2019

Successful Demand Forecasting Modeling Strategies for Increasing Small Retail Medical Supply Profitability

Arica Watkins
Walden University

Follow this and additional works at: https://scholarworks.waldenu.edu/dissertations

Part of the Finance and Financial Management Commons, and the Health and Medical Administration Commons

This Dissertation is brought to you for free and open access by the Walden Dissertations and Doctoral Studies Collection at ScholarWorks. It has been accepted for inclusion in Walden Dissertations and Doctoral Studies by an authorized administrator of ScholarWorks. For more information, please contact ScholarWorks@waldenu.edu.

Walden University

College of Management and Technology

This is to certify that the doctoral study by

Arica C. Watkins

has been found to be complete and satisfactory in all respects,
and that any and all revisions required by
the review committee have been made.

Review Committee
Dr. Wen-Wen Chien, Committee Chairperson, Doctor of Business Administration
Faculty

Dr. James Glenn, Committee Member, Doctor of Business Administration Faculty

Dr. Jorge Gaytan, University Reviewer, Doctor of Business Administration Faculty

The Office of the Provost

Walden University
2019

Abstract

Successful Demand Forecasting Modeling Strategies for Increasing Small Retail Medical

Supply Profitability

by

Arica C. Watkins

MBA, Texas A&M University-Commerce, 2013

BS, Spalding University, 2003

Doctoral Study Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Business Administration

Walden University

October 2019

Abstract

The lack of effective demand forecasting strategies can result in imprecise inventory

replenishment, inventory overstock, and unused inventory. The purpose of this single

case study was to explore successful demand forecasting strategies that leaders of a small,

retail, medical supply business used to increase profitability. The conceptual framework

for this study was Winters's forecasting demand approach. Data were collected from

semistructured, face-to-face interviews with 8 business leaders of a private, small, retail,

medical supply business in the southeastern United States and the review of company

artifacts. Yin's 5-step qualitative data analysis process of compiling, disassembling,

reassembling, interpreting, and concluding was applied. Key themes that emerged from

data analysis included understanding sales trends, inventory management with pricing,

and seasonality. The findings of this study might contribute to positive social change by

encouraging leaders of medical supply businesses to apply demand forecasting strategies

that may lead to benefits for medically underserved citizens in need of accessible and

abundant medical supplies.

Successful Demand Forecasting Modeling Strategies for Increasing Small Retail Medical

Supply Profitability

by

Arica C. Watkins

MBA, Texas A&M University-Commerce, 2013

BS, Spalding University, 2003

Doctoral Study Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Business Administration

October 2019

Dedication

The dedication of my doctoral study goes to my family and friends that supported me throughout the entire experience. I am thankful for my Christian faith, as it has sustained me during my entire doctoral study experience. I especially thank Dr. Wen-Wen Chien for her consistent cool demeanor, patience, and support. I thank my mother and father for always being there to support and encourage my goals.

Acknowledgments

I would first like to thank my chair, Dr. Wen-Wen Chien, for her tremendous support during the program. Thank you for believing in me and encouraging me. I would like to acknowledge the rest of the faculty, specifically Dr. Roger Mayer and Dr. James Glenn, for offering their guidance and support through the doctoral process. I would like to acknowledge my friends and family for their support during this journey.

Table of Contents

List of Tables

Section 1: Foundation of the Study

Forecasts are predictions necessary for optimizing business transactions and aide in introducing new products, improving inventory management, and determining future demand (Toledo, Silva, & Garo, 2017). The process of demand forecasting has become a significant function in business to maintain profitability and competitive advantage (Hofer, Eisl, & Mayr, 2015). Leaders consider demand forecasting important for product supply and demand considerations (Che-Jung, Yu, & Peng, 2016). Estimates of the projected consumption of products over time are also considered in demand forecasts (Kontus, 2014). Leaders use an accurate forecast to improve decision-making on inventory, relative to holding product necessary to meet customer demand (Kontus, 2014).

Today's forecasters have options to use different frameworks or models that include, but are not limited to, the following techniques: (a) judgmental, (b) econometric, and (c) time series (Padgett, DeVincenzo, Munn, & Rajagopalan, 2016; Rathnayaka, Seneviratna, & Jianguo, 2015). With time series techniques to forecasting, leaders use statistical models and supplemental analysis with some human judgment (Padgett et al., 2016). Time series forecast techniques hinge on the idea that future demand is a derivative of the past (Winters, 1960). Toledo et al. (2017) assumes that current demand patterns are repeatable in the future.

Background of the Problem

Managers use forecasts to predict future needs, resulting in information useful for guiding leaders in day-to-day decision-making (Meyerhoefer, Panovska, & Manski,

2016). Leaders apply proper forecasting to mitigate uncertainty in demand and help businesses adapt to economic and regulatory induced changes (Che-Jung et al., 2016). Forecasters should consider various facets of the business environment and internal business plans when developing forecasts (Winters's, 1960). A successful demand plan and strategy is dependent upon two things: the leader's use of an appropriate forecasting framework or model and the existence of capable in-house expert opinion and judgment (Sindelár, 2016). Experts should identify, categorize, and assess the impact of market conditions, consumer trends, and competitive actions (Trapero, Kourentzes, & Fildes, 2015). Equally important is an expert's ability to translate, categorize, and organize the data identified into information critical to the forecasting framework or model input (Cassettari, Bendato, Mosca, & Mosca, 2017). In an extremely competitive landscape, forecasters must have a proper balance of supply and demand (Raza & Kilbourn, 2015). The more effective the demand plan, the larger the degree of forecast accuracy (Che-Jung et al., 2016).

Business leaders use demand predictions to obtain critical insight into their operations, such as inventory management, replenishment, safety stock levels, and proper reorder quantity (Raza & Kilbourn, 2015). When researchers fail to apply accurate demand forecasting strategies, they witness bottlenecks, creating other issues such as imprecise inventory replenishment (Liu et al., 2016). Demand forecasting is one of the many essential business actions having a strong impact on company competitiveness and profitability (Winters, 1960). Through this study, I explored successful demand

forecasting strategies that small, retail, medical supply business leaders use to increase profitability.

Problem Statement

When business leaders fail to apply successful demand forecasting strategies, it can result in imprecise inventory replenishment, inventory overstock, and unused inventory (Liu et al., 2016). According to Ahmad and Shafie (2016), only 34% of 100 participants in their study utilized a systematic inventory management approach. The general business problem was that lack of attention to demand forecasting strategies in the retail medical supply industry lessened business leaders' ability to achieve the organizational goals of profitability and competitiveness. The specific business problem was that some small, retail, medical supply business leaders lack effective demand forecasting strategies to increase profitability.

Purpose Statement

The purpose of this qualitative single case study was to explore the successful demand forecasting strategies that small, retail, medical supply business leaders use to increase profitability. The target population for this study consisted of eight business leaders from a private, small, retail, medical supply business in Kentucky. These business leaders had a history of successfully implementing strategies to forecast customer demand to increase profitability. The implications for social change are that medically underserved Kentucky citizens in need of accessible and abundant medical supplies could benefit from successful demand forecasting strategies applied by small, retail, medical

supply companies through greater availability of retail medical products and an elevated level of caregiving as a result of the products.

Nature of the Study

Researchers should emphasize the importance of selecting the most appropriate research method to obtain useful results (Yin, 2018). The qualitative method is appropriate when a researcher seeks to understand a bounded system using multiple data sources in a real environment (Cope, 2015; Dabić & Stojanov, 2014). A researcher may utilize trusted literature to substantiate the findings from multiple data sources while inquiring into a bounded system (Elo et al., 2014; Wowak & Boone, 2015). Lach (2014) suggested that techniques of coding text and data into themes help support logical thoughts, arguments, and conclusions drawn to expand theoretical concepts. Because my aim was to explore a bounded system of demand forecasting strategies in a small medical supply business, I employed the qualitative method in this study.

Using the quantitative method, a researcher may test the statistical significance of relationships or differences among variables by testing related hypotheses (Lamb, 2013; Thamhain, 2014). Researchers use the quantitative method to explain numerical changes in a population or provide clarifications of predictions (Khan, 2014; Lach, 2014). The mixed method contains elements of both qualitative and quantitative research approaches (Caruth, 2013; Landrum & Garza, 2015). Researchers use the mixed method to explore problems and examine solutions relative to the overarching research question (Sparker, 2014). I did not intend to examine solutions or statistical measurements and relationships

among two or more variables relative to testing hypotheses; therefore, the quantitative method and quantitative elements of a mixed method were not suitable for this study.

The single case study design was suitable for this qualitative exploration of the demand forecasting strategies in a small, retail, medical supply business in Kentucky. I chose a single case study design so that clear, explicit and unique elements of my research could be identified and analyzed. Ang, Embi, and Yunus (2016) argued that with the single case study design, researchers gather and analyze qualitative data to realize explicit elements rather than broad generalizations. According to Dasgupta (2015) and Vohra (2014), the single case study is optimal for capturing explicit and unique cases. Lewis (2015) and Yin (2018) suggested that the single case study design allows a researcher to explore *how, why,* or *what* questions.

Phenomenological and ethnographic designs are often used in qualitative research studies for exploratory purposes. The goal of the phenomenological researcher is to explore the meanings of participants' lived experiences (Dasgupta, 2015; Stanley & Nayar, 2014). Additionally, phenomenological designs generally require at least 20 study participants (Bevan, 2014). Ethnographic researchers focus primarily on human cultures (Brown-Saracino, 2014; Goodrich, Hrovat, & Luke, 2014). Ethnographic researchers deepen their understanding of the behaviors and cultural effects of individuals and groups through social engagement (Brown, 2014; Welch, Rumyantseva, & Hewerdine, 2015). The phenomenological and ethnographic designs were not suitable for this study because I did not explore the participants' lived experiences or shared cultural beliefs.

Research Question

What demand forecasting strategies do small, retail, medical supply business leaders use to increase profitability?

Interview Questions

1. Which customer demand forecasting strategies have you found effective for achieving a substantial degree of accuracy?

2. What successful strategies do you use to forecast customer demand to increase profitability?

3. Which demand forecasting strategies have you found most effective to implement at the daily, weekly, monthly, quarterly, and annual rates?

4. Which demand forecasting strategies have you found effective in implementing successful forecasting processes?

5. How do you prepare forecast demand levels based on sales, seasonality, contracts, geography, or some combination of these elements?

6. How did you address the key barriers to implementing your forecasting strategies?

7. What other factors that we have not discussed may have contributed to your success?

Conceptual Framework

The conceptual framework for this study was Winters's (1960) forecasting demand approach. In 1959, Winters, a student and academic protégé of the former University of Texas Professor Emeritus Charles Holt, developed an effective model for

forecasting demand using time series reflecting (a) trend, (b) seasonality, and (c) randomness (Winters, 1960). The Winters approach involves the concept of smoothing. According to López, Mendoza, and Masini (2013), forecasters use smoothing to eliminate randomness from forecasting calculations, thereby creating a clear and precise model for future forecasting use. According to Matsumoto and Komatsu (2015), effective planning of used product management, inventory control, and capacity management occurs with time series analysis and forecasting techniques.

In my study, I focused on identifying the strategies for demand forecasting within a small, retail, medical supply business. Winters's (1960) approach was relevant for understanding the results of my study because traditional product offerings in small, retail, medical supply businesses include footwear and apparel products, such as compression socks and orthopedic shoes. The demand for footwear and apparel products is usually unstable, which can result in delays, unused inventory, or stock inaccuracies (Liu et al., 2016). Classic demand forecasting approaches are contingent upon stable and repeatable occurrences (Liu et al., 2016). Seasonality and trends often align with footwear and apparel demand and Winters's demand forecasting approach was designed to handle both seasonality and trends; therefore, I expected that the results from this study could yield insights useful for achieving a high degree of forecasting accuracy.

Operational Definitions

Business strategies: Current maneuvers and predictive thinking to the extent of maintaining competitive advantage and sustainability within any business and economic setting (Bentley, Omer, & Sharp, 2013).

Business success: Business success is the constant sustainability and profitability generation of business process over the 5-year duration (U.S. Small Business Administration, 2014).

Forecasting: The process of obtaining information about what leaders believe may or may not happen (Liu & Li, 2015).

Inventory management: The process of developing policies to realize an optimal inventory investment and maximize the business rate of return (Kontus, 2014).

Small business: A small business is an entity providing a service or product executed by a small group of leaders with less than 50 employees (Simionescu & Bica, 2014).

Sustainability: The power to support the future demands of the business without sacrificing business continuity (Wilson & Wu, 2017).

Assumptions, Limitations, and Delimitations

Researchers apply assumptions, limitations, and delimitations to understand any imparities relative to the exploration of the business problem in the study (Leedy & Ormrod, 2013). Literature supports each definition of the assumptions, limitations, and delimitations of the study (Laland et al., 2015). The underscoring of the assumptions, limitations, and delimitations might make it easier for the reader to understand the scope and autonomies of the study; addressing the ease of understanding can reduce the number of questions that readers have about the credibility of the study (Leedy & Ormrod, 2013).

Assumptions

Assumptions are concepts and beliefs considered true or certain without proof of evidence and may be preconceived or specific to research matters (Collins & Cooper, 2014; Lips-Wiersma & Mills, 2014; Marshall & Rossman, 2016). I assumed that forecasting was a strategy that could increase profitability. Another assumption was that all participants were honest and offered candid answers. Lastly, I assumed that all participants were available for any follow-up interview questions.

Limitations

Limitations are restraints and shortcomings that may be uncontrollable in the context of research studies and outcomes (Marshall & Rossman, 2016; Yin, 2018). It is imperative that the researcher understand the limitations of any research study (Wilson-Genderson & Pruchno, 2015). One limitation of this research study was the short time horizon of a case study. Demand forecasting strategies, as implemented in retail medical supply organizations, only bounded the information I collected during the interviews, adding another limitation. Lastly, the current effective forecasting strategies discovered in this study might not be successful in future business ventures.

Delimitations

Delimitations are the boundaries the researcher sets for a study (Hang Sub & Bong Gyou, 2015; Hyett, Kenny, & Dickson-Swift, 2014; Marshall & Rossman, 2016). The geographical location and specific industry under study were delimitations of this study. I narrowed the scope of this single case study to a retail, medical supply organization located in Kentucky. Another delimitation related to this study was the

sample size of participants and their knowledge and breadth of experience with forecasting in a small, retail, medical supply setting. Kai (2014) postulated that participants in a study with general knowledge of a topic might have restricted views to the extent of their experiences, resulting in an adverse impact on validity. A sample size of eight business leaders might not have allowed for full discovery of all strategies for best forecasting demand to increase profitability in this industry. Lastly, I focused my analysis in the study on the cost of new product introductions in the retail medical supply industry that could change the forecasting decisions.

Significance of the Study

Business leaders and society could benefit from the results of this study. Business leaders could derive value from applying successful demand forecasting strategies to increase profitability and improve accurate stock replenishment and inventory optimization. Medically underserved citizens in Kentucky could be helped by the greater availability of retail medical products to address medical needs and an elevated level of caregiving.

Contribution to Business Practice

Small, retail, medical supply business leaders could benefit from the results of the study. The results from this study may further awareness of successful demand forecasting strategies applied by retail, medical supply business leaders to increase profitability. The successful strategy outcomes documented in this study may offer useful insights to improve the accuracy of stock replenishment and reduce overstocks. Additionally, the availability of retail medical products for public consumption may

increase from the practical application of Winters's (1960) approach for demand

forecasting.

Implications for Social Change

Society could also benefit from the results of this study. The implications for

positive social change include the potential for business leaders to realize important

performance insights on demand forecasts, resulting in the reduction of excess

inventories and providing a potential source of funding for social and capital investment.

Social capital is the collective ability of social groups to work together for the common

good (Durojaiye, Yusuf, Falusi, & Okoruwa, 2013). Group members can enlarge

individual resources by improving connections among a network of champions and

benefactors (Durojaiye et al., 2013). Social capital investment on the part of the small,

retail, medical supply business studied could support Kentucky, national, and global

initiatives to foster accessible and abundant medical supplies and caregiving to medically

underserved citizens. Small business leaders and their organizations may use social

capital investment to establish a socially responsible and trusted reputation.

A Review of the Professional and Academic Literature

Through the literature review, researchers embrace the investigation of

theoretical, thematic, methodological, practical, and procedural studies regarding the

guiding framework and bounds of the case study (Ross & Mash, 2014). Carolan, Forbat,

and Smith (2015) suggested that the professional contribution to journals, reports,

legislative documents, and books on the part of scholars help justify research. The

researcher reviews existing literature to organize and hone the focus of a study because

literature is critical to developing a research problem and proposing a conclusion supported by existing theory (Carolan et al., 2015). According to Koch, Niesz, and McCarthy (2014), theories serve as the base or substance, guiding framework, and lens with which to convey research questions and to kindle an intellectual grasp of information.

Researchers explore empirical research literature to detect gaps, develop and answer questions about a subject, and gather new information (Koch et al., 2014). I conducted this literature review to gain an understanding of prior research related to demand forecasting and forecasting strategies that small, retail, medical supply business leaders use to increase profitability. Kozleski (2017) asserted that qualitative researchers derive data from experiences and observations, a function that is both empirical and necessary. Qualitative research yields information about perspectives, backgrounds, and practices (Yin, 2018). In this review, I provide an analysis of Winters's (1960) demand forecasting standards, which may support the practical business case for the demand forecasting strategies leaders use to increase small, retail, medical supply business profitability.

In this literature review, I summarize, restate, and synthesize past research work on demand forecasting. The review of literature reflects the conceptual groundwork of a study and gaps in the standing body of knowledge (Ross & Mash, 2014). The content of the literature review consists of secondary sources, such as scholarly, peer-reviewed journals; state and federal government publications; and Walden University publications. All sources offer valuable information (Ross & Mash, 2014).

As the practical approach, I searched for literature in online library databases and websites. In this strategic approach, the sources included the most relevant theoretical and empirical studies to answer the research question: What demand forecasting strategies do small, retail, medical supply business leaders use to increase profitability? From these searches, I discovered and retrieved scholarly, peer-reviewed and non-peer-reviewed journal articles. To find scholarly documents, I accessed databases through the Walden University Library, including Business Source Complete, ScienceDirect, ProQuest Central, Sage Premier, LexisNexis Academic, and Emerald Management Journals as well as Google Scholar and official government websites for the state of Kentucky and Centers for Medicare and Medicaid. The following search terms were used: *business strategy, case study, competitive advantage*, *Holt-Winters method, inventory, inventory management, judgemental forecasting, medical supplies, profitability, retail forecasting, seasonality, small retail forecasting, sustainability, time series method, triple exponential smoothing,* and *Winters exponential smoothing.*

The sources of the literature reviewed included websites and journals with peer-reviewed and pivotal articles. Table 1 contains the sources I used in this study with a publication date range of 1957 through 2018; 80% of the sources were peer-reviewed, and 81% of the peer-reviewed sources had a publication date within 5 years of my expected completion year of 2019.

Table 1

Literature Review Sources

Reference type	Total	2015–2019	2014 or earlier	Total % < 5 years

All sources	78	63	15	81%
Peer-reviewed/ government source	73	58	15	80%
Non-peer-reviewed sources	4	4	0	100%
Books	1	1	0	100%

Organized in subtopics, the literature review includes a discussion of the application to the business problem and the conceptual framework, which is Winters's (1960) demand forecasting approach. In the literature review, I also detail the historical origins and development of Winters's demand forecasting approach, outlining its significance and fit for my doctoral study. The review continues with a description of the hallmarks of Winters's model, the exponential smoothing trend and seasonality, followed by a tutorial on how to calculate demand using Winters's approach. I conclude the review with a presentation of alternative theories to the conceptual framework, inventory, and demand forecasting as well as a relevant overview regarding the establishment of sustainable, competitive, and strategic forecasts.

Winters's Demand Forecasting Model

Winters's (1960) forecasting demand approach was the conceptual framework for this study. According to the literature on the Winters's forecasting demand approach, the model is an effective model for forecasting demand using time series data reflecting (a) trend, (b) seasonality, and (c) randomness (Winters, 1960). The Winters approach involves the concept of exponential smoothing. According to López et al. (2013), smoothing eliminates randomness from forecasting calculations, thereby creating a clear

and precise model for future forecasting use. The commonly known and effective types of time series forecasting methods are moving averages and exponential smoothing (Tavakkoli, Hemmasi, Talaeipour, Bazyar & Tajdini, 2015). The time series is a sequence of observations, while moving averages takes the average of a time series frequency and moves that average over time (Tavakkoli et al., 2015). Matsumoto and Komatsu (2015) discussed the equal weights applied to past observations, explaining that exponential smoothing applies a weighted average approach when looking at the moving averages. Forecasters weight periods differently according to the degree of relevancy to the forecast (Matsumoto & Komatsu, 2015). According to Vujko, Papia, and Nataaja (2016), the most recent observation has more weight assigned, and the oldest observation has the least amount of weight assigned. Tavakkoli et al. (2015) asserted that exponential smoothing could be single, doubled, or tripled. Researchers using single exponential smoothing assume that the time series data do not contain trends and seasonality, while researchers using double exponential smoothing operate on the assumption that there are trends while ignoring seasonality and researchers using triple exponential smoothing assume the inclusion of both trends and seasonality in the time series data (Tavakkoli et al., 2015).

Researchers use wide applications of forecasting techniques, such as exponential smoothing methods, because of the simplicity and vigor of the techniques (Tavakkoli et al., 2015; Winters, 1960). Mathematically, the exponential smoothing methods involve a specific observation of the time series, denoted as a weighted aggregate of the prior set of observations (Matsumoto & Komatsu, 2015; Winters, 1960). Weighted historical data

values establish a linear series and decline gradually over time (Apic-Blagojevic, Vujko, & Gajic, 2016; Hassani & Silva, 2015). Current data values are more effective on forecasts than prior historical data because historical data traditionally becomes less relevant as probe information moves deeper into the past when individuals apply the Winters's model (Mastorocostas, Hilas, Varsamis, & Dova, 2016; Prestwhich, Tarim, Rossi, & Hnich, 2014). As a caveat, leaders with forecasting responsibility must be aware that assigning weights to past data may result in slightly ineffective forecasts that do not reflect results related to changes in data that are either too small or large to be statistically valid (Prestwhich et al., 2014).

Many researchers will argue for the advantages of the exponential smoothing method because of its simplicity and ease of use (Winters, 1960). Exponential smoothing methods are relatively economical in real-time use and cost of implementation (Winters, 1960). Additionally, apart from the norm, researchers apply exponential smoothing models at different times, when considering the input of seasonal occurrences (Kolassa, 2015). Despite the advantages, there is a key disadvantage noted by some researchers. A significant disadvantage of exponential smoothing methods is the likelihood for a weak forecast when there are volatile fluctuations in the data (Apic-Blagojevic et al., 2016; Ravinder, 2016; Ravinder & Misra, 2014). The primary limitation of Winters's model is that the model does not allow the forecaster to capture nonlinear problems (Omar, Hoang, & Liu, 2016; Veiga, Da Veiga, Catapan, Tortato, & Silva, 2014). On the contrary, researchers model seasonality in an additive or multiplicative form for forecasting purposes (Veiga et al., 2014). Despite this limitation, the overwhelming agreement

concerning the simplicity and accuracy of the model has continued to make it a recommended choice for time series demand forecasting for the last 50 years (Goodwin, 2010; Padgett et al., 2016).

