

**Use of entrepreneurial marketing in fostering resellers'
adoption of smart micro-grid technology**

by

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Abstract

This thesis investigates how entrepreneurial marketing (EM) can foster reseller's adoption of smart micro-grid (SMG) technology. Previous studies have emphasized the technical aspects of this new area of power systems industry. However, there is a need to understand the market adoption, especially that of resellers who act as intermediaries between suppliers and end-customers. An online survey based on the technology acceptance model (TAM) and EM literatures was used to gather data from 99 resellers. The data were analyzed using the partial least squares method to validate a model of the relationships between resellers' antecedents and intention to adopt SMG technology, and the role of suppliers' EM for the adoption. The results suggest that TAM can only partially be applied to the reseller context. Moreover, suppliers need to demonstrate EM, particularly entrepreneurial orientation, to increase resellers' performance expectancy and to decrease effort expectancy to foster the diffusion of novel SMG technology.

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Glossary:

End-customer: The final user of products or services; companies and/or consumers.

Entrepreneurial marketing: The opportunity creation, customer intimacy-based innovative products, resource enhancement and importantly, legitimacy for entrepreneurial of small and medium size firms to do marketing. EM is distinctive from conventional marketing: rather than relying on the traditional 4P's of marketing (product, price, place, and promotion), EM emphasizes the entrepreneurial 4P's (purpose, practice, process, and people) (Martin, 2009). EM outcomes comprise innovation and customer value (Jones et al., 2013). The example of EM can be, a) define your customer – resellers (Direct-energy co.), b) offer something new (SMG technology), c) go to customers (main distributor and retailer), d) An exceptional services (offer product and service all together).

Partial least squares: A statistical method that bears some relation to principal components regression, and this is used for constructing models when the factors are many and highly collinear.

Reseller: A company that buys products or services, and adds value or specialized input through effort, time, or innovative ways in order to resell them to end-customers; thus, a middleman between the supplier and end-customers.

Smart micro-grid technology: Emerge power technology to enhance energy reliability through advanced real-time control of energy generation and consumption of security

through integrated energy system managing interconnected loads and distributed energy resources intelligently.

Supplier: A company that prepares products or services for resellers to sell; it can be manufacturer, wholesaler, or vendor. In this study, reseller concept is used as vendor which provides products and services for resellers. The suppliers of SMG technology need to supply whole elements and parameters of supply chain (software, hardware, and knowledge) to give complete products and services to reseller.

Technology adoption: How and why individuals adopt in new technologies.

Table of Contents

Abstract.....	i
Acknowledgements	ii
Glossary	iii
Table of Contents	v
List of Tables	viii
List of Figures.....	ix
List of Appendices.....	x
1 Chapter: Introduction	1
1.1 Background.....	1
1.2 Objective.....	2
1.3 Deliverables	3
1.4 Structure	3
2 Chapter: Literature review and literature streams	4
2.1 Background to the choice of literature streams	4
2.2 Value of SMG technology	6
2.2.1 SMG value proposition.....	8
2.3 Tehnology adoption.....	10
2.4 Technology acceptance and innovation diffusion	13
2.4.1 User acceptance behavior and acceptance barriers.....	18
2.4.2 Value proposition and resellers' value add	22
2.5 Entrepreneurial Marketing	23
2.5.1 Entrepreneurial Orientation	29
2.5.2 Market Orientation	29

2.5.3	Innovation Orientation.....	31
2.5.4	Customer Orientation	31
3	Chapter: Method.....	34
3.1	Research design.....	34
3.2	Conceptual framework for analyzing	38
3.3	Data collection.....	42
3.4	Analytical approach.....	43
3.5	Design research questionnaire	45
3.5.1	Background information.....	46
3.5.2	Performance expectancy concept	46
3.5.3	Effort expectancy concept	46
3.5.4	Facilitating condition concept	46
3.5.5	Price value concept.....	47
3.5.6	Customer orientation concept.....	47
3.5.7	Market orientation concept.....	47
3.5.8	Innovation orientation concept	47
3.5.9	Entrepreneurial orientation concept	48
3.8.10	Behavioral intention	48
3.9	Sample size and power calculation.....	49
4	Chapter: Results.....	51
4.1	Semi-structured interview points.....	51
4.2	Response rate.....	52
4.3	Position in the organization	53
4.4	Number of years involoved with the business.....	54
4.5	Type of business	55

4.6	Customer segments.....	56
4.7	Customer location.....	57
4.8	Sales of the SMG technology	58
4.9	Changes needed to meet requirements of SMG technology.....	59
4.10	Portion of elemets.....	60
5	Chapter: Discussion	68
5.1	Discussion.....	68
5.2	Implications	70
5.2.1	Implication for theory.....	70
5.2.2	Implication for practice	72
5.3	Guidelines for suppliers of SMG technology	74
5.3.1	Guidelines related to supplier-reseller relationships	74
5.3.2	Guidelines related to technological products and services	75
5.3.3	Guidelines related to suppliers' entrepreneurial marketing.....	77
5.4	Limitations and future research avnues	78
5.5	Conclude results for future research.....	79

List of Tables

This is the List of Tables.

Table 1	The three literature streams reviewed in study	5
Table 2	Key SMG articles and their highlights reviewed in this study	7
Table 3	The key literature streams of TAM and highlights reviewed in this study.....	12
Table 4	The definition of different hypotheses in the conceptual framework.....	41
Table 5	Correlation matrix.....	62
Table 6	Regression statistics.....	63
Table 7	Testing model paths to EM's effects on technology acceptance #1.....	64
Table 8	Testing model paths to EM's effects on technology acceptance #2.....	64
Table 9	Testing model paths to EM's effects on technology acceptance #3.....	65
Table 10	Results of accepted hypotheses	66
Table 11	Results of of hypotheses testing.....	67

List of Figures

Figure 1	Fundamental concepts of user acceptance models	13
Figure 2	TAM as presented by Venketash and Bala.....	14
Figure 3	Cusrtomer acceptamce and use of IT	15
Figure 4	Hierarchical model of barriers to adopt SMG technology	20
Figure 5	Entrepreneurial marketing process	24
Figure 6	Entrepreneurial marketing orientation.....	28
Figure 7	The research method.....	37
Figure 8	Conceptual research framework	40
Figure 9	Position in the organization.....	53
Figure 10	Number of years involved with business.....	54
Figure 11	Type of business	55
Figure 12	Customer segments.....	56
Figure 13	Customer location.....	57
Figure 14	Sales of SMG technology	58
Figure 15	Change needed to meet SMG requirements of SMG technology	59
Figure 16	Suppliers' acceptance of SMG (Main model)	61
Figure 17	Final model with results	69

List of Appendices

This page lists all of the appendices.

Appendix A- Questions.....	85
Appendix B- Loading from PLS results.....	90

1 Chapter: Introduction

1.1 Background

As more and more energy is being used per person globally, the growing demand of electricity imposes major challenges for the electric power industry. The emerging Smart Micro Grid (SMG) technology can act as an integrated energy and communication system which allows for better management of interconnected loads and energy resources than the traditional power system technologies. The SMG offers a complex and technologically different system compared to previous systems, and the electric power industry needs to look at it from a new perspective. SMG solutions enhance reliability, efficiency, security, quality, and sustainability of energy supply for consumers and businesses alike to meet their increasing concerns about the characteristics and consumption of energy. Moreover, the vast majority of existing research in SMG is limited to technical perspective (Cardenas, Gemoets, Rosas, & Sarfi 2014; Cato, Arthur, & Smith 2008; Fang, Misra, Xue, & Yang, 2012; Hashmi, 2011; Saxena, 2014; Valocchi, Juliano, & Schurr, 2012).

The approach makes sense, because this emerging field of power systems industry requires new grid architecture to enable new technological applications (Giordano & Fulli, 2012). Consequently, it is reasonable to explore various failure protection mechanisms. Such as improving energy efficiency, profiling demand, maximizing utility, reducing cost, and controlling emissions (Fang et al., 2012).

In spite of the benefits that the SMG technology provides, it has not been commonly adopted in the market (Luthra, Kumar, Kharb, & Shimmi, 2014). This slow adoption may be because SMG technology needs more thorough consideration and investigation compared to existing technologies (Wilhite, 2012). However, the lack of knowledge of what exactly hinders the diffusion of SMG technology calls for research on the issue. Although the technology acceptance model (TAM) has been commonly used in studying the adoption of new technologies, the academic literature lacks applications of the model in the SMG context. In particular, there is a research gap in understanding adoption among power system resellers that act as purchasers, modifiers, and sellers of SMG solu-

tions to end-customers. Previous research typically applies TAM in the end-user context, while technology adoption in the reseller context has been sparsely studied (Westerlund, & Rajala, 2014).

Although there is ample scholarly research on marketing strategies related to new and complex technology, the role of suppliers' marketing aimed at resellers is largely neglected (Westerlund et al., 2014). Giordano et al. (2012) discuss new regulatory measures that can improve the business case and consumer value proposition in power systems technology, and enhance consumer engagement in energy efficiency. However, prior studies have not focused on suppliers' motivations or intentions to get involved in the SMG technology, nor how suppliers' proactive marketing might advance these intentions. In other words, there is a research gap regarding why power systems companies adopt novel technology for modification and reselling purposes, as well as/in addition to whether and how suppliers can encourage this adoption through entrepreneurial marketing efforts.

1.2 Objective

The objective of this research is to understand how suppliers of power systems technology can use entrepreneurial marketing (EM) to foster their resellers' adoption of SMG technology. In doing so, the study aims to find out how particular characteristics of SMG technology influence the intentions of reseller to adopt technology. The research leans to the technology acceptance model (TAM) and its' fundamental constructs to understand these characteristics. Moreover, the research aims to identify whether and how suppliers' entrepreneurial marketing efforts impact the intentions of resellers to adopt SMG solutions. Suppliers' entrepreneurial marketing is understood as a combination of strategic orientations as suggested in the EM literature. In a nutshell, the study investigates how power systems suppliers' EM can foster resellers' adoption of SMG. It should be noted that the study does not examine what the suppliers' specific marketing tactics are, whether the intentions of suppliers to adopt actually leads to the adoption of SMG technology, or whether the adoption provides resellers with concrete economic or other benefits.

1.3 Deliverables

The thesis introduces a conceptual model based on the TAM and EM literatures to understand the relationships between SMG technology characteristics and resellers' technology adoption, as well as the role of suppliers' EM in those relationships. EM elements act as potential moderators in the relationships between SMG technology and resellers' intention to adopt that technology. The model will be tested through multiple-regression analyses based on the partial least squares technique in order to provide statistical evidence on the anticipated relationships.

The results from the analyses will contribute to the discussions of technology adoption and EM by showing the required amendments in the technology adoption model when applied to the novel SMG technology, and by providing research-based knowledge on how EM can affect resellers' behavior in an emerging technological context. Moreover, the model can help business owners to develop their efforts to foster the adoption of new power systems technology by current or future resellers. In support of this goal, the research will provide some practical suggestions for suppliers to market technology adoption in such a way as to better address the reseller-perceived barriers of SMG.

1.4 Structure

This thesis is organized into five chapters; each of them is structured into subsections. Chapter one explains the background of SMG technology, and the value, objectives and deliverables of this research. Chapter two reviews previous literatures of TAM and EM, and focuses particularly on the barriers of technology adoption. The emphasis will be on applying the technology adoption model to the SMG technology context. Chapter three presents the method and the procedure used to gather required data. Furthermore, this chapter explains how the questions in the survey were chosen, and the steps taken to analyze the data. Chapter four provides the empirical results of the analyses. Chapter five concludes the study by summarizing the results, discussing their implications with respect to theory and practice, and providing the limitations of the present study, as well as listing potential subjects for further investigations.

2 Chapter: Literature review and literature streams

The literature review in this study summarizes information from academic literature and other sources which are relevant to SMG, TAM, and EM concepts. The literature review focuses on the meaning of each concept, the theoretical background of the concept, and relation with other related concepts in this research. It overviews and summarizes scholarly articles, research papers, books, and other research on the concept. This literature review introduces three main streams of research in three related concepts: SMG, resellers' technology adoption, and EM. This practice will provide sufficient background information, ideas and theoretical knowledge, and establish the potential solution space.

2.1 Background to the choice of literature streams

The SMG comprises a wide range of technologies to maximize service quality and cost savings. It refers to two-way communication technology which is the key enabler for new technological applications. That way, it allows for an easy shift of loads, better demand response, optimal management, and control of electricity in energy savings, as well as reduction of maintenance, operational, and disruption costs (Giordano et al. 2012). The emergence of SMG technology is particularly relevant and timid for managers of distributed energy resources and for power consumers within independent power systems. It creates novel services and business models, and poses considerable challenges and impetus for change in the power systems industry.

The SMG technology calls for new business models and frameworks in order to put all SMG parts together and to make a market-driven modernization in power systems sector (Giordano et al. 2012). The business case analysis in the power systems industry is becoming increasingly complex given the wide array of choices in SMG technology and variability in each utility's specific business requirements and external environmental

factors (Whlwhite, 2012). Table 1 shows the three main streams used for the literature review: SMG technology, resellers' technology adoption, and entrepreneurial marketing.

TABLE 1:
The three literature streams reviewed in this study

Stream	Key highlights of the stream	Key references
Smart micro-grid technology	<ul style="list-style-type: none"> • SMG solutions have a big potential, but they are more expensive than traditional products • SMG solutions offer a lot of benefits for utility owners and resellers through improved efficiency, customer value, security, privacy, safety, economic development, environmental benefits, as well as reliability • Huge amount of investment and lack of financial resources • Technology immaturity 	Cardenas et al. (2014) Cato & et al. (2008) Fang et al. (2012) Giordano & Fulli (2012) Hashmi (2011) Luthra et al. (2012) Valocchi et al. (2012) Vijayapriya & Kothari (2011)
Resellers' technology adoption	<ul style="list-style-type: none"> • Market uncertainty • Lack of regulatory framework • Low public awareness and engagement • Lack of structure • Lack of necessary technical skills and knowledge • Need of advanced bi-directional communication systems • Lack of open standard • Cyber security and data privacy 	Abrahamse et al. (2007) Arkesteijn & Oerlemans (2005) Barr et al. (2005) Benders et al. (2005) Caird et al. (2008) Collins et al. (2007) Kalafatis et al. (1999) Ozaki (2009) Pickett-Baker & Ozaki (2008) Rogers (2003) Steg (2008) Throne-Holst et. al (2007) Venkatesh et al. (2003) Venkatesh et al. (2012)
Entrepreneurial marketing	<ul style="list-style-type: none"> • Lack of innovativeness in the industry • Integration of grid with large scale renewable generation 	Cato et al. (2008) Collison & Shaw (2001) Franco et al. (2014) Jones & Rowley (2011) Miles et al. (2012) Moring (2000) Mort(2012) Stokes (2000) Tzokas et al. (2001)

These three streams were chosen to investigate resellers' adoption behavior and to understand how entrepreneurial marketing can help foster their technology adoption.

2.2 Value of SMG technology

The SMG is a two-way communication tool of power grid that allows online control of electricity flow in the grids, and that has an advanced communication facility for grids (Giordano et al. 2012). Digitalization and new technologies in the power systems infrastructure open a new way for entrepreneurs, researchers and resellers to make new market and value proposition strategies. Table 2 shows the key articles and their highlights which are reviewed in this research regarding the SMG. Militaries, many industries, as well as critical loads such as hospitals, data centers, SCADA, and control systems need a reliable source of power. Therefore, the investments in energy efficiency and renewable energy projects have been increasingly rising. However, this trend does not follow the same rate among different customers, and there is a need for value-add policies and strategies to encourage resellers of SMG to sell this solution.

TABLE 2:
Key SMG articles and their highlights reviewed in this study

Stream	Key highlights of the stream	Key references
SMG value proposition	<ul style="list-style-type: none"> • Increasing demand of electricity • Need reduction losses • Peak demand management • Integration of renewable energy generation systems • Solution to global warming • Better customer satisfaction • Overcome difficulties in meter reading • New business opportunities • Optimization and performance • Adoption of SMG enhance facet of electric delivery system 	Cardenas et al. (2014) Hashemi (2011) Saxena (2014)
Business case for SMG	<ul style="list-style-type: none"> • Penetration of new technological applications • Define the effectiveness of a market driven modernization • New regulatory measures that improve the business case • Segmentation consumers according to their energy profile and attaching business value to the "attributes" 	Bieser (2014) Giordano & Fulli (2012) Scicca (2013) Vijayapriya & Kothari (2011)
SMG infrastructure	<ul style="list-style-type: none"> • Improving energy efficiency • Profiling demand • Maximizing utility • Reducing Cost • Controlling emission • The system is energy, information & communication 	Fang et al. (2012) Whlwhite (2012)

2.2.1 SMG value proposition

The SMG is essentially an electric power system which has a control of whole sections of power system utilities from generation to distribution with support of existing technologies (Saxena, 2014). It enables information network in all integrated power electricity utilities: generation, transmission, substations, and distribution.

Valocchi et al. (2014) lists barriers for the adoption of SMG technology in traditional infrastructure; a) high investment, b) uncertainty of market c) lack of suitable infrastructure, d) lack of public attitude and engagement, e) lack of innovativeness in the industry, f) lack of technical skills, g) technology immaturity, h) lack of necessary technical skills in customers, i) difficulties of integration with large scale renewable generation, j) need of advanced bi-directional communication, k) lack of open, and accessible standard, and l) cyber security and data.

In the same way, Vijayapriya et al. (2011) provide a list of challenges for SMG business marketing opportunities;

- 1) Accessible and sufficient transmission capacity, which decreases need of using small and distributed generation systems.
- 2) Difficulties of connecting new renewable energy production plant to develop power systems.
- 3) Change the configuration of mature and developed power system to adapt into small scale production plant.
- 4) Make affordable and accessible communication system to connect millions of parties and devices into traditional electrical system.
- 5) Active demand side-enabling all consumers, convince customer to invest into power electricity production plant.
- 6) Integration with customers and making engagement in their attitudes to be part of this change.
- 7) Lack of concrete and strong knowledge about power system capabilities, such as generation, transmission, distribution, demand, and power usage among users.

Whereas the traditional power systems are facing challenges such as supply-demand authorities, rising costs, low energy efficiencies, and global warming (Luthra et al.,

2014), SMG technology provides affordable, cleaner, safer, more secure, and more reliable solutions than the traditional electricity power systems (Fang et al., 2012). The SMG technology has several value propositions for power systems (Hashemi, 2011), such as;

A. *Efficiency*: lower energy intensity and less loss in distribution system.

In terms of efficiency, the SMG reduces fuel consumption as it has the ability to control and manage consumption of users in the real time. It also helps customers to measure and be aware of their real time usage.

B. *Reliability*: real-time control for critical loads, supply and reliability of system, and have a backup source for power systems. In regards to reliability, the SMG technology can manage energy resources, consumption, and take care of power quality and reliability at variety of levels.

C. *Supply and demand supply balancing*: the power supply will reduce demand and minimize distribution losses. It also has an ability to produce electricity through new technologies, such as combined electricity and heat generation (CHP).

D. *Security*: enabling more effective cyber and physical security plan.

In terms of energy security, SMG solutions can help energy consumers to be sure of their sustainable energy supplement through on-site generation, and the grid independence capabilities.

E. *Quality*: stable power to meet exact consumer energy requirements, and predicting maintenance requirements. According to Luthra et al. (2014), SMG technologies can help with electricity demand intensity, and supply electricity temporary shortage. Moreover, they mention other quality-related capabilities such as decrease of losses through peak shading, more effectively of using renewable energy which leads to decrease of CO₂ footprint. Luthra et al. (2014) also show how using new technologies such as electric vehicles and smart metering can bring technological advancements with new market opportunities.

F. *Sustainability*: expand generation ability to customer, cleaner opportunity for fuel sources, increase capacity and efficiency of power networks, development of renewable energy sources, distributed generation opportunities, and reducing greenhouse gas emissions.

- G. *Fast reaction against power system changes.* This technology introduces new service of power flow optimization, improving energy efficiency, profiling demand, maximizing utility reducing cost, and controlling emission (Fang et al., 2012).
- H. *Customer choice to select its energy sources:* SMG technology enables customers to protect against cost fluctuation, reduction of electricity cost with on-site generation and energy management.
- I. *New business opportunities:* SMG makes a new application of technology which opens and improves the business cases of different technologies to enhance suppliers' engagement. The SMG technology is a small scale power system that ties into main grid. Whereas this technology is increasingly available for consumers, it has also an ability of operating in parallel with utility's grid or independently.

2.3 Technology adoption

Technology adoption is one of the most intriguing issues in business technology literature. According to Ozaki (2009), people decide to adopt an innovation not only because they see functionality, usability, and reasonable costs, but also because they are interested in the way the innovation reflects their identity, image, memberships, values, beliefs and norms. Ozaki (2009) further explains that the adoption rate increases when early adopters find innovation as a useful tool which becomes a norm among large group of people.

