APPLICATION OF UTAUT IN ASSESSING DETERMINANTS OF VIRTUAL KITCHEN ADOPTION AMONG LICENSED RESTAURANTS IN KENYA

BY

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DECLARATION

I declare that this research project is my original work and has not been submitted or presented in any academic institution for the award of any other academic degree or diploma. Except where otherwise indicated, this is my original work and no part of it may be reproduced without prior permission of the author and/or Maseno University.

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DEDICATION

To my dear husband, thank you for being with me and supporting my academic steps, I am forever indebted.

To my children, thank you for your endurance throughout the period of this work.

To God be the Glory.

ABSTRACT

Restaurants play a significant role in the diversification of a country's economy through employment creation and revenue generation and as such, various restaurants have come up in Kenya. Despite the increasing number of restaurants, there's a continuous demand for dine-out services facilitated by emergence of online food delivery (OFD) platforms such as Glovo, Uber Eats, Jumia Food, etc. This puts pressure on restaurant capacity to meet the needs of both dine in and dine out customers. With increasing demand for dine-out consumption including OFD, there's a need to adopt new restaurant business models for restaurants called virtual kitchens (VKs) in Kenya. While various studies have examined adoption of VKs mainly through qualitative methods, no study has been dedicated to understand VKs adoption in Kenya, with a focus on restaurant businesses. Existing studies in other context also provide contradicting results on determinants of VK adoption. This study, therefore, aimed at investigating the adoption of virtual kitchens among licensed restaurants in Kenya. Anchoring on the UTAUT theory, the study specifically set out to (1) determine the effect of performance expectancy on the intention to use virtual kitchens among licensed restaurants in Kenya; (2) identify the effect of effort expectancy on the intention to use virtual kitchens among licensed restaurants in Kenya; (3) determine the effect of facilitating conditions on the intention to use virtual kitchens among licensed restaurants in Kenya; and (4) identify the effect of price value on the intention to use virtual kitchens among licensed restaurants in Kenya. The study adopted a quantitative research approach and correlational research design to survey 149 managers or owners licensed restaurants in Kenya. The multiple regression analysis results indicated that performance expectancy, effort expectancy, facilitating conditions and price value had significant effect on intention to use virtual kitchens (VKs) ($F_{[4, 144]} = 20.662$, $p < .01$, $R^2 = .604$), implying that the predictors explained for 60.4% of the variance in intention to use VKs. The results indicates that restaurateurs would consider ability of VKs to enhance their performance, VKs user friendliness in carrying out intended business operations, availability of relevant facilitating conditions and cost benefit analysis of VKs before deciding their adoptions. The study findings therefore not only contribute to industry practice by providing informative insights on VK adoption in Kenya but also add to the existing body of knowledge debate on VK adoption.

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LIST OF ABBREVIATIONS AND ACRONYMS

AMOS	-	Analysis of Moments Structures
ANT	-	Actor-Network Theory
B$_2$B	-	Business to Business
B$_2$C	-	Business to Consumer
BOH	-	Back of the House
CFA	-	Confirmatory Factor Analysis
COS	-	Collinearity Statistics
DOI	-	Diffusion of Innovation
EE	-	Effort Expectancy
EFA	-	Exploratory Factor Analysis
F&B	-	Food and Beverage
FC	-	Facilitating Conditions
GDI	-	Gottlieb Duttweiler Institute
HM	-	Hedonic Motivation
INT	-	Intention to Use Virtual Kitchen
NACOSTI	-	National Commission for Science, Technology and Innovation
NRAT	-	National Restaurant Association and Technomic
NRAT	-	National Restaurant Association and Technomic
OFD	-	Online Food Delivery
OFD	-	Online Food Delivery
OFDs	-	Online Food Delivery Systems
PCA	-	Principal Component Analysis
PE	-	Performance Expectancy
PLS-SEM	-	Partial Least Square Structural Equation Modelling

POS	-	Point of Sale
PV	-	Price Value
Q-Q plots	-	Quintile-Quintile Plots
SEM	-	Structural Equation Modelling
SI	-	Social Influence
SPSS	-	Statistical Package for Social Science
STC	-	Standardized Coefficients
STE	-	Standard Error
TAM	-	Technology Acceptance Model
TOE	-	The Technology, Organisation and Environment
TOL	-	Tolerance
TPB	-	Theory of Planned Behaviour
TRA	-	The Theory of Reasoned Action
TRA	-	Tourism Regulatory Authority
USD	-	US Dollars
USTC	-	Unstandardized Coefficients
UTAUT	-	Unified Theory of Acceptance and Use of Technology
UTAUT2	-	Extended Unified Theory of Acceptance and Use of Technology
VIF	-	Variance Inflation Factor
VK	-	Virtual Kitchen
VKs	-	Virtual Kitchens
β	-	Standardized Beta Coefficients

DEFINITION OF TERMS AND CONCEPTS

Effort Expectancy: This is the ease of use that virtual kitchen will provide users once adopted by restaurants.

Facilitating Conditions: These are the prevailing conditions that must be met for successful adoption of virtual kitchens by restaurants.

Intention to Use Virtual Kitchen: Set of informed decisions that govern use behaviours of virtual kitchens by restaurateurs.

Licensed Restaurant: Restaurants that have been vetted and permitted by tourism regulatory authority (TRA) to operate in Kenya.

Online Food Delivery: Mechanism or platforms that allow for F&B orders to be made online and delivered to customers without them going to the restaurant.

Performance Expectancy: This is the perceived benefit derived from using virtual kitchen as a technology.

Price Value: This is the cost incurred by restaurateurs using virtual kitchens in comparison to the perceived benefits

Restaurant Manager: The person in charge of the overall operation of a restaurant business

Restaurant Owner: The person who owns a restaurant

Restaurant: A commercial business facility in which food and beverage is supplied or served to the general public for consumption.

Virtual Kitchen (VK):   Virtual Kitchen, also known as a Cloud Kitchen, is a delivery only restaurant that doesn't have a particular physical space for dining. So, it is essentially a commercial kitchen that can be found in a full-fledged restaurant, minus the seating options.

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INTRODUCTION

1.1 Background of the Study

This chapter introduces the study by describing the background of the study including the main study concepts and highlights the research gaps. It then presents statement of the problem where both the research problem is emphasized including the gaps in knowledge that warranted the formulation the study objectives. In line with this, the chapter presents the research objectives and hypotheses that guided the study. The chapter also addresses the significance of the study and present the scope within which the study findings can be interpreted. It finally describes the conceptual framework of the study as guided by UTAUT theory.

1.1.1 The Restaurant Sector

Restaurants form an integral part of the hospitality service industry (Martín-Martín, Maya García & Romero, 2022; Gouveia, 2021; Kapoor & Vij, 2018; Eurostat, 2013). According to Eurostat (2013), the restaurant sector includes all businesses that offer meals and drinks to the public for direct consumption. It forms an important sector in the economy of many countries especially those that specialise in tourism (Martín-Martín *et al.*, 2022), including Kenya. The restaurant sector includes fine dining, fastfood, take-out, and self-service among other ventures that provide food and beverage to the general public (Madeira *et al.*, 2021; Sarıışık, Çavuş & Karamustafa, 2019). According to Gouveia (2021), the restaurant sector constitutes 27.4% of all the enterprises in the hospitality industry, with over 32,000 businesses accounting for 170,790 employments worldwide. The majority of the restaurants in Kenya are located in main cities namely Nairobi, Mombasa, and Kisumu in that order of dominance. Just like in other parts of the world, this sector represents a significant economic contributor in Kenya, employing thousands of people both directly and indirectly.

Currently, the restaurant sector operates on two business models, namely dine-in and dine-out. Dine-in is a concept that requires consumers to present themselves to the various facilities that offer food and beverage, thriving on the service characteristics of inseparability (Can, 2021; Pyanikova *et al.*, 2020; Sarıışık, Çavuş & Karamustafa, 2019). According to Pyanikova *et al.* (2020), conventional hospitality services cannot be separated from consumers. Most dine-in restaurantsare, however, struggling to remain afloat and break even in the competitive industry coupled with advances in technology. The decrease in the dine-in restaurant business modelis further gravitated by the effects ofthe Covid-19 pandemic (Karniouchina *et al.*, 2022; Gouveia, 2021; Guszkowski, 2020) and the decreasing time available for eating out, inconveniences among many other factors (Gouveia, 2021; Deloitte, 2019). Most restaurant customers are also increasingly getting involved in the digital space which in turn shifts their demand for dine-in services (Martín-Martín *et al.*, 2022; Karniouchina *et al.*, 2022; Gouveia, 2021; Can, 2021; Khamidovich, 2021; Kim, Yoo& Yang, 2020). Can (2021) in particular notes that the ability of restaurants to adapt to newly emerging conditions in the restaurant market structure is strategically relevant. Similarly, Khamidovich (2021), opines that the adaptation of restaurant technologies towards enhancing customer service processes, including food delivery, is the success indicator of today's restaurant business. On this note, most restaurants have resorted to dine-out and delivery services leading to a rise in off-the-premise food and beverage facilities (Karniouchina *et al.*, 2022; Gouveia, 2021; Guszkowski, 2020).

Over the years, dining out has become an integral part of food and beverage service where visitors can get food and drinks away from home at a fee (Madeira, Palrão& Mendes, 2021; Pyanikova *et al.*, 2020; Choudhary, 2019). According to Gouveia (2021), there is increased demand for more convenient and faster ways to source food and beverage. Consequently, the public is quickly turning to online food delivery (OFD) services (Madeira *et al.*, 2021;

Gouveia, 2021; Deloitte, 2019; He *et al.*, 2019). In this regard, restaurant operators are responding with several enhanced business models to meet customers' premise needs and digital experiences (Gouveia, 2021; Sestino, Prete, Piper & Guido, 2020; National Restaurant Association and Technomic [NRAT], 2019). In fact, according to NRAT (2019), the provision of off-premise food and beverage services is considered strategic by 78% of restaurant businesses in the United States. Restaurants are therefore reverting to technology driven-processes (Martín-Martín *et al.*, 2022; Karniouchina *et al.*, 2022; Madeira *et al.*, 2021; Pyanikova *et al.*, 2020; Cavusoglu, 2019; Moreno & Tejada, 2019; Dinu, Lazăr & Pop, 2021) through the drive-thru, online food delivery and pickups formats to increase convenience of about 79% of their customers (Gouveia, 2021).

Pyanikova *et al.* (2020) in the study points to the inevitability of the digitalization of the restaurant business. In their study, they reported that technology use in restaurants increases profitability and reduces losses. Pyanikova *et al.* (2020) note that restaurant digitalisation through the adoption of various technology would have an impact on the financial activities of food service providers such as restaurants. They further contend that restaurant digitalisation is required not only to improve service delivery but also cost reduction (Pyanikova *et al.*, 2020).

Despite the demand for dine-out representing a large increase in the restaurant business worldwide, most restaurants in Kenya are characterised by the traditional restaurant layout that fails to meet this demand. This is because these restaurants were designed to offer dine-in experiences (Gouveia, 2021; Can, 2021; Sarıışık, Çavuş & Karamustafa, 2019). Additionally, having traditional restaurants targeting both dine-in clients and off-premise clients may result ina shortage of food and beverage supply for the two-clientele base for the restaurant, particularly when operating at maximum capacity (Gouveia, 2021; Lan, Ya, & Shuhua, 2016).

1.1.2 Online Food Delivery and Virtual Kitchens

Advances in technology have given rise to the emergence of third-party platforms that majors on online food delivery (OFD) (Madeira *et al.*, 2021; Pyanikova *et al.*, 2020; Deloitte, 2019; Kapoor & Vij, 2018). Food delivery has more than tripled in value since 2017, growing to a global market worth more than $150 billion (Ahuja et al., 2021, Statista, 2023). This figure is expected to rise by more than USD 198,000 million by the end of 2023 (Gouveia, 2021), and will total to over $220 billion by 2025 (Lavu, 2023, Statista, 2023).The OFD market focuses on restaurant-to-consumer (e.g., Domino's, Pizza Hut, Starbucks, etc.) and platform-to-consumer (e.g., Glovo, Jumia Eats, Uber Eats, Bolt Food etc.) kind of e-commerce. According to Gouveia (2021), platform-to-consumer represents the largest global market segment of the two, with China leading in terms of OFD market growth.

While OFD's popularity in Europe began in late 2013, in Kenya, OFD started to gain dominance in 2019 mainly through Jumia Eat, Uber Eat and Glovo (Kairu, 2022). This increased significantly during and after post Covid-19 pandemic. Currently, Uber Eats and Glovo hold about 50% of the global market share in OFD. However, the restaurant-to-consumer segment turns out to be the leading category in Europe with its popularity projected to reach a market volume of over USD 41,799 million by 2025. In Kenya, the demand for OFD is predominantly high in Nairobi County Kilimani, Ngong Road, and Kileleshwa areas leading in number of delivery orders (Kairu, 2022). This is followed by Mombasa County and then Nakuru County being third in the list. According to Ndiang'ui and Theunissen (cited in Kairu, 2022) this emergence of new restaurant business model would translate to adoption virtual kitchens, a new trend of kitchens tailored to OFDs

Virtual kitchens, also called ghost kitchen, cloud kitchens or dark kitchens is a back office (BOH) concept that has been introduced in the restaurant industry to enhance dine-out capabilities through online food delivery or restaurant website (Gouveia, 2021; Koll-

Schretzenmayr, 2019; Green, Lai, & Ewing, 2020; Choudhary, 2019). This concept is therefore believed to reduce the cost of restaurant operation since there are no dine-area, waiting staff and décor needed (Madeira *et al.*, 2021; Gouveia, 2021; Pyanikova *et al.*, 2020; Koll-Schretzenmayr, 2019; Deloitte, 2019; Ongkasuwan et al., 2022; Gottlieb Duttweiler Institute [GDI], 2022). The location of the VKs is also believed to minimise the cost of operation further as they can be established in low-traffic areas where rent is cheaper (Gouveia, 2021). VKs further said to create value for both restaurants and customers. For restaurants, VKs are used as a tool to streamline takeaway operations in a B_2B type of e-commerce (Gouveia, 2021; Green *et al.*, 2020; Deloitte, 2019). Similarly, it provides customers with more convenience and diverse options of takeaways, freshness in terms of food and faster delivery using a B_2C type of e-commerce (Gouveia, 2021; Green *et al.*, 2020; He *et al.*, 2019; Choudhary, 2019). When coupled with OFD, however, about 15-30% of the meal prices have to be shared with the delivery companies (Gouveia, 2021; He *et al.*, 2019), eating into the restaurants' revenues. Gouveia (2021) further notes that restaurant reputations may be ruined since they have little control over food delivery and marketing and that food quality is usually judged based on what is delivered.VKs provide delivery only services, which overcome revenue shortage by taking advantage of new demands (GDI, 2022; Ongkasuwan et al., 2022; Choudhary, 2019).

Adoption of virtual kitchens is still an emerging concept in Kenya (Kairu, 2022) and therefore there is a need to understand its adoption determinants. Previous studies on VKs have focused mainly on qualitative methods with few focusing on quantitative techniques (e.g., Gouveia, 2021). These studies have also adopted various models and theories in understanding VK adoption. Gouveia (2021) for instance used the Unified Theory of Acceptance and Use of Technology (UTAUT), but only focused on four determinants namely Performance expectancy (PE), effort expectancy (EE) facilitating conditions (FC), and price

value (PV). The study also took a case study approach of Kitch Restaurant in Portugal. This current study will, however, adopt a correlational survey research design to analyse views from managers licensed restaurants in Kenya.

1.2 Statement of the Problem

Restaurants play a significant role in the diversification of a country's economy through employment creation and revenue generation. This has seen several restaurants come up in Kenya. Being a component of the hospitality industry, the restaurant sector is, however, affected by various consumer trends, and various events including the Covid-19 pandemic and advances in technology. These trends globally have negatively impacted the dine-in restaurant business, which is on a sharp decline, including in Kenya. As a result, many dine-in restaurants are struggling to remain afloat and break even in the competitive industry that is coupled with advances in technology.