History and development. Researchers often refer to Winters's (1960) demand forecasting approach as Winters's additive, Winters's exponential smoothing model, or as the Holt-Winters method (Vujko et al., 2016). Researchers commonly apply the Winters technique, which expounds upon the work of Professor Charles Holt (1957), as a forecasting technique in time series methods. Forecasting practices and the level of forecasting accuracy are critical to inventory management (Goyal, Hardgrave, Aloysius, & DeHoratius, 2016). An elevated demand forecast may result in excessive inventories, which leads to high holding costs (Kontus, 2014). Forecasts that reflect a low demand output may result in stock-outs (Mueller et al., 2016). The accuracy of the demand forecast will drive the number of inventories held by a business (Holt, 1957). Demand forecasting is best suited for inventory planning and control (Winters, 1960). Chosen for forecasting seasonality considerations, Winters's model allows for simplicity and ease of understanding when compared to moving average forecasting models (Bernardi & Petrella, 2015; Wu, Song, & Shen, 2017). Effective planning of usage, product management, inventory control, and capacity management occurs with time series analysis and forecasting techniques (Matsumoto & Komatsu, 2015).

The Winters's (1960) approach may be relevant for answering my research question because forecasts of traditional product offerings in a small, retail, medical supply business will include footwear and apparel products, such as compression socks

and orthopedic shoes. The demand for footwear and apparel products is usually unstable, which results in delays, unused inventory, or stock inaccuracies (Liu et al., 2016). Classic demand forecasting approaches are contingent upon stable and repeatable occurrences (Liu et al., 2016). Seasonality and trends often correlate with footwear and apparel demand (Liu et al., 2016). Winters specifically designed the approach to handle both seasonality and trends, so I expected this study to yield findings that could be useful for achieving a high degree of forecasting accuracy. The time series forecasting process is useful for declarations made in advance based on a sequence of surveyed data points (Rathnayaka et al., 2015).

Demand forecasting researchers published since Winters's (1960) approach have postulated that accurate demand forecasting is critical to understanding inventory amounts, lead times, order scheduling, products, costs, and seasonality as well as improving profitability along with competitiveness (Kontus, 2014; Liu et al., 2016; Sindelár, 2016; Xi & Sha, 2014). Leaders use demand forecasting to improve inventory investment management and advance the customers' experience (Hill, Zhang, & Burch, 2015). Additionally, demand operations and strategic planning for decision-making purposes advance with demand forecasting (Govind, Rose, & Pisa, 2017; Matsumoto & Komatsu, 2015; Toledo et al., 2017; Trapero et al., 2015; Veiga, Da Veiga, Puchalski, Coelho, & Tortato, 2016).

Product life cycle is a core consideration in demand forecasting (Liu et al., 2016). The product lifecycle for apparel and footwear products usually lasts up to 3 months, causing instability in demand (Liu et al., 2016). This product lifecycle consideration may

be relevant for understanding the results of this study. Holidays and consumer preferences to price can affect sales on traditional and nontraditional products because seasonal and consumer partialities influence sales (Liu et al., 2016). Gur Ali and Pinar (2016) explored the impact of seasonality in a retail setting and discovered that factors such as pricing and other disturbances external of seasonality influence sales on most products. Liu et al. (2016) identified the four phases of the product lifecycle as introduction, growth, maturity, and decline. Over the four phases, forecasters should identify peaks and valleys of sales (i.e., demand) and profits (Liu et al.). The sales prediction information from the forecast supports replenishment and inventory management operations (Goyal et al., 2016; Liu et al.). Kontus (2014) explored the cost and benefits of variable inventory levels and profitability as significant activities in inventory management, finding a lower rate of stock-outs and an increase in sales due to the adequate replenishment of inventory.

Researchers imply that demand forecasting can prevent stock-outs when there is drastic variability in demand for medical supplies (Mueller et al., 2016). Goyal et al. (2016) in addition to Raza and Kilbourn (2015) concluded that insufficient visibility into inventory records might result in inaccurate demand plans and forecasts resulting in inventory stock-outs. Stock-outs occur when product demand exceeds product supply as a result of inadequate inventory planning (DeHoratius & Ton, 2015; Raza & Kilbourn, 2015) causing customer loss. Eventually, the overstatement of demand may result in the need for safety stock to counter recurring patterns of stock-outs (Raza & Kilbourn, 2015). Product stock-outs pose significant challenges for retailers, often resulting in lost sales

and profitability (Goyal et al., 2016). Two forms of stock-outs – sales floor stock-outs and shelf stock-outs – directly impact inventory and profitability. They occur when the product is available within the store but is not present on the shelf for purchasing (Govind et al., 2017; Goyal et al., 2016). Such stock-outs also adversely impact customer buying experiences, discouraging future purchases from that retailer (Goyal et al., 2016).

Demand forecasting of medical supplies supports effective supply ordering and aids in the management of storage costs (Cheng, Chiang, & Chen, 2016; Mueller et al., 2016). Researchers identify two consumption patterns of medical supply-demand: continuous demand, resulting from the daily use of a product, and intermittent demand, resulting from product diversification and seasonality (Cheng et al., 2016; Kolassa, 2015; Matsumoto & Komatsu, 2015). If not managed properly, both demand patterns can yield inventory shortages, unnecessary overages and high operating costs (Cheng et al., 2016). Business leaders can use the replenishment process to manage inventory and production planning (Cheng et al., 2016). Leaders should understand that high demand forecast accuracy would favorably affect business performance (Veiga et al., 2016). A short-term forecast horizon may result in high demand levels (Cheng et al., 2016). Short-term demand forecasts reflect results of leadership's efficiency and proven gains in competitive advantage (Chang, Dai, & Chen, 2015).

Demand forecasting can stimulate competitive advantage in the retail space if incorporated into the overarching strategy of a business (Hofer et al., 2015; Ren & Choi, 2015; Veiga et al., 2016). Siriram (2016) postulated that aligning marketing, operations, sales, and production to forecasting inputs drives competitive advantage if leveraged

properly. Competitive advantage results from a combination of quality products, competitive pricing, breadth of the product offering, and availability of product (Siriram, 2016). Competitive advantage aligns to business performance (Omar et al., 2016; Siriram, 2016). Demand elements that contribute to this alignment include scheduling, inventory, production, and purchasing (Siriram, 2016). Minimizing bias, reducing uncertainty and increasing accuracy drive forecasting effectiveness is (Che-Jung et al., 2016; Siriram, 2016). Hofer et al. (2015) suggested that forecasters should not focus on accuracy alone. Instead, focus on creating contingency plans to counter any surprises that pose a risk to the business. Researchers recommend an additional investigation to identify the appropriate forecasting framework for most business needs in the absence of a one-size-fits-all framework for accurate prediction (Veiga et al., 2016). Research findings do imply that data variability, seasonality, and trends continue as critical elements in any forecasting approach (Veiga et al., 2014).

Winters's (1960) model and the recent subsequent published research on demand forecasting contend that scheduling, inventory, production, and purchasing contribute to the alignment between competitive advantage and business performance. Winters specifically designed the approach to handle seasonality and trends. The model is an appropriate tool for answering my research question regarding the demand forecasting strategies that small, retail, medical supply business leaders use to increase profitability. Seasonality and trends often correlate with footwear and apparel demand, products that are variable and included in small, retail, medical supply product offerings (Liu et al.,

2016). I expected the insights from the use of the Winters's demand forecasting approach to yield findings that may be useful for achieving a high degree of forecasting accuracy.

A lesson on the Winters's model. Suppose that a small, retail, medical supply business needs a monthly demand forecast. To create a forecast, the forecaster using Winters' model should estimate no more than three factors in the forecast calculation – specifically, (a) the present underlying level of demand, (b) the present trend of demand, and (c) a seasonal indicator for the forecasted timeframe (Goodwin, 2010; Padgett et al., 2016). According to Goodwin (2010), the present level of demand is the remaining sales after the removal of any randomness. The present trend in demand represents the variations in the fundamental demand that the business can anticipate happening between the current and future month. For example, if the forecaster estimates that the current demand level is 200 and the expectation is a demand level of 205, then the estimated trend is a gain of 5. If a seasonal indicator is 1.3, the indicator shows that the demand in the month is 30% over the underlying demand. Next, assume that during February, the business requires a forecast for the upcoming month of April. In that case, using Winters's (1960) model yields of approximation of an existing demand level of 200 with a trend of 5 and with an April seasonal indicator of 1.3. Therefore, the demand level forecast calculation in April is as follows:

(Level [200] + 2 Months * Trend [10] * Seasonal [1.3] = 273)

Upon receiving updated demand numbers, forecasters using the Winters' model should update their estimates of underlying demand level, based on trend and seasonal indicators for the month. Researchers obtain the demand level, trend, and seasonal

indicator updates by applying a weighted average of prior estimates of these factors and the suggested estimates in the new forecast (Goodwin, 2010; Veiga et al., 2014). The calculation results in the smoothing of its constants. The existence of unusually high or unusually low values, of multiple seasonal patterns, and of possible narrow intervals are significant considerations a forecaster must consider when using the Winters model (Goodwin, 2010). Unusual demand levels may result in challenges for Winters's (1960) model, with revised estimates of the underlying demand level, trend or seasonality distorted by outliers (Goodwin, 2010). Outliers may represent unusually high or unusually low demand values because of unusual or nonrecurring aspects of the business (Winters, 1960). In a small, retail, medical supply business, one example of a nonrecurring or unusual aspect of business could be a temporary promotion offering a discount on a product (Eisend, 2014). The discount may attract more customers than usual, resulting in unusually high demand for the month (Eisend, 2014). Adjusting the data to remove these unusual outliers is critical before executing any future forecasts (Goodwin, 2010). Removal of outliers may ensure that there is no overstatement in demand.

Many researchers have concluded that Winters's (1960) designed a forecasting approach to handling simple seasonality that occurs across a year (Goodwin, 2010). On the contrary, some business models have multiple series of seasonality. According to Ahmad (2017), other models more effectively address multiple series of seasonality than the Winters model does. However, a small, retail, medical supply company may forecast

properly with simple seasonality. Forecasters can never be too sure that they have captured all the important elements of uncertainty.

In many cases, a prediction may largely underestimate the degree of uncertainty a business has in its future (Che-Jung et al., 2016). Researchers have made concerted efforts to understand the statistical properties of the Winters model, resulting in a more effective way of obtaining a prediction interval (Goodwin, 2010). Prediction intervals significantly affect safety stock estimates (Raza & Kilbourn, 2015). Forecasters who attempt to reduce the degree of uncertainty in demand forecasting using Winters's (1960) model may use statistical analysis and expert opinion to validate the outputs of the model. Forecasters should carefully document any outputs from the model as necessary while simultaneously monitoring changes in trends over time and accessing impact on forthcoming demand levels (Kontus, 2014).

Inventory. Inventory is a critical component of business operation and directly impacts production, customer satisfaction and profitability (Ahmad & Shafie, 2016; Kontus, 2014; Matsumoto & Komatsu, 2015; Xi & Sha, 2014). Managing inventory in today's competitive retail space has serious implications for business performance and sustainability (Ahmad & Shafie, 2016). Since retailing involves the furnishing and selling of goods and services for profit, leaders should focus on demand generated by meeting customer needs (Ahmad & Shafie, 2016; Viktorovna & Ivanovich, 2016). Ignoring the customer needs may result in unearned profits. Successful retailers are those that improve and sustain customer satisfaction levels by using just-in-time inventory management systems supported by excellent technology (Ahmad & Shafie, 2016; Hill et al., 2015).

The purpose of inventory management is to aid leaders in creating practices that maximize rates of return and optimize inventory to meet strategic objectives (Kontus, 2014; Viktorovna & Ivanovich, 2016). By comparing the costs of holding and selling, leaders can determine where opportunities exist to improve profitability (Kontus, 2014). The goals and objectives of any business should closely align with its inventory (Ahmad & Shafie, 2016; Viktorovna & Ivanovich, 2016).

According to Li, Zhao, and Xie (2015), working capital consists of two major components: inventory and labor. Li et al. asserted that if retailers can free up inventory, they will see lower carrying costs and increased net profitability. The result is an increased amount of capital used for other significant business pursuits that can bolster competitive advantage and sustainability.

Despite the benefits, researchers contend that small- to medium-sized enterprises fail to invest in integrated and sophisticated inventory systems (Ahmad & Shafie, 2016; López et al., 2013). Small-to-medium enterprises lack personnel with the knowledge, functional skill and leadership necessary for operating advanced inventory systems (Ahmad & Shafie, 2016). Researchers point to knowledge of inventory management systems as the strongest predictor of inventory performance (Ahmad & Shafie, 2016). Researchers have postulated that some retail employees rely on judgment alone to confirm the in-store availability and location of products (Goyal et al., 2016). Using formal inventory management systems can mitigate the inaccuracies resulting from unnecessary adjustments to inventory records based on memory rather than observation or analysis (DeHoratius & Ton, 2015). The difference between the inventory audit record

and the actual inventory observed as in-stock measures the accuracy of the inventory (Kontus, 2014). Proper inventory data collection involves observing the location of the product, counting the number of product units available, and tagging or labeling the product for future reference (Toledo et al., 2017). Business leaders should categorize and record products on a daily, weekly, and monthly basis (Goyal et al., 2016).

Leaders are responsible for generating the capital necessary to carry inventory (Kontus, 2014). As a best practice, businesses should maintain enough inventories for day-to-day operations while keeping the ordering and carrying costs as low as possible to meet most inventory goals (Kontus, 2014). Ordering costs are an important consideration and businesses incur costs with each new authorized order, regardless of the size of the order (Govind et al., 2017). The cost of doing business requires that orders be made in bulk to minimize the number of repeat orders (Toledo et al., 2017). Researchers consider batch ordering the result of a poor inventory replenishment process (Govind et al., 2017). Some researchers have suggested that retailers keep excess inventories (Eisend, 2014). However, the reason for maintaining low inventory, as suggested by (Kontus, 2014), is because inventories reflect the investments made in working capital and there is a cost associated with keeping large amounts of inventories on hand (Toledo et al., 2017). Possessing large amounts of inventory may result in high costs relative to holding, transporting, and managing inventory over time (Ahmad & Shafie, 2016; Salam, Panahifar, & Byrne, 2016).

Retailers should use some form of a demand-forecasting model to improve performance, advance business competitiveness and profitability based on accurate

inventory records (Goyal et al., 2017; Xi & Sha, 2014). Leaders use systematic demand

forecasts to improve inventory management (Ahmad & Shafie, 2016). An accuracy-first

approach to managing inventory may help small businesses avoid financial losses and

promote inventory precision in the business operation (Ahmad & Shafie, 2016;

Matsumoto & Komatsu, 2015; Viktorovna & Ivanovich, 2016; Xi & Sha, 2014).

Uncertainty in production schedules may make most supply chains complex and increase

the likelihood of bottlenecks and production delays (Matsumoto & Komatsu, 2015). The

uncertainty stems from unknown elements that may create abrupt changes in demand.

Forecasting can alleviate some uncertainty by creating information on future demand

(Che-Jung et al., 2016). According to Viktorovna and Ivanovich (2016), the demand for

inventories rests upon the degree of production and sales, creating dependence on

inventory funding. In such cases, a production schedule and a cash budget that considers

production and sales variability is in order. Variability in demand has a direct effect on

the inventories and total value in the retail space when under the influence of seasonal

factors (Viktorovna & Ivanovich). The demand for inventories is dependent on the degree

of production and sales (Che-Jung et al., 2016; Viktorovna & Ivanovich). Product

availability or fill rate is a critical element in the retail space and if ignored may result in

customer loss and profitability erosion (Salam et al., 2016). Profitability erosion may

signal an important misalignment between inventory levels and customer satisfaction

(Che-Jung et al., 2016; Salam et al., 2016). Leaders should organize routine inventory

reviews to gain visibility into product levels to ensure products are replenished timely

(Salam et al., 2016). Increasing visibility into products may confirm reassurance in product availability and stimulate profitability (Li et al., 2015).

An accurate demand forecast can aid leaders in managing inventory and avoid loss of profits (Kontus, 2014; Li et al., 2015). Identifying best practices ensures an accuracy-first approach to managing inventory and promotes precise inventory replenishment (Goyal et al., 2016). As a best practice, leaders should maintain sufficient inventory for day-to-day operations while keeping ordering and carrying costs as low as possible (Kontus, 2014). Additionally, leaders should encourage training in inventory planning and demand forecasting to promote the quality of knowledge and skill to operate an inventory management system (Govind et al., 2017). Lastly, using a just-in-time inventory management system supported by technology can help lower carrying costs. Business leaders can implement inventory control best practices to improve and sustain customer satisfaction levels (Goyal et al., 2016; Mohamed, 2016). As leaders may discover, profitability signals an important alignment between customer satisfaction and inventory levels (Ahmad & Shafie, 2016).

Alternative Theories

Retailers use several forecasting methods, including natural methods of judgment as well as time series methods such as moving averages (Hassani & Silva, 2015; Sindelár, 2016). Organizations suffer when a lack of experience and resources adversely affects the frequent use of statistical forecasting systems (Trapero et al., 2015). Researchers note a strong reliance upon the expert judgment and opinion (Alvarado-Valencia, Barrero, Onkal, & Dennerlein, 2017; Padgett et al., 2016; Trapero et al., 2015). Judgmental

forecasting involves the instinctive estimation based on experience (Padgett et al., 2016).

Time series forecasting is a mathematical method useful for making future predictions

based on time-driven data points (Rathnayaka et al., 2015). Autoregressive integrated

moving averaging (ARIMA) is one well-explored time series method used in retail

demand forecasting. Empirical evidence further substantiates claims to validity (Veiga et

al., 2016).

Judgmental forecasting. Researchers confirm the use of human judgment and

moving average forecasting methods for customer demand forecasting in small retail

settings (Padgett et al., 2016). Forecasting with statistical methods alone can falter

because of the volatility in the everyday business environment (Sindelár, 2016).

However, researchers identify expert knowledge as a vital input in the process of demand

forecasting and suggest that expert knowledge improves the competitive advantage of a

business (Alvarado-Valencia et al., 2017; Bohanec, Robnik-Sikonja, & Borstnar, 2017).

Researchers have argued that the judgmental forecasting model is perhaps the most used

in situations characterized by a lack of resources and expertise in the use of advanced or

simple statistical forecasting methods (Govind et al., 2017; Weatherford, 2016).

Judgmental forecasting is an intuitive process; involving predictions often based on

leadership and combined expert experience (Derbyshire & Wright, 2017; Sindelár, 2016).

The likelihood of success in the judgmental forecasting method fuels the method's

popularity (Derbyshire & Wright, 2017). Forecasters must understand when and how to

integrate expert judgment into the demand forecasting process to obtain a high degree of

accuracy (Alvarado-Valencia et al., 2017). Including prior promotional sales, the activity can improve the accuracy of judgmental forecasts (Trapero et al., 2015).

Judgmental forecasting can be hampered by blind spots (Meissner, Brands, & Wulf, 2017) since all experts do not possess uniform levels of knowledge and experience on specific subject matters that impact forecasts (Alvarado-Valencia et al., 2017; Chang et al., 2015). It is important to consider an expert's particular domain knowledge (Derbyshire & Wright, 2017). For example, a supply chain leader should know about ordering different products in specific quantities, while a marketing leader should understand market conditions, sales, and competitor factors (Trapero et al., 2015). Because each leader is an expert in his or her domain, it is critical that each expert offer contributions in his or her respective domain to avoid misguidance and maintain source credibility (Alvarado-Valencia et al., 2017; Sindelár, 2016).

Subject matter expert selection represents a key component of a judgmental forecasting strategy (Derbyshire & Wright, 2017) since subject matter experts possess expert knowledge on specific subjects. Macro and microenvironments are important areas to include (Trapero et al., 2015). Chang et al. (2015) discussed the varying levels of knowledge and experience on specific matters that experts possess. Chang et al. and Meissner et al. (2017) asserted that leaders should conduct a blind spot analysis to ensure that each expert is a fit for engaging in specific aspects of future research**.** Meissner et al. stressed the importance of interviewing each expert, openly asking about elements that may influence and guide the future growth of the company. Experts' interviews should include questions on economic, legislative, and technological elements, with the goal of

gathering data that applies to the organization (Meissner et al., 2017). Researchers also

recommend developing an action plan for providing guidance on the data gathered

through the interview process (Yin, 2018). Gathered data should be comprehensive and

supportive of the assumptions and perspectives of the decision makers providing the

feedback necessary for certifying the findings of the experts (Caretta, 2016).

   Autoregressive integrated moving average forecasting. The introduction of

new products into the marketplace and seasonal occurrences complicate the prediction of

customer demand when using judgment forecasting alone (Rathnayaka et al., 2015).

Statistical methods prove most effective when used in the traditional context of time

series demand estimation. Forecasters rely most consistently on moving average methods

and exponential smoothing methods to forecast demand (Trapero et al., 2015). The

ARIMA model is often used in retail settings to generate forecasts, having been

thoroughly explored, examined and applied in forecast research due to the model's

desirable academic properties and supportive empirical evidence (Hassani, Silva, Gupta,

& Segnon, 2015; Veiga et al., 2014). Researchers describe ARIMA as a basic linear

forecasting model that is easy to understand and that produces good results in most

analyses (Er & Mallick, 2017; Jin & Kim, 2015). The ARIMA model is a common time

series forecasting framework that can reduce the number of inaccurate forecasts and aid

leaders in lowering operating costs (Matsumoto & Komatsu, 2015). Researchers suggest

that its capability of capturing changing consumption patterns makes it capable of

outperforming frameworks like the Winters's model (Cheng et al., 2016). The erratic and

slow-moving nature of intermittent demand makes forecasting a challenge, with erratic

results yielding frequent variability of large demand (Cheng et al., 2016). Slow-moving

results result in small variability in demand (Cheng et al., 2016).

Time series forecasting is conditional upon the assumption that past events

influence the future (Ka Man, Na, & Kit, 2015; López et al., 2013; Matsumoto &

Komatsu, 2015; Toledo et al., 2017). However, when forecasting over longer terms such

as annual or multi-year periods, forecasters should adjust the prior trend, seasonal and

data elements that tend to evolve (Ka Man et al., 2015). The adaptive nature of ARIMA

models renders forecasts more useful for the short-term application (Tomic &

Stjepanovic, 2017). To use ARIMA strategies, forecasters construct a statistical model

using past data to reflect the recurring pattern of a time series. Forecasters must begin the

model with linear historical data to establish a pattern along the time series (Omar et al.,

2016). ARIMA gleans from a group of time series models called autoregressive

integrated moving average models (Omar et al., 2016). The ARIMA process consists of a

comprehensive set of three tasks: (a) model identification, (b) model estimation, and (c)

model checking (Omar et al., 2016; Tomic & Stjepanovic, 2017). The model

identification task requires awareness of the model elements – the moving average terms

or lags of the forecast errors, the differenced time series, and the stationary nature of the

series (Tomic & Stjepanovic, 2017). The identification task is the most important element

of the process (Omar et al., 2016). Forecasters should follow the ARIMA model process

for accurate forecasting (Omar et al., 2016).

ARIMA is simplistic and accurate but is not without disadvantages. ARIMA is

restrictive than other models when forecasters conduct volatility analyses within a time

series (Jin & Kim, 2015). Goodwin (2010) and Veiga et al. (2014) outlined the limitations of the ARIMA forecasting model, noting its (a) difficulty in obtaining accuracy for any forecast range and (b) the large degree of uncertainty in its estimation of various forecasting factors. As a result, forecasting intervals are slimmer than normal (Goodwin, 2010). Veiga et al. (2016) also noted the importance of avoiding certain assumptions with ARIMA, given its assumption that historical patterns of data will not change over time. Of course, if that assumption is true, then accurate forecasts are obtainable. Like other time series methods, ARIMA does not capture nonlinear patterns (Omar et al., 2016).

