INDEPENDENT NICHE RETAIL: BOARD GAME CAFÉ LOCATION & CLASSIFICATION

by

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Abstract

The main purpose of this study is to provide academic insight on the niche market, the board game café sector. Geographic investigative approaches were utilized to uncover operational/locational dynamics adopted by these retailers. Board game cafés are independent retailers who adopt a mixed-use business strategy. These establishments embody the characteristics of food, entertainment and retail point sale capabilities. The paper provides background understanding the changes of table top games throughout different periods in history. Contextual information is provided on table top gaming categories that define board games of the 21st century. The study then presents research within the Greater Toronto Area (GTA) on a sample of 16-board game café locations. Using researcher defined sets of variables, geographic methods were utilized in attempts to better understand the characteristics of the market. Huff Model analysis was conducted to determine the relative market influence and exposure of each café location. K-Means cluster analysis using researcher selected census data and Environics spending's estimates were used to classify census tract neighbourhoods into similar groupings. Seven user defined cluster groups by census tract were resulted, explaining the household profile characteristics within the study area. Combining the results of Huff Model and K-Means analysis determined that a favoured cluster grouping (Millennials & Millennial bearing households) was adopted by a majority of board game café trade areas. Using this cluster grouping as baseline indicators, a multi-criteria decision analysis was conducted to determine market gaps within the study area. The analysis revealed two areas in Toronto which are assumed to have untapped potential for board game café establishments.

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To my parents,
Charles & Tracy,
And my sister Wincy,
without whom none of my success would be possible.

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List of Acronyms Used in the Study

BGC or *BGCs* – are in short for board game café or board game cafés.

GTA – refers to the Greater Toronto Area. This is the area used in the study

CSCA – Centre for the study of commercial activity. It was one of the sources use within the study.

MCDA – Multi-Criteria Decision Analysis. A method based approach utilized in the research.

GIS – Geographic Information Science. A technically bounded discipline that is used in analyzing spatial patterns.

MATHM – Market Analysis Toolbox Huff Model. An *ArcMap* toolbox extension used for Huff Model implementation and design.

Chapter 1: Introduction

In the modern era of big-box and multi-national chain domination, what is truly left for independent retailers? One place is the niche market. Over the years, little to no research has been focused on the retail sector for independent niche retailers. One emerging market for niche retailers currently exists within the board game café[1] industry. The adoption of the digital age in everyday life has encouraged analog play, revitalizing the classic form of entertainment in board games, ultimately leading to the popularity of BGCs across major Canada/U.S cities. BGCs are a combination of traditional cafés with a twist, where lounging areas are available for groups to participate in table top activities. In addition, these cafés also second as potential retail spaces where the point sale of board games can occur.

This research paper seeks to develop a better understanding of the newly emerging BGC industry. It analyzes and examines how and where the independent BGC retailers operate. Methods traditionally used to evaluate grocery stores, malls or major chains are utilized and retrofitted in attempts to deconstruct the BGC phenomena.

1.1 Research Aim and Objectives

The purpose of this study takes two different approaches. Firstly, it is to present information on the changes in table top gaming throughout history, but more importantly, it is to understand the operational/locational dynamics of BGCs within the study area in attempts to uncover potential gaps in the market.

The data for this study were collected via various internet resources as well as making use of store location data provided by the Centre for the Study of Commercial Activity (CSCA). Geographic locations of stores were collected, and each café was investigated highlighting its strengths and weaknesses. The second objective was to analyze the collected data and create trade areas on a census tract level geography.

[1] From this point forward, Board Game Cafés will be referred to as BGC or BGCs.

In combination with cluster groupings that will be created in the study, trade areas will provide context to understanding extents where BGCs are typically located. Lastly using both trade areas and a multi-criteria analysis approach, unserved areas will be identified.

Research on independent niche markets is not only essential for those involved in the market but also for future potential investors of the niche market sector. This study attempts to address the gaps in academic literature regarding niche subculture retail markets. Little to no academic research is available regarding unique small independent businesses. However, in contrast, a surplus of studies (Dolega *et al.*, 2016; Ghosh, 1984; Lakshmanan & Hansen, 1965; Orpana & Lapinen, 2003; Stanley & Sewall, 1976) currently exists regarding large chains, department stores, food services, and clothing retailers. By undertaking analysis of subculture niche retail locations this research bridges a gap in knowledge and provides interesting new insight towards the ever-changing retail market today.

Identifying research regarding board game and BGCs proved to be challenging as information was scarce and limited for this newly emerging sub-sector. Though despite this setback, with the use of available data, sound models and conclusions were drawn. Through the use of relevant data regarding the industry, historical information on the opening of BGCs can be conducted. In addition, with related data, trade areas can be created to examine the potential influence a particular location can retain on a census tract level. Combining this information along with researcher defined cluster groupings within K-Means analysis, an enhanced theoretical understanding of location preferences can be obtained, permitting multi-criteria decision analysis (MCDA) to be performed. The MCDA outputs together with trade areas analysis can be used to highlight possible locations for new stores, which would enable an enriched insight into this newly emerging niche retail market.

1.2 Study Area

As a recent emergence in the retail market, only a handful of cities worldwide have hosted the BGC scene. Early adopters of the industry are located in areas of significant population (Jolin, 2016) with the majority of the market within the United States and Canada.

For this paper, the selected study area is the Greater Toronto Area (GTA) located in the Province of Ontario, Canada. Specifically, this area was selected since media outlets have dubbed Toronto, as well as the GTA as the 'hub' of the BGC scene worldwide (Reynolds, 2016). The GTA is a combination of five census divisions including Halton, Peel, York, Toronto and Durham, comprising of 25 census subdivisions. However, due to the availability of data[2], not all 25 census subdivisions will be researched. The census subdivisions of Scogg and Brock were removed from the study as datasets for both locations were incomplete and was not accessible on a census tract level geography. Therefore, the study will focus on a sample area of 23 census subdivisions within the GTA boundary.

1.3 Structure of the Research Paper

The research paper is divided into five chapters. *Chapter 2: Research Context* explores and examines the history of board games, independent niche retailers, food/service in retail and finally the newly adopted BGC trend. It furthermore provides an overview of the academic literature concerning the methods utilized in the study. *Chapter 3: Data Collection, Manipulation & Methodology Design* specifies the framework on how the data were collected and the methodology employed. *Chapter 4: Results & Analysis* presents quantitative results for data collected, discusses store openings, trade area findings, the results of the K-Means cluster analysis as well as the creation of multi-criteria decision analysis maps, which uncover untapped potential. *Chapter 5: Conclusions & Discussion* reviews the significance of the findings of the paper, addresses areas of further research, and finally notes limitations of the study.

[2] Census data for two of the subdivisions within the GTA were incomplete therefore not available for the study.

Chapter 2: Research Context

The first portion of the chapter provides essential background information on the historical context of board games. It discusses and highlights important transitional times for board games regarding their popularity as well as board gaming innovations. Next, investigative measures will be undertaken to uncover information regarding niche retail and its market. This explores the types of businesses that are considered as niche retail as well as elaborating on the typical locational practices adopted. Also, an overview of food/entertainment in retail and the newly adopted BGC industry will be studied. The examination of the BGC industry discusses its relative contemporary emergence in the retail market, while also isolating characteristics that make it similar but yet different to the traditional café. The second half of the chapter addresses the available academic literature on niche retailers and on board games. It then covers the analytical literature on Huff Model trade areas, K-Means cluster analysis and Multi-Criteria decision analysis used later in the project.

2.1 Board Games and its Early History

Within the past few years, board games have experienced an exponential growth in both sales and popularity[3] [4]. For starters, board games are a table top leisure activity that involves sets of players which move pieces on a surface governed by unique sets of rules. A handful of games are based on strategic actions, but many are based purely on the element of chance or luck (e.g., based on the role of dice or drawing a card randomly from a deck of cards).

What most people do not realize is that board games existed during prehistoric times in the forms of playing-boards and sticks (Attia, 2016). The evolution of board games have been carried through different cultures and religions, with board games often made fashionable by their play amongst royalty.

[3] Board games in North America have grew towards the $1.19 billion mark in 2015, a staggering $80 billion-dollars more than the previous year (Griepp, 2016).
[4] Statistics on the rising popularity of board games can be found in appendix A.

One of the most notable board games adopted by ancient Egyptian royalty was called *Senet*[5] (Piccione, 1980). The game involved 2 players strategically moving characters across a board comprised of 30 squares, with the ultimate goal of gaining positional authority on the edge of the board. The movement of the characters are governed by the toss of sticks associated with numeric intervals, (Piccione, 1980) much like the function of dice we have today. Trickling down to civilians as time progress, the complexity and accounts of board games have also increased. Samples of most notable historical board games include *Chess*, *Checkers* (aka. Draughts), *Backgammon*, and *Go* (Arneson, 2017). Variations of these table top games were embraced by many cultures, religions and have withstood the testament of time. Though individuals tend to believe that board games are meant for the youth, historically, the usage of board games has been associated with adult leisure activities (Parlett, 1999). Parlett (1999) notes that the expansion of board games for children did not exist until the early 20th century, and was first adopted by westernized cultures. In point of fact, it is believed that historically, board games were forms of diplomatic gifts to signify status amongst World elites (Viegas, 2011)

Looking back to 17th century America, the acceptance of board games in everyday life was still relatively scarce. The rural lifestyle adopted in society left little time for individuals to partake in table top leisure activity (Edwards, 2016). It was not until the 18th century when the development of board games began to increase and be adopted by the masses. Companies such as book publishers, printing establishments, and paper mills began diversifying their businesses publishing in the burgeoning board games for the public market (Edwards, 2016). Embodying this trend, the first known printed board game in America was created by F. & R. Lockwood, brother book publishers (Viegas, 2011). Titled *Traveller's Tour Through the United States* and its European counterpart *Traveller's Tour Through Europe*, the game had the simple objective of educating individuals on the geographic attributes of their respective countries. Played using a spinner instead of dice, as dice were associated with gambling (Boys, 2011), individuals moved game pieces onto individual geographic locations and were granted points based on their ability to

[5] Pictures of *Senet* can be found in appendix B.

name the location and its city. Unsurprisingly, being the first of its kind, the game was hugely successful prompting the Lockwood brothers to publish expansion packs[6] and a World edition copy titled *The Traveller's Tour through the World* (Boys, 2011).

Moving forward, the popularity of board games in the 19th century led to the opening of large game publishers in both Europe and the United States. Companies such as Waddingtons, Ravensburger, McLoughlin Brothers, Milton Bradley and Parker Brothers were consequently born further stimulating the growth of the industry (Parlett, 1999). The exponential increase in board game accounts and popularity in 19th century North America was declared as "the golden age of board and table games" (Hofer, 2003). Though despite being proclaimed as the golden age of board games, a majority of the classic family board games known today were in fact introduced in the early 20th century. Classic games such as *Monopoly*, *Risk*, *Scrabble*, *Game of Life*, *Clue*, *Sorry!*, *Snakes & Ladders* and lastly *Pictionary* were all created post-1900s. (The People History, 2008). In addition, the 20th century era also experienced the *Trivial Pursuit* phenomena. Long-running game shows such as *Wheel of Fortune*, *Who Wants to Be a Millionaire?*, and *Jeopardy!* were all adopted onto table top forms bringing televised entertainment to the family living room. The variations of American table top games developed in the 20th century were theme orientated, very competitive and pinned individuals against one another. As a result, gaming fans have categorized these types of games as *Ameritrash*[7] board games. Despite this, only selected mass-market American board games can be considered as *Ameritrash*. The categorization of *Ameritrash* typically centres around being theme positioned, containing dramatic gameplay, being luck orientated and embodying player to player conflict (BoardgameGeek, 2016).

[6] An expansion pack and or expansion set is an addition to the existing table top game. These add-ons usually add new game areas, objects and or an extended story line to the complete already released game.
[7] Examples of *Ameritrash* board games can be found in appendix B.

2.1.1 The Eurogame Movement

Board games have enjoyed a stellar increase in popularity amongst individual since the mid 20th century. However, in the late 20th century, a shift in dynamics have caused the board game industry to be dominated by the emergence of the *German Style* themed board games. German style board game, also referred as *Eurogames*[8] are board games of the European descent and portray a different game design regime. Much unlike *Ameritrash* style board games, *Eurogames* are designed to reduce direct conflict amongst players as well as emphasizing on the notion of selection and minimal luck (Woods, 2012). Built with simple character and theme development, these table top games promote a carefree motif unifying individuals through participation. *Eurogames* endorse the availability of choice and inclusion of all individuals during the interval of the game. It does not adhere to concepts such as surprise mishaps, game generating events or a bad roll of dies[9] (Edwards, 2016). Instead, players experience defeat due to poor strategic decisions, running out of cards/resources or simply being outperformed by the opponent. Typically, *Eurogames* tend to revolve around fictional storylines that are loosely related to the real-world themes. Some of the many themes include trading of resources to build establishments, building farms, developing railways, or purchasing supplies to power cities. As mentioned, many *Eurogames* focus on the collection or trading of resources[10]. Due to the importance of this aspect, heavy production values are placed on the playing card artwork and character tokens used in *Eurogames.* This attention to detail has drawn appreciation amongst its players.

When mentioning *Eurogames,* it is hard not to reference *Die Siedler von Catan* or better known as *The Settlers of Catan* in North America. Created by Klaus Teuber, *Settlers of Catan* is the all-time best selling *Eurogame* with more than 18 million copies and covering more than 30 different language releases worldwide (Miozzi, 2014). The objective of the game is for players to trade resources[11] to build the most

[8] Examples of *Eurogames* board games can be found in appendix B.
[9] An example of a game generating event that occurs from a bad roll of dies is when players are put in jail in *Monopoly.*
[10] The act of resource trading typically exists in the form of attribute cards or game pieces.
[11] The resources that are used in *Settlers of Catan* are Brick, Lumber, Wool, Grain, and Ore. These resources exist in the form of playing cards that are exchanged amongst players as part of the strategic gameplay.

successful colony on a fictional island called Catan (Raphel, 2014). Catan was first introduced to the North America in 1996 and has grown in popularity stimulating spin-off expansions and special editions such as *Catan Cards, Catan Junior* as well as cinematic adaptions like *Star Trek Catan*. According to Woods (2012), he describes the game of Catan as "a game of peaceful building rather than violence, and those who enjoy and play the game are most likely to believe in the constructive aspects of life". As evidence of being well received by the public, the *Washington Post* called Catan the "Monopoly of our time" (Eskin, 2010), and *Wired Magazine* dubbed it simply as the "Monopoly Killer" (Wired Magazine, 2009).

It is not hard to see the influence of *Eurogames* in the late 20th century era. The movement of *Eurogames* into the North American/worldwide market has fundamentally redefined the genre and portrayal of board games. This stimulus has led a path for the board games of the 21st century and has set the standard for modern board gamers.