The emergence of digital technology including online food delivery (OFD) is slowly transforming the concept of dine-in, where a client is required to present himself at the restaurant to partake in the restaurant's products and services. In this regard, the number of clients who interact with technology as part of carrying out their work and at the same time making online food orders is on the rise. The advent of online delivery platforms such as Glovo is even making it convenient for clients to order their best food and have it delivered to their workplaces or even their homes, accentuating the need for dine-out.

While this is the case, the majority of restaurants in Kenya are still characterised by the traditional restaurant layout that fails to meet the dine-in and dine-out demand at ago. This is because these restaurants were designed to offer dine-in experiences. Additionally, having traditional restaurants targeting both dine-in clients and dine-out clients often results ina shortage of food and beverage supplies for the two-clientele base for the restaurant, particularly when operating at maximum capacity. With increasing demand for dine-out

consumption including online food delivery, there's a need to adopt new restaurant business models for restaurants in Kenya, called virtual kitchens (VKs). Despite this, no study has been dedicated to understanding this concept in Kenya, with a focus on restaurant businesses.

1.3 Objectives

1.3.1 Main Objective

The main objective of this study was to investigate the application of UTAUT in assessing determinants of virtual kitchen adoption of among licensed restaurants in Kenya.

1.3.2 Specific Objectives

Specifically, the study will be guided by the following objectives:

  i.   Determine the effect of performance expectancy on the intention to use virtual kitchens licensed restaurants in Kenya.

 ii.   Identify the effect of effort expectancy on the intention to use virtual kitchens licensed restaurants in Kenya.

iii.   Determine the effect of facilitating conditions on the intention to use virtual kitchens licensed restaurants in Kenya.

 iv.   Identify the effect price value on the intention to use virtual kitchens licensed restaurants in Kenya.

1.4 Null Hypotheses

The study was guided by the following null hypotheses:

  i. H_{01}: Performance expectancy does not significantly affect the intention to use virtual kitchens licensed restaurants in Kenya.

 ii. H_{02}: Effort expectancy does not significantly affect intention to use virtual kitchens licensed restaurants in Kenya.

iii. H_{03}: Facilitating conditions do not significantly affect the intention to use virtual kitchens licensed restaurants in Kenya.

iv. H_{04}: Price value does not significantly affect intention to use virtual kitchens licensed restaurants in Kenya.

1.5 Significance of the Study

Virtual kitchens are an emerging disruptive business model that transforming the restaurant business worldwide. Advances in technology, the increasing number of tech-savvy clients with smartphones and accessibility to the internet have resulted in increasing demand for online food delivery (OFD) in Kenya. This is also attributable to some other factors including the need for convenience, quick service delivery and the Covid-19 pandemic. The effect has been the rationalisation of the restaurant business and focuses more on the dine-out business rather than the dine-in business. The findings of their study will therefore be of benefit to restaurateurs by identifying determinants of virtual kitchen adoption among restaurants which will inform their adoption intentions of virtual kitchens. The study finding will also be of significance to academia by expanding the knowledge and discussion on virtual kitchen adoption, which is an emerging phenomenon in Kenya.

1.6 Scope of the Study

The study focuses on licensed restaurants in Kenya by assessing determinants of virtual kitchen adoption. This excludes fast-food restaurants. While the study intends to use the original Unified Theory of Acceptance and Use of Technology (UTAUT) model as the theoretical basis, it focuses on four main predictor constructs namely Performance expectancy (PE), effort expectancy (EE) facilitating conditions (FC) and price value (PV) and therefore does not make use of all the UTAUT construct. It excludes other constructs such as social influence (SI). It also includes price value (PV) which is derived from the UTAUT2 model by Venkatesh, Thong and Xu (2012).

Social influence (SI) being the extent to which consumers perceive significant others such as families and friends influence their usage of a particular technology (Venkatesh *et al.,* 2012),

was not considered in this study. This is because the study focused more on technology adoption at an organisational level/business level rather than at a personal level, therefore SI was dropped from the research model. The study further does not capture any moderating variables in the research model as proposed in both the original UTAUT model and UTAUT2 since these are believed to work best at individual end-user levels. These include age, gender, experience and voluntariness of use.

1.7 Conceptual Framework

This study is guided by UTAUT theory based on four main constructs as espoused by Venkatesh *et al.* (2003). Performance expectancy (PE), effort expectancy (EE) facilitating conditions (FC) and price value (PV) are considered the independent variable in this study, while use intention is the dependent variable. This relationship is modelled in Figure 1.1.

Performance expectancy (PE) is the perceived benefit derived from using a particular technology (Venkatesh et al., 2003). PE in this study is the extent to which a restaurateur perceives VK usage will enhance the restaurant's takeaway operation (Gouveia, 2021). The study believes that the intention to use virtual kitchens (VK) by licensed restaurants in Kenya will be based on the expected performance of such a model. It's widely believed that the adoption of VK would greatly reduce the cost of operations and greatly increase profit margins by improving restaurant's off-premise operations (Madeira *et al.*, 2021; Gouveia, 2021; Pyanikova *et al.*, 2020; Deloitte, 2019).
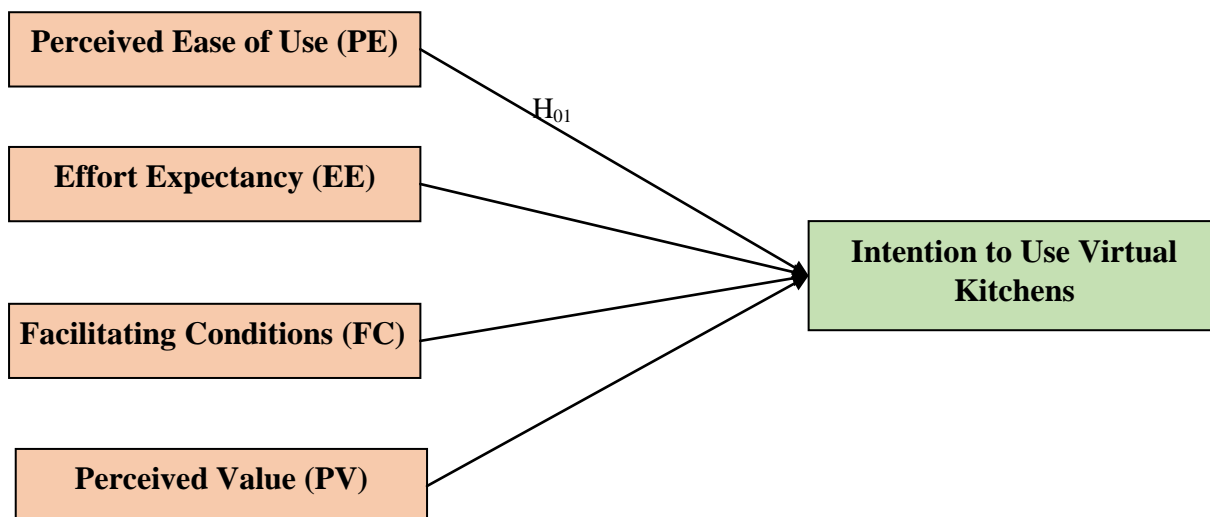
Figure 1.1 Research Model. Source: Adapted from Venkatesh et al. (2003) and Venkatesh et al. (2012)

Effort expectancy (EE) according to Venkatesh *et al.* (2003) and Venkatesh *et al.* (2012), is the perceived ease of technology use. In this study, EE is the degree of ease associated with the implementation of the restaurant's takeaway operation in a VK (Gouveia, 2021). Given that VK is a technology-enabled kitchen (Gouveia, 2021), its adoption would require it not to be complex in its use, therefore rendering the easiness of operations in these kitchens.

Facilitating conditions (FC) are the extent to which existing resources and support systems enable the use of a given technology (Venkatesh et al., 2012; Venkatesh et al., 2003). In this context, Gouveia (2021), argues that it's the restaurateur's perception of how the available resources will support the implementation of a VK in streamlining off-premise F&B operations. Favourable conditions including equipment, workspace, technology, and logistics among other requirements are also, therefore, advocated for to ensure the workability of the VKs. It's therefore believed that restaurateurs would intend to use VK if such conditions are ideal (Gouveia, 2021).

Price value (PV) is another consideration cited to determine the intention to use VK. The price value is the cost incurred by a user (in this case, a restaurateur) using that technology (Venkatesh et al., 2003; Venkatesh et al., 2012). According to Gouveia (2021), PV implies the quid pro quo between the perceived gains and cost related to the use of a VK in streamlining takeaway operations. Restaurateurs will develop an intention to use VK if they believe that such a business model offers more benefits at a better price. These would relate to the monetary cost associated with VK adoption in comparison to the gains that would be made, for instance, the convenience offered and quick delivery of food and beverage to clients (Madeira *et al.*, 2021; Gouveia, 2021; Deloitte, 2019; He *et al.*, 2019).

CHAPTER TWO
LITERATURE REVIEW

This chapter describes the theories underpinning the study constructs. It specifically pays attention to the UTAUT theory upon which the study is anchored. While few empirical studies in line with VK adoption exist, the chapter also makes efforts to present critical analysis of literature by examining extant studies, their outcomes and what the outcomes mean for the current research.

2.1 Theoretical Review

2.1.1 Major Technology Adoption Theories

Various theories have been postulated regarding technology adoption and use among various disciplines including the hospitality industry. The most used theories and models are the diffusion of innovation (DOI) (Rogers, 1983, 1995, 2003), theory of planned behaviour (TPB) (Ajzen 1985, 1991), technology acceptance model (TAM) (Davis 1989, Davis *et al.,* 1989), the technology, organisation and environment (TOE) framework (Tornatzky & Fleischer 1990),actor-network theory (ANT) (Latour, 2005; Law, 1999; Lee & Hassard, 1999), unified theory of acceptance and use of technology (UTAUT) (Venkatesh *et al.,* 2003), extended unified theory of acceptance and use of technology (UTAUT2) (Venkatesh *et al.,* 2012).

DOI illustrates the processes and elements that influence the spread of a new idea (innovation) (Rogers, 1983, 1995, 2003). The theory of reasoned action (TRA) which was proposed by Ajzen in 1985 was modified and extended to the theory of planned behaviour (TPB) by Ajzen in 1991, the aim being to understand and predict individuals' behaviours, in this case, behavioural intention to use technology. TAM has been widely applied to explain an individual's acceptance of technology, therefore focusing on end users (Davis, 1989). According to Davis (1989), two factors namely perceived usefulness and performance expectancy determine the acceptability of a technology system by its potential users.TOE

framework on the other hand explains the adoption process at the firm level. It identifies three aspects of a firm's context, namely the technology, the organisation and the environment that influence the process by which it adopts and implements a technological innovation (Setiowati et al., 2015; Tornatzky & Fleischer, 1990).Venkatesh *et al.* (2003) extended the previous existing technology adoption model including TAM by developing the UTAUT model.

2.1.2 Unified Theory of Acceptance and Use of Technology (UTAUT)

UTAUT model was developed by combining various existing theories and models that were established to help understand technology adoption. The aim was to develop a more comprehensive technology acceptance model that explains users' intentions towards accepting a technology and use behaviour. The original UTAUT model has six constructs namely performance expectancy (PE), effort expectancy (EE), social influence (SI), facilitating conditions (FC), behavioural intention (BI), and user behaviour (UB). The original model also has four moderating variables namely age, gender, experience and voluntariness of use as shown in Figure 2.1.

The extended UTAUT2 model has additional predictor constructs namely hedonic motivation (HM), price value (PV) and habit as shown in Figure 2.2. However, only three moderators are included. Unlike the original UTAUT model, the UTAUT2 model was developed to help understand technology use in the consumer market and not the organisation.

Performance expectancy (PE) is the perceived benefit derived from using a particular technology (Venkatesh et al., 2003).

Social influence (SI) is the extent to which consumers perceive significant others such as families and friends influence their usage of a particular technology (Venkatesh *et al.,* 2012),
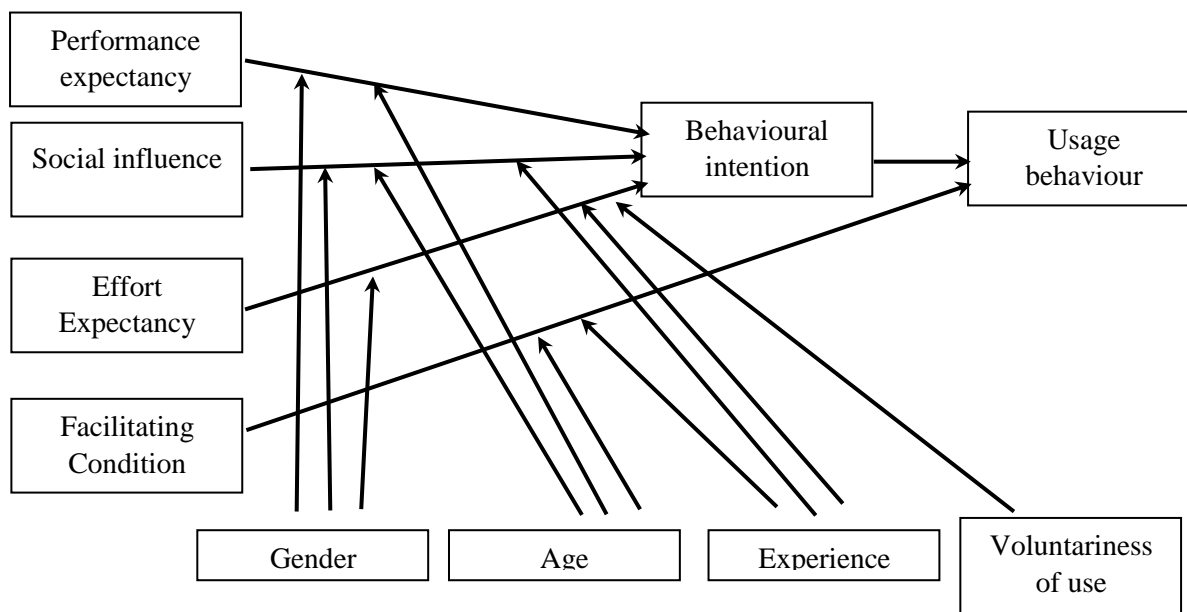
Figure 2.1 : Original UTAUT Model (Venkatesh et al., 2003)
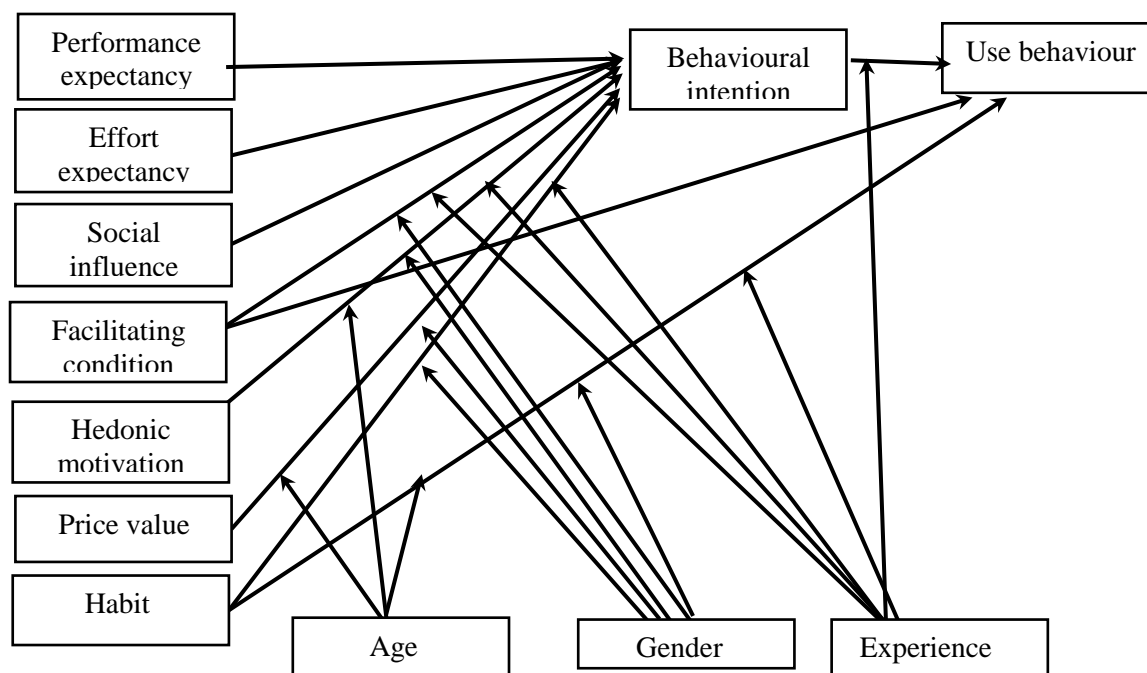
Figure 2.2 : UTAUT 2 Model (Venkatesh et al., 2012)

Effort expectancy (EE) according to Venkatesh et al. (2003) and Venkatesh et al. (2012), is the perceived ease of technology use.