Researchers have identified two effective types of time series forecasting methods – moving averages and exponential smoothing. Moving averages, unlike exponential smoothing models such as Winters's (1960) model, put equal weight on past observations. ARIMA is a commonly used times series method, especially for retail demand forecasting. While time series models are effective, the use of expert opinion continues as a viable (Sindelár, 2016). An expert opinion is an effective option for demand forecasting in retail settings with limited resources of knowledge and technology (Govind et al., 2017). Forecasters should understand the importance of observation timing and of the professional fit of experts for ensuring an accurate demand forecast (Alvarado-Valencia et al., 2017). Using either ARIMA or expert opinion for demand forecasting alone is simplistic since the two approaches limit the forecaster's ability to capture the volatility in data in seasonality (Alvarado-Valencia et al., 2017). As a result, exponential smoothing methods fit this doctoral study.

Demand Forecasting Strategy and Process

Demand planning is the genesis of a great demand forecasting strategy (Raza & Kilbourn, 2015). Demand forecasting strategies should consist of formulating and implementing the stages necessary to advance small business profitability (Samiloglu & Akgün, 2016). To implement a demand forecasting strategy in a small, retail, medical supply business, leaders should pay attention to details relative to the method of forecasting selected (Holt, 1957) and observe the availability of current and past data. The importance of understanding the intricacies of demand forecasting cannot be understated. If applying Winters's (1960) demand forecasting approach, leaders will need to pay attention to the details involved in trends and seasonality as these intricacies can affect profitability. The benefits of competitiveness and sustainability align with the profitability of an enterprise and are therefore important to the overarching strategy discussion (Wilson & Wu, 2017). Determining the best means of executing the strategy must include considerations of competitiveness and sustainability (Teh & Corbitt, 2015; Wilson & Wu, 2017).

Demand planning. Demand planning drives decisions on inventory management, replenishment, ordering, and production (Cassettari et al., 2017; Raza & Kilbourn, 2015). Retail leaders face sensitive concerns due to fluctuations, diverse product offering, and the customers' expectation for quality (Veiga et al., 2016). Planning is essential to countering volatile economic conditions and establishing a strong customer loyalty position for all businesses (Raza & Kilbourn, 2015). Align the demand plan with inventory plans and profitability goals (Kontus, 2014; López et al., 2013; Samiloglu &

Akgün, 2016). The collaborative task of demand planning requires the participation of sales, finance, market research and customer service professionals in an organization (Raza & Kilbourn, 2015). Demand planners use prior data on orders placed to lay the groundwork for their plans (Raza & Kilbourn, 2015; Toledo et al., 2017). Other relevant factors include sales history, enterprise strategy, competitor influence, promotions, economic conditions, internal constraints, and other social drivers (Raza & Kilbourn, 2015). The demand plan allows a retail leader to gain a deeper understanding of customer needs and confirms the positioning to meet the resulting product demand (Raza & Kilbourn, 2015; Salam et al., 2016; Veiga et al., 2016). Failure to understand the customer creates an imbalance between the product supply and customer demand (Govind et al., 2017; Raza & Kilbourn, 2015).

Balancing supply and demand creates value and profitability for a business (Che-Jung et al., 2016; Raza & Kilbourn, 2015). A customer-focused strategy that includes evaluating customer satisfaction and loyalty levels may induce profitability (Mohamed, 2016). Loyal customers are the most profitable for businesses since they do not draw marketing or promotional costs. Additionally, loyal customers may be willing to pay more for a product when there is trust and assurance that the product will be available (Goyal et al., 2016; Mohamed, 2016). The factors that measure customer satisfaction include (a) the number of product returns or replacements and (b) the decline or increase in sales (Mohamed, 2016). The demand forecasting strategy should consist of formulating and implementing stages necessary to advance a small business's profitability (Samiloglu & Akgün, 2016). The collaborative task of demand planning

requires the participation of sales, finance, market research and customer service professionals in an organization (Siriram, 2016). A customer-focused strategy might induce profitability because loyal customers are the most profitable for business since they do not draw marketing or promotional costs (Mohamed, 2016). A customer-focused strategy may emerge from this study as a best practice.

   Forecasting strategy. According to Gebczynska (2016), the first stage of strategy creation begins with the outcome in mind. Leaders use the desired outcome to lay the groundwork for the analysis and the vision for the strategy. Forecasters should align the strategy with operating activities and identify themes, goals, and objectives. Successful strategy implementation depends on successful strategy formulation (Isaenko & Degtyar, 2015; Van & Nienaber, 2015). Bunger et al. (2017) suggested several considerations when implementing any strategy: (a) identifying the responsible party for designing and executing the strategy, (b) enforcing the processes necessary for designing and executing the strategy, and (c) identifying the targets and measures for success. Strategy implementation also depends on identifying the rate of frequency for applying the strategy, identifying the desired outcomes, and identifying the impacts to the business (Bunger et al.). It is also necessary to identify the business, pragmatic or empirical case justification for the strategy. Strategy implementation may have a positive or adverse impact on business operations and outline solutions to business problems for which the strategy is intended (Bunger et al.). Leaders should create a monitoring plan to ensure that the postmortem occurs on the strategy to review and analyze quantitative and qualitative success indicators (Van & Nienaber, 2015). Profitability should be the

quantitative measure of success for the small business with customer satisfaction

providing the qualitative measure of success (Samiloglu & Akgün, 2016). Modifications

to the strategy may be necessary if the analyses indicate weaknesses in the strategy.

Leaders must compare and analyze actual historical data for inaccuracies to determine a

forecast model's efficiency and effectiveness for the current period (Holt, 1957; Winters,

1960).

     Bunger et al. (2017) explained implementation strategies as methods or

techniques used to heighten the acceptance and sustain a program or operation. In most

large enterprises, those who design strategies are different from the leaders who

implement and execute them (Otchere-Ankrah, Tenakwah, & Tenakwah, 2015). Formed

silos exist in the larger businesses, and thus there may be a loss of communication and

reasoning behind the strategy (Trapero et al., 2015). Smaller businesses can avoid the

silos and loss of communication that plague larger enterprises (Simionescu & Bica,

2014). Business leaders may see the need to adjust the strategy to the ever-changing

business environment to avoid implementation failure (Gebczynska, 2016). Strategy

implementation failure often results from an unapproved strategy, lack of skill, poor

communication, lack of details, and inability to execute in the planning phase (Shockley,

Plummer, Roth, & Fredendall, 2014). Leadership input during strategy implementation

supports comprehensive feedback on quality assurance procedures, educational literature,

and any new process or procedural documents needed (Bunger et al., 2017). A pro

strategy workplace depends on competency building, vision for organizational change,

and sustaining competitive advantage (Bunger et al., 2017; Jansson, Nilsson, Modig, & Hed Vall 2015).

Van and Nienaber (2015) suggested that time constraint is a barrier faced by forecasters. Strategy implementation can be time-consuming as dictated and perceived by leaders at various levels. Additionally, Van and Nienabar suggested that the components to the implementation phase of a demand forecasting strategy in a small retail environment include: (a) understanding inventories, customer demand, increasing knowledge and expertise among associates, and (b) selecting a forecasting framework/model. Otchere-Ankrah et al. (2016) stressed the importance of teaching the forecasting and allowing associates and leaders to grasp the subject, make mistakes, and learn from them. Shockley et al. (2014) found that most of the 219 poor-performing, low-profitability retail companies they studied had failed to invest proper resources into their forecasting infrastructure and training/development of employees. While researchers have not identified a perfect method, findings suggest that the use of forecasting models and investing in the skill development of associates can improve inventory with profitability long-term (Otchere-Ankrah et al., 2016). Sindelár (2016) contended that domain and forecasting work experience are significant contributors to forecasting success in the retail space. The literature included some discussion of other factors such as education, but findings confirmed that education does not contribute greatly to forecasting performance (Sindelár, 2016). Business leaders can acknowledge the social climate in the workplace with communication among peers and leadership (Sindelár, 2017) to encourage forecasting expertise.

Forecasting process. The forecasting process is vital to any business operation according to Weatherford (2016) and contributes to the decision-making process (Che-Jung et al., 2016). Large businesses use a mix of qualitative and quantitative forecasting methods and have more resources than small businesses (Hofer et al., 2016). However, a lack of resources does not diminish the value or importance of forecasting accuracy in small businesses. The accuracy level of the forecast should increase the intelligence on market demands (Che-Jung et al., 2016). A forecast should begin with the selection of a model, with prior historical information modified as the forecast progresses (Stekler, 2015). Forecast method criteria should include the likelihood of accuracy, cost avoidance, return on investment, simplicity, timeliness, and comprehensibility (Hofer et al., 2016; López et al., 2013. Forecasters will establish a baseline mathematical forecast and later adjust for market conditions and other external factors (Trapero et al., 2015). A forecaster must be careful not to modify too early in the process, to avoid the risk of not having captured all the information critical to the output of the forecast (Goodwin, 2010). A test for efficiency is necessary when evaluating a forecast in real time, with efficiency defined as the declining gap between the forecasts and realization (Bohanec et al., 2017; Stekler, 2015). Stekler (2015) recommended evaluating forecast variables together. The Winters's (1960) model includes the variables of the level, trend, and seasonality, with the three variables evaluated simultaneously. The model relies on the alignment and impact on the forecast as the basis for evaluation. The forecaster, through a process known as multivariate evaluation, will avoid confirming one variable as sensible while the other two variables are determined to be suboptimal (Stekler, 2015).

Therefore, selecting a forecast model is vital to the success of the overall forecast, with simplicity and vigor being the most important criteria for evaluation (Van & Nienabar; 2015; Winters, 1960). Forecasters must take important steps to build a strategy, design phases of execution, and monitoring, engage the workplace culture, and select a forecast model. It is critical that forecasts align the forecasting strategy with operating activities and identify themes, goals, and objectives. Strategy implementation and postmortem phases are ideal processes for ensuring the forecast execution and monitoring of success indicators (Bunger et al., 2017). The quantitative and qualitative measures of profitability and repeat purchases align with the customer satisfaction demonstrated the level of success (Van & Nienaber, 2015). Competency building and sustaining competitive advantage can promote demand forecasting in the workplace (Bunger et al., 2017; Jansson et al., 2015).

Competitiveness and sustainability. Effective strategies should include the goal of competitiveness, a benefit of which is profitability (Samiloglu & Akgün, 2016). A small, retail, medical supply business should position itself to offer a full and best-in-quality product offering when compared to its competitors (Liu et al., 2016). Effective demand forecasting strategies may aid a small, retail, medical supply business in the quest to increase profitability (Kontus, 2014). Van and Nienaber (2015) described the competitive advantage as rare, indisputable, and resourced based. Business leaders may need to reflect and identify the product categories that they wish the business to introduce and sustain (Van & Nienaber, 2015; Wilson & Wu, 2017). The products that drive multiple revenue streams are those sold to the public for profit and those that are also

made available for fee reimbursement from the state and federal government's durable

medical equipment and supplies programs (Kentucky Cabinet for Health & Family

Services, 2018; U.S. Department of Health & Human Services, 2017).

Business sustainability from a demand-forecasting context meets the existing and

future needs of the business and its customers (Wilson & Wu, 2017). Sustainability

supports a small, retail, medical supply company in the aim of prospering financially

without sacrificing the company's organic contribution to itself, society and social capital

(Inigo, Albareda, & Ritala, 2017; Teh & Corbitt, 2015). Businesses with sustainment

capacity demonstrate this capacity while also predicting future needs and supporting

internal growth (Wilson & Wu, 2017). Sustainability is important and is conditional upon

the leadership strategy, planning, vision, and decision-making of business leaders

(Jansson et al., 2015). Otchere-Ankrah et al. (2016) argued that leaders with planning and

forecasting responsibilities perform such tasks to monitor competition, legislation,

technology, economic and market conditions that may threaten or strengthen a business.

Small, retail, medical supply business leaders may scan the environment to stay proactive

and not reactive to macroenvironmental factors that may induce a change in the business

(Holt, 1957). Leaders should understand the business environment while building a

demand strategy (Holt, 1957). A leader in a small, retail, medical supply business in

Kentucky, therefore, should understand the customer population, the product offering, the

federal and state regulatory implications, and the prior documented weaknesses and

threats to the business. Understanding the environment allows business leaders to identify

and assess the likelihood of new opportunities, product offerings, and customers (Raza & Kilbourn, 2015; Siriram, 2016).

Liu et al. (2016) affirmed the alignment between business competitive advantage and profitability. Leaders need to understand the source of revenues and find ways to minimize costs for greater profits (Weatherford, 2016). As profitability increases, so does sustainability (Mohamed, 2016; Wilson & Wu, 2017). Businesses with sustainability can operate while predicting future needs and supporting internal growth (Wilson & Wu, 2017). Understanding the overall environment is critical for building and executing a competitive, profitable, and sustainable business through demand forecasting (Hofer et al., 2015; Siriram, 2016; Wilson & Wu, 2017). The business environment includes internal business needs such as inventory management as well as external business aspects such as market conditions (Kontus, 2014; Winters, 1960). Understanding the overall environment may position leaders to recognize the opportunities and threats that can strengthen or weaken the product offering and better generate the forecasts used to make business decisions.

Transition

The literature review included a synthesis and analysis of current literature, including (a) the Winters's (1960) demand forecasting approach that is the conceptual framework of the study; (b) alternative methods to the conceptual framework, including judgment forecasting and autoregressive integrated moving averages; and (c) the small business environment alignment to demand forecasting, inventory management, and sustainable strategy. I discussed research that supports the retailers' use of a demand-

forecasting model to improve performance, advance business competitiveness, and profitability based on accurate inventory records. I referenced the work of researchers who have supported the alignment of inventory plans and design goals with a demand plan. Additionally, I discussed the practice of the small, retail, medical supply business leader scanning the environment to stay proactive while building a demand strategy.

In Section 2, I expanded on the problem statement, restated the purpose statement, and provided a description of the roles of the researcher. I included a discussion of research methods and designs, population and sample size, ethical considerations, modes of data collection, analysis, and techniques. Section 2 concludes with a discussion of qualified research on reliability and validity. In Section 3, I outlined the results of the study through the presentation of outcomes, professional practice application, implications for social change, call for action, recommendation for future research, reflections, and study conclusions.

Section 2: The Project

Section 2 begins with the purpose statement outlining the intent to explore successful demand forecasting strategies. The section includes a summary of my role as the researcher and a description of my intent to build trust and ethically engage with the eight participants that served as the target population of the study. I outlined and elaborated on the research method and design and discussed the population and sampling methods necessary for conducting a qualitative case study. The section includes my gathering and analyzing of the data in an ethically sound manner and confirming the reliability and validity of the study.

Purpose Statement

The purpose of this qualitative single case study was to explore the successful demand forecasting strategies that small, retail, medical supply business leaders use to increase profitability. The target population for this study consisted of eight business leaders from a private, small, retail, medical supply business in Kentucky. These business leaders had a history of successfully implementing strategies to forecast customer demand to increase profitability. The implications for social change are that medically underserved Kentucky citizens in need of accessible and abundant medical supplies could benefit from successful demand forecasting strategies applied by small, retail, medical supply companies through greater availability of retail medical products and an elevated level of caregiving as a results of these products.

Role of the Researcher

The role of the qualitative researcher is to collect data based on the experiences of participants for interpretation and data analysis, which is critical to qualitative research (Kozleski, 2017). I collected data from participants who had successful experience applying demand forecasting strategies within a small, retail, medical supply setting in Kentucky. According to Neale (2016), qualitative researchers may use iterative categorization for managing the analysis, most analytical methods, and conceptual frameworks. Lach (2014) explained that the qualitative researcher should code and analyze data according to topic, theme, theory, or concept. Therefore, I applied techniques of coding text and data into themes to help support logical thoughts, arguments, and conclusions drawn to expand theoretical concepts in this study.

I have a scholarly interest in demand forecasting, and I do not have prior professional experience or current professional relationships in the small, retail, medical supply industry. Manurung and Mashuri (2017) proposed that interest-based instructional materials could motivate a learner to apply prior knowledge of an instructional topic. Zhe, Zhiyuan, Lichan, and Ed (2015) noted that building up an interest in a topic through belief influences and expressed written and oral communication is an effective method to foster support. Kidney and McDonald (2014) postulated that having a relationship with the participants might reduce the number of barriers to collecting data. Therefore, I made personal introductions to all study participants and communicated my interest in the retail, medical supply space to encourage dialogue and support.

According to Elo et al. (2014), the ethical role of the researcher is to build trust and safeguard the rights of participants in a research study (Bull et al., 2015; Hammersley, 2015). Researchers use *The Belmont Report* for ethical guidance on research involving human subjects (U.S. Department of Health & Human Services, 2014). *The Belmont Report* includes the instructions for research participant invitation and consent to engage in a research study as well as outlines the basic ethical principles of beneficence, justice, and respect for persons or subjects (U.S. Department of Health & Human Services, 1979). Mhaskar et al. (2015) suggested that university institutional review boards (IRBs) are the primary authority for clinical research studies approval in the United States. As the leading authority, IRBs safeguard the rights and welfare of human participants and work to approve ethical, safe, and compliant studies (Mhaskar et al., 2015).

Researchers use strategies to lessen bias during the data collection, analysis, and conclusion of a case study (Onwuegbuzie & Hwang, 2014; Perkmann & Schildt, 2015). Researchers act alone as the data collector to reduce bias (Heslop, Burns, Lobo, & McConigley, 2017; Merriam, 2014). Additionally, researchers use methodological triangulation to analyze data and minimize bias in study findings (Perkmann & Schildt, 2015). As part of the strategy to minimize bias, I acted alone as the data collector and used methodological triangulation as part of my data analysis process. I also used member checking to reduce bias. Member checking is a method of presenting results and interpretations to the participants to be confirmed and validated, and in this way, the

plausibility and truthfulness of the data collected can be acknowledged and supported (Zohrabi, 2013).

Qualitative researchers use an interview protocol (see Appendix A) to guide them in complying, coordinating, and executing the data collection process (Dikko, 2016; Yin, 2018). Researchers also use an interview protocol to complete the information analysis process (Yin, 2018), which may strengthen the reliability of semistructured interviews (Castillo-Montoya, 2016). Researchers conduct an inquiry-based conversation along with a feedback and piloting system by following the interview protocol (Castillo-Montoya, 2016). Additionally, researchers can use an interview protocol to stay on task and aligned with research goals (Baskarada, 2014; Boehm & Hogan, 2014). Gould et al. (2015) postulated that the inclusion of open-ended questions in the interview protocol and follow-up inquiries, when allowed, is appropriate in a qualitative study. Therefore, I used an interview protocol as an important guide for coordinating, executing, and strengthening semistructured interviews with open-ended questions. My interview protocol included seven, open-ended questions designed to elicit the participant responses necessary to extract data that helped me answer the overarching research question for the study (see Appendix A).

Participants

Business leaders with at least 5 years of demand forecasting strategy experience within a retail medical supply setting to increase profitability met the participant eligibility criteria. Manhas and Oberle (2015) suggested that existing expertise and knowledge determines the degree of readiness to participate in a study and communicate

articulately and thoughtfully. Coleman (2014) postulated that knowledge of company

operations and finances is essential eligibility criteria. According to Cadman et al. (2014)

and Young et al. (2014), the skills and experience in a specific phenomenon are

significant criteria for the selection of participants.

Qualitative researchers must obtain approval from gatekeepers to access

participants for data collection purposes (Ortiz, 2015; Speer & Stokoe, 2014).

Gatekeepers have great knowledge of the company and can provide access to internal

workings of the company to external parties (Stark, Garza, Bruhn, & Ane, 2015; Van den

Brink & Benschop, 2014). Letters of cooperation traditionally contain a standard that

participants have the right to engage or disengage from the study at their will without

consequence (Nguyen, 2015; Petrova, Dewing, & Camilleri, 2016). Researchers should

use electronic communication channels to gain access to an organization (Byrne et al.,

2016; Song & Suh, 2016). Al-Alwani (2015) and Lenters, Cole, and Godoy-Ruiz (2014)

asserted the importance and relevance of e-mail correspondence. I identified an

authoritative gate keeper in a retail medical supply organization through viva voce. My

strategy for gaining access to participants was to send an e-mailed letter to an

organizational gatekeeper requesting access to the organization and explaining

participants' rights. I prepared an interview protocol beforehand as a guide to my

compliance, coordination, and execution of the data collection process (see Appendix A).

The next steps I took were to (a) extend an invitation to the gatekeeper to participate in

my study, (b) explain my study, and (c) request permission to ethically interview

participants. Once the letter of invitation was accepted by the gatekeeper, I sent a letter of

cooperation to confirm approval to conduct my research study in an organizational setting and further explaining participants' rights. If the gatekeeper had not accepted my invitation, I would have ceased all communication and moved on to invite a gatekeeper of another organization where the owners are operators.

Researchers treat participants as partners to establish trust and build a working relationship with them (Angrist, 2015). Research participants need to trust researchers to have an effective working relationship (Johnson, 2014; Marshall & Rossman, 2016). Astin, Horrocks, and Closs (2014) and Kidney and McDonald (2014) asserted that fostering trust is conditional upon the informal and flexible aspects of participation. Alby and Fatignant (2014) asserted that researchers and participants need clear, frequent, and spontaneous communication because, according to Yanchar (2015), communication style is vital to relationship building. Therefore, I treated participants as partners through maintaining a relaxed and flexible style of communication during the informed consent process to build a trust-based working relationship.

The overarching research question for this study aligned with my intent to select participants having at least 5 years of demand forecasting strategy experience within a retail medical supply setting. Marshall and Rossman (2016) suggested that participants with the greatest number of years of experience establish the strongest foundation for a better understanding of the phenomenon. Researchers set eligibility criteria, as asserted by Shoup (2015), to confirm selected participants have the successful experience and knowledge relative to the research study (Young et al., 2014). I selected eight leaders with at least 5 years of demand forecasting strategy experience within a retail medical

supply setting because of their knowledge relating to the topic under study, reinforcing alignment to the research question.

Research Method and Design

Research Method

Yin (2018) asserted the importance of selecting the most appropriate research method for useful results. The qualitative method is appropriate when a researcher seeks to understand a bounded system using multiple data sources in a real environment (Cope, 2015; Dabić & Stojanov, 2014). Elo et al. (2014) and Wowak and Boone (2015) postulated that the qualitative method is also useful to inquire about the process of a phenomenon. Lach (2014) suggested that techniques of coding text and data into themes help support logical thoughts, arguments, and conclusions drawn to expand theoretical concepts. I applied the qualitative method for my study because my intent was to explore a bounded system of demand forecasting strategies in a small medical supply business.

Using the quantitative method, a researcher may test the statistical significance of relationships or differences among variables by testing related hypotheses (Lamb, 2013; Thamhain, 2014). Researchers use the quantitative method to explain numerical changes in a population or provide clarifications of predictions (Khan, 2014; Lach, 2014). The mixed method contains elements of both qualitative and quantitative research approaches (Caruth, 2013; Landrum & Garza, 2015). Researchers use the mixed method to explore problems and examine solutions relative to the overarching research question (Sparker, 2014). I did not intend to examine solutions or statistical measurements and relationships

among two or more variables relative to testing hypotheses; therefore, the quantitative method and quantitative elements of the mixed method were not suitable for this study.