2.1.2 Board Games of the Modern Era

Board games of the 21st century are an evolutionary extension of their historical counterparts. They incorporate board game styles from different periods such as both *Ameritrash* and *Eurogames*. Board games of today can be classified into three categories of *Ameritrash, Eurogames,* and *Hybrids.* The *Hybrid*[12] category is an embodiment of both the qualities of *Ameritrash* and *Eurogames.* It requires tactics and intelligent thinking as well as elements of chance, it focuses on simple mechanics, peer-to-peer competition while incorporating strong thematic elements (BoardgameGeek, 2013). *Hybrids* place an emphasis on creative artwork much like *Eurogames* attempting to attract audiences of all age groups. The majority of board games today are designed using the hybrid characteristic. They complement the best qualities of both *Ameritrash* and *Eurogames* creating a simple but yet competitive atmosphere for their players.

Today, table top games are driven by the implementation of the internet. The adoption of smartphones and tablets has given rise to board game popularity as individuals can test digital versions.

[12] Examples of *Hybrid* board games can be found in appendix B.

This trial sequence exposes a greater audience to available board games, and often, individuals would go on to buy physical copies (Duffy, 2014). In addition, online retailers[13] have made table top games more accessible than in the past. Previously, games would only be available in certain game shops, but now, with a few clicks, the board game can be delivered straight to your doorstep. Furthermore, the internet essentially acts as an advertising platform for table top games. Through the usage of blogs, online videos, social networks it has created a word-of-mouth attention for the industry (Duffy, 2014).

Besides purchasing and marketing schemes, the publishing dynamics of board games have also changed. Individuals are now able to generate exposure to their board game design through the use of social media. Crowd sourcing campaigns such as *Kickstarter*[14] allow prospective game makers to pitch their ideas to audiences worldwide. If funded successfully, the designer uses the collected funds to publish their own board game. This is all completed in the absence of a big-name publisher resulting in more independence and freedom for the table top game industry. *Exploding Kittens* is an example of a crowd sourced funded board game. The game has generated over 219,282 backers who have pledged a total of $8.5 million dollars (KickStarter, 2015). This freedom has allowed board game publishing rates to increase at a steady amount year after year (BoardgameGeek, 2016).

2.1.3 Niche Retail and its Market

Since the early 1980s, the Canadian retail market has undergone a shift where traditional marketing methods have become obsolete (Dalgic, 2013). New demands, changing customer behavior and specialized individual needs have fractured the retail market in what was once a simply unified sector. This fragmented market has also been referred to as the "multiple option society" (Naisbitt, 1988). To fulfill demands, retailers began tailoring products to further suit customer needs. As a result, the number of niche retail businesses has increased. The niche retail market is a subsector of the greater retail market and is usually

[13] Examples of online retailers include eBay, Amazon, or other potential sites that sell table top games using an online storefront.
[14] *Kickstarter* is a funding platform where creators can share and gather interest on a particular creative project they would like to launch. The ability to launch an item depends on the amount of crowdfunding received.

composed of smaller independent establishments. Instead of pursuing the whole market, these businesses target segments or gaps within the greater retail sector (Dalgic, 2013). Effectively, niche retailers only carry products that market to their target audience. Common ways to define niche retailers are on price, target demographics, product, product quality, psychographics as well as geography (Hartman, 2016).

Besides better catering towards customers, big box and multi-national chains are lacking and lagging to deliver greater shopping experiences. Currently, within the retail market, there is a fundamental relationship binding service and shopping experience to retail (Taylor, 2013). Big establishments simply are not meeting the needs of customers' as the saturation and standardization of products reduces the level of service expertise. Reduced amounts of expertise creates negative shopping experiences as sales or service representatives are unable to provide proper assistances (Taylor, 2013). In contrast, smaller independent niche retailers can provide this experience as products are streamlined only to carry specialty items. Niche retail establishments can appeal to customers as they feel they are treated better without necessarily paying too much more (Goko, 2017). It has been argued that customers are not looking for niche retailers to offer competing prices (Berry, 2014), but instead, are seeking better services. Marketing schemes embraced by niche retailers provide special attention to their clientele as it differs from the one size fits all offerings adopted by bigger chains (Salzer, 2017). The prioritization of personalization is what differentiates niche retailers from the mainstream market.

Though despite gaining increased popularity, the niche retail market has existed in many different forms historically. Businesses such as secondhand bookstores, antique stores, comic stores, and independent toy stores are all considered as forms niche retail establishments. These stores were the first to offer local, personalized experiences. Customers of these stores would see their interest align with the overall dynamics of the products, creating a sense of community and cohesion with clients to products.

2.1.4 Locational Preferences for Niche Retailers

Recently in Canada, changes in the retail structure have created a shift in the marketplace landscape. Specifically, fluctuations are occurring within the structural dynamics of the retail industry (Industry

Canada, 2013). Shopping malls and power centres are not the major players they once were. The retail market has experienced concurrent changes due to new customer requirements and the growth of e-commerce retailing (Stromquist, 2017). Previously for retailers, it was supposed that shopping malls and power centres are the best options for retail. They believed these multiplexes served great geographic extents and their customers were attracted by many items at a centralized location. But lately, the adoption of the digital age and the need for personalized shopping experience has created competition within the retail market, (Bradshaw, 2017). As a result of failing to meet the needs of customers, many retail businesses have been forced to restructure. Samples of what is left over are in malls are large retail brands and multi-national chains creating a saturation of big brand retail storefronts. This phenomenon has caused rent premiums to increase as property owners are trying to extract economic means from high-end retail establishments (Retail Insider, 2016).

As this retail pattern becomes predominant, questions concerning the relevancy of small businesses have risen. Though despite being lesser in nature, small businesses[15] are still relevant in the retail market today. Small businesses are relatively successful in niche market dynamics. These independent retailers are frequently identified as the backbone of local economies (Industry Canada, 2013). But with increasing rent prices in shopping centres and along major retail strips, small independent niche businesses cannot afford to exist within these retail conditions. Moreover, the target markets of shopping centres are significantly different to the ones adopted by small independent niche retailers. Thus, locating in larger centres may not a viable option for these businesses. Therefore, places that best suit niche businesses are community focused centres such as strip malls or shopping plazas.

Despite locating in smaller retail market areas, niche businesses are relatively sustainable. The locations adopted by niche retailers are typically smaller in size and in geographic reach but are counterweighed by lower rent premiums. Retailers of this nature survive by positioning themselves in areas where their business would appeal to the surrounding population (Carcio, 2016), and often these locations

[15] Industry Canada defines small businesses as firms that have fewer than 100 employees.

are found along strip malls as well as community plazas (IBISWorld, 2015). Understanding the importance of staying local has strengthened the relevance of smaller independent niche businesses (Berry, 2014). Though being forced out of shopping centre settings, independent retailers are still able to stay completive by doing what they do best. Smaller niche retailers are able to exist in the highly competitive retail market today by tailoring to smaller communities, providing personalized experiences, offering unique streamlined products, and offering friendly local encounters.

2.1.5 Food and Entertainment Services in Retail

Entertainment has emerged as one of the developing themes for retail developments. Referred to as *Retail-tainment*, this is the concept of adding entertainment and experiences towards the overall retail mix (White, 2010). Retail establishments that focus on food as a service are heavily adopting and building towards entertainment/experiences into their offerings. Businesses that are adapting to this shift in entertainment services are experiencing growth and popularity, for example, theatres, arcades, bowling alleys and rock/rope climbing venues (Howland, 2016). These retail businesses have catered towards bringing a hybrid mix of services (Fung, 2016).

The trend of food and entertainment service mix is a response to the habits adopted by consumers. Customers nowadays prioritize spending on experiences with friends over the accumulation of items. (Howland, 2016). Specifically targeted at millennials, younger consumers are especially prone towards spending on entertainment and food based leisure (PwC, 2015).

Evidently, the growth towards entertainment and retail mix is seen to be adopted by large companies. Canadian cinematic giant *Cineplex* has recently diversified their business to offer what they classify as an *Eats & Entertainment* service emporium. This entertainment establishment concept called *The Rec Room* is a large arcade style eatery which targets young adults (Wright, 2017). Groups of individuals can partake in arcade games while also indulging in restaurant style service and food. The objective is to provide a unique dining experience along with forms of group entertainment.

Food and entertainment service mix is not a new phenomenon. Pre-existing as piano bars[16], children's arcades, and old fashioned bowling alleys these retailers have pioneered the way in employing multi-aspects into the retail service industry. Today, businesses are revisiting this style of operation as they understand solely offering one aspect of service is not enough to attract customers. By providing a multi-aspect offering with entertainment, experience, and food, businesses can better provide for their customers resulting in greater economic profit.

2.1.6 The BGC Trend in North America

The BGC trend is a derivative of the rising popularity of table top games and the increasing demand for food/entertainment in retail. The concept of this retail establishment is much similar to an ordinary café but adopting a significantly different business model. Instead of lounging and chatting, BGCs provide retail, food services, as well as experiential aspects in the form of table top games. The popularity and rise of this retail type began in 2010 when business owners in Toronto opened the first BGC in North America (Snakes & Lattes, 2017). Called *Snakes & Lattes* the business model was adopted to provide retail point of sale services, café style food/beverages and access to hundreds of board games for customers during their stay (Daubs, 2010). Customers that enter the café are greeted with a wide selection of board games which requires a flat fee[17] to play. Café style food/beverage are served to your table and board games purchases are assisted by knowledgeable staff members. This hybrid of services between board games access/sale and café style food service was the first of its kind prompting an influx of newspaper articles (Clapson, 2016; Hutchcraft, 2016; Kosloski, 2016; Reynolds, 2016; Sung, 2011), focusing on its interesting business model dynamics.

The introduction of the café styled establishment with added entertainment value in board game has greatly appealed to the public. Millennials of today are beginning to seek for experience through participation, and BGCs are seen as the answer. These individuals look to BGCs as an escape from

[16] A piano bar is a lounge or bar that features entertainment by a pianist or a vocalist.
[17] An admission fee that is charged to every customer that enters the café looking to participate in board game activities.

technology as the adoption has limited human interaction (Reynolds, 2016). Participating in board game activities can force individuals to communicate attributing to the human desire for interaction (Kosloski, 2016). The evident success of BGCs can be seen as companies are using this platform to initiate and promote a healthy social culture in the workplace environment (Clapson, 2016). This movement has created echoes in different social media platforms creating word of mouth publicity attracting individuals towards BGCs. As a result of its acceptance, many investors have replicated the businesses model from *Snakes & Lattes* and have opened their own table top café establishment worldwide.

As BGCs grow in number, the locational preferences adopted by these retailers are seen to be quite interesting. Due to its specialization on board games, and being typically owned by private individuals, these cafés are classified as small independent niche retailers (Hutchcraft, 2016). Representing the characteristics of independent niche retail locations, BGCs are specifically tailored to hold specialty items as well as catering towards a specific market demographic (Sung, 2011). It is specialized in the sense that BGCs typically target younger professional groups within a local environmental setting. BGCs are typically located along strip malls or within community plazas (in best case scenarios) as they tend to cater towards their surrounding local population (Reynolds, 2016).

2.2 Independent Niche Retail Stores and Methods in Literature

This section of the paper address the deficiency of academic work and data that focuses on the study of niche retail stores. In addition, an exploration of relevant academic literature on methods devised for the study is present. First, trade area analysis in the form of Huff Model is introduced, then the statistical grouping method of K-Means cluster analysis is defined, and finally, GIS based multi-criteria decision analysis is examined.

2.2.1 Independent Niche Retail and Board Games in Literature

Board games have been studied in small samples of academic approaches where the majority of materials are not directly relevant to the objectives of this study. Recent literatures on board games are

mostly focused on cultural or media studies (Booth, 2016; Levine, 2013; Schafer, 2016). Most studies elaborate on the dynamics of board games solidifying cultural constructs, as well as how they exemplify contemporary new media characteristics. Historical board games, such as, chess and checkers, are mentioned in psychological health articles (Aciego *et al*., 2012; Barlett *et al*., 2013; Bilalić *et al*. 2008), exploring the benefits of such games and how they can aid intellectual/social-emotional enrichment amongst individuals.

Still, samples of academic literature focused on table-top games, (Aciego *et al*., 2012; Barlett *et al*., 2013; Bilalić *et al*. 2008; Booth, 2016; Levine, 2013; Schafer, 2016) none truly focus on board games in modern day retail from a locational perspective. Amidst the growing theme of retail geography and GIS, amazingly little investigative work on independent niche retail establishments has been conducted. To address this issue, an objective of this research study is to conduct and present research on this topic to help alleviate this gap in academic based literatures.

2.2.2 Huff Model in Literature

The Huff model is one of the most popular methods in understanding/examining locations and the areas they serve. Explanations and application of Huff models catchment areas are found in retail based literature on large retailers, (De Beule et al., 2014; Suárez-Vega *et al*., 2015; Wang *et al*., 2016) as well as social-economical based studies (Jia *et al*., 2017; Luo, 2014). As seen in this cross-field adoption of the model, its popularity can be justified as its considered one of the most accurate behavioural estimation models. The Huff Model was introduced in 1962 by David Huff as a consumer choice behavioural model using a probabilistic gravity ideal (Huff, 1962). This gravitational model can explain customer choice in a market-based retail network (Huff, 1964). Through calculation of customer probability for location visitation, the Huff Model embodies a vital component in assessing trade areas. The model builds consumer spatial performance analysis through the use of factors such as location attractiveness and consumer distance away from establishments.

Since the introduction of the model in 1962, many advancements have been suggested to improve the analytical accuracy of the gravity model. Lakshmanan & Hansen (1965) claimed that a non-linear association between attraction and location size increases model calculation accuracy, as the interchange between location size and travel distance was now more adaptable. Stanley & Sewall (1976) included location brand image appeal into the attractiveness factors for a store. They state that independent/affiliation chains have qualities that support the rationale behind a consumer's decision to visit locations. They illustrate that consumer supermarket perceptions are based on three underlying factors of: i) quality, ii) variety, iii) price (Stanley & Sewall, 1976). Location brand image can be equally as important as distance in a retail market setting. Ghosh (1984) presented the notion of accounting for spatial parameter variances used in the gravity model. His study suggests that due to different archetypes across geographic boundaries, the impacts/drivers of store attractiveness can vary (Ghosh, 1984). Therefore, the probability distribution of attractiveness cannot be standardized across mediums. Orpana & Lapinen (2003) accounted for different locational elements of grocery stores based on the size. The study tailored specific parameters of each store in individual models, varying the influence of locational attractiveness as each store is believed to serve different purchasing purposes (Orpana & Lampinen, 2003). Dolega *et al*. (2016) explored catchment areas in a national context suggesting that flexible models using a composite attractiveness index should be considered.