Both the original UTAUT and UTAUT2 model predictor constructs are defined below:

Facilitating conditions (FC) are the extent to which existing resources and support systems enable the use of a given technology (Venkatesh et al., 2012; Venkatesh et al., 2003).

The price value is the cost incurred by a user (in this case, a restaurateur) using that technology (Venkatesh et al., 2003; Venkatesh et al., 2012).

Hedonic Motivation is the fun or pleasure that a technology user derives from using particular technology (Venkatesh et al., 2012).

Habit refers to the tendency to perform behaviours automatically (Venkatesh et al., 2012) and may relate to the habitual use of technology.

2.1.3 Application of UTAUT in the Restaurant Industry

Over the past five years, several studies (e.g., Gouveia, 2021; Palau-Saumell *et al.*, 2019; Lee *et al.*, 2019; Okumus *et al.*, 2018; Khalilzadeh *et al.*, 2017) have applied the UTAUT model to understand technology system use within the restaurant sector in various settings. These are summarised in Table 2.1 below.

UTAUT model was created to help explain the use of new technology at the organisational level rather than the consumer level. The UTAUT model, therefore, finds a better fit in this study as it can be adopted to explain the intention to use VKs by licensed restaurants in Kenya.

Table 2.1: Adoption Models (UTAUT and UTAUT2) applied to the hospitality and tourism context

Author(s)	Research Context	Sample	Model	Statistical Method	UTAUT Variables
Gouveia, 2021	Virtual Kitchens in the foodservice industry, Portugal	N = 55	Modified UTAUT	PLS-SEM (SPSS, XLSTAT & SmartPLS)	PE, EE, FC, PV
Palau-Saumell *et al.*, 2019	Mobile apps for restaurant reservation	N = 1200	Modified UTAUT	SEM and CFA (EQS)	PE, EE, FC, SI, HM, Habit
Lee *et al.*, 2019	Food delivery apps, Korea	N = 340	Modified UTAUT-2	CFA and SEM (SPSS & AMOS)	PE, EE, FC, SI, HM, Habit, PV
Okumus *et al.*, 2018	Smartphone diet apps when ordering food at restaurants inthe USA	N = 395	UTAUT	PLS-SEM (SPSS & SmartPLS)	PE, SI & EE
Khalilzadeh *et al.*, 2017	Mobile payment in the restaurant industry, USA	N = 412	Extended UTAUT Model	SEM (SPSS & AMOS)	SI, EE, FC, HM, PE, BI

2.2 Empirical Review

2.2.1 The Restaurant Sector

Restaurants form an integral part of the hospitality service industry and the economy of a country at large (Martín-Martín *et al.*, 2022; Gouveia, 2021; Kapoor & Vij, 2018; Eurostat, 2013). According to Eurostat (2013), the restaurant sector includes all businesses that offer meals and drinks to the public for direct consumption. It forms an important sector in the economy of many countries especially those that specialise in tourism (Martín-Martín *et al.*, 2022), including Kenya. The restaurant sector includes fine dining, fast food, take-out, and self-service among other ventures that provide food and beverage to the general public (Madeira *et al.*, 2021; Sarıışık, Çavuş & Karamustafa, 2019). According to Gouveia (2021),

the restaurant sector constitutes 27.4% of all the enterprises in the hospitality industry, with over 32,000 businesses accounting for 170,790 employments worldwide. The majority of the restaurants in Kenya are located in main cities namely Nairobi, Mombasa, and Kisumu in that order of dominance. Just like in other parts of the world, this sector represents a significant economic contributor in Kenya, employing thousands of people both directly and indirectly.

Currently, the restaurant sector operates on two business models, namely dine-in and dine-out. Dine-in is a concept that requires consumers to present themselves to the various facilities that offer food and beverage, thriving on the service characteristics of inseparability (Can, 2021; Pyanikova *et al.*, 2020; Sarıışık, Çavuş & Karamustafa, 2019). According to Pyanikova *et al.* (2020), conventional hospitality services cannot be separated from consumers. Most dine-in restaurants are, however, struggling to remain afloat and break even in the competitive industry coupled with advances in technology. The decrease in the dine-in restaurant business model is further gravitated by the effects of the Covid-19 pandemic (Karniouchina *et al.*, 2022; Gouveia, 2021; Guszkowski, 2020) and the decreasing time available for eating out, inconveniences among many other factors (Gouveia, 2021; Deloitte, 2019). Most restaurant customers are also increasingly getting involved in the digital space which in turn shifts their demand for dine-in services (Martín-Martín *et al.*, 2022; Karniouchina *et al.*, 2022; Gouveia, 2021; Can, 2021; Khamidovich, 2021; Kim, Yoo & Yang, 2020). Can (2021) in particular notes that the ability of restaurants to adapt to newly emerging conditions in the restaurant market structure is strategically relevant. Similarly, Khamidovich (2021), opines that the adaptation of restaurant technologies towards enhancing customer service processes, including food delivery, is the success indicator of today's restaurant business. On this note, most restaurants have resorted to dine-out and delivery services leading to a rise in off-the-premise food and beverage facilities (Karniouchina *et al.*, 2022; Gouveia, 2021; Guszkowski, 2020).

Over the years, dining out has become an integral part of food and beverage service where visitors can get food and drinks away from home at a fee (Madeira, Palrão & Mendes, 2021; Pyanikova *et al.*, 2020). According to Gouveia (2021), there is increased demand for more convenient and faster way to source food and beverage. Consequently, the public is quickly turning to online food delivery (OFD) services (Madeira *et al.*, 2021; Gouveia, 2021; Deloitte, 2019; He *et al.*, 2019). In this regard, restaurant operators are responding with several enhanced business models to meet customers' premise needs and digital experiences (Gouveia, 2021; Sestino, Prete, Piper & Guido, 2020; National Restaurant Association and Technomic [NRAT], 2019). In fact, according to NRAT (2019), the provision of off-premise food and beverage services is considered strategic by 78% of restaurant businesses in the United States. Restaurants are therefore reverting to technology driven-processes (Martín-Martín *et al.*, 2022; Karniouchina *et al.*, 2022; Madeira *et al.*, 2021; Pyanikova *et al.*, 2020; Cavusoglu, 2019; Moreno & Tejada, 2019; Dinu, Lazăr & Pop, 2021) through the drive-thru, online food delivery and pickups formats to increase convenience of about 79% of their customers (Gouveia, 2021).

Pyanikova*et al.* (2020) in their study points to the inevitability of the digitalization of the restaurant business. In their study, they reported that technology use in restaurants increases profitability and reduces losses. Pyanikova *et al.* (2020) note that restaurant digitalisation through the adoption of various technology would have an impact on the financial activities of food service providers such as restaurants. They further contend that restaurant digitalisation is required not only to improve service delivery but also cost reduction (Pyanikova *et al.*, 2020).

Despite the demand for dine-out representing a large increase in the restaurant business worldwide, most restaurants in Kenya are characterised by the traditional restaurant layout that fails to meet this demand. This is because these restaurants were designed to offer dine-in

experiences (Gouveia, 2021; Can, 2021; Sarıışık, Çavuş & Karamustafa, 2019). Additionally, having traditional restaurants targeting both dine-in clients and off-premise clients may result ina shortage of food and beverage supplies for the two-clientele base for the restaurant, particularly when operating at maximum capacity (Gouveia, 2021; Lan, Ya, & Shuhua, 2016).

2.2.2 Online Food Delivery and Virtual Kitchens

Advances in technology have given rise to the emergence of third-party platforms that majors on online food delivery (OFD) (Madeira *et al.*, 2021; Pyanikova *et al.*, 2020; Deloitte, 2019; Kapoor & Vij, 2018). Food and beverage sales are projected to reach over USD 198,000 million sales by the end of 2023 (Gouveia, 2021). A third of global consumers today are using food delivery services according to Nielsen study, with about 7% of this making online food delivery requests every week. The OFD market focuses on restaurant-to-consumer (e.g., Domino's, Pizza Hut, Starbucks, etc.) and platform-to-consumer (e.g., Glovo, Jumia Eats, Uber Eats, Bolt Food etc.) kind of e-commerce. According to Gouveia (2021), platform-to-consumer represents the largest global market segment of the two, with China leading in terms of OFD market growth. While OFD's popularity in Europe began in late 2013, in Kenya, OFD started to gain dominance in 2019 mainly through Jumia Eat, Uber Eat and Glovo (Kairu, 2022). This increased significantly during and after post Covid-19 pandemic. Currently, Uber Eats and Glovo hold about 50% of the global market share in OFD. However, the restaurant-to-consumer segment turns out to be the leading category in Europe with its popularity projected to reach a market volume of over USD 41,799 million by 2025.

Virtual kitchens, also called ghost kitchen, cloud kitchens or dark kitchens is a back office (BOH) concept that has been introduced in the restaurant industry to enhance dine-out capabilities through online food delivery or restaurant website (Gouveia, 2021; Koll-Schretzenmayr, 2019; Green, Lai, & Ewing, 2020; Choudhary, 2019). This concept is

therefore believed to reduce the cost of restaurant operation since there are no dine-area, waiting staff and décor needed (Madeira *et al.*, 2021; Gouveia, 2021; Pyanikova *et al.*, 2020; Koll-Schretzenmayr, 2019; Deloitte, 2019; Choudhary, 2019). The location of the VKs is also believed to minimise the cost of operation further as they can be established in low-traffic areas where rent is cheaper (Gouveia, 2021). VKs is further said to create value for both restaurants and customers. For restaurants, VKs are used as a tool to streamline takeaway operations in a B_2B type of e-commerce (Gouveia, 2021; Green *et al.*, 2020; Deloitte, 2019). Similarly, it provides customers with more convenience and diverse options of takeaways, freshness in terms of food and faster delivery using a B_2C type of e-commerce (Gouveia, 2021; Green *et al.*, 2020; He *et al.*, 2019). When coupled with OFD, however, about 15-30% of the meal prices have to be shared with the delivery companies (Gouveia, 2021; He *et al.*, 2019), eating into the restaurant's revenues. Gouveia (2021) further notes that restaurant reputations may be ruined since they have little control over food delivery and marketing and that food quality is usually judged based on what is delivered.

2.2.3 Determinants of Virtual Kitchen Adoption

Adoption of virtual kitchens is still an emerging concept in Kenya (Kairu, 2022) and therefore there is a need to understand its adoption determinants. Previous studies on VKs have focused mainly on qualitative methods with few focusing on quantitative techniques (e.g., Gouveia, 2021). These studies have also adopted various models and theories in understanding VK adoption. Gouveia (2021) for instance used the Unified Theory of Acceptance and Use of Technology (UTAUT) to examine virtual kitchen adoption in Portugal. By focusing on four determinants namely Performance expectancy (PE), effort expectancy (EE) facilitating conditions (FC), and price value (PV). The study also took a case study approach of Kitch Restaurant in Portugal. Their results indicated that performance

expectancy (PE) and price value (PV) significantly predicted virtual kitchen adoption while effort expectancy (EE) and facilitating (FC) conditions did not.

Ongkasuwan et al. (2022) examined virtual kitchen partnership as-a-Service aimed at improving efficiency of healthy and hygienic meal delivery service management in culinary industry. They adopted a mixed method research to collect and analyse data collected from 554 participants and 18 food service providers in Thailand, China and USA. Their study revealed that five variables namely performance expectancy (PE), effort expectancy (EE), social influence (SI), perceived trust (PT) and price value (PV) significantly predicted purchase decisions from online service providers that partnered with VKs. While this study is an indicative of determinant to use VKs and its partnerships, the study mainly focused on customers and not directly on adopters of VKs.

Choudhary (2019) through a case study explored cloud kitchen in terms of business model in India and concluded that both organisation's internal factors (e.g., operations, service, logistics, etc.) and external factors (e.g., customers preference, competition, technological, etc.) affects virtual kitchen adoption. This case study however adopted a descriptive approach and thereby not clear as to how the identified factors would affect virtual kitchen adoption. Capri (2021) surveyed 180 urban consumers to investigate the factors influencing consumer adoption of OFD services in South Africa. Using UTAUT2, the results of the study indicated that performance expectancy (PE), effort expectancy (EE), social influence (SI) and trust were the most important factors influencing OFD adoption. This study, however, focused on adoption of OFD, and not VKs. The study also focused on consumers and not organisations involved in the production and service process of food and beverage.

This current study will, however, adopt a correlational survey research design to analyse views from managers of licensed restaurant in Kenya.

CHAPTER THREE
RESEARCH METHODOLOGY

This chapter describe the study area, research approach and design, study population and sampling criteria adopted. It also describes the data collection tool and the procedures adopted in data collection including variable measurements, pre-test, validity and reliability. It further details procedures and methods adopted in analysis of the collected data and finally the ethical considerations during the research process.

3.1 Study Area

The research was carried out in Kenyan licensed restaurants. Kenya has a variety of food and beverage service outlets, including restaurants. A restaurant, according to the Hotels and Restaurants Act (2009), is any establishment that provides food or drink for a fee. Restaurants in Kenya use a variety of business models, including dine-in and dine-out, with the latter gaining popularity recently. Kenya has a variety of restaurants, including casual dining establishments, fine dining establishments, pizzerias, and family-style establishments. The majority of the restaurants can be found in major cities such as Nairobi and Mombasa, as well as Kisumu, Nakuru, and other major towns. Because of the convenience this business model provides, the restaurant industry in Kenya is now characterized by increased demand for food and beverage takeaway orders through online food delivery platforms such as Glovo, Uber Eats, and Jumia Food, among others.

3.2 Research Approach and Research Design

The research approach is described as the plans and procedures deployed in research that include broad research assumptions as well as detailed methods of data collection, analysis, and interpretation (Creswell & Creswell, 2018; Veal, 2018).In contrast, research design refers to the plans put in place to address research objectives or research questions (Saunders, Lewis & Thornhill, 2019; Creswell & Creswell, 2018; Veal, 2018). Quantitative research designs are generally associated with positivist philosophical underpinnings that involve

predetermined and structured data collection techniques (Saunders et al., 2019; Creswell & Creswell, 2018; Veal, 2018) as will be the case in this study. In line with this, the data for this study was collected and analysed quantitatively using a quantitative approach. In order to collect data through surveys, a correlational research design was used. A correlational study was deemed relevant in this study because it involved hypothesis testing and the analysis of cause-effect relationships.

3.3 Population

According to the Tourism Regulatory Authority [TRA] (2022), there are 149 licensed restaurants classified as class B facilities. As a result, the study targeted all of the 149 restaurant managers/owners. Managers and owners were chosen because they are in charge of investment decisions and thus have a better understanding of the information required for this study.