Research Design

The single case study design was suitable for this qualitative exploration of the demand forecasting strategies in a small, retail, medical supply business in Kentucky. I selected the single case study design because I intended to explore explicit, unique aspects of my research, and best understand the why and how of demand forecasting strategies. Ang et al. (2016) argued that with the single case study design, researchers gather and analyze qualitative data to realize explicit elements rather than broad generalizations. According to Dasgupta (2015) and Vohra (2014), the single case study is optimal for capturing explicit and unique cases. Lewis (2015) and Yin (2018) suggested that the single case study design allows a researcher to explore best *why, how,* or *what* of a phenomenon which, in this case study, was successful demand forecasting strategies used to increase profitability.

While not a part of my study design, qualitative researchers employ the application of ethnographic and phenomenological designs, focusing on cultures and lived experiences. The goal of the phenomenological researcher is to explore the meanings of participants' lived experiences (Dasgupta, 2015; Stanley & Nayar, 2014). Additionally, phenomenological designs generally require at least 20 study participants (Bevan, 2014). Ethnographic researchers focus primarily on human cultures (Brown-Saracino, 2014; Goodrich et al., 2014). Ethnographic researchers deepen their understanding of the behaviors and cultural effects of individuals and groups, through

social engagement (Brown, 2014; Welch et al., 2015). The phenomenological and ethnographic designs were not suitable for this study because I did not explore participants' lived experiences or shared cultural beliefs in this study. Therefore, the case study design was the most appropriate qualitative research design for this study.

As a researcher, I aimed to accomplish data saturation during this doctoral study on demand forecasting strategies. Fusch and Ness (2015) suggested that data saturation would vary by study design. I selected a single case study design to include a census of eight participants. Marshall, Cardon, Poddar, and Fontenot (2013) asserted that researchers reach data saturation with as few as three study participants in a qualitative case study. According to Robinson (2014), researchers need a census under 20 to reach data saturation. Saturation refers to reaching a point of informational exhaustion (Gentles, Charles, Ploeg, & McKibbon, 2015; Roy, Zvonkovic, Goldberg, Sharp, & LaRossa, 2015). The technique of interviewing participants until the repetition of responses occurs is in line with the Carman et al. (2015) suggestion for achieving data saturation. Additionally, data saturation occurs when there is adequate information without diminishing returns (Liu et al., 2014). Data saturation occurs when after interviewing participants, there is no discovery of new information (Fusch & Ness, 2015; Liu et al., 2014). Therefore, I reached data saturation by interviewing all participants until repetitive responses occurred and there was no new information introduced. If I had not reached data saturation with eight participants, I would have continued to interview the participants until no new themes emerged.

Population and Sampling

I sampled a small number of individuals so that I obtained a thorough and intensive analysis. According to Gentles et al. (2015), researchers sample a portion of the target population rather than the population in its entirety. The goal of qualitative research sampling is to obtain rich and in-depth information useful for understanding multifaceted, varying, and relative details of a case (Boddy, 2016; Gentles et al., 2015). Idiographic (small) sample sizes are effective enough for single cases to offer enough data for intensive analysis (Robinson, 2014).

I purposefully sampled individuals with successful demand forecasting strategy experience from a population of leaders within a small, retail, medical supply company in Kentucky. Researchers describe purposeful sampling as a widely applied tool in qualitative research and participant selection (Bethea, Murtagh, & Wallace, 2015; Gentles et al., 2015). Researchers find purposeful sampling most helpful for the selection process of participants based on the phenomenon (Barratt, Ferris, & Lenton, 2014; Misigo & Kodero, 2014). Robinson (2014) and Wang, Rafiq, Li, and Zheng (2014) described the importance of purposeful sampling as identifying critical persons within a population, possessing the most knowledge about a subject.

Qualitative researchers use convenience and snowball sampling as alternatives to purposeful sampling (Carman et al., 2015). Generalizations in research limit convenience sampling (Donoghue & De Klerk, 2013). Convenience sampling is restrictive to limited data (Bashir & Madhavaiah, 2014; Prabadevi, 2014). Hutabarat and Gayatri (2014) asserted that the success of snowball sampling hinges on personal contacts. Additionally,

snowball sampling involves the use of individuals influenced by study participants (McCreesh, Tarsh, Seeley, Katongole & White, 2013). The restrictive nature of convenience sampling was not appropriate for my study. The large reliance upon influenced persons in snowball sampling was not appropriate for my research.

In this single case study, my sample included eight participants. I sampled a small size of participants so that I obtained a thorough and intensive analysis. According to Gentles et al. (2015), researchers sample a portion of the target population rather than the population in its entirety. The goal of qualitative research sampling is to obtain rich and in-depth information useful for understanding multifaceted, varying, and relative details of a case (Boddy, 2016; Gentles et al., 2015). Robinson (2014) asserted that idiographic (small) sample sizes are effective enough for single cases to offer enough data for intensive analysis. The small sample size of a qualitative case study may be homogenous and expressive regarding work-life history homogeneity (Robinson, 2014). Additionally, McIntosh and Morse (2015) postulated that a case study analysis is thorough with a smaller sample size.

Fusch and Ness (2015) suggested that data saturation would vary by study design. I selected a single case study design to include a census of eight. Marshall et al. (2013) asserted that researchers reach data saturation with as few as three study participants in a qualitative case study. According to Robinson (2014), researchers need a census under 20 to reach data saturation. Saturation refers to reaching a point of informational exhaustion (Gentles et al., 2015; Roy et al., 2015). Additionally, the technique of interviewing participants until the repetition of responses occurs is in line with the Carman et al.

(2015) suggestion for achieving data saturation. Data saturation occurs when there is

adequate information without diminishing returns (Liu et al., 2014). Data saturation

occurs when after interviewing participants, there is no discovery of new information

(Fusch & Ness, 2015; Liu et al., 2014). I reached data saturation by interviewing all

participants until repetitive responses occurred and there was no new information

introduced.

Selection criteria for participating in this study was a working knowledge of

demand forecasting strategies, demonstrated through at least 5 years of successful

demand forecasting experience. According to Cadman et al. (2014) and Young et al.

(2014), the skills and experience in a specific phenomenon are significant criteria for the

selection of participants. Marshall and Rossman (2016) suggested that participants with

the greatest years of experience establish the strongest foundation for a better

understanding of the phenomenon. I conducted confidential, in-depth interviews in a

private, quiet office on site of the organization, at a time of convenience for the

participants. Cotter et al. (2015) and Dikko (2016) suggested that a quiet environment is

necessary for an interview and may encourage participation. Cetina, Dumitrescu, and

Vinerean (2014) and Easterling and Johnson (2015) postulated that valuable interviews

occur at the confidential place and time of convenience for interviewees.

Ethical Research

I had the responsibility of ensuring that participants understand any possible

ethical challenges that may arise in the research study through an informed consent

process. An informed consent document is a participant agreement containing participant

rights in the research data collection process (Atz, Sade, & Williams, 2014; Halkoaho, Pietila, Ebbesen, Karki, & Kangasniemi, 2016). Researchers are encouraged to draft the informed consent form in a comprehensible format (Montalvo & Larson, 2014). Birt, Scott, Cavers, Campbell, and Walter (2016) postulated that including consent practices might further encourage participation in a study. Therefore, I interviewed only the individuals who signed an informed consent form to participate without receipt of incentives.

The ethical prowess of a study hinges on a high degree of trust between participants and the researcher (Barker, 2013; Elo et al., 2014). Participants are research partners (Angrist, 2015). As partners, participants should receive information about the aim of the study, including its voluntary nature and without financial incentives (Kendall & Halliday, 2014; Robinson, 2014). Offering incentives to participants may raise valid concerns about the data quality (Dixon, 2015; Parsons & Manierre, 2014). I established trust with participants to build the ethical prowess of this study by proactively sharing information about the purpose and voluntary conditions of the study. I did not offer any incentives to participants because an inappropriate reward or other overture to gain a participant's compliance is a form of undue influence and is prohibited by the Belmont Report (U.S. Department of Health & Human Services, 1979).

Participants were free to withdraw from the study at any time. Participants should understand that they have the right to freely engage or disengage from the study at their will without penalty (Kawar, Pugh, & Scruth, 2016; Petrova et al., 2016). Researchers further adhere to ethical standards by informing participants of their right to withdraw

from the research study (Faisal, Matinnia, Hejar, & Khodakarami, 2014; Furunes et al., 2015). Maintaining open communication with all parties during the data collection process aligns with the strategy of (Yeldham & Gruba, 2014). Al-Alwani (2015) and Lenters et al. (2014) asserted the importance and relevance of e-mail communication. Therefore, I required that participants use e-mail as the primary channel to communicate with me their intent to disengage, before or after signing the informed consent form.

My completion of the National Institute of Health training reflected my assurance to protect research participants (see Appendix D). The National Institute of Health emphasizes the researcher's responsibility for safeguarding human research participants in the National Institute of Health training program (U.S. Department of Health & Human Services, 2014). Wolf et al. (2015) postulated that researchers holding certificates in privacy and protections have the best opportunities to increase study participation. Anderson and Cummings (2016) asserted that IRBs approve researchers who need to certify their compliance with ethics in a study. Mhaskar et al. (2015) suggested that university IRBs are the primary authority for clinical research studies approval in the United States and focus on safeguarding human rights. I obtained documented IRB approval from Walden University. The IRB approval number for this study was 02-13-19-0541444.

Researchers should take every opportunity to mitigate the risk of violating a research participant's privacy and confidentiality (Bull et al., 2015). Check, Wolf, Dame, and Beskow (2014) strongly asserted the importance of privacy of all subjects when gathering data. Andrews, Dyson, and Wishart (2015) promoted the use of confidentiality

of research participants for mitigating risks to the privacy of participants. Thus, I omitted and replaced the names of participants in addition to the target organization from the study with codes to protect the privacy and confidentiality of participants. Miller, Gottlieb, Morgan, and Gray (2014) and Bamrara (2015) encouraged the secure protection of participants' data. Watson (2015) and Wolf et al. (2015) concluded that the destruction of all data is necessary following its original purpose. I now store all collected data in a locked safe. I have planned to destroy all applicable data upon the 5-year expiration date.

Data Collection Instruments

In this qualitative, single case study, I acted as the primary instrument of data collection. Researchers have a valuable role as the primary instrument of data collection (Merriam, 2014). Heslop et al. (2017) asserted that qualitative researchers act alone as the primary instrument to detect and explain the findings of a study (Marshall & Rossman, 2016). I used a semistructured interview format to ask open-ended questions to gather data. Semistructured interviews can be in-depth and honed through meaningful dialogue (Bryman, 2015; Esteves, 2014; Starr, 2014). Through meaningful dialouge, I explored demand forecasting strategies that small, retail, medical supply business leaders use to increase profitability. The semistructured interview differs from the traditional phenomenological interview as more preparation is required to collect data over a longer duration (Brown, 2014; Levine, 2015). Additionally, I reviewed company documents such as product offering sheets and prior month forecasts. Brédart et al. (2014) and Saunder, Lewis, and Thornhill (2015) suggested the review of documents and relevant processes to extend the opportunity for additional data. Dabić and Stojanov (2014)

confirmed documents as a useful type of data for qualitative studies. I found the use of secondary data viable to the study.

Enhancing the validity and reliability of any study is of great importance according to several scholars (De Massis & Kotlar, 2014; Yin, 2018). Researchers confirm the credibility of results using member checking according to Birt et al. (2016) and increases the validity of qualitative research (Caretta, 2016). Additionally, member checking is a tool used to validate the responses of participants (Cope, 2015; Houghton, Casey, Shaw, & Murphy, 2013). Member checking is a technique that qualitative researchers may use for verifying participants' answers to interview questions to ensure the accuracy and alignment of participants' responses (Andrasik, Chandler, Powell, Humes, & Wakefield, 2014; Saunder et al., 2015; Simpson & Quigley, 2016). I ensured credibility by conducting member checking while adhering to an interview protocol. I gave study participants my interpretation of their responses to interview questions and asked participants to verify their answers.

Data Collection Technique

The data collection process includes face-to-face semistructured interviews as the primary technique for data collection. I followed an interview protocol (see Appendix A). I collected data from the possible interview sources: (a) initial consented face-to-face participant interviews, (b) transcribed interview responses, and (c) member checks for interpretation accuracy purposes. I conducted initial in-depth 30-minute semistructured, face-to-face interviews to explore demand forecasting strategies that small, retail, medical supply business leaders use to increase profitability.

Bryman (2015) and Yii, Powell, and Guadagno (2014) described the semistructured interview as an effective qualitative research data collection technique. Yin (2018) and Sparker (2014) suggested that semistructured interviews are appropriate when seeking out a stronger insight into a phenomenon. Roberts et al. (2014) and Keränen and Jalkala (2014) suggested the use of open-ended questions in a case study to gather direct views. Alexanders, Anderson, and Henderson (2015) asserted that researchers could obtain a rich understanding of participants' experiences through open-ended questions.

Augustsson (2014) and Kihl, Babiak, and Tainsky (2014) recommended researchers conduct face-to-face interviews lasting 30-60 minutes. Face-to-face interviews are common in qualitative studies (Bowden & Galindo-Gonzalez, 2015; Schaupp & Bélanger, 2014; Sorina-Diana, Dorel, & Nicoleta-Dorina, 2013). Participants prefer face-to-face interviews (Irvine, Drew, & Sainsbury, 2013). Face-to-face interviews are flexible for the researcher to clarify responses and expand findings (Pacho, 2015). I conducted face-to-face, semistructured interviews to obtain deeper insights into demand forecasting strategies. Seven open-ended questions aligned with a primary research question: What demand forecasting strategies do small, retail, medical supply business leaders use to increase profitability?

According to Walker et al. (2016), note taking during interviews contribute to the success of a study. Yeldham and Gruba (2014) concluded that researchers benefit from good listening skills during the data collection process. Researchers should transcribe rich details, verbal and nonverbal on the study topic during the note-taking process (Shapka,

Domene, Khan, & Yang, 2016). Therefore, I listened and drafted notes during the interview process.

Member checking is a practical tool for interpretation of responses in interviews (Birt et al., 2016). Researchers use member checking to verify the accuracy and completeness of the interpretation of interviewees' responses in interviews (Cope, 2015; Doubet & Ostrosky, 2015). Andrasik et al. (2014) and Onwuegbuzie and Byers (2014) postulated that follow-up interview questions allow the researcher to obtain clarity and verify accuracy on the participant's comments. Therefore, I asked the participants to verify the accuracy of my written interpretation of their responses as part of the member checking process.

Researchers realize the advantages of semistructured interviews as traditionally reflecting rich and extensive results (Frels & Onwuegbuzie, 2013). According to Kihl et al. (2014), researchers can obtain fully understandable perspectives through semistructured interviews, thus, making the interview format advantageous. Bowden and Galindo-Gonzalez (2015) asserted that researchers find semistructured, face-to-face interviews advantageous when observing body language. Additionally, the researcher's use of secondary data such as archival documents may further support findings from initial data collected (Yin, 2018). Secondary sources are additional and contribute to the triangulation method to enhance the credibility of a study (Fusch & Ness, 2015). Researchers can save time on analysis using secondary sources (Saunder et al., 2015). Doody and Noonan (2013) concluded that a disadvantage of semistructured interviews is that novice researchers may fail to ask direct questions, resulting in missed data

collection opportunities. McIntosh and Morse (2015) postulated that researchers might encounter socially awkward dialogue during semistructured face-to-face interviews due to the possible nervousness of participants. Roulston and Shelton (2015) asserted that researchers discover bias when there is no use of reflective notetaking during semistructured interviews. Additionally, researchers may encounter the disadvantage of misinterpretation when analyzing data gathered by others (Camfield & Palmer-Jones, 2013). Researchers may not gain additional knowledge supporting the initial findings (Putnam, Molton, Truitt, Smith, & Jensen, 2016). Additionally, researchers may discover a lack of documentation and are not able to confirm the primary data collected (Jansen, Capesius, Lachter, Greenseid, & Keller, 2014). I conducted semistructured face-to-face interviews, reviewed various archival documents and collected data for analysis and interpretation.

Yin (2018) asserted that the validity and reliability of any study are important. Williams (2014) suggested that researchers conduct a pilot study to measure the reliability and validity of the collected data. However, I used member checking to confirm the accuracy of participants' interview responses. Researchers use member checking to confirm the accuracy of interview responses (Alsulami, Scheepers, & Rahim, 2016). Researchers use member checking to enhance the validity and reliability of the single case study (Birt et al., 2016; Caretta, 2016). I gave participants my interpretation of their responses to interview questions and asked participants to verify the accuracy of their responses.

Data Organization Technique

Yin (2018) suggested that researchers code and organize semistructured interview transcripts and research notes accumulated over the course of the data collection process. Researchers that organize their data are more likely to conduct rigorous research (Yin, 2018). It is valuable to compile data in an orderly way, comparable to quantitative data in a database (Yin, 2018). Flannery and Gormley (2014) and Yin discussed researchers' use of catalogs to document and organize research materials into themes.

I conducted semistructured, face-to-face interviews with eight business leaders following an interview protocol (see Appendix A). Each participant interview transcript was coded as numbers 1 through 8. I omitted and replaced the names of participants with codes to protect the privacy of participants. Miller, Gottlieb, Morgan, and Gray (2014) and Bamrara (2015) encouraged the secure protection of participants' data. Garcia and Gluesing (2013) suggested that researchers codify and analyze all qualitative data into themes for effectiveness. Thus, I coded and organized all data collected on the transcripts into themes using themes, patterns, and commonalities extracted from the data collection and interview process.

Chen and Zhang (2014) postulated the importance of technique and technologies for supporting effective data organization. I assigned each participant a password protected file that includes (a) their transcribed interviews, (b) any interview notes recorded on participant behavior or other occurrences during the interviews that may have influenced responses, and (c) any additional data related to the research process or the participants. I stored my data and information in password protected folders located

on a personal computer. The stored data and information has a backup storage in password protected folders on a Memorex 64GB flash drive. I scanned and saved any handwritten notes, written interview transcripts and recorded interviews into the separate password protected folders. Using Microsoft Word, I transcribed the interviews and export to NVivo 11 Pro. NVivo is a qualitative data analysis software, used in transcriptions as part of data collection and storage. The NVivo 11 software has features that help the researcher in data organization (Sotiriadou, Brouwers, & Le, 2014; Woods, Paulus, Atkins, & Macklin, 2015).

Researchers use reflective journals to record their initial thoughts of each data collection event and themes emerging in the data collected (Nickson & Henriksen, 2014; Van Wijk, 2014). Researchers may create a journal section documenting emerging themes, events, and documents collected during the study (Applebaum, 2014; Davies, Reitmair, Smith, & Mangan-Danckwart, 2013). This part of the journal has insightful elements to anyone seeking to understand parts of the research study that focuses on the results, including discussions on the successes and challenges of the study (Davies et al., 2013). I kept an electronic reflective journal, documenting emerging themes and insight into aspects of the interview process, setting and initial thoughts during the events of data collection.

Researchers should retain data no longer than required as well as maintain a secure location for data collected (Casteleyn, Dumez, Van Damme, & Anwar, 2013). I filed and stored all data and findings of the study confidentially inside a safe for 5 years. I plan to destroy all related data after 5 years. Miller et al. (2014) and Bamrara (2015)

encouraged the secure protection of participants' data. Watson (2015) and Wolf et al. (2015) concluded that the destruction of all data is necessary following its original purpose.

Data Analysis

The methodology for qualitative study data analysis often includes case study research designs and analysis of data, systematic and specific (Yin, 2018). I used triangulation as the primary data analysis process. Triangulation is the process of analyzing a case study through multiple in-depth approaches (Cope, 2014; Wilson, 2014). According to Carter, Byant-Lukosius, DiCenso, Blythe, and Neville (2014), there is data triangulation, methodological triangulation, investigator triangulation and the theory of triangulation. I used methodological triangulation because I conducted interviews and reviewed company documents as multiple methods of data collection. Methodological triangulation involves the use of multiple methods of data collection including interviews and company documents (Balzacq, 2014; Durif-Bruckket et al., 2014). Additionally, using methodological triangulation may control bias in the study (Perkmann & Schildt, 2015) and increase the reliability of themes (Joslin & Müller, 2016).

Alternative triangulation methods include data, investigator, and theoretical. Researchers use data triangulation to confirm the data collected during the semistructured interview and document review (Yin, 2018). Data source triangulation may occur at different times in the data collection process (Wang et al., 2014). Investigator triangulation involves the use of findings from more than one researcher (Carter et al., 2014). Archibald (2015) postulated that investigator triangulation paired well with the

data collection efforts for mixed method research. Theoretical triangulation involves the use of multiple theoretical perspectives (Burau & Andersen, 2014; Wahl, Avery, & Henry, 2013).

Tractability is an important element of case study data analysis (Fusch & Ness, 2015). De Massis and Kotlar (2014) postulated the importance of analyzing qualitative data systematically to ease the explanation of any data analyses. Yin (2018) postulated that researchers might use an analysis cycle including compilation, disassembly, reassembly, interpretation, and conclusion for a successful case study analysis. Cope (2014) and Yin asserted that cross-case synthesis and the technique of pattern matching are appropriate for analyzing case studies. Researchers should employ a systematic process to extract valuable themes from the data (Claps, Svensson, & Aurum, 2015; Lawrence & Tar, 2013). Therefore, I compiled, disassembled, and reassembled as necessary all word patterns, coded and organized into themes for interpretation and conclusions.

Researchers use NVivo data analysis software to enable the process of analyzing data collected and organized (Sotiriadou et al., 2014; Woods et al., 2015). De Massis and Kotlar (2014) suggested that researchers use the NVivo software for their coding and analytical tasks. Researchers use NVivo software when seeking minimal user error and simplification in the data analysis process (King, 2017). Therefore, I used NVivo data analysis software to code and analyze all data collected. Upon initially loading interview transcripts into NVivo 11 Pro software, I saved the member checked transcripts to a computer file. Second, I identified reoccurring words and phrases. Third, I assigned

codes. Lastly, I focused on the analysis that occurs when extracting themes from phrases and transcript passages.

Du Plessis and De Vries (2016) and Keränen and Jalkala (2014) demonstrated successful application of thematic analysis to extract from and align key themes with existing literature and frameworks. Brailas et al. (2017) and Vohra (2014) suggested the use of a thematic analysis of qualitative data to identify emerging themes in the study data. Qualitative researchers conduct thematic analysis by analyzing data and searching for the most prominent themes that describe a case or phenomenon (Estrada, 2017). I used thematic analysis to focus on key themes, aligned the themes with the literature and the conceptual framework, which is Winters forecasting demand approach.

Reliability and Validity

Reliability

The foundation for exploring and examining the quality of research designs starts with the domains, reliability, and validity (Alshenqeeti, 2014; Yin, 2018). According to Titze, Schenck, Logoz, and Lehmkuhl (2014), researchers apply rigor to ensure reliability. Dependability is the criteria for evaluating reliability in qualitative research (Cope, 2014). Researchers ensure dependability through documenting research procedures, thus, ensuring reliability (Nobel & Smith, 2015). Researchers apply member-checking strategies to ensure that a study is reliable (Morse, 2015). Member checking is a technique that qualitative researchers may use for validating participants' responses to interview questions to ensure the accuracy of responses (Andrasik et al., 2014). I ensured reliability through member checking and documenting research procedures.

