel, Flores, and Lucas (2004) remarked that international students are similar to domestic students on the United States campuses because they may experience social, academic, and emotional difficulties as they advance into higher education. A better understanding of the student services’ counseling center in addressing the concerns of international students is necessary for this special population in today’s higher educational system.

This paper aims to highlight the need for student services in higher educational institutions to pay more attention to international students because such students lack friends and family members here. This paper will present research on international student services in higher education in the following three aspects: (1) how to provide better communication between local students and international students, (2) how student services personnel can demonstrate cultural understanding and multicultural counseling competence, and (3) how international higher education students can use student services to help them improve academic performance.

COMMUNICATION

In search for better communication between domestic and international students, student services staff may employ two methods: peer friendship programs and online blog communications. Moreover, when the researcher was a high school student in China, she joined a peer partner program that included a girl from Tibet. The program was an excellent one-on-one activity for making friends across different nationalities because this activity provided better understanding through communicating differences and similarities between cultures.

Abe, Talbot, and Geelhoed (1998) stated that settled international students could effectively teach incoming international students about learning styles and skills and the resources needed to succeed in the United States. Pairing students with similar academic interests could improve the

academic achievement of international students. Peer program administrators could recruit participants for a service project aimed at campus improvement.

Peer programs positively influence the development of academic skills between domestic and international students. Strategies also can be applied to raise the international students' academic level connection with the institution. Peer pairing programs could help international students become familiar with valuable contacts on the campus or in the community, adding to their sense of belonging.

Zhai (2004) asserted that international students encounter many troubles like language and communication difficulties and challenges while adjusting to the United States' higher educational system. Studying in the U.S. is more stressful for international students because the academic cultures are different. Faculty use unfamiliar education techniques, including fast-paced class sessions, communication between professors and students, classroom participation, group activities, reading and writing assignments, presentation and speech requirements, and different attitudes about assignments.

Williams and Jacobs (2004) stated that blogs are the scope for interactivity over a period of time, and the course of writing entries and responding to feedback reflects the personal character of the blog's creator. Blogs are perhaps the most prominent tools for academic conversation that achieves beyond the scope of a university theme and augments. Knowledge creation occurs throughout student enrollment in a higher education program. Significantly, students have long-term learning from each other more than from instructors or textbooks. Blogs are becoming useful tools for facilitating learning.

Andrade (2006) asserted that international students responded with negative behaviors such as embarrassment, frustration, disappointment, and boredom when arriving in a foreign country. Underlying many of the problems experienced by international students is a need for more language proficiency and cultural knowledge in a different country. However, some evidence suggests that 'language problems' may be culturally based ways of seeing the world.

Swail, Redd, and Perna (2003) stated that many campuses had initiated computer-based advising systems. Although these systems are cost-effective, higher educational institutions allow for the development of professional relationships or interactions between advisers and students that may differ from the relationships or interactions between advisers and students in other academic cultures. The central goal for communicating with the students is about students' development, allowing higher education institutions to mirror societal transformations and encourage pluralism.

MULTICULTURAL UNDERSTANDING

The issue of race and attainment of degrees in higher education has not and cannot be ignored. Figure 2 extracted from Fry (2002) shows that Caucasian high school students were not the majority student population right now attending higher education institutions in 1999. Swail, Redd, and Perna (2003) also indicated that a significant number of Asian students attained their bachelor's degrees within six years rather than four years in 1995-1996 than Caucasians, Hispanic, and African Americans.

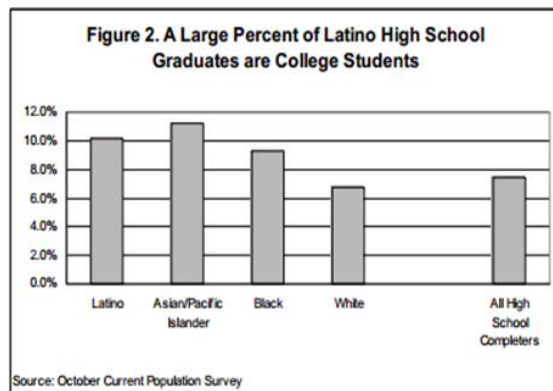
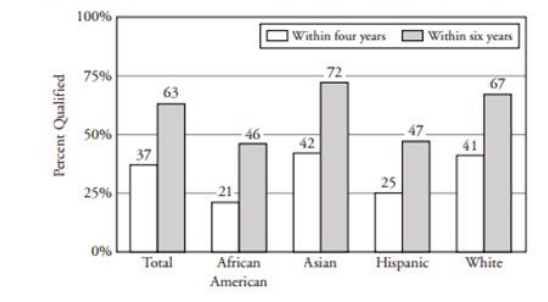


FIGURE 9
Bachelor's Degree Attainment Rates for Students Who First Enrolled in a Four-Year Institution in 1995-96 with the Goal of Completing a Bachelor's Degree, by Race or Ethnicity



California is a state where the minority has become the majority population. Still, its flagship public institutions of higher education have embarrassing small amounts of participation rates among African American and Hispanic-American students. Moreover, African American, Hispanic, and Native American students continue to earn degrees at substantially lower rates than Caucasians and Asians. Texas, Florida, and several other states also face hosting comparable dilemmas. If such issues are not resolved in fewer decades, today's retention and diversity problems will seem like child's play. Educational opportunity and success are uneven in the United States by income, race and/or ethnicity (Swail, Redd & Perna, 2003).

Andrade (2006) pointed out that international students contribute valuable educational and economic benefits to higher educational institutions. Yet, domestic and international students face similar academic and social transition issues in their first year of higher education with distinct differences. International students need more help adapting and engaging in educational activities than domestic students. Universities should become knowledgeable about international students' concerns about issues and appropriate support services put into practice for their continued benefit. Trice (2003) asserted that more than 540,000 international students study in the United States annually. Educators should realize the differences between international and domestic students in school preparation, goals, career paths, or academic performance. Faculty members observe how difficult it can be for international students to acculturate into American culture. However, Hellstén (2002) explained that coming to a foreign country can often be embarrassing because of the uncertainty and disorientation of finding your way around new cultures and social expectations. The resulting confusion seems to lead to less harmonious change among incoming international students between old and new study environments.

Zhai (2004) recommended that higher educational institutions provide more intensive orientation programs for international students that deal with cultural and academic differences regarding student services and help-seeking behaviors. Because many international students do not anticipate academic differences before they come to the United States, they are tremendously overwhelmed during the early adjustment period. Additionally, international students have to deal with the psychological effects of handling a different culture and social isolation, loneliness, academic stress, and financial crisis that may not be recognized or accounted for.

Thomas, Quinn, Slack, and Casey (2002) asserted that it has not been easy to reveal a quantifiable and direct relationship between student services and student maintenance because of several factors that Pritchard and Wilson (2003) noted influenced change in meeting the higher education needs of international students. For example, the social and emotional factors involved with the academic performance and retention of international students require higher education institutions to address problems and conflicts that may exist with their student populations.

First, student services are responsible for international students' campus life and academic and future career advice. Second, reviewing and measuring the impact of any involvement is complicated due to the many factors that influence students' decisions. Third, there is a lack of evaluation and research into the effects of student services (Thomas, Quinn, Slack & Casey 2002); therefore, critical information is needed about the types of concerns that many international students may face (Nilsson, Berkel, Flores & Lucas, 2004). Although it may be hard to provide services to international students, it does not mean that delivery of such services should be ignored in higher education even though there is not an agreed way of calculating the cost of delivering student services to international students (Thomas, Quinn, Slack & Casey 2002).

ACADEMIC PERFORMANCES COMPREHENSION

The significant strengths for diversity expansion in higher education on campus include the growing proportion of diversification and the rising encouragement being supplied by governments globally for students to have equivalent rights of entry to higher education. The expansion of education, escalating skill levels and competencies, and continual professional upgrading require new possibilities to meet the growing and complex demands of the globally-competitive modern world (Johnstone, 1998). Understanding international students' adjustment challenges has global implications for intercultural education, mainly attributable to their English language proficiency and cross-cultural knowledge. In essence, academic achievement is affected by language proficiency, academic skills, and prior educational background (Andrade, 2006).

Nilsson, Berkel, Flores, and Lucas (2004) stated that earning superior scores was another concern among international students. Furthermore, it is significant to remember that even though the number of international students is small, most international students require counseling services at university counseling centers during their first year of study in America. Zhai (2004) suggested that interactions between international and domestic students could improve the variety of student activities, such as differences in celebrating holidays.

Student service staff should be aware that international students often fail to take advantage of social support services because of different cultural backgrounds, academic pressure, and isolation

from the campus community for international students living off campus. Therefore, higher education institutions should continually provide social support to help international students adjust to American higher education (Zhai, 2004). Moreover, institutions that successfully support minority access and achievement focus on the learning environment rather than race or ethnicity. In other words, they maintain diverse learning experiences emphasizing excellence in instruction and providing social opportunities for students to build new friendships and forge trust with classmates (Swail, Redd & Perna, 2003).

International students were collapsed into one group, ignoring the diversity of race, ethnicity, nationality, gender, and cultural background. Efforts need to be made by university counseling center staff to reach out to ensure that they have the tools to manage the change and succeed academically (Nilsson, Berkel, Flores & Lucas, 2004). Additionally, Andrade (2006) asserted that understanding cultural adjustment and implementing measures that ensure the benefits of cultural diversity are recognized by other host institutions of higher education worldwide.

International students are often less prepared to study abroad than domestic students participating in foreign exchange programs. Educators should consider the adjustment issues that arise in cross-cultural exchanges to enhance the mutually rewarding experiences for international study (Andrade, 2006). Helping students connect with current issues and higher education organizations deals with the manifestation of determination, functional behavioral assessment, behavioral intervention plans, and protection for students and those eligible for higher education (Skiba, 2002). The high academic quality of international students can benefit every department in higher education according to Trice (2003). Newly enrolled international students could not find an advisor to take them into their research group, even though funding was available. Moreover, faculty members lacked awareness of international students' desire to integrate with their American counterparts in academic research (Trice, 2003); this may be an area in which faculty, staff, and the student services department may want to consider changing.

Moreover, Hellstén (2002) further pointed out the academic concern about reduced academic learning achievement and opportunities for international students. In addition, international students' perspective on educational offerings available in higher education and the student

services available to them is one way to help educators enlarge pathways towards improving the content and focus of international curriculum offerings to highlight the responsibility.

CONCLUSION

In the United States, there are more than four thousand accredited institutions of higher education competing for the international student market. Approximately 565,000 international students from nearly every nation in the world travelled to the United States for higher education, which include approximately 14,000 students from Mexico, more than 28,000 students from Canada region, and 327,785 students from Asia and more than 30 different countries. This means that international students population accounted for 3% of students enrolled in institutions of higher education in 2006 (Verbik & Lasanowski, 2007).

During the past several years, the Asian international student population in higher education represented 40% of total number of international students studying in institutions in the United States. Moreover, the highest percentages of the Asian international students come from China, India, South Korea, and Japan, according to Verbik and Lasanowski (2007). Therefore, modern higher education involves more challenges than before because competition and students' population have changed tremendously.

Successfully servicing international students in the same setting as non-international students is an essential goal and eventually the target for diversity educators, educational administrators, faculty, and staff. Additionally, comfortable, and friendly learning environments should be a part of the international culture provided by administrators of higher education on campus for international students. Moreover, Gurin, Dey, Hurtado, and Gurin, (2002) mentioned that it is vital that a variety of individual, institutional, and societal benefits are associated with diversity experiences and dissimilarity in educational results between students from diverse cultural or ethnic backgrounds. Diversity may endorse a wide range of learning outcomes which include dynamic judgment skills, scholarly commitment and enthusiasm, and a variety of intellectual abilities, particularly significant during the higher educational years because students are at a critical developmental period which opens understanding to endorse future improvement (Gurin, Dey, Hurtado & Gurin,

2002). Recognition of differences enables the university to suitably customize student services which could facilitate excellence in education for all students and to maintain the international student population (Grebennikov & Skaines, 2007).

Student services dedicated to students include social activities such as clubs, associations, cafeterias, sport facilities, academic support, housing facilities, religious facilities, and public transportation are reasonably provided, and given that those services are also utilized by international students studying away from their homeland. Particular attention is focused on student services differently by domestic and overseas students. International students have rated the need for such services higher than domestic students. However, the uses of these services are rated lower by international students compared to domestic students (Grebennikov & Skaines, 2007).

This indicates that there are some obstacles for international students. For one thing they may have a problem to understanding the universities catalog and the educational culture in a different society successfully. The student services may not be aware of the difficulties of international students and unprepared to service them in specific ways, such as asking them if they need help intentionally or communicating enough with them. Except for all of above, student service should not forget the importance of emotional support more than study assistance. They might need to gain the trust of international students and communicate with them about the potential of psychological and emotional issues experienced in a different culture and society.

REFERENCES

Abe, J., Talbot, D. M. & Geelhoed, R. J. (1998). Effects of a peer program on international student adjustment. *Journal of College Student Development*. 39(6), 539-547.

- Andrade, M. S. (2006). International students in english-speaking universities: adjustment factors. *Journal of Research in International Education*. 5(131), 1-25.
<https://doi.org/10.1177/1475240906065589>
- Barro, R. J. & Lee, J. (2000). International data on educational attainment updates and implications. *Nber Working Paper Series*. National Bureau of Economic Research.
- Fry, R. (2002). Latinos in higher education: many enroll, too few graduates. The Paw Hispanic Center.
- Grebennikov, L. & Skaines, I. (2007). Comparative analysis of student surveys on international student experience in higher education. *Journal of Institutional Research*. 13(1), 97–116.
- Gurin, P., Dey, E. L., Hurtado, S., & Gurin, G. (2002). Diversity and higher education: Theory and impact on educational outcomes. *Harvard Educational Review*. 72(3), 330-366.
- Hellstén, M. (2005). *Students in transition: Needs and experiences of international students in Australia*. Retrieved from http://www.aiec.idp.com/pdf/Hellsten_p.pdf
- Johnstone, B. (1998). The financing and management of higher education: A status report on worldwide reforms. *The Finance and Management of Higher Education*. Retrieved from <http://www.worldbank.org/html/extdr/educ/postbasc.html>
- Kennedy, G., Krause, K., Judd, T., Churchward, A., & Gray, K. (2006). First year students' experiences with technology: Are they really digital natives? Retrieved from https://www.griffith.edu.au/_data/assets/pdf_file/0008/39266/NativesReport.pdf
- Nilsson, J. E., Berkel, L. A., Flores, L. Y., & Lucas, M. S. (2004). Utilization Rate and presenting concerns of international students at a university counseling center: Implications for outreach programming. *Journal of College Student Psychotherapy*. 19(2), 49-59.

- Mary E. Pritchard Gregory S. Wilson (2003). Using emotional and social factors to predict student success. *Journal of College Student Development*. 44(1), 18-28.
- Pereda, M., Airey, D. & Bennett, M. (2007). Service quality in overseas education: The experience of overseas students. *Journal of Hospitality, Leisure, Sport and Tourism Education*. 6(2), 55 – 67.
- Skiba, J. R. (2002). Special education and school discipline: A precarious balance. *Behavioral Disorders*, 27(2), 81–97.
- Swail, W. S., Redd, K. E. & Perna, L. W. (2003). Retaining minority students in higher education. *ASHE-ERIC Higher Education Report*. 30(2), 1-187.
- Thomas, L., Quinn, J., Slack, K., & Casey, L. (2002). Student service: Effective approaches to retaining students in higher education. Retrieved from <http://www.staffs.ac.uk/access-studies/docs/SSReport.pdf>
- Trice, A. G. (2003). Faculty perceptions of graduate international students: The benefits and challenges. *Journal of Studies in International Education*. 7(379), 378-403.
<https://doi.org/10.1177/1028315303257120>
- Verbik, L. & Lasanowski, V. (2007). International student mobility: Patterns and trends. *The Observatory on Borderless Higher Education*. 1-48. Retrieved from http://www.eua.be/fileadmin/user_upload/files/newsletter/International_Student_Mobility_-_Patterns_and_Trends.pdf
- Williams, J. B. & Jacobs, J. (2004). Exploring the use of blogs as learning spaces in the higher education sector. *Australasian Journal of Educational Technology*. 20(2), 232-247.
- Zhai, L. (2004). Studying international students: Adjustment issues and social support. *Journal of International Agricultural and Extension Education*. 11 (1), 97-104.

(IJ-06) Achieving Sustainable Global Industrialization Through Advanced Manufacturing Technologies: A Post-COVID-19 Case Study of Tesla

Yiran Li

The Webb Schools

Pengda Sun

DBA candidate, Alliant International University

ABSTRACT

The global pandemic in the past three years highlighted the significance of establishing resilient and sustainable supply chains in the automotive industry and accelerated the adoption of advanced manufacturing technologies. This study utilizes Tesla as a case study to examine the role of advanced manufacturing technologies in achieving sustainable global industrialization in the post-COVID-19 era. The research explores the challenges and opportunities Tesla faces in pursuing sustainable global industrialization and how the company uses advanced manufacturing technologies to strengthen competitiveness, efficiency, and sustainability. The study uses a qualitative case analysis method to examine Tesla's advanced characteristics, including manufacturing technologies, supply chain strategy, and the impact of policy and regulation on technology adoption. The research also assesses the benefits and potential drawbacks of these technologies on Tesla's competitiveness, sustainability, and resilience and analyzes the company's supply chain management to evaluate its contribution to post-COVID-19 sustainability and competitiveness. The study also discusses the influence of government policies and regulations on Tesla's global expansion.