3.4 Sampling

Given that Kenya has 149 licensed restaurant facilities, the study used a census survey to target all of the managers/owners from the 149 facilities. As a result, all 149 restaurant managers/owners were polled. Census was considered as this number was too small to generate sample from it. Therefore, census survey was deemed adequate.

3.5 Data Collection

This study collected primary data from managers/owners of licensed restaurants in Kenya. Self-administered questionnaires were distributed to the 149 restaurant managers/owners to fill by the help of trained research assistants. Self-administered questionnaires were considered because they allow for the collection of standardised data from a larger sample size in a shorter period of time (Saunders et al., 2019).

3.5.1 Data Collection Instrument

The questionnaire used to collect data for this study was adapted from Gouveia's tool (2021).The questionnaire is divided into three sections: A, B, and C. (see Appendix 3). Part A concentrated on gathering data on demographic characteristics. Part B focused on data collection related to virtual kitchen adoption elements, while Part C concentrated on data collection related to the intention to use virtual kitchens.

3.5.2 Variable Measurement

The main variables investigated in this study were virtual kitchen determinants (as independent variables) and virtual kitchen use intention (as the dependent variable).The UTAUT theory's four main constructs were used to operationalize the determinants of virtual kitchen adoption (Venkatesh et al.,2003).These are performance expectancy (PE), effort expectancy (EE), facilitating conditions (FC), and price value (PV).PE was further operationalised with four measurement items, EE with three measurement items, FC with four measurement items, and PV with four measurement items. The respondents were asked to rate their level of agreement with the measurement items regarding their intention to use the virtual kitchen on a five-point Likert scale. The Likert scale continuum ranged from 1 (Strongly Disagree) to 5 (Strongly Agree), with a value of five carrying more weight (see Appendix 3).

Three measurement items were used to operationalize the dependent variable, which is the intention to use the virtual kitchen. Similarly, respondents were asked to rate their level of agreement with the measurement items regarding their intention to use virtual kitchens on a five-point Likert scale. The Likert scale continuum also ranged from 1 – Strongly Disagree to 5 – Strongly Agree, with a value of five given more weight (see Appendix 3).

3.5.3 Questionnaire Pre-Test

Questionnaire pre-testing was relevant as it helped in detecting misunderstandings, ambiguities, or other difficulties participants in the survey encountered with instrument items (Saunders et al., 2019; Perneger et al., 2015). The questionnaire was pre-tested with other non-licensed restaurants representing 10% of the study sample, i.e., 8 restaurant managers/owners drawn randomly across the country. This was in line with a number of researchers (e.g., Patrick et al., 2011; Beatty & Willis, 2007; Wild et al., 2005) who opined that the sample size for a pre-test study should be between 5 and 10 participants.

To conduct the pre-test, test-retest method was applied. This involved the instrument, after a thorough revaluation by a faculty supervisor, being sent to the 8 targeted respondents via their acquired email using Survey Monkey. The participants were actually informed that they were taking part in a pre-test and therefore were free to take note of any question that posed a challenge in understanding or responding. During the first round, six participants managed to respond to all the questions while the other two did not. There were reported difficulties in question wording, particularly on the dependent variable, where respondents could not tell the difference between using and intention to use. The participants also reported challenges in using Survey Monkey to respond to the questionnaires and proposed that physical questionnaires would be better. Issues raised were rectified and the tool refined farther for simplicity and ease of understanding without losing focus of the study. It was then sent out in person to each of the targeted 8 participants to fill. The respondents were given one week to fill the questionnaires after which their responses were collected back for a second evaluation. Since their responses were complete this time with no major issue reported, their responses were subjected to reliability analysis.

3.5.4 Validity and Reliability

According to Sürücü and Maslakçı (2020), researchers must test both the validity and reliability of an instrument they intend to use in conducting research. Validity is the extent to which a concept is accurately measured in a study (Sürücü & Maslakçı, 2020; Creswell & Creswell, 2018; Veal, 2018; Heale & Twycross, 2015). Various types of validity including content validity, construct validity, face validity, criterion validity, internal validity, external validity, and predictive validity among many others exist (Sürücü & Maslakçı, 2020; Creswell & Creswell, 2018). This study focused more on content validity at this level, which was evaluated using the content validity index. Responses from the pre-test showed no major deviations among the respondents. Further, construct validity was ascertained using exploratory factor analysis

Reliability is the extent to which the study's operations can be repeated with the same results being replicated (Sürücü & Maslakçı, 2020; Saunders et al., 2019; Creswell & Creswell, 2018). It is the consistency of a measurement tool in replicating the same results (Veal, 2018; Heale & Twycross, 2015). Cronbach's alpha was used to assess the instrument's internal consistency, with a value greater than 0.7 considered acceptable. Cronbach's alpha was used to assess the instrument's internal consistency, with a threshold of > 0.7 considered acceptable. However, one item from each of PE, FC, and PV was dropped, and two items from both EE and intention to use VKs were dropped due to reliability coefficients being less than 0.7 when these items were included in the analysis.

3.5.5 Questionnaire Distribution

Initially, the study questionnaire was to be designed and administered through Survey Monkey. However, the pre-test report indicated that respondents preferred physically administered questionnaires. As a result, the final questionnaires were printed and distributed to the targeted respondents with the assistance of trained research assistants. All of the

targeted restaurants were identified and their contact information was obtained from the TRA listings. They were contacted by phone and asked to participate in the study. A letter requesting their participation in the study was also sent to their email address, which they gladly provided. Once this was agreed upon, the researcher obtained a research permit from NACOSTI, allowing the research to proceed (see Appendix 1).Within four weeks, the entire questionnaire distribution and collection process was completed. The majority of the questionnaires were distributed and collected over the course of three weeks, with follow-ups completed in the final week.

3.6 Data Analysis

Data collected was subjected to both descriptive and inferential statistics using SPSS v. 26. Inferential statistics was done through regression analysis. Before conducting regression analysis, descriptive statistics were used to explore and screen the data and understand the demographic composition of the study sample.

3.6.1 Descriptive Statistics

Descriptive statistics was deployed in exploring and screening the data. This involved assessing and addressing cases of missing values and outliers in the data set as well as normality. To assess cases of missing values, the study used missing value analysis option in SPSS. To evaluate cases of outliers, box plots were generated in SPSS and examined. The study deployed both graphical techniques and numerical and statistical tests to assess normality. Graphical techniques such as Quintile-Quintile plots (Q-Q plots) and histograms as well as numerical and statistical tests such as skewness and kurtosis absolute values ±1were used. Data is said to be normally distributed when the skewness and kurtosis values are within the ±1 range. Descriptive statistics was also used to help understand the demographic composition of the study sample by use of frequencies.

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3.6.2 Regression Analysis

Before conducting multiple regression analysis to test the hypotheses, the data was assessed to ascertain whether it meets the regression analysis assumption. These included assessment of linearity, autocorrelation and multicollinearity in addition to normality that is already described above.

Linearity was examined using scatter plots generated in SPSS. The rule of thumb is that, the predictor variables in the regression, (i.e., PE, EE, FC and PV) should have a straight-line relationship with the outcome variable (i.e., intention to use VKs [INT]). The results are presented using figures 4.1a to 4.1d in Appendix 6 for each predictor variable and the outcome variable.

Autocorrelations were evaluated using Pearson's Bivariate Correlation coefficients. The regression coefficients are expected not to be so high (i.e., $r \geq .7$). The results are presented in Table 7 in Appendix 6.

Normality as already described was assessed using Quintile-Quintile plots (Q-Q plots) and the histogram as well as skewness and kurtosis. To assess multicollinearity, variance inflation factor (VIF) threshold value of < 3 was used (Hair et al. 2022). Multicollinearity problem would exist in a data set if the VIF value is > 3. Q-Q plots results are as shown in figures 4.2a to 4.2e while histogram is shown in Figure 13 (see Appendix 6). Skewness and kurtosis results are presented in Table 4 (see Appendix 5) while VIF results are shown in Table 3 in chapter four.

Data was then subjected to multiple regression analysis with intention to use VKs as the dependent variable and performance expectancy (PE), effort expectancy (EE), facilitating conditions (FC) and price value (PV) as the dependent variables. To arrive at one construct in each case, means of the measurement items were computed in SPSS such that the three

measurement items for intention to use VKs would generate one construct called intention to use VKs (INT). The four measurement items for PE would generate one construct called PE and so on.

The regression model is therefore represented by Equation 3.1 as shown below:

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon \ \text{…………………………….……Equation 3.1}$$

Y-Represents the dependent variable (intention to use VKs)

α- the constant of the equation (represents the changes that cannot be explained by independent variables in the model)

X_1Represents Performance expectancy (PE)

X_2Represents Effort expectancy (EE)

X_3Represents Facilitating conditions (FC)

X_4 Represents Price value (PV)

$\beta_1, \beta_2, \beta_3$ **and** $\beta_4$are the coefficients of independent variables

ε **-** error term.

3.7 Ethical Considerations

Once the proposal was approved, the researcher sought research permit from the National Commission for Science, Technology and Innovation (NACOSTI) to conduct the research. Before engaging the participants in the study, their consent to take part in the study was sought for by allowing them fill and sign a consent form (see Appendix 2). They were informed of the study purpose (i.e., for academic purpose) and that they could withdraw from taking part in the study at will. Study participants were assured of privacy and confidentiality

and that no personal information of the participants or restaurants will be published in a manner that directly or indirectly identifies the participants or the hotels.

Further, participants were informed that their participation had no direct benefit. However, the information they provide would be very helpful in completing the study and that the study findings would be informative in guiding VKs adoption by restaurateurs in Kenya. The collected data both hard copies of the questionnaires, consent forms will be kept safe under key and lock cabinet that could be accessed only by the research team. SPSS data file will be password protected and can only be accessible by research team.

CHAPTER FOUR
RESULTS AND DISCUSSIONS

4.1 Introduction

This chapter describes the study findings by emphasizing the methodology used and then presents the findings in accordance with the research objectives. It first report on the questionnaire response rate, then the results on preliminary results regarding the data such as cases of missing values and outliers. The questionnaire reliability results are also presented. Secondly, the chapter presents descriptive statistics results in order to understand the data in terms of distribution and to provide a general overview of the respondents' demographic profile. Finally, the chapter also includes regression analysis results and inferential statistics results related to the research objectives and hypotheses. These are interpreted and discussed in the context of extant research.

4.2 Questionnaire Response, Reliability and Validity

The main objective of this study was to investigate the adoption of virtual kitchens among licensed restaurants in Kenya. The study specifically adopted four components of UTAUT2 such as performance expectancy, effort expectancy, facilitating conditions and price value to understand intention for VK adoption among licensed restaurants in Kenya. To achieve this, a total of 149 self-administered questionnaires were sent out to restaurant managers/owners of the targeted restaurants. All the complete questionnaires were received back for analysis accounting for 100% response rate. This was attributable to series of follow up phone calls and visits to various restaurants where questionnaires had not been collected back by the end of the initial three weeks that were dedicated for data collection.

The internal consistency of the data collection instrument was evaluated using SPSS's Cronbach's alpha. The results in Table 5 (see Appendix 5) show that the measurement items for PE, EE, FC, PV and intention to use VK were consistent in measuring the constructs with Cronbach's alpha ranging between .914 for EE and .952 for PE.

Construct validity of the measurement items was assessed by conducting exploratory factor analysis (EFA) through principal component analysis (PCA). Factor rotation was by varimax approach. Number of factors to extract was based on eigen values > 1. The results indicated a five-factor solution explaining for 85.96% of the variance accounted for. All the respective measurement items loadings on a factor were >.700 with the loadings ranging between .750 and .878 as shown in Appendix 5, Table 6

4.3 Data Screening Results

The results showed that there were no missing values in the data set. Outliers were assessed by creating box plots in SPSS, with the result indicating that there were no outliers in the data. As shown in Appendix 5, Table 4, the data had an average normal distribution, with the majority of the skewness and kurtosis falling within the +1 and -1 thresholds.

4.4 Demographic Profile of Respondents and Restaurants

Demographic characteristics of the respondents and the restaurants are as shown in Table 4.1. the table show that the sample consisted of mainly people aged between 40-49 years at 40.3% followed by 30-39 years at 27.5%. In terms of gender, the majority of the respondents (67.8%) were male. Majority of the respondents (38.9%) had food and beverage related work experience of between 5 – 10 years with the least (8.7%) having food and beverage related work experience of over 20 years. Most of the respondents (65.1%) were restaurant managers, with 57.7% of the respondents having attained diploma education level.

Table 4.1: Demographic profile of respondents and restaurants

Profile	Freq	Percent	Profile	Freq	Percent
Age			*Education Level*		
20 – 29 Years	13	8.7	Diploma	86	57.7
30 – 39 Years	41	27.5	Undergraduate	63	42.3
40 – 49 Years	60	40.3	Total	149	100.0
50 – 59 Years	22	14.8			
60 Plus Years	13	8.7	*Take Away Services*		
Total	**149**	**100.0**	Yes	117	78.5
			No	32	21.5
Gender			**Total**	**149**	**100.0**
Male	101	67.8			
Female	48	32.2	*Take Away Intentions*		
Total	**149**	**100.0**	N/A	117	78.5
			Yes	32	21.5
Experience			**Total**	**149**	**100.0**
< 5 Years	34	22.8			
5 – 10 Years	58	38.9	*Meal Preparation*		
11 – 20 Years	44	29.5	In-Premise	143	96.0
> 20 Years	13	8.7	Off-Site	6	4.0
Total	**149**	**100.0**	**Total**	**149**	**100.0**
Position					
Restaurant Manager	97	65.1			
Restaurant Owner	3	2.0			
Manager and Owner	49	32.9			
Total	**149**	**100.0**			

Majority of the participants surveyed (78.5%) reported that their restaurant was providing take away services with 21.5% of the restaurant not providing take away services. However, all the respondents (21.5%) who indicated that their restaurants were not offering take away services reported intentions to provide take away services. Majority of the respondents (96%) also indicated that their restaurants meal preparation was done within the restaurant premise (in-premise).

4.5 Regression Analysis Assumptions

Prior to conducting regression analysis, the data was examined to see if it met the regression analysis assumption. These included tests for multicollinearity, normality, linearity, and autocorrelation.

4.5.1 Linearity and Autocorrelation Results

Scatter plots generated (see Figures 4.1a to 4.1d in Appendix 6) to examine linearity revealed a strong linear relationship between the predictor variables (EE, FC, PE, and PV) and the dependent variable (INT).Pearson's Bivariate Correlation results (see Appendix 6, Table 7) show that both the dependent and independent variables were correlated at $p < 0.01$.the correlation coefficients ranged between $r = .486$ with respect to FC and INT, and $r = .571$ in respect of PE and INT. this indicated that autocorrelation was not a major issue in this study.

4.5.2 Multivariate Normality and Multicollinearity Results

Quintile-Quintile plots (Q-Q plots) and the histogram show that the data appears to be normally distributed, with no significant deviation from the diagonal (see Figures 4.2a to 4.2e and Figure 13in Appendix 6). This corroborates skewness and kurtosis results, which showed fairly acceptable range of ± 1 for both kurtosis and Skewness (see Table 4). The results show that the data is reasonably normally distributed and that multivariate normality is not a significant issue for this data set. Further results (see Table 3) indicate that multicollinearity is not a problem in this study given low VIF values below 3. The VIF values ranged between 1.635, with respect to FC and 1.835 with respect to PE.

4.6 Determinants of Virtual Kitchen Adoption

In line with the four research objectives, the following research hypotheses were tested using multiple regression analysis in SPSS.

$H0_1$: Performance expectancy does not significantly affect the intention to use virtual kitchens licensed restaurants in Kenya.

$H0_2$: Effort expectancy does not significantly affect intention to use virtual kitchens licensed restaurants in Kenya.

$H0_3$: Facilitating conditions do not significantly affect the intention to use virtual kitchens licensed restaurants in Kenya.

H0$_4$: Price value does not significantly affect intention to use virtual kitchens licensed restaurants in Kenya.