Perhaps the most widely used model for understanding the adoption of technology is the Technology Acceptance Model (TAM). The TAM aims to predict users' adoption of any given products or services; therefore, it was developed to understand individuals' adoption of new systems or services. It has also been used in a variety of research outside the original technology adoption field, resulting in variations of the model with different constructs and variables. For instance, it has been applied in a two-country study of SMS advertising and in understanding the influence of content and trust on consumers' intention to accept mobile advertisements (Westerlund et al., 2009)

This chapter reviews the literatures of TAM in order to identify the elements that either increase or decrease resellers' technology adoption. It focuses on three main streams of technology acceptance models found in the literature (Table 3).

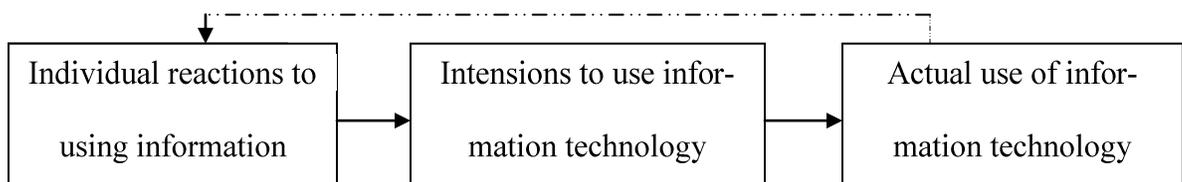
TABLE 3:
The key literature streams of TAM and their highlights reviewed in this study

Stream	Key highlights	Key references
Technology acceptance & innovation diffusion	<ul style="list-style-type: none"> • Theory of reasoned action • Technology acceptance model • Motivational model • Theory of planned behavior • Professional customer utilization • Innovation diffusion theory • Social cognitive theory • Individual acceptance 	<p>Rogers (2003) Venkatesh (2000) Venkatesh et al. (2003)</p>
User acceptance behavior & acceptance barriers	<ul style="list-style-type: none"> • Performance expectancy • Effort expectancy • Social influence • Facilitating conditions • Perceived usefulness • Extrinsic motivation • Job-fit • Relative advantage • Outcome expectations • Usefulness and relative advantage • Innovation expectancy 	<p>Arkesteijn & Oerlemans (2005) Irani et al. (2009) Ozaki (2009) Venkatesh & Bala (2008) Venkatesh et al. (2012) Westerlund et al. (2009)</p>
Value propositions & resellers' value-added	<ul style="list-style-type: none"> • Establish brands • Customer purchase decision • Product performance • Willing to pay • Innovation performance • Shape customer behavior • Relationship between people's beliefs and norms. • Trusted and informative relationship • Communication the value factors beyond the core product or service • Information sharing • Supplier key resource of information • Training & certification • Information, relationship & instrumental value 	<p>Abrahamse et al. (2007) Barr et al. (2005) Benders et al. (2006) Caird et al. (2008) Collins et al. (2007) Faiers & Neame (2005) Kalafatis et al. (1999) Niemeyer (2010) Pickett-Baker & Ozaki (2008) Steg (2008) Westerlund & Rajala (2011)</p>

2.4 Technology acceptance and innovation diffusion

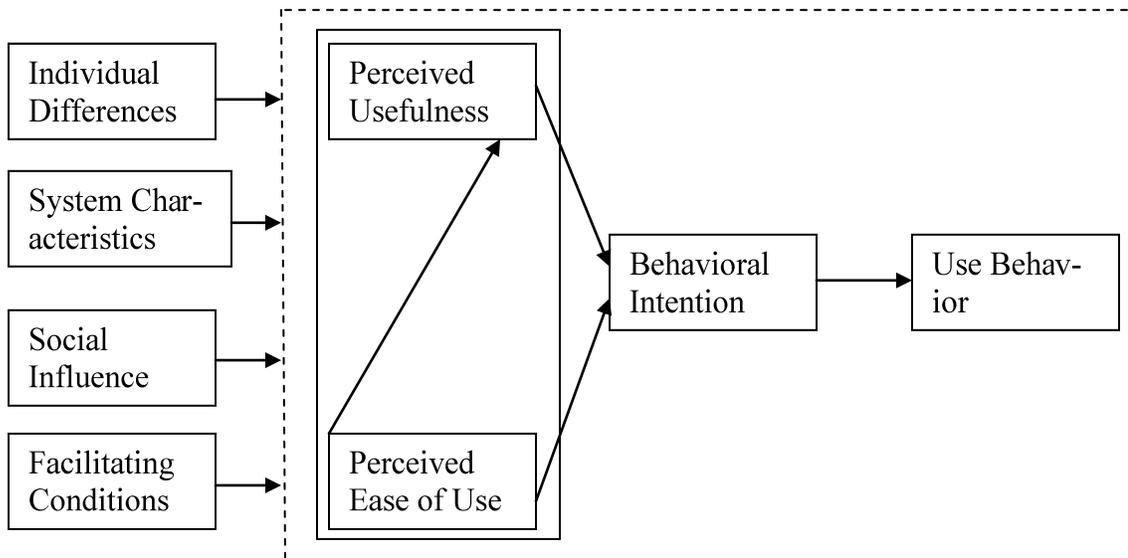
TAM grounds on two fundamental elements: i) individual reactions, which is defined as perceived value of each person who interacts with service and product, and ii) intention of use for individual, which determines ease of use to influence perceived usefulness. Figure 1 shows the basic concepts underlying user acceptance models (Venkatesh et al., 2003). As there are a variety of elements that affect directly or indirectly technology acceptance parameters, Venkatesh et al. (2003) investigate how and why individuals' adopt a new technology, particularly in terms of the drivers that affect the adoption behavior.

FIGURE 1:
Fundamental concepts of user acceptance models



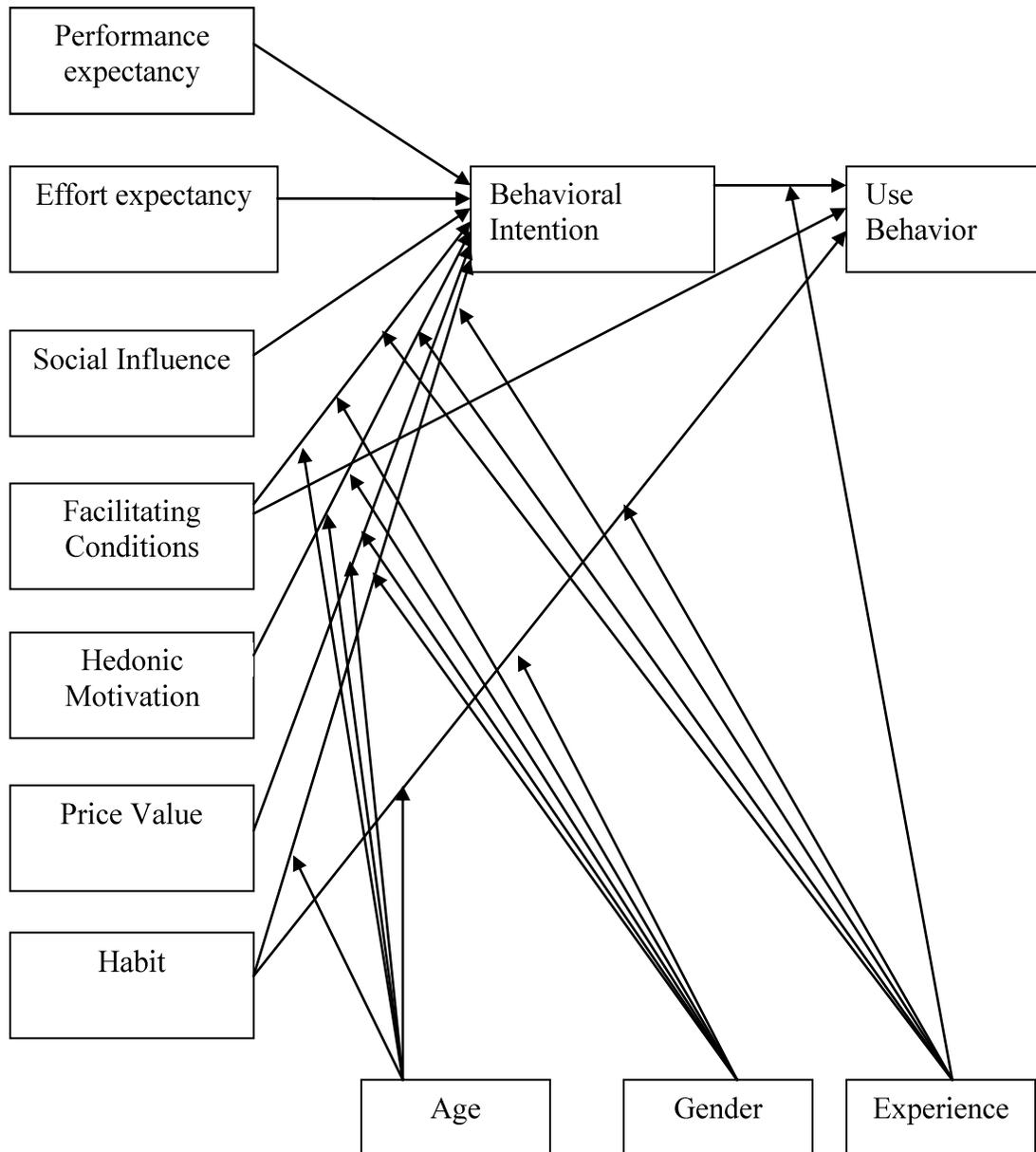
Venkatesh and Bala (2008) introduced the TAM with four constructs that affect users' behavioral intention (cf. Figure 2 showing the TAM as presented by Venkatesh and Bala, 2008). The four main elements of TAM are: a) individual differences, b) system characteristics, c) social influence, and d) facilitating conditions. These elements have direct impact on perceived usefulness and perceived ease of use, which lead to user's behavioral intention (Fishbein & Ajzen, 1975; cf. Venkatesh et al., 2003).

FIGURE 2:
TAM as presented by Venkatesh and Bala (2008)



The extended TAM (Figure 3) by Venkatesh et al. (2003) is a modified acceptance model. Venkatesh et al. (2003) developed the extended TAM using seven diverse elements; a) performance expectancy, b) effort expectancy, c) social influence, d) facilitating conditions, e) attitude toward using technology, f) self-efficacy, g) anxiety, h) behavioral intention to use, i) hedonic, j) motivation, k) price value, and l) habit. In addition, the model has been further extended to include various demographic (e.g. age, gender) and other characteristics (e.g. experience) as moderating factors in the causal relationships. These moderating factors stem mainly from the research by Davis et al. (1989).

FIGURE 3:
Consumer acceptance and use of IT: An extended TAM by Venkatesh et al. (2003)



The acceptance models introduced in figure 2 and figure 3 have been used and further developed in a number of studies building on technology studies, and theoretical approaches to reasoned actions (TRA), technology acceptance of information systems (TAM), sociological models and theories of individual acceptance, and the theory of innovation diffusion. Technology acceptance model and the related adoption barriers are useful in understanding what encourages power systems technology resellers to adopt novel SMG solutions and put effort on selling these solutions to end users. These encouragements include functionality, trainability, and the price value of technology; however, as decisional factors they also reflect suppliers' identity and values.

- 1) *Technology studies*: The technology adoption model which has been studied in many of model development and comparison studies has been relatively simple, individual-orientated into information technology which is opposed into complex and sophisticated organizational technologies.
- 2) *Theory of reasoned actions (TRA)*: This approach comes from social studies which focus on the core of human behavior. TRA tries to find the variables that can largely explain choices made in the context of human behavior. The definition for attitude toward behavior is explained as an individual's positive or negative feelings (evaluative affect) about performing the target behavior (Fishbein & Ajzen, 1975; cf. Venkatesh et al., 2003). TRA also explains the subjective norm as individual attitude to using the system (Fishbein & Ajzen, 1975; Venkatesh et al., 2003).
- 3) *Technology acceptance model (TAM)*. The TAM, tailored specifically for the information systems contexts, is designed to predict information technology acceptance usage in jobs. The objective and conceptualization of TAM is the attitude value to explain behavioral intention. This model has three fundamental elements:
 - Perceived Usefulness refers to whether an individual perceives using the system can increase his/her job performance (Davis, 1989; cf. Venkatesh et al., 2003).

- Perceived Ease of Use refers to whether the service or system is easy to learn and use (Davis, 1989; cf. Venkatesh et al., 2003).
- Facilitating conditions refers to the degree to which an individual believes that an existent infrastructure has technical and managerial value for using the system (Venkatesh et al., 2003).

4) *Models and theories of individual acceptance.* The core of this approach tries to predict user behavior rather than intention, and the effect on intention. Based on Venkatesh et al. (2003), there are five elements:

- Job-fit is defined as the degree which user believes that using a specific kind of technology can enhance the performance of his/her job (Thompson et al., 1991; cf. Venkatesh et al., 2003).
- Complexity is introduced as the value of which innovation has to perceive relative difficulty to understand and usage (Rogers & Shoemaker, 1971; cf. Venkatesh et al., 2003).
- Affect towards use is defined as a feeling of enjoyment, pleasure, satisfy, or conversely negative feeling about some new services or material (Thompson et al., 1991; cf. Venkatesh et al., 2003).
- A social factor establishes as an individual's acceptance in reference group and subjective culture at specific subjects, and pre-defined social situations (Thompson et al., 1991; cf. Venkatesh et al., 2003).
- Facilitating conditions is defined as an objective factor in the environment that can observe an act to achieve and complete task successfully (Thompson et al., 1991; cf. Venkatesh et al., 2003).

5) *Innovation diffusion theory.* This area of knowledge is grounded in sociology, and the model has been used since 1960s in a number of studies and innovation in the fields of science, engineering, architecture, and agriculture to support for the predictive validity of the innovation characteristics. The different elements are;

- Relative advantage which is defined as a degree that individual sees benefits and advantages in innovation than its precursor (Moore & Benbasat, 1991; cf. Venkatesh et al., 2003).
- Ease of use identifies the degree that an innovation is easy to use and the benefit of using this system and service (Moore & Benbasat, 1991; cf. Venkatesh et al., 2003).
- Image introduces the degree to which an innovation is perceived to have and introduce brand and enhance one's image or status in one's social system (Moore & Benbasat, 1991; cf. Venkatesh et al., 2003).
- Visibility introduces the degree to which an individual can see others using the system in the organization (Moore & Benbasat, 1991; cf. Venkatesh et al., 2003)
- Compatibility refers to the degree to which an innovation can work and do with norms, values, needs, and past useful experiences of users (Moore & Benbasat, 1991; cf. Venkatesh et al., 2003).
- Results demonstrability expresses as tangibility and doable results of using new adventure, innovation, including observability, communicability, and beneficially (Moore & Benbasat, 1991; cf. Venkatesh et al., 2003).
- Voluntariness of use: the degree to which use of the innovation is free of mandatory push and open to every ones (Moore & Benbasat, 1991; cf. Venkatesh et al., 2003).

2.4.1 User acceptance behavior and acceptance barriers

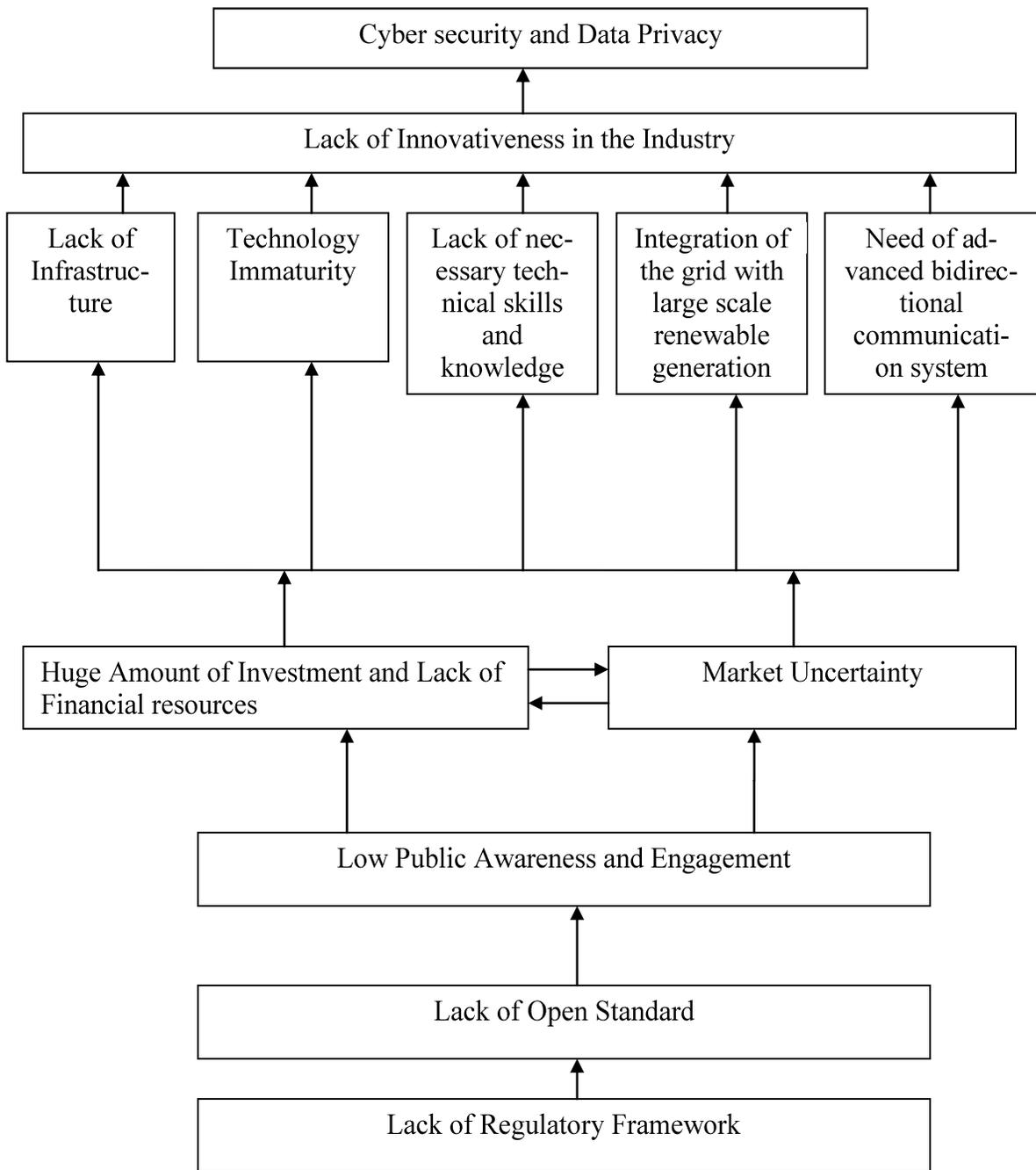
Ozaki (2009) describes several reasons that lead people to adopt sustainable innovation in the power systems industry. In spite of all the benefits that the SMG technology offers (in both technical and business sides), the industry-wide adoption of the technology is slow. According to Ozaki (2009), consumers adopt new innovation if the service or product shows clearly a) identity, b) image, c) values, d) norms, e) functionality f) usability g) costs, and h) intended outcomes.

Moreover, customers are willing to adopt sustainable product or service innovations when they see the following elements:

- Benefits, i.e. using the product or service increases their positive consequences
- Compatibility with what they have and their common practices
- Feel enough social pressure to use any specific product or services
- Using system is enjoyable, and it provides some kind of fun for users.
- They see it as a very low risk and they think that a third party takes care of it.

Luthra et al. (2014) demonstrate a hierarchical model (figure 4) of barriers to adopt SMG technology. It also shows the framework, open standard, public awareness, and market uncertainty for technical requirements. Moreover, it includes technical requirements such as the lack of infrastructure, technology immaturity, and the lack of technical skills, as well as integration to large scale power systems, and the need for advanced bidirectional communication system.

FIGURE 4:
Hierarchical model of barriers to adopt SMG technology



Furthermore, Hashmi (2011) identifies a number of barriers; each of these barriers leads to slow adoption of SMG technology. The barriers include high cost investment, complexity and confusion, inability to secure internal approval/funding, questionable investment, immature technology, the lack of knowledge, low professional usage, few incentives, and the lack of technical expertise. The adoption of SMG requires meeting all changes in all parts of a power system from generation and transmission up to distribution and consumption (Saxena, 2014).

According to Fariers & Neame (2005), there are particular recommendations which increase technology adoption among resellers:

- 1) Suppliers and resellers should work closely with the end customers to develop the operational, economical and aesthetical aspects of the products.
- 2) Suppliers need to get complete understanding of product perceptions and reseller needs in order to customize their products.
- 3) Financial assessments of power products should be undertaken, as well as determination of the optimal level of products.
- 4) The more products are used, further work should determine the difference between the different technologies and type of products
- 5) More research and investigation need to be done to fill the gap of the concept of non-adoption barriers.

2.4.2 Value proposition and suppliers' value added

The study engages with the investigation of innovative marketing strategies in order to use factors out of traditional relation between reseller and supplier and focus just on core benefits of products/services (Westerlund et al., 2011). Suppliers need new cooperation and a co-creative business models to encourage resellers to sell (Westerlund et al., 2014).