Keywords: global industrialization, global supply chain, advanced manufacturing technologies, post-covid-19

INTRODUCTION

The COVID-19 pandemic has profoundly impacted global supply chains and manufacturing industries worldwide and highlighting the need for more resilient and flexible supply chains and advanced manufacturing technologies that can adapt to sudden changes and disruptions (Arntz et al., 2016; Allwood et al., 2011). The automotive industry has been one of the sectors most affected by the pandemic, with production disruptions and supply chain challenges affecting companies worldwide (Ivanov & Dolgui, 2020). However, Kumar et al. (2020) also indicated that Tesla, a leader in the global new energy vehicle industry, has shown remarkable resilience and innovation in responding to the challenges post-COVID-19. Tesla's strict corporate management, supply chain, advanced technologies, and market leadership have enabled it to respond effectively to the pandemic's impact and continuously optimize its manufacturing processes and innovations (Tukker, 2015; Ivanov & Dolgui, 2020).

This study aims to explore the role of advanced manufacturing technologies in achieving sustainable global industrialization in the post-COVID-19 era, specifically focusing on Tesla's experience. By analyzing Tesla's case, this study is to identify the company's strengths and opportunities and inspire other advanced manufacturing industries to innovate and adapt to the changing global landscape (Wu et al., 2022; Singh et al., 2023).

LITERATURE REVIEW

Global industrialization, the worldwide expansion of industrial production and manufacturing, has been a critical driver of economic growth and development over the past century (Manyika et al., 2017; Gambhir et al., 2019). The growth of industrialization has been closely linked to the development of global supply chains and trade and the adoption and development of advanced manufacturing technologies (Jovane et al., 2008; Liao et al., 2017). The connection between global industrialization, sustainability, and advanced manufacturing technologies has garnered significant attention in recent years, particularly during the COVID-19 pandemic (Manyika et al., 2017). As global industries desire to pursue economic growth with environmental and social considerations,

advanced manufacturing technologies have arisen as a critical driver of sustainable global industrialization (Gambhir et al., 2019; Jovane et al., 2008).

Advanced manufacturing technologies, encompassing automation robotics, additive manufacturing, digital operation, data analysis, and artificial intelligence, are at the forefront of the Industry 4.0 revolution (Liao et al., 2017). These technologies enhance productivity, efficiency, and adaptability while raising situations about labor displacement and environmental impact (Frey & Osborne, 2017; Bughin et al., 2018). For instance, adopting robotics and automation can lead to job losses, and organizations and industries need to develop strategies for workforce retraining and technology development (Arntz et al., 2016).

The adoption of advanced manufacturing technologies can lead to increased resource efficiency, reduced waste, and improved environmental performance (Jovane et al., 2008; Allwood et al., 2011). Organizations that adopt sustainable manufacturing techniques can optimize their production processes and minimize their environmental impression while remaining competitive in a rapidly changing global market (Mangram, 2012; Despeisse et al., 2015).

Circular economy principles, which highlight the need to reduce resource consumption and waste generation, have become increasingly relevant in advanced manufacturing technologies (Geissdoerfer et al., 2017). By integrating circular economy concepts into their operations, companies can further enhance the sustainability of their manufacturing processes, extending product lifecycles and having better control of overall environmental impact (Lieder & Rashid, 2016; Tukker, 2015).

In order to achieve global industrialization, supply chain resilience has arisen as a critical aspect of post-COVID-19 industrialization, with advanced manufacturing technologies playing a central role in enabling organizations to adapt to disturbances and uncertainties (Ivanov & Dolgui, 2020). By investing in advanced manufacturing technologies and adopting innovative supply chain strategies, organizations can enhance their competitiveness and sustainability in the face of ongoing global challenges (Wu et al., 2022; Singh et al., 2023).

Digital technologies, such as the Internet of Things (IoT), big data analytics, and artificial intelligence, are increasingly being leveraged to improve global operations and supply chains, allowing organizations to track and manage their procedures more accurately and respond to disruptions more rapidly (Kamilaris et al., 2019; Queiroz et al., 2019). These digital technologies help to mitigate risks and enhance the resilience of global supply chains, contributing to sustainable industrialization (Ivanov et al., 2019).

Government guidance and support are instrumental in promoting adopting of advanced manufacturing technologies and transitioning to Industry 4.0 (Rüßmann et al., 2015). Governments provide various supports, such as research and development funding, infrastructure investments, and regulatory incentives, to encourage the possibility of advanced manufacturing and sustainable industrialization (Zhou et al., 2009). Policy interventions can facilitate the expansion of innovative organizations into global markets and emphasize the significance of government-industry collaboration in fostering innovation and sustainability (Teixeira et al., 2022). The role of government support extends beyond direct financial assistance and includes the creation of an enabling environment for advanced manufacturing through regulatory frameworks, standards development, and workforce training initiatives (Rüßmann et al., 2015; Baily & Bosworth, 2014). By fostering a supportive ecosystem for advanced manufacturing, governments can facilitate the growth of innovative industries and help to drive sustainable global industrialization (Tassey, 2014).

In addition to government support, collaboration between industry, academia, and research institutions is essential for advancing the development and adoption of advanced manufacturing technologies (Lee et al., 2015). Such partnerships can help bridge knowledge gaps, accelerate the transfer of technology, and promote innovation, ultimately contributing to sustainable global industrialization (Tidd & Bessant, 2018).

These key concepts provide a valuable context for understanding the role of advanced manufacturing in achieving sustainable industrialization in the post-COVID-19 era. By examining the benefits and challenges associated with these technologies, as well as the role of government

support, supply chain resilience, and industry collaboration, this research contributes to the broader discourse on the role of Industry 4.0 in achieving sustainable global industrialization.

TESLA'S ADVANCED MANUFACTURING TECHNOLOGIES

Tesla has been implementing advanced manufacturing technologies to improve its operations and overcome challenges posed by the COVID-19 pandemic. These technologies include robotics, automation, machine learning, the Internet of Things (IoT), and artificial intelligence (AI).

One of the critical manufacturing innovations implemented by Tesla is the Gigafactory, which is a large-scale manufacturing facility designed to produce batteries for electric vehicles. The facility incorporates advanced data analytics and machine learning algorithms to optimize production processes, enabling Tesla to scale up its production capacity while reducing costs rapidly. The Gigafactory has also enabled Tesla to reduce its carbon footprint by producing batteries using renewable energy sources such as solar and wind power (Cooke, 2020). The Gigafactory has enabled Tesla to produce electric vehicles more sustainably, utilizing renewable energy sources and minimizing material waste, thus improving its environmental sustainability (Goldhammer et al., 2021).

Another significant manufacturing technology utilized by Tesla is the Giga Press. The Giga Press is a proprietary machine manufacturing large structural components for its electric vehicles. The Giga Press enables Tesla to produce large parts, such as the Model Y's rear underbody, in a single piece, reducing manufacturing time and minimizing waste. The utilization of the Giga Press enables Tesla to simplify its manufacturing processes and reduce its overall carbon footprint by minimizing material waste and energy consumption (Shao et al., 2021).

Furthermore, Tesla is also implementing AI and IoT technologies to enhance its manufacturing processes. For instance, Tesla has deployed factory robots to perform repetitive and complex tasks. This approach has enabled Tesla to improve the safety of its workers while increasing production efficiency (Ajitha & Nagra, 2021). In addition, Tesla is also utilizing IoT technologies to collect data from its production processes and analyze them to identify areas for optimization. Through

this approach, Tesla has identified areas of waste, reduced downtime, and improved production efficiency (Liu et al., 2022).

Implementing advanced manufacturing technologies has enabled Tesla to overcome challenges posed by the COVID-19 pandemic. For instance, automation and robotics have enabled Tesla to reduce the need for human labor and adhere to social distancing guidelines, thereby reducing the risk of virus transmission (Shiddiq, 2020). Additionally, deploying IoT technologies and machine learning algorithms has enabled Tesla to optimize its production processes remotely, reducing the need for in-person inspections and manual adjustments (Zhou, 2023).

Tesla's utilization of advanced manufacturing technologies has resulted in significant benefits in competitiveness, sustainability, and resilience. The Gigafactory and Giga Press have enabled Tesla to produce electric vehicles more sustainably, utilizing renewable energy sources and minimizing material waste. Utilizing AI and IoT technologies has improved production efficiency and reduced the need for human labor, thereby improving worker safety and reducing the risk of virus transmission. These technological advancements have enabled Tesla to continue to operate effectively during the COVID-19 pandemic and position itself as a leader in the automotive industry.

TESLA'S GLOBAL SUPPLY CHAIN STRATEGY

Tesla's global supply chain strategy has been critical to its success as an electric vehicle manufacturer. The company has implemented a strategy of localizing its supply chains to improve efficiency and reduce costs while increasing its competitiveness and sustainability in the post-COVID-19 era. According to the research from Wang, Qin, and Zhang (2021), Tesla's supply chain vulnerabilities in the Chinese EV market have been a challenge for the company. However, the company has responded by localizing its supply chain to improve stability and reduce risks associated with supply chain disruptions. Chen and Wang (2022) noted that Tesla's supply chain in China has both advantages and disadvantages. However, the company's focus on localizing its supply chain has allowed it to mitigate risks and improve efficiency. The company's commitment to sustainability has also shaped Tesla's approach to supply chain management. As Sytko (2022)

noted, Tesla has implemented a time-based competition strategy in its supply chain to reduce waste and improve efficiency. This approach has enabled the company to reduce its carbon footprint and improve its environmental sustainability.

Moreover, Tesla has been able to leverage its global supply chain to navigate the challenges posed by the COVID-19 pandemic. By localizing its supply chains and reducing its reliance on global suppliers, the company has maintained production levels despite supply chain disruptions. The strategy has been particularly evident in the case of the Chinese super factory, which continued producing cars despite the pandemic-related disruptions in the global supply chain (Du & Li, 2021).

THE ROLE OF POLICY SUPPORT

Government policies and regulations have played a crucial role in shaping the adoption of advanced manufacturing technologies in the electric vehicle industry, including Tesla. Global policies to support the development and adoption of new energy vehicles have been significant, with countries like the US, China, and Europe implementing measures to ensure the production and operation of companies like Tesla during the COVID-19 pandemic. In addition, policies aimed at encouraging the use of advanced manufacturing technologies have provided significant support for Tesla's manufacturing processes.

Wu et al. (2021) argued that China's evolving policy incentives for the sustainable development of electric vehicles have been instrumental in driving the industry's growth. Huang (2022) also highlighted the significance of Tesla's localization strategy in China, which has been supported by Chinese government policies promoting new energy vehicles.

Moreover, policies aimed at promoting sustainable practices and reducing the carbon footprint of manufacturing processes have also influenced Tesla's adoption of advanced manufacturing technologies. As Wu et al. (2022) noted, Tesla's success in driving sustainability and the evolution of electric vehicles is partly due to its adoption of sustainable practices and environmentally friendly technologies.

Therefore, government policies and regulations play a crucial role in shaping the adoption of advanced manufacturing technologies in the electric vehicle industry. These policies provide incentives and support for companies to invest in advanced manufacturing technologies and sustainable practices, enabling them to improve efficiency, reduce costs, and enhance their competitiveness and sustainability in the global market.

LIMITATIONS AND FUTURE RESEARCH

Despite the insights provided by this study, certain limitations should be acknowledged. Primarily, the research's focus on Tesla may only partially represent the experiences of other industries or companies implementing advanced manufacturing technologies. Furthermore, the study does not extensively explore the potential negative consequences of adopting these technologies, such as job displacement and increased reliance on rare materials.

To further enhance the understanding of advanced manufacturing technologies' role in sustainable global industrialization, future research should examine a broader range of industries and companies. Comparative case studies encompassing various sectors and regions could offer valuable insights into diverse applications of these technologies and the extent of government support in different contexts. Additionally, investigating the potential drawbacks of advanced manufacturing technologies and developing strategies for mitigating their adverse effects on the workforce and the environment would contribute to a more comprehensive perspective on sustainable industrialization in the post-COVID-19 era.

CONCLUSION

The study reveals that advanced manufacturing technologies, including robotics, additive manufacturing, digital operations, and artificial intelligence, are instrumental in fostering sustainable global industrialization. Tesla's case serves as a prime example of how the adoption of advanced manufacturing technologies can substantially improve competitiveness, efficiency, sustainability, and resilience in the post-COVID-19 era. The company's Gigafactory and Giga Press, along with its dedication to sustainable practices and innovative supply chain strategies,

have empowered it to navigate the challenges brought forth by the pandemic and maintain its leadership in the electric vehicle industry.

Government policies and regulations are crucial in promoting the adoption of advanced manufacturing technologies and encouraging sustainable industrialization. Government backing through incentives, infrastructure investments, and regulatory frameworks has been pivotal in nurturing the growth and development of pioneering companies like Tesla. Additionally, cooperation between industry, academia, and research institutions is essential for advancing the development and adoption of advanced manufacturing technologies, ultimately contributing to sustainable global industrialization.

The study adds to the larger conversation surrounding the role of advanced manufacturing technologies in achieving sustainable global industrialization in the post-COVID-19 era. It underscores companies' need to invest in advanced manufacturing technologies and embrace innovative supply chain strategies to boost their competitiveness and sustainability amidst ongoing global challenges. Furthermore, it accentuates the significance of government support, policy interventions, and industry collaboration in facilitating the growth of innovative industries and driving sustainable global industrialization.

REFERENCE

Ajitha, P. V., & Nagra, A. (2021). An Overview of Artificial Intelligence in Automobile Industry—A Case Study on Tesla Cars. *Solid State Technology*, 64(2), 503-512.

Allwood, J. M., Ashby, M. F., Gutowski, T. G., & Worrell, E. (2011). Material efficiency: A white paper. *Resources, conservation and recycling*, 55(3), 362-381.

Arntz, M., Gregory, T., & Zierahn, U. (2016). The risk of automation for jobs in OECD countries: A comparative analysis.

- Baily, M. N., & Bosworth, B. P. (2014). US manufacturing: Understanding its past and its potential future. *Journal of Economic Perspectives*, 28(1), 3-26.
- Bessant, J., & Tidd, J. (2007). *Innovation and entrepreneurship*. John Wiley & Sons.
- Bughin, J., Hazan, E., Lund, S., Dahlström, P., Wiesinger, A., & Subramaniam, A. (2018). Skill shift: Automation and the future of the workforce. *McKinsey Global Institute*, 1, 3-84.
- Chen, J., & Wang, S. (2022, April). Research on the Advantages and Disadvantages of Tesla's Supply Chain in China. In *2022 7th International Conference on Social Sciences and Economic Development (ICSSSED 2022)* (pp. 731-735). Atlantis Press.
- Cooke, P. (2020). Gigafactory logistics in space and time: Tesla's fourth gigafactory and its rivals. *Sustainability*, 12(5), 2044.
- Despeisse, M., Oates, M. R., & Ball, P. D. (2013). Sustainable manufacturing tactics and cross-functional factory modelling. *Journal of Cleaner Production*, 42, 31-41.
- Du, X., & Li, B. (2021). Analysis of Tesla's Marketing Strategy in China. In *2021 3rd International Conference on Economic Management and Cultural Industry (ICEMCI 2021)* (pp. 1679-1687). Atlantis Press.
- Frey, C. B., & Osborne, M. A. (2017). The future of employment: How susceptible are jobs to computerisation?. *Technological forecasting and social change*, 114, 254-280.
- Gambhir, A., Rogelj, J., Luderer, G., Few, S., & Napp, T. (2019). Energy system changes in 1.5 C, well below 2 C and 2 C scenarios. *Energy Strategy Reviews*, 23, 69-80.
- Geissdoerfer, M., Savaget, P., Bocken, N. M., & Hultink, E. J. (2017). The Circular Economy—A new sustainability paradigm?. *Journal of cleaner production*, 143, 757-768.

- Goldhammer, T., Höhne, A., Kleine, L., Kronsbein, A. L., Lewandowski, J., Mehner, T., Müller, B. M., Pusch, M., Reith, C. J., Schulz, H., & Spahr, S. (2021). The Berlin-Brandenburg region and the Tesla Gigafactory. IGB Leibniz Institute of Freshwater Ecology and Inland Fisheries. <https://www.igb-berlin.de/en/news/berlin-brandenburg-region-and-tesla-gigafactory>
- Graham, J. D., Belton, K. B., & Xia, S. (2021). How China beat the US in electric vehicle manufacturing. *Issues in Science and Technology*, 37(2), 72-79.
- Huang, J. (2022). Brand marketing strategy of new energy vehicles in the Chinese market-taking Tesla as an example. *Journal of Buddhist Education and Research*, 8(3), 128-134.
- Ivanov, D., & Dolgui, A. (2020). Viability of intertwined supply networks: extending the supply chain resilience angles towards survivability. A position paper motivated by COVID-19 outbreak. *International Journal of Production Research*, 58(10), 2904-2915.
- Ivanov, D., Dolgui, A., & Sokolov, B. (2019). The impact of digital technology and Industry 4.0 on the ripple effect and supply chain risk analytics. *International Journal of Production Research*, 57(3), 829-846.
- Jovane, F., Yoshikawa, H., Alting, L., Boer, C. R., Westkamper, E., Williams, D., ... & Paci, A. M. (2008). The incoming global technological and industrial revolution towards competitive sustainable manufacturing. *CIRP annals*, 57(2), 641-659.
- Kamilaris, A., Fonts, A., & Prenafeta-Boldó, F. X. (2019). The rise of blockchain technology in agriculture and food supply chains. *Trends in Food Science & Technology*, 91, 640-652.
- Lee, J., Bagheri, B., & Kao, H. A. (2015). A cyber-physical systems architecture for industry 4.0-based manufacturing systems. *Manufacturing letters*, 3, 18-23.