The results (see Appendix 7, Tables 4.6 and 4.7) show that all the predictors namely PE, EE, FC and PV had significant effect on intention to use virtual kitchens (VKs) (F [4, 144] = 20.662, p < .01, R^2 = .604). This means that the four predictors account for 60.4% of the variance in intention to use virtual kitchens (VKs) among licensed restaurants in Kenya.

4.6.1 Effect of Performance Expectancy on Intention to Use Virtual Kitchens

Regression results in Table 4 shows that performance expectancy had a significant effect on intention to use virtual kitchens among licensed restaurants in Kenya (β = .195, t = 2.531, p < .05).As a result, the first null hypothesis of the study was rejected and the alternative hypothesis adopted. Performance is always at the core of any organisation including licensed restaurants. The perceived benefit derived from using a specific technology is referred to as *performance expectancy* (Venkatesh et al., 2003; Venkatesh et al., 2012). In this context, it's the belief that VK adoption will be beneficial to the adopters, i.e., the restaurants. The study results indicate that a percentage increase in the belief that VK will lead to beneficial outcomes (performance expectancy) will increase intention to use VK among licensed restaurants by about 0.20%.

The study generally indicates that restaurants are more likely to adopt VKs if they believe that its adoption will enhance performance of the operation. Through adoption of VKs, licensed restaurants in Kenya would be better off in terms of fulfilling takeaway orders made through online food delivery systems. This would bring about conveniency and enhanced speed in fulfilment of online orders, which in turn would enhance productivity of the restaurants in terms of sales. The findings support that of Gouveia (2021) and Ongkasuwan et al. (2022) who reported that PE significantly predicted VK adoption. The study also corroborates other similar findings that used UTAUT in understanding technology adoption.

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For instance, Capri (2021) in his study indicated that PE significantly affected adoption and use of online food delivery systems.

Table 4.2: Regression Coefficients

Model	USTC		STC			COS	
	B	STE	Beta	t	Sig.	TOL	VIF
(Constant)	.638	.360		1.772	.078		
Performance Expectancy (PE)	.195	.092	.192	2.131	.035	.545	1.835
Effort Expectancy (EE)	.187	.093	.173	2.000	.047	.591	1.693
Facilitating Conditions (FC)	.215	.091	.202	2.374	.019	.611	1.635
Price Value (PV)	.206	.099	.182	2.073	.040	.575	1.740

Note:
a.   Dependent Variable: Intention to use VKs (INT)
USTC - Unstandardized Coefficients; STC - Standardized Coefficients; COS - Collinearity Statistics; STE - Std. Error; TOL – Tolerance; VIF – Variance Inflation Factor

4.6.2 Effect of Effort Expectancy on Intention to Use Virtual Kitchens

Table 4.2 also indicate that effort expectancy had a significant effect on intention to use virtual kitchens among licensed restaurants in Kenya (β = .187, t = 2.000, p < .05). Similarly, the second null hypothesis of the study was rejected and the alternative hypothesis adopted. *Effort expectancy* is the degree of expediency and the easiness experienced when using a particular technology (Venkatesh et al., 2003; Venkatesh et al., 2012). VKs though functions similar to a typical kitchen where personnel are used to working, they are technologically advanced kitchens designed to maximize delivery. It is therefore expected that VK operation and its technological application should be easily understandable by its adopters or users among licensed restaurants in Kenya. The study results indicate that a percentage increase in the belief that VK use will be easy (effort expectancy) will also increase intention to use VK among licensed restaurants by about 0.20%.

The study suggests that restaurants are more likely to adopt VKs if they believe that its adoption will be an easy process free from any technicality and complexity. Users should find it easy to transfer food and beverage preparation of the takeaway orders to a VK. It should

therefore be easy for staff to learn and find use of VK easy. The findings of this study are consistent with Ongkasuwan et al. (2022) who reported that EE significantly predicted VK adoption. It also supports findings of Capri (2021) who found that EE was a significant predictor of OFD use. The findings are in consistent with similar studies (e.g., Venkatesh et al., 2003; Venkatesh et al., 2012) that used UTAUT construct, effort expectancy in predicting intention to use a new technology. The study findings, however, contradicts findings of Gouveia (2021) who concluded that EE had no significant effect on adoption of virtual kitchens in Portugal.

4.6.3 Effect of Facilitating Conditions on Intention to Use Virtual Kitchens

Regression analysis results (see Table 4.2) reveals facilitating conditions had a significant effect on intention to use virtual kitchens among licensed restaurants in Kenya ($\beta = .215$, t = 2.374, $p < .05$). The results lead to rejection of the third null hypothesis of the study and adoption of the alternative hypothesis. Facilitating conditions as a construct in UTAUT is the perception that relevant infrastructure and structures needed for successful adoption of a new technology is available to use the intended technology (Venkatesh et al., 2003; Venkatesh et al., 2012). In this context, facilitating conditions will largely be determined by indicators such as availability of relevant equipment and space for production, availability of point of sale (POS) systems that can integrate with the VK, packaging amenities, logistical integration as well as availability of relevant structures that would link the VK to existing OFDs. According to the current study findings, a percentage increase in the perception that relevant structures and infrastructures are available to support VK use (facilitating conditions) increases intention to use VK among licensed restaurants by about 0.22%.

The study findings imply that for licensed restaurants in Kenya to use VKs, there is a need to ascertain availability of relevant structures and conditions needed to expand their business to a more efficient delivery model. These conditions relate to equipment for production and

packaging, space availability, technology e.g., POS and OFDs, as well as logistics in terms of partnering with delivery companies. According to the current study findings, restaurateurs will only develop intentions if they believe the conditions are ideal for implementing the VK model (FC). The results of this current study support Ongkasuwan et al. (2022) who reported that FC had a significant effect on VK adoption in Thailand, China and USA. It further corroborates other similar studies (e.g., Venkatesh et al., 2003; Venkatesh et al., 2012) that used UTAUT construct, facilitating conditions, in predicting technology adoption. The study findings, however, contradict Gouveia's (2021) findings, which found no significant effect of facilitating conditions on virtual kitchen adoption in Portugal. The findings also do not conform with that of Capri (2021) who on the contrary reported non-significant effect of facilitating conditions on adoption of OFDs.

4.6.4 Effect of Price Value on Intention to Use Virtual Kitchens

The results of the regression analysis (see Table 4.3) show that facilitating conditions had a significant effect on the intention to use virtual kitchens among licensed restaurants in Kenya (β =.206, t = 2.073, p<.05). The findings lead to the rejection of the study's fourth null hypothesis and the acceptance of the alternative hypothesis. *Price value* is defined as the cost incurred by a user when using a technology (Venkatesh et al., 2003; Venkatesh et al., 2012). Various business operations including restaurants are always conscious about their costs of operations and would only consider those strategies that offset their cost in relation to benefits realized. VKs use have got cost bearings in monetary terms and therefore restaurateurs often have to choose between the cost implications of VKs and the benefits attributable to VK use. In this context, cost implication in relation to use of VKs would include lower initial investment costs, reduced rental cost, reduced cost on staff and reduced marginal cost of operation. In accordance with the current study findings, a percentage increase in the perception that VK use will lead to reduced cost of operation in comparison to

the benefits (price value) increases intention to use VK among licensed restaurants by about 0.21%.

The study findings generally suggests that restaurant managers and owners will be more willing to use VKs if the perceive that there will be a significant reduction in the cost involved in the adoption of VK as compared to the accruing benefits of VK use. While there would be additional cost such as those incurred in partnering with delivery companies, OFDs linkage as well as commissions paid to delivery personnels, the benefits realized such as reduced cost related to in house staff, and rental units outweighs the cost incurred. The findings back up those of Gouveia (2021) and Ongkasuwan et al. (2022), who found that PV significantly affected VK adoption. The study also supports previous findings that used UTAUT to understand technology adoption (e.g., Venkatesh et al., 2003; Venkatesh et al., 2012; Capri, 2021).Capri (2021), for example, found that PV had a significant impact on the adoption and use of online food delivery systems in his study.

CHAPTER FIVE

CONCLUSIONS, LIMITATIONS AND RECOMMANDATIONS

This chapter presents conclusions, limitations and recommendations of this study. It begins by first presenting the study conclusions in relations to the research objectives and the implications of the same to practitioners. It then discusses the study limitations and finally presents study recommendations.

5.1 Conclusions

The main objective of this study was to investigate determinants of virtual kitchen adoption of among licensed restaurants in Kenya. The study adopted UTAUT theory in order to understand adoption of VKs among licensed restaurants in Kenya by focusing on four UTAUT constructs, namely performance expectancy (PE), effort expectancy (EE), facilitating conditions (FC) and price value (PV) and how these affects intention to use virtual kitchens (VKs). Data was collected from 149 restaurant managers/owners of 149 licensed restaurants in Kenya and subjected to multiple linear regression analysis.

The first and foremost, the study set out to determine the effect of performance expectancy on the intention to use virtual kitchens licensed restaurants in Kenya.Performance expectancy in this study context is the perceived benefit derived from using VKs.The study findings indicated that performance expectancy significantly affects intention to use VKs among licensed restaurants in Kenya. The implications of these findings are that restaurateurs will first analyse the VKs in terms of its ability to enhance performance of the restaurants before making decisions to use it. Performance enhancement in this case would be in relation to convenience, efficiency and enhanced speed of delivery of orders as well as the possibilities of VKs increasing productivity and profitability of the restaurants.

Secondly, the study set out to identify the effect of effort expectancy on the intention to use virtual kitchens licensed restaurants in Kenya. Effort expectancy is the degree of easiness in

terms of using VKs without posing any challenges or technicality to the restaurateurs. The study findings revealed that effort expectancy significantly affects intention to use VKs among licensed restaurants in Kenya. The implications of this findings are that restaurateurs will first assess the possibilities VKs in terms in terms of its usability and friendliness in carrying out intended operations before making decisions to use it. These include ease of transferring food and beverage preparations of the takeaway orders to VK. VK should also be easy to learn and understand by staff for it to considered for adoption by restaurateurs.

The third objective of the study was to determine the effect of facilitating conditions on the intention to use virtual kitchens licensed restaurants in Kenya.Facilitating conditions in this context means perceived availability of the relevant conditions including infrastructure and structures needed for successful adoption VKs. The study findings indicated that facilitating conditions is a significant determinant of intention to use VKs among licensed restaurants in Kenya. The study, therefore, implies that restaurateurs will likely adopt VKs if relevant facilitating conditions such as availability of the needed equipment, space availability, logistical integration with delivery platforms and relevant structures are in place.

The final specific objective of the study was to identify the effect price value on the intention to use virtual kitchens licensed restaurants in Kenya. Price value in this case relates to the cost implications of using VKs by licensed restaurants in Kenya in comparison to the benefits resulting from using the same. The study findings show that price value is a significant predictor of intention to use VKs among licensed restaurants in Kenya. The study acknowledges the fact that VK use would have some cost bearings on the users in terms of offsetting cost of online order deliveries. However, it emphasizes that restaurateurs while attempting to seize the benefits provided by the online delivery options of takeaway orders,

do always assess the cost implications of the same before deciding to use VKs. It suggests that they would adopt VKs only if the benefits outweigh the cost of VK use.

5.2 Limitations and Recommendations

While this study presents some interesting findings about VK adoption among licensed restaurants in Kenya, it harbours some limitations. The study begins by recognizing the scarcity of scientific literature on the VK business model. This study can thus be considered preliminary, particularly in Kenya. Secondly, the study focused on licensed restaurants in Kenya, and did not consider other restaurant set ups in Kenya. Kenya has a number of unlicensed restaurants that could also be providing food and beverage takeaway services. It's not clear as to whether such restaurants would be interested in the VK business model. As a result, the findings of this study may differ. The finding of this study should therefore be interpreted in line with licensed restaurant businesses in Kenya only. The OFD market in Kenya remains unregulated, though there are emerging concerns regarding OFD operations. OFD being a very key component to success of VKs may affect how VKs operate and interact with various stakeholders.Finally, the study was purely quantitative in nature. Given that VK is still an emerging phenomenon in Kenya, it would be interesting to conduct more in-depth investigations by adopting a qualitative lens.

The study therefore makes recommendations for future research as follows:

a) There is a need to investigate adoption of VKs by restaurant categories not included in this study and results compared.

b) There is a need to investigate VK adoption in relation to OFD partnership in Kenya in order to understand the role of other stakeholders in the process of VK adoption. In this case, there is a need to incorporate other UTAUT constructs such as social influence, hedonic motivation among others.

c) More research is needed to investigate the potential of VKs and their impact on the current state of the food and beverage market.

d) Future studies can incorporate restaurant age to determine their effect on intention to use VKs.

e) There is also a need to conduct a mixed method research regarding VK adoption in Kenya in order to get a deeper understanding.

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APPENDICES

Appendix 1: NACOSTI Research Permit

Appendix 2: Sample Informed Consent Form

MASENO UNIVERSITY

INFORMED CONSENT FORM FOR RESTAURANT MANAGERS/OWNERS

You are invited to take part in a study titled ***Determinants of Virtual Kitchen Adoption Among Licensed Restaurants in Kenya*** as part of ethical procedures, your consent to participation is required. Kindly fill the form as required to express your consent.

Name of Principle Investigator: ***Violet Chebet***

Name of Organisation: ***Maseno University***

Name of Project and Version: ***MSc in Hospitality Research***

This Informed Consent Form has two parts:

    I.   Information Sheet (to share information about the study with you)

    II. Certificate of Consent (for signatures if you choose to participate)

You will be given a copy of the full Informed Consent Form

Part I: INFORMATION SHEET

Introduction

I am a masters student in the Department of Eco-tourism, Hotel and Institution Management, Maseno University. As part of my MSc degree in Hospitality Management, I am carrying out a study that is concerned with virtual kitchen (VK) adoption among licensed restaurants in Kenya. VK is an emerging phenomenon in Kenya and its uptake is occasioned by the ever-increasing demand for takeaway orders through online food delivery platforms such as Uber Eats, Glovo, Jumia Food among others. It's my duty therefore to provide you with

information that will inform your decision to take part in this study or not.

Purpose of the Research

This study is to be conducted among licensed restaurants in Kenya targeting managers and owners of these restaurants. The study applies UTAUT theory construct such as performance expectancy (PE), effort expectancy (EE), facilitating conditions (FC) and price value (PV) by assessing how they affect intention to use VKs.

Type of Research Intervention

The research requires you to take part by filling self-administered questionnaires that will be given out only when you consent to participation.

Participant Selection

You are being invited to take part in this research because we feel that your experience as a restaurant manager or owner can contribute much to our understanding VK adoption among licensed restaurants in Kenya.

Voluntary Participation

Your participation in this research is entirely voluntary and the choice that you make will have no bearing on your job or organisation or on any work-related evaluations or reports.

Procedures

We are inviting you to take part in this research project. If you accept, you will be asked tofill out a survey which will be provided by and collected by research assistants in a span of three to four weeks. You may also mail the completed questionnaire back to the principal investigator using the contacts provided under the "who to contact" section. Any question or clarification regarding the research are welcomed and can be directed to the principal investigator at any time through the contacts provided. If you do not wish to answer any of the questions included in the survey, you may skip them and move on to the next question. The information recorded will be treated with highest level of confidentiality and your name or that of your institution will not be mentioned anywhere. The data will be stored in the principal researcher's computer and the content will be password protected. The information is solely for writing my MSc project and no one else except myself and my research assistant will have access to your survey.

The questions in this research are basically general and they revolve around the organisation, the respondents' demographic profile, and determinants of VK adoption.

Duration

The research takes place over a period of three to four weeks. The first three weeks will be used entirely for distribution of the questionnaires while the last week for conducting follow ups.

Benefits and Compensations

There will be no direct benefit to you, but your participation is likely to help us develop insights that will be useful in the adoption of VKs by licensed restaurants in Kenya. You will also not be provided any incentive to take part in the research.