Resellers' attitude to sell the products and services has a very important role to become more conscious on SMG solutions. Information sharing increases the value of the supplier-reseller relationship, as perceived by the value-added resellers and it fosters adaption and trust into this relationship (Westerlund et al., 2014). Westerlund et al. (2014) posit that marketing communications play an important role and need to be clear. In addition, information sharing increases the value between reseller and supplier. Communication and information sharing are the key factors that influence reseller adoption (Westerlund et al., 2011).

Reselling of SMG solutions is linked with the ability of understanding, developing and offering new relationships with suppliers. Resellers should add value in system integration which can work with almost all kinds of technology and comprehensive solutions (Westerlund et al., 2014). Resellers, as the final point of sale to customers, have a lot of value in final customer acceptance. Users are responsible for the costs that, besides being important, can dominate consumer adoption (Venkatesh et al., 2012). However, resellers have diverse reasons for the negative adoption behavior; a) high capital cost, and b) lack of confidence in the long-term among end customers. Thus, they need to be able to increase the quality of service and overcome the high initial costs. The relationship between the reseller and the supplier plays a strong role by motivator.

According to Valocchi et al. (2012), companies (resellers) willing to tackle industrial change and business innovation and sit at the nexus of new, complex relationships among business partners and customers will be well positioned to create and capture new demand for emerging products and services. Moreover, strong growth in

revenues and profits is achievable in multisided business models because of embedded network economics of scale, so the close and continuous working between supplier and reseller is necessary for successful business.

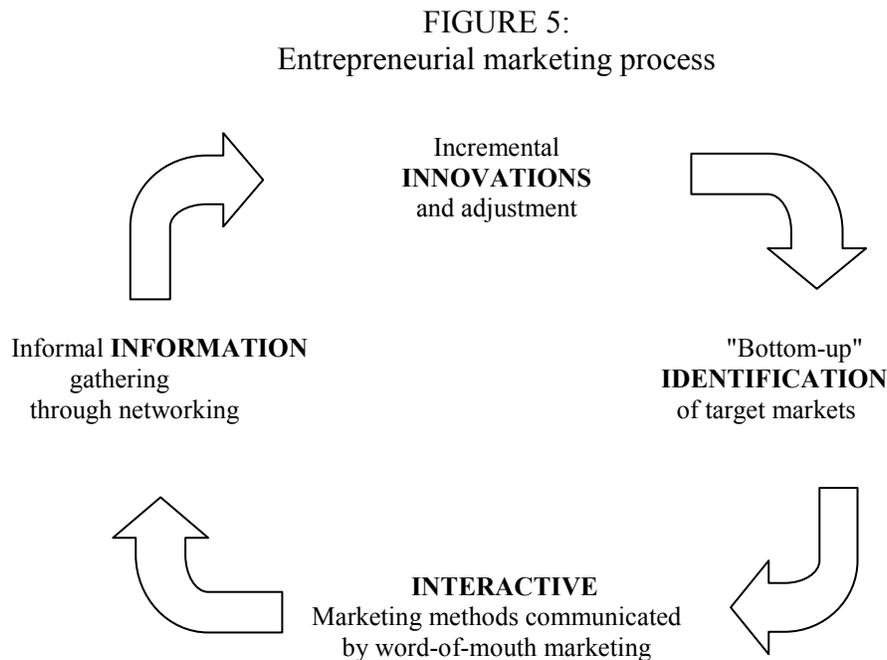
The more users trust SMG technology, the higher the probability of adoption with the innovative marketing (Arkesteijn & Oerlemans, 2005). Independent variables should be related to the technical system, some of the other variables to the technical system, and yet other variables related to economic issues (Arkesteijn et al., 2005). Tailored information about possibilities to reduce energy use, global setting, and tailored feedback about energy saving would result in changes in direct and indirect energy use (Abrahamse et al., 2007). With a focus on continued development, the present study tries to develop a conceptual framework to understand general points in SMG technology acceptance model and the ways that suppliers can use to develop adoption of the SMG technology among their resellers.

2.5 Entrepreneurial Marketing

This research tries to understand how entrepreneurial marketing can increase the adoption of novel technology among resellers. EM describes the marketing processes of firms pursuing opportunities in uncertain market circumstance (Becherer et al., 2008; cf. Franco et al., 2014). Marketing strategies often focus on government as the biggest stakeholder; for instance, China authority administration and management policies on developing SMG technology (for many reasons such as saving money or increasing reliability of power system infrastructure and so on). Although SMG technology has not been established properly in some developing countries by governments, some other developing countries governments such as China, India, and Brazil have had significant effort in the field (Franco et al., 2014).

There are different definitions and elements of entrepreneurial marketing procedures; however, the majority of literature emphasizes value for incremental innovations and adjustment, "bottom-up" identification of target markets, interactive- marketing methods communicated by word-of-mouth marketing, and informal information gather-

ing through networking (Stokes, 2000). Figure 5 demonstrates four items in entrepreneurial marketing process and the interaction that each element has on other elements (Stokes, 2000).



The main aim of EM studies is to provide a conceptual model for entrepreneurs to have a better marketing tool in compare to traditional marketing strategies. Stokes (2000) categorizes entrepreneurial marketing with four main concepts; marketing as an organizational philosophy or culture, marketing as a strategy, techniques for developments, and market intelligence;

- Entrepreneurial marketing as an organizational philosophy or culture requires a strong understanding of customer needs to precede and inform the development. The marketing procedure of products and services, the concept of market or customer orientation should be planned based on customer needs and expectations.
- Entrepreneurial marketing as a strategy can define how an organization is to compete and survive in the marketplace.

- Entrepreneurial marketing refers to the specific activities and techniques in product development, pricing, advertising and selection of distribution channels which implement as strategy.
- Market intelligence underpins each of these marketing principles. The members of a marketing-oriented organization undertake information-related activities (Kohli & Jaworski, 1990; cf. Stokes, 2000).

Entrepreneurs can convert opportunities of SMG technology to workable and marketable ideas, and suppliers can add value by using EM elements more effectively (Kuratko, 1995; cf. Jones & Rowley, 2011). EM is configured in seven categories: a) proactiveness, b) focus of opportunities, c) calculated risk taken, d) innovativeness, e) customer intensity, f) resource leveraging, and g) value creation (Morris et al., 2002; Becherer et al., 2008; cf. Franco et al., 2014).

The EM literature offers opportunities to explore marketing behaviors. The entrepreneur is an innovator or developer who recognizes and seizes opportunities, converts those opportunities into workable/marketable ideas, adds value through time effort, money or skills, assumes the risks of the competitive marketplace to important to implement these ideas, and realizes the rewards from these efforts (Bjerke & Hultman, 2002).

Combining “entrepreneurial” and “marketing” leads to the concept of entrepreneurial marketing (Jones & Rowley, 2011). The approach of entrepreneurial marketing is not just based on marketing, but also innovation as key activity for entrepreneurship and customer relationships (Jones & Rowley, 2011). Morris et al. (2002; cf. Jones & Rowley, 2011) explain EM as the proactive identification and exploitation of opportunities for acquiring and retaining profitable customers through innovative approaches to risk management, resource leveraging and value creation. In EM, opportunity creation needs learning from market with facing obstacles and the ability to take advantage of unexpected events.

EM is new field of technological marketing which is based on conceptualization from qualitative research. It is initially associated with small firm resources and practices which do not have coherent focus and are based on effectuation rather than causation (Mort et al., 2012). Marketing is a critical activity which has an important role in company's success (Franco et al., 2014). Franco et al. (2014) also mention that entrepreneurs are developers and leaders of changes, and that they will look into finding new ways to upgrade solutions and find better ways of overcoming barriers. Marketing as a strategy involves the processes of segmentation, targeting and positioning, where products and services are focused on appropriate buyer groups (Doyle, 1994; cf. Stokes, 2000).

Marketing and entrepreneurship have three overlapping key areas as they are both a) change focused, b) opportunistic in nature, and c) innovative in their approach to management (Collinson et al. 2001). There are other overlaps that can be revealed by seeing entrepreneurial marketing through the strategic orientation lens. Based on a review of the extant literature, EM consists of four key orientations (Jones & Rowley, 2011):

- a) Market orientation**
- b) Customer orientation**
- c) Entrepreneurial orientation**
- d) Innovation orientation**

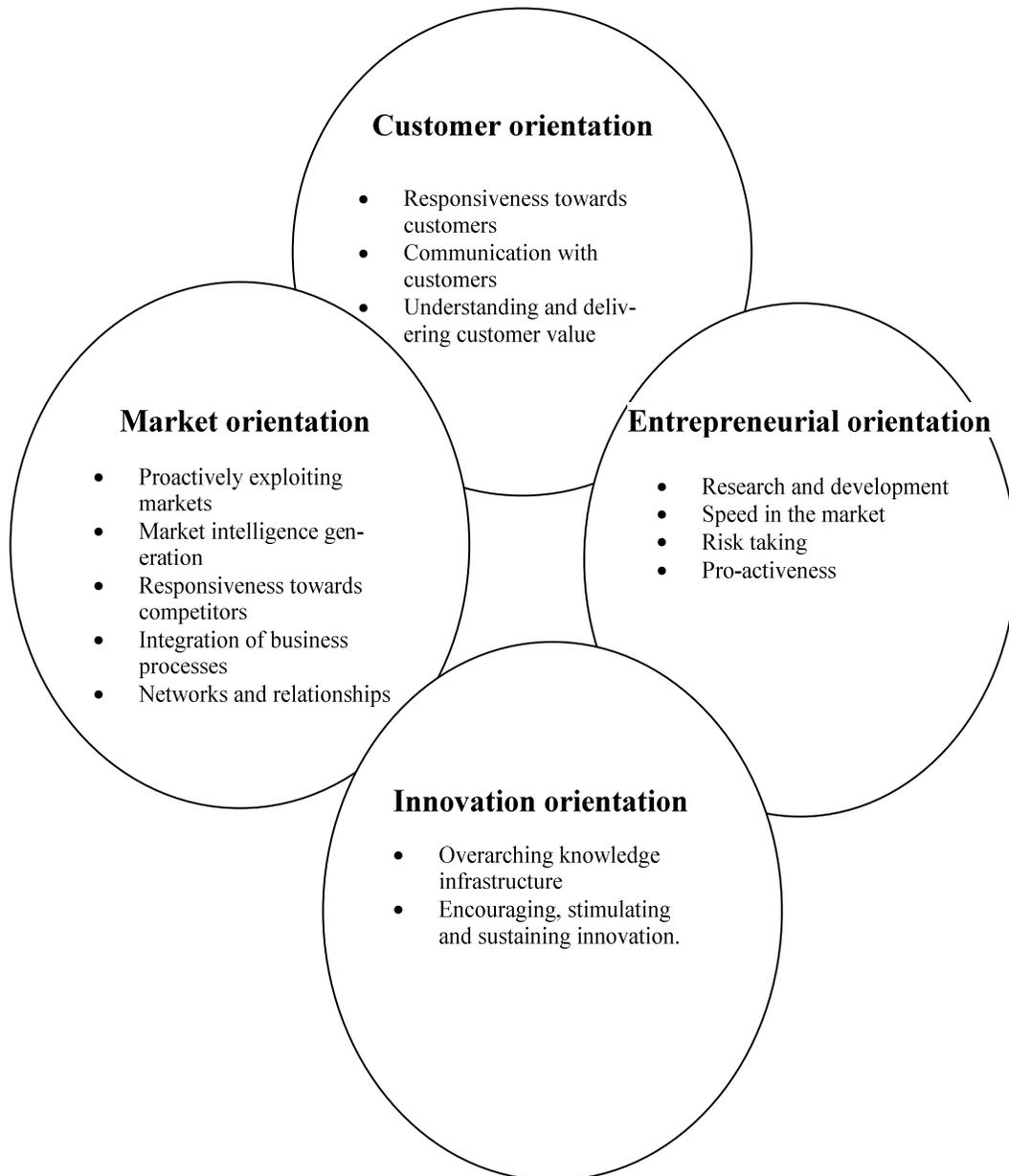
EM acknowledges the interface between entrepreneurship, marketing and innovation, and pursuance of customer value (Jones et al., 2013). Each of the four main orientations, i.e. customer orientation, market orientation, entrepreneurial orientation, and innovation orientation (cf. Jones et al. 2013), has its specific dimensions, as shown in Figure 6. Market orientation refers to having a positive effect on business performance, and using market information and intelligence (innovation in market) instead of focusing on customer as the central core business (Jones & Rowley, 2011).

Customer orientation refers to the importance of customer-focused employees as a tangible sign of quality for core business, and being close to customer as a key point of customer needs and wants. The whole concept of EM is to determine and realize the target of customers need and adapting the selling organization policy. It has three dimensions: i) responsiveness toward customers, ii) communication with customer, and iii) understanding and delivering customer value (Jones & Rowley, 2011).

Entrepreneurial orientation is defined by risk aversion, proactiveness, and innovation that the entrepreneur accepts, and it includes culture, innovation, and risk taking (Jones & Rowley, 2011). Finally, innovation orientation is associated with the identification of new opportunities and usage of innovative techniques to successfully meet customer needs (Jones & Rowley, 2011).

EM puts an emphasis on marketing in the forms that is appropriate to small and medium- size enterprises (SMEs). Consequently, it stresses the pivotal role of the entrepreneur in any marketing activities (Stokes, 2000). The entrepreneurial proclivity has positive effect on relationship in market orientation. In the same way, innovation is the core of business creation, and entrepreneurial activity refers to creativity, proactivity, and risk acceptance to solve customer problems (Miles et al., 2014).

FIGURE 6:
Entrepreneurial marketing orientations



2.5.1 Entrepreneurial Orientation

Entrepreneurial orientation is a general concept of marketing segmentation criteria, because it builds on using demographic, psychological and buyers' behavior variables to evaluate the attraction of each segment with effective communication. Entrepreneurs, who find new opportunities, will have identified more advantages than other competitors through first focus on innovation to products and services, and then consumer needs (Stokes, 2000).

Entrepreneurial marketing aims at the ability to understand and react quickly to market changes by adopting new technology based on market needs. In this study, entrepreneurial orientation is used in four main elements which are research and development, speed to market, risk taking, and pro-activeness.

All of these elements are dimensions of entrepreneurial orientation in support of entrepreneurial marketing.

- 1- Research and development is associated with the level of finding new way to do leadership in technology through R&D (Jones et al., 2011).
- 2- Speed to market is associated with being competitive and having a good position in market, working together, and following the rules in the market, as well as being the leader in new products and services (Jones et al., 2011).
- 3- Risk taking explains the calculated risk taking; preparedness to accept of risk taking to make new opportunities, doing new and revolutionary activity, transformational acts, and reliance on learning by doing (Jones et al., 2011).
- 4- Pro-activeness refers to commitment to find new opportunities, focus of finding new way of doing tasks which may cheaper, or simpler (Jones et al., 2011).

2.5.2 Market Orientation

EM builds on resources and new opportunities to understand the market and growth opportunities, which come from market orientation and networks (Miles et al., 2014). It should explore novel opportunities, strategically assess firm's resources and capabilities, and create positive advantages (Miles et al., 2014). In this study, market

orientation is categorized into exploiting markets, market intelligence, and responsiveness towards competitors, integration of business process, and networks and relationships (Jones & Rowley, 2011):

- 1- Exploiting markets is about policy and passion to do, using strategy as driven by tactical success, and process of finding new ways of doing, in short steps, and continuously exploiting smaller market niches; being flexible in market (Jones & Rowley, 2011).
- 2- Market intelligence generation is about gathering information from external resources or competitors, personal contact or relation, social, through network, or whatever which can help to find new ways of doing (Jones & Rowley, 2011).
- 3- Responsiveness towards competitors is a suitable reaction to competitor's new products, new, unique, and innovative marketing strategies, use of new and different strategies for different product; for instance, tailoring the product and service based on understanding of customer needs (Jones & Rowley, 2011).
- 4- Integration of business process means close connections between research, development, and marketing. Sharing of resources product/venture development is interactive, work very closely together through core processes, project planning, project management, and marketing which permit various levels of functional areas (Jones & Rowley, 2011).
- 5- Networks and relationships refer to sharing resources, making new capacity for building professional and beneficial network in business competence, creation of value through relationships, and doing marketing as a daily and usual practice with entrepreneurial networks (Jones & Rowley, 2011).

2.5.3 Innovation Orientation

Innovation orientation has been introduced as one of the main pillars for entrepreneurial marketing to realize and provide opportunities in any business. Innovative value creation can develop customer's unmet needs and combine resources in a unique way to create value to customers (Miles et al., 2014). In other words, innovation is using potential opportunities in current and future markets with accepting risks (Miles et al. 2014). Being innovation-focused involves not only new products, ideas, and seeking potential for improvement and changes, but also pervasive attitude that facilitates firms beyond the present situation and for future improvement (Bessant, 2003; Von Stamm, 2003; cf. Miles et al., 2014).

In this study, innovation orientation is categorized as knowledge infrastructure and propensity to innovate as suggested by Jones and Rowley (2011).

- 1- Knowledge Infrastructure means making an infrastructure's knowledge to meet formal and informal procedures, practices to be intensive, and gathering data and disseminating information from inside and external resources (Jones & Rowley, 2011).
- 2- Propensity to innovate means processes for shaping the organization's culture to use and sustain creativity and innovation into all types, services, and processes (Jones & Rowley, 2011).

2.5.4 Customer Orientation

Entrepreneurial marketing grounds on entrepreneurs' effective marketing strategies (Stokes, 2000), and EM strategies use bottom-up process to target specific customer orientations. EM should be able to categorize marketplace, and anticipate changes in customer attitude and demands (Collinson et al., 2001). Entrepreneur who acts as a person in charge for his business to modify customers catching process and finds new ways, methods to produce and make a successful or a fluent business model.

Suppliers as change leaders should maintain trusted and informative relationships with their resellers and provide them with hands-on sales tools to push resellers' commitment of selling their services or solutions (Westerlund et al., 2014). Customer orientation has a variety of segmentations and definitions; however, this study applies responsiveness towards customer, communication with customer, understanding and delivering customer value, and promotion and policy procedure.

- 1- Responsiveness towards customers defines as responsiveness to customer feedback and behavior, and how fast the reaction can shift to customer preferences (Jones & Rowley, 2011).
- 2- Communication with customers strives to lead customer feedback gathering mechanism, policy of getting regularly feedback and response from customer ongoing dialogue with customers to build long term relationships; acceptable and confidence relationship based on trust and credibility (Jones & Rowley, 2011).
- 3- Understanding and delivering customer value refers to an organization based on customers' satisfaction; make product and service based on customer value, use innovation as a main core of their business from customer interactions (Jones & Rowley, 2011).
- 4- Promotion and sales describes an organizational focus, policy and procedure on sales and promotional activities (Jones & Rowley, 2011).

Collinson and Shaw (2001) argue that an innovator should realize and recognize the opportunities to make the idea marketable and make a commercial valuable business case through putting effort, time, skills and suitable investment. According to Jones et al. (2013), EM puts forward the following elements:

- a) Research and development (R&D)
- b) Market intelligence generation
- c) Responsiveness to competitor actions
- d) Integration of business processes
- e) Network and relationship

- f) Knowledge infrastructure
- g) Propensity to innovate
- h) Communications with customers
- i) Risk taking
- j) Proactiveness
- k) Exploiting markets
- l) Sales and promotions

3 Chapter: Methods

The quantitative research methods used in this study comprise an on-line survey administrated to selected professionals with a background in SMG technology. The aim of the survey was to gather data from individuals who are familiar with SMG technology, as questionnaire is a widely accepted method for collecting information for data analysis through a statistical approach. The questionnaire used for the survey purpose was initiated by reviewing the relevant literatures and interviewing a couple of industry experts.

3.1 Research design

This research develops a conceptual model with variables derived from the Technology Acceptance Model (TAM) and the Entrepreneurial Marketing (EM) literatures. The conceptual model helps to formulate and illustrate several hypotheses with different elements of TAM and EM. The hypotheses were tested by analyzing survey data from resellers who had either adopted or not adopted the SMG technology. The researcher has worked in the power systems industry for a number of years, and is well connected with resellers and other power systems companies. Contacts were derived from the researcher's LinkedIn account, and focused on industry professionals with technical background in power systems. The design of the research focused on the following steps:

- a) Semi-structured interviews with three industry experts to explore ideas that could be useful in narrowing down the intended questions in the survey: a sales engineer, a design engineer, and a CEO in the SMG industry about their concerns and interest toward SMG technology.
- b) Formation of hypotheses and the research model based on the literature review and semi-structured interviews.
- c) Online questionnaire addressed to contacts in power technology companies (particularly resellers) about their adoption of SMG technology and attitudes on suppliers' marketing strategies.
- d) Analysis of the collected survey data to test the hypotheses and validate the proposed research model.

Three individuals with professional technical backgrounds were chosen for the semi-structured interviews:

- a) A sales engineer from compact substation business, who is familiar with the SMG concept, and offers or uses this technology in some ways in its business.
- b) A design engineer of a smart metering technology manufacturer that has adopted in the SMG technology (note: smart metering system is one of the main parts of SMG). This individual was also consulted later to narrow down and select the most related questions for the questionnaire.
- c) The CEO of a solar system company associated with the FIT programs (a provincially funded program to provide power energy from renewable solar power).