- Liao, Y., Deschamps, F., Loures, E. D. F. R., & Ramos, L. F. P. (2017). Past, present and future of Industry 4.0-a systematic literature review and research agenda proposal. *International journal of production research*, 55(12), 3609-3629.
- Lieder, M., & Rashid, A. (2016). Towards circular economy implementation: a comprehensive review in context of manufacturing industry. *Journal of cleaner production*, 115, 36-51.
- Liu, Y., Shen, Y., Zhang, L., & Zhang, Y. (2022, December). A Comprehensive Analysis of Tesla. In *2022 2nd International Conference on Financial Management and Economic Transition (FMET 2022)* (pp. 344-356). Atlantis Press.
- Mangram, M. E. (2012). The globalization of Tesla Motors: a strategic marketing plan analysis. *Journal of Strategic Marketing*, 20(4), 289-312.
- Manyika, J., Lund, S., Chui, M., Bughin, J., Woetzel, J., Batra, P., ... & Sanghvi, S. (2017). Jobs lost, jobs gained: Workforce transitions in a time of automation. *McKinsey Global Institute*, 150.
- Queiroz, M. M., Ivanov, D., Dolgui, A., & Fosso Wamba, S. (2022). Impacts of epidemic outbreaks on supply chains: mapping a research agenda amid the COVID-19 pandemic through a structured literature review. *Annals of operations research*, 319(1), 1159–1196. <https://doi.org/10.1007/s10479-020-03685-7>
- Rüßmann, M., Lorenz, M., Gerbert, P., Waldner, M., Justus, J., Engel, P., & Harnisch, M. (2015). Industry 4.0: The future of productivity and growth in manufacturing industries. *Boston consulting group*, 9(1), 54-89.
- Shao, X., Wang, Q., & Yang, H. (2021). Business Analysis and Future Development of an Electric Vehicle Company--Tesla.

- Shiddiq, M. (2020). Case Study of Tesla, Inc. as Dynamic Organization in Automotive Industry and How It Acts Amidst COVID-19 Epidemic. *Inc. as Dynamic Organization in Automotive Industry and How It Acts Amidst COVID-19 Epidemic (April 30, 2020)*.
- Singh, G., Rajesh, R., Daultani, Y., & Misra, S. C. (2023). Resilience and sustainability enhancements in food supply chains using Digital Twin technology: A grey causal modelling (GCM) approach. *Computers & Industrial Engineering, 179*, 109172.
- Sypko, D. (2022). Time-Based Competition in Tesla's Supply Chain in the Era of Industry 4.0.
- Tassey, G. (2014). Competing in advanced manufacturing: The need for improved growth models and policies. *Journal of Economic Perspectives, 28*(1), 27-48.
- Teixeira, J. E., & Tavares-Lehmann, A. T. C. (2022). Industry 4.0 in the European union: Policies and national strategies. *Technological Forecasting and Social Change, 180*, 121664.
- Tukker, A. (2015). Product services for a resource-efficient and circular economy—a review. *Journal of cleaner production, 97*, 76-91.
- Wang, Y., Qin, S., & Zhang, C. (2021). Tesla's Supply Chain Vulnerabilities in the Chinese EV market. *Frontiers in Economics and Management, 2*(4), 102-112.
- Tao, F., Qi, Q., Liu, A., & Kusiak, A. (2018). Data-driven smart manufacturing. *Journal of Manufacturing Systems, 48*, 157-169.
- Wu, Y. A., Ng, A. W., Yu, Z., Huang, J., Meng, K., & Dong, Z. Y. (2021). A review of evolutionary policy incentives for sustainable development of electric vehicles in China: Strategic implications. *Energy Policy, 148*, 111983.
- WU, Z. Q., NGUYEN, P. Q., PHANKASEMSAN, I., & WOLF, E. (2022). Driving Sustainability and Electric Vehicles Evolution: Tesla Company's Success Strategies.

Zhou, H., Leong, G. K., Jonsson, P., & Sum, C. C. (2009). A comparative study of advanced manufacturing technology and manufacturing infrastructure investments in Singapore and Sweden. *International Journal of Production Economics*, 120(1), 42-53.

Zhou, Y. (2023). Tesla's Strategies to Achieve Positive Growth for Production and Sales During the COVID-19 Epidemic. In *SHS Web of Conferences* (Vol. 154, p. 02024). EDP Sciences.

(IJ-07) Public Finance Choice and Citizens' Involvement: The Resource Curse of Libya

Hussein Elkamel

Assistant professor of Economics, The College of Law, Sultan Qaboos University

Amer Ahmed Ahmadi

Ph.D. candidate, Leadership, The School of Management and Leadership, Alliant International University

ABSTRACT

Libya is an oil-dependent country that relies heavily on oil sales and neglects to use other public finance sources, besides being one of the highest corrupt governments worldwide. The study investigates the assumption that the Libyan government's significant reliance on oil revenues in a way that reduces citizens' involvement leads to poor institution persistence and results in a resource curse. The study tests the relationship between oil revenue share of total revenue, multiple institutional indices, and resource curse utilizing a dataset from 1984-2019.

The results indicate that the government's decision to increase reliance on oil revenues directly contributes to the resource curse and indirectly through a poor institution that prospers with decreasing financial burdens on citizens. Ultimately, the choice of government on public finance contributes to the poor institutions prevailing.

INTRODUCTION

Libya exemplifies the literature findings that oil resource is a curse for some developing countries rather than a blessing (Ploeg 2011) (Sachs & Warner, 1995). Resource wealth encourages rent-seeking and corruption activities that hurt institutions (IMF, 2012) and consequently lower growth (Beck & Laeven, 2006). Corruption is a cumbersome Libyan obstacle, with no significant

improvement against corruption over the last decade (TI, 2021). However, oil countries with better economic and institutional conditions tend to grow well (Arezki & Brückner, 2012).

The quality of institutions in oil-dependent countries is the key switch to the resource curse and considerably reduces economic growth (Tornell & Lane , 1999). The resource wealth tends to lower the aggregate income of individuals and firms where the institution is vulnerable (Mehlum, Moene, & Torvik, 2006) and causes excessive public sector employment and patronage (A.Robinson, Torvikb, & Verdierc , 2006). Resource wealth abundance and poor institutions are correlated (Anthonsen, Löfgren, Nilsson, & Westerlund , 2012), and lousy institution drives the resource curse, creating an environment that leads poor institutions to persist (Wiens, 2013).

Corruption is one of the significant issues in the Libyan economy that scores among the worst countries regionally and internationally (TI, 2021). The level of accountability among government officials towards their citizens is low. According to the Libyan Audit Bureau (LAB) in the General Annual Report, public corruption consumes most of the country's resources. The LAB has announced that the financial corruption cases in 2015 reached 102 files in which 483 public officials were involved. Financial corruption is just one out of 18 chapters that the auditing report on corrupt activities covers. The LAB's report released in September 2022 confirmed the non-improvement in government transparency and anti-corruption actions.

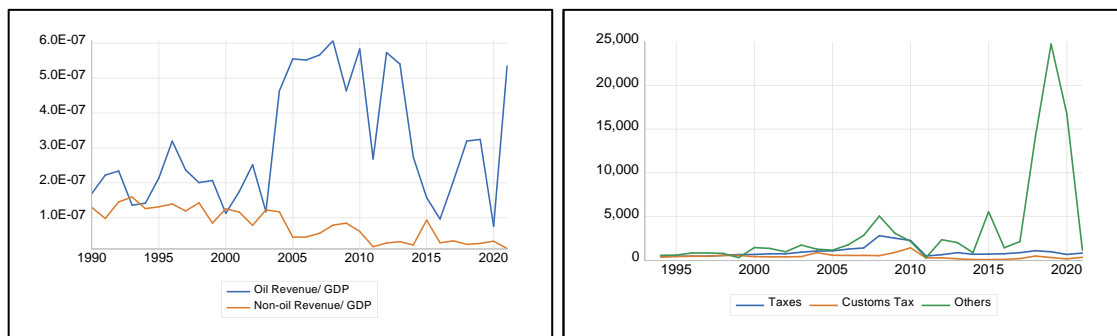
Holding government officials accountable is a societal process that can be strengthened or weakened according to the interactivity between the government and its citizens (Ross, 2004). However, this interactivity puts more pressure on the government's accountability and transparency, which the Libyan government hypothetically doesn't favor. Thus, the government loses the ability to develop non-oil resource revenues such as taxes. Taxes collection procedures require the government's effective interaction with its citizens and firms. Despite the financial conflict of interest between the government and taxpayers, the government will keep enhancing and responding to economic and social taxpayers' needs to ensure tax collection stability. Taxpayers will get more involved in government spending and demand higher accountability from the

government. A government that transparently communicates with its society regarding tax will contribute to greater government accountability (Boogaard, Prichard, Beach, & Mohiuddin, 2021).

The relationship between the institution and a resource curse can take two-way causality; it can be a poor institution causing a resource curse or a resource wealth creating an evil institution. But why is the institution flawed, or do Libyan citizens not fight strongly enough for a better institution? We assume that both sides of the deal (i.e., government and society) are in equilibrium; that is, the government's public finance choice is made to reduce citizens' involvement, and the citizens enjoy low financial burdens. In return, the citizens don't demand accountability. Libya's unsuccessful anti-corruption attempts potentially refer to forces that keep this statement in balance. Thus, this study investigates the collaborative relationship between public finance sources and institutions. It is more about the interaction effect of institutions and the government's ability to finance its budget independently of its citizens. *Perhaps, their long-run relationship locks the Libyan economy within the most corrupt countries in the world.*

GOVERNMENT REVENUES, CORRUPTION, AND RESOURCE CURSE IN LIBYA

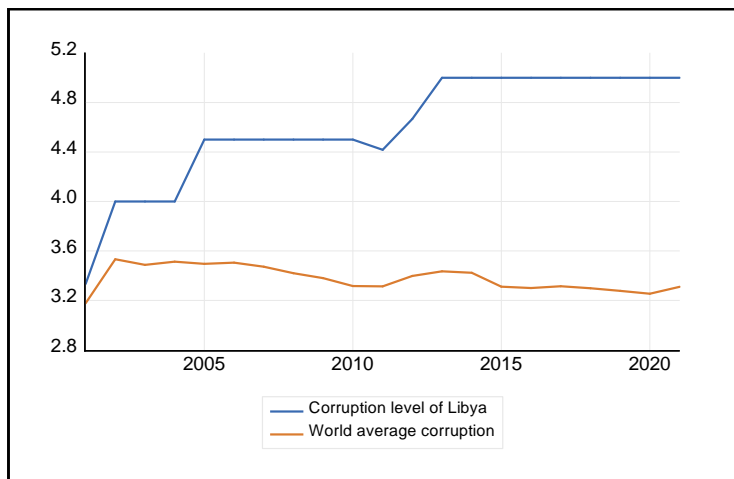
Public finance, corruption, and cursed oil are all critical indicators for the Libyan economy. Oil revenues have dominated revenue resources for the Libyan government. Graph 1 contains two figures; the Libyan government's oil and non-oil revenues relative to the GDP through 1990-2021, and the non-oil revenues in its three classifications Taxes, Custom Taxes, and Others 1994-2021. The trend of non-oil revenues from 1990-2020 is decreasing relative to the country's GDP, while oil revenues fluctuate considerably through the same period. Presumably, governments intentionally give up the potential benefits of non-oil resources to avoid societal pressure and simultaneously accept the anxiety of oil market instability.



Graph 1: Libyan government revenue sources

We observe that "others" as a source of revenues is the most active and leading measure relative to the two taxes measures. Others include gains the Libyan government obtained from sources other than taxes, except for taxes imposed on foreign currency sales since 2018³. The taxes and custom taxes reveal that no noticeable improvements are achieved despite GDP growth. The crumbling of oil revenues over the period should create an ambition to develop non-oil revenues, but the government has neglected them (Knack, 2009).

At the same time, corruption in Libya is high and relatively above average worldwide. The Corruption Index is an assessment of corruption within the political system. Graph 2 indicates that the level of corruption in Libya is high and above average world corruption and has tended to increase over past decades. Regarding Graph 1, Libyan officials' choice⁴ to be over-dependent on oil revenue is associated with ongoing corruption activities and refers to the country's oil-cursed experiences. In practice, officials are more concerned about oil prices in the world market than they regard the conditions of the local economy. In addition, the officials are not asking people to participate financially in government spending and are expected not to object to officials' use of oil resources.



³ Taxes imposed on foreign currencies sold by CBL to reduce the gap in the Libyan exchange market between formal and parallel exchange rates.

⁴ The government has the sovereignty to develop taxes and other non-oil revenues but the choice through decades has been to neglect non-oil sources.

Graph 2: Libyan corruption level and the world corruption level by ICRG.

Figure 3 below presents pairs of observations of oil and non-oil revenues as a share of the GDP with corruption levels⁵ in Libya, along with a regression fitted line. The two figures indicate that from 1984-2021, oil revenues and good governance are negatively correlated, and non-oil revenues and better governance are positively correlated.

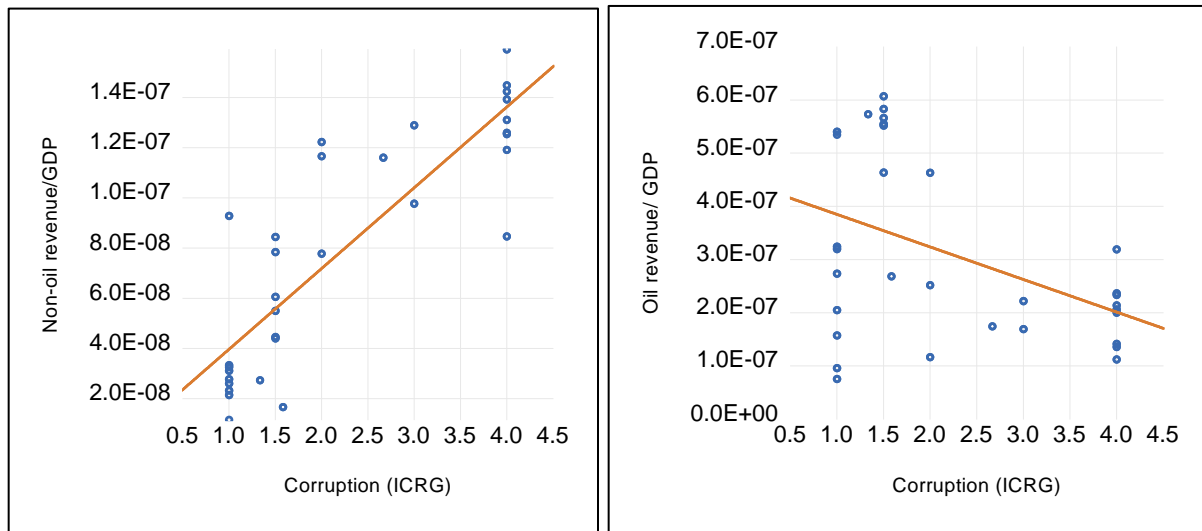


Figure 3: Oil and non-oil revenues and corruption in Libya 1984-2021

DATA

Brief definitions and sources are in the appendix of all variables used in the analysis. The independent variables consist of critical variables related to the research question and other control variables that may explain some of the dependent variable variations. The institutional indicators are obtained from ICRG risk indicators, including a *composite institutional index*, *corruption*, *government stability*, *democratic accountability*, and *investment profile risk*. The *composite institutional risk* is a 12 Political risk indicator that gives an overview of Libya's institutional quality.

Other institutional variables within *the composite index* indicate government-citizens' institutional relationship. *The government stability* indicator measures the connectivity between the

⁵ High values of corruption refer to low risk of corruption and low values refer to high risk of corruption.

government and its people by measuring its popular support. *The investment profile index* measures the investment risk due to expropriation, profit repatriation, and payment delays; in the Libyan context, as the government relies less on revenues obtained from businesses, the government is more likely to risk businesses' investment at its private gains. *The corruption index* is a measure of corruption in the political system. With its disregard for non-oil revenues, the Libyan government is more likely to commit corrupt activities. Finally, *democratic accountability* measures how responsive a government is to its people, which is presumed to be low in a government that relies heavily on oil sales and minimizes taxes on its people as the Libyan government does.