Procedural consistency is a primary principle of reliability (Fan & Sun, 2014; Kihn & Ihantola, 2015). Researchers strengthen their ability to replicate the findings of a study with the process of documenting procedures, thus, ensuring dependability (Williams, 2014; Yin, 2018). According to Harvey (2015) and Morse (2015), qualitative researchers use member checking to increase the reliability of research. Birt et al. (2016) asserted that the process of member checking the responses of participants should occur after the researcher initially collects data. Cope (2014) asserted that researchers could establish dependability through a clear and outlined documentation process. I documented the semistructured interview process as well as the member checking by asking participants to review and validate data collected, enabling future study replication.

Validity

Credibility, transferability, and confirmability are constructs of research validity (Cope, 2014). The validity and credibility of a study rest upon the clear interpretation of perspectives (Fusch & Ness, 2015). The process of data verification, triangulating sources and member checking are part of increasing credibility and confirmability (Yin, 2018). The process of triangulation is essential to the credibility of the study (Morse, 2015). According to Elo et al. (2014), researchers achieve transferability through extrapolation of study findings to other settings. Yin (2018) postulated that a case study finding that supports or rejects new theories has a large degree of transferability. Additionally, transferability may hinge on accurate interpretation and documentation of data gathered in the study (King, 2017; Nobel & Smith, 2015). Kornbluh (2015) asserted that

researchers use member checking to increase the trustworthiness and confirmability of study outcomes. I conducted interviews, interpreted what the participants stated, and shared this interpretation with the participants for confirmation and validation.

Credibility. According to Yin (2018), credibility is the process of verifying data collection using member checking and source triangulation. MacRae et al. (2015) and Munn, Porritt, Lockwood, Aromataris, and Pearson (2014) postulated that credibility is most prominent when there is a match between data collected initially and the views of the participants upon member checking. The researcher's use of an interview protocol can add strength to the credibility of a case study (Lin, Han, & Pan, 2015; Yin). Qualitative researchers can use an interview protocol (see Appendix A) as a multifaceted process to establish credibility (Dikko, 2016; Yin). I ensured credibility by using an interview protocol and member checking all documented participant interview responses.

Transferability. Researchers achieve transferability by circulating information to others about the most important boundaries of the study to other contextual situations (Elo et al., 2014; Piškur et al., 2017). Researchers' enhance transferability by comprehensively explaining the data collection process adequately for others to apply to their setting (Saab, Landers, & Hegarty, 2017). According to Black et al. (2013), researchers achieve transferability by explaining the original context of their study. Additionally, researchers attain an increased level of analytical transferability because there is substantiation between study outcomes and primary external concepts (Yin, 2018). I addressed transferability by explaining the data collection process to ensure ease of interpretation, should future researchers determine the study applicable for transfer.

Confirmability. Confirmability, criteria of validity involves the assurance of trust in the methods and process of the study (Lin et al., 2015). Confirmability is necessary to certify the trustworthiness of the research study methods, procedures, and processes (Cope, 2014; Elo et al., 2014; Lin et al., 2015). Researchers may conduct an audit to verify the existence of information to substantiate the interpretation of findings and establish confirmability (Brott, 2015). Researchers use member checking as a method of verifying the alignment of interview responses and interview questions to establish confirmability (Birt et al., 2016; Morse, 2015; Saunder et al., 2015). I addressed confirmation and validation by member checking my interpretation with the participants.

Data saturation. Fusch and Ness (2015) suggested that data saturation would vary by study design. I have selected a single case study design to include a census of eight participants. Marshall et al. (2013) asserted that researchers reach data saturation with as few as three study participants in a qualitative case study. According to Robinson (2014), researchers need a census under 20 to reach data saturation. Saturation refers to reaching a point of informational exhaustion (Gentles et al., 2015; Roy et al., 2015). The technique of interviewing participants until the repetition of responses occurs is in line with the Carman et al. (2015) suggestion for achieving data saturation. Additionally, data saturation occurs when there is adequate information without diminishing returns (Liu et al., 2014). Data saturation occurs when after interviewing participants, there is no discovery of new information (Fusch & Ness, 2015; Liu et al., 2014). Therefore, I reached data saturation by interviewing all participants until repetitive responses occurred and there was no new information introduced. If I had not reached data saturation with

eight participants, I would have continued to interview the participants until no new themes emerged.

Transition and Summary

Section 2 included the role of the researcher and the participants. Also included are the research method and design, sampling, ethics, data collection analysis, and techniques, along with reliability and validity. The information supported the alignment between the overarching research question, conceptual framework, and research design. Section 3 contains the findings, professional practice application, implications for social change, call to action, recommendations for future study, reflections, and conclusions.

Section 3: Application to Professional Practice and Implications for Change

Introduction

The purpose of this qualitative single case study was to explore the successful demand forecasting strategies that small, retail, medical supply business leaders use to increase profitability. I conducted face-to-face, semistructured interviews with eight business leaders of a small, retail, medical supply business in Kentucky who had at least 5 years of successful demand forecasting experience. Prior to the interviews, each participant reviewed and signed the informed consent form and agreed to participate in the study. Following the initial interviews, I used member checking with each participant to ensure that my interpretations of the initial interviews were accurate. My review of the company's sales, pricing, and inventory documents enhanced my understanding of the uncovered strategies and themes. The following three themes emerged from my analysis of the data: understanding sales trends, inventory management with pricing, and seasonality. In this section, I provided an overview of the study and a presentation of the findings. The section also contains discussions of applications to professional practice and implications for social change as well as my recommendations for action, recommendations for further study, and reflections. The section and study are then summarized in the conclusion.

Presentation of the Findings

I designed this study to answer the following overarching research question: What demand forecasting strategies do small, retail, medical supply business leaders use to increase profitability? Each interview occurred in a conference room of the company in a

quiet and confidential setting. I asked each participant seven interview questions to gain an in-depth understanding of the demand forecasting strategies small, retail, medical supply business leaders used to increase profitability. The initial interview lasted 30 minutes. After the initial interviews, follow-up member checking took place with each participant to confirm the accuracy of my interpretations of the participants' responses to interview questions. During the member checking process, I asked each participant, P1 through P8, to review my interpretive notes of their individual interviews to either contest or confirm my interpretations of their responses. Each participant confirmed the accuracy of the interpretive reports. Additionally, for triangulation purposes, I used data from reviews of company documents (i.e., sales, pricing, and inventory documents) to support my findings from the interviews. The following three themes emerged from my analysis of the data gathered: understanding sales trends, inventory management with pricing, and seasonality.

Theme 1: Understanding Sales Trends

The first theme that emerged from data analysis was understanding sales trends. All participants communicated the importance of reviewing sales trends and indicated their knowledge of reviewing sales trends through hands-on experience and company training. Sales reports are reviewed daily, weekly, monthly, and annually. My review of the sales reports enhanced my understanding of the company's sales trends. The sales reports covering the prior 36 months reflected consistent daily sales in apparel, footwear, accessories, and instruments. Participant 8 stated, "having consistent sales definitely helps with forecasting. There are some slow periods that we have to consider, but overall,

our sales in apparel and footwear are the most consistent." Participants 2 and 3 specifically discussed the identification of patterns, such as days of the week and product specificity, to include in their forecast. I did not notice a daily sale pattern for durable medical equipment while reviewing the sales reporting. Participants 1, 2, and 3 confirmed that wheelchairs and scooters are not products they sold every day. Participant 2 stated, "some product sales peak on Saturdays, while other products sell consistently no matter the day."

While reviewing the sales return and refund documents with Participants 4 and 6, I learned that the sales return and refund policies are an important element to understanding trends in sales and the forecasting strategy. According to Participant 4, "fixed sales are a critical element to a reliable margin that is easier to forecast than variable sales and do not require additional accounting with the use of accruals." When abiding by the sales return and refund policy, sales employees are not allowed to accept open, used, and special-order products or provide refunds on such products. Participants 3, 4, 5, and 6 gave the following examples of nonrefundable products: (a) wheelchair cushions, (b) commodes, and (c) stockings. Participant 4 stated, "special orders are easy to include in our monthly forecasts because we know those sales are fixed. We don't accept returns or provide refunds on those types of items." Participant 6 stated,

> There are two sales return policies that you should be aware of. We have one
>
> policy for special orders and another for power wheelchairs/scooters. Special
>
> order sales are final, but we give each customer 72 hours to return powerchairs

and scooters. There is a $350 dollar restocking fee for powerchairs and a $200 dollar restocking fee for scooters if they are returned without an exchange.

Furthermore, Participants 4 and 6 reiterated the importance of knowing the sales return and refund policies when developing forecasts and understanding potential reasons behind sales trends. Participants 3 and 7 specifically asserted that understanding market conditions in addition to understanding sales trends was a crucial strategy needed to develop demand forecasts. To develop a working knowledge of the needs and wants of the consumers, Participant 3 stressed the importance of understanding the economic and environmental factors within the state. Participant 3 commented,

> Kentucky is impacted by lower income in some communities and has a higher rate of diabetes, so we see a high demand for diabetic foot care products. We understand that some of our customers are looking for reasonably priced goods that will address their outpatient care needs.

Furthermore, Participants 3 and 7 reiterated the significant impact of market conditions on sales, which can have a critical impact on the strategy to develop a demand forecast. Participant 7 commented, "you can increase sales by carrying products that customers need. We need to understand the market very well in order to meet the customer needs." Participants 3 and 7 specifically emphasized the importance of understanding the market and build on their market understanding by applying their knowledge of sales trends at weekly, monthly, quarterly, and annual frequencies. To overcome any barriers associated with increased risk of using irrelevant data, all sales inputs are approved upon a team review.

When comparing these findings to peer-reviewed literature, I confirmed the study participants' strategy of combining market knowledge and sales trends are viable for the purpose of demand forecasting. Ross and Lo Presti (2018) identified sales demand through the historical sales trends and gross profit margin earned over time. Additionally, Pavelková et al. (2018) and Ross and Lo Presti postulated that market analysis should reflect sales trends as well as the impact of imminent developments and additional factors on prospective sales. The collaborative task of demand planning requires the participation of sales, finance, and market research in an organization (Raza & Kilbourn, 2015). Demand planners use prior data on sales orders placed to lay the groundwork for their plans (Raza & Kilbourn 2015; Toledo et al., 2017).

Additionally, in my review of sales reports, sales returns, and refund documents, I discovered variable and fixed sales patterns depending on the product. The durable medical equipment line item did not have a daily sales pattern and requires special order. During the interview process, Participant 6 confirmed that special orders applied to durable medical equipment, such as wheelchairs. Nonrefundable products associated with potential biohazards, such as commodes and cushions, were documented on the income statement as a fixed sale. Commodes were an example of a nonrefundable product provided by Participants 3, 4, 5, and 6. After the document review, I concluded that the fixed sales figures are the easiest to forecast from historical data due to the customer's inability to return related products. These findings align with the commentary provided by Participant 4 related to the ease of forecasting fixed sales. This knowledge of the sales over time can help business leaders continue to forecast prospective sales through trends

and maintain their insights into the market demands, aligning further with peer-reviewed literature.

Alignment with conceptual framework. The theme of understanding sales trends aligns with Winters's (1960) demand forecasting approach. All participants indicated they each relied upon their individual experience and training in the company's sales trends to formulate demand forecasts. According to the literature on the Winters forecasting demand approach, the model is an effective model for forecasting demand using time series data reflecting trend (Winters's, 1960). Trends form a set of data points over time, and time series data in forecasting has significance to various practical areas because time series forecasting enables predicting the future by understanding the past (Ivanovski, Milenkovski, & Narasanov, 2018). Current data values are more effective in forecasts than prior historical data (Ivanovski et al., 2018). Historical data traditionally becomes less relevant as probe information moves deeper into the past when individuals apply the Winters model (Mastorocostas et al., 2016; Prestwhich et al., 2014). Furthermore, company leaders may find the montly sales trends more effective than the annual sales trends when forecasting using Winters approach.

Alignment to the existing literature on effective business practice. The findings aligned with existing literature on the effective business practice of including sales trends to build forecasts. The strategy of using sales trends for demand forecasting aligned with various peer-reviewed studies. All of the study participants revealed knowledge of their employer's finances during the interview process. Each participant's knowledge of their employer's finances adds credibility to their contribution to my study.

Coleman (2014) asserted that decision-makers must have knowledge of the company's operations and finances. The understanding sales trends theme aligned with the work of Pavelková et al. (2018) and Ross et al. (2018), which emphasized the need for knowledge of sales trends to effectively forecast future sales. The sales prediction information from the forecast supports replenishment and inventory management operations (Goyal et al., 2016; Liu et al., 2016).

Theme 2: Inventory Management with Pricing

The second theme that emerged from the data analysis of interviews, inventory logs, and pricing sheets was inventory management with pricing. When asked for successful strategies used to forecast customer demand to increase profitability, Participants 1, 3, 4, 6, and 7 stressed the importance of implementing an inventory management plan. My review of the companies' daily inventory log enhanced my understanding of the inventory management plan. Participants 4 and 6 specifically indicated that the goal behind managing the inventory was to ensure that the business keeps plenty of stock on hand. In their responses, Participants 4 and 6 implied that the availability of product is necessary to generate sales and profits. According to the inventory log, there are 33 different product categories, 35 product subcategories, and 100 different brands in stock by the start of each quarter. Participant 1 stated, "it is important to keep a detailed log of inventory available. The current inventory log is an optimized view of the current inventory on hand." Participant 4 stated,

We label each product offering and code the product with a unique identifier.

Each unique identifier starts in the 100 series and goes up to the 10,000 series.

This labeling process helps us stay organized around which products are in stock versus those products that need to be reordered.

Furthermore, Participant 4 reiterated the importance of implementing an inventory management plan with the intent to log products to know and ensure product availability properly. I confirmed that there was a unique identifier for each product when reviewing the inventory log. For example, each post surgery bra in-stock was labeled in the 300 series and started as item number 305. I asked Participant 4 to confirm if this labeling process has any part in the demand forecasting strategy. Participant 4 stated, "the labeling process certainly helps when forecasting. We are able to quickly determine which unique identifiers linked to the product are in high demand by reviewing the movement from inventory to shelf and then sold." Through my documentation review, I confirmed that unique inventory identifiers are on the sales report. Additionally, restocks are inventory elements that must be factored into the demand forecast strategy as well. Participant 6 stated, "there is a $350 dollar restocking fee for powerchairs and a $200 dollar restocking fee for scooters if they are returned without an exchange." I learned from Participant 6 that the purpose of restocking fees on such items was to alleviate some of the costs to receive and process high cost but not regularly sold items back into the inventory. Through a review of documentation, I confirmed that the company imposed and collected restocking fees. According to Participant 6, "an accrual is created for the potential return of such items and the impact is included in the forecast. If such items aren't returned the accrual is reversed in the following month forecast."

All participants specifically indicated that, through experience and company training, they learned the best practice of including pricing as part of the overall strategy to forecast demand. Participant 3 stated, "through company training each participant is required to price at market rate and only with approval through consensus, markdown or markup prices." As part of methodological triangulation, I reviewed the research partner's monthly pricing sheets. My review of the organization's monthly pricing sheets enhanced my understanding of the pricing model. Through this review, I discovered that the pricing model reflected routine discounts on hearing devices and durable medical equipment. Pricing markdowns occur only when a product is obsolete, underselling, or when there is a need to make room for new products on the shelves. I noticed a pricing markup on products where there was a documented history of returns on the related products. In addition, I compared the pricing of in-store items to online items and noticed that there were some online items that did not display a price. I learned from interviewing Participant 5 that prices are not listed online for durable medical equipment and government-controlled products. Durable medical equipment requires special orders, and government-controlled products require documentation prior to sale. Participant 5 stated,

> It is against the law for anyone in the company to openly sell a product controlled by a government mandate without first receiving proper documentation from the customer. After the receipt of proper documentation, we can price the product to sell.

All study participants indicated that their company's policy was not to display prices on items that are governed by government mandates. Participants 5 and 7 provided

the example of nasal masks accessories that attach to a breathing apparatus, as an example of a controlled product. Participant 7 stated,

> We keep copies of all documentation including proof of insurance provided by the customer for the purchase of controlled products. We know to forecast for the purchase of these items in advance because we cannot price the product and make the sale without receiving documentation in advance.

To overcome any barriers associated with increased risk of using irrelevant data, all inventory and pricing inputs for all products, including controlled and noncontrolled, are approved upon a team review. When comparing these findings to peer reviewed literature, I confirmed the study participants' strategy of considering pricing while managing inventory is viable for the purpose of demand forecasting and profitability. Taleizadeh and Rasuli-Baghban (2018) asserted that retailers must mark inventory-pricing decisions to ensure customer satisfaction and amplify profitability. Because retailing involves the furnishing and selling of goods and services for profit, leaders should focus on the demand generated by meeting customer needs (Ahmad & Shafie, 2016; Viktorovna & Ivanovich, 2016). Inventory is a critical component of business operation and directly impacts production, customer satisfaction, and profitability (Ahmad & Shafie, 2016; Kontus, 2014; Matsumoto & Komatsu, 2015; Xi & Sha, 2014). According to Chenavaz and Paraschiv (2018), profit is revenues minus costs and pricing and demand affect revenues. Inventory levels affect costs. This fact underscores the impact of inventory and price on profitability. Individuals maximize profits by

establishing the best pricing and control for inventory forces at work (Chenavaz &

Paraschiv, 2018).

Alignment with conceptual framework. The theme of inventory management

with pricing aligned with Winters's (1960) demand forecasting approach. All participants

relied heavily upon their implemented inventory plans and their ability to adjust pricing

accordingly. According to the literature on the Winters's forecasting demand approach,

the accuracy of the demand forecast will drive the number of inventories held by a

business (Holt, 1957). Demand forecasting is best suited for inventory planning and

control (Winters, 1960). Furthermore, effective planning of usage, product management,

inventory control, and capacity management occurs with time series analysis and

forecasting techniques (Matsumoto & Komatsu, 2015). Business leaders could use

Winters approach to plan inventories in the future and ensure the business capacity for

more or less of a product based on its demand.

Alignment to the existing literature on effective business practice. The

findings aligned to existing literature on effective business practice of making inventory

management with pricing decisions. The study participants' best practice of considering

pricing as part of an inventory management plan for demand forecasting aligned with

various peer reviewed studies. The study participants' knowledge of the company's

inventory management process aligned with Kontus' (2014) study in that the practice of

inventory management with increased focus on pricing and adequate replenishment may

increase profits. The inventory management with pricing theme aligned with the work of

Che-Jung et al. (2016) and Toledo et al. (2017), which emphasizes the importance of

inventory management to overall demand forecasting considerations. Researchers assert the importance of addressing inventory management issues with consumer behavior. Relative to demand, purchasing a product hinges on the important decision factor of price (Aktepe, Ersoz, Turker, Barisci, & Dalgic, 2018).

Theme 3: Seasonality

The third theme that emerged from the data analysis derived from interviews and a review of sales report planning was seasonality. Ivanovski et al. (2018) defined seasonality as a pattern that emerges in a regular period wherein the frequency of an event is within a year or less. When specifically asked the question: How do you prepare forecast demand levels based on sales, seasonality, contracts, geography, or some combination of these elements. All participants communicated the importance of knowing seasonal patterns and indicated their knowledge of seasonal product demand through hands on experience. All participants mentioned the impact of seasonality as an extension of the discussion of sales trends.

Liu et al. (2016) asserted that holidays and consumer preferences to price at different times of the year can affect sales on traditional and nontraditional products. Gur Ali and Pinar (2016) and Liu et al. explored the impact of seasonality in a retail setting and discovered that other disturbances, in addition to seasonality, influence sales on most products. Thus, seasonal and consumer partialities to holidays influence sales. In addition, Manoitit and Mitra (2019) supported the practice of using seasonal patterns to determine pricing, which has a direct impact on sales planning. Participants 5 stated,

We mark holidays as days for a potential increase in demand on our monthly sales plan. Everyone on our staff should be incorporating seasonality when working on the sales planning. When I first started working, we never did include things like seasonality. As time went on, we learned and got better at that aspect of our jobs.

I initially inquired into the available time series data that could reflect seasonality of traditional product offerings, as identified by Liu et al. (2016). According to Tavakkoli et al. (2015), seasonality is a characteristic in trend and time series data and reflects varied patterns depending on the time of year. Traditional product offerings in small, retail, medical supply businesses include footwear and apparel products, such as compression socks and orthopedic shoes (Liu et al., 2016; Winters, 1960). Liu et al. asserted that footwear and apparel demand is seasonal. Participant 5 suggested reviewing the sales reports to identify products that sale at a peak, or low end, during certain times of the year.

To triangulate data from interviews, I reviewed the company's prior 36 months of sales reporting to enhance my understanding of the seasonality within sales. The sales reporting reflected increased sales on government-controlled products during the October to December period. In the sales reporting, I found notes referring to Medicare enrollment season purchases. According to the U.S. Department of Health and Human Services (2017), Medicare open enrollment period is between October and December. The timing of such events may help explain the increased sales of controlled products. These products require documentation that may include proof of insurance. Forecasting seasonality is not without its challenges in relevancy of data because of uncertainty and

timing. However, to overcome any barriers associated with increased risk of using irrelevant data, all seasonal inputs are approved upon a team review. Participant 3 stated,

> Some products are sold more during spring and winter seasons. For example, during the spring season we'll see an influx of people come to shop right after the insurance enrollment season. To ensure that we have the most accurate forecast I must make a note of this event and mark it annually and account for it in my reporting.

The statement provided by Participant 3 supported my findings from reviewing the sales reports and the U.S. Department of Health & Human Services (2017) readings. I confirmed that the company sales of government-controlled products increase seasonally between October and December on the income statement. When comparing these findings to peer-reviewed literature, I confirmed the study participants' strategy of including seasonality as viable for the purpose of demand forecasting accuracy. Cheng et al. (2016) and Veiga et al. (2014) identified seasonality as an important factor of demand forecasting in a retail medical supply setting. Researchers (Cheng et al., 2016; Kolassa, 2015; Matsumoto & Komatsu, 2015) identified two consumption patterns of medical supply-demand: continuous demand, resulting from the daily use of a product; and intermittent demand, resulting from product diversification and seasonality. Research findings do imply that seasonality and trends continue as critical elements in any forecasting approach (Veiga et al., 2014). Ehrenthal, Honhon, and Van Woensel (2014) investigated the value of demand seasonality in inventory control within a retail setting and found gaps in optimality when demand seasonality is not included. Salvino, Tarleton,

Kuhn, and Kauffman (2018) argued that understanding seasonality may identify the periods of time that demand has its greatest density. Furthermore, the forecaster may use demand data to formulate an accurate forecast.

Alignment with conceptual framework. The theme of seasonality aligned with Winters's (1960) demand forecasting approach. All participants relied heavily upon their experience and knowledge of seasonality as a factor in sales planning as part of forecasting demand. Chosen for forecasting seasonality considerations, Winters model allows for simplicity and ease of understanding when compared to *moving average* forecasting models (Bernardi & Petrella, 2015; Wu et al., 2017). Winters designed a forecasting approach to handling simple seasonality that occurs across a year (Goodwin, 2010). Business leaders could use Winters approach to adjust their forecasts for seasonality due to simplicity and user acceptance.

Alignment to the existing literature on effective business practice. The findings aligned with existing literature on effective business practice of including seasonality. The study participants' best practice of considering seasonal demand as part of the strategy for demand forecasting aligned with various peer-reviewed studies. The study participants' knowledge of the company's seasonal sales trends aligned with literature authored by Liu et al. (2016) in that seasonal and consumer partialities influence sales. The seasonality theme aligned with the work of Tavakkoli et al. (2015) and Veiga et al. (2014), which emphasized the importance of modeling seasonality in demand forecasting to identify demand patterns fully.