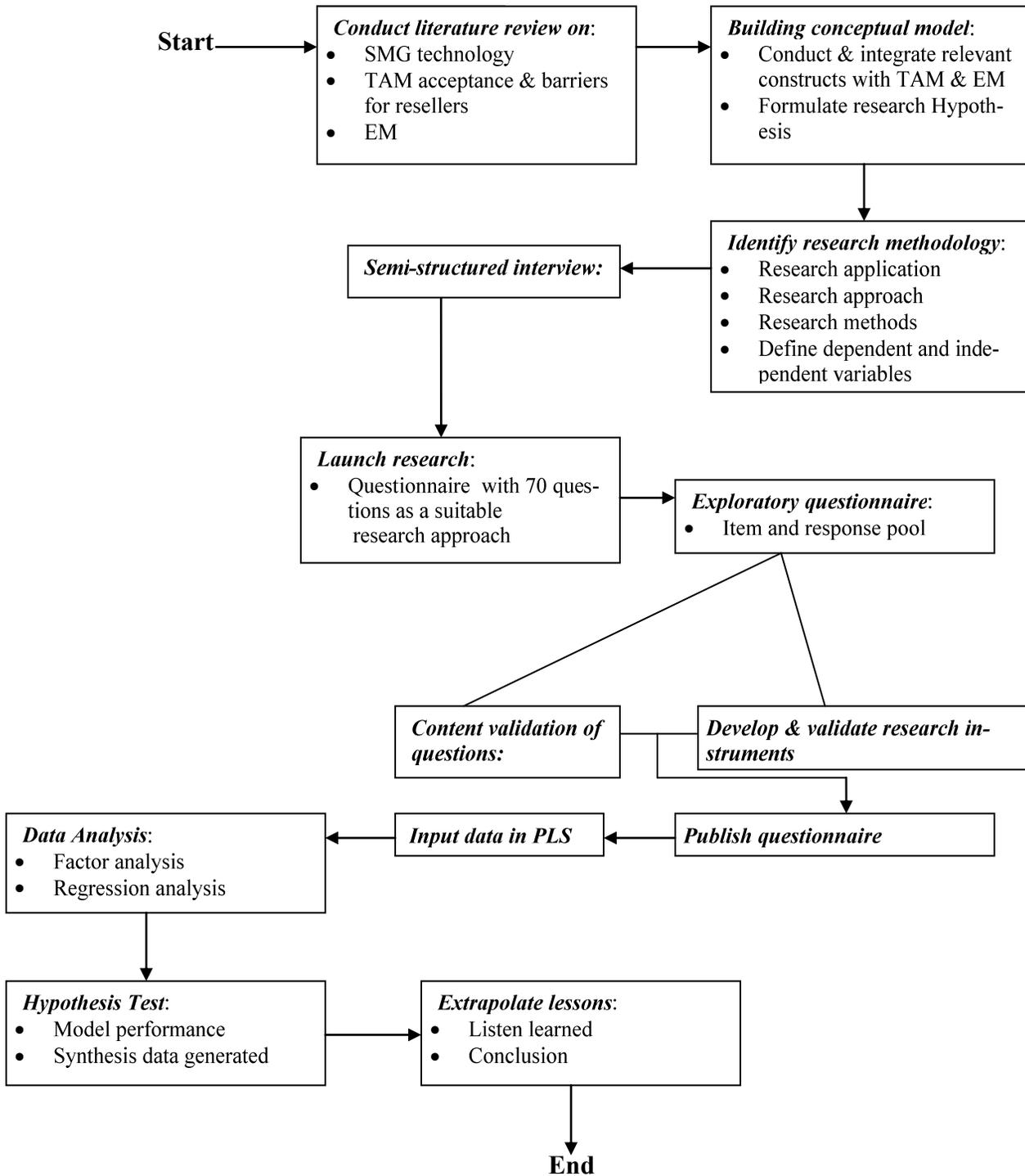
Each interviewee or survey respondent was made aware that the collection of data was approved by the Research Ethics Board of the Carleton University, and that they had the option to withdraw from the research at any time. Thus, participants engaged voluntarily as they were invited to participate in the survey by email and were informed of the options to decline or withdraw. Similarly, semi-structured interviews were based on the participants' voluntary acceptance of being interviewed in order to understand the perceived value and technology adoption behavior in their businesses. The interviews further addressed the interviewed experts' attitudes toward the functionality of SMG and the degree of familiarity of SMG technology, as well as their expectations from suppliers.

Thereafter, based on the literature review, the established research framework, and feedback from semi-structured interviews, an online questionnaire was launched among individuals in the power systems industry. The questions were adopted from a variety of previous studies, including the power systems technology, TAM and EM models, and were modified to fit with the SMG focus of the study whenever applicable.

To select the target participants, the invitation was sent to a list of 300 potential respondents based on the researcher's personal contacts in the industry. The items were developed based on the literature review and interviews with industry experts, and the

items were measured on a five-point like scale (1="Strongly disagree" to 5="Strongly agree"). Figure 7 summarizes the chosen research method and the steps taken in this study. The model in Figure 7 is adopted from Irani et al. (2009), and is then modified and adapted to meet the needs of the present thesis study. The survey was launched in the winter of 2015, and resulted in useful response from 99 respondents of different sections (Executive/entrepreneur, sales/customer service, design/engineering, and maintenance).

FIGURE 7:
The research method



The data were analyzed using the Smart PLS 3.0 software to test the research model and validate the established hypotheses. The benefits of PLS include the facts that it does not require normalized data and places minimum requirements on measurement levels unlike many other multivariate modeling approaches (Tenenhaus et al., 2005). Moreover, PLS is robust even if there is missing data, and it allows for modeling multiple relationships simultaneously, easy testing of moderating effects, and effective handling of multicollinearity among constructs (Chin et al., 2003; Haenlein & Kaplan, 2004). In addition, PLS is considered appropriate for predictive models such as various adoption models (Teo et al., 2003). Thus, PLS makes a good approach for analysis technology adoption.

3.2 Conceptual framework for analyzing impact of entrepreneurial marketing

The conceptual model (Figure 8) is a result of the literature review and the selection of elements derived from semi-structured interviews with industry experts. In the model, performance expectancy is understood as a value which users believe that system will help in their job to get more productivity (Venkatesh et al., 2003). Performance expectancy has five variables, including: a) usefulness, b) extrinsic motivation, c) job-fit d) relative advantage, and e) outcome expectations.

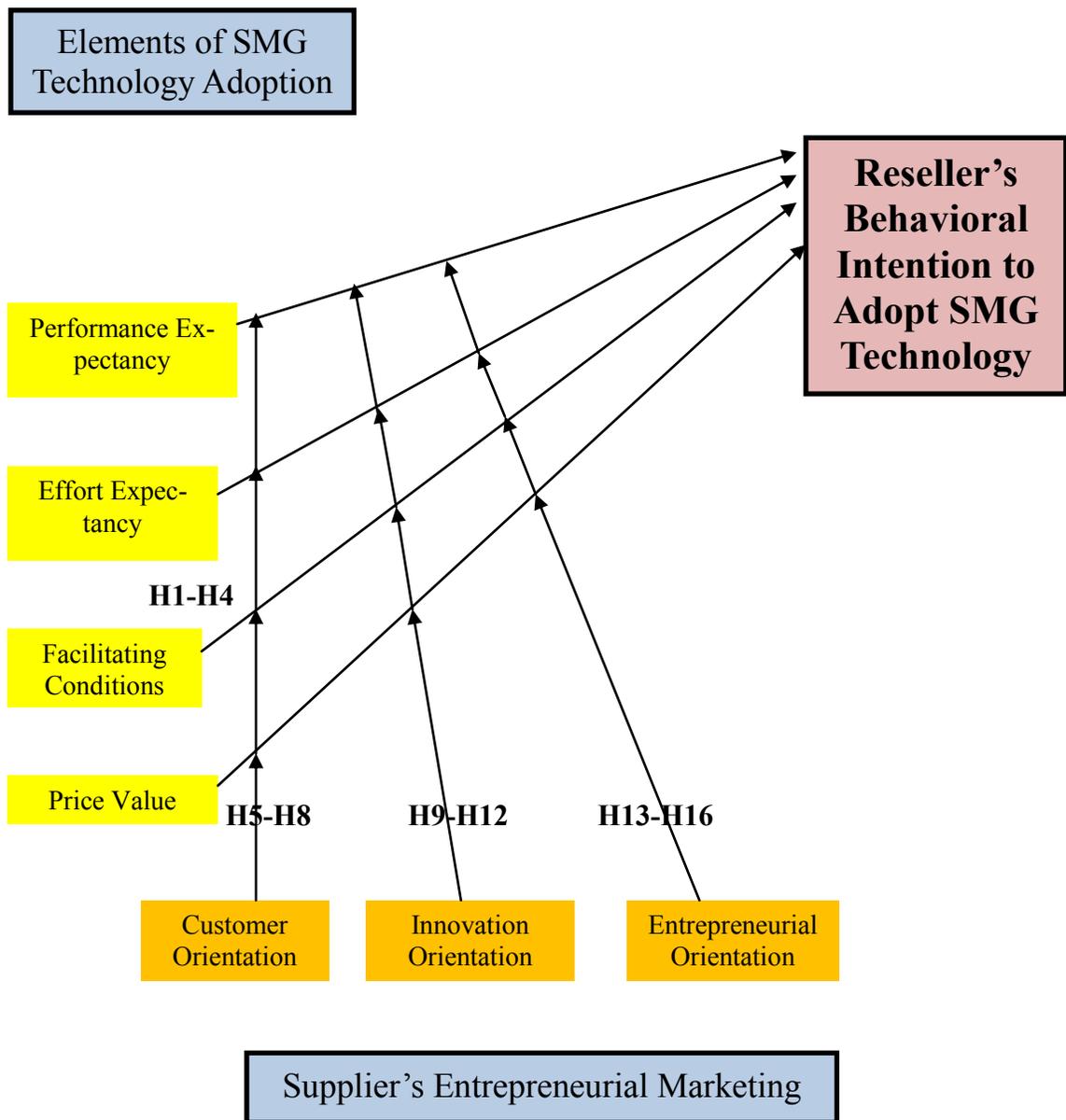
In Figure 8, effort expectancy is defined as the degree that an individual feels using system is simpler than existing systems (Venkatesh et al., 2003). Facilitating conditions define the degree to which individuals believe they have technical tools and service which can help them when required. Price value is the monetary value and effect that technology has on customer decision. People commonly believe that when they pay more money, they get better quality; however, they often choose products and services based on the lower expenses (Venkatesh et al., 2012).

Entrepreneurial orientation is used for research and development of finding new ways, speed in the market, risk taking, and being proactive in the commitments (Jones & Rowley, 2011). Innovation orientation is the ability of making infrastructure knowledge through formal and informal procedure, practice, and the process of being sustain creative

and innovative (Jones & Rowley, 2011). Finally, customer orientation is based on entrepreneurs' effective market investigation, responsiveness towards customer needs, effective customer communication to gather customer's feedback, understanding and delivering customer value (Jones & Rowley, 2011).

Resellers' actual behavior, which is the ultimate goal of most adoption research, comes from their intention to accept a product, service or technology. Resellers intend to adopt technology, such as the SMG, in an effort to modify and sell it to end-customers. Intention reflects resellers' likelihood to engage and sell the technology. As the SMG technology is an emerging area, this research only measures resellers' behavioral intention.

FIGURE 8:
Conceptual research model



The research model in Figure 8 includes a number of direct and moderated relationships between dependent and independent constructs. There are a total of 16 different hypotheses established in this study (Table 4).

TABLE 4:
The definition of different hypotheses in conceptual framework

Hypothesis	Dependent variable	Independent variable	Moderator	Explanation
H1	Behavioral intention	Performance expectancy		The performance expectancy has a positive effect on behavioral intention.
H2	Behavioral intention	Effort expectancy		The effort expectancy has a positive effect on behavioral intention.
H3	Behavioral intention	Facilitating Conditions		The facilitating condition has a significant effect on behavioral intention.
H4	Behavioral intention	Price Value		The price value has a positive effect on behavioral intention.
H5	Behavioral intention	Performance expectancy	Customer orientation	The influence of performance expectancy on behavioral intention will be moderated by customer orientation such that the effect will be stronger.
H6	Behavioral intention	Effort expectancy	Customer orientation	The influence of performance expectancy on behavioral intention will be moderated by market orientations Such that the effect will be stronger.
H7	Behavioral intention	Facilitating conditions	Customer orientation	The influence of performance expectancy on behavioral intention will be moderated by innovation orientation such that the effect will be stronger.
H8	Behavioral intention	Price Value	Customer orientation	The influence of performance expectancy on behavioral intention will be moderated by entrepreneurial orientation such that the effect will be stronger.
H9	Behavioral intention	Performance expectancy	Innovation orientation	The influence of facilitating condition on behavioral intention will be moderated by customer orientation such that the effect will be stronger.
H10	Behavioral intention	Effort expectancy	Innovation orientation	The influence of facilitating condition on behavioral intention will be moderated by market orientation such that the effect will be stronger.
H11	Behavioral intention	Facilitating conditions	Innovation orientation	The influence of facilitating condition on behavioral intention will be moderated by innovation orientation such that the effect will be stronger.

H12	Behavioral intention	Price value	Innovation orientation	The influence of facilitating condition on behavioral intention will be moderated by entrepreneurial orientation such that the effect will be stronger.
H13	Behavioral intention	Performance expectancy	Entrepreneurial orientation	The influence of price value on behavioral intention will be moderated by customer orientation such that the effect will be stronger.
H14	Behavioral intention	Effort expectancy	Entrepreneurial orientation	The influence of price value on behavioral intention will be moderated by market orientation such that the effect will be stronger.
H15	Behavioral intention	Facilitating conditions	Entrepreneurial orientation	The influence of price value on behavioral intention will be moderated by innovation orientation such that the effect will be stronger.
H16	Behavioral intention	Price value	Entrepreneurial orientation	The influence of price value on behavioral intention will be moderated by entrepreneurial orientation such that the effect will be stronger.

3.3 Data collection

The population under consideration includes power system professionals who were chosen based on their background and professional experience from the researcher's LinkedIn resources website. At the first step, around 2,000 people who had the power systems background were listed as potential research participants. Then, approximately half of them were excluded as they were not considered familiar with the SMG technology. Then again, approximately one third of the filtered pool accepted to engage in a survey, so the final questionnaire was sent to 300 individuals with their permission.

Participants were approached by email and asked if they are willing to participate in the study. Those who agreed to participate received a link to a questionnaire in English language. The questionnaire was located on the SurveyMonkey.com website. The invitation and the questionnaire informed the participants of the approval of the study by Carleton University Research Ethics Board, as well as the options to decline and withdraw.

Participants who completed the questionnaire submitted their responses anonymously. Email addresses had been recorded for those participants who were willing to receive a

reminder email, and the reminder was sent to those participants' several times after the questionnaire was distributed. Those participants interested in obtaining results will receive a short summary of the findings at the conclusion of the study. The obtained data are used to identify factors that influence on resellers' adoption of SMG technology. In particular, the survey addressed suppliers' attitudes toward SMG technology acceptance and the role of suppliers' entrepreneurial marketing in acceptance.

The constructs and their variables covered in the model were formulated into 70 questions in a questionnaire based on the literature review and semi-structured interviews with industry experts. This highlights that potential problems in the questionnaire instrument were addressed, and the researcher tried to minimize any defects. The endeavor included:

- a) Choosing the appropriate presentation method
- b) Choosing the appropriate questionnaire method
- c) Choosing the appropriate measurements and scales

3.4 Analytical approach

As the objective of this study is to explore the relationship of supplier's EM and reseller's technology acceptance, there is no existing theory that could directly explain the established hypotheses. In order to test the relationships between dependent and independent variables with respect to the adoption of SMG technology, the model was analyzed with the partial least squares method. The PLS path modeling technique provides a specific method of performing multiple regression analyses in which there are multiple constructs expected to have direct or moderated effects on other constructs. In this research PLS 3.0 software was applied to estimate the parameters tension to determine composite data. Jagpal (1982) developed a PLS -based ridge estimator to deal with multicollinearity in structural equation models (Schmidt & Muller 1987, Maruyama 1998 cf Grewal et al., 2004).

The SmartPLS 3.0 is an appropriate tool for testing the validity of model, as it is one of the most popular software tools for PLS modeling of constructs with latent variables. The measurement model relates dependent variables to independent variables, and the structural model relates dependent variables to each other. All variables were entered into the measurement model to analyze the R-squared value that shows the coefficient of multiple determination (i.e. variance explained), as well as the interpretation of the beta coefficient (β). This coefficient shows the amount of change in the dependent variable for a unit change in the independent variable.

The indicators are comparable with R-squared in linear regression analysis. If R-squared value is 0 or close to zero, the independent variables do not provide causal value. Conversely, if the value is 1 or close to one, the independent variables have value on independent variable. The second model (structural model) tires validity and effect of each variable on each other through the measurement and compare T-value and weights. Data analysis of the present study focuses on resellers' attitudes towards adopting SMG solutions. The analysis revolved around testing the hypotheses presented in the research model, i.e. the relationships between the resellers and the supplier which are categorized into elements of technology adoption, attitude towards suppliers' marketing, and suppliers' intention to adopt novel SMG technology.

The PLS is used as a tool to analysis multi linear regression with different R parameters to make these values as a judgment tools for hypotheses which are accompany the answer and which one is the neutral or against it. The PLS path-modeling method was used for the empirical study. The PLS analysis focuses on the analysis of variance, and was particularly used to get the sequence of regression in terms of weight and tension factors. The weighting scheme provides the highest R-squared value for the elements. The SmartPLS v3.0 software was also used to test internal validity and consistency of the constructs in the model, as well as to test the 16 established hypotheses. The analysis employed a bootstrapping method which used randomly selected subsamples to test the PLS model. The bootstrapping procedure was applied to test coefficients in outer loadings, paths, and their standard errors. The advantage of PLS is its ability to model multiple

construct in both dependent and independent manner (Chin et al., 2003; Tenenhaus et al., 2005; cf. Westerlund et al., 2014).

3.5 Design research questionnaire

Suppliers' concern about uncertainty, risk, visibility, and price value are very important factors, which should be part of research to see how much value should be in it to convince resellers to adopt into this technology. A questionnaire was launched to understand the adoption rate of SMG technology among power system resellers. The target group of response is the professionals who are working in energy and power system sector to capture the resellers' ideas in this area.

In this thesis, four elements of technology acceptance model were chosen which are related into SMG technology. The chosen constructs included: performance expectancy, effort expectancy, facilitating conditions, and price value. They help to understand the effect of technology adoption on resellers' behavioral intention toward SMG adoption. The study used behavioral intention as the dependent variable, and did not measure the actual adoption of the technology. This decision was because the SMG technology is new, and anticipated not to be widely accepted. However, the approach helps to understand the main reasons which can encourage resellers to go and sell SMG products or services with a consideration of using EM techniques for effective branding. This questionnaire follows these steps: research design with questionnaire consists of 70 questions to test different hypotheses (See appendix B). The questions are categorized into background questions, performance expectancy, effort expectancy, facilitating conditions, price/value ratio, customer orientation, market orientation, innovation orientation, entrepreneurial orientation, and actual behavioral intention.

3.5.1 Background information

The first section of questionnaire considers respondents' background information. The questions cover the respondent's position in their organization (executive/entrepreneur, sales/customer service, design/engineering, maintenance, or other carrier), years of experience, type of business which they are involved in, main customer segments and categories, the percentage of sales related to SMG technology, interest in selling SMG solutions, the expected impact of SMG on their business performance or productivity, and the perceived effectiveness of SMG in core business.

3.5.2 Performance expectancy concept

The second section is related to the TAM and its elements. Performance expectancy among resellers is addressed especially through the respondents' beliefs in whether SMG solutions can increase the rate of their business, knowledge or the chance of obtaining business benefits, or speed in the market. These elements give valuable information from the perspective of the respondents' business, particularly in terms of anticipation on SMG providing better results with the same amount of effort or adding new business benefits.

3.5.3 Effort expectancy concept

The third section of questionnaire is about investigation of effort expectancy. It addresses whether SMG solutions should take less time from business, be easy to learn to operate, be easy to use, promote clear and understandable interaction with the supplier, be flexible and interactive, be easy for business to be skillful in using or selling it, and take less time in doing operational tasks.

3.5.4 Facilitating condition concept

The fourth section categorizes facilitating conditions which addresses aspects such as the control over using solution, resources requirements from the business, requirement of little knowledge, being compatible with other systems, available guidelines, specialized instructions available, and available resources (such as specific person or technical group available for assistance with this system difficulties).

3.5.5 Price value concept

The fifth section is about price/value ratio. The questions are categorized into high price/value ratio to make important benefits in business, bearing the monetary cost of using compared to regular systems, high price/value ratio and its possible positive effect on business, the increased quality of business provided by the SMG technology, and the tradeoff between perceived benefits and monetary cost of usage.