Huff Models equations can be embedded in many ways depending on the research scope. The software utilized in this paper, Market Analysis Toolbox Huff Model (MATHM) 2013, an ArcMap toolbox extension, makes use of one of the Huff Model equations employed in Dolega *et al*. (2016) study, depicted in *(Equation 1).* The model is calibrated using the main factors of distance and attractiveness:

$$P_{cs} = \frac{U_s d_{cs}^{-\beta}}{\sum_{s-1}^{N} (U_s d_{cs}^{-\beta})}$$

P_{cs} probability of consumer at location c selecting store s
U_s attractiveness (utility) of store 's'
d_{cs} distance between c and s
β Distance Friction Coefficient

Equation 1: Huff Model Equation

Drewf (2013) provides instructional examples for the use of the MATHM toolkit. The text runs through the procedures and the criteria that are needed for model processing. Upon assigning variables and completing the model synthesis, output layers were created identifying trade areas for the example dataset. The MATHM toolkit is a free alternative to the business analyst ArcMap extension, which requires a paid subscription for usage.

2.2.3 K-Means Cluster Analysis

Clustering algorithms are generally divided into two groups of hierarchical and partitional methods. Jain *et al*., (1999) notes that hierarchical clustering is separated into two categories of agglomerative and divisive. The agglomerative approach begins with each case in its own cluster, and proceeds to merge similar pairs of clusters together forming a cluster hierarchy. The divisive method is the opposite of agglomerative, all cases start in the same cluster and are recursively split into similar cluster groupings. Partitional clustering, on the other hand, identifies all clusters simultaneously, and does not inflict a hierarchical clustering structure. One of the most popular forms of partitional clustering is K-Means clustering.

K-Means clustering is a statistical analysis technique first introduced in different scientific fields (Ball & Hall, 1956; Lloyd, 1957; MacQueen, 1967), but despite being proposed over 60 years ago, it is still widely adopted in multiple research disciplines. The statistical method is well known for partitioning data records and assigning them to one specific k-groupings, attempting to draw clustering patterns within a dataset. (Kaur & Kaur, 2013). This helps achieve the goal of data clustering by uncovering natural groupings for sets of points or objects (Jain, 2010). Jain (2010) identifies three main purposes where data clustering is used. The reasons being: i) to gain insight into the data, generating hypotheses, detecting anomalies, and identifying significant features, ii) identifying the degree of similarities within data sets defining natural classifications, iii) organizing data in a way where information is compressed summarizing it through cluster prototypes.

K-Means clustering has been featured in various disciplines of academic literature, several including road accident hotspot profiling (Andersen, 2008) to wireless network authentication studies (Krishna & Doja, 2017). In terms of retail-based geographical studies, the statistical method is popular for understanding customer subgroups or conducting sales predictive analysis. Reynolds *et al*. (2002) uses K-Means clustering to understand the retail strategy for traditional malls vs. factory outlets. The clustering technique has been used to compare shopper typologies for retail markets (Lu & Chang, 2014). Kim & Ahn (2008) explored and investigated the growing market of internet commerce with the use of K-Means analysis. The study was able to uncover a cluster pattern of five segmentations representing customer subgroupings for the online shopping industry. Lu & Chang (2014) incorporated K-Means clustering into sales forecasting for retail businesses. The study proposed that using this clustering algorithm could be beneficial for forecasting sales in the retail industry. The authors believe that using cluster analysis for sales data provides crucial forecasting information assessing the short-term success of the business.

In essence, the adoption and usage of K-Means clustering is considered to be an interdisciplinary method. Through understanding groupings of the datasets provided, similarities can be identified outlining significant features. However, despite its implementation in wide scopes of academic literature, Pastor (2010) warns that undertaking cluster analysis techniques needs to be proceeded with caution, as analysis can potentially impose groups in datasets where no grouping structures truly exist.

2.2.4 GIS Based Multi-Criteria Decision Analysis

Spatial decisions habitually involve large sets of feasible alternatives, along with various conflicting and disproportionate evaluation criteria. To accommodate and relieve spatial decision complications, the usage GIS based multi-criteria decision analysis has been greatly adopted in the recent decade (Malczewski, 2006). *Geographic Information Science (GIS)* is a technically bounded discipline that plays a major role in analyzing spatial decision problems. Cowen (1988) describes GIS as "a decision support system involving the integration of spatially referenced data in a problem-solving environment." MCDA is a methodological based approach which provides a vast collection of practises and procedures to

tackle decision centred problems. MCDA allows alternative decisions to be assessed and prioritized aiding decisional outcomes. These two areas of research are covered in many forms of literature elaborating on benefits that coexist when methods are combined (Chakhar & Martel, 2003; Thill, 1999). At the most primitive level, GIS MCDA practices combine the technological/methodological aspects of both applications bringing geographical data and assessment judgments into decision making. As a result of this, GIS MCDA approaches have benefit numerous of applied research and theoretical studies.

The utilization of GIS based MCDA approaches has been widely represented in many investigative bodies of literature post-1990 (Carver, 1991; Church *et al*., 1992; Eastman *et al*., 1998; Feick & Hall, 2004). Major applications of GIS MCDA are mostly found in urban/environment planning studies (Jha *et al*., 2001; Noss *et al*., 2002; Seppelt & Voinov, 2002; Weigel & Cao, 1999) along with transit planning, forestry studies, urban water management, waste disposal. Such literature applies GIS to understand the current geographical data and is based on the information acquired, MCDA methods are conducted to weigh/assess the trade-offs between different scenarios. Ultimately through conducting these steps, the most systemized and logical decision can be identified.

Despite the focus on urban/environmental studies, GIS MCDA methods are still represented in samples of location selection studies. Jamal (2016) uses GIS MCDA practices on elementary school site selection. The study embodies GIS analytics to provide preliminary geographical data determinants and weights them using the MCDA methodology. Hierarchies were created for chosen variables allowing the study to conclude with several possible areas where elementary schools would be best suited. Rikalovic *et al.*, (2014) explored the combination of GIS and MCDA on industrial site selection. The study elaborates that industrial site selection is deemed to be a spatial problem and undertaking the GIS MCDA approach addresses and resolves potential complications. Kates (1997) presented the use of GIS MCDA for jewellery store site selection in Toronto. The study combines the use of demographics as well as road network data for MCDA weighting purposes. Kates (1997) emphasized that the model approach for GIS MCDA is universal in the sense that framework methodologies should accommodate any type of retail industry in any areas of the world. Lin & Zu (2013) examined coffee shop location decision using the GIS MCDA

approach. The research involved collecting complex GIS data (raster & vector) and implementing MCDA methods to assign constraint weighting for decision analysis.

Though specific examples of GIS MCDA work with the retail sector are limited, literature focusing on location selection studies provides indications that the use of these techniques are robust and sound.

Chapter 3: Data Collection, Manipulation, and Methodology Design

This chapter relates to how the data were collected, manipulated and establishes the methodology used in the later analysis (*Chapter 4).* The beginning of the section below elaborates on how stores were selected. Following this is a description of data collection and manipulation practices used for historical analysis on store openings, Huff Model trade area analysis, K-Means cluster analysis and finally GIS-based MCDA.

Following explanation of collection methods, approaches and reasoning used to complete the methodology for the study is presented. The usage of Huff Model in *ArcMap* be presented as well as the application of *IBM SPSS Statistic 24* for K-Means cluster analysis will be explained. Furthermore, GIS based MCDA approaches will also be explained describing the steps taken to complete the analysis. The following flowchart provides a brief overview of the methodology sequences.

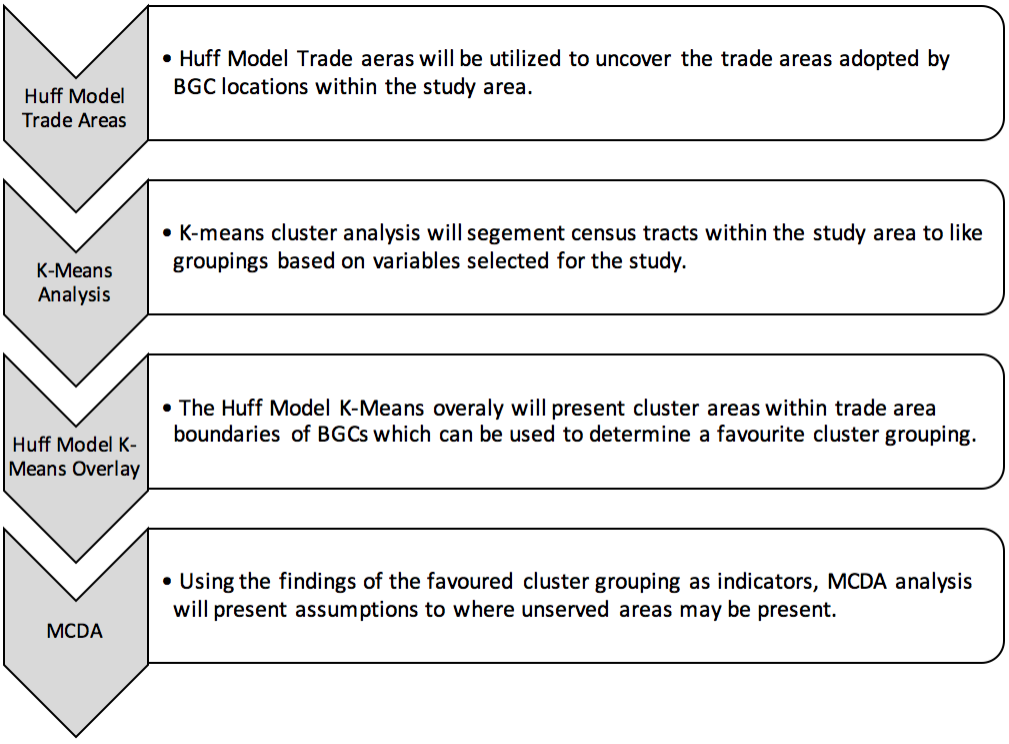

Figure 3.1: Methodology Flowchart

3.1 Determination and Selection of Study Stores

The first step of the project was the creation of a data set of BGC locations within the GTA study area. A preliminary list compiled from blogTO provided an initial list for the researcher which was then further enhanced and cross-referenced using information from Yelp as well as GoogleMaps. Both of these resources were able to provide basic information[18] regarding the existence of BGCs across the greater Toronto area.

Through undertaking the list compilation stages, many other stores were misclassified as being BGCs. These locations were not taken into consideration as they did not fulfill the requirements of being BGCs. Some of the questioned locations did not embody a true BGC characteristic as they were missing critical components such as not offering in store board game selections. Therefore, these sites were removed from the list resulting in a final list of 16 locations classified as BGCs.

3.1.2 Data Collection for Historical Analysis of BGCs

The data required for the historical analysis of openings in BGCs were provided by the CSCA. Although different internet resources were able to provide similar information, the researcher deemed the CSCA as a more reliable source as than the information found online. As their collection methods are known to the researcher, it was considered to be a more dependable source for the data. To obtain data, an initial data request was sent to the CSCA providing them with the address, postal code and the city of each of the 16-BGC location. Post submission, a datasheet was sent to the researcher identifying the opening dates for each of the 16 cafés. The information on the datasheet was then transposed onto a new document where the information was organized for further geoprocessing in later steps.

[18] The basic information included detailed location information such as postal codes and street addresses.

3.1.3 Data Collection and Manipulation for Huff Model Trade Area Analysis

This section begins with discussing the type of data collected, the methods adopted to collect the data and finally the in which the ways data were manipulated for Huff Model Analysis.

Prior to gathering data components for BGCs, the collection of study area and road network shapefiles was required. The study extent shapefile was downloaded from *SimplyMap* on a census level boundary, and road networks of the GTA were provided by Professor Shuguang Wang from Ryerson University. These shapefiles are an essential component towards Huff Model analysis as the geographic files act as analysis boundaries and distance parameter measures. After obtaining boundary and road network shapefiles, data regarding floor space for each store location were collected. Estimated floor space for the 16 café locations were provided by the CSCA as they are accessible from their yearly shopping centre database collection.

In addition to floor space, the researcher deemed multiple aspects important to the overall appeal of each café location[19]. The majority of these aspects are service related store attributes. The attributes were collected in numeric counts reflecting the offerings of each BGC. Table 3.1 lists the variables offerings, a brief description of, and the sourced used to collect the information.

Table 3.1: Cafe Attribute Variables

Variable	Description	Source
No. of Drinks	No. of drinks items available at the café	Website for the café establishment
No. of Food	No. of food items available at the café	Website for the café establishment
No. of Available Board Games	No. of board game items available at the café	Website for the café establishment
Website Infromation Quality	A score out of 8 for the overall website quality	Reseracher rating through the use of café website
Walk Score	Walk-score rating for the café	Score rated by Walkscore.com
Transit Score	Transit-score rating for the café	Score rated by Walkscore.com
Monday-Thursday Service Hours (Duration)	Monday-Thursday total service hours	Website for the café establishment
Friday Service Hours (Duration)	Friday total service hours	Website for the café establishment
Saturday Servie Hours (Duration)	Saturday total service hours	Website for the café establishment
Price/Hr (Weekday)	Flat fee service charge per hour to play on weekdays	Website for the café establishment
Price Unlimited Play (Weekday)	Flat fee service charge for unlimited play on weekdays	Website for the café establishment
Price/Hr (Weekend)	Flat fee service charge per hour to play on weekends	Website for the café establishment
Price Unlimited Play (Weekend)	Flat fee service charge for unlimited play on weekends	Website for the café establishment
Reviews	A score out of 10 for the overall rating of the café	Score rated by Google Reviews

[19] The determination of aspect is based on first hand understanding of the BGC industry.

The majority of the variables were obtained either from café websites or a secondary resource website. It is worth noting that within the table, the website information variable was rated based on judgment by the researcher. This was done through field survey and evaluation of all 16 café websites. The hierarchy used to evaluate the quality of the website is listed in Table 3.2.

Table 3.2: Website Evaluation Criteria

Category	Requirement	Maximum Score that can be Received
Board Game Index	Has to have a Board Game index online reflecting the titles in the café	1
Bookings Online	Has to have the availability to book tables in advance	1
Menu Online	Has to have the café menu available online	1
Pricing for Games Online	Has to have the pricing of board games available online	1
How to get there (Map)	Has to have a map of the café location embedded within the website	1
Usability	Has to be user friendly	1
New Games Section	Has to have a section dedicated on new board game titles	1
Service Hours	Has to have the café service hours available online	1

As shown in Table 3.2, a simple scoring scheme was adopted as the highest score attainment for each category was 1. The maximum score of 1 was recorded if a category met the requirement, and a score of 0 is given when the website did not. In the particular circumstance for usability, the lowest possible score of 0.5 was given to websites that were deemed non-user friendly by the researcher. This is because personal biases can exist when judging user friendliness, so adopting a minimum score of 0.5 was understood to a be the fairest option without negatively skewing the data.