The variable on government revenues is *oil revenues to total* government revenues. The variable should show the government's tendency to obtain revenues without interacting with its people. At the same time, the government can impose taxes and other types of payments on its people. *Openness* is import plus export to the GDP of the Libyan economy, with high dependence on oil; this variable is assumed to explain part of the variations in the dependent variable statistically. *Government spending* is included to control the size of the government, which contributes resource curse as the country suffers from an inflated public sector. Lastly, the *regime change* is a dummy variable that takes zero before 2011 and one from 2011 and on. The variable is to account for the regime effect on the resource curse and whether the resource curse is a result of a regime or not.

METHOD

The methodology intends to test whether the Libyan officials' choice of public finance contributes to the poor institution, which in turn causes a resource curse. The study examines the combined effects of the Libyan government revenue structure with multiple institutional indicators on the resource curse. To proceed with this test, we utilize the following simple time series regression model:

$$\begin{aligned} Oil\ Rent_t = & \alpha + oil\ revenue\ share_t + institutions_t + oil\ revenue\ share * institution_t \\ & + Controls_t + \varepsilon \end{aligned}$$

The oil rent is the measurement of the resource curse. The oil revenue share of total revenue is expected to have a positive effect on the resource curse. Whereas institutional indicators should have a negative impact as the indicators' high values represent low risk and low values represent a high risk. The primary focus is on the interaction variables that will show the impact of government intensity of using oil resources and the separability from its people that comes with it over the resource curse in Libya.

RESULTS

Table 1 presents five models of regression analysis investigating the direct effect of oil revenues' reliance on oil rent and the indirect impact through the five different institutional indexes. The first observation is that the results in all five models are consistent in terms of coefficient signs and significance. *Openness* has a positive and significant effect on oil rent through all models, which is expected as the country's export and import relies heavily on oil sales. *Government spending* has no considerable impact through models. The *regime change* indicator in all models has a negative sign and statistical significance that may indicate some benefit of regime change on reducing resource curse.

Table 1: OLS time series regression: oil rent, institutions, and oil revenue (1990-2021)

CONSTANT	1.84 (0.00)	1.857 (0.00)	2.097 (0.00)	1.934 (0.00)	1.911 (0.00)
OPENNESS	0.019 (0.03)	0.014 (0.09)	0.019 (0.02)	0.018 (0.03)	0.020 (0.02)
GOV SPENDING	-3.27E-06 (0.63)	-3.67E-06 (0.53)	4.72E-06 (0.45)	-6.10E-06 (0.29)	-3.39E-06 (0.58)
REGIME CHANGE	-0.350 (0.01)	-0.349 (0.01)	-0.369 (0.00)	-0.406 (0.00)	-0.356 (0.01)
OIL REV	2.497 (0.00)	2.456 (0.00)	2.152 (0.00)	2.415 (0.00)	2.414 (0.00)
COMPOSITE INST	0.011 (0.45)				
OIL*COMPOSITE INST	-0.014 (0.02)				

CORRUPTION	0.041				
	(0.76)				
OIL REV*CORRUPTION	-0.417				
	(0.01)				
GOV STABILITY		-0.054			
		(0.38)			
OIL REV*GOV STABILITY		-0.103			
		(0.01)			
DEMO ACCOUNT			0.954		
			(0.00)		
OIL REV*DEMO ACCOUNT			-0.679		
			(0.01)		
INVEST PROFILE				0.039	
				(0.59)	
OIL REV*INVEST PROFILE				-0.116	
				(0.03)	
R-squared	72%	75%	79%	77%	73%

Note: Dependent variable is *Oil Rent* in log form. All variables are in first different representations due to the existence of first-order unit root, except *Oil Rev & Regime Change*. *P-values* are in parenthesis.

The coefficients on the oil revenue indicator are significant and have the expected sign; that is, as the dependence on oil revenues increases, the resource curse of oil increases. However, this result could have been arising from economic conditions, that is, over-dependent on oil leads the economy to be less efficient and be subject to oil market fluctuations which cause oil to be a curse, not a blessing. Thus, we construct an interaction term between the public finance choice and institutional measures for the Libyan economy and see how both variables collectively contribute to oil rent.

All coefficients on institutions variables are not significant except for the democratic accountability where its sign is positive and contradicts our assumption. However, the interaction coefficients on all models indicate the assumption that oil revenues and institutions collectively contribute to the resource curse in Libya. This reveals that the government's decision to increase

reliance on oil revenue associated with poor institutions has led to resource curse prevalence. Thus, a constructive change in government revenue resources is needed to bring people and the government together to better improve the quality of institutions.

CONCLUSION

The resource curse is a critical issue that faces most oil resource countries at least right after oil discovery when oil revenues crowd out exportable sectors and increase rent-seekers activists around the government (Dutch Dieses). Some oil resource countries experience oil blessing, while others experience oil curse. Several studies reveal that poor institution is the distinguished factor that splits oil resource countries into resource blessing or resource curse once. This study contributes to the relevant literature by investigating the assumption that the oil resource government's official choice to be over-dependent on oil revenue and neglecting other sources that involve citizens' participation is the key that makes poor institutions persist, and so does the oil curse. The study investigates the assumption validity of Libya, but it extends the implications to all oil-over-dependent countries. Despite the oil prices instability and all interruptions to the Libyan government's development plans, the officials, through decades, have kept relying extensively on oil resources and disregarded other sources where citizens' involvement is needed. The regression results on the Libyan economy show that over-reliance on oil revenues leads to a resource curse; in addition, the government's choice of oil over-dependency along with negatively multiple institutional indices negatively contributes to the resource curse Libya through decades.

APPENDIX

Table 2: Variables definitions and sources

Variables	Definitions	Source	Obs.
<i>Oil rent (%GDP)</i>	Oil rents differ between the production value at regional prices and the total production costs.	WDI	31
<i>GDP growth</i>	GDP growth current local currency value	The Central Bank of Libya CBL	31
<i>Openness</i>	Export and import to GDP	WDI	30
<i>Government expenditure</i>	All spending; operational (salaries), development (investment), and contemporary (subsidy).	Ministry of Finance of Libya	38

<i>Composite risk index</i>	The political risk of different 12 components where High values refer to low risk and low values to higher risk.		
<i>Corruption</i>	An indicator of corruption in the political system. High value is the least corruption, and low once is the highest corruption level.	International Country Risk Guide	38
<i>government stability</i>	The risk rating is calculated based on government cohesion, legislative strength, and popular support. High values refer to low risk and low values to higher risk.	International Country Risk Guide	38
<i>democratic accountability</i>	A measure of how responsive government is to its people. High values refer to low risk and low values to higher risk.	International Country Risk Guide	38
<i>investment profile</i>	The risk falls on investment due to contract expropriation, profit repatriation, and payment delays. High values refer to low risk and low values to higher risk.	International Country Risk Guide	38
<i>Oil revenue</i>	Oil revenue collected by the government is represented in national currency.	CBL and the Ministry of Finance	38
<i>Non-oil revenue</i>	Including taxes, customs taxes, and others. Values are national currency.	CBL and the Ministry of Finance	38
<i>Regime change</i>	It takes the value 0 before 2011, and 1 for the 2011 year and on.	Author constructed	38
<i>Taxes</i>	Taxes excluded custom taxes.	CBL	38

REFERENCES

A.Robinson, James, Ragnar Torvikb, and Thierry Verdierc . 2006. "Political foundations of the resource curse." *Journal of Development Economics* 79 (2): 447-468.

Anthonsen, Mette, Åsa Löfgren, Klas Nilsson, and Joakim Westerlund . 2012. "Effects of rent dependency on quality of government." *Economics of Governance* 13: 145-168.

- Arezki, Rabah, and Markus Brückner. 2012. "Commodity windfalls, polarization, and net foreign assets: Panel data evidence on the voracity effect." *Journal of International Economics* 86 (2): 318-326.
- Beck, Thorsten, and Luc Laeven. 2006. "Institution Building and Growth in Transition Economies." *Journal of Economic Growth* 11 (2): 86-157.
- Boogaard, Vanessa van den, Wilson Prichard, Rachel Beach, and Fariya Mohiuddin. 2021. "Enabling tax bargaining: Supporting more meaningful tax transparency and taxpayer engagement in Ghana and Sierra Leone." *Development Policy Review*.
- IMF. 2012. "Macroeconomic Policy Frameworks for Resource-rich Development Countries." August. <https://www.imf.org/external/np/pp/eng/2012/082412.pdf>.
- Knack, Stephen. 2009. "Sovereign rents and quality of tax policy and administration ." *Journal of Comparative Economics* 37: 359-371.
- LAB, Libyan Audit Bureau. 2015. "General Annual Report." Tripoli.
- Mehlum, Halvor, Karl Moene, and Ragnar Torvik. 2006. "INSTITUTIONS AND THE RESOURCE CURSE." *The Economic Journal* (Published by Blackwell Publishing) 116: 1-20.
- Ploeg, Frederick van der. 2011. "Natural Resources: Curse or Blessing?" *Journal of Economic Literature* 49 (2): 366–420.
- Ross, Michael. 2004. "Does Taxation Lead to Representation?" *British Journal of Political Science* 34 (2): 229-249.
- Sachs, Jeffrey D, and Andrew M Warner. 1995. "Natural resource abundance and economic growth." *NBER working paper*.

TI. 2021. *Transparency International, the global coalition against corruption*. Accessed July 13, 2022. <https://www.transparency.org/en/news/cpi-2021-middle-east-north-africa-systemic-corruption-endangers-democracy-human-rights>.

Tornell, Aaron, and Philip R Lane . 1999. "The Voracity Effect." *American Economic Association* 89 (1): 22-46.

Wiens, David. 2013. "Natural resources and institutional development." *Journal of Theoretical Politics* 26 (2): 197-221.

(IJ-08) The Pizza Organization (TPO)

Decision-Based, Analytical Case

Gabriela Delgado Almada

MBA Student (Graduating May 2023)

Dr. J. Rob Handley

Assistant Professor of Leadership and Management, Alliant International University

ABSTRACT

This case study goes into detail about Andrea's experience with IPC company, a restaurant/entertainment business who hired her as a sales associate. Andrea really enjoyed the training days and thought it was very thorough and well explained, but when it came to practice what she was taught, she realized that the type of business conducted during the week did not prepare her for what the weekend challenges were going to be, and brought this up to her management team. The trainer was not appreciative of Andrea criticizing her training methods. However, the trainer did agree to let Andrea shadow her on the weekend shift. It was by analysis and observation that Andrea realized what the training was omitting and what needed to be implemented.

CASE STUDY – IPC TRAINING

When Andrea first started to work for Incredible Pizza Company, she did not have any work, sales, or marketing experience. Her dream was to put herself through college by having a part-time job, as she still lived with her parents. IPC was the first company to give her this opportunity. Andrea had dealt with kids before, as she had volunteered at elementary schools to help with talent shows and had tutored kids in math while she was finishing high school. Fresh out of college, she got a job, thanks to her experience with kids. Little did she know, she was going to be engaged and sell towards adults with kids. This sales associate job was not related to her experience with children.

IPC had a big operation that included dining rooms, buffet, arcade, and parties happening simultaneously throughout the day. Training was done during the week so that Andrea could learn

the operation at a smaller scale and understand the workflow of the operation. Eventually, Andrea had to be thrown into the real challenge on her own; to work on the weekends. While the company dealt with about 2,500 guests on each day of the weekend, weekdays varied more around 300 guests a day, Monday thru Thursday. The weekdays were days that Andrea shadowed her team lead and learned the basics of being a cashier, the membership, and the business. She came into a big surprise on her first weekend day Saturday, during her 12:00 to 8:30pm shift. She saw the lines to get in were out the door. The floors were getting messy because of the amount of traffic, people on the party entrance were coming in with parties of 60-100 people for big reservations, buffet attendants were running around, and arcade attendants were trying to keep up to the customer's needs. Andrea was startled. This was her first day not shadowing her trainer and getting a cash register of her own. This customer pool was not the one she trained with. These people were out on the weekend with big families. They had been waiting in line at least 30 minutes with kids full of energy and excitement. Also, there were not as many weekend coupons or specials to offer when they walked in. People getting to the register did not seem to want to engage in conversation with Andrea. They wanted to pay for their entrance, then rush and move along. She felt exhausted at the end of the day. She was not confident anymore and did not reach her upselling quotas.

With a business-like IPC, within the Entertainment/Restaurant industry, it is expected that weekends and Holidays are the busiest days. One may think that because of this same reason, weekends should not be used for training, especially for new and inexperienced employees like Andrea. She had a different experience on the first day performing her job on her own; completely different to the days she shadowed or was shadowed to learn how the business worked. Andrea needed to be prepared by her trainers and superiors for all kinds of scenarios. She needed to have the preparation necessary to serve the purpose of a sales associate; not just stand there and charge the fee to come in. However, to not upset the customers anymore, nor keep them waiting, Andrea did as a parking garage cashier would do; charge a person and move them along.

IPC seems to believe that training during the most hectic is not effective. The company standards and beliefs are that a person must learn to do things while it is slow and not complicated to learn the true basics. The training is reserved for days where the amount of guest flow is reduced, there are minimal issues, and where the time can be invested for a trainer to shadow new employees and

experience the usual transaction flow. The idea, like when practicing a dance, is that Andrea will learn step-by-step in a slow, no pressure environment, so that when the show begins, she can perform naturally and without hesitation. However, when Andrea expressed her concerns and insecurities to her trainer the next day, the trainer was quick to let the manager know that Andrea was not ready. The manager did however show true concern and asked why; and the sales associate trainer responded, “the weekend flow overwhelmed her, she seem to me like she was ready on our last training on Wednesday, but she claims she would like some more shadowing to be done today.” Being a Sunday, the manager was a little hesitant to waste an extra pair of hands to just “continue to observe and train,” but his trainer did claim that there was a difference between the flow of Wednesdays and weekend days; so, he accepted Andrea’s request.

Andrea was set with the trainer on a Sunday, and the trainer let her know “I cannot go slow, so pay attention.” Andrea now felt both anxious and positively challenged. “I can help the next guest!” The trainer yells as she calls the next person in line because there are multiple cashier stations moving the operation along. Andrea notices a different script, more target focused, rather than engaging, but still friendly. The cashier avoids small talk, moves the conversation along in a fast but engaging way. The cashier focuses the upselling on families with kids or large groups, which there is plenty coming through during the weekend. For single couples or senior guests, she mentions only the benefits of the membership that include a birthday buffet and 5% back in points and excludes explaining the play card specials. Instead, she just asks, “will you be playing today?” Most guests said no. She greets and thanks them for the wait. Instead of asking why they are here today, or how many people are in your group; the trainer counts the group present as they approach and greets them with a “Welcome to IPC, thank you for the wait, 2 adults and 3 kids?” She makes assumptions on what can be perceived already. No transaction takes more than 2 minutes, and the trainer seems to have full control of the flow of the transaction. This was not the way Andrea was trained. Andrea thought she was always supposed to engage the customer and mention all the specials and benefits of becoming a member. However, the trainer is efficient, courteous, quick, and still manages to make her upsells. Andrea started to see that training is just basics and she needed to adjust her own pitches depending on the type of people and type of day. She now had in her mind “should I bring this issue up to management or should I continue to analyze and test my own theories.” She had consequences to consider. If she did not bring it up to management, she

might not be able to verify her theory, and if she was right, then maybe her bringing the issue up would make it better for future hires and trainers. Or she could keep it to herself, not seem ungrateful for the training, and not bother management or the trainers anymore. She could just work on her reputation and on bettering her work performance and be an efficient employee. What should Andrea do?

TEACHING NOTE: TEAM MORALE AND PERSPECTIVES

ABSTRACT

The management team in Incredible Pizza Co. decided to promote their best sales associate from part-time to full-time as a reward for her high performance. The rest of the team now resents her because they believe her to be favored by the managers. The following teaching note attempts to capture what management could have done better and what must be done moving forward for the team to continue to work together and not institute grievances among coworkers.

SYNOPSIS

The membership best-selling cashier got promoted to full time employee, which caused some resentment and jealousy among her peers, who claimed that the promotion was due to favoritism, and not because of achieved goals. Some peers were supporting, but a few are not so convinced and blame their low scores for sales on the low number of hours they get.

Keywords: Jealousy, communication, transparency, sales scores.

Suggested audience: Sales associates, managers, supervisors, HR

LEARNING OBJECTIVES

- Managers will make sure to stop rumors and clarify the reasoning behind the promotion.
- Managers need to encourage the team and be clear about possible rewards from the beginning.

- Sales associates need team building exercises and clarity that the ratings are based on ratios to number of transactions, not related to hours worked.

DISCUSSION QUESTIONS

- Why do certain associates correlate their peers' success as favoritism?
- How did the managers fail to make the process more transparent? Would having the process as a competition for a full-time position motivate the others with low sales?
- How will morale and team spirit be kept amongst the sales associates?
- How can training be improved so that everybody feels appropriately incorporated; whether it is to the team or to the workflow?

PEDAGOGY (TEACHING TIPS)

In TeachThought.com - “We grow teachers,” Terry Heick talks about The Gradual Release of Responsibility Model In 6 Simple Words: “Show me, help me, let me” explaining how it is a teacher’s, or an employer’s responsibility to teach the tasks, but also to slowly make it the student’s or employee’s responsibility. The objective of this method is autonomy and efficiency. It is to be achieved by the person learning the skill, and eventually making them responsible for the understanding and performing of its own. How is this related to the sales associates?