3.5.6 Customer orientation concept

The sixth section is about customer orientation which is defined as responsiveness towards customer value, communication with customer as source of knowledge and value, understanding and delivering customer with positive a effect, ability to quick react with a positive value, localization customer need to create a value, customer with strong impact on retail business, and adapting customer response to satisfy are those need are crucial for the success.

3.5.7 Market orientation concept

The seventh section of questionnaire is about market orientation which is defined as consisting of proactive market exploration, market intelligence, responsiveness toward competitors, and integration of system to customers' business process, supplier networks and relationship with suppliers, good marketing strategy, and cultural focus in understanding customers' high value in SMG technology.

3.5.8 Innovation orientation concept

The eighth section addresses innovation orientation which is categorized into sufficient knowledge about suppliers' availability, supplier encouragements, supplier stimulated motivation. Supplier supported sustainable innovation, and supplier support to find and identify new opportunities in business, and convert opportunities into concrete, workable and marketable ideas.

3.5.9 Entrepreneurial orientation concept

The ninth section is focused on entrepreneurial orientation. It contains suppliers' research and development activities, suppliers' responsiveness to inquiry, suppliers' risk taking abilities, pro-active support from supplier, whether resellers are getting advantages over competitors by using new technologies, as well as development and use of new technology to give companies and unfair advantages.

3.5.10 Behavioral intention

The tenth section of questionnaire is used for studying behavioral intention. It is categorized into using SMG technology as a good opportunity for business, whether using SMG technology is wise idea for business, the SMG provides a good opportunity to increase the core of business, and the SMG promotes a business, whether using SMG makes the business more interesting compared to before, whether using SMG solutions corresponds well with current business core, and whether the SMG is pleasant for the business. Appendix A lists all questions and response options presented in the questionnaire.

3.6 Sample size and power calculation

Before gathering data for the purposes of analyzing complex models, especially when the model involves moderated relationships, it is beneficial to estimate the sufficient number of sample size. Therefore sample size and power calculation accounts the number of responses are need to have trustable responses. Sample size is the number of observations which is used to calculate and estimate of given population. Sampling is selecting process to select group and subset of population to analyze potential group (participants) in different categories. This process estimates characteristics and behavior of whole population with choosing adequate research design and data collection. Sample populations are collected from power system professionals, and the samples are directly chosen from potential populations. This study estimates interactions which are similar to comparing coefficients estimated from subsets of the data. It has a collection of data which can typically be expressed in terms of estimates and standard.

The sample size calculation requires assumptions that typically cannot be tested until the data have been collected and the sample size calculations are thus inherently hypothetical. It is important to estimate how many samples are needed to be selected from the population to get reliable results. This study runs to determine if entrepreneurial marketing is linked into technology acceptance model as a moderator, how much it can increase the value and rate the effect of different element of them.

The power calculation is the number or percentage that indicates the probability of this research is significantly effective. A power of 80% (or 0.8), which is commonly used randomized controlled trials (RCT), means that a survey or study when conducted repeatedly over time, is likely to produce a statically significant result (it has 80% power to detect a 20% differences) 8 times out of 10 (Youssf, 2011). And the probability of rejecting the null hypothesis with acceptance of alternative hypothesis is defined as power (the power of test increase with having a larger sample size).

Through investigation of participants' technical and business backgrounds, approximately half of the surveyed resellers had adopted the SMG technology, and the rest had not adopted the technology. This resulted in approximately 50/50 percent balance.

$$\text{The standard error of the difference of two proportions} = \frac{\sqrt{P(1-p)}}{\sqrt{n_1}} + \frac{\sqrt{P(1-p)}}{\sqrt{n_2}}$$

It assumes that the equal size and that under null hypothesis, the proportion of technology adopted is .5 in both cases. $\frac{\sqrt{.5(1-.5)}}{\sqrt{n}} + \frac{\sqrt{.5(1-.5)}}{\sqrt{n}} = \frac{\sqrt{.5}}{\sqrt{n}}$,

$$\text{So, } Z(\text{power}) \frac{\text{Difference}}{\text{Standard error(difference)}} - Z(\alpha/2) = \frac{.20}{\sqrt{\frac{.5}{n}}} - 1.96$$

$$.84 = \frac{.20}{\sqrt{\frac{.5}{n}}} - 1.96 \text{ then } n = 98$$

Sample size estimation is an important part for survey results calculation to achieve and have correct balance in research hypothesis. This calculation shows that the investigation must catch at least 98 of responses for its study sample size, power and detectable alternative hypothesis. With 99 responses, the adequate sample size was met in the study.

4 Chapter: Results

This section reports the results from the analyses described in the previous chapter. The results are organized into a variety of illustrations, including tables and graphs. The chapter walks through responses to individual survey questions, and then shows the results from the statistical analyses using the partial least squares technique.

4.1 Semi-structured interview points:

Semi-structured interviews were conducted with an open discussion that allowed causal and two-way communication. The interviewees have chosen from a group of professionals to interview and these people are giving information about their problems, and marketing policies. This helped to gather unexpected results and information from interviewees. The key outputs from the semi-structured interviews included:

- 1) Prepare a list of potential respondents and contact them through LinkedIn.
- 2) Discuss the questionnaire, including areas that should be highlighted, and prepare a preliminary list of questions.
- 3) Problem of using this technology, and focus on their problem as technology acceptance barriers.
- 4) Investigate their marketing policy and find potential solutions in entrepreneurial marketing.
- 5) Discuss and choose the most relevant TAM model elements for this technology (performance expectancy, effort expectancy, facilitating conditions, and price value).
- 6) Investigate marketing strategies which should focus in technology and in final guideline.
- 7) Compare and decide on entrepreneurial marketing elements (customer orientation, innovation orientation, and entrepreneurial orientation).

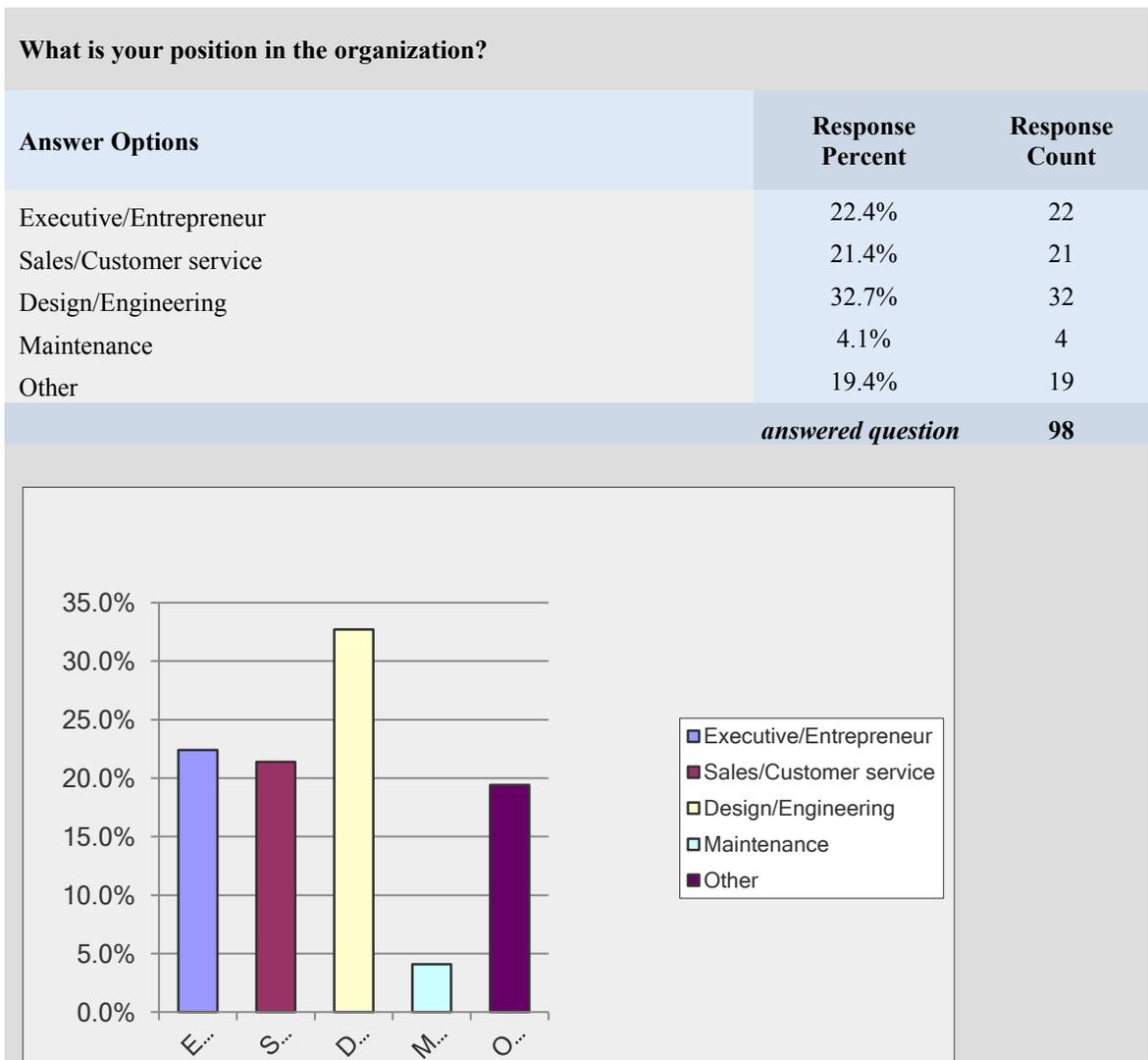
4.2 Response rate

From a total of 300 questionnaires distributed to resellers, 107 questionnaires were returned. This means a response rate of approximately 35%. As 8 of those returned questionnaires were not completed, a total of 99 responses were used in the analysis, thereby creating a final response rate of 33%.

4.3 Position in the organization

The survey explores the respondents' background. In terms of position in the company, the respondents identified themselves as follows: 22 % executive/entrepreneur, 21% sales/customer service, 33% design/engineering, 4% maintenance, and 20% other responsibilities (Figure 9).

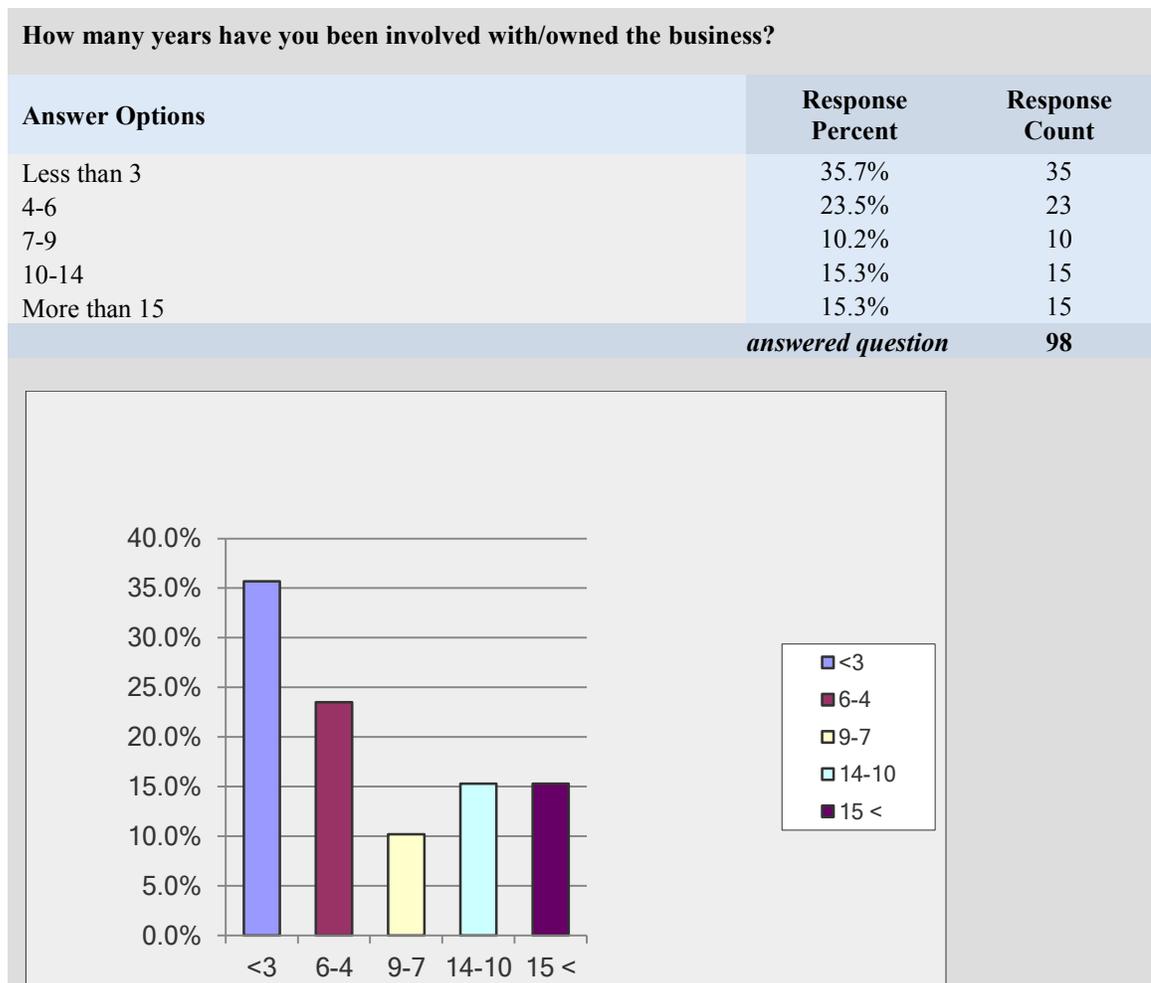
FIGURE 9:
Participant's position in the organization



4.4 Number of years involved with the business

The second background question is about participants' experience in their business (measured as the number of years). Figure 10 demonstrates the categories: less than 3 years, between 4 up to 6 years, between 7 and 9 years, from 10 to 14 years, and more than 15 years. The majority of responses come from people with less than 3 years (with almost 36%), which may be due to the immaturity of the smart power systems field. The respondents have heterogeneous backgrounds in terms of work experience: 36% had less than 3 years, 24% between 4-6 years, 10% for 7-9 years, 15% between 10-14 years, and 15% over 15 years of experience in their respective fields.

FIGURE 10:
Number of years involved with the business

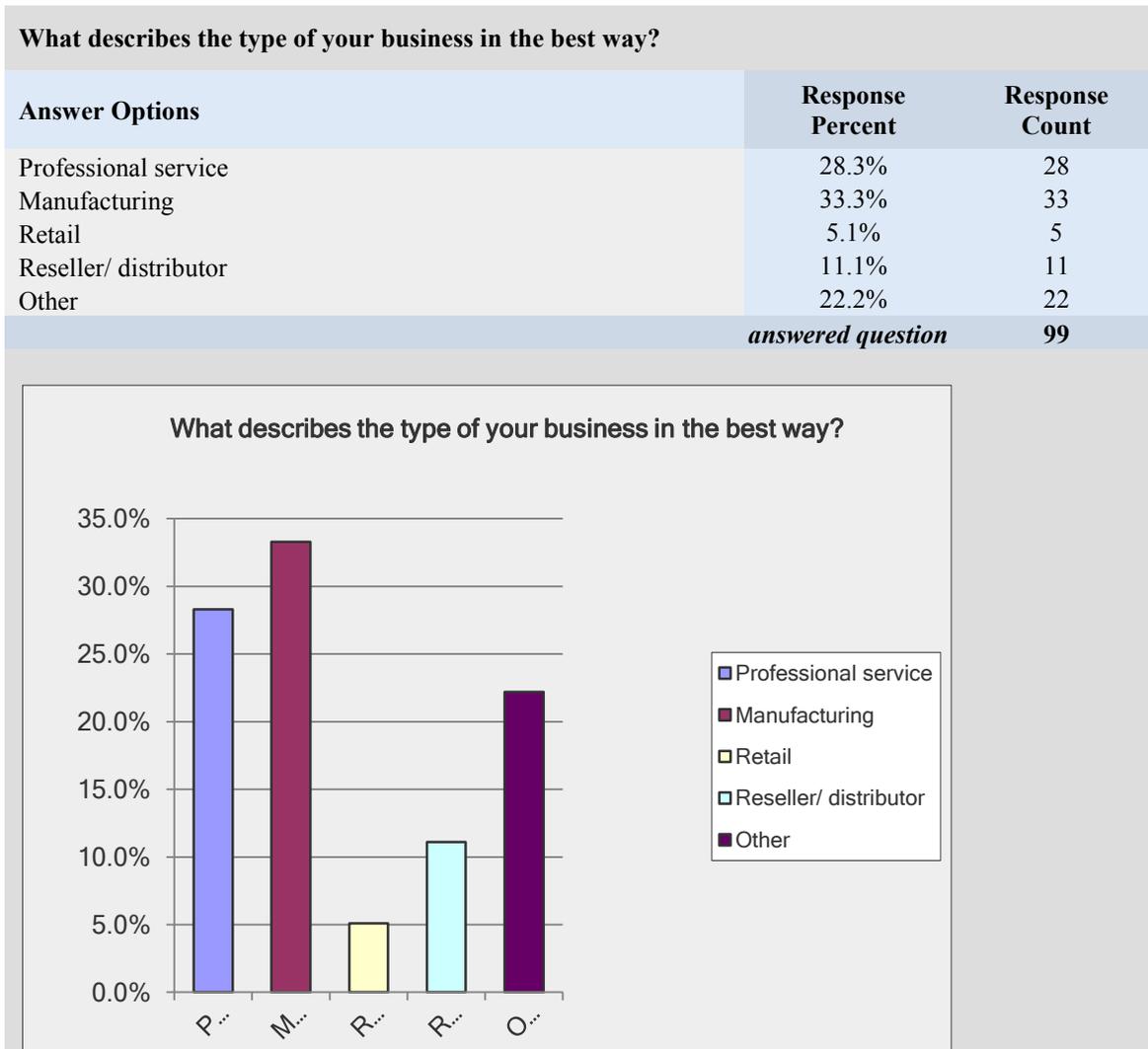


4.5 Type of business

The third background information is about the type of respondents' business. The options were: professional service, manufacturing, retail, reseller/distributor, or other.

Figure 11 illustrates that the majority (approximately 34%) is involved with manufacturing, with professional service following at 28%.

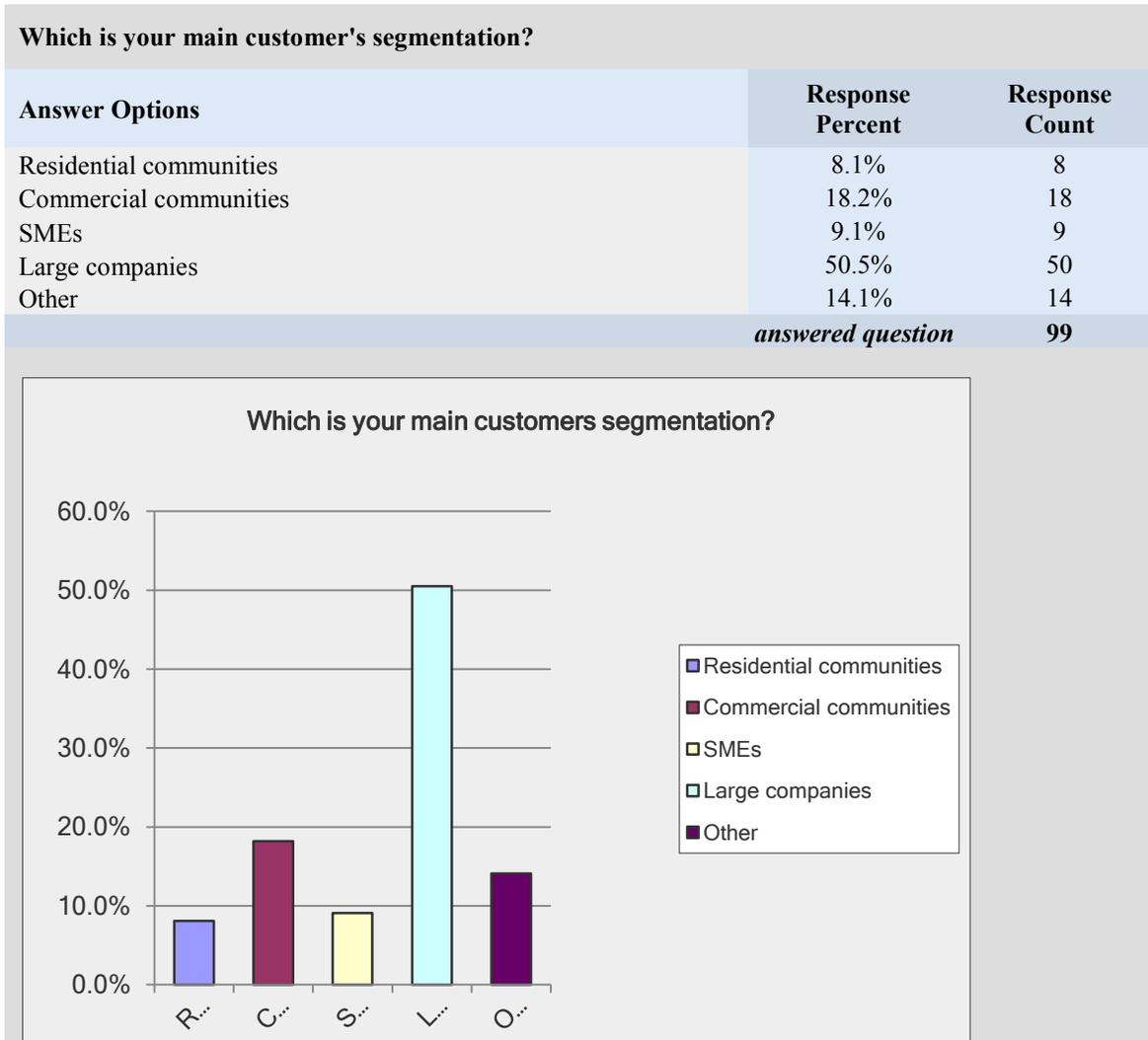
FIGURE 11:
Type of business



4.6 Customer segments

The fourth background question is about the main customer segments, which are categorized into: residential communities, commercial communities, SMEs, large companies, and other. Large companies with more than 50% comprised the biggest group, as shown in Figure 12. Commercial communities accounted for almost 20%, and residential communities and SMEs followed with around 10% each.