In addition, all four pricing variables[20] were adjusted in accordance with a scoring hierarchy. The scoring hierarchy is when higher numeric values are signified as superior, and lower numeric values are represented to be less superior. This allows a higher cost of play to represent a lower count value (less superior), and a lower cost of play would represent a greater count value (more superior). The equation that was used for this process is as follows:

$$10 - [\text{Price to Play}] = \text{Pricing Attribute Score}$$

Equation 2: BGC Pricing Adjustment

[20] Pricing variables include: Price/Hr (Weekday), Price Unlimited Play (Weekday), Price/Hr (Weekend) and Price Unlimited Play (Weekend).

Post collection and manipulation of the collected data, a standardization of the store attribute variables was conducted. The process to standardize each variable is to divide each initial variable count by the lowest count value of that variable category. To illustrate how to standardize the variables, café data regarding floor space are used in Table 3.3.

Table 3.3: BGC Standardization Example

Café	Floor Space
For the win Board Game Café	500
A Game Café	750
Time Capsule Board Game Café	800
Snakes & Lattes Annex	1200
Snakes & Lattes College	6500
Café Princess	1300
Riddle Room	2000
Bampot	500
Mystery Board Game Café	900
Chit-Chat-Play Food & Games	1200
Brew Wizard Board Game Café	1400
Utopia Dream Café	2500
Omescape Markham	1000
Studio.89	1000
De Code Adventures	1200
House of Card Board Games	950

To standardize the floor space variable for Snakes & Lattes Annex is to divide the initial variable of *1200* by the lowest count value in the variable category which is *500* from Bampot Café. The result of the standardization value is *2.4.*

This standardization step was performed by all variables for all cafés collected in *Table 3.1*. This procedure prepares the values for the next phase of weighting in preparation to calculate for final composite attractiveness.

Assigning variable weightings is the second to last step in preparation for the composite attractiveness stage. Weighting schemes are allocated based on the importance identified by the researcher[21]. The weights represent how important a variable is to the overall appeal to a BGC. The scoring

[21] Variables weighting of importance are based on what the researcher believes to be essential service aspect of a BGC.

range of weights are structured from 1 to 3. The score of 1 is given to variables of least importance, and a score of 3 is given to a variable with the most importance. The weighting system used for this study is provided in Table 3.4.

Table 3.4: Variable Weighting

Weighting	
Floor Space	2.5
No. Of Drinks	2
No. Of Food	1.5
No. Of Board Games	3
Website Infomraiton Quality	2
Walk Score	1.5
Transit Score	2
Mondary-Thurs Service Hours	1.5
Friday Service Hours	3
Saturday Service Hours	3
Sunday Service Hours	2.5
Price/Hr (Weekday)	2
Price Unlimited Play (Weekday)	2
Price/Hr (Weekend)	2.5
Price Unlimited Play (Wekeend)	2.5
Reviews	2

Finally, post standardization and assigning of weights, a composite attractiveness score can be calculated for Huff Model implementation. A composite attractiveness score will provide a numeric result that represents the attractiveness of a café location. The score embodies all the service related attribute variables as well as the weights associated with them. The values that were used in the calculation steps are the *post standardized store attribute variables*, and the *numeric weighting* values assigned in the previous step. The equation is calculated by multiplying all the standardized service variable with the corresponding variable weighting. After this, all the calculated values will be added together which will represent a composite attractiveness score representing each café location. A segment of the formula used is as per Equation 3:

(Std Floor space * Floor space Weight) + (Std No. of Drinks * No. of Drinks Weight) + (Std No. of Food * No. of Food Weight) + …… (Std. Reviews * Reviews Weight)

Equation 3: Attractiveness Score Calculation

Post calculation, the composite attractiveness values are ready for Huff Model implementation in the methodology stage. The final composite attractiveness score for each of the café locations is presented in Table 3.5.

Table 3.5: BGC Attractiveness Scores

Café	Composite Attractiveness Score
For the win Board Game Café	116.6221232
A Game Café	94.40905293
Time Capsule Board Game Café	82.39618822
Snakes & Lattes Annex	156.4055814
Snakes & Lattes College	145.7353862
Café Princess	120.6306701
Riddle Room	118.8174245
Bampot	93.32677583
Mystery Board Game Café	58.76715696
Chit-Chat-Play Food & Games	65.2703557
Brew Wizard Board Game Café	98.39613799
Utopia Dream Café	161.4404615
Omescape Markham	58.84980002
Studio.89	111.274304
De Code Adventures	116.4501762
House of Card Board Games	86.26835954

3.1.4 Data Collection for K-Means Analysis

The data section for K-means analysis first begins with a discussion on the reasoning behind the variable selection and sourcing. Then an explanation of the approaches taken to prepare the data for the methodology stage is provided.

The data selection process for K-Means clustering proved to be a very challenging task. Essentially, gaps in academic literature regarding this topic prohibited the researcher from drawing insight on data variables used in prior research. The final set of data variables were selected based on information derived from articles and the researcher's understanding of the industry[22].

[22] The researcher has participated and visited numerous of board game café locations since 2013. Participating in the board game scene has granted the researcher a broad understanding of the community.

Through the information provided and the researcher's understanding, it is identified that the typical customer for BGCs embodies the characteristics of the millennial category. In addition to being millennials, articles (Hutchcraft, 2016; Reynolds, 2016; Sung, 2011) suggest that individuals are of professional occupation. Therefore, the data variables that were selected to represent this profile customer are *Average Household Income 2011*, *Ages 15-34 (%)*, *Bachelor's Degree or Above (%)*, and lastly *Professional Occupation (%)*[23].

The variables of *Ages 15-34 (%)*, *Bachelor's Degree or Above (%)*, and lastly *Professional Occupation (%)* was required to be compiled as in raw collection form they do not exist in such groupings. The formulas used to assemble the groupings are as per follows:

- *Ages 15-34 (%)* = (% Household Population Age 15-19) + (% Household Population Age 20-24) + (% Household Population Age 25-29) + (% Household Population Age 30-34)

Equation 4: Ages 15-34 Variable Calculation

- *Bachelor's Degree or Above (%)* = (% Household Population Bachelor's Degree) + (% Household Population Bachelor's Above)

Equation 5: Educational Attainment Calculation

- *Professional Occupation (%)* = (% Labour Force Business & Finance) + (% Labour Force Natural & Applied Sciences) + (% Labour Force Health Occupations) + (% Labour Force Education, Law & Social Government Services) + (% Labour Force Art, Culture Occupations)

Equation 6: Occupational Variable Calculation

With regards to the professional occupation formula, it is worth noting that included occupations were classified as "professional" based on the researcher's interpretation of the information provided by Statistics Canada[24]. The researcher identified all the professions that required a post-secondary university education and determined those occupations to being professional in nature.

[23] Variables used were all by-products of the 2011 census data. The 2011 census data was the most up-to-date full census listing available during the time of the study. The reserach variables were obtained from *SimplyMap*.
[24] This information can be found on the Statistics Canada website upon searching "National Occupational Classification (NOC) 2016.

Additionally, to the variables above, the researcher also considered the addition of expenditure based variables into the analysis. It is believed that implementation of spending variables into cluster analysis provides insight towards the spending habits adopted by the profile group. The spending variables selected in addition to the previously selected variables are *Average Yearly Expenditure: Children Toys* and *Average Yearly Expenditure on Snack & Beverage (Restaurant/Café)*[25].

3.1.5 Data Collection for MCDA

The MCDA utilized the majority of the data variables used in K-Means cluster analysis, specifically: *Ages 15-34 (%), Bachelor's Degree or Above (%), Professional Occupation (%), Average Yearly Expenditure: Children Toys* and lastly *Average Yearly Expenditure on Snack & Beverage (Restaurant/Café).* The newly introduced data variable that will be used in MCDA is *(%) of Household Income* defined by the favoured cluster grouping. The selection of this variable was based on the results of the K-Means analysis stage.

Lastly, to prepare the dataset for the analysis portion, all variables were required to exist in a percentage format. Therefore, the variables that required manipulation were *Average Yearly Expenditure: Children Toys* and *Average Yearly Expenditure on Snack & Beverage (Restaurant/Café).* To make better use of these data in percentage form, each expenditure account was individually divided by *Average Household Income 2011.* The result provided a theoretical assumption of the percentage household income in each census tract that is spent on the two expenditure variables. The formula used for this calculation is as per follows (Equation 7 & 8):

[25] Variables used were 2011 Environics analytics spending data estimates. To stay consistent with the census data used, the 2011 estimates were used as opposed to more up to date datasets.

- *% of Household Income Spent on Children Toys* = Average Yearly Expenditure: Children Toys / Average Household Income 2011 Toys * 100
- *% of Household Income Spent on Snacks & Beverage* = Average Yearly Expenditure on Snack & Beverage (Restaurant/Café) / Average Household Income * 100

Equation 7: Household Expenditure on Children Toys
Equation 8: Household Expenditure on Snacks & Beverage

3.2.0 Historical Analysis of BGC Openings

To analyze the historical opening of BGC locations, geoprocessing was required to plot each site location. Geocoding of the BGC locations[26] are done using *Quantum GIS 2.14.* The output creates a geographic shapefile which was then imported into *ArcMap* where cartographic styles were applied. Post application of cartographic techniques, a map was created identifying BGC opening years for each of the 16 location.

3.2.1 Trade Area Classification using Huff Model

A trade area classification using the Huff Model provided an overview of the market area influence of each BGC. Composite attractiveness scores of each BGC along with café locations, study extent and GTA road network datasets were applied into *Market Analyst Toolbox* parameter calculations. A distance coefficient function was left as the default value of 2, signifying the default inverse distance squared function will be applied. The output of Huff Model calculations produces trade area findings for all 16 BGC locations within the specified study boundary.

Making use of the output information, cartographic standards were applied to identify the primary and secondary trade areas for each café. To do this, probability of visitation by each census tract was classified by colour, so 0.4-0.6 was classified as a secondary trade area, and 0.6 or above was classified as a primary trade area. The cartographic classification technique was performed for all 16 locations which ultimately created a composite trade area map which identifies the market influence of each café within the GTA.

[26] The location information required for geocoding to work are Address, City, and Postal Code.

3.2.2 Statistical Groupings using K-Means Analysis

The methodology explanation of K-Means grouping starts with presenting the data that were used in the analysis. This is then followed by a rationalization of *k* selection, and finally, the steps used to create the K-Means classification map by census tract ID.

K-Means clustering analysis was undertaken using *IBM SPSS Statistic 24.* The Partitional clustering type was used which identifies all clusters simultaneously (Jain *et al*., 1999). The K-Means approach effectively assigns values within the study variables to the nearest cluster mean based on all the variable data. Variables previously prepared in the data collection and manipulation stages were input in the analysis variable section.

A *k*=7 cluster grouping was selected as it was deemed the most appropriate by the researcher. When clustering data sets, the right number of *k* is often not obvious as there is no one right selection method (Hamerly & Elkan, 2004). Oftentimes the best selection of *k* is chosen by the researcher through a sequence of experiments as well as interpreting if the data suits the study (Dimov, Pham, & Nguyen, 2004). The selection of *k*=7 for this study resulted from a testing of multiple *k* options. The final variable of *k*=7 was selected as it best suited for the study. This *k* grouping was superior in the sense that it contained a good spread of values amongst the clusters, each cluster was homogeneous in their own right, clusters were far away from one another, and lastly, it had the least number of outliers in comparison to other *k* selections.

K-Means analysis was then run segmenting and associating each individual census tract with a cluster grouping based on the analysis variables. The cluster groupings were then saved and spatially joined to the corresponding census tract ID in *ArcMap*. In *ArcMap,* each census tract ID was given cartographic styling techniques which identified a cluster grouping by a colour scheme. The results group like census tracts which embody the same variable characteristic. Essentially this provides a generalization profile regarding each census tract of the variables used in the study.

3.2.3 Identifying BGC Trade Area Groupings

Combining Huff Model trade areas with K-Means cluster analysis can lead to some powerful insights. Specifically, joining the two allows an understanding of the clustering groups within each BGC trade area. To associate café trade areas with K-Means cluster analysis findings, trade areas were layered over top of the K-Means cluster analysis findings. This action was performed through *ArcMap* where the trade area shapefile was overlayed on top of K-Means findings map. To determine if a BGC trade area favours a certain cluster grouping, a count was conducted to determine if a trade area fell within location of a certain cluster domination. This process was performed for all 16 café locations in determining if BGCs cater towards a certain cluster grouping.

3.2.4 Multi Criteria Decision Analysis

The MCDA was built upon the findings of which cluster grouping was favoured by BGC trade areas. The study variables within the favoured cluster grouping were used as an indicator towards establishing which census tract variable values needed to be removed prior to MCDA calculation. Values that were required to be removed were the ones that did not meet the minimum criteria set forth by the favoured cluster grouping. For example, if the favoured grouping had a value of 28.65% for individuals aged 15-34, that amount was considered as the minimum target variable value. Census tract variables that do not meet the minimum corresponding value were altered to reflect a score of 0%. This process removes locations that do not meet the criteria, so they are not considered in MCDA. This procedure was completed for all 5 variables of *Ages 15-34 (%)*, *Bachelor's Degree or Above (%)*, *Professional Occupation (%)*, *Average Yearly Expenditure: Children Toys* and *Average Yearly Expenditure on Snack & Beverage (Restaurant/Café).*

It is worth noting that *Average Yearly Expenditure: Children Toys* and *Average Yearly Expenditure on Snack & Beverage (Restaurant/Café)* are not the values used for MCDA as they do not exist in percentage form. These variables were altered in the previous sequence so they can assist with removing

values for the corresponding variables of % of Yearly Household Income Spent on Children Toys and % of Yearly Household Income spent on Snack & Beverage (Restaurant/Café). Essentially, the corresponding variables were used so that census tracts that were given a score of 0 can be carried over onto the percentage based variables.

Finally, for the last variable of household income, the favoured cluster grouping income was used as a reference indicator. This indicator plays towards determining the target income range favoured by BGC trade areas. After determining the target income range, the variable was input and utilized within MCDA. The household income range variable identifies the number of households within the census tract that fall within the determined income bracket.

In conducting MCDA, census tract variables repurposed above were placed into the *ArcMap* toolkit, and the Weighted Linear Calculation (WLC) method was selected. Within the toolkit, a weighting value was required to be given for all study variables. A weighting scheme (Table 3.1) was determined by what the researcher deemed to be the most important variables[27] for a BGC location.

Table 3.6: MCDA Variable Weightings

Variable Name	Weights
Ages 15-34 (%)	37%
Favoured HH Income Range (%)	25%
Yearly HH Income on Children Toys (%)	13%
Yearly HH Income on Snacks & Beverage (%)	10%
Bachelor's Degree or Above (%)	7.5%
Professional Occupation (%)	7.5%

Post weighting, the program was run creating a thematic map over the study area presenting census tracts as either 'ideal' or 'not ideal'. This information was calculated based on the input variables along with the weights associated with the variables. Cartographic techniques were then applied separating the calculated output scores into 5 classes for better visualization. An appropriate colour scheme was then

[27] Percentage weightings were a judgement call by the researcher in what is hypothesized to be the target factors for BGCs.

adopted by the researcher where a darker shade would be associated with a higher ideality score, and a lighter shade would represent the opposite.