Risks

We don't envisage any negative consequences for you in taking part in this study. However, it is possible that you may share some personal or confidential information by chance, or that you may feel uncomfortable talking about some of the topics. We do not wish for this to happen. You therefore do not have to answer any question or take part in the survey if you feel the question(s) are too personal or if talking about them makes you uncomfortable.

Sharing the Results

Nothing that you tell us today will be shared with anybody outside the research team, and nothing will be attributed to you by name directly or indirectly. The knowledge that we get from this research will be shared through my MSc project, publications in journals and conferences. Each participant may also request a summary of the results six months after their participation.

Who to Contact

Questions regarding this research are welcomed now or later. If you wish to ask questions later, you may contact any of the following: Violet Chebet, Mobile number: 0721498109, Email: viobillcheb@gmail.com

Part II: CERTIFICATE OF CONSENT

Research Title: *Determinants of Virtual Kitchen Adoption Among Licensed Restaurants in Kenya*

Name and Contacts of the Researcher: *Violet Chebet, MSc Student, Department of Eco-Tourism Hotel and Institution Management, Maseno University, P.O. Box 333 – 40105, Maseno. Mobile number: 0721498109, Email:* viobillcheb@gmail.com

I _____[name of the participant] have been invited to participate in research whose title is *"Determinants of Virtual Kitchen Adoption Among Licensed Restaurants in Kenya ".*

		Please Initial Ellipses
1.	I confirm that I have read and understand the information sheet for the above study and have had the opportunity to ask questions.	[ ]
2.	The purpose and nature of the study has been explained to me in writing	[ ]
3.	I agree to take part in the above study.	[ ]
4.	I understand that my participation in this study is voluntary and that I am free to withdraw at any time, without giving reason.	[ ]
5.	I agree to the interview being audio recorded	[ ]
6.	I agree to the interview being video recorded	[ ]
7.	I understand that anonymity will be ensured in the write-up by disguising my identity.	[ ]
8.	I understand that disguised extracts from my interview and or questionnaire survey may be quoted in the thesis and any subsequent publications	[ ]
9.	I agree to the use of anonymised quotes in publications	[ ]

_____   _____   _____

Name of Participant   Day/Month/Year   Signature

_____   _____   _____

Name of Researcher   Day/Month/Year   Signature

Appendix 3: Questionnaire

Violet Chebet

Postgraduate Student, Maseno University

MASENO, KENYA

Email: viobillcheb@gmail.com

Dear Sir/ Madam,

RE: <u>COMPLETION OF RESEARCH QUESTIONNAIRE</u>

I am Chebet Violet, an MSc Hospitality Management student at Maseno University, Department of Ecotourism, Hotel and Institution Management. I am currently collecting data for my project analysis and writing titled "***Determinants of Virtual Kitchen Adoption Among Restaurants in Nairobi County***". I am therefore appealing for your input by filling in the attached questionnaire to help me complete my studies. The results arising from this study are for research purposes and will be treated with the highest level of confidentiality. I appreciate your sincere and constructive input.

For more information and clarification, you may contact the researcher via Cell Phone: at 0721498109, or via e-mail at viobillcheb@gmail.com

Thank you for your sincere responses and the cooperation accorded.

Yours faithfully,

Chebet Violet

Postgraduate Student (Principal Investigator), Department of ECOHIM, Maseno University

Attached: Survey Questionnaire

THE SURVEY QUESTIONNAIRE

PART A: DEMOGRAPHIC CHARACTERISTICS

Respond to the questions in this part by checking (√) the appropriate box

Q1. What is your age group?

20 – 29 Years □   30 – 39 Years □   40 – 49 Years □

50 – 59 Years □   60 Plus Years □

Q2.What is your Gender?

Female□   Male □   N/A □

Q3. What is your F&B industry experience in years?

< 5 Years □   5 – 10 Years □ 11 – 20 Years □   > 20 Years □

Q4. What is your job position?

Restaurant Manager □   Restaurant owner □   Owner/Manager □

Q5. What is your education Level?

Secondary Level □   Diploma Level □   Undergraduate Level □

Postgraduate Level □   Others (Specify)_____

Q6. Does your restaurant offer takeaway services?

Yes□   No□

Q7. If your answer in Q6 above is No, does your restaurant intend to venture into takeaway services?

Yes□   No□

Q8. Where do you prepare the meals intended for takeaway?

In-house □   Off-site □

PART B: VIRTUAL KITCHEN ADOPTION ELEMENTS

This section of the questionnaire seeks to obtain your responses concerning virtual kitchen adoption based on four key adoption issues namely Performance Expectancy (PE), Effort Expectancy (EE), Facilitating Conditions (FC) and Price value (PV).

Kindly respond to the following statements regarding virtual kitchen adoption by indicating the level of agreement with the statements provided, whereby 1 – Strongly Disagree to 5 – Strongly Agree

Performance Expectancy (PE)		Strongly Disagree	Disagree	Neither Agree Nor Disagree	Agree	Strongly Agree
PE1	I would find a VK useful to fulfil the online orders for takeaway	1	2	3	4	5
PE2	I think using a VK to fulfil the online orders would be more convenient than using my existing kitchen	1	2	3	4	5
PE3	I believe that using a VK would help me to fulfil the delivery orders more quickly	1	2	3	4	5
PE4	I believe using a VK to fulfil the online orders for takeaway would increase my restaurant's productivity	1	2	3	4	5

Effort Expectancy (EE)		Strongly Disagree	Disagree	Neither Agree Nor Disagree	Agree	Strongly Agree
EE1	I think it would be easy for me to transfer the preparation of the takeaway orders to a VK	1	2	3	4	5
EE2	I believe that my staff would easily learn how to work in a VK	1	2	3	4	5
EE3	I believe that it would not take me long to learn how to use the technology provided by the VK	1	2	3	4	5

Facilitating Conditions (FC)		Strongly Disagree	Disagree	Neither Agree Nor Disagree	Agree	Strongly Agree
FC1	I believe that the equipment and space provided in this kitchen would be appropriate for my operation	1	2	3	4	5
FC2	I believe the POS system integrated into the kitchen would be convenient for my operation	1	2	3	4	5
FC3	I believe that the packaging provided by VK would enable me to deliver better-quality food to customers	1	2	3	4	5
FC4	I believe that this model has a logistical operation that would make It easier for me to interact with the couriers	1	2	3	4	5

Price value (PV)		Strongly Disagree	Disagree	Neither Agree Nor Disagree	Agree	Strongly Agree
PV1	I believe that this model requires a lower initial investment to increase the capacity of my kitchen	1	2	3	4	5
PV2	If I use a Virtual Kitchen, I believe I would be able to save money in rent every month	1	2	3	4	5
PV3	By using a VK, I believe I would be able to save money on staff	1	2	3	4	5
PV4	I believe I would be able to increase my profit margin per meal if I use a VK	1	2	3	4	5

PART C: INTENTION TO USE VIRTUAL KITCHEN

This section of the questionnaire seeks to obtain your responses concerning your intention to use virtual kitchens.

Kindly respond to the following statements regarding the intention to use the virtual kitchen by indicating the level of agreement with the statements provided, where1 – Strongly Disagree to 5 – Strongly Agree

Intention to Use Virtual Kitchens (VK)	Strongly Disagree	Disagree	Neither Agree Nor Disagree	Agree	Strongly Agree
INT1 I intend to relocate the takeaway operation to a VK	1	2	3	4	5
INT2 I intend to use a VK to fulfil the online orders for takeaway	1	2	3	4	5
INT3 As soon as possible, I intend to use a VK as it will add value to my business	1	2	3	4	5

Thank You

Appendix 4: TRA List of Licensed Restaurants in Kenya

S/N0.	NAME OF ESTABLISHMENT	LICENSE NO.	COUNTY
1	Kipevu Restaurant Ltd	35911	Nairobi
2	Wild Waters Limited	36538	Mombasa
3	Spring Time Ltd T/A Baby Marrow Restaurant	3807	Kilifi
4	Close The Gap Limited	31772	Mombasa
5	BenosKenduiyo Ltd	39292	Bomet
6	The Lobo Village	34278	UasinGishu
7	Mediheal Cafeteria	34259	UasinGishu
8	Hubei Bar And Restaurant	39182	Nakuru
9	Itz Flavours Limited	36490	Mombasa
10	Culture Mambo Lounge	39389	Nakuru
11	The Food Movement	38309	Kilifi
12	Coffee Shop Lo Sfizio	38308	Kilifi
13	Rivervale Holdings	34258	UasinGishu
14	Millenium Cinemas Limited	35846	Mombasa
15	Nuu'sShawarma	38361	Kilifi
16	Miyako Café	34270	UasinGishu
17	Caeser's Water Front	34302	U. Gishu
18	Giga Bites Eldoret	34281	UasinGishu
19	Gilanis Restaurant	35865	Nakuru
20	Shimoni Aqua Ventures	36620	Kwale
21	Eldostream Restaurant	34291	UasinGishu
22	Better Health Restaurant	34251	UasinGishu
23	Aquadrom Limited	38832	Mombasa
24	Big Square	34292	U. Gishu
25	The Party Island Limited	39329	Nakuru
26	Yummy Factory Group Limited	0 39715	Nairobi
27	Pins Entertainment Ltd	0 37688	Nairobi
28	Conference Caterers	0 40007	Nairobi
29	Tin Tin Restaurant Ltd	0 36981	Nairobi
30	The Arks Restaurant	34369	Trans Nzoia
31	Bbrood Kenya Ltd	0 40917	Nairobi
32	Magic Peak Ltd T/A	0 35297	Nairobi
33	Eagle Peak Ltd	0 35298	Nairobi
34	Growers Café Ltd	0 40779	Nairobi
35	The Tavern Ltd	0 32700	Nairobi
36	Gauchos Limited	0 39799	Nairobi
37	Clay Oven Limited	0 39955	Nairobi
38	Ankole Grill Limited	0 37488	Nairobi
39	ChakulaChema Bar and Restaurant	33500	Kilifi
40	African Forest Lodges Limited	0 37281	Nairobi
41	Pizza Time-Chicken Run	34323	UasinGishu
42	Cai Ventures T/A New Cai Resort	0 34014	Machakos
43	Bradomm Star Ventures Limited	0 35563	Nairobi
44	Kathiani Inn	0 37879	Machakos
45	A.R. Casuarina Ltd	38124	Kilifi
46	Zen Garden Ltd	0 39707	Nairobi
47	Maita Lux Garden Resort Limited	34340	Nandi

48	Milan Concepts Limited	0 39837	Nairobi
49	The Graceful Chinese Restaurant	0 37212	Nairobi
50	Horientertainment Ltd T/A Chekafe Japanese Restaurant	0 35424	Nairobi
51	Mubarak Café	34349	UasinGishu
52	Sunjeel Palace Limited	34373	UasinGishu
53	Apache Indian Restaurant	33303	Kilifi
54	Joma Resort	34331	Nandi
55	Kitchenette Bistro & Café Limited	0 37504	Nairobi
56	Kerio Green Dreams	34344	UasinGishu
57	Lafavorito Restaurant	0 37279	Nairobi
58	Red Lantern	34354	UasinGishu
59	Three Pedals Resort	34360	Nandi
60	Open House Restaurant Limited	0 37679	Nairobi
61	Suhana Ventures Ltd T/A Kailash Parbat	0 39780	Nairobi
62	Tokyo Restaurant	0 36875	Nairobi
63	Misono Japanese Restaurant	0 37053	Nairobi
64	Lesan Caterers Ltd	0 35576	Nairobi
65	Fusion Veg Limited	0 32739	Nairobi
66	Taj Express (K) Ltd	0 37534	Nairobi
67	Texas Arena Choma Zone	0 36279	Kajiado
68	Xanadu Investments Limited T/A	0 40834	Nairobi
69	Makuti Springs	34371	Trans Nzoia
70	Acorn To Oak Ventures	11185	UasinGishu
71	Siam Restaurant Ltd	11170	UasinGishu
72	Kingsbury Group Ltd T/A Mister Wok	0 35572	Nairobi
73	Lsg Sky Chefs Kenya Ltd	0 39989	Nairobi
74	Encounter Camps Limited	0 35338	Kiambu
75	Nautilus Restaurant	37969	Kilifi
76	Umang Holdings Ltd T/A Open House Karen	0 36291	Nairobi
77	Trout Tree Restaurant	33625	Nyeri
78	Villa Dreams Resort	11146	UasinGishu
79	Canaan Restaurant	11187	Trans Nzoia
80	Casa Pietro Restaurant	38034	Kilifi
81	Bosphorous Company Ltd T/A Pizza Pitta	0 37109	Nairobi
82	MesoKicthen And Bar	0 37506	Nairobi
83	Jit Mart Ltd T/A Bambino Latin Italian Kicthen And Bar	0 37508	Nairobi
84	Jit Mart Ltd T/A Mercadomexican Kitchen And Bar	0 37509	Nairobi
85	MesoKicthen And Bar	0 37506	Nairobi
86	Kiambethu Farm Ltd	0 37473	Nairobi
87	Slate Kitchen And Bar	0 37505	Nairobi
88	Inti By Jit Ltd T/A Inti A Nikkie Experience	0 37893	Nairobi
89	Inti By Jit Ltd T/A Inti A Nikkie Experience	0 37893	Nairobi
90	McFrys Ltd- Hurligham	0 35130	Nairobi
91	McFrys Ltd- Karen	0 35131	Nairobi
92	McFrys Ltd- Lavington	0 35132	Nairobi
93	McFrys Ltd- Limuru Rd	0 35133	Nairobi
94	McFrys Ltd- 3rd Parklands Rd	0 35134	Nairobi

95	McFrys Ltd- Westlands	0 35135	Nairobi
96	McFrys Ltd- Adams Arcade	0 35136	Nairobi
97	McFrys Ltd- Kiambu Rd	0 35137	Nairobi
98	McFrys Ltd- Butere Rd	0 35138	Nairobi
99	McFrys Ltd- Muthaiti Rd	0 35139	Nairobi
100	Mc Frys Ltd- Mai Mahiu Rd	0 35140	Nairobi
101	Mc Frys Ltd- Langata Rd	0 35141	Nairobi
102	McFrys Ltd- Ngong Rd	0 35142	Nairobi
103	McFrys Ltd- South B	0 35143	Nairobi
104	The MC FRYS LTD	0 35130	Nairobi
105	Chicago The Pizza Place Ltd	0 37498	Nairobi
106	Chicago The Pizza Place Ltd	0 37498	Nairobi
107	Bakers Point Yard	11173	UasinGishu
108	Bakers Point Yard	11173	UasinGishu
109	ChowpatyWestlands Limited	0 37211	Nairobi
110	ChowpatyWestlands Limited	0 37211	Nairobi
111	Chinese Corner Ltd	0 37659	Nairobi
112	Chinese Corner Ltd	0 37659	Nairobi
113	Afritopia Limited T/A Rift Valley Spur	0 40913	Nairobi
114	Afritopia Limited T/A RocomamasSarit Centre	0 36967	Nairobi
115	Afritopia Limited T/A Silver Tream Spur	0 37108	Nairobi
116	Afritopia Limited T/A Rocomamas Village Market	0 37110	Nairobi
117	Afritopia Limited T/A RocomamasSarit Centre	0 36967	Nairobi
118	Afritopia Limited T/A Silver Tream Spur	0 37108	Nairobi
119	Afritopia Limited T/A Rocomamas Village Market	0 37110	Nairobi
120	Haandi Restaurant Ltd	0 37280	Nairobi
121	Haandi Twenty Four Carats Ltd	0 37495	Nairobi
122	Haandi Restaurant Ltd	0 37280	Nairobi
123	Haandi Twenty Four Carats Ltd	0 37495	Nairobi
124	Oriental Food Kings Ltd	0 35296	Nairobi
125	Oriental Food Kings Ltd	0 35296	Nairobi
126	Urban Smoke Limited	LAIKIPIA	Nanyuki
127	Urban Smoke Limited	9182	Laikipia
128	Urban Smoke Limited	9182	Laikipia
129	Somaki Ltd T/A Bar Bar Restaurant	29013	Kilifi
130	Mitsuki Group Ltd T/A Sushi Mitsuki	0 35444	Nairobi
131	Leading Edge Food And Entertainment Compnay	0 39983	Nairobi
132	Leading Edge Food And Entertainment Compnay	0 39983	Nairobi
133	Brand Discovery Limited	0 32864	Nairobi
134	Brand Discovery Limited	0 32864	Nairobi
135	Bradegate Restaurant-Nyeri	33731	Nyeri
136	Wasafi Swahili Dishes	38099	Kilifi
137	Kipchimatt Hotel	34339	Nandi
138	Spiced Basil Limited	0 40053	Nairobi
139	Spiced Basil Limited	0 40053	Nairobi
140	Nirvana Vegetarian Khazana Ltd	0 40075	Nairobi
141	Nirvana Vegetarian Khazana Ltd	0 40075	Nairobi
142	Chowpaty Deluxe Limited	0 37218	Nairobi
143	Chowpaty Deluxe Limited	0 37218	Nairobi
144	Go Fresh Go Healthy	0 39725	Nairobi