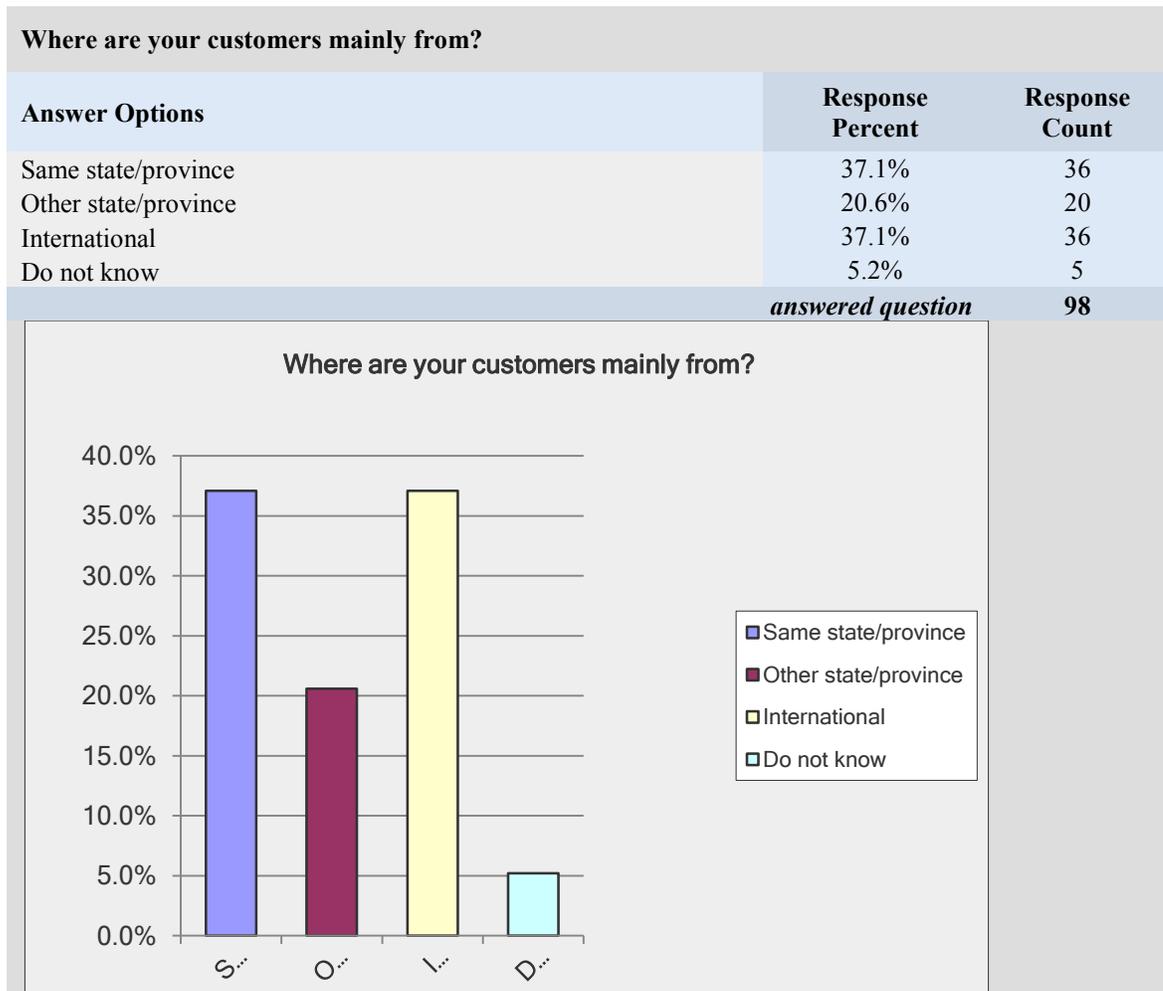
Figure 12:
The main customer segments



4.7 Customer location

The fifth background question is about the location of main customers, and how the companies reach these customers. The location of customers is categorized into: same state/ province, other state/province, international, and do not know. As shown in Figure 13, there is no bias because the same state (local) and international are represented equally.

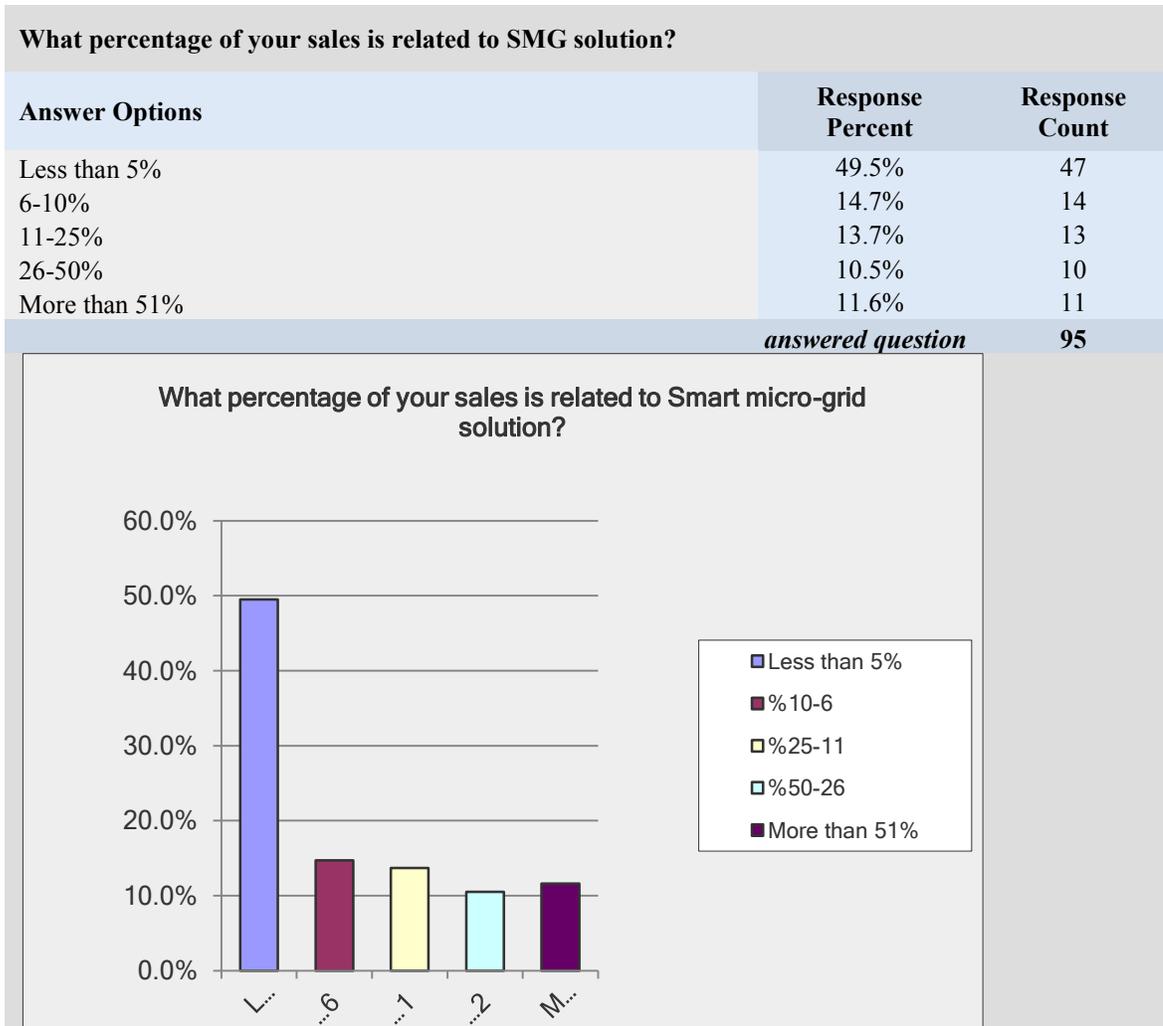
FIGURE 13:
The main customer location



4.8 Sales of the SMG technology

The sixth question focused on the sales of SMG technology (measured as the percentage relative to overall sales). The results are categorized into: less than 5%, between 6 and 10%, between 11 and 25%, between 26 and 50%, and more than 51%. Figure 14 shows that half of the respondents attribute less than 5% of their sales to SMG. Again, this may suggest the immaturity of SMG technology market. Other options are represented by 10 to 15% each.

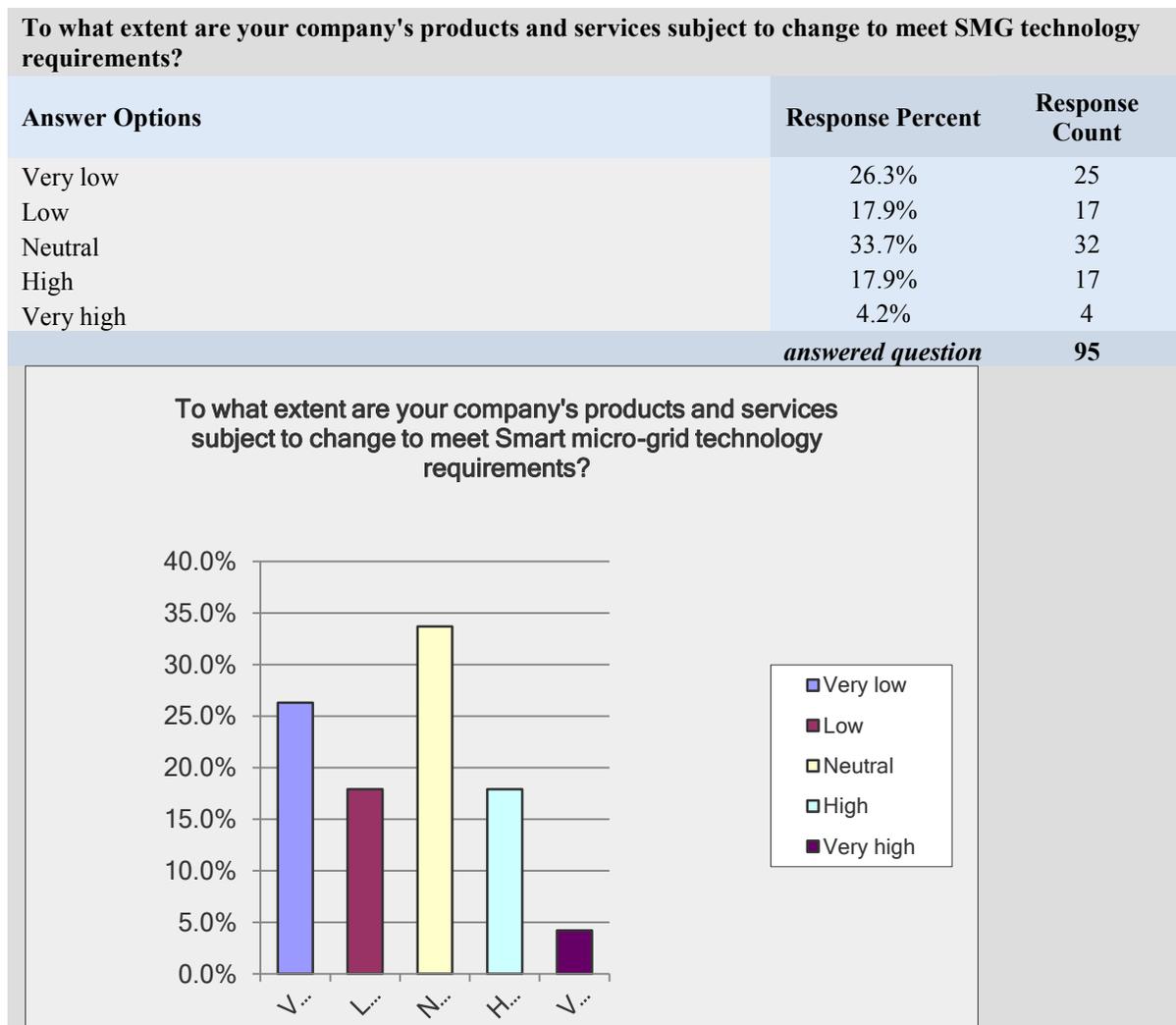
FIGURE 14:
The portion of sales related to SMG



4.9 Changes needed to meet the requirements of SMG technology

The seventh background question asks what amount of products and services are subject to change to meet the SMG technology requirements. When approaching new services and products, resellers need to rethink and reframe their strategies. The options are categorized into: very low, low, neutral, high, and very high. The results show that resellers have limited attitude and engagement to accept new technology (SMG technology) which emphasizes the EM role (Figure 15).

FIGURE 15:
Changes needed to meet SMG requirements



Although resellers' attitudes are not an absolute predictor of designing the most suitable marketing strategies, the unique relationship between the supplier and reseller can promote the resellers' technology adoption rate. Marketing communications influence customers' knowledge and beliefs, as well as impact their behaviors. Suppliers need to build conscious knowledge and awareness among resellers, who are deeply dependent on resellers' decision-making processes, to be able to create and offer SMG solutions based on needs.

Figure 15 demonstrates the lack of strong attitudes and values, (as almost 75% of responses are neutral, low or very low). Suppliers should use EM elements to prepare a whole variety of services and tools for resellers and make reseller well equipped with sourcing and assembling, either software, or hardware.

4.10 Portion of elements

After the background questions (Questions 1-7), the remainder of the questionnaire focused on the effects of TAM and EM elements. Figure 16 shows the main effects model without any moderating effects. The main model in Figure 16 demonstrates direct links between SMG technology adoption and reseller's behavioral intention, as well as between supplier's entrepreneurial marketing and reseller's behavioral intention.

FIGURE 16:
Suppliers' acceptance of (Main effects model)

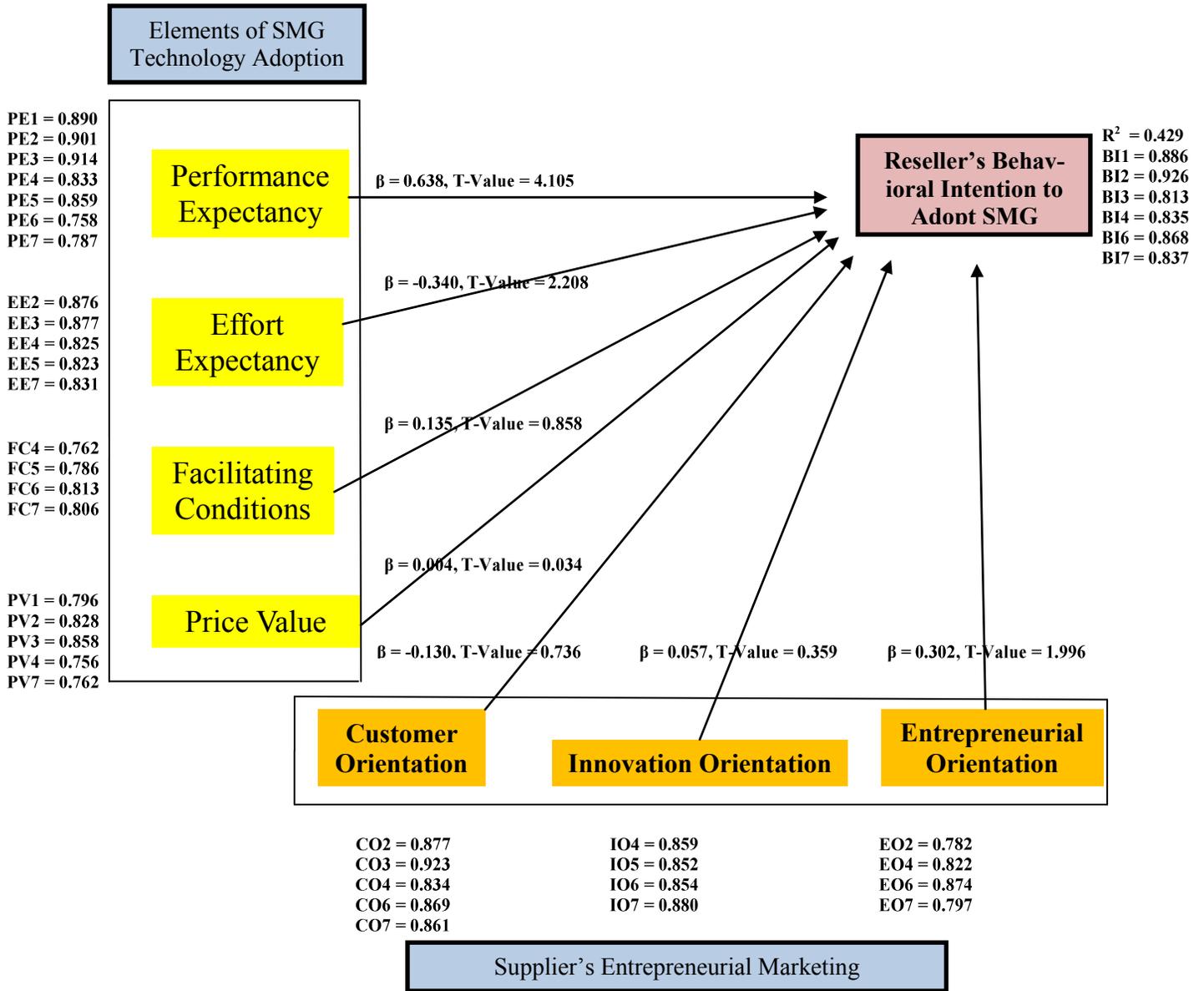


Figure 16 also illustrates loadings of variables to relevant constructs. Nunnally (1978; cf. Santos, 1999) has indicated 0.7 to be an acceptable loading of a variable but lower values are sometimes used. Lower loadings typically result in lower internal validity. The present data set was used to assess reliability and validity of the constructs in terms of composite reliability values (CR), Cronbach's Alpha (CA), and average variance extracted values (AVE). In order to provide a feasible solution, CA and CR should each be more than 0.70 (Hair Jr, Sarstedt, Hopkins, & Kuppelwieser, 2014), and AVE should be more than 0.50 (Chou & Chang, 2008). Table 5 shows that all constructs exceed the threshold values, and, thus, they are strong and meaningful for this research.

Table 5 illustrates correlations between different TAM and EM elements. The PLS technique is resistant to bias, as evidenced by the fact that data does not need to be preprocessed and standardized before the analysis (among the more formal remedies is ridge estimation, which introduces a small amount of bias in return for greater efficiency). A correlation of more than 0.6 is a sign of possible bias, and 0.7 is usually considered to show an undesirably strong correlation. At the same time, satisfactory discriminant validity among constructs is obtained when the square root of the average variance is greater than the corresponding construct correlation (cf. Westerlund et al., 2011).

TABLE 5:
Correlation matrix (n=99)

Construct	AVE	CR	CA								
				1(BI)	2(CO)	3(EI)	4(EO)	5(FC)	6(IO)	7(PE)	8(PV)
1- Behavioral Intention	0.743	0.945	0.930	(0.861)							
2- Customer Orientation	0.762	0.941	0.922	0.418	(0.873)						
3- Effort Expectancy	0.717	0.927	0.901	0.378	0.695	(0.847)					
4- Entrepreneurial Orientation	0.672	0.891	0.838	0.499	0.715	0.620	(0.820)				
5- Facilitating Conditions	0.628	0.871	0.803	0.408	0.716	0.700	0.651	(0.792)			
6- Innovation Orientation	0.741	0.920	0.884	0.485	0.722	0.622	0.795	0.604	(0.861)		
7- Performance Expectancy	0.724	0.948	0.936	0.586	0.662	0.757	0.566	0.572	0.663	(0.851)	
8- Price Value	0.641	0.899	0.860	0.413	0.609	0.511	0.568	0.680	0.620	0.563	(0.801)

The partially overlapping constructs are conceptually very close to each other, and, therefore, are expected to have higher than above (average .5) correlations. For example, performance expectancy and effort expectancy can be considered opposite sides of a coin. Similarly, entrepreneurial orientation and innovation orientation both describe proactive orientation within a company. Nevertheless, the high correlation values in some constructs of the present model should be considered as a potential problem and a limitation when interpreting and deriving implications from the results.