3.2.5 Identifying Areas of Untapped Potential using Trade Areas and MCDA

The identification of areas of untapped potential was conducted using a combination of the Huff Model trade area results along with the MCDA generated map. The findings of the trade area results for all 16 café locations were layered on top of the MCDA map using *ArcMap*. Huff model trade areas essential shade in the areas where market influence currently exists for the BGC industry. Through visual interpretation of the layered map, areas of untapped potential can be determined as darker MCDA areas do not fall within trade area groupings.

Chapter 4: Results and Analysis

The chapter presents and discusses the findings of the research. It begins with providing the results on the historic overview of BGC openings and includes a discussion on their spatial pattern. Following this, the completed Huff Model will be introduced, and information is provided for all 16-BGC areas. This identifies all the primary and secondary trade areas for each café location, with a brief discussion of the patterns depicted. K-Means analysis findings in the study area are examined highlighting cluster areas while also analyzing the quantitative results. In combination with the trade area map, the dominant cluster group findings for each BGCs are identified and reviewed. Subsequently, the results of the MCDA are detailed. Lastly, the joint results for trade areas and MCDA are provided. Areas of untapped potential determined using MCDA and trade area findings are determined and reviewed.

4.1 Historic Overview on BGC Openings

The depiction and reporting on store openings for BGCs made by this study are for establishments opened post 2010 (the initial year that started the BGC industry within the GTA). Figure 4.1 indicates the year opening of BGCs that are still open as of July 2017.

The results from the historical analysis indicate that the BGC industry has experienced a growth as time progresses. Since the introduction of the first *Snakes & Lattes* (Annex Location) in 2010, overall, the industry has gained traction attracting independent business owners to open their own cafés. It is worth noting that post introduction of the first location in 2010, the findings suggest that no cafés were subsequently opened in 2011 or 2012. This result indicates the industry may have gone through a lag period where no succeeding stores were open, or stores that were opened in 2011 and 2012 have closed by the time study locations were collected, therefore were excluded in the study.

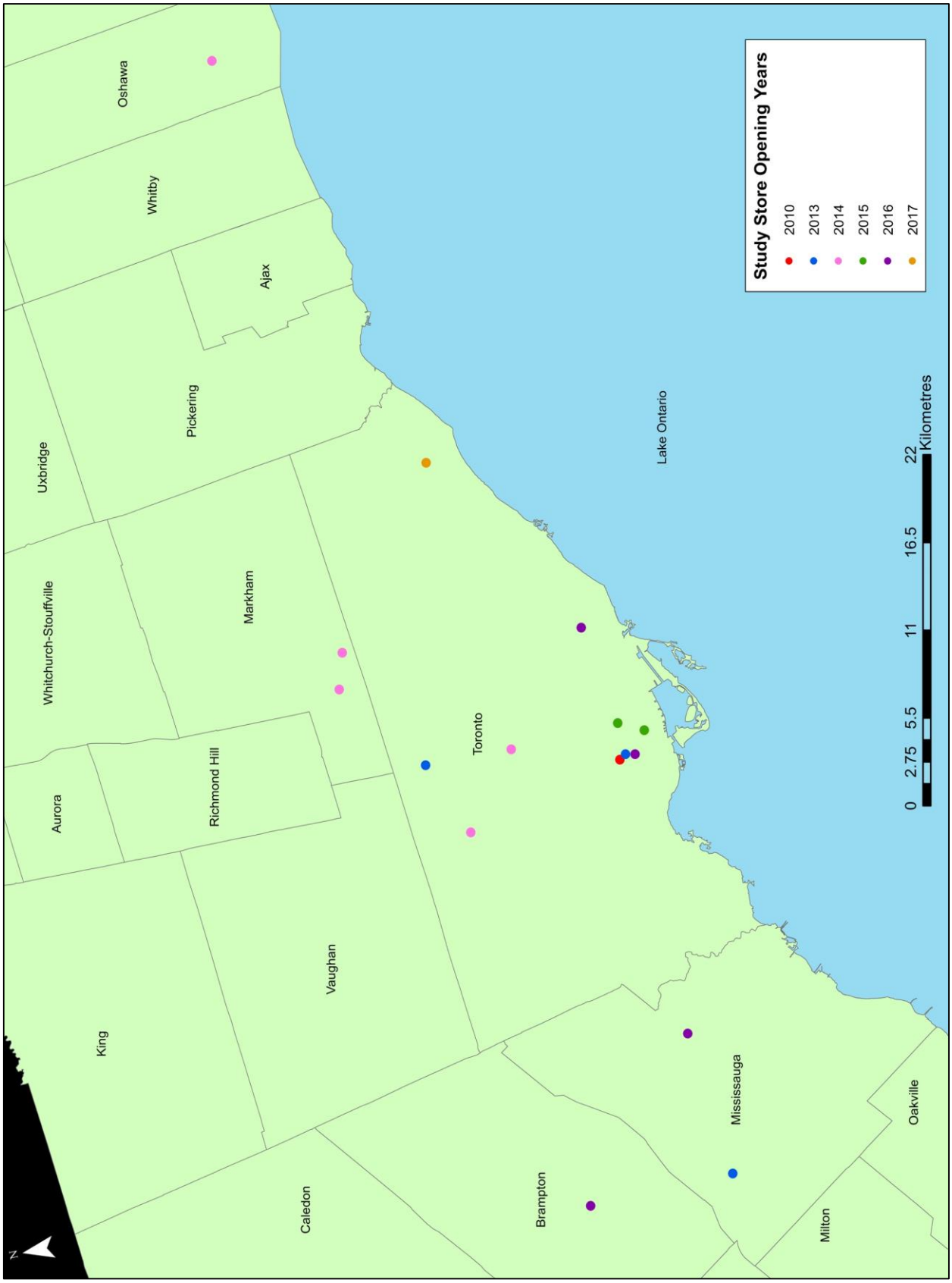

Figure 4.1: The Opening of BGCs over Time

Post 2010, three locations (*Café Princess, Bampot & De Code Adventures*) were opened in 2013, and six locations (*For the Win Board Game Café, Mystery Board Game Café, Brew Wizards Board Game Café, Utopia Dream Café, Omescape Markham & A Game Café*) were opened in 2014. The year of 2014 saw the greatest growth in the occurrences of BGC openings and can be considered the peak growth year for the industry. 2015 saw the opening of one café (*Riddle Room*) followed by four locations (*Time Capsule Board Game Café, Snakes & Lattes College, Studio 8.9, House of Card Board Game)* in 2016, and only one location (*Chit-Chat-Play Food & Game)* in 2017 (January-August).

The findings of the opening years provide background context towards understanding the growth in the industry. However, in addition to this, the results also present interesting spatial findings. The illustration in Figure 4.1 suggests that early adopters of the industry decided to locate within the City of Toronto. Prior to the peak café opening year in 2014, three of the four locations (*Snakes & Lattes Annex, Café Princess,* and *Bampot)* were located within Toronto. Through the progression of time, post 2014, the industry has diffused towards the outer regions of the City of Toronto. The adoption towards outer regions of Mississauga, Markham and Oshawa came along first, followed by the expansion towards Brampton. Despite the diffusion pattern, based on the findings, a majority of BGCs within the GTA still prefer to locate within the City of Toronto.

4.2 BGC Trade Areas Map

The usage of Huff Model analysis on BGCs produced quite revealing results for the study. Figure 4.2 presents the analysis results of the Huff Model trade areas on the BGC industry within the GTA. The trade areas findings were created using attractiveness scores for each café along with distance based parameters. The study successfully created trade areas for all 16 café locations identifying primary and secondary trade areas. Primary trade areas are defined when census tract have a visitation probability of 0.6 or greater and secondary trade areas are when the visitation probability is between 0.4-0.6. Table 4.1 summarizes the primary and secondary trade area characteristics for each BGC.

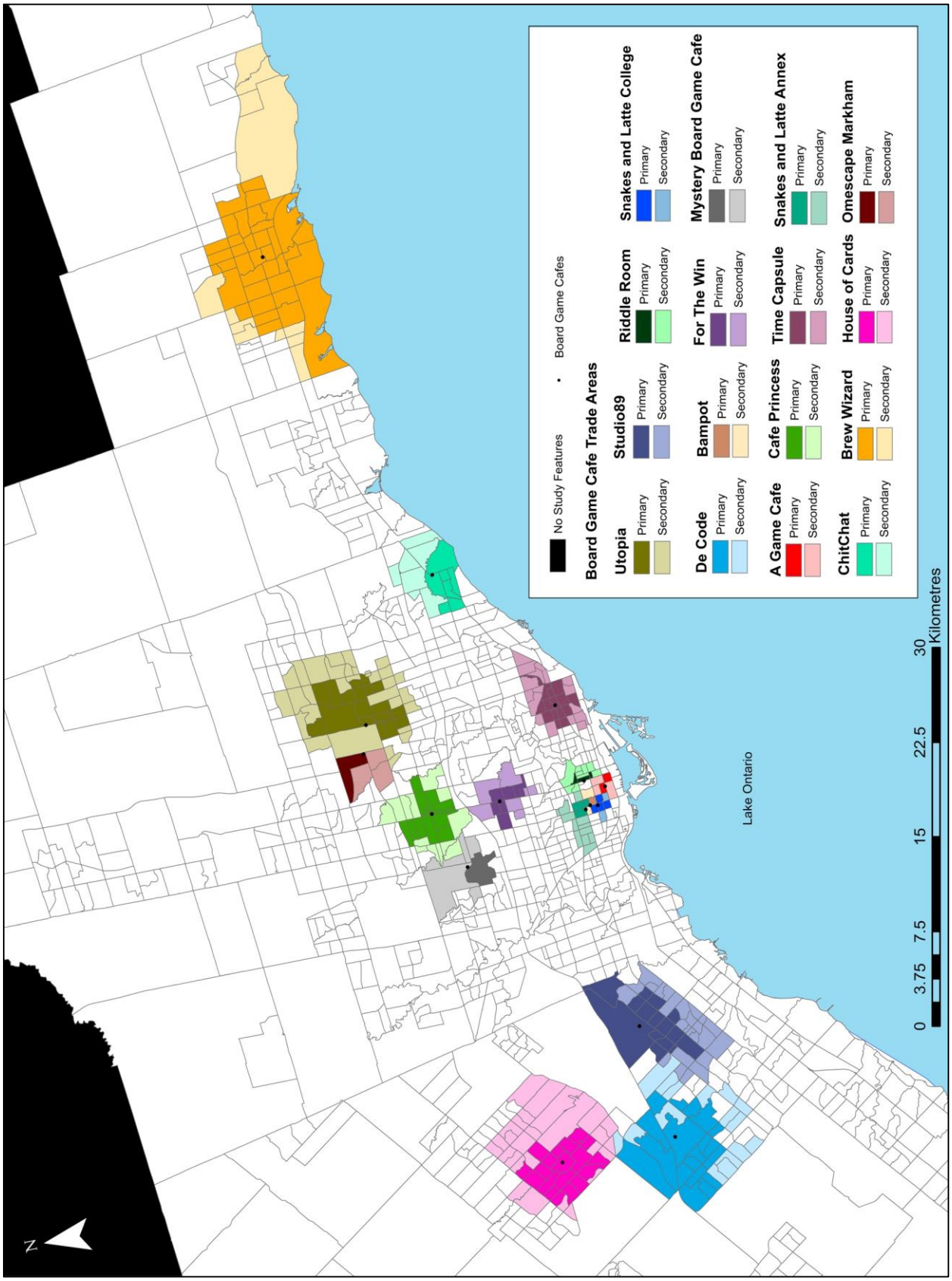

Figure 4.2: BGC Trade Areas within the GTA

Table 4.1: BGC Trade Area Characteristics

BGC Name	No. Primary Trade Areas	No. Inhabitants in Primary Trade Area	No. Secondary Trade Areas	No. Inhabitants in Secondary Trade Area
Utopia Dream Café	19	175,369	32	145,142
Studio89	15	81,758	25	137,920
Riddle Room	3	15,813	9	55,311
Snakes & Latte College	4	16,261	2	9,210
De Code Adventures	19	109,745	16	88,615
Bampot	1	3,955	2	3,833
For the win Board Game Café	7	36,975	7	35,538
Mystery Board Game Café	1	1,598	5	30,797
A Game Café	2	5,559	3	20,780
Café Princess	16	85,437	13	62,094
Time Capsule Board Game Café	15	70,094	16	77,884
Snakes & Latte Annex	3	15,185	12	55,065
Chit Chat Play Food & Games	7	15,874	7	41,916
Brew Wizards Board Game Café	37	226,229	12	50,784
House of Cards Board Games	19	101,696	27	135,109
Omescape Markham	1	4,464	3	13,081

The results shown above in Table 4.1 present indications that BGC locations embody different trade area characteristics. They allow for a generalized understanding for BGC markets within the GTA. Depending locality, BGC trade area impacts can range from small areas of influence to substantial boundaries of trade area authority. The trade area influence is affected by the combination of surrounding area competition as well as the inherited attractiveness score[28] embodied by each BGC location. The findings suggest that even when café locations have superior attractiveness scores, locating in an area of existing competition can negatively affect trade area exposure. In contrast, cafés with moderate, or even moderate low attractiveness scores can perform extremely well under circumstances where there is no

[28] Attractiveness scores was ranked based on the researcher's discretion using collected store attributes as well as assigned weightings.

competition café in close proximity. This pattern is apparent when interpreting the visualized results of Figure 4.2. As depicted, BGCs in the downtown core of Toronto, which include *Snakes & Lattes Annex, Bampot, A Game Café, Snakes & Lattes College* and *Riddle Room,* had smaller areas of trade area influence since it resides in an area of high competition. Despite a few of the cafés in this area attaining the highest total attractiveness scores in the study, none is able to assert dominance over another. In dissimilar fashion, BGCs portrayed that are located in remote areas of little competition are able gain an area of large influence. This can be seen in BGCs such as *Brew Wizards, Chit Chat Play Food & Games, Time Capsule Board Game Café, House of Cards Boards Game Café, De Code,* and *Studio89.* All these BGC locations are located in areas where no direct competition is in close proximity, therefore even with their medium valued store attractiveness scores, they are still able to solidify a certain degree of trade area authority.

4.3 K-Means Cluster Analysis Findings

K-Means cluster analysis was used to determine hypothesized household profile groupings on a census tract level geography for the BGC study. Using variables specified by the researcher, the resulting findings classified all census tracts within the study area to fall within a specific cluster grouping. Table 4.2 depicts the final cluster findings for the analysis along with census tract population information and the numeric accounts of number of cases in each. The depiction of cluster groupings joined with their respective census tract is represented in Figure 4.3.