1. Show me: Have all the sales associates been given the same amount of time for training and attention to development as the one getting the most hours?
2. Help me: Practice with the cashiers, role play, give them key points, do it for them, with them, in front of them, introduce them slowly to it.
3. Let me: Allow them to do it on their own and give them key observations and constructive criticism to improve on the spot, or after their individual try. Also, allow

them to see that the cashier that sells two memberships in a four-hour shift, has the same score as the full time selling four in his/her shift.

DISCUSSION QUESTIONS AND SUGGESTED ANSWERS

- Why do certain associates correlate their peers' success as favoritism?
 - As the hours given to a cashier and sales scores are correlated, the cashiers selling more and spending more time at work, make it seem like they spend more time closer to management.
- How did the managers fail to make the process more transparent? Would having the process as a competition for a full-time position motivate the others with low sales?
 - Managers may be focused on praising and rewarding their good assets and promoting healthy competition. They fail to be fair if they were not transparent about what was at stake from the beginning.
- How will morale and team spirit be kept amongst the sales associates?
 - Constant proof that it is all based on a transaction to membership ratio, not correlated to the hours worked. Constructive criticism and attention are necessary for the ones that need it most.
- How can training be improved so that everybody feels appropriately incorporated; whether it is to the team or to the workflow?
 - Managers being too focused on the basic understanding of what the membership benefits are and not how the idea translates to the team, need to incorporate their

vision into the training. Cashier's different scenarios and perspectives of these should be taken into consideration when implementing training.

EPILOGUE

At work, and as managers, you might not feel the need to explain your decisions to your employees, especially the ones that do not perform as well. But it is your job, and in this case, it was Incredible Pizzas Co. managers' task, to give everybody equal attention, opportunity, and full transparency to what is expected of them. There will be a training session for everyone to be aligned and work as a team.

REFERENCES

Heick, T. (2022, January 11). *The gradual release of responsibility model in 6 simple words*.

TeachThought. Retrieved January 29, 2023, from:

<https://www.teachthought.com/pedagogy/gradual-release-responsibility>

(IJ-09) Traffic Congestion and Gridlock Solution Proposal Using Smart Intersections

Dr. Shams Al Ajrawi,

Department of Electrical & Computer Engineering, San Diego State University,
San Diego, CA, USA

Judson Balding,

Department of Electrical & Computer Engineering, San Diego State University,
San Diego, CA, USA

Victor Darakjian,

Department of Electrical & Computer Engineering, San Diego State University,
San Diego, CA, USA

Dr. Aaron Wester

MSDA Program Director, CSML, Alliant International University, San Diego, CA, USA

ABSTRACT

This project attempts to solve the issue of rush hour gridlock in intersections by implementing a hardcoded A.I. that will make decisions on when to turn a certain direction of light green based on queue capacity and predicted incoming traffic flow. The scenario depicted assumes that all vehicles at an intersection are autonomously controlled and operated, and that traffic intersections control the movement of vehicles based on information from adjacent intersections regarding traffic congestion. The project attempts to utilize a NS2 network model to experiment scenarios. Although the simulation does not encompass many practical examples of everyday traffic situations, this report will hypothesize on the appropriate logic needed to meet the expectations of a smart traffic intersection communicating with autonomous vehicles.

INTRODUCTION

According to the Los Angeles based news provider, KTLA, traffic congestion in Los Angeles cost commuters 62 hours and \$968 in 2021 [1]. It goes without saying that metropolitan traffic

infrastructure has not been able to handle high congestion efficiently. This can be seen in most metropolitan traffic statistics, including San Diego [2]. For this project, we will narrow our problem scope to a couple of adjacent intersections and try to make intelligent network decisions to minimize congestion. At a traffic intersection, often congestion can lead into more congestion at other intersections. Assuming autonomous vehicles and smart intersection controls, we want to control traffic light changes to best minimize overflow of congestion into other intersections. Vehicles will need to be instructed from the traffic infrastructure to make various decisions which would be best for the overall traffic situation. The solution presented in this paper will be to prepare an algorithm and system that can predict traffic based on information from other intersections in order to either prepare or prioritize certain routes. Thus, to ensure that no intersection has traffic which would overflow into another intersection. First, we will predetermine a communication protocol to be used with the car/lights interface (Bluetooth, Wi-Fi, etc.). Assess the pros and cons of that protocol. Run some simulations on how the network will handle and redirect traffic. Come up with ideas on how to handle incoming traffic (wait at light, allow to proceed, instruct to take a turn). Also, we would create a general packet format in which the infrastructure could communicate with vehicles and vice versa. This packet structure would be optimized to allow for fast processing of instructions and status.

BACKGROUND

There are a number of factors that can cause traffic congestion and eventual gridlock, and there is absolutely no one solution that will cure all traffic problems. The following opinion article, [6], lays out the sum of contributors based out of Manhattan in New York as too many cars on the road causing blockage and inadequate green time. To back up these opinions the following study expands on this, [7].

There have been other attempts to solve this complex problem and numerous studies have been done on the problem since growing populations in large cities cause increasingly problematic traffic problems. A primary problem outlined by F.V Webster [4] discussed the delay due to cars taking time to accelerate to a normal driving speed as well as the delay in order to create ample

room between cars when starting up again. This combination adds up to wasted green light time that could be used to empty the queue, and instead could cause serious congestion.

The first steps in combating this was a software called TRANSYT developed by D.I. Roberston. This software would try to optimize the traffic time length of a red light based on traffic streams. [5] This is an early solution that was the inspiration for the start of this project. This project will expand the amount of variables needed to make the decision while the early focus is on flow rate.

Other countries have also employed their own solution to climate change which has been said to also aid in traffic due to their relationship. In Asia the method that was adopted is an A.S.I. [8] model which stands for avoid, shift, improve. Avoid means to reduce the number of trips and or implement more work from home, shift means to increase walking or public transportation, and improve means to increase the reliability of electric vehicles. The method that applies to our current project is the shifting to public transportation. While this method would greatly benefit the amount of cars on the road by fitting large sums of people onto one vehicle, the American Culture is one that seems set on owning a personal vehicle and does not seem to encourage public transportation except in older large cities such as New York, Boston and San Francisco. Therefore, it seems more relevant to implement a system that will be useful to the American Society.

DESCRIPTION

The project will attempt to help alleviate the congestion of the everyday traffic at intersections such as during rush hour. The problem that has been noticed by a number of people is that when rush hour traffic comes around during early morning and late afternoon. Then in some intersections there are too many cars that build up in one intersection and while the light is still green. This is a frustrating situation as just sitting while a green light opportunity wastes away, and the situation will continue to worsen as more cars get onto the road. This is also in part due to the timer based light system, where no matter if there are cars queued up or not, the light might turn green for a certain amount of time in a direction.

The solution we proposed is to tap into the possibilities of autonomous cars that also utilize highly accurate GPS location. Each intersection in a large city could read into the amount of cars in each queue and make a decision based on how many cars need to go each way. Even expanding to each neighboring intersection to warn them of incoming large flow of cars. In order to combat this and not allow any backup the intersection would either clear its current queue or stay green for an extended amount of time in order no cars are waiting at the intersection even while the light is green.

Each different iteration of the overall experiment will work with different possible situations and decide what is best for the flow of traffic. The different situations will include:

- Similar car flow rate Northbound and Southbound vs Eastbound and Westbound.
- Northbound and Southbound is experiencing higher car flow than east and west
- Variable North, East, West, and Southbound
- Communication delay if there are too many users

In each of the situations the system would adapt to ensure there is no buildup of cars. It would follow the following logic of Figure 1:

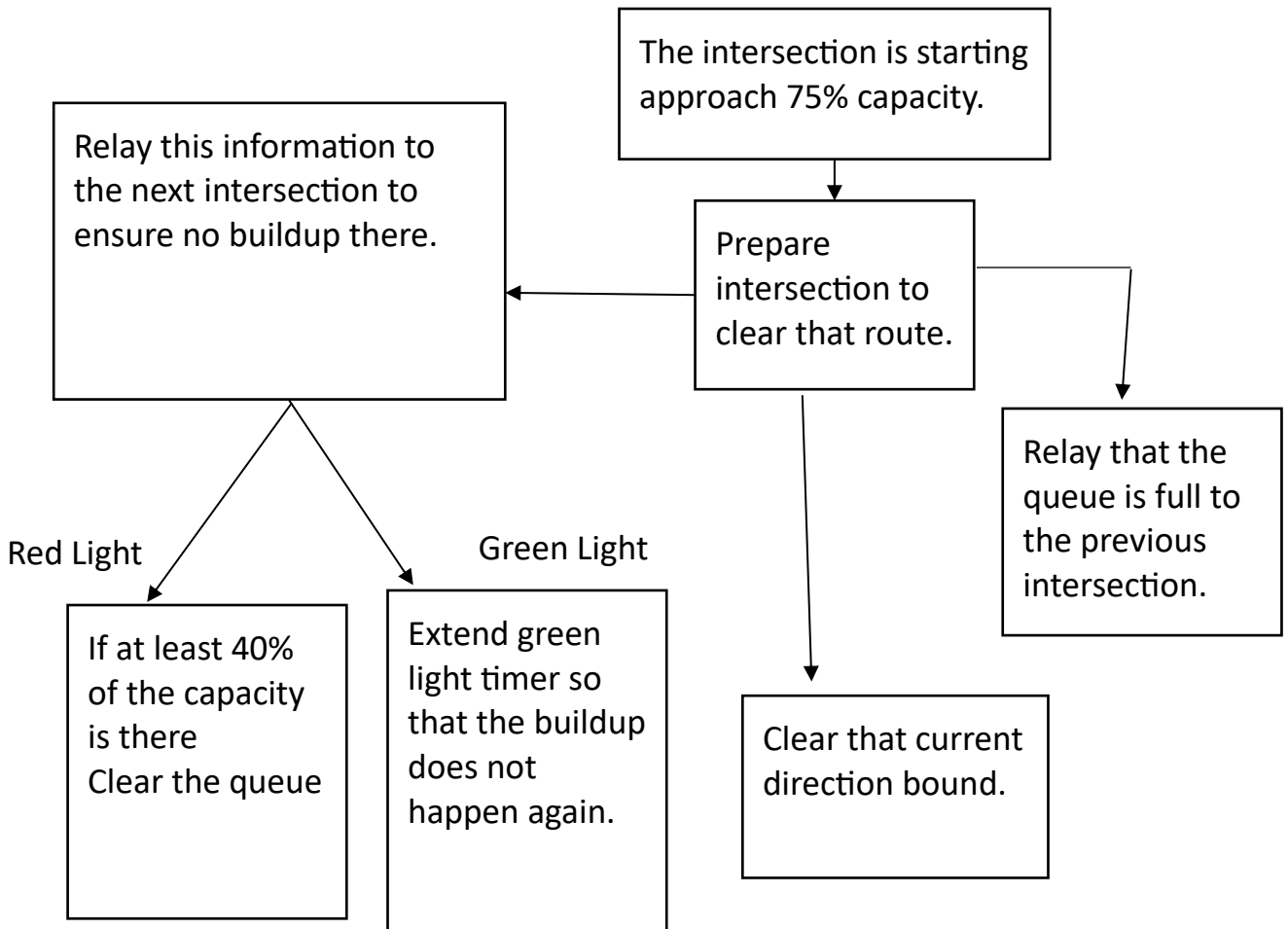


Figure 1: Logic flow diagram for Intersections

This basic logic will ensure that the cars do not build up too much and the problem does not flow into the next intersection. It can also be extended to the previous intersection to relay that the queue in front of it is full and should not turn green until the capacity has been reduced so that there can be opportunity for the other directions to clear their queues in order to not waste time where cars are sitting at a green light not able to move.

Naturally this would not need to be implemented at all times, and only needed during rush hour. Therefore, if there were any restrictions or power limitations the system could be used at certain times such at 7am-10am and 4pm - 7pm and all other times it could be moved to a timer-based system as the traffic would be much lower during the middle of the day.

It should be noted that this is a theoretical idea that can be scaled up to a whole city. Currently the amount of coding and logic would require a large team and logistics as well as the development of new technologies where all cars are able to communicate with each other as well as the intersection they are currently at. Although a more basic version of the project could be accomplished with electromagnetic sensors at the beginning of the intersection and scattered along the queues to give an indication of how many cars are present to give an indication of whether or not the system should start clearing queues. Once a car is detected by the underground electromagnet the system would wait until the second electromagnet detected that a car was at rest right above it. That would tell the system that the queue is getting full and to clear it according to the scenario depicted in Figure 2:

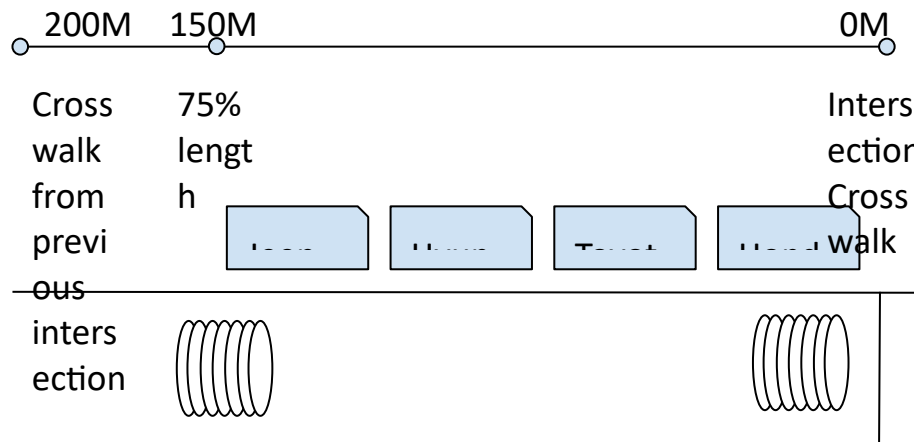


Figure 2: Intersection Congestion Scenario

Foreseeable problems could arise from the digging up of every major intersection in the United States to implement this idea. It would be extremely costly and time consuming as they all could not be done at the same time. In addition, creating road traffic in order to defeat road traffic is rather ironic and should not be implemented unless the construction of roads is starting from scratch such as in planned communities.

EXPERIMENTS

The intersection/vehicle communication network was incorporated into an NS2 simulation. NS2 is a network simulation software that can perform coded network scenarios. The network used for this project contains a minimum of 5 nodes: One main intersection, and four adjacent intersection

nodes (North, South, West, East). The additional nodes will be used to represent the incoming and departing cars at the main intersection. Figure 3 is the graphical output of the tcl code used for the network simulation. The green connection lines are connections between the Main Intersection (node 0) and the adjacent intersection nodes (North = node 1, West = node 3, South = node 2, East = node 4). The remaining nodes are a collection of vehicles coming to the main intersection from various directions. The two vehicles coming from North are nodes 5 and 6, both located at the top-left section of node 0. The two vehicles coming from West are nodes 10 and 9, both located at the bottom-left of the node 0. The two vehicles coming from South are nodes 7 and 8, both located at the bottom-right of the node 0. The two vehicles coming from East are nodes 11 and 12, both located at the top-right of the node 0.

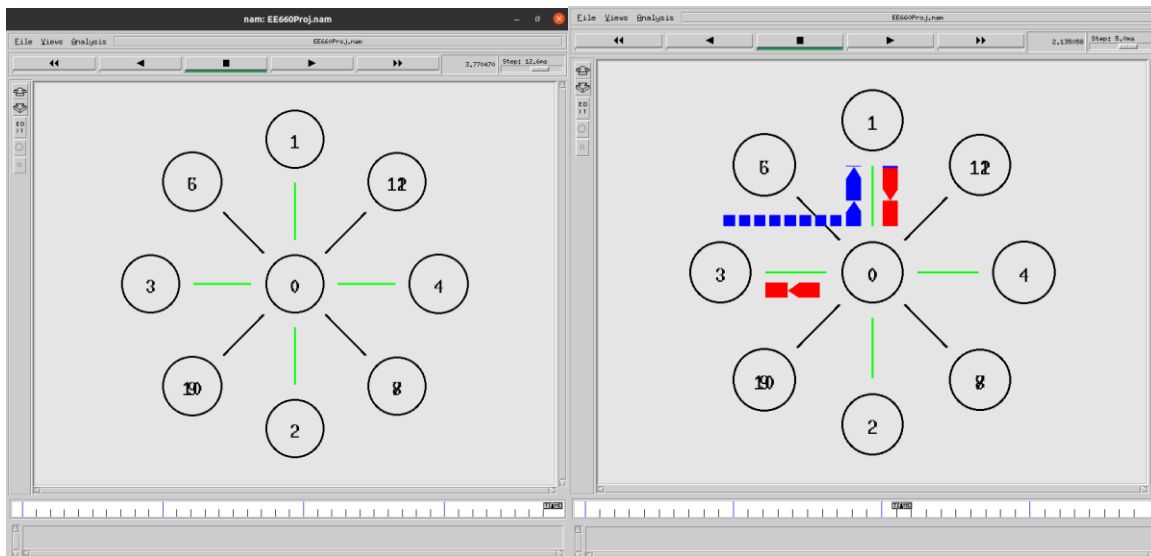


Figure 3: NS2 Network Simulator Output Displaying Intersections and Vehicles as Nodes.