145	Go Fresh Go Healthy	0 39725	Nairobi
146	Mombasa Blueroom Limited	38890	Mombasa
147	Mombasa Blueroom Limited	38891	Mombasa
148	Mombasa Blueroom Limited	38892	Mombasa
149	Bradegate Restaurant-Kahiga	33732	Nyeri

Appendix 5: Normality, Reliability and Validity Results

Table 4. Normality results

	Min	Max	Mean	SDEV	Skewness		Kurtosis	
					Statistic	Std. Error	Statistic	Std. Error
EE1	2.00	5.00	4.060	.887	-.649	.199	-.352	.395
EE2	1.00	5.00	4.148	.865	-.799	.199	.256	.395
EE3	2.00	5.00	4.215	.827	-.711	.199	-.378	.395
FC1	1.00	5.00	3.906	.873	-.620	.199	.160	.395
FC2	1.00	5.00	3.940	.840	-.509	.199	.103	.395
FC3	1.00	5.00	3.873	.880	-.592	.199	.364	.395
FC4	1.00	5.00	3.980	.919	-.543	.199	-.339	.395
PE1	1.00	5.00	3.920	.927	-.613	.199	-.157	.395
PE2	1.00	5.00	3.846	.906	-.573	.199	-.082	.395
PE3	1.00	5.00	3.960	.900	-.654	.199	.029	.395
PE4	2.00	5.00	3.860	.870	-.408	.199	-.465	.395
PV1	1.00	5.00	3.973	.838	-.718	.199	.550	.395
PV2	1.00	5.00	3.960	.813	-.691	.199	.685	.395
PV3	1.00	5.00	3.913	.838	-.742	.199	.967	.395
PV4	1.00	5.00	3.993	.826	-.716	.199	.616	.395
INT1	1.00	5.00	3.805	.970	-.499	.199	-.290	.395
INT2	1.00	5.00	3.866	.920	-.573	.199	.073	.395
INT3	2.00	5.00	3.819	.863	-.280	.199	-.594	.395

Note: N = 149

Table 5. Reliability results

Key Variables	Cronbach's Alpha	No. of items
Performance Expectancy (PE)	.952	4
Effort Expectancy (EE)	.914	3
Facilitating Conditions (FC)	.935	4
Price Value (PV)	.934	4
Intention to Use VK	.926	3

Table 6. Construct validity results through Rotated Component Matrix

Variables	Component				
	PE	**FC**	**PV**	**INT**	**EE**
EE1					.820
EE2					.832
EE3					.831
FC1		.852			
FC2		.831			
FC3		.840			
FC4		.826			
PE1	.793				
PE2	.878				
PE3	.829				
PE4	.845				
PV1			.750		
PV2			.856		
PV3			.841		
PV4			.858		
INT1				.877	
INT2				.818	
INT3				.869	
% of Variance	19.041%	18.995%	18.681%	14.792%	14.452%
			85.960%		

Note:

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.880
Bartlett's Test of Sphericity	Approx. Chi-Square	2744.645
	df	153
	Sig.	.000

Appendix 6: Regression Assumption Results
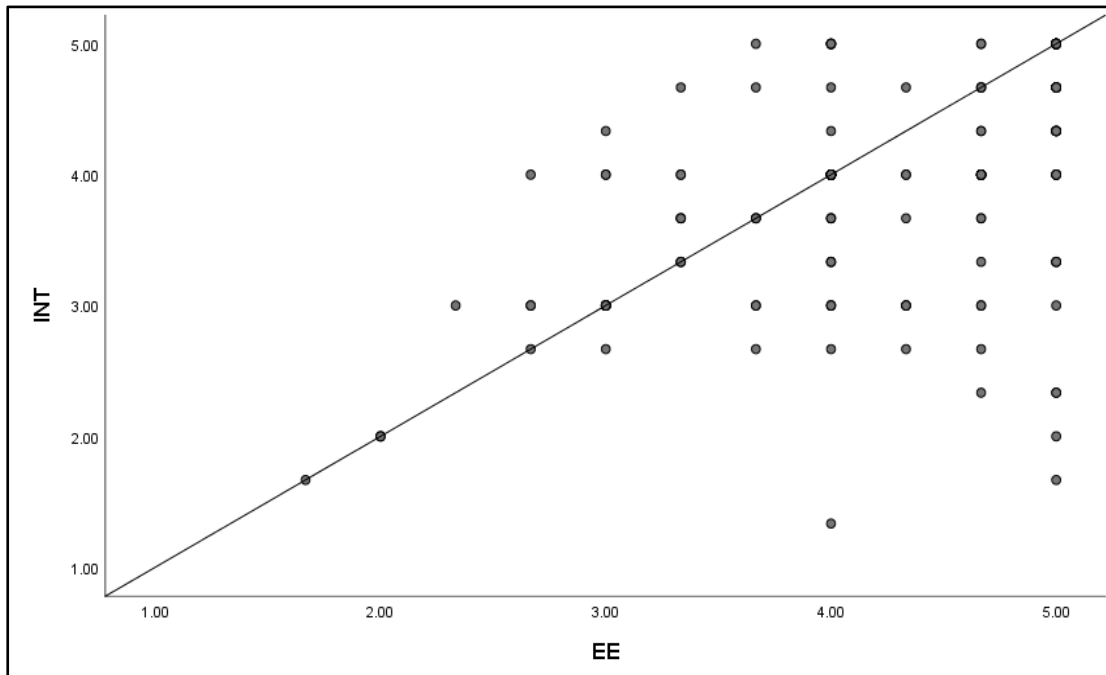
Figure 4. Scatter plot for EE and intention to use VKs
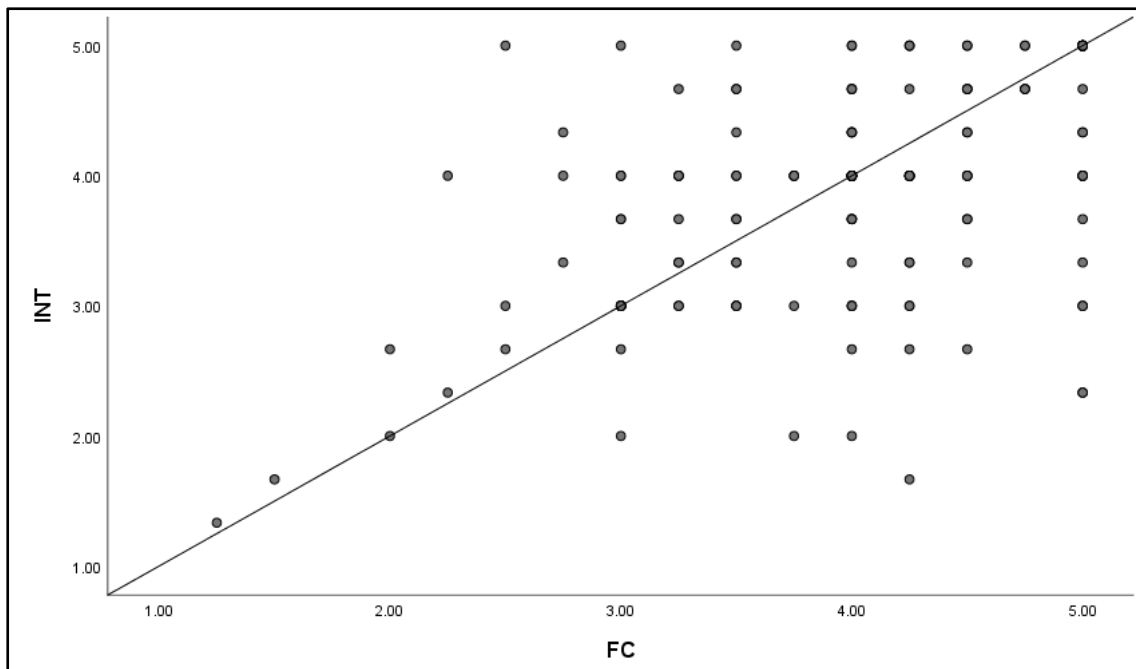
Figure 5. Scatter plot for FC and intention to use VKs
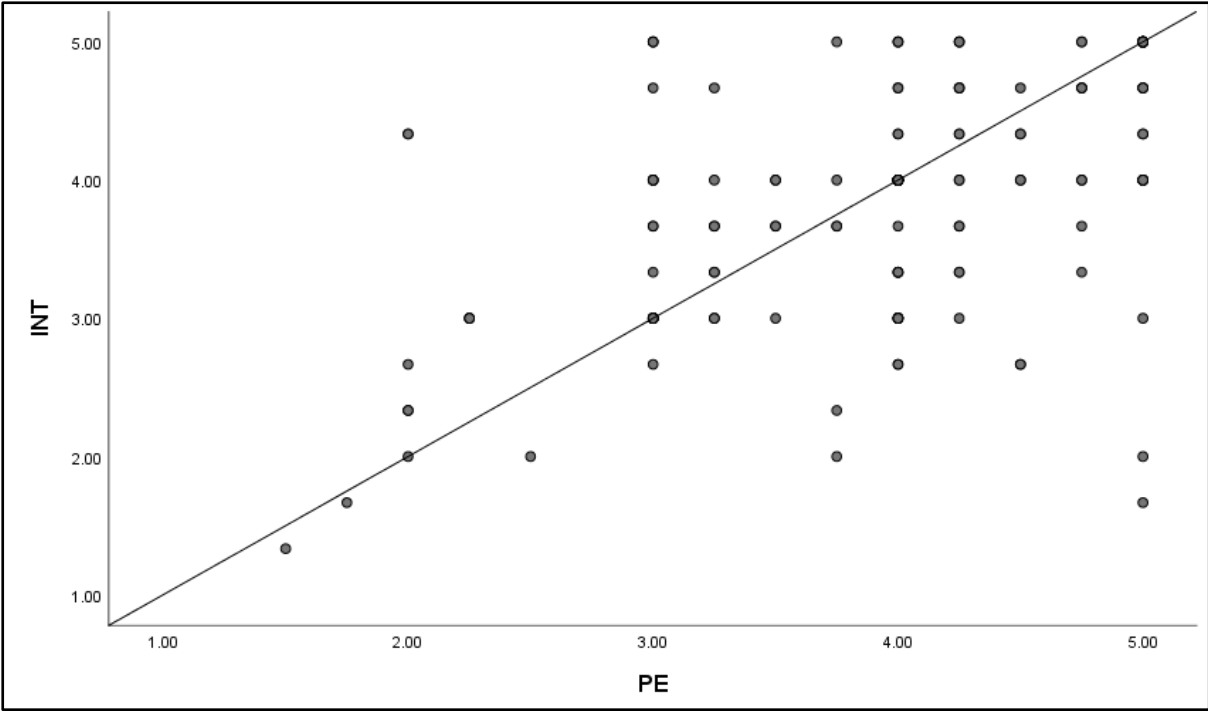
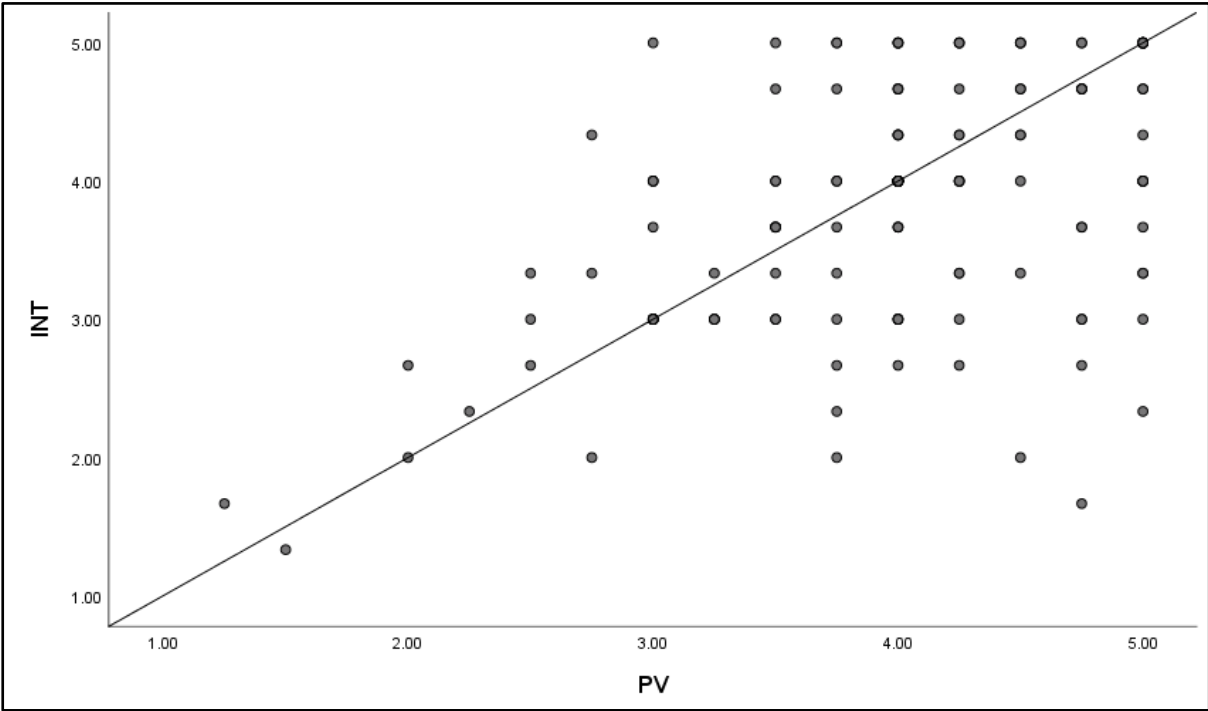**Figure 6. Scatter plot for PE and intention to use VKs**

Figure 7. Scatter plot for PV and intention to use VKs

Table 7. Correlations for the study constructs

Constructs	EE	FC	PE	PV	INT
Effort Expectancy (EE)	1				
Facilitating Conditions (FC)	.509**	1			
Performance Expectancy (PE)	.570**	.519**	1		
Price Value (PV)	.510**	.535**	.571**	1	
Intention to use Virtual Kitchen (INT)	.477**	.486**	.498**	.487**	1