The cluster analysis was conducted using a specified *k* value determined by the researcher. The correct determination of a *k* value for studies is often ambiguous no one standardized method is deemed to be the most precise. For this study, a *k* value of k=7 was used as it best modeled the study. The k=7 generated results coincided with the researcher's knowledge of the area as well as corresponding to characteristics modeled in secondary studies. In the following section, results are presented regarding the variable findings of each cluster grouping.

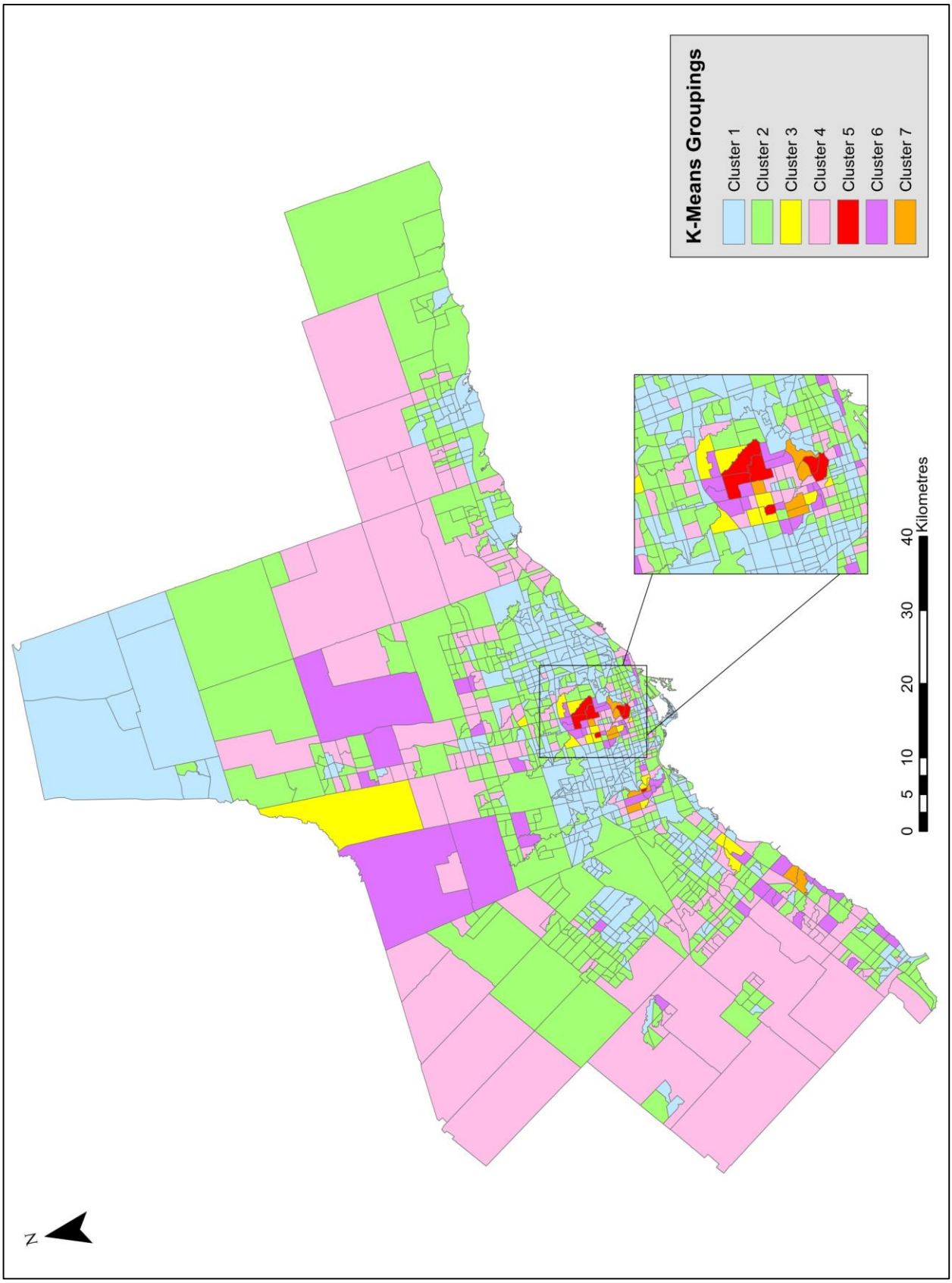

Figure 4.3: K-Means Cluster Grouping of the GTA based on variables used in the study

Table 4.2: Final Cluster Centre Solutions of K-Means Analysis along with census tract information

Cluster	1	2	3	4	5	6	7
Avg Household Income	$72,123	$107,503	$289,801	$144,282	$560, 267	$200,797	$239,945
Avg Expenditure: Snack & Beverage	$329	$466	$767	$557	$1407	$658	$958
Avg Expenditure: Children Toys	$137	$224	$560	$293	$918	$404	$748
Ages 15-34 (%)	28.65	26.42	22.44	25.48	20.76	23.21	21.68
Bachelor's Degree or Above (%)	25.14	30.22	53.44	38.33	62.45	48.18	56.36
Professional Occupation (%)	49.89	58.19	77.14	66.07	84.65	73.06	78.09
No. Census tracts in Cluster Group	454	440	16	206	7	52	11
% of Study Area Census Tract in Cluster Group	38.28	37.10	1.35	17.37	0.59	4.38	0.93
No. Inhabitants in Cluster Group	2,375,636	2,179,078	66,303	1,091,864	20,200	251,911	36,012
% of Study Area Population in Cluster Group	39.45	36.19	1.10	18.13	0.34	4.18	0.60

The findings of the study suggest that cluster 1 is deemed to be the dominant cluster grouping within the study area boundary. The cluster grouping profile occupies 454 census tracts which accounts for 38.28% of the total area included in the study. This cluster profile has the lowest household income, expenditure accounts, educational attainments and professional occupation rates but in contrast holds the highest account for % of individuals ages 15-34. The concentration of youth population justifies the low variable results as majority of the population are not of the post-secondary or job bearing age requirement. The findings of this cluster grouping coincide with a millennials study conducted by Environics Analytics. The research specifies millennials household income to average around $71,000 (Norris, 2015), which

closely resembles the cluster finding of $72,123. Also, obtaining the highest concentration of youth population grouping, it is assumed cluster 1 embodies census tracts with or of millennial households.

Another heavily dominated cluster grouping is cluster 2, it occupies 440 census tracts which cover 37.10% of the total areas included in the study. This cluster profile has the second lowest household income, expenditure accounts, educational attainments and professional occupation rates, but the second highest accounts for % of individuals ages 15-34. The cluster grouping is presumed to represent census tracts households where a small portion millennials have graduated and obtained a full-time job.

The third most occupied cluster in the study is cluster 4. The cluster profile employs 206 census tracts within the study area making up 17.37% of the total area included in the study. This cluster profile has the third lowest household income, expenditure accounts, educational attainments and professional occupation rates but the third highest accounts for % of individuals ages 15-34. This cluster grouping is believed to represent census tract households where a majority of the population are well educated established middle aged adults with professional occupations.

The remaining cluster groupings (3,5,6,7) account for the remaining 7.25% of the census tracts within the study area. The majority of these profile groupings are of higher income, expenditures accounts, education attainments and professional occupation rates, but these cluster groups possess low accounts for % of individuals ages 15-34. A generalized characterization of these cluster groupings can be classified as individuals that are wealthy older aged adults having graduated from post-secondary education and having professional occupations.

In succession to presenting the findings, the naming of the cluster groupings is required for a better comprehension for the profile groups. Using the resulting findings from the analysis, cluster groups were given names based on the researcher's discretion. Table 4.3 presents the cluster groups and their associated names.

Table 4.3: Researcher Given Cluster Name Classifications

K-Means Cluster Groupings	Researcher given Cluster Names
Cluster 1	Millennials & Millennial bearing Households
Cluster 2	Newly Graduated Millennials
Cluster 3	Well Educated Professional Middle Aged Adults
Cluster 4	Established Educated Millennials
Cluster 5	Mature Aged Very Educated Professional Elites
Cluster 6	Sensibly Professional Educated Middle Age Adults
Cluster 7	Well Educated Mature Aged Professional

4.4 BGC Trade Area Groupings Maps

Given the findings of Huff Model trade areas and K-Means cluster analysis, the successive maps were layered upon one another to identify cluster groupings by BGC trade area (Figure 4.4). The following section provides the quantitative findings for the Huff Model, K-Means overlay map. The result provides a favoured cluster grouping adopted by BGC. This favourite cluster grouping finding provides an indication towards establishing if BGCs do indeed adopt locational preferences when opening establishments.

Analysis findings are presented in table 4.4. The information included in the table provides the total number of census tracts within primary/secondary BGC trade areas, the numeric accounts of cluster groupings that fall within the trade areas, the favoured cluster grouping adopted by BGCs and lastly the number of inhabitants within the favoured cluster grouping.

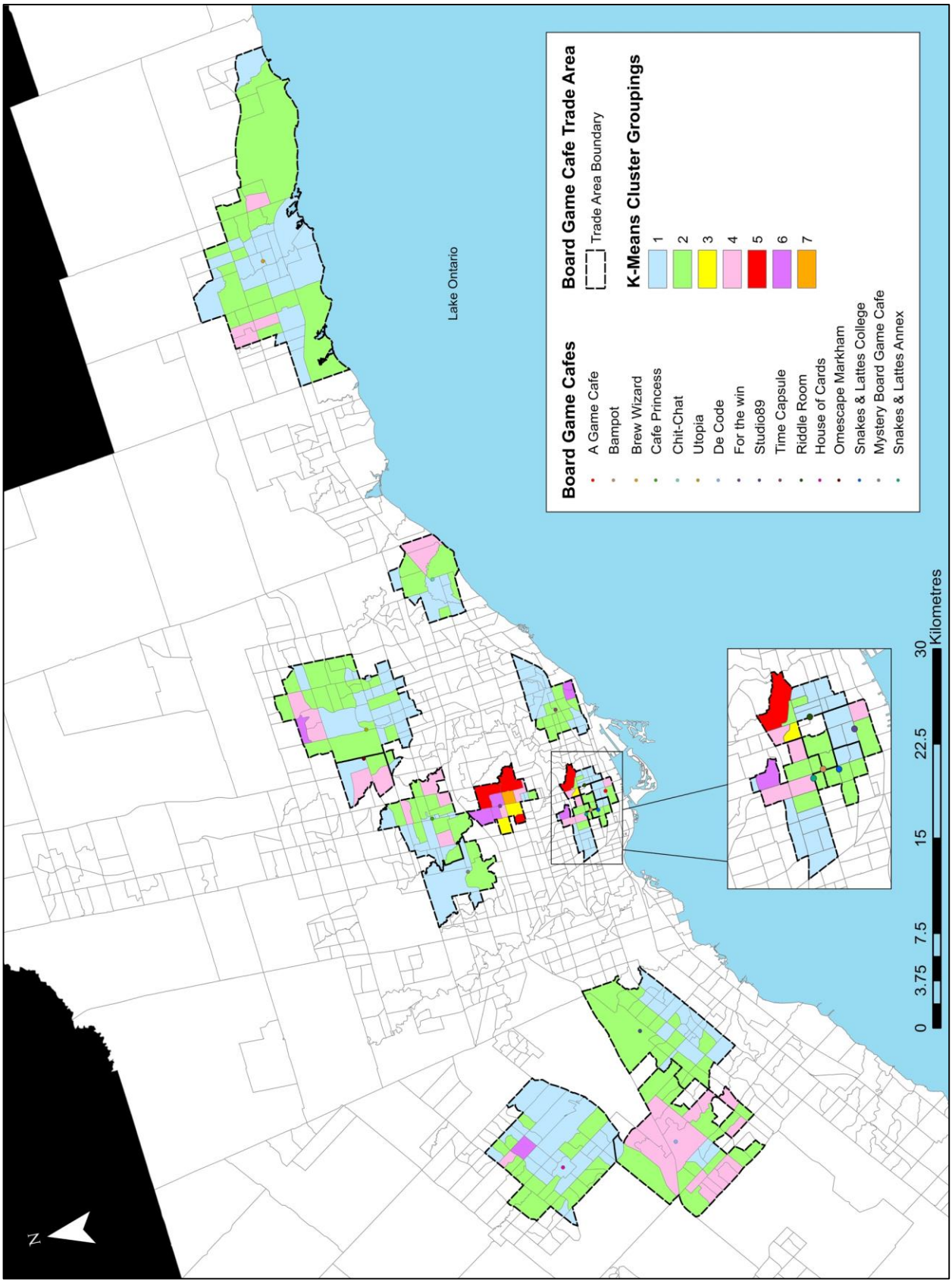

Figure 4.4: Huff Model, K-Means overlay map

Table 4.4: BGC Favoured Cluster Count

BGC Name	Total No. of Census Tracts	1	2	3	4	5	6	7	Favoured Cluster Grouping	No. Inhabitants in favoured grouping
Utopia Dream Café	51	26	21	0	3	0	1	0	1	119,012
Studio89	40	22	18	0	0	0	0	0	1	120,895
Riddle Room	12	7	2	1	1	1	0	0	1	52,208
Snakes & Latte College	6	2	4	0	0	0	0	0	2	16,764
De Code Adventures	35	4	15	0	16	0	0	0	4	83,968
Bampot	3	0	3	0	0	0	0	0	2	7,788
For the win Board Game Café	14	2	1	2	2	3	3	1	N/A	N/A
Mystery Board Game Café	6	4	2	0	0	0	0	0	1	24,626
A Game Café	5	3	1	0	1	0	0	0	1	17,050
Café Princess	29	15	10	0	4	0	0	0	1	80,742
Time Capsule Board Game Café	31	16	13	0	0	0	2	0	1	81,945
Snakes & Latte Annex	15	8	3	0	3	0	1	0	1	32,834
Chit Chat Play Food & Games	14	7	5	0	2	0	0	0	1	37,829
Brew Wizards Board Game Café	49	25	20	0	4	0	0	0	1	100,783
House of Cards Board Games	46	25	19	0	1	0	1	0	1	138,715
Omescape Markham	4	1	1	0	2	0	0	0	4	10,495

The compiled quantitative results above shown in Table 4.4 indicate that BGC locations do favour a certain cluster grouping. As 11 out of the 16 BGC locations[29] showed a dominance in the cluster 1 grouping, it is determined that BGCs are assumed to target a customer profile of younger demographics and its households. As for the remaining 5 locations[30], all of which favoured other cluster groupings[31] except *For the Win Board Game Café*. This particular cafe is classified as not favouring a cluster grouping. The quantitative measures for this particular café provides inconclusive results in determination of a favoured cluster group.