Application to Professional Practice

The results from this study could be applicable to business practice and shed light on demand forecasting strategies applied by retail medical supply business leaders. Some small, retail, medical supply business leaders lack effective demand forecasting strategies to increase profitability. The purpose of this single case study was to explore successful demand forecasting strategies small, retail, medical supply business leaders use to increase profitability. Through the exploration of the research question, I confirmed that demand forecasting in a small, retail, medical supply setting encompasses thought leadership in inventory with pricing, sales demands and trends, and seasonal inputs. Demand forecasting is a task best completed by consensus instead of single accountability; that is, multiple stakeholders have input on the forecast. The inclusion of multiple stakeholders is the single underlying practice to overcoming barriers in the development of the forecast. When an individual lacks experience or judgement, another leader is able to close any gaps in knowledge. Each leader relied heavily on the experience and knowledge of their peers in addition to their own experiences. Additionally, forecasts are not final until there is a team sign off for agreement.

The results of this study reflect similar yet a diverse range of experiences and practices external from what is provided in company training to promote successful demand forecasting. The results of this study were relevant to beneficial aspects of demand forecasting, such as competitive advantage. Demand forecasting can stimulate competitive advantage in the retail space if incorporated into the overarching strategy of a business (Hofer et al., 2015; Ren & Choi, 2015; Veiga et al., 2016). I discovered through

the findings that business leaders can incorporate inputs from market research, operations

and sales to develop a robust demand forecast. Siriram (2016) postulated that aligning

marketing, operations, sales, and production to forecasting inputs drives competitive

advantage if leveraged properly.

Implications for Social Change

The strategies identified in this research have been successful for leaders of small,

retail, medical supply company in Kentucky. Inventory management with pricing is a

theme among successful demand forecasting. Business leaders focusing on inventory

management for demand forecasts can realize potential insights, leading to a reduction of

excess inventories to provide potential funding for social and capital investments. Social

capital is the collective ability of social groups to work together for the common good.

Group members can enlarge individual resources by improving connections among a

network of champions and benefactors (Durojaiye et al., 2013). Social capital investment

on the part of a small, retail, medical supply business could support Kentucky and global

initiatives designed to foster accessible and abundant medical supplies and caregiving to

medically underserved citizens. Social capital investment could establish a socially

responsible and trusted reputation.

Recommendations for Action

In alignment with the conceptual framework of Winters's (1960) demand

forecasting approach, the findings of this study could serve as an advisory guide for

business leaders seeking to improve their forecasting, demand plan, and profitability. The

strategies mentioned in the research findings came from experienced business leaders in

the small, retail, medical supply industry. The results of this study could enable other retail medical supply organizations to learn from the experiences of the participants, including gaining sustainability and a competitive advantage. Business leaders lacking demand forecasting exposure and experience could benefit from the knowledge that emerged from this study. The results of this study can be disseminated during trainings and through use of professional white papers made available to business leaders seeking professional development.

Demand forecasting can stimulate competitive advantage in the retail space if incorporated into the overarching strategy of a business (Hofer et al., 2015; Ren & Choi, 2015; Veiga et al., 2016). The first recommendation is for business leaders to focus on gaining demand forecasting knowledge and inquiring into various methods or approaches to forecast. By doing so, business leaders will have a fundamental understanding of potential strengths and challenges from forecasting demand. This strategy can enable leaders to understand the differences and similarities in the inputs, including trend, seasonality, and sales of forecasting approaches and to create a plan selecting the best approach to meet their organizational need.

The second recommendation is for business leaders to invest in an inventory management system. Inventory management is the process of developing policies to realize an optimal inventory investment and maximize the business rate of return (Kontus, 2014). As indicated in the results of this study, inventory management is essential to demand forecasting by ensuring there is enough stock available to meet the sales demand. The accuracy of the demand forecast will drive the number of inventories

held by a business (Holt, 1957). Govind et al. (2017) asserted that leaders should encourage training in inventory planning and demand forecasting to promote the quality of knowledge and skill to operate an inventory management system.

Recommendations for Future Research

I derived the findings from a limited geographic area; therefore, I recommend furthering the research through the perspectives of other small, retail, medical supply business leaders from different states. Conducting research among a similar population of leaders working in different states may give insights into the strengths and challenges that exist to forecast demand in those different states. A comparison between states may give further insight into the sales demand and sustainability of businesses. The findings of this study are limited to the small, retail, medical supply business. There may be potential for business leaders within other industries to benefit from the knowledge provided in this study. Thus, confirming or denying the applicability of my findings to other populations.

Reflections

My experience during the DBA doctoral study process was challenging yet rewarding. Pursuing qualitative research placed me in a position to communicate and gain valuable knowledge from a diverse group of academics. The doctoral study process exposure has strengthened my ability to engage more openly and cross pollinate ideas suitable for future research. During this doctoral study I became aware of my own bias. To mitigate bias, I maintained an open mind and acted only as the researcher. I understood the findings from the viewpoints of the participants and maintained an impartial position during the research process. All of the themes from the findings were

consistent with my own views. As a holder of a graduate degree in business, I have undertaken graduate-level courses on inventory and sales, all of which were among the strategic elements shared by the participants. Thus, confirming and expanding upon my own knowledge in those subject matters.

Conclusions

As business opportunities continue to arise due to ever-growing medical needs of consumers, leaders require strategies to predict demand using a variety of approaches. Leaders must have the appropriate resources and capabilities to guide their business through the forecasting process successfully. Three themes emerged from the study, understanding sales trends, inventory management with pricing, and seasonality. Through the results, I confirmed that demand forecasting strategies guided by the conceptual framework of Winters's (1960) demand forecasting approach can assist leaders seeking to forecast accurately for profitability and competitive advantage.

Business leaders should consider gaining demand forecasting knowledge and inquiring into various methods or approaches to forecast. By doing so, business leaders may have a fundamental understanding of potential strengths and challenges from forecasting demand. This strategy can enable leaders to understand the differences and similarities in the inputs, including trend, seasonality, and sales of forecasting approaches and create a plan selecting the best approach to meet their organizational needs. The strategies used by the participants in this study can serve as guidelines for business leaders seeking to explore demand forecasting best practices to increase profitability and garner social change.

References

Ahmad, K., & Shafie, M. Z. (2016). Inventory management practices among Malaysian micro retailing enterprises. *Journal of Business and Retail Management Research, 11*, 20-27. Retrieved from http://www.jbrmr.com/

Ahmad, M. I. (2017). Seasonal decomposition of electricity consumption data. *Review of Integrative Business and Economics Research, 6*, 271-275. Retrieved from http://buscompress.com/journal-home.html

Aktepe, A., Ersoz, S., Turker, A. K., Barisci, N., & Dalgic, A. (2018). An inventory classification approach combining expert systems, clustering and fuzzy logic with the ABC method, and an application. *South African Journal of Industrial Engineering, 29*, 49-62. doi:10.7166/29-1-1784

Al-Alwani, A. (2015). Improving e-mail response in an e-mail management system using natural language processing-based problematic methods. *Journal of Computer Science, 11,* 109-119. doi:10.3844/jcssp.2015.109.119

Alby, F., & Fatignant, M. (2014). Preserving the respondent's standpoint in a research interview: Different strategies of doing the interview. *Human Studies, 37*, 239-256. doi:10.07/s10746-013-9292-y

Alexanders, J., Anderson, A., & Henderson, S. (2015). Musculoskeletal physiotherapists' use of psychological interventions: A systematic review of therapists' perceptions and practice. *Physiotherapy, 101*, 95-102. doi:10.1016/j.physio.2014.03.008

Alshenqeeti, H. (2014). Interviewing as a data collection method: A critical review. *English Linguistics Research, 3*, 39-45. doi:10.5430/elr.v3n1p39

Alsulami, M., Scheepers, H., & Rahim, M. M. (2016). *A comparison between organizational stakeholders' and external consultants' perceptions on CSFs affecting ERP life cycle phases.* Paper presented at the 49th Hawaii International Conference on System Sciences (HICSS), Koloa, Hawaii. Retrieved from https://ieeexplore.ieee.org/document/7427767

Alvarado-Valencia, J., Barrero, L. H., Onkal, D., & Dennerlein, J. T. (2017). Expertise credibility of system forecasts and integration methods in judgmental demand forecasting. *International Journal of Forecasting, 33*, 298-313. doi:10.1016/j.ijforecast.2015.12.010

Anderson, A. J., & Cummings, B. J. (2016). Achieving informed consent for cellular therapies: A preclinical translational research perspective on regulations versus a dose of reality. *The Journal of Law, Medicine & Ethics, 44*, 394-401. doi:10.1177/1073110516667937

Andrasik, M. P., Chandler, C., Powell, B., Humes, D., Wakefield, S., Kripke, K., & Eckstein, D. (2014). Bridging the divide: HIV prevention research and Black men who have sex with men. *American Journal of Public Health, 104*, 708-714. doi:10.2105/ajph.2013.301653

Andrews, T., Dyson, L. E., & Wishart, J. (2015). Advancing ethics frameworks and scenario-based learning to support educational research into mobile learning. *International Journal of Research & Method in Education, 38*, 320-334. doi:10.1080/1743727X.2015.1026252

Ang, C., Embi, M., & Md Yunus, M. (2016). Enhancing the quality of the findings of a longitudinal case study: Reviewing trustworthiness via ATLAS.ti. *The Qualitative Report*, *21*, 1855-1867. Retrieved from http://tqr.nova.edu/

Angrist, M. (2015). Start me up: Ways to encourage sharing of genomic information with research participants. *Nature Review Genetics, 16*, 435-436. doi:10.1038/nrg3981

Apic-Blagojevic, N., Vujko, A., & Gajic, T. (2016). Comparative analysis of exponential smoothing models to tourists' arrivals in Serbia. *Ekonomika Poljoprivreda, 63*, 835-845. Retrieved from http://www.iep.bg.ac.rs

Applebaum, L. (2014). From whining to wondering: Reflective journaling with preservice educators. *Journal of Jewish Education*, *80*, 5-23. doi:10.1080/15244113.2014.880140

Archibald, M. (2016). Investigator triangulation: A collaborative strategy with potential for mixed methods research. *Journal of Mixed Methods Research, 10*, 228-250. doi:10.1177/1558689815570092

Astin, F., Horrocks, J., & Closs, S. J. (2014). Managing lifestyle change to reduce coronary risk: A synthesis of qualitative research on peoples' experiences. *BMC Cardiovascular Disorders, 14*(96), 1-16. doi:10.1186/1471-2261-14-96

Atz, T., Sade, R., & Williams, P. (2014). Perceptions of academic health science research center personnel regarding informed consent processes and therapeutic misconception. *Accountability in Research-Policies and Quality Assurance, 21*, 300-314. doi:10.1080/08989621.2013.861328

Augustsson, G. (2014). Temporary and regular workers fulfill their tasks side-by-side, but in different learning conditions. *Journal of Workplace Learning, 26*, 79-90. doi:10.1108/JWL-06-2013-0037

Balzacq, T. (2014). The significance of triangulation to critical security studies. *Critical Studies on Security, 3*, 377-381. doi:10.1080/21624887.2014.982410

Bamrara, A. (2015). Evaluating database security and cyber-attacks: A relational approach. *Journal of Internet Banking & Commerce, 20*(2), 1-8. doi:10.4172/1204-5357.1000115

Barker, M. (2013). Finding audiences for our research: Rethinking the issue of ethical challenges. *The Communication Review, 16*, 70-80. doi:10.1080/10714421.2013.757504

Barratt, M. J., Ferris, J. A., & Lenton, S. (2014). Hidden populations, online purposive sampling, and external validity taking off the blindfold. *Field Methods, 27*, 3-21. doi:10.1177/1525822X14526838

Bashir, I., & Madhavaiah, C. (2014). Determinants of young consumers' intention to use Internet banking services in India. *Vision, 18*, 153-163. doi:10.1177/0972262914538369

Baškarada, S. (2014). Qualitative case studies guidelines. *The Qualitative Report, 19*(40), 1-25. Retrieved from http://tqr.nova.edu/

Bentley, K. A., Omer, T. C., & Sharp, N. Y. (2013). Business strategy, financial reporting irregularities, and audit effort. *Contemporary Accounting Research, 30*, 780-817. doi:10.1111/j.1911-3846.2012.01174.x

Bernardi, M., & Petrella, L. (2015). Multiple seasonal cycles forecasting model: The

    Italian electricity demand. *Statistical Methods and Applications, 24*, 671-695.

    doi:10.1007/s10260-015-0313-z

Bethea, J., Murtagh, B., & Wallace, S. (2015). I do not mind damaging my own body: A

    qualitative study of the factors that motivate smokers to quit. *BMC Public Health,*

    15(4), 1-9. doi:10.1186/1471-2458-15-4

Bevan, M. T. (2014). A method of phenomenological interviewing. *Qualitative Health*

    Research, 24, 136-144. doi:10.1177/1049732313519710

Birt, L., Scott, S., Cavers, D., Campbell, C., & Walter, F. (2016). Member checking.

    Qualitative Health Research, 26, 1802-1811. doi:10.1177/1049732316654870

Black, D., Palombaro, K., & Dole, R. (2013). Student experiences in creating and

    launching a student-led physical therapy pro bono clinic: A qualitative

    investigation. *Physical Therapy, 93,* 637-685. doi:10.2522/ptj.20110430

Boddy, C. R. (2016). Sample size for qualitative research. *Qualitative Market Research:*

    An International Journal, 19, 426-432. doi:10.1108/QMR-06-2016-0053

Boehm, D. N., & Hogan, T. J. (2014). A jack of all trades: The role of PIs in the

    establishment and management of collaborative networks in scientific knowledge

    commercialization. *The Journal of Technology Transfer, 39*, 134-149.

    doi:10.1007/s10961-012-9273-8

Bohanec, M., Robnik-Šikonja, M., & Borštnar, M. K. (2017). Organizational learning

    supported by machine learning models coupled with general explanation methods:

A case of B2B sales forecasting. *Organizacija, 50*, 217-233.

doi:10.1515/orga20170020

Bowden, C., & Galindo-Gonzalez, S. (2015). Interviewing when you're not face-to-face:

The use of e-mail interviews in a phenomenological study. *International Journal*

of Doctoral Studies, *10*, 79-92. Retrieved from

https://www.informingscience.org/Journals/IJDS/Overview

Brailas, A., Avani, S., Gkini, C., Deilogkou, M., Koskinas, K., & Alexias, G. (2017).

Experiential learning in action: A collaborative inquiry. *The Qualitative Report,*

22, 271-288. Retrieved from http://tqr.nova.edu/

Brédart, A., Marrel, A., Abetz-Webb, L., Lasch, K., & Acquadro, C. (2014). Interviewing

to develop patient-reported outcome (PRO) measures for clinical research:

Eliciting patients' experience. *Health and Quality of Life Outcomes*, *12*(15), 1-10.

doi:10.1186/1477-7525-12-15

Brott, P. E. (2015). Qualitative career assessment processes. *Career Assessment, 1*, 31-

39. doi:10.1007/978-94-6300-034-5_4

Brown, A. (2014). The place of ethnographic methods in information systems research.

International Journal of Multiple Research Approaches, 8, 166-178.

doi:10.1080/18340806.2014.11082058

Brown-Saracino, J. (2014). From methodological stumbles to substantive insights:

Gaining ethnographic access in queer communities. *Qualitative Sociology, 37*, 43-

68. doi:10.1007/s11133-013-9271-7

Bryman, A., & Bell, E. (2015). *Business research methods* (4th ed.). New York, NY: Oxford University Press.

Byrne, Z. S., Dvorak, K. J., Peters, J. M., Ray, I., Howe, A., & Sanchez, D. (2016). From the user's perspective: Perceptions of risk relative to benefit associated with using the Internet. *Computers in Human Behavior, 59*, 456-468. doi:10.1016/j.chb.2016.02.024

Bull, S., Cheah, P. Y., Denny, S., Jao, I., Marsh, V., Merson, L., … Parker, M. (2015). Best practices for ethical sharing of individual-level health research data from low-and middle-income settings. *Journal of Empirical Research on Human Research Ethics, 10*, 302-313. doi:10.1177/1556264615594606

Bunger, A. C., Powell, B. J., Robertson, H. A., MacDowell, H., Birken, S. A., & Shea, C. (2017). Tracking implementation strategies: A description of a practical approach and early findings. *Health Research Policy and Systems, 15*(15), 1-12. doi:10.1186/s12961-017-0175-y

Burau, V., & Anderson, L. B. (2014). Professions and professionals: Capturing the changing role of expertise through theoretical triangulation. *American Journal of Economics and Sociology*, *73*, 264-293. doi:10.1111/ajes.12062

Cadman, M. E., Murphy, J. H., Brintnall-Karabelas, J., Squire, C., Whorton, K., & Pao, M. (2014). A training program for improving the informed consent discussion between clinical researchers and their subjects. *Journal of Empirical Research on Human Research Ethics, 9*, 71-75. doi:10.1177/1556264614546096

Camfield, L., & Palmer-Jones, R. (2013). Improving the quality of development research: What could archiving qualitative data for reanalysis and revisiting research sites contribute? *Progress in Development Studies, 13*, 323-338. doi:10.1177/1464993413490481

Caretta, M. A. (2016). Member checking: A feminist participatory analysis of the use of preliminary results pamphlets in cross-cultural, cross-language research. *Qualitative Research, 16*, 305-318. doi:10.1177/1468794115606495

Carman, M. J., Clark, P. R., Wolf, L. A., & Moon, M. D. (2015). Sampling considerations in emergency nursing research. *Journal of Emergency Nursing, 41*, 162-164. doi:10.1016/j.jen.2014.12.016

Carolan, C. M., Forbat, L., & Smith, A. (2015). Developing the descarte model: The design of case study research in health care. *Qualitative Health Research, 26*, 626-639. doi:10.1177/1049732315602488

Carter, N., Byant-Lukosius, D., DiCenso, A., Blythe, J., & Neville, A. J. (2014). The use of triangulation in qualitative research. *Oncology Nursing Forum, 41*, 545-547. doi:10.1188/14.onf.545-547

Caruth, G. D. (2013). Demystifying mixed methods research design: A review of the literature. *Mevlana International Journal of Education, 3*, 112-122. doi:10.13054/mije.13.35.3.2

Cassettari, L., Bendato, I., Mosca, M., & Mosca, R. (2017). A new stochastic multi-source approach to improve the accuracy of the sales forecasts. *Foresight:*

International Journal of Applied Forecasting, 19, 48-64. Retrieved from

http://www.forecasters.org/foresight

Casteleyn, L., Dumez, B., Van Damme, K., & Anwar, W. (2013). Ethics and data

protection in human biomarker studies in environmental health. *International*

Journal of Hygiene and Environmental Health, 216, 599-605.

doi:10.1016/j.ijheh.2013.03.016

Castillo-Montoya, M. (2016). Preparing for interview research: The interview protocol

refinement framework. *The Qualitative Report, 21*, 811-831. Retrieved from

https://tqr.nova.edu/

Cetina, I., Dumitrescu, L., & Vinerean, S. (2014). Exploring consumer engagement in an

e-setting: A qualitative research of marketing executives. *Economic Computation*

& Economic Cybernetics Studies & Research, 48, 37-56. Retrieved from

http://www.ecocyb.ase.ro

Chang, C., Dai, W. L., & Chen, C. (2015). A novel procedure for multi-model

development using the grey silhouette coefficient for small-data-set forecasting.

Journal of the Operational Research Society, 66, 1887-1894.

doi:10.1057/jors.2015.17

Check, D. K., Wolf, L. E., Dame, L. A., & Beskow, L. M. (2014). Certificates of

confidentiality and informed consent: Perspectives of IRB chairs and institutional

legal counsel. *IRB: Ethics and Human Research, 36*(1), 1-8. Retrieved from

https://www.thehastingscenter.org/publications-resources/irb-ethics-human-

research/

Che-Jung, C., Yu, L., & Peng, J. (2016). A mega-trend-diffusion grey forecasting model for short-term manufacturing demand. *The Journal of the Operational Research Society, 67*, 1439-1445. doi:10.1057/jors.2016.31

Chen, C. L. P., & Zhang, C. (2014). Data-intensive applications, challenges, techniques, and technologies: A survey on big data. *Information Sciences, 275*, 314-347. doi:10.1016/j.ins.2014.01.015

Chenavaz, R., & Paraschiv, C. (2018). Dynamic pricing for inventories with reference price effects. *Economics, 12*, 1-16. doi:10.5018/economics-ejournal.ja.2018-64

Cheng, C., Chiang, K., & Chen, M. (2016). Intermittent demand forecasting in a tertiary pediatric intensive care unit. *Journal of Medical Systems, 40*, 217-230. doi:10.1007/s10916-016-0571-9

Claps, G. G., Svensson, R. B., & Aurum, A. (2015). On the journey to continuous deployment: Technical and social challenges along the way. *Information and Software Technology, 57*, 21-31. doi:10.1016/j.infsof.2014.07.009

Coleman, L. (2014). Why finance theory fails to survive contact with the real world: A fund manager perspective. *Critical Perspectives on Accounting, 25*, 226-236. doi:10.1016/j.cpa.2013.02.001

Collins, C. S., & Cooper, J. E. (2014). Emotional intelligence and the qualitative researcher. *International Journal of Qualitative Methods, 13*, 88-103. Retrieved from http://www.iiqm.ualberta.ca/en/InternationalJournalofQualitati.aspx

Cope, D. G. (2015). Case study research methodology in nursing research. *Oncology Nursing Forum, 42*, 681-682. doi:10.1188/15.ONF.681-682

Cotter, P., Kaess, M., Corcoran, P., Parzer, P., Brunner, R., Keeley, H., . . . Wasserman, D. (2015). Help-seeking behavior following school-based screening for current suicidality among European adolescents. *Social Psychiatry and Psychiatric Epidemiology, 50*, 973-982. doi:10.1007/s00127-015-1016-3

Dabić, T., & Stojanov, Z. (2014, April). *Techniques for collecting qualitative field data in education research: Example of two studies in information technology filed.* Paper presented at Sinteza, Belglade, Serbia.

Dasgupta, M. (2015). Exploring the relevance of case study research. *Vision, 19*, 147-160. doi:10.1177/0972262915575661

Davies, S., Reitmaier, A., Smith, L., & Mangan-Danckwart, D. (2013). Capturing intergenerativity: The use of student reflective journals to identify learning within an undergraduate course in gerontological nursing. *Journal of Nursing Education, 52*, 139-149. doi:10.1161/CIRCULATIONAHA.107.742775

DeHoratius, N., & Ton, Z. (2015). The role of execution in managing product availability. In N. Agrawal & S. Smith (Eds.), *Retail supply chain management: International series in operations research & management science* (pp. 53-77). Boston, MA: Springer.

De Massis, A., & Kotlar, J. (2014). The case study method in family business research: Guidelines for qualitative scholarship. *Journal of Family Business Strategy, 5*, 15-29. doi:10.1016/j.jfbs.2014.01.007

Derbyshire, J., & Wright, G. (2017). Augmenting the intuitive logic scenario planning

    method for a more comprehensive analysis of causation. *International Journal of*

    Forecasting, 33, 254-266. doi:10.1016/j.ijforecast.2016.01.004

Dikko, M. (2016). Establishing construct validity and reliability: Pilot testing of a

    qualitative interview for research in Takaful (Islamic insurance). *The Qualitative*

    Report, 21, 521-528. Retrieved from http://tqr.nova.edu/

Dixon, C. (2015). Interviewing adolescent females in qualitative research. *The*

    Qualitative Report, 20, 2067-2077. Retrieved from http://tqr.nova.edu/

Doody, O., & Noonan, M. (2013). Preparing and conducting interviews to collect data.