The Network model simulates communication between different traffic intersections to imitate the communication that would occur to share congestion/traffic information. With this information intersections could then determine whether it would relieve congestion to redirect some traffic to another intersection even if it is not the most optimal path for a commuter to take. The simulation above is limited in its scenarios, for this reason this paper will convey traffic logic through the thought experiments explained below.

The following scenarios are the most simple yet the most common types of traffic congestions that one would encounter during a rush hour:

- Northbound and eastbound traffic is the same
- All-bound traffic is the varying
- Northbound is more than eastbound
- Communication delay if there is congestion/traffic/many users

NORTHBOUND AND EASTBOUND ARE THE SAME

In this scenario, the traffic is seeing the same flow rate of cars in each orthogonal direction and thus no one way would require minimal interaction from the system. In order to keep the steady state system at this level of flow, the system would still operate on the more “laissez faire” method and use a set timer that is based on the individual intersection.

EXPECTATION FROM THE CODE/SIMULATION

The code activates a timer mechanism for each direction. The red lights will be set for a predetermined amount of time. The average red light in the United States is between 60 and 90 seconds so 75 would be a target time [3]. Thus, the expectation for the code and simulation to change from red to green every 75 seconds on average during non-rush hour times. The most famous of these rush hours is Los Angeles due to their extremely high population density. The times that are considered rush hour there are between the hours of 7A.M. and 10A.M. and 4P.M. and 7P.M.

NORTHBOUND IS GREATER THAN EASTBOUND

In this scenario, there is a rush hour and one of the directions needs more attention and flow in order to prevent congestion and building up into the next intersection. Thus, the system is actively attempting to keep at a higher ratio of green light time to red light time. The eastbound would be slowly building up its queue during this time and since a lower volume going east the need for a longer green light is overshadowed by the need for a longer green light from the northbound.

EXPECTATION FROM THE CODE/SIMULATION

The code is actively attempting to keep the light green for a longer duration of time since there are significantly more cars in that route. Referring back to the flowchart in Figure 1, the northbound

would be filling up its queue until it reaches a threshold, in this case 75% of the queue length. It would then begin preparations for the light turning green, i.e., turning yellow for other directions and ensuring that the next intersection is prepared to receive the large batch of cars and either turn green itself or remain red. The light would then turn green for the regular 75 seconds plus an additional 15 seconds since it is known that there is a larger volume in that direction. In this way, keeping the green light timer would actually reduce the length of the rush hour since the number of cars going that way is not going to change.

ALL TRAFFIC BOUND IS VARIED

Similar to the previous scenario this would occur during rush hour times; however, there would not be one direction that is seen as more high volume than the other. Additionally, there is no way to know if one direction is going to be heavier, and at any moment one direction could experience a large influx of cars. This would be the most useful of the scenarios as it could act as a general setting and handle most scenarios in a decent way.

EXPECTATIONS FROM THE CODE

In order to combat this scenario, the code would follow the flowchart in Figure 1 and act to turn green and red on a needed basis and not use any timers. The system would remain green in any given direction until another direction's queue reaches the 75% threshold and then that direction would have priority and would follow the flowchart in order to clear out its queue.

COMMUNICATION DELAY BETWEEN CARS AND INTERSECTION

In a scenario where there the system is either lagging or overwhelmed by too many data packages. The lag would delay the threshold detection and thus the flowcharts logic flow could be enacted much later than 75% and will eventually lead to congestion.

EXPECTATIONS FROM THE CODE

The code can sense if there are too many cars and is unable to keep the flow of traffic at a steady state. If data packets are being built up for way too long indicating that there are too many cars that are there and will decrease the threshold limit to 65% in order to have a buffer so that the lag cannot cause backup.

POSSIBLE EXPANSION IMPROVEMENT PACKS

If given more resources and time there are various ways that the concept of this project could be expanded and scaled up. Currently the model, as seen in Figure 4, only represents 1 intersection with 4 adjacent lights that all interact based on the situation happening at the middle node. Thus, the middle node is the only node in which decisions are solely based on. All other nodes are simple add ons and only make decisions based on what is happening at the center node.

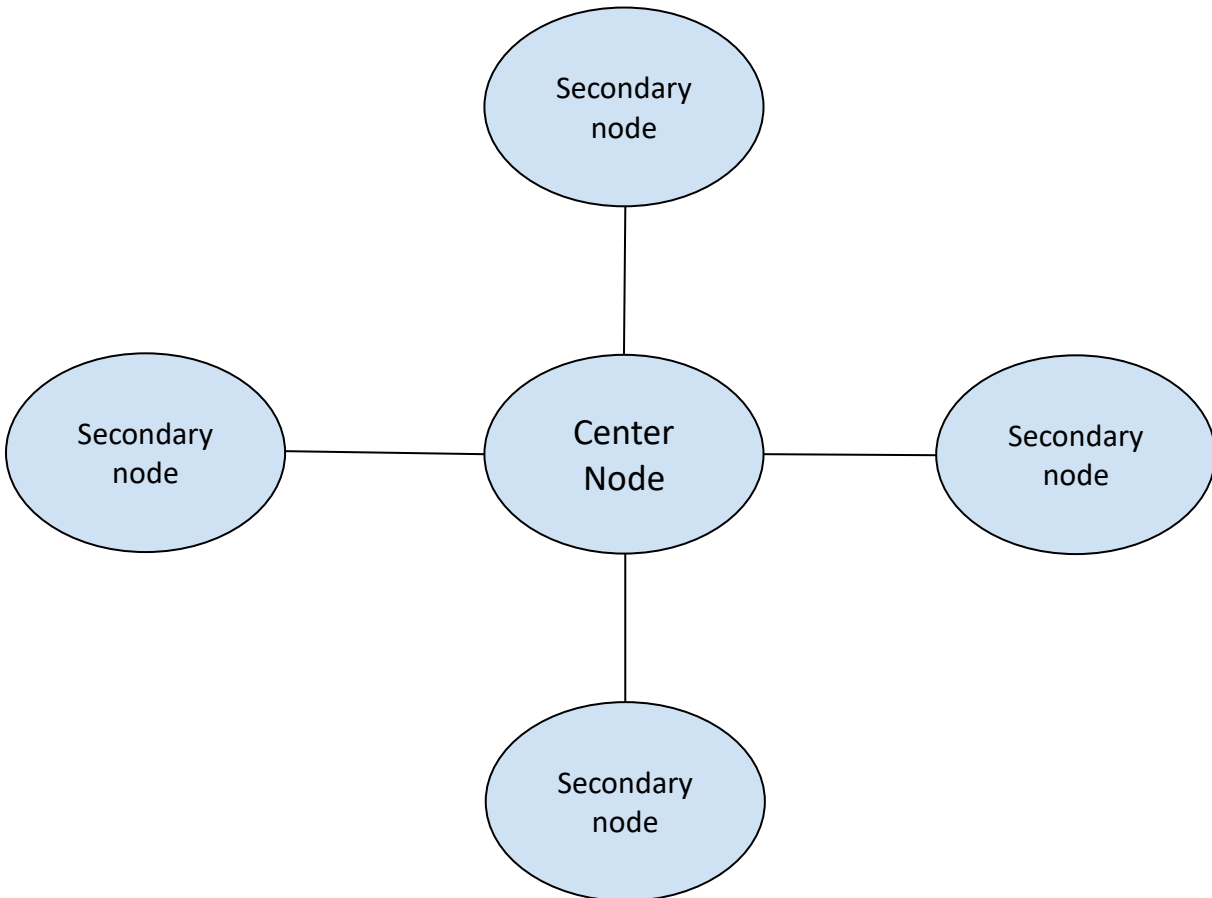


Figure 4: *Current Setup of Network Simulation*

In this current model, this is the extent of the simulation code. However, in order to scale upward, every node must simultaneously be a secondary node and a center (primary) node. Thus, the following node setup, as seen in Figure 5, would be a more developed system:

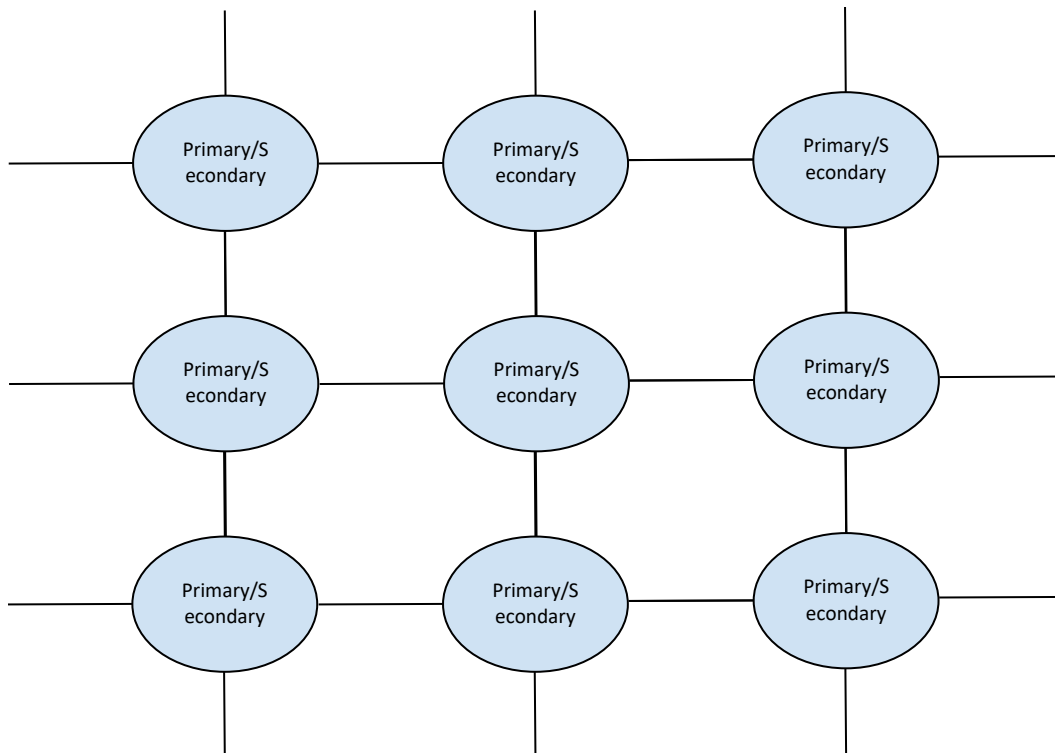


Figure 5: More Developed model where all Intersections act as Primary and Secondary Nodes

In addition to the scalable aspect of the system, the system can be optimized and tuned to each intersection. For example, a shorter intersection length would require a longer timer to clear out a traffic congestion in some cases. If the current logic chart flow chart and code was implemented, in a scenario of two adjacent intersections, suppose intersection 1 had a length of 200 meters and intersection 2 only had 60 meters. The code would only add 15 seconds to the green timer. However, this would still leave a lot of cars prone to congestion since the code would in turn be unloading 150 meters of cars (75% capacity) into a 60-meter queue, and intersection 2 would be backed up immediately. Thus, an optimal solution would be to find a formula for green light timer in terms of intersection length and adjacent intersection lengths.

An additional dimension would be integral for cars making turns at an intersection. Currently the software is only capable of cars going straight, however this is not a real-world case. Although the addition of this would be rather simple, currently there is only one lane for traffic to go. Once the intersection reaches 75% capacity, the simulation starts to clear it out. In order to expand this to cars making turns, each direction in an intersection will be categorized into 3 lanes depending on

if they're turning right, left, or going straight. Each of those lanes will have their own capacity trackers.

CONCLUSION

Overall, this project attempts to define a network and logic for a smart traffic intersection that communicates with autonomous vehicles and collects capacity information from adjacent intersections. The network topography and basic communication was shown using the NS2 Network Simulator program. The system works based on the assumption that all cars are autonomous in order to make a solution where startup delay and extreme road gutting and construction are not needed. The solution also only operates as a single intersection with 4 intersections connections; however, this is still scalable. The solution offers a very simple logic flowchart decision making system that would help relieve traffic congestion based on high volume priority and prevent gridlock in large intersections. As expected, the most general form of the solution would behave the best. The situation where there can be varying car influxes is the most useful and the most general solution. This solution would likely be optimized going forward for expansion of this smart intersections concept in practical applications. The current state of daily commute involves heavy usage of personal vehicles. With recent developments of autonomous vehicle technology, the concepts presented in this paper may soon come to fruition in metropolitan areas that want to relieve traffic congestion issues. The future of smart interactions between infrastructure and individual vehicles may potentially increase efficiency of people's daily commute.

REFERENCES

[1] LA traffic statistic:

<https://ktla.com/news/local-news/l-a-commuters-lost-62-hours-and-968-to-traffic-in-2021-new-study-finds/>

[2] San Diego Traffic Volume

<https://data.sandiego.gov/datasets/traffic-volumes/>

[3] Signal Time Length

<https://nacto.org/publication/urban-street-design-guide/intersection-design-elements/traffic-signals/signal-cycle-lengths/>

[4] Traffic signal Setting research

<https://trid.trb.org/view/113579>

[5] Early Traffic control

<https://trid.trb.org/view/115048>

[6] Causes of Traffic congestion (Opinion)

<https://bklyner.com/what-really-causes-traffic-congestion-sheepshead-bay/>

[7] Gridlock Research

<https://www.insidescience.org/news/what-causes-traffic-gridlock>

[8] Proposed Solutions by Asia

<https://development.asia/explainer/three-steps-tackle-traffic-gridlock>

(IJ-10) Stay Ahead of the Puck: The Value of Applying a Data Driven Paradigm in Disrupted Marketplaces to Improve ROI Through an Evaluation of Amazon Purchaser Sentiment Before and During a Global Pandemic

Dr. Aaron Wester

Dr. Rachna Kumar

Dr. Huiyu Qian

Linar Molotov

ABSTRACT

Organizations that could not pivot quickly throughout the initial waves of COVID-19 found themselves in Bankruptcy courts. Businesses that proactively pivoted based on their disrupted shifting marketplace environments were able to succeed. Organizations that utilize a data-driven approach through competitive and generic benchmarking may yet uncover new innovative ways to stay ahead of the puck through behavioral influencers insights and predictive modeling. A targeted evaluation of Amazon consumers' behavioral (e.g., customer satisfaction) factor of "frustration" both before and during the global pandemic may provide critical insights in helping organizations navigate through the ongoing pandemic and all its forthcoming variant mutations which continue to disrupt organizations.

Ice hockey legend, Wayne Gretzky, was once asked what his secret was to being so successful in the sport. His response was simple and poignant, "a good hockey player plays where the puck is. A great hockey player plays where the puck is going to be." (Lang, 2022). Having the foresight to

be where the next play will occur based on the trajectory of that moving object enabled this mighty athlete to be a formidable force against his opponents. He found valuable pockets of space to occupy in close enough proximity to where the puck was going. The bottom line, he got to the mark and in position proactively while others scrambled reactively to catch up. Not an easy feat to say the least given the trajectory was not a simple straight path. Instead, multiple course corrections were required to pivot accordingly to be in just the right place at just the right time. For Gretzky this approach led to an astonishing career accomplishment of being the leading goal scorer, assist producer and point scorer in National Hockey League (NHL) history (Stubbs, 2017).