[29] The 11 locations that fell within cluster 1 trade area grouping are: *Utopia Dream Café, Studio89, Riddle Room, Mystery Board Game Café, Café Princess, A Game Café, Snakes and Lattes Annex, Chit Chat Play Food & Games, Brew Wizards Board Game Café, House of Cards Board Games & Time Capsule Board Game Café.*

[30] The 5 locations that favoured other cluster groupings are: *Snakes & Lattes College, De Code Adventures, Bampot, & Omescape Markham.*

[31] *Snakes & Lattes College* and *Bampot* favour a cluster 2 grouping, and *De Code Adventures* and *Omescape Markham* favour a cluster 4 grouping

The generalized findings through the Huff Model K-means overlay map show that BGCs do attempt to located in certain customer profile census tracts. The resulting finding indicates that BGCs are favoured to locate in areas of cluster 1 groupings. This subsequent result coincides with the researcher's understanding as well as samples of exploratory news articles, (Clapson, 2016; Hutchcraft, 2016; Kosloski, 2016; Reynolds, 2016; Sung, 2011) conducted on BGC industry. An additional map highlighting BGCs and their favoured trade area is available in appendix C.

4.5 MCDA and BGC Untapped Potential

The MCDA was conducted with the sole purpose of identifying areas of untapped potential for BGC retailers. The analysis makes use of identified favoured cluster grouping results and attempts to identify census tract areas where variable profiles are best suited for BGC locations. In combination with the Huff Model trade areas, a findings map was generated highlighting where these areas may exist (Figure 4.5). A version of MCDA map without Huff Model implementation can be found in appendix D.

The MCDA-Huff Model map indicates that areas of untapped potential do exist within the study area. Areas of MCDA scores were identified in locations where the study variable combinations[32] scored the highest, and are therefore seen as the most attractive. These areas embodied variable characteristic which are believed to be most favoured by BGC retailers. Interpreting the overlay map, two boundary areas were identified as untapped areas (both in the City of Toronto) as existing BGC trade areas do not overlap their census tracts. It is worth mentioning that other areas of non-overlap census trade areas do exist within the study boundary. However, due to their close proximity to existing BGC trade areas, they were ultimately excluded from consideration as being areas of untapped potential.

Note that both selected boundary areas are locationally diverse from existing BGC areas. Essentially, the identified areas fill in "gaps" within the market where no existing BGC trade areas are of

[32] The study variables used were those that met the minimum criteria identified by the favoured cluster grouping. Variables include: Ages 15-34 (%), Favoured HH Income Range % ($70,000-$79,000), Yearly HH Income on Children Toys (%), Yearly HH Income on Snacks & Beverage (%), Bachelor's Degree or Above (%) and Professional Occupation (%).

influence. The first location resides within the western quadrants of the city. It consists of fourteen census tracts with MCDA scores between (24.79-36.53), seventeen census tracts of scores between (18.83-24.78), and lastly two census areas adopting scores between (14.18-18.82).

The second location, it resides in the eastern parts of the city and contains twenty-eight census tract areas where eight areas score between (24.79-36.53), six between (18.83-24.78), nine between (14.18-18.82) and lastly five census tracts adopting scores between (10.27-14.17).

All census tract areas of the two untapped area boundary selections consist of high MCDA results compared to surrounding areas. These areas of untapped potential are assumed to be the next two best locational boundaries for implementation of a new BGC location.

Besides identifying areas of untapped potential, the resulting MCDA-Huff Model overlay map also provides context on the spatial distribution of MCDA scores within the study area. The spatial pattern depicted shows a spatial diffusion for census tracts of high attractiveness. The findings indicate that the core for the City of Toronto is assumed to be the most ideal, and as distances increases, the suitability for BGC implementation decreases.

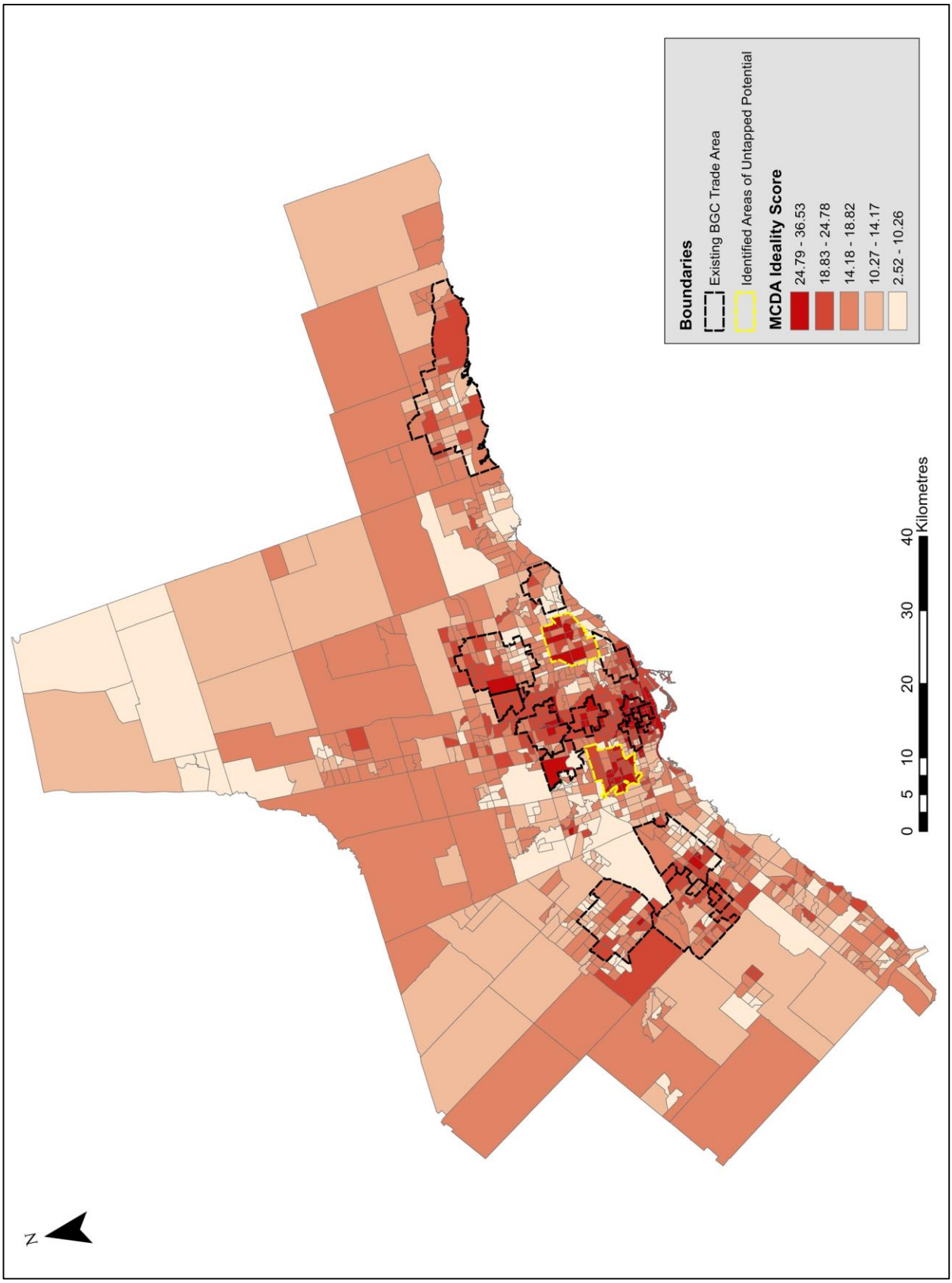

Figure 4.5: MCDA, Huff Model overlay

Chapter 5: Discussion and Conclusion

This final chapter summarizes the key findings and the value of the research, discusses the limitations and identifies areas for further research.

5.1.1 Value of the Research

This paper has initiated exploratory research on a subcategory of the retail market unexplored in previous academic literature. Formerly, large samples of retail based academic studies are based on big box retail, shopping centres, and even supermarkets, but far fewer studies focus on smaller establishments that make up the greater retail environment. The researcher believes undertaking an investigative understanding on smaller niche markets can potentially initiate other pilot studies on smaller segment establishments within the retail market. Variable selection assumptions were also adopted in the study as innovative measures were required for a study where little supporting literature is present. The value of this aspect is it allows for growth as this study topic becomes propagated in academic studies. The tinkering of methods and user selected variables can be fine-tuned in contributing to yield better result findings in the future.

For BGC enthusiasts, particularly those in the GTA, this research provides a detailed overview regarding the history of table top games and the changes in the industry within their neighbourhoods. The study is able to solidify assumptions of growth in BGCs allowing individuals within the study area to appreciate the measures taken to amplify this niche market sector.

Finally, as for current or future BGC owners, this research should prove to be of value as their introduction into the hybrid retail market[33] is believed to be unsighted. As the retail market continues to fragment, conducting an analysis of the newly adopted hybrid retail market should prove to be an interesting read for industry practitioners. The research provides a brief overview on the changes within the retail market and how a shift into experience within retail is a growing phenomenon. It elaborates on the fact that

[33] Retailers that provide a variety of food and service entertainment mix in their offerings.

this pattern is not something of relatively new emergence, but as a re-visitation of food and entertainment in retail evident previously. The research then provides values and gives insight towards the overview perspective into the profile dynamics of the BGC market using sets of variable assumptions as well as innovative research methods. It also allowed for the uncovered understanding of aspects that can potentially make stores more desirable for visitation. Moreover, it also permits insight into areas of assumed untapped potential which is extremely valuable to those looking to invest into the market.

5.1.2 Findings

This paper has presented a background for the board game industry as well as a profile of the BGC retail market in the GTA. The results were generated based on exploratory articles conducted on the industry, the researcher's knowledge, as well as sets of suboptimal variables selected using theoretical assumptions. It was shown through historical analysis that indeed the market for BGCs has grown in the GTA post 2010. Since the introduction of the first *Snakes and Lattes* BGC establishment, the industry has risen in popularity stimulating alike businesses to grow in number. The rising recognition of the retail establishment created a diffusion pattern spreading establishments from the core of Toronto outwards to surrounding census subdivisions within the study area boundary. The avid adopters of the industry have created a word-of-mouth buzz triggering sample of news articles, (Clapson, 2016; Hutchcraft, 2016; Kosloski, 2016; Reynolds, 2016; Sung, 2011) to focus on the target customer dynamics, as well as profile groups in attempts to understand the community for BGCs. Though news articles provide some insight towards the industry, no investigative approaches were conducted to comprehend if BGCs locate with an inherited favouritism towards market subsets. The research conducted utilizing the combination of Huff Model and K-means analysis finds that BGCs do favour a certain customer profile. The findings found that the majority of BGCs within the GTA favour a customer grouping where of millennials and millennial profile characteristics are high. Although the target customer subset may not provide the highest accounts of expenditure, income and or educational attainments, this profile is still presumed to be favoured by BGCs.

Within the defined study area, two areas of untapped potential have been identified as areas where the inclusion of BGC can be of success. Both areas are located within the City of Toronto, but cover opposite parts of the city (east and west)

5.2 Limitations

As with any analytical work, particularly those with little supporting literature, limitations are bound to exist. There is a chance that despite all precautions, the dataset might not, in fact, cover all the stores within the study area. With the absence of a maintained standardized database of BGC locations, new locations or potentially concealed establishments in smaller towns may have been overlooked for the study. Moreover, the misclassification of store categories[34] in both, *GoogleMaps* and *Yelp* could have also hindered the inclusion of potential locations into the study.

The BGC locations collected for the study is are based on the assumption that these businesses have situated where it is best 'ideal'. It is understood that possibilities can exist that BGCs only have located in areas where it was most viable option (e.g., in terms of leasing availability or affordability). Extensive market research, field surveys, focus groups, and interviews can help reduce this limitation, but ultimately due to time constraints for this research, this aspect has been left out of the study. However, the study findings still hold a certain degree of legitimacy, but they would have been greatly complimented if solidification of location selection reasoning were to be uncovered.

The selection of variables for the study also proved to be a challenging task. The absence of investigative literature regarding the industry on BGCs limited the researcher from drawing insight on the proper sets of variables to utilize. Though despite this, a best set of suboptimal variables[35] were selected in providing assumptions towards the BGC industry. But it should be noted other potential variables may have been excluded unintendedly by the researcher's discretion which can reduce the overall explorative finding of the study.

[34] The classification of "Board Game Cafés" could potentially be listed just as "Cafés".
[35] the variables were chosen based on articles based on the BGC industry as well as the researcher's knowledge of the market.

Segmenting census tract neighbourhoods using suboptimal selections of variables for the study was theoretically sound but tenuous. While there is support for this based on the K-means analysis result correlating with exploratory articles and researcher's knowledge on the industry, the method's legitimacy would be significantly improved if related supporting research were to be conducted on profiling neighbourhoods for the niche market. While relating to supporting evidence, the segmentation of neighbourhood types conducted in the methodology remains idiosyncratic. K-Means clustering is often accused of being subjective (Pastor, 2010), therefore proper statistical evaluation techniques and comparative measures to the researcher's understanding were conducted to best minimize this inherent weakness.

Huff Models are very distance based allocating consumer visitation towards the nearest storefront. Though this can be solved using attractiveness scores along with weighting schemes, but in the end, this is subjected to the researcher's discretion. The road network boundaries used for Huff Model calculation may also not reflect the most updated information as the dataset was from 2011. This can potentially affect the accuracy of results as road network distances from census tract to BGCs are a deterministic factor.

Lastly, the relevancy of the census data used restricted the accuracy in reflecting the BGC market today. As this research was conducted during a gap year where current census data are undergoing compilation, it prohibited the use of the most up to date datasets available. The fallback use of prior census and data variables was instead utilized which marginally limited precision factors in uncovering the market potential, segmenting census tracts and predicting spending habits.

5.3 Further Research

As this research establishes the foundation for explorative studies for BGC, further researches is required to solidify and produce superior in depth results. Firstly, a better standardized way of obtaining BGC locational data will have to be devised. In conjoining efforts with BGC owners, a store locator should be created. This allows researchers to keep track and manage information regarding the opening and closing of café locations in aiding the advancement of collective research methods for the study of BGCs.

With regards to data variables, more up-to-date census data will be required to uncover dynamics of customer profile characteristics. Expanding the census data can also lead to an introduction of new variables into the study. Variables such as ethnicity, immigration information and population growth predictions should all be considered as they can potentially lead to revealing results advancing the study and the understanding of the market.

Focus group, field surveys and extensive research are also required to further the research. As this paper acts as an initial pilot study for BGC, the next step would be to collect primary data on these establishments. This can help to generate a useful set of data variables that mitigates the ambiguity of assumptions. Moreover, interview-based questions conducted with BGC owners should also be considered. This can provide insight towards the aspects that makes their business unique and factors that allow them to stay sustainable. It can also provide revealing results such as expenditures of BGCs, how customers locate stores, and distances they are willing to travel.

Expanding the sample to cover a larger portion of the study area would also improve the overall statistical reliability of the results. Conducting similar research on the BGCs in other geographic locations and associating it with this study would provide important insight on the applicability of the findings.