    Nurse Researcher, 20, 28-32. doi:10.7748/nr2013.05.20.5.28.e327

Donoghue, S., & De Klerk, H. (2013). Consumer Anger and Coping Strategies following

    appraisals of appliance failure. *International Journal of Consumer Studies, 37*,

    214-221. doi:10.1111/j.1470-6431.2012.01106.x

Doubet, S. L., & Ostrosky, M. M. (2015). The impact of challenging behavior on

    families: I don't know what to do. *Topics in Early Childhood Special Education,*

    34, 223–233. doi:10.1177/0271121414539019

Du Plessis, L., & De Vries, M. (2016). Towards a holistic customer experience

    management framework for enterprises. *South African Journal of Industrial*

    Engineering, 27, 23-36. doi:10.7166/27-3-1624

Durif-Bruckert, C., Roux, P., Morelle, M., Mignotte, H., Faure, C., & Mourmjid-

    Ferdjaoui, N. (2014). Shared decision-making in medical encounters regarding

breast cancer treatment: The contribution of methodological triangulation.

European Journal of Cancer Care, 24, 461-472. doi:10.1111/ecc.12214

Durojaiye, A. M., Yusuf, S. A., Falusi, O. A., & Okoruwa, V. O. (2013). Social capital

and its influence on profitability of foodstuff traders in Southwestern Nigeria.

American Journal of Social and Management Sciences, 4, 42-53.

doi:10.5251/ajsms.2013.4.1.42.53

Easterling, B. A., & Johnson, E. I. (2015). Conducting qualitative research on parental

incarceration personal reflections on challenges and contributions. *The*

Qualitative Report, 20, 1550-1567. Retrieved from http://tqr.nova.edu/

Ehrenthal, J.C.F., Honhon, D., & Van Woensel, T. (2014). Demand seasonality in retail

inventory management. *European Journal of Operational Research*, *238*(2),

527-539. doi:10.1016/j.ejor.2014.03.030

Eisend, M. (2014). Shelf space elasticity: A meta-analysis. *Journal of Retailing, 90*, 168-

181. doi:10.1016/j.jretai.2013.03.003

Elo, S., Kaariainen, M., Kanste, O., Polkki, T., Utriainen, K., & Kyngas, H. (2014).

Qualitative content analysis: A focus on trustworthiness. *SAGE Open, 4*(1), 1-10.

doi:10.1177/215824401422633

Enguidanos, S., Coulourides Kogan, A. M., Schreibeis-Baum, H., Lendon, J., & Lorenz,

K. (2015). Because I was sick: Seriously ill veterans' perspectives on reason for

30-day readmissions. *Journal of the American Geriatrics Society, 63*, 537-542.

doi:10.1111/jgs.13238

Er, G. J., & Mallick, B. (2017). A study of time series models ARIMA and ETS. *International Journal of Modern Education and Computer Science, 9*, 57-63. doi:10.5815/ijmecs.2017.04.07

Esteves, J. M. (2014). An empirical identification and categorization of training best practices for ERP implementation projects. *Enterprise Information Systems, 8*, 665-683. doi:10.1080/17517575.2013.771411

Estrada, S. (2017). Qualitative analysis using R: A free analytic tool. *The Qualitative Report, 22*, 956-968. Retrieved from http://tqr.nova.edu/

Faisal, I., Matinnia, N., Hejar, A. R., & Khodakarami, Z. (2014). Why do primigravidae request cesarean section in a normal pregnancy? A qualitative study in Iran. *Midwifery, 30*, 227-233. doi:10.1016/j.midw.2013.08.011

Fan, X., & Sun, S. (2014). Generalizability theory as a unifying framework of measurement reliability in adolescent research. *Journal of Early Adolescence, 34*, 38-65. doi:10.1177/0272431613482044

Flannery, T., & Gormley, G. (2014). Evaluation of the contribution of theater attendance to medical undergraduate neuroscience teaching-a pilot study. *British Journal of Neurosurgery, 28*, 680-684. doi:10.3109/02688697.2014.896873

Frels, R. K., & Onwuegbuzie, A. J. (2013). Administering quantitative instruments with qualitative interviews: A mixed research approach. *Journal of Counseling & Development, 91*, 184-194. doi:10.1002/j.1556-676.2013.00085.x

Furunes, T., Mykletun, R. J., Solem, P. E., de Lange, A. H., Syse, A., Schaufeli, W. B., & Ilmarinen, J. (2015). Late career decision-making: A qualitative panel study. *Work, Aging and Retirement, 1*, 284-295. doi:10.1093/worker/wav011

Fusch, P., & Ness, L. (2015). Are we there yet? Data saturation in qualitative research. *The Qualitative Report, 20*, 1408-1416. Retrieved from http://tqr.nova.edu/

Garcia, D., & Gluesing, J. (2013). Qualitative research methods in international organizational change research. *Journal of Organizational Change Management, 26*, 423-444. doi:10.1108/09534811311328416

Gebczynska, A. (2016). Strategy implementation efficiency on the process level. *Business Process Management Journal, 22*, 1079-1098. doi:10.1108/BPMJ-01-2016-0004

Gentles, S. J., Charles, C., Ploeg, J., & McKibbon, K. (2015). Sampling in qualitative research: Insights from an overview of the methods literature. *The Qualitative Report, 20*, 1772-1789. Retrieved from http://tqr.nova.edu/

Goodrich, K. M., Hrovat, A., & Luke, M. (2014). Professional identity, practice, and development of Kenya teacher-counsellors: An ethnography. *Journal of Counselor Leadership and Advocacy, 1*, 44-66. doi:10.1080/2326716X.2014.886976

Goodwin, P. (2010). The Holt-Winters approach to exponential smoothing: 50 years old and going strong. *Foresight: International Journal of Applied Forecasting, 19*, 33-33. Retrieved from www.forecasters.org/foresight

Gould, R. K., Klain, S. C., Ardoin, N. M., Satterfield, T., Woodside, U., Hannahs, N., ...

    Chan, K. M. (2015). A protocol for eliciting nonmaterial values through a cultural

    ecosystem services frame. *Conservation Biology, 29*, 575-586.

    doi:10.1111/cobi.12407

Govind, A., Rose, L., & Pisa, N. (2017). Investigating stock-outs in Johannesburg's

    warehouse retail liquor sector. *Journal of Transport and Supply Chain*

    Management, 11, 303-312. doi:10.4102/jtscm.v11i0.303

Goyal, S., Hardgrave, B. C., Aloysius, J. A., & DeHoratius, N. (2016). The effectiveness

    of RFID in backroom and sales floor inventory management. *International*

    Journal of Logistics Management, 27, 795-815. doi:10.1108/IJLM-03-2015

Gur Ali, O., & Pinar, E. (2016). Multi-period-ahead forecasting with residual

    extrapolation and information sharing: Utilizing a multitude of retail series.

    International Journal of Forecasting, 32, 502-517.

    doi:10.1016/j.ijforecast.2015.03.011

Halkoaho, A., Pietilä, A., Ebbesen, M., Karki, S., & Kangasniemi, M. (2016). Cultural

    aspects related to informed consent in health research. *Nursing Ethics, 23,* 698-

    712. doi:10.1177/0969733015579312

Hammersley, M. (2015). On ethical principles for social research. *International Journal*

    of Social Research Methodology, *18*, 433-449.

    doi:10.1080/13645579.2014.924169

Hang Sub, K., & Bong Gyou, L. (2015). An empirical analysis of smart signage and its

market delimitation. *KSII Transactions on Internet & Information Systems, 9*,

2910-2927. doi:10.3837/tiis.2015.08.009

Harvey, L. (2015). Beyond member-checking: A dialogic approach to the research

interview. *International Journal of Research & Method in Education, 38*, 23-38.

doi:10.1080/1743727X.2014.914487

Hassani, H., & Silva, E. S. (2015). A Kolmogorov-Smirnov based test for comparing the

predictive accuracy of two sets of forecasts. *Econometrics, 3*, 590–609.

doi:10.3390/econometrics3030590

Hassani, H., Silva, E. S., Gupta, R., & Segnon, M. K. (2015). Forecasting the price of

gold. *Applied Economics, 47*, 4141–4152. doi:10.1080/00036846.2015.1026580

Heslop, C. W., Burns, S., & Lobo, R. (2017). Developing a framework for community-

based sexual health interventions for youth in the rural setting: Protocol for a

participatory action research study. *BMJ Open, 7*(5), 1-8. doi:10.1136/bmjopen-

2016-013368

Hill, A. V., Zhang, W., & Burch, G. F. (2015). Forecasting the forecast ability quotient

for inventory management. *International Journal of Forecasting, 31*, 651-663.

doi:10.1016/j.ijforecast.2014.10.006

Hofer, P., Eisl, C., & Mayr, A. (2015). Forecasting in Austrian companies. *Journal of

Applied Accounting Research*, *16*, 359-382. doi:10.1108/JAAR-10-2014-0113

Holt, C. (1957). Forecasting seasonal and trends by exponentially weighted moving averages. *International Journal of Forecasting, 20*, 5-10. doi:10.1016/j.ijforecast.2003.09.015.

Houghton, C., Casey, D., Shar, D., & Murphy, K. (2013). Rigour in qualitative case study research. *Nurse Researcher, 20*(4), 12-17. doi:10.7748/nr2013.03.20.4.12.e326

Hutabarat, P., & Gayatri, G. (2014). The influence of sponsor-event congruence in sponsorship of music festival. *South East Asian Journal of Management, 8*, 47-64. doi:10.21002/seam.v8i1.3101

Hyett, N., Kenny, A., & Dickson-Swift, V. (2014). Methodology or method? A critical review of qualitative case study reports. *International Journal of Qualitative Studies on Health and Wellbeing, 9*(1), 1-12. doi:10.3402/qhw.v9.23606

Inigo, E. A., Albareda, L., & Ritala, P. (2017). Business model innovation for sustainability: Exploring evolutionary and radical approaches through dynamic capabilities. *Industry and Innovation, 24*, 515-542. doi:10.1080/13662716.2017.1310034

Irvine, A., Drew, P., & Sainsbury, R. (2013). Am I not answering your questions properly? Clarification, adequacy and responsiveness in semi-structured telephone and face-to-face interviews. *Qualitative Research, 13*, 87-106. doi:10.1177/1468794112439086

Isaenko, E. V., & Degtyar, O. N. (2015). Self-service in retail trade of consumer cooperation: Assessment and strategy of development. *Journal of Internet Banking and Commerce, 20*(1), 1-22. doi:10.4172/1204-5357.S1-009

Ivanovski, Z., Milenkovski, A., & Narasanov, Z. (2018). Time series forecasting using moving average model for extrapolation of number of tourist. *UTMS Journal of Economics, 9*(2), 121-132. Retrieved from https://www.utmsjoe.com

Jansen, A. L., Capesius, T. R., Lachter, R., Greenseid, L. O., & Keller, P. A. (2014). Facilitators of health systems change for tobacco dependence treatment: A qualitative study of stakeholders' perceptions. *BMC Health Services Research, 14*(1), 575-578. doi:10.1186/s12913-014-0575-4

Jansson, J., Nilsson, J., Modig, F., & Hed Vall, G. (2015). Commitment to sustainability in small and medium-sized enterprises: The influence of strategic orientations and management values. *Business Strategy and the Environment, 26*, 69-83. doi:10.1002/bse.1901

Jin, J., & Kim, J. (2015). Forecasting natural gas prices using wavelets, time series, and artificial neural networks. *PLoS One, 10*(11), 1-23. doi:10.1371/journal.pone.0142064

Johnson, B. (2014). Ethical issues in shadowing research. *Qualitative Research in Organizations and Management, 9*, 21-40. doi:10.1108/QROM-09-2012-1099

Joslin, R., & Müller, R. (2016). Identifying interesting project phenomena using philosophical and methodological triangulation. *International Journal of Project Management*, *34*, 1043-1056. doi:10.1016/j.ijproman.2016.05.005

Ka Man, L., Na, C., & Kit, Ng. (2015). IoT based asset management system for healthcare related industries. *International Journal of Engineering Business Management*, *7*, 10-21. doi:10.5772/61821

Kai, W. (2014). Factors influencing the adoption and effective use of creativity

    techniques in business settings: An exploratory study. *Engineering Management*

    Journal, 26, 29-37. doi:10.1080/10429247.2014.11432026

Kawar, L. N., Pugh, D. M., & Scruth, E. A. (2016). Understanding the role and legal

    requirements of the institutional review board. *Clinical Nurse Specialist, 30*, 137-

    140. doi:10.1097/NUR.0000000000000197

Kendall, S., & Halliday, L. E. (2014). Undertaking ethical qualitative research in public

    health: Are current ethical processes sufficient? *Australian and New Zealand*

    Journal of Public Health, 38, 306-310. doi:10.1111/1753-6405.12250

Kentucky Cabinet for Health and Family Services, Department for Medicaid Services.

    (2018). *Durable medical equipment*. Retrieved from

    http://www.chfs.ky.gov/dms/dme.htm

Keränen, J., & Jalkala, A. (2014). Three strategies for customer value assessment in

    business markets. *Management Decision, 52*, 79-100. doi:10.1108/MD-04-2013-

    0230

Khan, S. N. (2014). Qualitative research method: Grounded theory. *International Journal*

    of Business and Management, 9, 224-233. doi:10.5539/ijbm. v9n11p224crounch

Kidney, C. A., & McDonald, K. E. (2014). A toolkit for accessible and respectful

    engagement in research. *Disability & Society, 29*, 1013-1030.

    doi:10.1080/09687599.2014.902357

Kihl, L., Babiak, K., & Tainsky, S. (2014). Evaluating the implementation of a

   professional sport team's corporate community involvement initiative. *Journal of*

   Sport Management, 28, 324-337. doi:10.1123/jsm.2012-0258.

Kihn, L., & Ihantola, E. (2015). Approaches to validation and evaluation in qualitative

   studies of management accounting. *Qualitative Research in Accounting &*

   Management, 12, 230-255. doi:10.1109/QRAM-03-2013-0012

King, S. (2017). *Small business participation in federal set-aside contracting* (Doctoral

   dissertation). Retrieved from ProQuest Dissertations & Theses Full- Text

   database. (UMI No. 10619804)

Koch, L. C., Niesz, T., & McCarthy, H. (2014). Understanding and reporting qualitative

   research: An analytical review and recommendations for submitting authors.

   Rehabilitation Counseling Bulletin, 57, 131-143. doi:10.1177/0034355213502549

Kolassa, S. (2015). Retail analytics: Integrated forecasting and inventory management for

   perishable products in retailing. *The Journal of the Operational Research Society,*

   66, 2103-2104. doi:10.1057/jors.2015.36

Kontus, E. (2014). Management of inventory in a company. *Ekonomski*

   Vjesnik/Econviews, 27, 245-256. Retrieved from

   http://www.efos.unios.hr/ekonomski-vjesnik

Kornbluh, M. (2015). Combatting challenges to establishing trustworthiness in qualitative

   research. *Qualitative Research in Psychology, 12*, 397-414.

   doi:10.1080/14780887.2015.1021941

Kozleski, E. B. (2017). The uses of qualitative research. *Research & Practice for Persons with Severe Disabilities, 42*, 19-32. doi:10.1177/1540796916683710

Kuhlmann, D. O., & Ardichvili, A. (2015). Becoming an expert: Developing expertise in an applied discipline. *European Journal of Training and Development, 39*, 262-276. doi:10.1108/EJTD-08-2014-0060

Lach, D. (2014). Challenges of interdisciplinary research: Reconciling qualitative and quantitative methods for understanding human-landscape systems. *Environmental Management, 53*, 88-93. doi:10.1007/s00267-013-0115-8

Laland, K. N., Uller, T., Feldman, M. W., Sterelny, K., Müller, G. B., Moczek, A., … Odling-Smee, J. (2015). The extended evolutionary synthesis: Its structure, assumptions, and predictions. *Proceeding of the Royal Society B: Biological Sciences, 282*(1), 1-14. doi:10.1098/rspb.2015.1019

Lamb, D. (2013). Research in the first person: Reflection on the research experience using a research journal. *Market and Social Research, 21*, 32-39. Retrieved from https://www.amsrs.com.au

Landrum, B., & Garza, G. (2015). Mending fences: Defining the domains and approaches of quantitative and qualitative research. *Qualitative Psychology, 2*, 199-209. doi:10.1037/qup0000030

Lawrence, J., & Tar, U. (2013). The use of grounded theory technique as a practical tool for qualitative data collection and analysis. *Electronic Journal of Business Research Methods, 11*, 29-40. Retrieved from http://www.ejbrm.com

Leedy, P. D., & Ormrod, J. E. (2013). *Practical research: Planning and design* (10th

    ed.). Upper Saddle River, NJ: Pearson Education.

Lenters, L. M., Cole, D. C., & Godoy-Ruiz, P. (2014). Networking among young global

    health researchers through an intensive training approach: A mixed methods

    exploratory study. *Health Research Policy and Systems, 12*(5)*,* 1-11.

    doi:10.1186/1478-4505-12-5

Levine, R. A. (2015). Ethnographic studies of childhood: A historical overview. *American*

    Anthropologist, 109, 247-260. doi:10.1525/AA.2007.109.2.247.248

Lewis, S. (2015). Qualitative inquire and research design: Choosing among five

    approaches. *Health Promotion Practice, 16*, 473-475.

    doi:10.1177/1524839915580941

Li, T., Zhao, X., & Xie, J. (2015). Inventory management for dual sales channels with

    inventory-level-dependent demand. *The Journal of the Operational Research*

    Society, 66, 488-499. doi:10.1057/jors.2014.15

Lin, C. C., Han, C. H., & Pan, I. J. (2015). A qualitative approach of psychosocial

    adaptation process in patients undergoing long-term hemodialysis. *Asian Nursing*

    Research, 9, 35-41. doi:10.1016/j.anr.2014.10.007

Lips-Wiersma, M., & Mills, A. J. (2014). Understanding the basic assumptions about

    human nature in workplace spirituality: Beyond the critical versus positive divide.

    Journal of Management Inquiry, 23, 148-161. doi:10.1177/1056492613501227

Liu, D., & Li, L. (2015). Application study of comprehensive forecasting model based on

    entropy weighting method on trend of PM^sub 2.5^ concentration in Guangzhou,

China. *International Journal of Environmental Research and Public Health, 12*, 7085-7099. doi:10.3390/ijerph120607085

Liu, Y., Wangwei, J., Zhao, J., Gao, J., Zheng, J., & Jiang, A. (2016). Product lifecycle-based demand forecasting by using artificial bee colony algorithm optimized two-stage polynomial fitting. *Journal of Intelligent & Fuzzy Systems, 31*, 825-836. doi:10.3233/JIFS-169014

Liu, Z., Beaver, K., & Speed, S. (2014). Being healthy: A grounded theory study of help seeking behavior among Chinese elders living in the UK. *International Journal of Qualitative Studies on Health and Well-Being, 9*(1), 1-10. doi:10.3402/qhw.v9.24820

López, J. A., Mendoza, A., & Masini, J. (2013). A classic and effective approach to inventory management. *International Journal of Industrial Engineering, 20*, 372-386. Retrieved from http://journals.sfu.ca/ijietap/index.php/iji

MacRae, S., Brown, M., Karatzias, T., Taggart, L., Truesdale-Kennedy, M., Walley, R., . . . Davies, M. (2015). Diabetes in people with intellectual disabilities: A systematic review of the literature. *Research in Developmental Disabilities*, *47*, 352-374. doi:10.1016/j.ridd.2015.10.003

Manhas, K. P., & Oberle, K. (2015). The ethics of metaphor as a research tool. *Research Ethics, 11*, 42-51. doi:10.1177/1747016114523421

Manoitit, C., & Mitra, S.K. (2019). Determinants of revenue per available room: Influential roles of average daily rate, demand, seasonality and yearly trend.

International Journal of Hospitality Management, 77, 573-582.

doi:10.1016/j.ijhm.2018.09.001

Manurung, K., & Mashuri, M. (2017). Implementing interest based instructional

materials to minimize EFL learners' speaking skills de-motivating factors. *Theory*

and Practice in Language Studies, 7, 356-365. doi:10.17507/tpls.0705.05

Marshall, C., Cardon, P., Poddar, A., & Fontenot, R. (2013). Does sample size matter in

qualitative research? A review of qualitative interview in is research. *Journal of*

Computer Information Systems, 54, 11-22. doi:10.1080/08874417.2013.11645667

Marshall, C., & Rossman, G. B. (2016). *Designing qualitative research* (6th ed.).

Thousand Oaks, CA: Sage.

Mastorocostas, P. A., Hilas, C. S., Varsamis, D. N., & Dova, S. C. (2016).

Telecommunications call volume forecasting with a block-diagonal recurrent

fuzzy neural network. *Telecommunication Systems, 63*, 15-25.

doi:10.1007/s11235-015-9968-x

Matsumoto, M., & Komatsu, S. (2015). Demand forecasting for production planning in

remanufacturing. *International Journal of Advanced Manufacturing Technology,*

79, 161-175. doi:10.1007/s00170-015-6787-x

McCreesh, N., Tarsh, M. N., Seeley, J., Katongole, J., & White, R. G. (2013).

Community understanding of respondent-driven sampling in a medical research

setting in Uganda: Importance for the use of RDS for public health research.

International Journal of Social Research Methodology, 16, 269-284.

doi:10.1080/13645579.2012.661204

McIntosh, M. J., & Morse, J. M. (2015). Situating and constructing diversity in semistructured interviews. *Global Qualitative Nursing Research*, *2*(8), 1-12. doi:10.1177/2333393615597674

Meissner, P., Brands, C., & Wulf, T. (2017). Quantifying blind spots and weak signals in executive judgment: A structured integration of expert judgment into the scenario development process. *International Journal of Forecasting, 33*, 244-253. doi:10.1016/j.ijforecast.2015.08.002

Merriam, S. B. (2014). *Qualitative research: A guide to design and implementation* (3rd ed.). New York, NY: John Wiley & Sons.

Meyerhoefer, C. D., Panovska, I., & Manski, R. J. (2016). Projections of dental care use through 2026: Preventive care to increase while treatment will decline. *Health Affairs, 35*, 2183-2189. doi:10.1377/hlthaff.2016.0833

Mhaskar, R., Pathak, E. B., Wieten, S., Guterbock, T. M., Kumar, A., & Djulbegovic, B. (2015). Those responsible for approving research studies have poor knowledge of research study design: A knowledge assessment of institutional review board members. *Acta Informatica Medica, 23*, 196-201. doi:10.5455/aim.2015.23.196-201

Miller, L. C., Gottlieb, M., Morgan, K. A., & Gray, D. B. (2014). Interviews with employed people with mobility impairments and limitations: Environmental supports impacting work acquisition and satisfaction. *Work, 48,* 361-372. doi:10.3233/WOR-131784

Misigo, B. L., & Kodero, M. N. (2014). The qualities of effective secondary school

    teachers and criteria for selection of secondary teachers in Kenya. *Journal of*

    Emerging Trends in Educational Research and Policy Studies, 5, 210-214.