Table 6 summarizes the key regression statistics, which contain R Square, R Square adjusted, Cronbach's Alpha, Composite Reliability, and Average Variance Extracted. The R Square values exemplify that the independent constructs explain approximately 40% of the variance in the dependent variable of the model, which can be considered acceptable.

TABLE 6:
Regression statistics

Regression Statistics
<i>R Square = 0.429</i>
<i>R Square Adjusted = 0.385</i>
<i>Cronbach's Alpha = 0.930</i>
<i>Composite Reliability= 0.945</i>
<i>Average Variance Extracted= 0.743</i>

TABLE 7:
Testing model paths to EM's effects on technology acceptance #1

H#	Variables	Model 1: Main effects Model	H5: CO*PE→ BI	H6: CO*EE→ BI	H7: CO*FC→ BI	H8: CO*PV→ BI
H1	PE → BI	0.638(4.105)	0.629(4.309)	0.659(3.992)	0.636(3.937)	0.635(4.041)
H2	EE → BI	-0.340(2.208)	-0.279(2.114)	-0.334(2.072)	-0.340(2.015)	-0.340(2.022)
H3	FC → BI	0.135(0.858)	0.141(0.994)	0.127(0.829)	0.139(0.801)	-0.133(0.82)
H4	PV → BI	0.084(0.034)	0.032(0.272)	0.024(0.189)	0.003(0.024)	0.011(0.088)
	CO → BI	-0.130(0.736)	-0.177(0.982)	-0.149(0.796)	-0.127(0.716)	-0.130(0.714)
	IO → BI	0.057(0.359)	0.057(0.404)	0.055(0.374)	0.058(0.351)	0.057(0.348)
	EO → BI	0.302(1.996)	0.294(2.247)	0.301(2.034)	0.301(1.994)	0.306(1.97)
R ²		0.429	0.476	0.436	0.429	0.429
ΔR ²			0.047	0.007	0	0
F			0.09	0.01	0	0

TABLE 8:
Testing model paths to EM's effects on technology acceptance #2

H#	Variables	Model 1: Main effects Model	H9: IO*PE→ BI	H10: IO*EE→ BI	H11: IO*FC→ BI	H12: IO*PV→ BI
H1	PE → BI	0.638(4.105)	0.645(4.014)	0.636(3.692)	0.619(3.836)	0.636(4.335)
H2	EE → BI	-0.340(2.208)	-0.295(1.943)	-0.340(2.057)	-0.346(2.121)	-0.340(2.204)
H3	FC → BI	0.135(0.858)	0.139(0.868)	0.134(0.835)	0.140(0.894)	0.122(0.704)
H4	PV → BI	0.084(0.034)	0.001(0.008)	0.005(0.036)	0.017(0.143)	0.021(0.26)
	CO → BI	-0.130(0.736)	-0.146(0.799)	-0.126(0.639)	-0.128(0.74)	-0.119(0.68)
	IO → BI	0.057(0.359)	0.037(0.222)	0.058(0.339)	0.075(0.476)	0.017(0.121)
	EO → BI	0.302(1.996)	0.306(2.708)	0.302(1.975)	0.296(1.892)	0.308(2.199)
R ²		0.429	0.434	0.429	0.432	0.00
ΔR ²			0.005	0	0.003	0.00
F			0.05	0	0	0.00

TABLE 9:
Testing model paths to EM's effects on technology acceptance #3

H#	Variables	Model 1: Main effects Model	H13: EO*PE→ BI	H14: EO*EE→ BI	H15: EO*FC→ BI	H16: EO*PV→ BI
H1	PE →BI	0.638(4.105)	0.616(4.478)	0.619(3.505)	0.605(3.842)	0.638(4.251)
H2	EE →BI	-0.340(2.208)	-0.287(1.986)	-0.340(2.158)	-0.340(2.232)	-0.340(2.011)
H3	FC →BI	0.135(0.858)	0.135(0.824)	0.13(0.824)	0.152(0.951)	0.131(0.851)
H4	PV →BI	0.084(0.034)	0.006(0.047)	0.011(0.082)	0.044(0.328)	0.003(0.026)
	CO →BI	-0.130(0.736)	-0.139(0.798)	-0.119(0.679)	-0.141(0.804)	-0.126(0.701)
	IO →BI	0.057(0.359)	0.07(0.411)	0.043(0.254)	0.041(0.256)	0.06(0.329)
	EO →BI	0.302(1.996)	0.281(1.971)	0.326(1.915)	0.323(2.100)	0.295(1.625)
R ²		0.429	0.435	0.430	0.439	0.429
ΔR ²			0.006	0.001	0.01	0
F			0.01	0.000	0.02	0

Tables 7, 8, and 9 show the results of all PLS analysis. The hypotheses are shown in the left and top columns (From H1 to H16). The hypotheses H1 to H4 are shown in all three tables as they represent the effect of the TAM elements on behavior intention. Therefore, H5 to H16 were used to try the validity (increase the β co-efficient) of EM elements on TAM elements. In tables 7 to 10, some numbers are bolded (accepted results) based on two factors; 1) The validation of acceptance is seen from the T-value which has to be equal or more than 1.96 which is significant (Machlis et al., 2010), and 2) if the value for correlation co-efficient (β) is higher than its value in main model.

All accepted results are summarized in Table 10 which have a higher value for β for Co-efficient than the main model (for all accepted results the T-value is higher than 1.96). The unexpected result of this research is shown in Table 10; i.e. EO (Entrepreneurial Orientation) has a direct and positive effect on BI (Behavioral Intention).

TABLE 10:
Results of accepted hypothesis

H#	Variables	Main effects model	EE → BI	PE → BI
H1	PE → BI	0.638 (4.105)		
H2	EE → BI	-0.340 (2.208)		
H5	CO*PE → BI		-0.279- Difference $\beta(\mathbf{D}\beta)$ = 0.061	
H6	CO*EE → BI		-0.334($\mathbf{D}\beta$ =0.006)	0.659($\mathbf{D}\beta$ =0.021)
H9	IO*PE → BI			0.645($\mathbf{D}\beta$ =0.007)
H13	EO*PE → BI		-0.287($\mathbf{D}\beta$ =0.053)	
	EO → BI	0.302(1.996)		

Tables 10 and 11 demonstrate that H1, H2, H5, H6, H9, and H13 are supported by the analysis. After testing 16 hypotheses, it can be concluded that 6 hypotheses were supported, and 10 were not. In addition, there was unexpected result which is entrepreneurial orientation has direct and positive effect on behavioral intention. The overall results show that resellers who have background knowledge of the SMG technology are more keen adaptors of the SMG technology. The performance expectancy and effort expectancy have a direct and significant effect on behavioral intention (T-value higher than 1.96) even if no EM elements affect them (non-moderated). The results clarify what factors influence the adoption of SMG technology and what barriers must be removed to persuade the non-adopters to use SMG technology.

TABLE 11:
Results of hypothesis testing (n=99, Average of three run bootstrap)

Hypotheses	Relationship	β	t-value	D β -value	Support
H1	PE \rightarrow BI	0.638	4.105		Yes
H2	EE \rightarrow BI	-0.340	2.208		Yes
H3	FC \rightarrow BI	0.135	0.858		No
H4	PV \rightarrow BI	0.084	0.034		No
H5	CO \rightarrow PE	0.629	4.309	0.009	Yes
H6	CO \rightarrow EE	-0.334	2.072	0.006	Yes
H7	CO \rightarrow FC	0.139	0.801	0.004	No
H8	CO \rightarrow PV	0.011	0.088	0.073	No
H9	IO \rightarrow PE	0.645	4.014	0.007	Yes
H10	IO \rightarrow EE	-0.340	2.057	0.000	No
H11	IO \rightarrow FC	0.140	0.894	0.005	No
H12	IO \rightarrow PV	0.021	0.260	0.063	No
H13	EO \rightarrow PV	0.616	4.478	0.022	Yes
H14	EO \rightarrow PV	-0.340	2.158	0.000	No
H15	EO \rightarrow PV	0.152	0.951	0.017	No
H16	EO \rightarrow PV	0.003	0.026	0.008	No

5 Chapter: Discussion and Conclusion

This study focused on understanding the role of suppliers' entrepreneurial marketing in the adoption of novel SMG technology by power systems suppliers. In doing so, the study reviewed literatures on SMG technology, technology acceptance, and entrepreneurial marketing. The study aimed to develop a research model which can explain how suppliers' entrepreneurial marketing affects suppliers' intention to adopt SMG technology. The model and its hypotheses were tested by using the PLS method on a survey data of 99 power systems resellers. The findings and recommendations can be used as a guideline for encouraging reseller adoption of SMG products and services.

5.1 Discussion

The research focused on entrepreneurial marketing elements which can foster resellers' adoption of SMG technology. As the SMG is still an emerging technology, and its adoption is in early stages, there is a demand for more consideration and research in this area. In particular, this thesis addressed a theoretical gap in what can explain resellers' adoption of a novel, complex technology. In spite of the vast amount of technology adoption studies previously conducted, research focusing on resellers as intermediaries in technology diffusion has been almost non-existent. By studying resellers' attitudes toward new technology, it may be possible to identify critical barriers of market adoption. Hence, this thesis focused on understanding reseller adoption in the SMG context.

In an effort to understand reseller's adoption of novel power systems technology, the thesis had two additional goals; i) to test the appropriateness of the TAM within the domain of SMG technology, and ii) to examine the influence of EM on the adoption behavior across reseller market conditions. Considering the objectives of this research, the results were supportive of the TAM for understanding how SMG technology can be diffused in the market more quickly and effectively by focusing on resellers as intermediaries.

FIGURE 17:
Final model with results

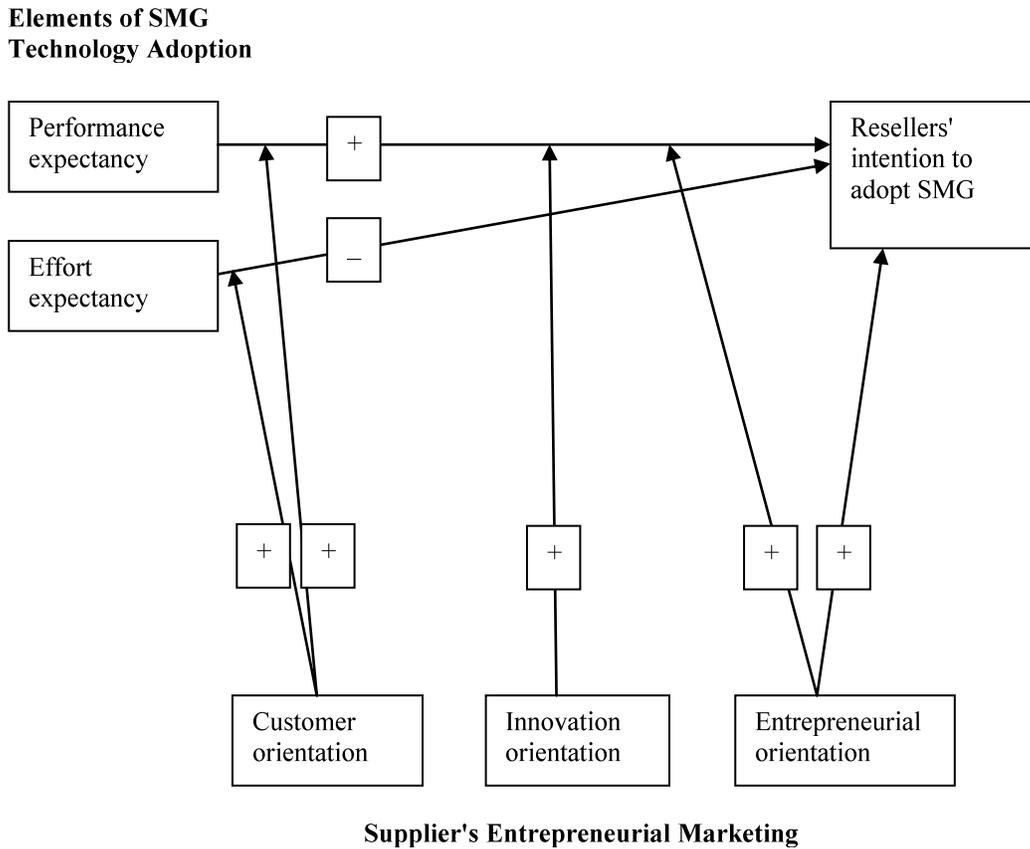


Figure 17 illustrates the confirmed relations between TAM and EM. The results showed that performance expectancy increases suppliers' behavioral intention while effort expectancy decreases the intention. Behavioral intention reflects the resellers' actual behavior (i.e. the likelihood to engage in SMG technology). Moreover, suppliers' customer orientation moderates both of these relationships. In other words, customer orientation magnifies the effects of performance and effort expectancy on the intention of power systems reseller to adopt novel technology. However, as found in the main model, the moderated effect of effort expectancy on resellers' behavioral intention is not positive.

Innovation orientation moderates the performance expectancy-behavioral intention relationship. That is, suppliers' innovation orientation amplifies the effect of performance expectancy on resellers' behavioral intention, much the same way that customer

orientation does. Finally, suppliers' entrepreneurial orientation increases the effect of performance expectancy on suppliers' intention to adopt the SMG technology. The unexpected finding of this research is the direct and positive relationship between suppliers' entrepreneurial orientation and resellers' behavioral intention. The entrepreneurial orientation which was not directly connected in the main model shows some strong and positive effect in the mediating model. EM may be especially appreciated in established markets, as it is characterized by well formulated customer perceptions.

The results of the analyses lead to a tentative conclusion that entrepreneurial marketing has a positive effect on performance expectancy. That is, performance expectancy is the main driver of reseller adoption, and suppliers' entrepreneurial marketing amplifies the importance of that specific driver. Suppliers can foster the adoption of SMG technology among their resellers by offering more information, extended support, better incentives, and by creating trust in the supplier-reseller relationship. Thus, it is anticipated that the suppliers' intention to adopt SMG technology requires a change in their marketing and selling practices. Furthermore, the results suggest that none of the other important predictors of the TAM model – facilitating conditions or price value – have an effect on the resellers' adoption intention. These results reflect the present immaturity of the SMG and the lack of awareness of this novel technology among power systems resellers.

5.2 Implications

This section consists of implications of the results to theory and practice, as well as the set of recommendations that can act as a guideline for suppliers of the SMG technology. The recommendations are classified into relevant categories to clarify reasons.

5.2.1. Implications for theory

The main implications of the results to theory can be categorized as follows: i) applicability of the TAM in resellers' contexts, ii) applicability of the TAM in a complex technological context, and iii) the effects of EM to the TAM. The present research validated some of the established hypotheses, but not all of them. For example, whereas prior literature on TAM suggests that (lower) effort expectancy will increase the intention

to adopt a technology in a positive relationship, the results did not support the notion directly. Rather, the results indicated a negative relationship between effort expectancy and behavioral intention. This may reflect the fact that SMG technology is perceived to be complex in nature, and is expected to require a lot of effort. Resellers may even prefer more complex technology because understanding the technology would give them competitive advantage over the others. It would be hard to compete with price as the only differentiating factor on trivial technology. On the other hand, the (negative) value becomes weaker when moderated by customer orientation. This means that suppliers' EM (specifically customer orientation) will help the reseller feel more comfortable about selling the technology. The finding will contribute to the literature on TAM by adding that resellers may not be interested in information that technology that does not require effort, but at the same time they value the attention and support provided by the supplier.

Surprisingly, the results did not speak of the role of TAM elements beyond performance- and effort expectancy. The anticipated effects of the other TAM elements, specifically the facilitating conditions and the price value, on resellers' technology adoption were not supported. The lack of these effects may be due to the fact that TAM is usually applied in end-user contexts (Venkatesh et al., 2003; Venkatesh et al. 2012), and the value of technology is perceived differently by the users and resellers of a technology. Consequently, it is likely that power systems resellers in the present study were not emphasizing facilitating the conditions or price value, because their value comes from a good input/output ratio in terms of selling. That is, resellers have differing motivations as they are focused on reducing the effort required to sell the SMG technology, and on the business performance they can achieve by selling that technology. For instance, resellers are likely looking at margins and revenue from selling a specific product (i.e. sales value). Conversely, it can be concluded that end-users are more interested in the use value and the amount of investment required for using the technology. This finding provides major implications to the existing TAM literature, as it basically suggests that TAM is only partially applicable in the reseller context. The findings indicate that there is a need for further development of the TAM to fit the characteristics of reseller businesses.

However, it can be concluded that there is a significant correlation between technology adoption and suppliers' EM. This finding brings about interesting contributions to the existing literature on technology adoption. TAM is usually applied “as-is”, meaning that the technology acceptance model, or any of its derivatives, is tested over a given technology. In other words, research that would apply the TAM and some other model in the same research (such as theory of reasoned action, motivational model, theory of planned behavior, model of PC Utilization, innovation diffusion theory, and social cognitive theory in Venkatesh et al., 2003) is practically non-existent. The present study used EM as a moderating factor and anticipated that EM will affect the adoption of technology. The finding that EM has amplifying effects, particularly on the performance expectancy-behavioral intention linkage, provides an interesting contribution to the TAM literature. It suggests that attempting to synthesize different models is superior to trying to amend the TAM in accordance with different contexts. Using the second model, such as the EM and its factors, as moderating factors seems to make a meaningful approach when mixing different models and assessing their co-effects.

5.2.2. Implications for practice

This research considers marketing through the concept of entrepreneurial marketing which is defined as a set of company's strategic orientations. Moreover, the approach means that the focus is on entrepreneurial behavior, not on marketing. Future research could focus on the actual marketing practice. The findings are also interesting from the managerial point of view, as increasing suppliers' performance expectancy and reducing their effort expectancy toward the technology may significantly promote the adoption of SMG. In particular, as performance expectancy is clearly related to suppliers' intention to adopt new technology, SMG technology suppliers may be able to initiate a major change in the power systems industry toward novel technology by encouraging their resellers to adopt SMG technology. Naturally, this would require effective entrepreneurial marketing focused on helping resellers to consider SMG technology as the core of their business. Suppliers need to consider the following points related to performance expectancy when planning their marketing activity and subsequent marketing messages aimed at power systems resellers:

- a) Using SMG technology should improve resellers' job performance
- b) Using SMG technology should increase resellers' productivity
- c) Using SMG technology should enhance resellers' effectiveness
- d) Using SMG technology should enable resellers to accomplish tasks more quickly
- e) Using SMG technology should prepare resellers with valuable information
- f) Using SMG technology should make resellers' jobs easier
- g) Using SMG technology should enhance job benefits

Similarly, effort expectancy was shown to have an effect on resellers' adoption of SMG technology. Tables 12-15 illustrate that the value for effort expectancy is negative. That is, resellers prefer to adopt technology that requires less effort. The effect of effort expectancy on intended technology adoption is weaker than that of performance expectancy; however, the effect is significant and suppliers need to address the following points in their marketing efforts aimed the resellers:

- a) Learning to operate the SMG technology should take the business less time.
- b) Learning to operate the SMG technology should be easy.
- c) The reseller should perceive that SMG technology is easy to use through suppliers' assistance.
- d) Interaction with the SMG technology should be clear and understandable.
- e) SMG technology should be flexible, and easy to interact with.
- f) It should be easy for the business to customize the SMG technology to fit their needs.

More than half of the respondents in this study reported that they do not consider SMG solutions as their core business. As entrepreneurial marketing – understood as strategic orientations – explained, only a limited share of variance in suppliers' behavioral intention exists in supplier's marketing strategies. It is likely that other factors, such as a clearly articulated and implemented marketing strategy, play a role as well. Suppliers should better understand the needs and expectations of resellers to allow resellers to take advantage of emerging market opportunities. Most notably, good supplier-reseller rela-

tions can facilitate and increase the value of SMG adoption by reducing structural barriers.

5.3 Guidelines for suppliers of SMG technology

This section provides lists and particular recommendations to suppliers of the SMG technology. The provided information is mainly focused on specific EM and TAM drivers. This section draws on the previous sections and extends the findings to cover more broadly the conceptual model. That is, the results are turned into relevant, concrete, and more comprehensive guidelines that managers of SMG technology companies can use to improve their business performance and to foster reseller adoption of the technology. Based on the results, the guidelines below are gathered for suppliers of SMG. The guidelines address the supplier-reseller relationship, technological products and services, and suppliers' entrepreneurial marketing strategies based on the SMG technology.

5.3.1 Guidelines related to supplier-reseller relationships

A sufficient understanding of products and services is valued. Fully understanding suppliers' needs and wants will develop suppliers' attitudes and increase resellers' loyalty. A system with valued output and high performance degree has a better chance of being adopted, and resellers should believe that using this system will help them to attain gains in their job performance. Being close and understanding resellers' needs pays off, thereby creating a culture that defines customers' value as the overriding organizational goal. The ability to flexibly respond to customer inquiries and to respond and react to resellers' needs is valued.