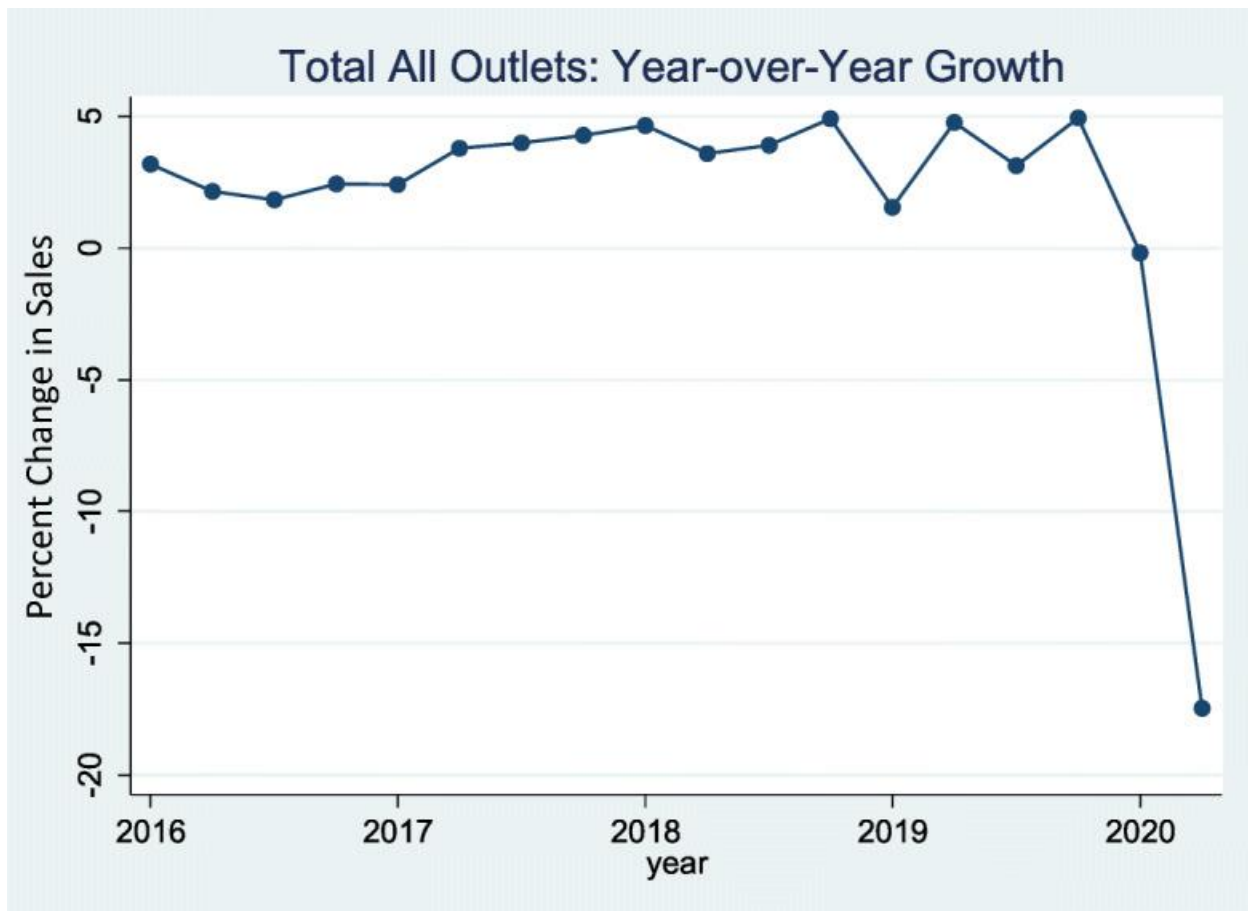
Across industries, businesses can accomplish a similar feat from a Return-on-Investment perspective. More particularly, organizations may shift their paradigm to a data-first approach through a utilization of data-driven modeling including behavioral influencers evaluations and predictive probability modeling to pivot directionally as needed. One area of disruption that has affected almost all businesses trans-nationally has been COVID-19, a global pandemic that is still ongoing at the time of this study. Organizations have had to navigate through the unpredictable spread of an aggressive deadly virus that has disrupted supply chains, offline and online sales completions, worldwide distributions, and inventory availability among other essential factors leading to sustainable sales revenues. Some companies have perished and gone the route of Chapter 11 Bankruptcy due in part to an inability to weather the disruptive storm and stay ahead of the puck. Companies such as Hertz, Neiman Marcus, Dean & DeLuca, J.C. Penney, J. Crew, GNC, Cirque du Soleil, Pier 1 Imports, Brooks Brothers, Century 21, Stein Mart, California Pizza Kitchen, Gold's Gym, ALDO, Helios, and Matheson (remember "MoviePass"?), Cosi, and Sizzler just to name a few (Goldfine, 2020).

To put initial pandemic related business losses in perspective, the following graph (fig. 1) exhibits the impact to California businesses. A majority of businesses in the state of California experienced an aggregate loss of nearly 91% of their sales when mandatory lockdowns were put into place at the onset of the global pandemic. At the same time, online sales increased a shocking 180% (Fairlie & Fossen, 2021). Consumers accustomed to in-store shopping experiences had to pivot to shopping from home computers through digital means. Companies that had an online presence and

the means to accept e-commerce sales not only saw their sales volumes increase, but also saw high levels of frustration from consumers.

Figure 1

Total All Outlets: Year-Over-Year Growth in California

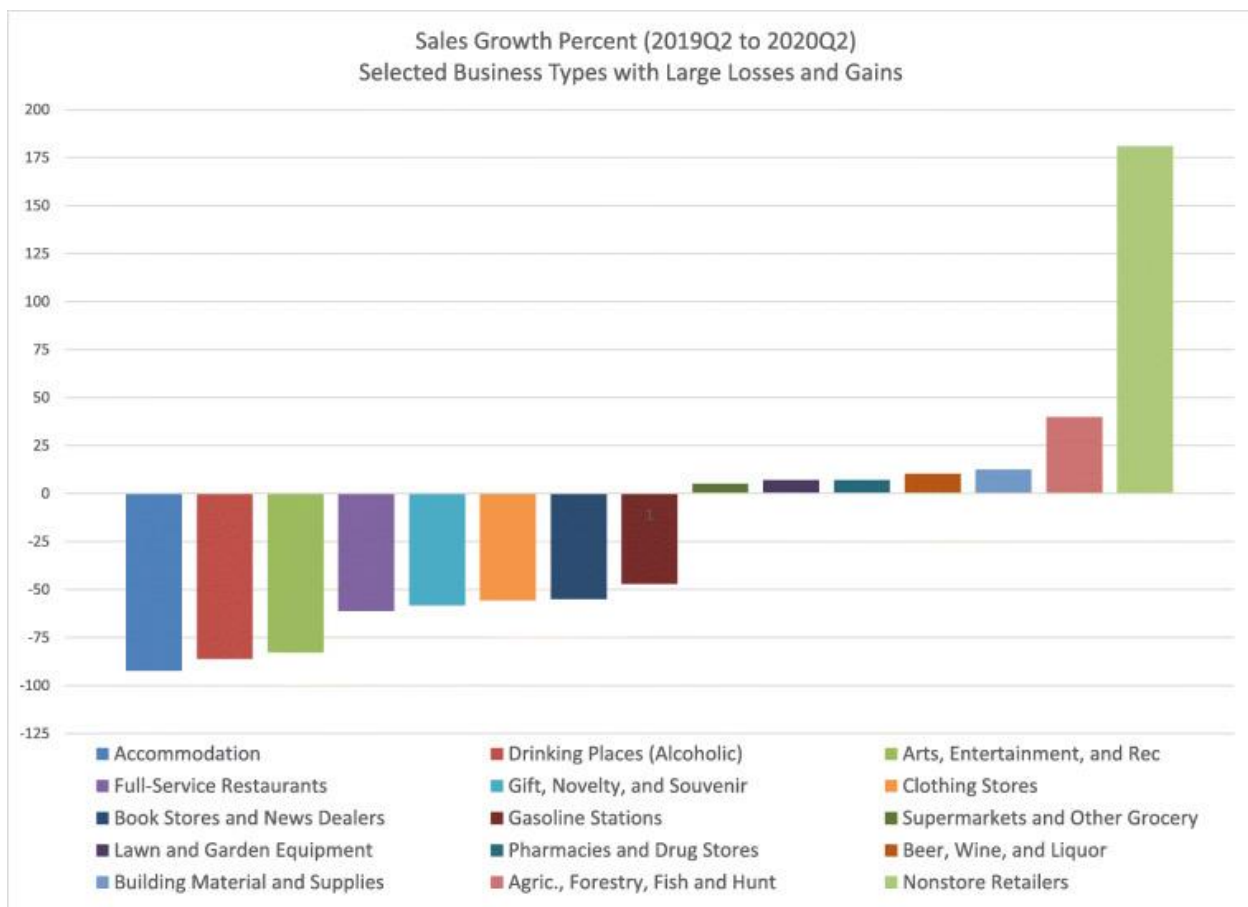


One organization that has found a valuable space to occupy through the pandemic while staying ahead of the pack is Amazon. COVID-19 shifted sales from offline to online. In 2021, Amazon reported \$8.1 billion in profit, an increase of 220 percent over the same period the previous year (Weise, 2021). While the organization performed exceptionally well during this critical period in human history, humans being humans, tended to have strongly correlated emotions tied to their purchases. Most companies struggled through the pandemic. They were not able to anticipate

consumer needs or wants as clearly as they hoped. For instance, anybody with the foresight to stock up on toilet paper at the early onset of the pandemic would have seen their sales of this product type spike exponentially. Figure 2 exhibits sales growth percentage from Q2 2019 to Q2 2020 for selected business types with most significant losses and gain. The category of Accommodation is reflective of retail sales including Children and Home, while Clothing falls within the category of Clothing Stores in the chart (Fig. 2). Further, Amazon sales fell under the category of Nonstore Retailers which showed a 181% increase over the same period.

Figure 2

Sales growth percent for Q2 2019 to Q2 2020: Selected business types with large losses and gains.



Two methods to gain competitive advantage during a period of chaotic disruption is through customer satisfaction and sentiment analysis. More particularly, Amazon data associated with the

consumer purchase sentiment type of “frustration” is a valuable dataset commodity that can provide significant satisfaction context on consumer behavior. If tensions run high during a global pandemic, then consumer frustrations may increase which disrupt the shopping experience leading to higher churn volume, higher product returns, diminished brand loyalty, and ultimately fewer sales. Through behavioral statistical analysis of Amazon reviews before and during the pandemic comparatively, disrupted companies may better find an open space to occupy. Companies can then benefit from where the puck is heading, thus improving their sales and customer relationships.

Three key shopping categories on Amazon.com were selected for this inferential study within the targeted geographic region of the United States. The categories selected included Children’s Category (e.g., Toys & Games Department), Home Category (e.g., Home & Kitchen Department), and Clothes Category (e.g., Clothing, Shoes, & Jewelry Department). Our hypothesis was as follows:

H.: Consumers did not experience a statistically significant increase in the level of frustration in their shopping experience during COVID-19 global pandemic when compared to previous years.

H.: Consumers experienced a statistically significant increase in the level of frustration in their shopping experience during COVID-19 global pandemic when compared to previous years.

Ratings data was scraped from Amazon.com department-specific products pages by targeting 100 Best Seller products per each department within the selected categories. A Date range for the data extraction was set to Jan 2008 through March 2021, including 1 year prior to COVID-19 and 1 year during Covid-19. The data was scraped using ParseHub, through the Amazon Web API via Amazon Affiliates access, and JungleScout. Variables included “StarRating”, “TimeStamp”, “Location”, “TypeProduct”, “TypeCustomer”, and “HowManyFoundUseful”. Best Seller product data for 116 products across the three categories of Children’s Category (e.g., Toys & Games Department), Home Category (e.g., Home & Kitchen Department), and Clothes Category (e.g., Clothing, Shoes, & Jewelry Department) provided n=500 reviews spanning a period of 2008 through 2021.

The methodology selected to determine relevant statistical significance in results was to conduct a parametric univariate z-Test: Two Sample for Means test for a number of targeted product samples. Additionally, a Spearman Correlation Coefficients evaluation was applied to determine any relationships between the two groups of Ratings2008_2019 (e.g., prior to Covid-19) and Ratings2020_2021 (During Covid-19 Global Pandemic). Further, all $R^{\wedge}rho$ ranking correlation values needed to be normalized to subvert the mean average from being used in a correlation coefficient given multiple z-Tests were conducted to establish baseline averages. As a result, normalizing Z Fisher Transformations were added to increase validity and reliability in measurements. Multiple mean averages were multiplied by each respective product's sample population size to achieve a weighted population total, then divided by the total population parameter of all product samples aggregated. The null hypothesis was rejected when the probability value (e.g., p-value) exhibited a value less than the alpha of 0.05 at a 95% confidence interval. This represented the likelihood that if one more random sample were included, then 95% of the time, it would not align with the null hypothesis and instead exhibit the Central Limits Theorem principle of plotting towards the central tendency (e.g., mean average) in a statistically significant pattern rather than as an outlier by random happen-chance.

For the category of Children's (e.g., Toys & Games Department), across targeted products evaluated, the null hypothesis failed to be rejected in 18 product evaluations (representing a minority 45.0% of total for this category). Likewise, for 23 products, the null hypothesis was rejected and the alternative hypothesis was accepted (representing a majority 57.50% of total for this category). There was a statistically significant effect identified between a rise in consumer frustrations and the COVID-19 global pandemic. In the state of California, as an example, products from this category that would have otherwise been sold in on-ground stores fall under "Miscellaneous Store Retailers" and experienced a 17% loss in taxable sales from Q2 2019 to Q2 2020, while representing 2.9% of total sales across all business types (Fairlie & Fossen, 2021).

For the category of clothes (e.g., Clothing, Shoes, & Jewelry Department), across targeted products evaluated, the null hypothesis failed to be rejected in 19 product evaluations (representing a minority 47.50% of total for this category). Likewise, for 22 products, the null hypothesis was rejected and the alternate hypothesis was accepted (representing a majority 55.0% of total for this

category). There was a statistically significant effect identified between a rise in consumer frustrations and the COVID-19 global pandemic. In the state of California, as an example, products from this category that would have otherwise been sold in on-ground stores fall under “Clothing and Clothing Accessories Stores” and experienced a 54% loss in taxable sales from Q2 2019 to Q2 2020, while representing 3.1% of total sales across all business types (Fairlie & Fossen, 2021).

For the category of Home (e.g., Home & Kitchen Department), across targeted products evaluated, the null hypothesis failed to be rejected in 24 product evaluations (representing a majority 72.73% of total for this category). Likewise, for 10 products, the null hypothesis was rejected and the alternate hypothesis was accepted (representing a minority 30.3% of total for this category). There was no statistically significant association detected between consumer frustrations or the COVID-19 global pandemic. In the state of California, as an example, products from this category that would have otherwise been sold in on-ground stores fall under “Furniture and Home Furnishings Stores” and experienced an 18% loss in taxable sales from Q2 2019 to Q2 2020, while representing 1.7% of total sales across all business types (Fairlie & Fossen, 2021).

For organizations seeking to improve sales through the continuing epidemic, there are a number of tactics that might be used to optimize the user experience leading to higher customer satisfaction. The first step is recognizing there is indeed a statistically significant relationship between the pandemic and an alarming increase in customer purchase frustrations. Optimization tactics require drilling down to influential friction points such as the following pointed out by Incentivesmart (2022):

- I had to re-explain my problem multiple times
- I was transferred between multiple representatives
- I had to contact multiple times about the same query
- I couldn't find the information I needed

Resolving friction points like these, leading to an improvement in customer relations, may include ensuring alignment between customer needs and descriptive information and questions/answers provided on product pages. Second, organizations may focus on reducing wait times in the delivery process for back orders. Third, companies may enhance their communications with customers by hiring or outsourcing a dedicated customer service team who can help more rapidly resolve

concerns through various channels including email, chat, forums, messaging, dial-in number, automated internal search bot referrals, Peripheral smart device app referrals such as from Google Home, Amazon Alexa, or Apple Siri, or social media presence.

FIGURES

Figure 1. Total All Outlets: Year-Over-Year Growth. The early impacts of the COVID-19 pandemic on business sales. Retrieved from:

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8009687>

Figure 2. Sales Growth Percent (2019Q2 to 2020Q2): Selected Business Types with Large Losses and Gains. The early impacts of the COVID-19 pandemic on business sales. Retrieved from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8009687/>

REFERENCES

Fairlie, R., & Fossen, F. M. (2021). The early impacts of the COVID-19 pandemic on business sales. Small Business Economy, as seen in Nature public health emergency collection.

Goldfine, J. (2020). Here's every company that went bankrupt during COVID-19. B2, The Business of Business

Incentivesmart (2022). How a customer effort score (CES) can gauge your customer satisfaction. Incentivesmart.com

Lang, B. (2021). Be ahead of the buck like Gretzky was ahead of the puck. Real Money.

Stubbs, D. (2017). Wayne Gretzky: 100 greatest NHL players. National Hockey League.

Weise, K. (2021). Amazon's profit soars 220 percent as pandemic drives shopping online. The New York Times.

(IJ-11) Generating Music for Musical Scenes: Practice of AIGC Technology in Musical Creation for Entrepreneurship

Wei Li (Wish Li, Li Li) wei_li_1@alumni.brown.edu

Huiyue Gao gaohuiyue1029@163.com

Jiaqi Xu 18817371519@163.com

ABSTRACT

Musical theatre is a comprehensive art form that combines various elements such as music, dance, and drama to tell a story through dialogue, singing, and dancing. The overall musical theatre market in China is still in its early stage of development, with more and more musicians and playwrights attempting to create original musicals. However, due to the drawbacks of long creative cycles and high production costs, it is difficult for fledgling musical theatre companies to overcome these challenges and maintain a regular performance schedule, resulting in many failures in their entrepreneurial endeavors. One of the difficulties is creating different scene scores based on different musical theatre scenes. This challenge not only involves a lot of work and time, but also often leaves creators with insufficient inspiration based solely on the scenes, making it difficult to compose. In this paper, we propose an innovative application of AIGC (Artificial Intelligence Generated Content) technology in musical theatre creation, using cross modal machine learning to generate corresponding scores for different scenes, and through experimentation, adapting the commercially performed play "Blind Date is Cool, Being Serious is Fool?" into a musical to verify the feasibility of this approach, and analyzing the impact of different scenes on music generation. AIGC technology can serve as an auxiliary tool for musical theatre creation, saving creative time, improving the efficiency of theatre companies, and helping early-stage musical theatre teams shorten production cycles, thus assisting entrepreneurs in achieving success in their endeavors. More about this research can be found on my website www.liliwish.com.