**. Correlation is significant at the 0.01 level (2-tailed), N = 149.
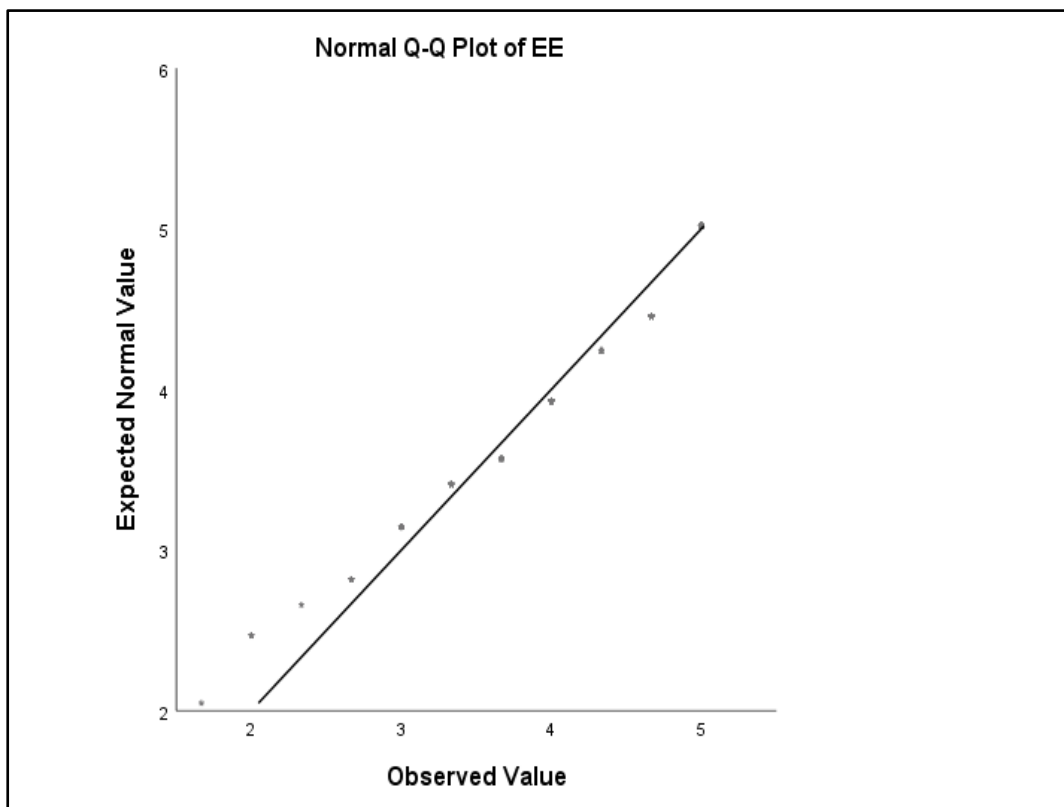
Figure 8. Q-Q plot for effort expectancy
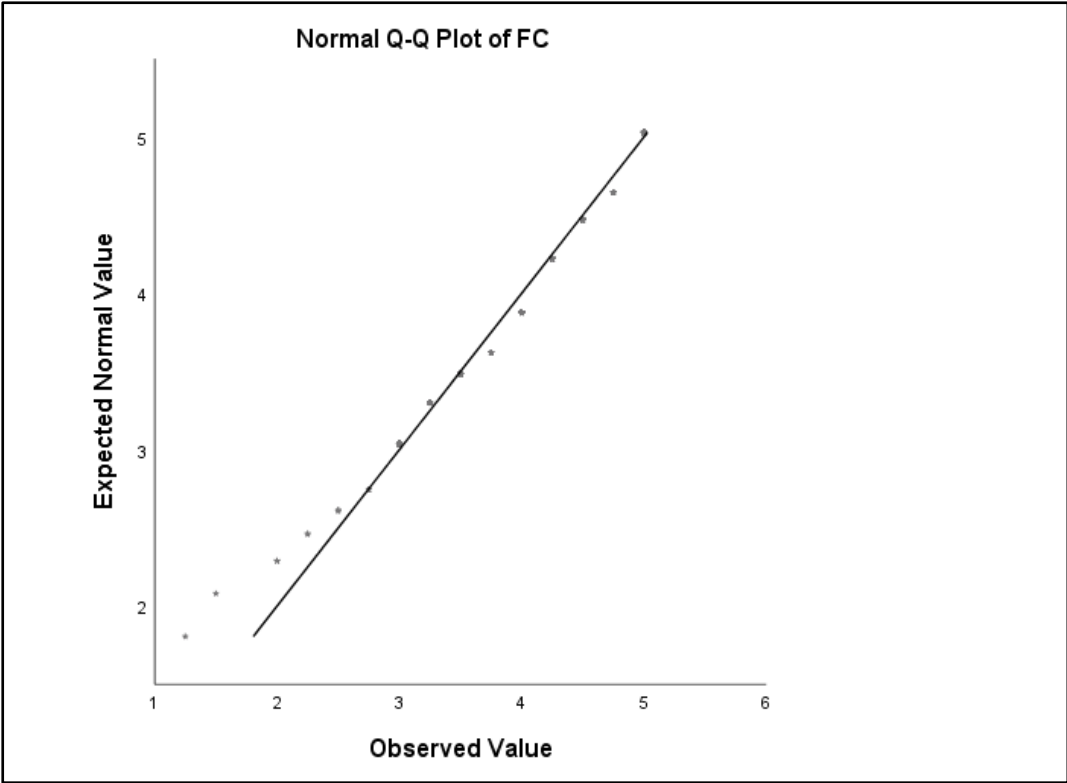
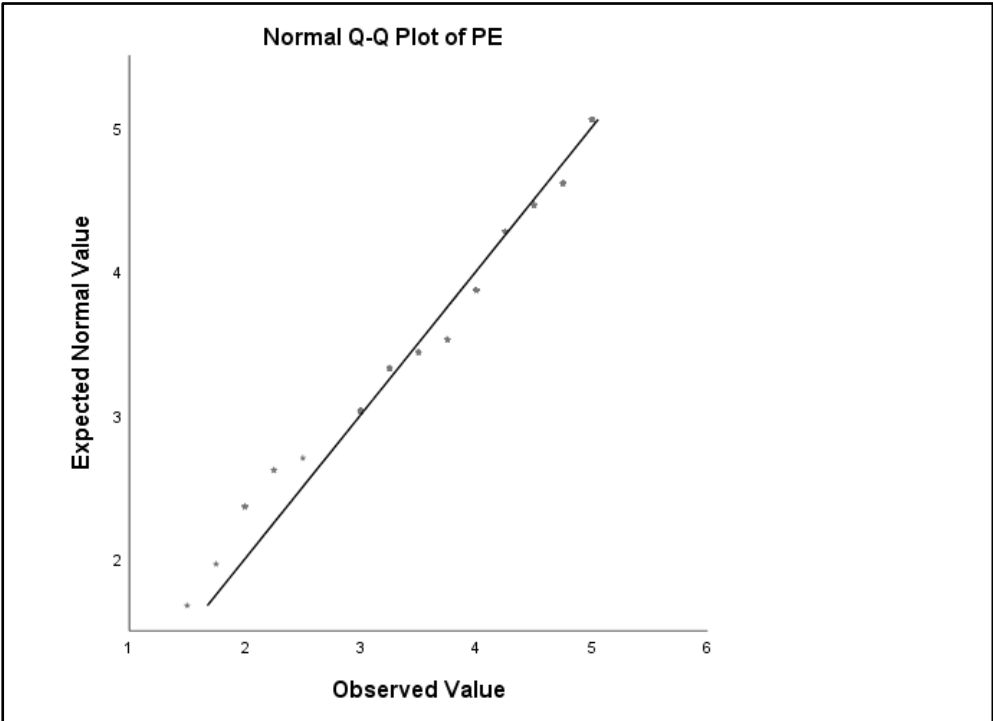**Figure 9. Q-Q plot for facilitating conditions**
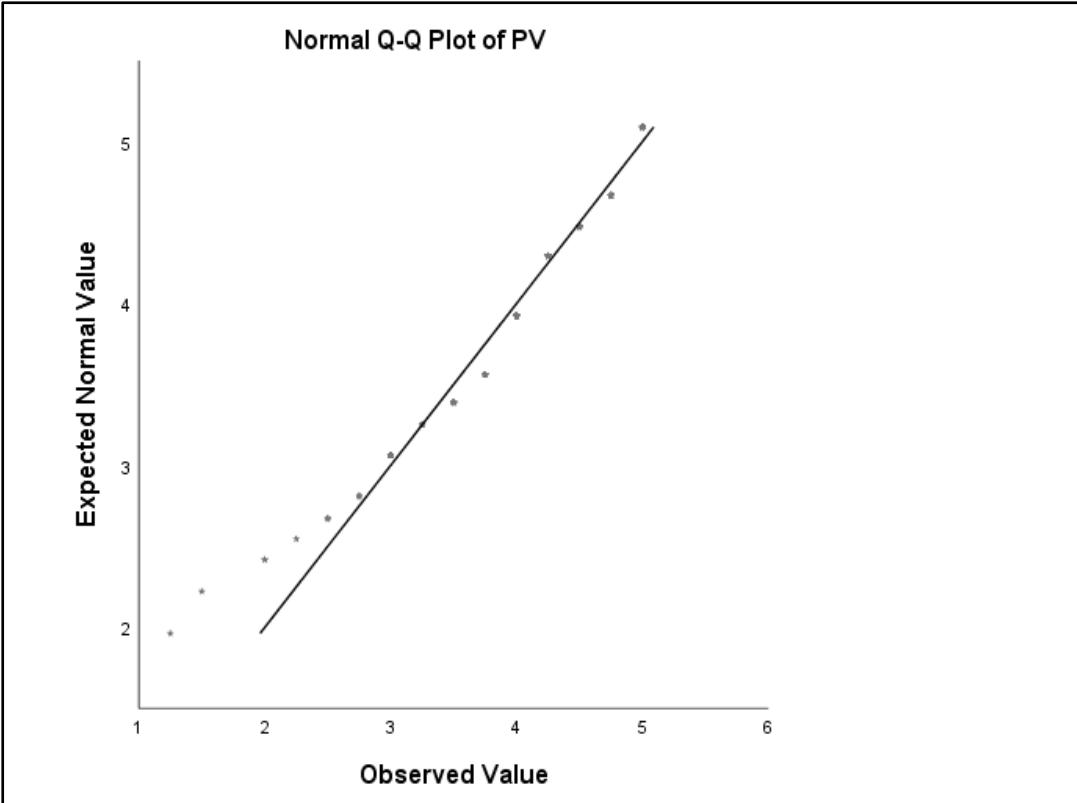

Figure 10. Q-Q plot for performance expectancy
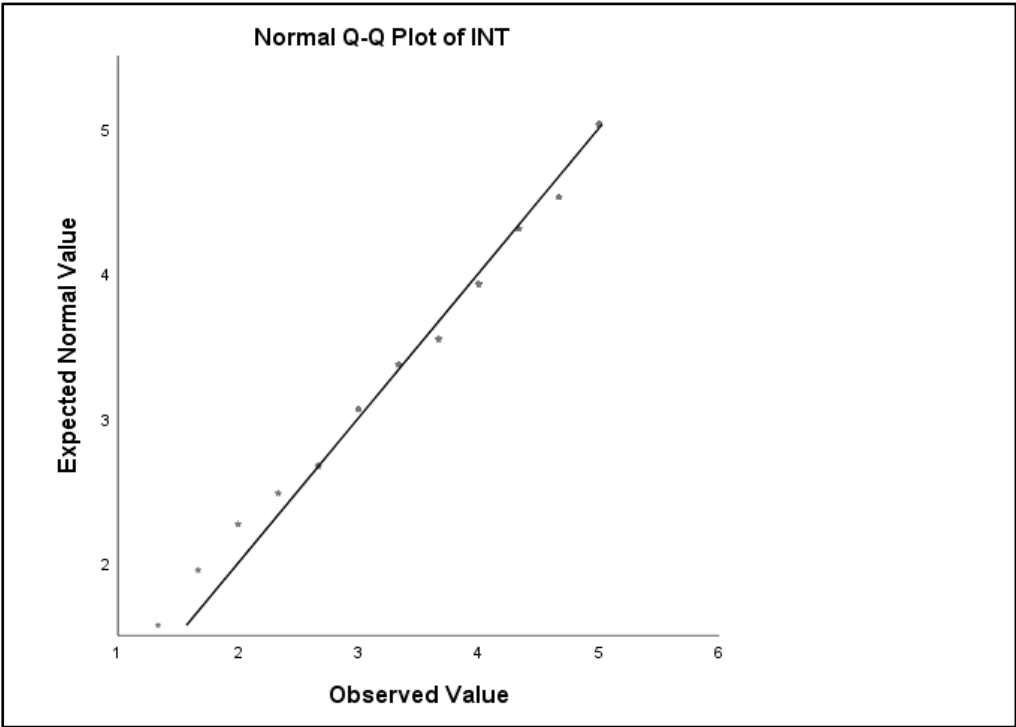
Figure 11. Q-Q plot for price value
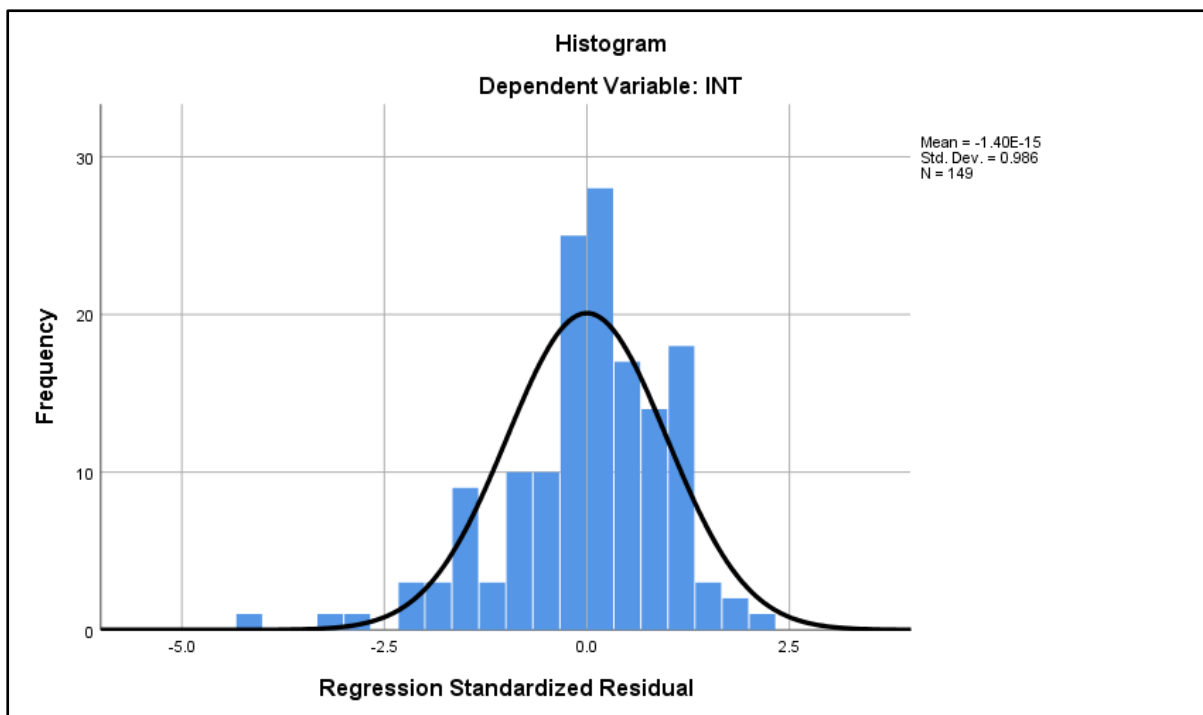

Figure 12. Q-Q plot for intention to use VKs (INT)

Figure 13. Histogram showing normality of the data

Appendix 7: Regression Analysis Results

Table 8. Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.604[a]	.365	.347	.69286

Note:

a. Predictors: - (Constant), Effort Expectancy (EE), Facilitating Conditions (FC), Performance Expectancy (PE), Price Value (PV)

Table 9. ANOVAa

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	39.675	4	9.919	20.662	.000[b]
	Residual	69.129	144	.480		
	Total	108.804	148			

Note:

a. Dependent Variable: Intention to use VKs (INT)

b. Predictors: (Constant), Effort Expectancy (EE), Facilitating Conditions (FC), Performance Expectancy (PE), Price Value (PV)