    Retrieved from http://jeteraps.scholarlinkresearch.com

Mohamed, A. (2016). The relationship between revenue management and profitability -

    A proposed model. *Journal of Business Studies Quarterly, 7*, 44-63. Retrieved

    from http://www.jbsq.org

Montalvo, W., & Larson, E. (2014). Participant comprehension of research for which

    they volunteer: A systematic review. *Journal of Nursing Scholarship, 46*, 423-

    431. doi:10.1111/jnu.12097

Morse, J. M. (2015). Critical analysis of strategies for determining rigor in qualitative

    inquiry. *Qualitative Health Research, 25*, 1212-1222.

    doi:10.1177/1049732315588501

Mueller, L. E., Haidari, L. A., Wateska, A. R., Phillips, R. J., Schmitz, M. M., Connor, D.

    L., … Lee, B. Y. (2016). The impact of implementing a demand forecasting

    system into a low-income country's supply chain. *Vaccine, 34*, 3663-3669.

    doi:10.1016/j.vaccine.2016.05.027

Munn, Z., Porritt, K., Lockwood, C., Aromataris, E., & Pearson, A. (2014). Establishing

    confidence in the output of qualitative research synthesis: The ConQual approach.

    BMC Medical Research Methodology, 14(1), 1-7. doi:10.1186/1471-2288-14-108

Neale, J. (2016). Iterative categorization (IC): A systematic technique for analyzing

    qualitative data. *Addiction, 111*, 1096-1106. doi:10.1111/add.13314

Nguyen, T. Q. T. (2015). Conducting semistructured interviews with the Vietnamese. *Qualitative Research Journal, 15*, 35-46. doi:10.1108/QRJ-04-2014-0012

Nickson, L. M., & Henriksen, R. C. (2014). Leaders and recruiters from the next generation: A phenomenological study. *The Qualitative Report*, *19*(35)*,* 1-13. Retrieved from http://tqr.nova.edu/

Noble, H., & Smith, J. (2015). Issues of validity and reliability in qualitative research. *Evidence Based Nursing, 18*, 34-35. doi:10.1136/eb-2015-102054

Omar, H., Hoang, V. H., & Liu, D. (2016). A hybrid neural network model for sales forecasting based on ARIMA and search popularity of article titles. *Computational Intelligence and Neuroscience, 2016*, 1-9. doi:10.1155/2016/9656453

Onwuegbuizi, A. J., & Hwang, E. (2014). Interviewing successfully for academic position: A framework for candidates for asking for asking question during the interview process. *International Journal of Education, 6*, 98-113. doi:10.5296/ije.v6i2.4424

Ortiz, A. M. (2015). The Qualitative Interview. *Research in the college context* (2nd ed.). London, England: Routledge

Otchere-Ankrah, B., Tenakwah, E. S., & Tenakwah, E. J. (2015). Organizational reputation and impact on employee attitude: A case study of MTN Ghana limited and vodafon Ghana Limited. *Journal of Public Affairs*, *16*, 66-74. doi:10.1002/pa.1566

Pacho, T. O. (2015). Exploring participants' experiences using case study. *International Journal of Humanities and Social Science, 5*, 44-53. Retrieved from http://ijhssnet.com/

Padgett, C. S., DeVincenzo, M., Munn, J., & Rajagopalan, H. K. (2016). Building forecasting models for restaurant owners and managers: A case study. *American Journal of Entrepreneurship, 9,* 84-109. Retrieved from http://www.americanjournalentrepreneurship.org

Parsons, N. L., & Manierre, M. J. (2014). Investigating the relationship among prepaid token incentives, response rates, and nonresponse bias in a web survey. *Field Methods, 26*, 191-204. doi:10.1177/1525822X13500120

Pavelková, D., Homolka, L., Vychytilová, J., Ngo, V. M., Bach, L. T., & Dehning, B. (2018). Passenger car sales projections: Measuring the accuracy of a sales forecasting model 1. *Ekonomicky Casopis, 66(*3), 227-249. Retrieved from http://www.ekonom.sav.sk/sk/casopis

Perkmann, M., & Schildt, H. (2015). Open data partnerships between firms and universities: The role of boundary organizations. *Research Policy, 44*, 1133-1143. doi:10.1016/j.respol.2014.12.006

Petrova, E., Dewing, J., & Camilleri, M. (2016). Confidentiality in participatory research: Challenges from one study. *Nursing Ethics, 23*, 442-454. doi:10.1177/0969733014564909

Piškur, B., Beurskens, A. J., Ketelaar, M., Jongmans, M. J., Casparie, B. M., & Smeets, R. J. (2017). Daily actions, challenges, and needs among Dutch parents while

supporting the participation of their child with a physical disability at home, at

school, and in the community: A qualitative diary study. *BMC Pediatrics, 17*(1),

1-11. doi:10.1186/s12887-016-0768-6

Prabadevi, P. (2014). A study on organizational commitment of employees in life

insurance companies. *Global Management Review, 9*, 30-36. Retrieved from

http://www.sonamgmt.org/gmr.html

Prestwhich, S. D., Tarim, S. A., Rossi, R., & Hnich, B. (2014). Forecasting intermittent

demand by hyperbolic-exponential smoothing. *International Journal of

Forecasting, 30*, 928-933. doi:10.1016/j.ijforecast.2014.01.006

Putnam, M., Molton, I. R., Truitt, A. R., Smith, A. E., & Jensen, M. P. (2016). Measures

of aging with disability in US secondary data sets: Results of a scoping review.

Disability and Health Journal, 9, 5-10. doi:10.1016/j.dhjo.2015.07.002

Rathnayaka, R. M. K., Seneviratna, D. M. K. N., & Jianguo, W. (2015). Grey system

based novel approach for stock market forecasting. *Journal of Grey Systems, 5*,

178-193. doi:10.1108/GS-04-2015-0014

Ravinder, H. V. (2016). Determining the optimal values of exponential smoothing

constants-does solver really work? *American Journal of Business Education, 9*(1),

1-14. doi:10.19030/ajbe.v9i1.9574

Ravinder, H. V., & Misra, R. B. (2014). ABC analysis for inventory management:

Bridging the gap between research and classroom. *American Journal of Business

Education (Online), 7*, 257-264. doi:10.19030/ajbe.v7i3.8635

Raza, D., & Kilbourn, P. (2017). The impact of point-of-sale data in demand planning in the South African clothing retail industry. *Journal of Transport and Supply Chain Management*, *11*, 304-308. doi:10.4012/jtscm.v11i0.304

Ren, S., & Choi, T. (2016). Selection and industrial applications of panel data-based demand forecasting models. *Industrial Management and Data Systems*, *116*, 1131-1159. doi:10.1108/IMDS-08-2015-0345

Roberts, M. E., Stewart, B. M., Tingley, D., Lucas, C., Leder-Luis, J., Gadarian, S. K., … & Rand, D. G. (2014). Structural topic models for open-ended survey responses. *American Journal of Political Science, 58*, 1064-1082. doi:10.1111/ajps.12103

Robinson, O. C. (2014). Sampling in interview-based qualitative research: A theoretical and practical guide. *Qualitative Research in Psychology, 11*, 25-41. doi:10.1080/14780887.2013.801543

Ross, A., & Mash, B. (2014). African primary care research: Reviewing the literature. *African Journal of Primary Health Care & Family Medicine, 6*(1), 1-4. doi:10.4102/phcfm.v6i1.584

Ross, F. H., & Lo Presti, S, (2018). Appraising retail properties in the amazon jungle. *The Appraisal Journal, 86*, 265-278. Retrieved from https://www.appraisalinstitute.org

Roulston, K., & Shelton, S. A. (2015). Reconceptualizing bias in teaching qualitative research methods. *Qualitative Inquiry, 21*, 332-342. doi:10.1177/1077800414563803

Roy, K., Zvonkovic, A., Goldberg, A., Sharp, E., & LaRossa, R. (2015). Sampling

richness and qualitative integrity: Challenges for research with families. *Journal

of Marriage and Family, 77*, 243-260. doi:10.1111/jomf.12147

Saab, M. M., Landers, M., & Hegarty, J. (2017). Exploring awareness and help-seeking

intentions for testicular symptoms among heterosexual, gay, and bisexual men in

Ireland: A qualitative descriptive study. *International Journal of Nursing Studies,

67*, 41-50. doi:10.1016/j.ijnurstu.2016.11.016

Salam, A., Panahifar, F., & Byrne, P. J. (2016). Retail supply chain service levels: The

role of inventory storage. *Journal of Enterprise Information Management, 29*,

887-902. doi:10.1108/JEIM-01-2015-0008

Salvino, R., Tarleton, T., Kuhn, N., & Kauffman, R. (2018). Regional growth and

transportation infrastructure from greenways to public transit. *Review of

Business, 38*, 74-86. Retrieved from http://rbr-journal.org

Samiloglu, F., & Akgün, A. I. (2016). The relationship between working capital

management and profitability: Evidence from Turkey. *Business and Economics

Research Journal, 7*(2), 1-14. doi:10.20409/berj.2016217492

Saunder, M., Lewis, P., & Thornhill, A. (2015). *Research methods for business students*.

Harlow, England: Pearson Education.

Schaupp, L. C., & Bélanger, F. (2014). The value of social media for small businesses.

Journal of Information Systems, 28, 187-207. doi:10.2308/isys-50674

Shapka, J. D., Domene, J. F., Khan, S., & Yang, L. M. (2016). Online versus in-person interviews with adolescents: An exploration of data equivalence. *Computers in Human Behavior*, *58*, 361-367. doi:10.1016/j.chb.2016.01.016

Shockley, J., Plummer, L. A., Roth, A.V., & Fredendall, L.D. (2014). Strategic design responsiveness: An empirical analysis of US retail store networks. *Production and Operations Management, 24*, 451-468. doi:10.1111/poms.12241

Shoup, V. S. (2015*). One hospital's satisfaction plans in response in response to a changing healthcare environment* (Doctoral dissertation). Retrieved from Dissertations & Theses @ Walden University. (Order No. 3685479)

Simionescu, S., & Bica, E. (2014). Controversies and comparisons of definition for small and medium-sized enterprises at level of European Union. *Journal of Advanced Research in Management, 5*, 74-80. doi:10.14505/jarm.v5.2(10).02

Simpson, A., & Quigley, C. F. (2016). Member checking process with adolescent students: Not just reading a transcript. *The Qualitative Report, 21*, 377-392. Retrieved from http://tqr.nova.edu/

Sindelár, J. (2016). Investigation of factors influencing employee performance. *International Journal of Organizational Analysis, 24*, 340-368. doi:10.1108/IJOA-07-2013-0687

Siriram, R. (2016). Improving forecasts for better decision making. *South African Journal of Industrial Engineering, 27*, 47-60. doi:10.7166/27-1-486

Song, W., & Suh, Y. (2016). Making gatekeepers in supplier systems. *Annals of Business Administrative Science*, *15*, 59-73. doi:10.7880/abas.0150805a

Sorina-Diana, M., Dorel, P. M., & Nicoleta-Dorina, R. (2013). Marketing performance in Romanian small and medium-sized enterprises: A qualitative study. *Annals of the University of Oradea, Economic Science Series, 22*, 664-671. Retrieved from http://anale.stec

Sotiriadou, P., Brouwers, J., & Le, T. A. (2014). Choosing a qualitative data analysis tool: A comparison of NVivo and Leximancer. *Annals of Leisure Research, 17*, 218-234. doi:10.1080/11745398.2014.902292onomiceuoradea.ro/en

Sparker, A. C. (2014). Developing mixed methods research in sport and exercise psychology: Critical reflections on five points of controversy. *Psychology of Sport and Exercise, 16*, 49-58. doi:10.1016/j.psychsport.2014.08.014

Speer. S. A., & Stokoe, E. (2014). Ethics in action: Consent-gaining interactions and implications for research practice. *British Journal of Social Psychology, 53*, 54-73. doi:10.1111/bjso.12009

Stanley, M., & Nayar, S. (2014). Methodological rigor: Ensuring quality in occupational therapy qualitative research. *New Zealand Journal of Occupational Therapy, 61*(1), 6-12. Retrieved from http://www.otnz.co.nz/public/publications/new-zealand-journal-of-occupational-therapy/

Stark, M., Garza, Y., Bruhn, R., & Ane, P. (2015). Student perceptions of sandtray in solution-focused supervision. *Journal of Creativity in Mental Health*, *10*, 2-17. doi:10.1080/15401383.2014.917063

Starr, M. A. (2014). Qualitative and mixed-methods research in economics: Surprising growth, promising future. *Journal of Economic Surveys, 28*, 238-264. doi:10.1111/joes.12004

Stekler, H. O. (2015). Forecasting – yesterday, today and tomorrow. *International Journal of Forecasting, 31*, 96-98. doi:10.1016/j.ijforecast.2014.03.003

Taleizadeh, A. A., & Rasuli-Baghban, A. (2018). Pricing and lot sizing of a decaying item under group dispatching with time-dependent demand and decay rates. *Scientia Iranica.Transaction E, Industrial Engineering, 25*, 1656-1670. doi:10.24200/sci.2017.444

Tavakkoli, A., Hemmasi, A. H., Talaeipour, M., Bazyar, B., & Tajdini, A. (2015). Forecasting of particleboard consumption in Iran using univariate time series models. *Bioresources, 10*, 2032-2043. Retrieved from http://www.bioresourcesjournal.com

Teh, D., & Corbitt, B. (2015). Building sustainability strategy in business. *The Journal of Business Strategy, 36*(6), 39-46. doi:10.1108/JBS-08-2014-0099

Thamhain, H. J. (2014). Assessing the effectiveness of quantitative and qualitative methods for R&D project proposal evaluations. *Engineering Management Journal, 26*(3), 3-12. doi:10.1080/10429247.2014.11432015

Titze, K., Schenck, S., Logoz, M. Z., & Lehmkuhl, U. (2014). Assessing the quality of the parent-child relationship: Validity and reliability of the child-parent relationship test (Chip-C). *Journal of Child and Family Studies, 23*, 917-933. doi:10.1007/s10826-013-9749-7

Toledo, T. C., Silva, G. F., & Garo, W. R. (2017). Analysis of demand in the importation process for the trade of individual protection equipment. *Independent Journal of Management & Production, 8*, 720-746. doi:10.14807/ijmp.v8i5.595

Tomic, D., & Stjepanovic, S. (2017). Forecasting capacity of ARIMA models: A study on Croatian industrial production and its sub-sectors. *Zagreb International Review of Economics & Business, 20*, 81-99. doi:10.1515/zireb-2017-0009

Trapero, J. R., Kourentzes, N., & Fildes, R. (2015). On the identification of sales forecasting models in the presence of promotions. *The Journal of the Operational Research Society, 66*, 299-307. doi:10.1057/jors.2013.174

U.S. Department of Health & Human Services, Center for Medicare and Medicaid Services (2017). *CMS awards contracts for the DMEPOS competitive bidding program round 1 2017*. Retrieved from http://www.cms.govNewsroom/MediaReleaseDatabase/Fact-sheets/2017-Fact-sheets-items/2017-11-01-2.html

U.S. Department of Health and Human Services. (1979). *The Belmont report on ethical principles and guidelines for the protection of human subjects of research.* Retrieved from www.hhs.gov/ohrp/humansubjects/guidance/belmont.html

U.S. Department of Health and Human Services, National Institutes of Health, Office for Human Research Protections. (2014). *The Belmont report: Ethical principles and guidelines for the protection of human subjects of research* (NIH Publication No. L. 93-348). Retrieved from http://www.hhs.gov/ohrp/humansubjects/guidance/belmont.html

U.S. Small Business Administration (2014). *Frequently asked questions*. Retrieved from

    https://www.sba.gov/sites/default/files/sbfaq.pdf

Van, D. M., & Nienaber, H. (2015). Factors hindering strategy implementation as

    perceived by top, middle and frontline managers in a South African electronics

    organization. *Journal of Global Business and Technology, 11*(2), 45-57. Retrieved

    from http://gbata.org/journal-of-global-business-and-technology-jgbat/

Van den Brink, M., & Benschop, Y. (2014). Gender in academic networking. The role of

    gatekeepers in professional recruitment. *Journal of Management Studies, 51*, 460-

    492. doi:10.1111/joms.12060

Van Wijk, E. (2014). Recruitment and retention of vulnerable populations: Lessons

    learned from a longitudinal qualitative study. *The Qualitative Report*, *19*(28)*,* 1-

    21. Retrieved from http://tqr.nova.edu/

Veiga, C., Da Veiga, C. R. P., Catapan, A., & Tortato, U., Silva, W. (2014). Demand

    forecasting in food retail: A comparison between the Holt-Winters and ARIMA

    models. *WSEAS Transactions on Business and Economics, 11*, 608-614.

    Retrieved from http://www.weseas.org

Veiga, C., Da Veiga, C. R. P., Puchalski, W., Coelho, L., & Tortato, U. (2016). Demand

    forecasting based on natural computing approaches applied to the foodstuff retail

    segment. *Journal of Retailing and Consumer Services, 31*(7), 174-181.

    doi:10.1016/j.jretconser.2016.03.008.

Viktorovna, I., & Ivanovich, P. (2016). Issues of forming inventory management system in small business. *International Review of Management and Marketing*, *6*, 522-527. Retrieved from https://www.econjournals.com/index.php/irmm

Vohra, V. (2014). Using the multiple case study design to decipher contextual leadership behaviors in Indian organizations. *Electronic Journal of Business Research Methods, 12*, 54-65. Retrieved from www.ejbrm.com

Vujko, A. P., Blagojevia, N., & Gajia, T. (2016). Comparative analysis of exponential smoothing models to tourists' arrivals in Serbia. *Economic of Agriculture, 63*, 835-847. doi:10.5937/ekoPolj1603835P

Wahl, D., Avery, B., & Henry, L. (2013). Studying distance students: Methods, findings, actions. *Journal of Library & Information Services in Distance Learning, 7*, 183-209. doi:10.1080/1533290X.2012.705656

Walker, R. C., Howard, K., Morton, R. L., Palmer, S. C., Marshall, M. R., & Tong, A. (2016). Patient and caregiver values, beliefs, and experiences when considering home dialysis as a treatment option: A semi-structured interview study. *Nephrology Dialysis Transplantation, 31*, 133-141. doi:10.1093/ndt/gfv330

Wang, C. L., Rafiq, M., Li, X., & Zheng, Y. (2014). Entrepreneurial preparedness: An exploratory case study of Chinese private enterprises. *International Journal of Entrepreneurial Behavior & Research, 20*, 351-374. doi:10.1108/IJEBR-06-2013-0079

Watson, T. J. (2015). E-file storage: How to make it safe: What to keep, for how long, and where? *Family Advocate, 37*, 43-46. Retrieved from

http://www.americanbar.org/publications/family_advocate_home.html

Weatherford, L. (2016). The history of forecasting models in revenue management. *Journal of Revenue and Pricing Management, 15*, 212-221. doi:10.1057/rpm.2016.18

Welch, C., Rumyantseva, M., & Hewerdine, L. J. (2016). Using case research to reconstruct concepts: A methodology and illustration. *Organizational Research Methods, 19*, 111-130. doi:10.1177/1094428115596435

Williams, A. (2014). How to write and analyze a questionnaire. *Journal of Orthodontics, 30,* 245-252. doi:10.1093/ortho/30.3.245

Wilson, M. C., & Wu, J. (2017). The problems of weak sustainability and associated indicators. *International Journal of Sustainable Development & World Ecology, 24*, 44-51. doi:10.1080/13504509.2015.1136360

Wilson, V. (2014). Research methods: Triangulation. *Evidence Based Library and Information Practice, 9*(2*)*, 45-47. doi:10.18438/B8WW3X

Wilson-Genderson, M., & Pruchno, R. (2015). Functional limitations and gender differences: Neighborhood effects. *The International Journal of Aging and Human Development, 81*, 83-100. doi:10.1177/0091415015614843

Winters, P. R. (1960). Forecasting sales by exponentially weighted moving averages. *Management Science, 6*, 324-342. doi:10.1287/mnsc.6.3.324

Wolf, L. E., Patel, M. J., Williams, Tarver, B. A., Austin, J. L., Dame, L. A., & Beskow, L. M. (2015). Certificates of confidentiality: Protecting human subject research data in law and practice. *The Journal of Law, Medicine & Ethics, 43*, 594-609. doi:10.1111/jlme.12302

Woods, M., Paulus, T., Atkins, D. P., & Macklin, R. (2015). Advancing qualitative research using qualitative data analysis software (QDAS)? Reviewing potential versus practice in published studies using ATLAS.ti and NVivo, 1994-2013. *Social Science Computer Review, 34*, 597-617. doi:10.1177/0894439315596311

Wowak, K. D., & Boone, C. A. (2015). So many recalls, So little research: A review of the literature and roadmap for future research. *Journal of Supply Chain, 51*(4), 54-72. doi:10.1111/jscm.12079

Wu, D. C., Song, H., & Shen, S. (2017). New developments in tourism and hotel demand modeling and forecasting. *International Journal of Contemporary Hospitality Management, 29*, 507-529. doi:10.1108/IJCHM-05-2015-0249

Xi, J., & Sha, P. B. (2014). Research on optimization of inventory management based on demand forecasting. *Applied Mechanics and Materials, 687*, 4828-4831. doi:10.4028/www.scientific.net/AMM.687-691.4828

Yanchar, S. C. (2015). Truth and disclosure in qualitative research: Implications of hermeneutic realism. *Qualitative Research in Psychology, 12*, 107-124. doi:10.1080/14780887.2014.933460

Yeldham, M., & Gruba, P. (2014). Toward an instructional approach to developing interactive second language listening. *Learning Teaching Research, 18*, 33-53. doi:10.1177/1362168813505395

Yii, S. B., Powell, M. B., & Guadagno, B. (2014). The association between investigative interviewers' knowledge of question type and adherence to best-practice interviewing. *Legal & Criminological Psychology, 19*, 270-281. doi:10.1111/lcrp.12000

Yin, R. K. (2018). *Case study research and applications: Design and methods* (6th ed.). Los Angeles, CA: Sage.

Young, I., Gropp, K., Pintar, K., Waddell, L., Marshall, B., & Thomas, K. (2014). Experiences and attitudes towards evidence-informed policy-making among research and policy stakeholders in the Canadian agri-food public health sector. *Zoonoses and Public Health, 61*, 581-589. doi:10.1111/zph.12108

Zhe, Z., Zhiyuan, C., Lichan, H., & Ed, H. C. (2015, May). *Improving user topic interest profiles by behavior factorization.* Paper presented at the International World Wide Web Conference, Florence Italy.

Zohrabi, M. (2013). Mixed method research: Instruments, validity, reliability and reporting findings. *Theory and Practice in Language Studies*, *3*, 254-262. doi:10.4304/tpls.3.2.254-262

Appendix A: Interview Protocol

Interview: Explore successful demand forecasting strategies small, retail, medical supply business leaders use to increase profitability. I will start with greetings and a brief introduction.

1. I will thank the participant for accepting my invitation to participate in the interview.

2. I will ensure that participants read and understand before signing the informed consent form.

3. I will inform participants that the interview will last no more than 30 minutes, and the interviews will be audio recorded.

4. I will begin interviewing.

5. I will explain to participants that as part of member checking, I will present my interpretation of the interviews to them for validation.

6. I will conclude the interview, stop audio recording, and thank the interviewee again for taking part in the interview.

Appendix B: National Institutes of Health Training Certificate

Certificate of Completion

The National Institutes of Health (NIH) Office of Extramural Research certifies that **Arica Watkins** successfully completed the NIH Web-based training course "Protecting Human Research Participants."

Date of Completion: 04/23/2018

Certification Number: 209594

NIH National Institutes of Health
Office of Extramural Research