INTRODUCTION

1. Musical Theatre

Musical theatre is a comprehensive art form that integrates various expressions such as music, dance, drama, and more, including plot, characters, dialogue, music, and dance, with the aim of telling a story or expressing a theme through various artistic forms. Originating in late 19th century America, musical theatre was initially known as "operetta" and was a light-hearted, upbeat form of musical drama with catchy tunes and lively dancing. Over time, as the art form developed, musical theatre became more complex and diversified, incorporating a wider range of musical and dance styles, and it has not only thrived in the United States, but also gained popularity worldwide.

The creation of a musical theatre production is a complex process that involves multiple stages and steps. Generally speaking, the creative process of a musical theatre can be divided into the following three aspects: (1). Scriptwriting: The story and plot of the musical are written by scriptwriters, who need to design the plot, characters' personalities, and actions, and also consider the integration of songs and dances. (2). Music composition: The music of the musical is composed by composers and lyricists working together. Composers need to create music based on the plot's emotions and atmosphere, while lyricists need to write suitable lyrics for the music. (3). Choreography: The dance of the musical is designed and choreographed by choreographers. Choreographers need to consider the coordination of dance with music and plot, as well as aspects such as rhythm, form, and style of the dance.

Musicals can also be adapted from plays, TV shows, movies, comics, and other sources. Among them, adapting plays into musicals has become a popular entrepreneurial direction for many emerging theater companies. By adapting a well-received and commercially successful play into a musical, it can greatly save the time of scriptwriting. Plays that have already been successfully performed commercially have a certain box office foundation and audience base, which can also help increase the box office of the adapted musical. The experiment in this article is to adapt a commercially performed play "Blind Date is Cool, Being Serious is Fool?"

2. Music In Musical

The music in a musical can be broadly categorized into two types: "songs with lyrics and melodies" and "scene underscore." Songs with lyrics and melodies are the music that requires actors to sing, such as the song "Memory" in the musical "Cats." Scene underscore, on the other hand, is music without lyrics that serves as background music to connect scenes and enhance the overall storytelling, often appearing between different songs.

The focus of this article is on the process of creating scene underscore, and does not discuss the process of lyric and melody composition. Scene underscore does not require the involvement of a lyricist, as it is solely composed by the composer, without the need to consider the relationship between lyrics and melodies, making it more suitable for utilizing AIGC (Artificial Intelligence Generated Content) technology. The creation of scene underscore in musicals requires different underscore for different scenes, while also emphasizing the continuity of the overall musical style, and ensuring smooth transitions between songs, plot, and story. The experimental scene underscore in this article does not consider the continuity of the overall musical style, and focuses only on individual scenes for music composition. The disadvantage of such an approach is the lack of overall continuity, but the advantage is that it allows composers to break free from the conventional thinking patterns of the entire musical, and explore more diverse inspirations.

3. The Challenges of Creating Background Underscore

In the process of creating a musical, composers often face challenges due to time constraints, as the creative team typically has tight deadlines. Composers often have limited time to generate sufficient inspiration, as the average duration of a musical can range from 1.5 to 3 hours [1], and the entire musical score needs to be composed within this timeframe. Additionally, musical theatre scoring typically involves arranging and composing for a variety of instruments, which further adds to the complexity of musical theatre scoring. Furthermore, the creation of a musical also requires showcasing the unique personality of the production, with subjective elements, making the underscore distinct and recognizable.

4. Motivation

This article utilizes AIGC technology as an auxiliary tool, capable of generating underscore with harmonious performance for multiple instruments simultaneously. This not only provides composers with more creative inspiration but also helps them identify suitable directions for their musical composition. By making secondary adjustments to the generated underscore, composers can highlight their own personal style. The application of AIGC technology can effectively assist emerging theater companies in shortening the creative cycle of productions, reducing time costs, and contributing to the success of their entrepreneurial endeavors.

RELATED WORK

1. AIGC (Artificial Intelligence Generated Content)

The popularity of ChatGPT has sparked immense interest in related artificial intelligence technologies. ChatGPT, along with other AIGC technologies, falls under the realm of artificial intelligence-generated content. AIGC is a generation technique that uses AI models to create digital content such as images, music, and natural language. The process of AIGC generation involves extracting and understanding intent information from human-provided instructions, and then generating content based on the knowledge and intent information. For example, OpenAI's MuseNet [2] model can generate songs in 10 different music genres and 15 different music styles based on user inputs. It can also imitate classical music styles, such as composing music in the style of Mozart, as well as imitate popular music styles, such as creating music in the style of Lady Gaga [2]. The recent popular Midjourney is capable of generating images and other content based on textual descriptions provided by users [3]. These are all applications of AIGC technology.

The foundation of AIGC technology is the transformer architecture [4]. Prior to the emergence of the transformer architecture, generative models followed different developmental paths in various fields, but the transformer architecture [4] served as a crossroads for these diverse paths. In 2017, the Transformer was introduced by Vaswani et al. for natural language processing (NLP) tasks. In the NLP field, many renowned large-scale language models, such as BERT and GPT, utilize the transformer architecture as their primary building block. In the CV field, Vision Transformer (ViT) [5] has further pushed the boundaries of the transformer architecture, laying the foundation for

generating music from images. Overall, the emergence of transformer-based models has revolutionized AI generation and provided possibilities for large-scale training.

2. Generating Music for Scenes

Generating music for scenes can also be abstracted as generating music from images, as scenes are spatial concepts in musical theater that share similarities with the essence of images. Therefore, generating music from images is a research direction within AIGC technology, specifically falling under the category of cross-modal machine learning, which also includes other research directions such as multi-modal machine learning and large-scale models.

Modalities refer to the different forms or manifestations of things. The world around us contains various modalities, such as visual objects, auditory sounds, tactile textures, and olfactory smells, among others. In cross-modal machine learning, the goal is to establish mapping relationships between different modalities, so that models trained on cross-modal data can generate output in a different modality based on input from one modality. For example, generating images from text input. In the context of this discussion, the application is generating music from images.

Algorithms and applications that directly generate music from images are not very common. Typically, an indirect approach is used to achieve music generation from images through a multistep process involving image-to-text-to-music generation. Specifically, cross-modal techniques are used to first extract information from images and generate textual descriptions of the images, which are then used to generate music.

3. Image to Text

There are several approaches proposed for text-music generation. Text-Music Generation [6] utilizes a deep cross-modal correlation learning architecture that employs intermodal canonical correlation analysis to measure the similarity of temporal structures between audio and lyrics. Another approach, JTAV [7], integrates textual, acoustic, and visual information using cross modal fusion and attentive pooling techniques to better understand social media content. In contrast, [8]

combines various types of music-related information such as playlists-track interactions and genre metadata, and aligns their latent representations to model unique music pieces. The CLIP Interrogator, created by pharma psychotic, is a tool for both artists and prompt engineers. It leverages the power of OpenAI's CLIP models [9] to test a given image against a variety of artists, mediums, and styles.

4. Text to Music

Rather than referring to it as text-to-music, it would be more accurate to call it description-to-music. This is because most text-to-music techniques aim to generate melody based on lyrics. The goal of the technology proposed in this paper, however, is to generate music based on textual descriptions of images, which is fundamentally different from the former. Therefore, description-to-music is a more appropriate term.

MusicLM [11] is a mature technology for description-to-music. Specifically, MusicLM treats conditional music generation as a hierarchical sequence-to-sequence modeling task and generates coherent music. This model is capable of generating high-fidelity music from text descriptions, such as "a calming violin melody backed by a distorted guitar riff". MusicLM: Generating Music From Text [10] Mubert AI is a platform which can make text-to-music engine available for all content creators. It will generate a suitable track with duration up to 25 minutes which is good enough for music generation based on different scenes.[11]

METHOD

In this paper, we utilize AIGC technology to first transform scenes from a musical into text descriptions using "image-to-text" techniques, and then generate music using "description-to-music(text-to-music)" techniques. Specifically, the entire process is illustrated in Figure 1, which involves four steps: scene selection, image-to-text conversion, text pruning, and text-to-music conversion.

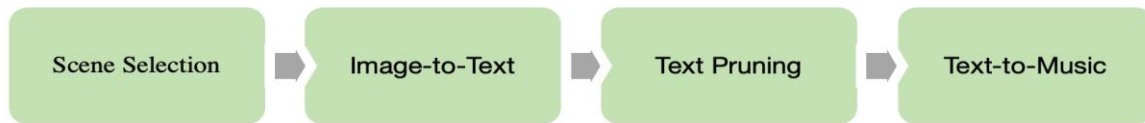


Figure 1

1. Scene Selection

First, the scenes from the musical are sliced, and among all the sliced scenes, representative scenes are selected as inputs for the model. The selection of scenes is crucial for music generation, as it can greatly impact the resulting music. The optimal scene selection should meet the following criteria:

CRITERIA 1: No characters present: Scenes with characters should be avoided during scene selection, because different actors may perform the same musical, but the scenes remain unchanged. This eliminates the variable of characters' impact on music generation. The influence of characters on scene-based music generation will also be analyzed in subsequent experiments.

CRITERIA 2: Clear visuals: Scenes with clear visuals should be chosen, avoiding scenes that are too bright, too dark, or blurry etc.

CRITERIA 3: Simplistic visuals: Scenes with minimal objects should be chosen, avoiding scenes with too many objects. If a scene contains too many objects and is overly complex, it may result in overly complex text descriptions during the "image-to-text" step, which could hinder the "description-to-music" process in later stages.

2. Image-to-Text

In the experiment, we utilized CLIP Interrogator [12] to accomplish the process of image-to-text.

3. Text Pruning

Optimize the obtained text by pruning it. The text obtained from the previous step "Image-toText" is usually too lengthy and contains errors. It needs to be pruned through human intervention to make it suitable for the input of the next step "Text-to-Music", while also complying with the author's intention.

4. Text-to-Music

In the experiment, we utilized Mubert text-to-music to generate music from the input image. Then we convert the mp3 file into music score.

EXPERIMENT

1. Experiment

The experiment adapted an original stage play "Blind Date is Cool, Being Serious is Fool?" into an original musical. This is an original stage play from a startup theater company in Beijing, China. The play consists of 3 parts, each telling a different love story where people's life paths are changed by blind dates. The play has already had 4 successful commercial performances in Beijing, China, with considerable box office results.



Figure 2

To adapt this play into a musical, it needs to be done based on different scenes. The play consists of 3 acts, so there are at least 3 fundamental scenes. We will demonstrate the specific process of experimentation using one of the minimalist scenes from Act 1 as an example.

This scene does not contain any characters, the visuals are clear, and the composition is simple, which meets the requirements for input scenes in our AIGC approach.

When inputting this scene into the "Image-to-Text" model, CLIP Interrogator, the generated text description is as follows:

a table with two chairs and a vase with flowers on it, set design, tables and chairs, chairs and tables, still life photo of a backdrop, detailed set design, white tablecloth, inspired by Peter Brook, marina abramovic, hundreds of chairs and tables, romantic ambiente, containing tables and walls, inspired by Carrie Mae Weems

The original description was too complex and contained some errors. Following the author's subjective intent, the text description has been adjusted as follows:

a table with two chairs and a vase with flowers on it.

Inputting this scene into the Mubert text-to-music engine, an MP3 format music is generated and the MP3 audio file is converted to sheet music through a scoring software shown in Figure 2.

2. Experimental Analysis:

2.1 The impact of text pruning on music generation.

The most important manual intervention in the above experiment process is text pruning. In the Image-to-Text stage, the generated textual descriptions are too complex to be used as input for the existing Text-to-Music AI technology. Therefore, text pruning is necessary.

Text pruning is a subjective process that requires creators to adjust the text based on their own preferences. Typically, the generated text in the Image-to-Text stage is complex because existing AI algorithms tend to describe all information in the image in detail. The more information described, the better the algorithm performs. However, in the field of "generating music based on scenes", more detailed descriptions do not necessarily correspond to the creator's intentions.

Proper text pruning can help creators optimize the text according to their subjective artistic ideas.

Text pruning is not only influenced by the creator's subjective intentions, but also by the development of "text-to-music" technology. Since this technology has certain restrictions on the number of characters in the input text, the Mubert engine selected in this paper requires the text to be less than 200 characters. If the text exceeds 200 characters, the program will generate an error. Therefore, overly complex descriptions cannot be used as input for "text-to-music" and music cannot be generated.

2.2 The Impact of Different Text Descriptions on Music Generation.

We compare the differences in music generated from the following two text descriptions:

Text A *a table with two chairs and a vase with flowers on it.*

Text B *a beautiful table with two beautiful chairs and a beautiful vase with beautiful flowers on it.*

Here are two texts with an obvious difference of 4 "beautiful" adjectives in text B. We inputted both texts into the music generation engine Mubert, and the resulting music scores are shown in Figure 3 for Text A and Figure 4 for Text B.



Figure 3.



Figure 4.

The differences in the generated music are all produced by the algorithm itself without any manual intervention. The key in Figure 3 is E major while the key in Figure 4 is F major, and the melody are totally different. These differences can provide composers with more inspiration, but also require creators to be more cautious in the "manual pruning" stage, as different descriptions can produce completely different effects.

CONCLUSION & FUTURE WORK

This paper innovatively applies AIGC technology to the creation of musicals, effectively helping fledgling theater companies to quickly create music for scenes, providing more musical inspiration for creators, saving time and costs in musical creation, and increasing the possibility of entrepreneurial success. The feasibility of this paper's proposed method has been verified through experiments, by adapting a previously staged play into a musical. The proposed method relies on two algorithms: image-to-text generation and text-to-music generation. Currently, these two algorithms have limitations in accuracy and may require manual modifications. However, with the continuous development and maturity of AIGC technology, it is believed that these limitations will be gradually addressed.

In future exploration, the direction proposed in this paper can be continued by trying different AIGC algorithms to generate diverse types of music. Alternatively, a reverse approach can be explored by generating scenes based on music. This can provide broader perspectives and possibilities for musical creation.

More about this research can be found on my website www.liliwish.com.

FUNDING

This article supported by “the Fundamental Research Funds for the Central Universities”, Academic-level student project from The Central Academy of Drama, NO.YNXS2212 "Multimodal Generation and Display with Music#

REFERENCE

- [1]. Musical theatre (2023) Wikipedia. Wikimedia Foundation. Available at: https://en.wikipedia.org/wiki/Musical_theatre.
- [2]. Christine Payne, “MuseNet,” OpenAI, openai.com/blog/musenet, 2019.
- [3]. Midjourney. Available at: <https://www.midjourney.com>.
- [4]. Vaswani, N. Shazeer, N. Parmar, J. Uszkoreit, L. Jones, A. N. Gomez, L. u. Kaiser, and I. Polosukhin, “Attention is all you need,” in Advances in Neural Information Processing Systems (I. Guyon, U. V. Luxburg, S. Bengio, H. Wallach, R. Fergus, S. Vishwanathan, and R. Garnett, eds.), vol. 30, Curran Associates, Inc., 2017.
- [5]. R. Fergus, S. Vishwanathan, and R. Garnett, eds.), vol. 30, Curran Associates, Inc., 2017.
A. Ramesh, M. Pavlov, G. Goh, S. Gray, C. Voss, A. Radford, M. Chen, and I. Sutskever, “Zero-shot text-to-image generation,” 2021.
M. Lewis, Y. Liu, N. Goyal, M. Ghazvininejad, A. Mohamed, O. Levy, V. Stoyanov, and L. Zettlemoyer, “Bart: Denoising sequence-to-sequence pre-training for natural language generation, translation, and comprehension,” arXiv preprint arXiv:1910.13461, 2019.
A. Dosovitskiy, L. Beyer, A. Kolesnikov, D. Weissenborn, X. Zhai, T. Unterthiner, M. Dehghani, M. Minderer, G. Heigold, S. Gelly, et al., “An image is worth 16x16 words: Transformers for image recognition at scale,” arXiv preprint arXiv:2010.11929, 2020.
- [6]. Y. Yu, S. Tang, F. Raposo, and L. Chen, “Deep cross-modal correlation learning for audio and lyrics in music retrieval,” ACM Transactions on Multimedia Computing, Communications, and Applications (TOMM), vol. 15, no. 1, pp. 1–16, 2019.

- [7]. H. Liang, H. Wang, J. Wang, S. You, Z. Sun, J.-M. Wei, and Z. Yang, “Jtav: Jointly learning social media content representation by fusing textual, acoustic, and visual features,” arXiv preprint arXiv:1806.01483, 2018.
- [8]. A.Ferraro,X.Favory,K.Drossos,Y.Kim,andD.Bogdanov, “Enrichedmusicrepresentationswithmultiplecross-modal contrastive learning,” IEEE Signal Processing Letters, vol. 28, pp. 733–737, 2021.
- [9]. Clip: Connecting text and images (no date) CLIP: Connecting text and images. Available at: <https://openai.com/research/clip>.
- [10]. Agostinelli, A. et al. (2023) MusicLM: Generating music from text, arXiv.org. Available at: <https://arxiv.org/abs/2301.11325>.
- [11]. Thousands of staff-picked royalty-free music tracks for streaming, videos, podcasts, commercial use and online content (no date) Mubert. Available at: <https://mubert.com/>.
- [12]. Pharmapsychotic (no date) Pharmapsychotic/clip-interrogator: Image to prompt with blip and clip, GitHub. Available at: <https://github.com/pharmapsychotic/clip-interrogator>.