Increasing the awareness of benefits as well as providing accurate information helps resellers to make informed decisions. Social media and user-friendly websites can also be helpful in delivering information and creating trust, thereby advancing resellers' intention to adopt new technologies. Suppliers' support and collaboration with resellers provides a huge impetus for resellers to increase their adoption rates.

Suppliers and resellers relationships have a big value and effect on reseller's adoption;

- SMG system suppliers should stay close to their resellers, and be more proactive and interactive to understand the resellers' needs.
- SMG system suppliers should forge strong communication channels with their resellers.

Close interconnection and relations between resellers and the supplier will help both sides to have better and more effective marketing strategies:

- SMG system suppliers should show the results of high output system performance to resellers.

Due to the immaturity of SMG technology, training will help a lot of resellers to become more familiar with the new technology.

- SMG system suppliers should provide training which helps to decrease effort expectancy among resellers.

5.3.2 Guidelines related to technological products and services

The high relative advantages are valued among resellers. For example, using SMG technology decreases the time needed for job responsibility, and increases the quality of output. The output expectations are related to the consequences of innovative behavior, such as using a product or service in a way that is more effective and user friendly. Resellers act as marketers, promoters, and sellers of the technology of suppliers' products and services. More knowledge about SMG products and services would facilitate resellers' adoption, and consequently more informed responsible consumption of technology in the market. This is since resellers maintain a critical position in the market as intermediaries between technology providers and end customers.

The low input systems are valued as resellers believe that using the system would either be free of effort or require less effort. SMG is difficult to engage, so it is necessary for suppliers to give technical information and brief picture of this technology. Resellers will adopt SMG technology if they see the value, namely that it can reduce the risks associated with emerging technology in its early stages of adoption:

- SMG system suppliers should establish new ways of implementing the SMG technology in order to decrease system complexity among resellers.
- SMG system suppliers should highlight the high-performance of SMG technology to resellers.
- SMG system suppliers should emphasize the perceived usefulness of their products and services.
- SMG system suppliers should illustrate the ease of use of the SMG technology to increase the rate of adoption among resellers.

Suppliers should demonstrate the ability of the new SMG technology, including remote control, primary maintenance plan, and the need for fewer maintenance workers to encourage resellers to put more effort on selling the new technology:

- SMG system suppliers should explicitly show and explain SMG products and services to their resellers.
- SMG system suppliers should take more risks to provide resellers with comforts in using their products and services. The immaturity of this technology puts a lot of risks on resellers, so suppliers should provide some return policies and guarantees to support the adoption of SMG by resellers.

Suppliers should demonstrate the benefit of using SMG systems to encourage their resellers to adopt the new technology. Resellers should see the benefits of using the system as well as the advantages of the system and technology:

- SMG system suppliers should encourage and support suppliers' extrinsic motivations toward products and services. In particular, suppliers should use free samples, guarantees of maintenance, and provide continued learning for resellers to speed up the adoption rate.
- SMG system suppliers should demonstrate the relevant advantages of the new technology to resellers' businesses.

Resellers will adopt this novel technology if they see that it provides better advantages than the current technology. Being able to do a job faster, cheaper, and so on brings about major benefits to their businesses:

- SMG suppliers should show tangible outcomes brought by this technology to satisfy resellers' expectations.

Resellers want to see not only the better quantity, but also better quality, such as more accrue results:

5.3.3 Guidelines related to suppliers' entrepreneurial marketing

The results of this study suggest the importance of providing and sharing knowledge between suppliers and resellers to increase the adoption rate. Suppliers need to provide clear and consistent marketing messages, and demonstrate strong entrepreneurial, technical (innovation), and market orientation.

The application of innovative techniques to supplier-reseller relationships pays off and helps to increase adoption rates where the more new opportunities the supplier identifies, the more likely the reseller is to adopt this technology. The characteristics of the entrepreneurs, whereby the change focuses and is opportunistic in nature as well as innovative in terms of the management approach, helps to increase adoption rates. The more entrepreneurially oriented the supplier is, the more likely the reseller will adopt SMG technology, and in the same way, being proactive in supplier-reseller relationships pays off. The more risk suppliers take, the more likely resellers will adopt SMG technology. Therefore, being a risk taker, pro-active, and innovative is beneficial / desired to increase the rate of adoption.

SMG technology affects a very mature industry of power systems where any developments or modifications need to go through mature sections. As such, there is a need for innovative and attractive marketing strategies to increase the market adoption rate:

- SMG suppliers should respond quickly to resellers' requests and satisfy their needs.
- SMG suppliers should express the value of SMG technology to resellers.

- SMG suppliers should use entrepreneurial marketing strategies to speedup resellers' adoption rates.
- SMG suppliers should encourage resellers to focus on SMG technology as their core business.

In addition, branding strategies can help to decrease the perceived risks associated with SMG technology, and in the same way, increase the adoption rate among resellers.

- SMG suppliers should make use of their brands and trademarks to create credibility and trust among resellers.
- The reseller makes a bridge between the supplier and end customers. So, suppliers' marketing strategies should have some policies and implications to end customers as well.

SMG is in the developing process, which means that suppliers need to be more pro-active and continue R&D activity to better cover market needs and requirements.

- SMG system suppliers should have an active R&D program to share their results and findings with resellers.
- SMG system suppliers should use innovative ways to change resellers' perceptions of the new technology as better than its precursor.

5.4 Limitations and future research avenues

Every study has its limitations, which provide opportunities for further researches. Although the present study provides a new way to look at technology diffusion based on the model of SMG technology adoption and entrepreneurial marketing, the results may be confounded by the following issues which show the need for more investigations:

- Little marketing investigation has been conducted about suppliers' attitudes toward SMG technology, thus providing limited support in terms of literature.
- This research was conducted among a small group of individuals sharing somewhat similar professional backgrounds, which may affect their responses.
- The research model is based on the generic literature of TAM, as well as some experts' opinions, which may be atypical in the power systems industry.
- Other methods, such as the Structural Equation Modeling (SEM) or Systems Dynamics modeling (SDM) to test validity of the model may be needed.

SMG is still in the early stages of the technology adoption lifecycle, and there are many ways to increase the adoption rate. Based on the review of technology acceptance literature, resellers should gain knowledge about SMG technology from their suppliers. Obviously, this co-operation has not happened properly to date. The information has to be prepared with clarity and technical support to resellers. Training has been suggested as one of the key elements that will lead to increased reseller acceptance and, subsequently, marketing success. This research aimed to understand the technology acceptance model theory where the future research should focus on identifying more effective constructs which can add the prediction of adoption moderator above what has been discussed here. Future research should also aim to acquire a larger sample size, and as shown in the present study, pursue finding what needs to be done in order to make the end-user focused TAM model a better match with the reseller context.

5.5 Conclude results for future research

The conceptual model which is used in this study was developed for later stages of adoption, but in this study it is applied in early stages. The value of this research is for resellers who can add value to services or products (knowledge) and sell final products to end-customers. The findings are also interesting from the practice point of view, as improving the input/output ratio expected by the reseller may significantly promote their adoption of SMG technology. In more detail, performance expectancy is the main driver of reseller adoption, and supplier's entrepreneurial marketing amplifies the importance of that specific driver.

Entrepreneurial marketing focuses on entrepreneurial and innovative ways of doing marketing instead of focusing on just serving customer. Entrepreneurial marketing gives handy tools to supplier to do their marketing work with less money. This research shows that entrepreneurial marketing elements are applicable to the technology acceptance model elements. However, some of the elements should be further honed and explored. The results suggest that user adoption models can only partially be applied to the reseller context, and future research should develop models that can further explain reseller's decision making in regards to getting involved in an emerging technology.

Moreover, the fact that facilitating conditions or price value were not significant factors reflects the lack of awareness and understanding of SMG technology among power systems resellers. Thus, Suppliers need to address the supplier-reseller relationship, benefits of new technological solutions, and entrepreneurial marketing strategies when planning their marketing activity and subsequent marketing messages aimed at power systems resellers. Suppliers can foster the adoption of SMG technology among their resellers by offering more information, extended support, better incentives, and by creating trust in the supplier-reseller relationship. Thus, the elements of model should be chosen wisely where they are related to SMG technology and resellers. The future study needs to be done with appropriate elements of the TAM model and with more investigation on resellers' role in SMG technology diffusion.

As to implications to practice, suppliers need to demonstrate proactive EM, particularly entrepreneurial orientation, to increase the performance expectancy perceived by their resellers through creating better awareness and understanding of SMG technology to cultivate its diffusion. This study focused on understanding the role of Suppliers' entrepreneurial marketing for the reseller adoption of SMG technology. The endeavor is of importance because SMG technology has not yet been widely adopted in the market despite of the value it can provide, and although resellers are play important role as distribution channel members in the market diffusion of new technology. Despite the limitations of our research (i.e. the small sample size) the focus on power systems resellers in North America, and the lack of previously validated reseller adoption models, the results from our empirical analysis point out what factors influence the adoption of SMG technology and what barriers must be removed to persuade resellers to adopt SMG technology. Thus, the results can be used as a guideline for developing strategies to encourage reseller adoption of novel SMG solutions.

Although resellers may also be end-users of the novel technology, the motivation of a reseller to engage in technology is likely different. Hence, future research should focus on developing reseller adoption models that focus on the input/output of functional value (e.g., how to make more money and differentiate from the competitors by selling a specific technology) rather than the use value (e.g., how to benefit from implementing and using a specific technology). Second, reseller's proactive channel marketing seems to

have major effect on why resellers adopt and stock novel technology. The results suggest that supplier should pay more attention to channel marketing instead of looking only at the end-user part.

The conceptual model which comes from combination of EM and TAM model makes this research a very unique study. The TAM model has not been applied in this field, and the EM elements moderators on TAM elements make a strong and accessible model in SMG technology field. This study shows that TAM model is applicable in this field of technology and EM elements have positive effect and value on and effect of TAM at behavioral intention. The results suggest that user adoption models can only partially be applied to the reseller context, and future research should develop models that can further explain reseller's decision making in regards to getting involved in an emerging technology. As to implications to practice, vendors need to demonstrate proactive EM, particularly entrepreneurial orientation, to increase the performance expectancy perceived by their resellers through creating better awareness and understanding of SMG technology to cultivate its diffusion.

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Appendices

Appendix A. Questions:

- 1) What is your position in the organization?
Executive/ entrepreneur Sales/customer Design/Engineering Maintenance
- 2) How many years have you been involved with/owned the business?
Less than 3 4-6 7-9 10-14 More than 15
- 3) What describes the type of your business in the best way?
Service Manufacturing Retail Reseller other
- 4) Which is your main customers' segmentation?
Residential Commercial SMEs Large companies other
- 5) Where are your customers mainly from?
Same state\province Other state\province International Do not know
- 6) What percentage of your sales is related to Smart micro-micro-grid solution?
Less than 5% 6-10% 11-25% 26-50% more than 51%
- 7) To what extent are your company's products and services subject to change to meet SMG technology requirements?
Very low Low Neutral High Very high

PERFORMANCE EXPECTANCY:

- 1) I would prefer reselling SMG solutions that will improve my business performance.
Strongly agree Agree Neutral Disagree Strongly disagree
- 2) I would prefer reselling SMG solutions that will increase my business productivity.
- 3) I would prefer reselling SMG solutions that will enhance the effectiveness in my business.
- 4) I would prefer reselling SMG solutions that enable me to reach my business goals more quickly.
- 5) I would prefer reselling SMG solutions that provide me with valuable information from the perspective of business.

6) I would prefer reselling SMG solutions that will increase my business output for the same amount of effort.

7) I would prefer reselling SMG solutions that will increase my chances of obtaining business benefits.

EFFORT EXPECTANCY:

1) I would prefer reselling SMG solutions that take less time from my business to install.

2) I would prefer reselling SMG solutions that are easy to learn to operate.

3) I would prefer reselling SMG solutions that are easy to use.

4) I would prefer reselling SMG solutions that promote clear and understandable interaction with the supplier.

5) I would prefer reselling more flexible and interactive SMG solutions.

6) I would prefer reselling SMG solutions that make it easy for my business to become skillful at using.

7) I would prefer reselling SMG solutions that require little time in doing operational tasks.

FACILITATING CONDITIONS:

1) I would prefer reselling SMG solutions that my business has control over.

2) I would prefer reselling SMG solutions that require little resources from my business.

3) I would prefer reselling SMG solutions that my business require little knowledge from my business.

4) I would prefer reselling SMG solutions which are compatible with other systems that my business sells.

5) I would prefer reselling SMG solutions that have guidance available for my business.

6) I would prefer reselling SMG solutions that have specialized instructions available for my business.

7) I would prefer reselling SMG solutions that have specific person or technical group available for assistance with system difficulties.

PRICE/VALUE RATIO:

1) I would prefer reselling SMG solutions whose high price/value ratio makes an important benefit for my business against competitors.

- 2) I would prefer reselling SMG solutions that are superior in bearing the monetary cost of use compared to regular systems.
- 3) I believe that the high price/value ratio of a SMG solution has a positive effect on my business as a reseller.
- 4) I would prefer reselling SMG technology with a high price/value ratio, as I think it can act as a predictor of customer's behavior.
- 5) I believe low price/value ratio has a negative effect on my business as a reseller of SMG technology.
- 6) I would prefer reselling SMG technology that increases the quality of my business even though it is expensive.
- 7) I would prefer reselling SMG technology which has a balanced tradeoff between the perceived benefits and the monetary cost of using it.

CUSTOMER ORIENTATION:

- 1) I believe that responsiveness towards customers has a strong value to be successful in my business as a reseller of SMG solution.
- 2) I believe communication with customers has a strong value in my business for being successful reseller of SMG solution.
- 3) I believe understanding and delivering customer value have a highly positive impact on my business as a successful reseller of SMG solutions.
- 4) I believe the ability to react to customer needs quickly has a very strong impact on reselling SMG solutions.
- 5) I believe the ability of narrowing down and localizing customer needs would create a highly positive effect on reselling of SMG solution business.
- 6) I believe the adoption of customer satisfaction perspective has a strong impact on SMG solution retail business.
- 7) I believe understanding customer needs and adapting the seller's response to satisfy those needs are crucial for the success of smart grid solution retail business.

MARKET ORIENTATION:

- 1) I believe that proactive market exploration can result in more successful resale of SMG solutions.

- 2) I believe market intelligence can provide a huge impact on the success of SMG solutions retail business.
- 3) I believe that responsiveness towards competitors has a highly positive business value for resellers of SMG solutions.
- 4) I believe integration of a system to customer's business processes provides the most value for SMG solutions retail business.
- 5) I believe that supplier networks and relationships with suppliers have a highly positive impact on the success of a SMG solutions business.
- 6) I believe that a good marketing strategy influences the most in SMG retail business.
- 7) I believe the cultural focus in understanding customers has a very high value in SMG solution retail business.

INNOVATION ORIENTATION:

- 1) I would put more effort in reselling SMG solutions if I had sufficient knowledge about suppliers availability.
- 2) I would put more effort in reselling SMG solutions if the supplier encouraged me
- 3) I would put more effort in reselling SMG solutions if the supplier stimulated my motivation.
- 4) I would put more effort in reselling SMG solution if the supplier supported sustaining innovation.
- 5) I would put more effort in reselling SMG technology if the supplier can identify new opportunities for my business.
- 6) I would put more effort in reselling SMG solutions if the supplier supported my innovation and application of SMG solutions.
- 7) I would put more effort in reselling SMG solutions if they converted opportunities into concrete, workable and marketable ideas.

Entrepreneurial orientation:

- 1) I would put more effort in reselling SMG solutions that give me access to suppliers' research and development activities.
- 2) I would put more effort in reselling SMG solutions if the supplier responded to my inquiry quickly.

- 3) I would put more effort in reselling SMG solutions if the supplier carried most of the risk.
- 4) I would put more effort in reselling SMG solutions if I had pro-active support from the supplier.
- 5) I would put more effort in reselling SMG solutions if they were newer than those of my main competitors.
- 6) I would put more effort in reselling SMG solutions if the supplier emphasized the development of new and innovative products.
- 7) I would put more effort in reselling SMG solutions if my business was asked to introduce new products/services, administrative or operational techniques.

Behavioral intention:

- 1) I believe reselling SMG solutions is a really good opportunity for my business.
- 2) I think reselling SMG solutions is a really wise idea for my business.
- 3) I believe reselling SMG solutions provides the best opportunity to enhance my core business.
- 4) I think reselling SMG solutions is promoting my business.
- 5) I believe reselling SMG solutions makes my business more interesting compared to before.
- 6) I think reselling SMG solutions corresponds well with my business content.
- 7) I believe reselling SMG solutions is pleasant for my business.

Appendix B.

Table Item loading from PLS (N:99)

	<i>Item</i>	<i>Loading</i>	<i>Weight</i>	<i>Item description</i>
<i>Behavioral Intention</i>	BI1	0.886	0.190	Reselling SMG solutions is a really good opportunity for my business.
	BI2	0.926	0.201	Reselling SMG solutions is a really wise idea for my business.
	BI3	0.813	0.189	Reselling SMG solutions provides the best opportunity to enhance my business.
	BI4	0.835	0.211	Reselling SMG solutions is promoting my business.
	BI6	0.868	0.187	Reselling SMG solutions corresponds well with my business content.
	BI7	0.837	0.183	Reselling SMG solutions is pleasant for my business.
<i>Customer Orientation</i>	CO2	0.877	0.254	Communication with customers has a strong value in my business for being successful.
	CO3	0.923	0.258	Understanding and delivering customer value have a highly positive impact on my business.
	CO4	0.834	0.180	The ability to react to customer needs quickly has a very strong impact on reselling SMG solutions.
	CO6	0.869	0.206	The adoption of customer satisfaction perspective has a strong impact on SMG solution retail business.
	CO7	0.861	0.244	Understanding customer needs and adapting the seller's response to satisfy those needs are crucial for the success
<i>Effort Expectancy</i>	EE2	0.876	0.196	Reselling SMG solutions are easy to learn to operate
	EE3	0.877	0.239	Reselling SMG solutions that are easy to use.
	EE4	0.825	0.250	Reselling SMG solutions that promote clear and understandable interaction with the supplier
	EE5	0.823	0.268	Reselling more flexible and interactive SMG solutions
	EE7	0.831	0.231	Reselling SMG solutions that require little time in doing operational tasks.
<i>Entrepreneurial Orientation</i>	EO2	0.782	0.247	Put more effort in reselling SMG solutions if the supplier responded to my inquiry quickly
	EO4	0.822	0.303	Put more effort in reselling SMG solutions if I had pro-active support from the supplier.
	EO6	0.874	0.321	Put more effort in reselling SMG solutions if the supplier emphasized the development of new and innovative products
	EO7	0.797	0.347	put more effort in reselling SMG solutions if my business was asked to introduce new products/services, administrative or operational techniques.
<i>Facilitating Conditions</i>	FC4	0.762	0.311	Reselling SMG solutions which are compatible with other systems that my business sells
	FC5	0.786	0.296	Reselling SMG solutions that have guidance available for my business.
	FC6	0.813	0.295	Reselling SMG solutions that have specialized instructions available for my business
	FC7	0.806	0.360	Reselling SMG solutions that have specific person or technical group available for assistance with system difficulties.
<i>Innovation Orientation</i>	IO4	0.859	0.312	Put more effort in reselling SMG solution if the supplier supported sustaining innovation for my business
	IO5	0.852	0.252	Put more effort in reselling SMG technology if the supplier can identify new opportunities for my business
	IO6	0.854	0.260	Put more effort in reselling SMG solutions if the supplier supported my innovation and application of SMG solutions
	IO7	0.880	0.336	Put more effort in reselling SMG solutions if they converted opportunities into concrete, workable and marketable ideas.
<i>Performance Expectancy</i>	PE1	0.890	0.209	Would prefer reselling SMG solutions that will improve my business performance
	PE2	0.901	0.194	Would prefer reselling SMG solutions that will increase my business productivity
	PE3	0.914	0.188	Would prefer reselling SMG solutions that will enhance the effectiveness in my business
	PE4	0.833	0.173	Would prefer reselling SMG solutions that enable me to reach my business goals more quickly
	PE5	0.859	0.161	Would prefer reselling SMG solutions that provide me with valuable information from the perspective of business
	PE6	0.758	0.138	Would prefer reselling SMG solutions that will increase my business output for the same amount of effort
	PE7	0.787	0.102	Would prefer reselling SMG solutions that will increase my chances of obtaining business benefits
<i>Price Value</i>	PV1	0.796	0.242	Would prefer reselling SMG solutions whose high price/value ratio makes an important benefit for my business against competitors
	PV2	0.828	0.204	Would prefer reselling SMG solutions that are superior in bearing the monetary cost of use compared to regular systems
	PV3	0.858	0.278	High price/value ratio of a SMG solution has a positive effect on my business as a reseller.
	PV4	0.756	0.258	Prefer reselling SMG technology with a high price/value ratio, as I think it can act as a predictor of customer's behavior
	PV7	0.762	0.269	Would prefer reselling SMG technology which has a balanced tradeoff between the perceived benefits and the monetary cost of using it