Lastly, the estimating sales potential for BGC locations should also be a consideration for the next steps of the study. This can provide insight towards market influence in terms of economic means of each BGC location. BGCs could then be ranked based on economic profitability which can potentially be a valuable finding for industry practitioners and potential BGC investors.

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Appendix A:

Board Game Industry & BGC Statistics

In comparison to other toys and hobbies categories, table top games have grown the fastest at 10.87%. in the United States. The dataset provides an indication that board game markets have experience an upwards growth rate

Annual 2015 U.S. Toy Industry Performance

Super-category	Dollar % Change
Games/Puzzles	10.8 percent
Vehicles	9.7 percent
Building Sets	9.4 percent
Outdoor & Sports Toys	8.8 percent
Action Figures & Acc	8.7 percent
Dolls	8.4 percent
Infant/Toddler/Preschool Toys	5.7 percent
All Other Toys	4.3 percent
Plush	1.6 percent
Arts & Crafts	-4.3 percent
Youth Electronics	-4.9 percent

Table source: The NPD Group Inc. / Retail Tracking Service (2015)

Board Game sales data by category in the United States and Canada in 2015.

U.S. / Canada Games Sales -- 2015	
Category	**Retail Sales (in millions)**
Collectible Games	$625
Non-Collectible Miniature Games	$175
Hobby Board Games	$250
Hobby Card and Dice Games	$105
Roleplaying Games	$35
Total Hobby Games	$1,190

Table source: ICv2, Griepp (2016)

Google search trends in Toronto (GTA) using the keyword “Board Game Café”.

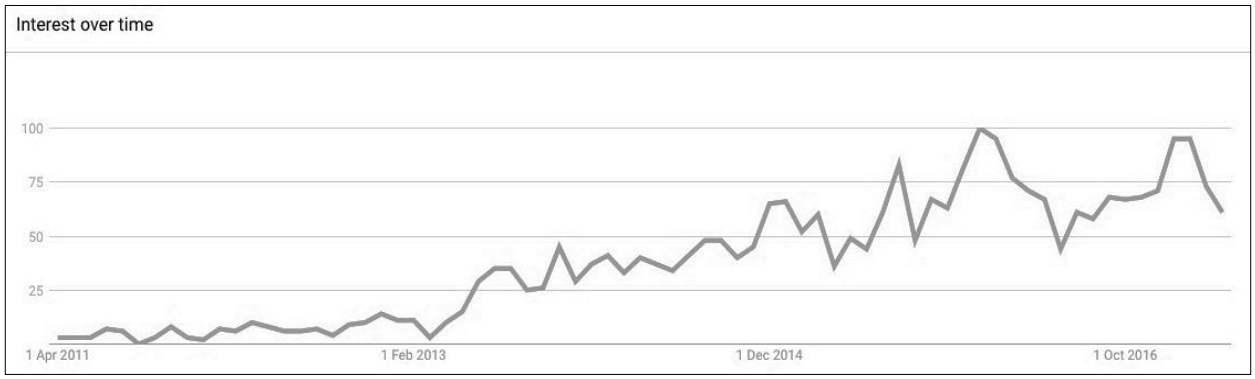


Chart source: Google Trends (2016)

Appendix B:

Examples of Board Games Mentioned in the Study

The following sets of picture depicts a complete set of *Senet* board game that was found inside King Tutankhamen's tomb along with a picture of the game board surface.

Image source: BoardGameGeek.com (2016)

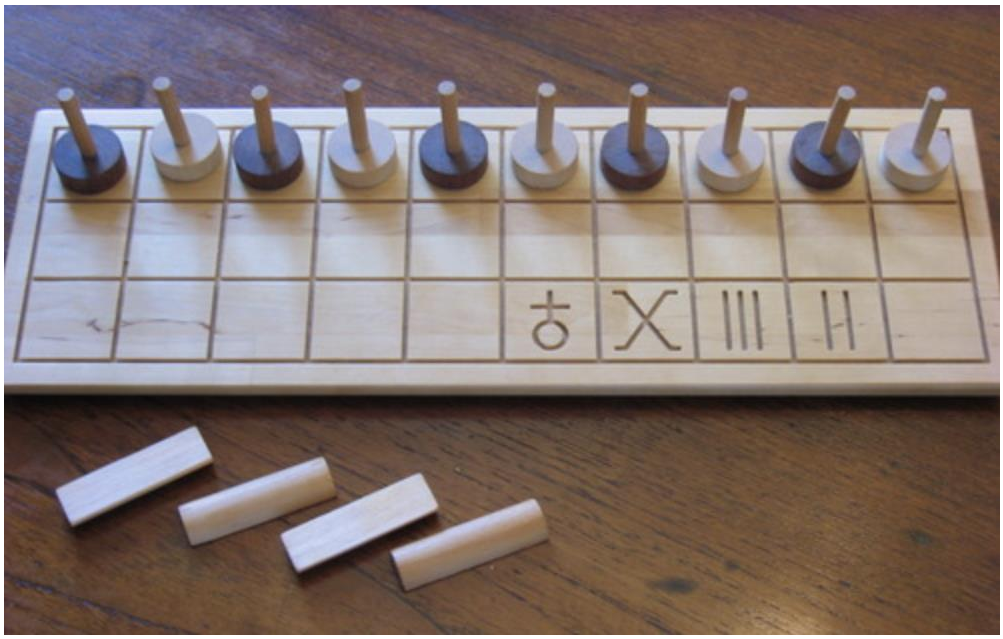


Image source: BoardGameGeek.com (2016)

Samples of *Ameritrash* board game include: *StarCraft the Board Game,* and *BattleStations.*

StarCraft the Board Game

Image source: BoardGameGeek.com (2016)

BattleStations

Image source: BoardGameGeek.com (2016)

Samples of *Eurogames* board games include: *Settlers of Catan* and *Puerto Rico*

Settlers of Catan

Image source: BoardGameGeek.com (2016)

Settlers of Catan Resource Cards

Image source: BoardGameGeek.com (2016)

Puerto Rico

Image source: BoardGameGeek.com (2016)

Samples of modern day *hybrid board* games include: *Blood Bowl: Team Manager*, and *Bootleggers*

Blood Bowl: Team Manager

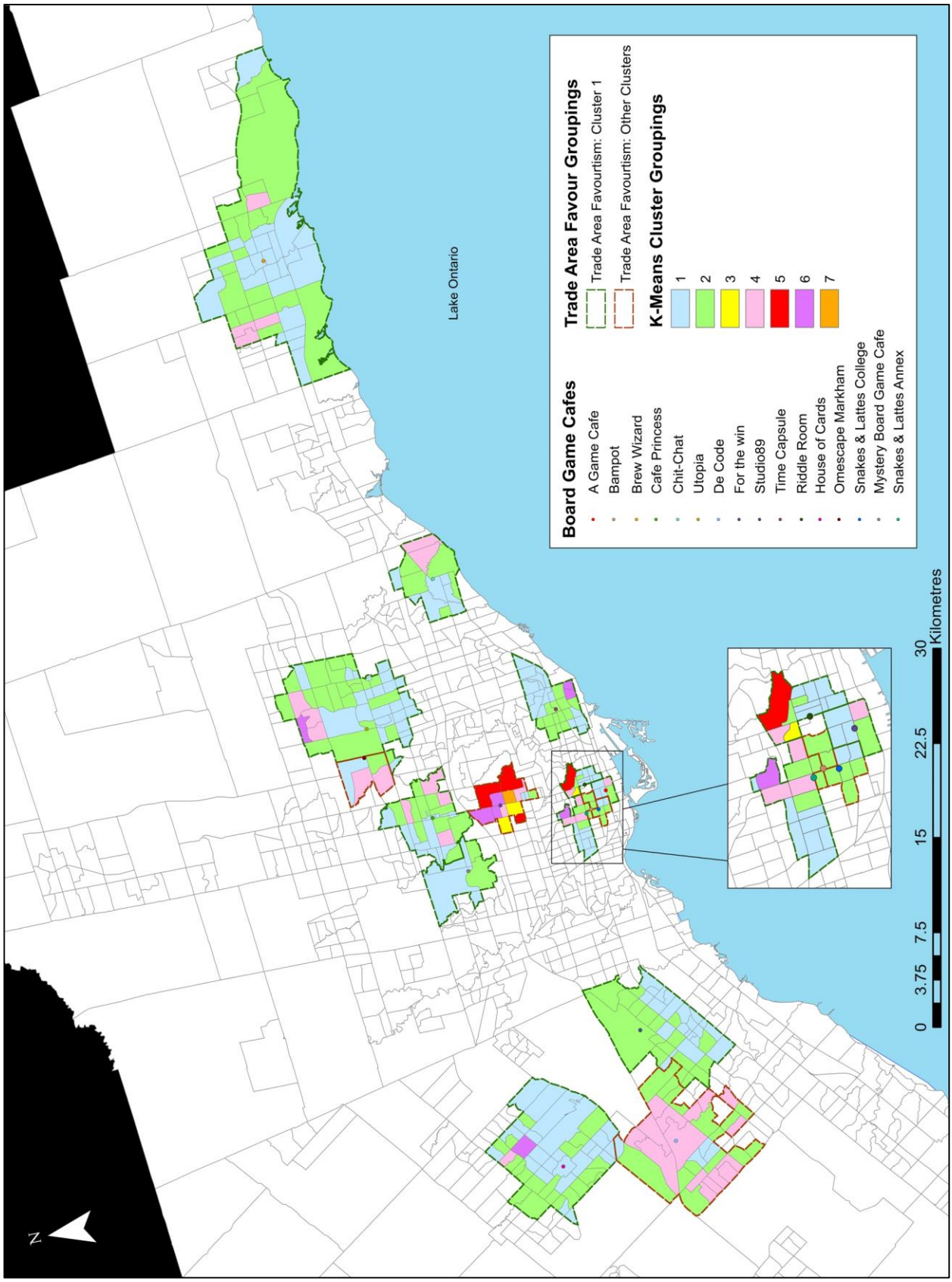
Image source: BoardGameGeek.com (2016)

Bootleggers

Image source: BoardGameGeek.com (2016)

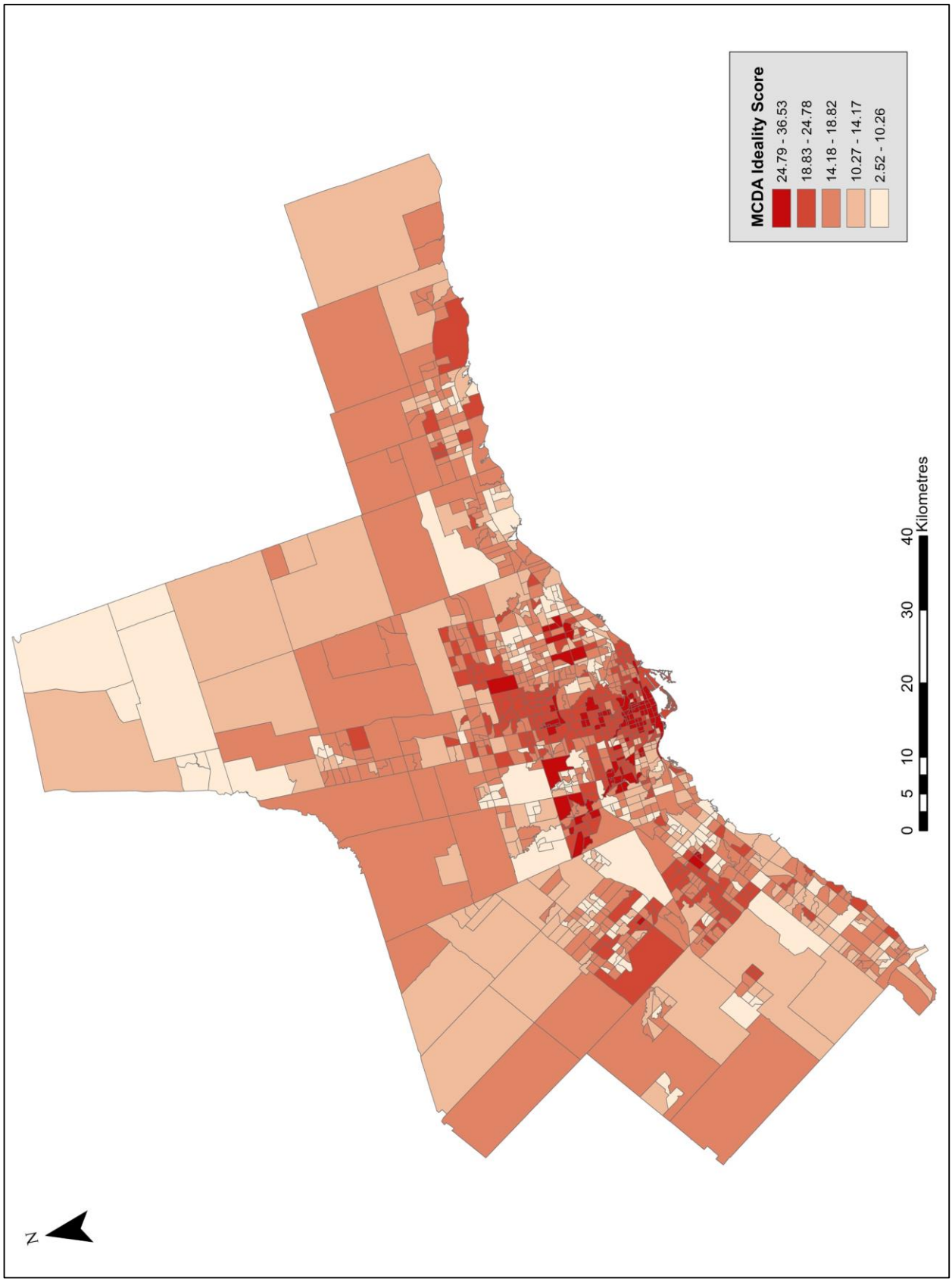
Appendix C:

Huff Model, K-Means overlay Map (Favoured Cluster Defined)


Lake Ontario
Board Game Cafes
A Game Cafe
Bampot
Brew Wizard
Cafe Princess
Chit-Chat
Utopia
De Code
For the win
Studio89
Time Capsule
Riddle Room
House of Cards
Omescape Markham
Snakes & Lattes College
Mystery Board Game Cafe
Snakes & Lattes Annex
Trade Area Favour Groupings
Trade Area Favourtism: Cluster 1
Trade Area Favourtism: Other Clusters
K-Means Cluster Groupings
1
2
3
4
5
6
7
0
3.75
7.5
15
22.5
30
Kilometres
N

Appendix D:

Raw MCDA outputs without Huff Overlay Map


MCDA Ideality Score
24.79 - 36.53
18.83 - 24.78
14.18 - 18.82
10.27 - 14.17
2.52 - 10.26
0 5 10 20 30 40 Kilometres
N