

PetHeads

The Development of a One-stop-shop Application for Pet  
Owners

**Masterarbeit**

zur Erlangung des akademischen Grades „Master of Science (M. Sc.)“  
im Studiengang Wirtschaftswissenschaft  
der Wirtschaftswissenschaftlichen Fakultät der Leibniz Universität  
Hannover

vorgelegt von

Name: Sahakyan



Vorname: Hayk



Prüfer: Prof. Dr. M. H. Breitner

Ort, den: 01.10.2018

## **Table of content**

List of Figures .....	I
List of Tables .....	II
List of Abbreviation .....	III
Abstract .....	V
1. Introduction.....	1
1.1 Motivation and Relevance of the Topic.....	1
1.2 Research Methodology Design Science Research .....	3
2. Theoretical Foundation.....	6
2.1 Technology Acceptance Model (TAM).....	6
2.2 Customer Development Model .....	10
2.3 Alternative Apps.....	13
3. Developing a Mobile Application with Design Science - concept and implementation .....	16
3.1 Concept and Idea Development .....	16
3.1.1 Background of the initial idea .....	16
3.1.2 Explanation of the initial idea .....	19
3.1.3 Facts and Figures on the Pet Market .....	20
3.1.4 Concept Explanation .....	27
3.2 Concept Implementation: Development of a Mobile One-Stop-Shop Application .....	31
4. Design Evaluation .....	43
4.1 Development of a Theoretical Framework.....	43
4.2 Research Design .....	45
4.3 Measurement Model .....	48
4.4 Structural Model.....	50
5. Discussion of Empirical Findings.....	55
6. Limitations and Practical Implications .....	57
7. Conclusion and Outlook .....	57
List of References .....	59
Appendix .....	a

# 1 Introduction

## 1.1 Motivation and Relevance of the Topic

People's interaction with their pets is subject to constant change and is shaped by many social, demographic and economic factors. Many former farm animals or even "pests" are now kept and cared for in the home and enrich the lives of their owners (cf. Ohr, 2014, p. 3). Moreover, pets play an important role in people's lives: In addition to seeing-eye dogs and dogs that can be trained to recognize seizures, animals can also be applied in occupational therapy, speech therapy or physical rehabilitation to help patients recover. These therapeutic tasks are complemented by the appreciation of pets as companions, which can positively affect the quality of the lives of many individuals (cf. Casciotti, Zuckermann, n.d.). Most people treat their pets as members of the family (cf. Risley-Curtley et al., 2006). According to some research studies, people who own a pet have healthier hearts, stay home sick less often, go to the doctor less often, get more exercise and are less depressed (cf. Casciotti, Zuckermann, n.d.). Pets can also have a significant impact on allergies, asthma, social support and interactions with other people (ibid.). According to the 2017 - 2018 APPA National Pet Owners Survey, over 84 million homes owned a pet in the USA. This equates to 68% of U.S. households. In 1988, when this study was conducted for the first time, 58% owned a pet. The increasing number of pets results in increased expenditures. In 2017, 69.51 billion US dollars were spent on pets in the United States. For the year 2018, sales are expected to exceed 72 billion US dollars (cf. APPA, n.d.). A growing trend can be observed here over the years. However, this is not only the case in the USA. Pet spending is on the rise worldwide, and in many regions, the growth in e-commerce sales in the pet category is surpassing both total category sales growth and total e-commerce growth. Euromonitor International estimates that e-commerce represented only 4.4% of global pet care sales in 2014. Total global pet food sales grew 4% over the previous year to \$70 billion in 2015, according to research firm GfK (cf. Fung Global Retail & Technology, 2016). Figure 1 shows that more than a third of this was generated in the US.

Baby Boomers were the first to humanize their pets, while Generation Xers and Millennials follow this example. The pet industry welcomed this trend because it started to boom. Millennials and Xers have now overtaken the Boomers as the largest pet owner population in the US. This transformation is influencing how consumers buy for their pets and is also driving the growth of e-commerce in pet sales. Millennials are very experienced in using technologies to research and purchase products, and they look for convenience when shopping. These habits are transferred into spending money on their pets (cf. Howe, 2017).

## Share of Global Pet Food Sales, by Country, 2015

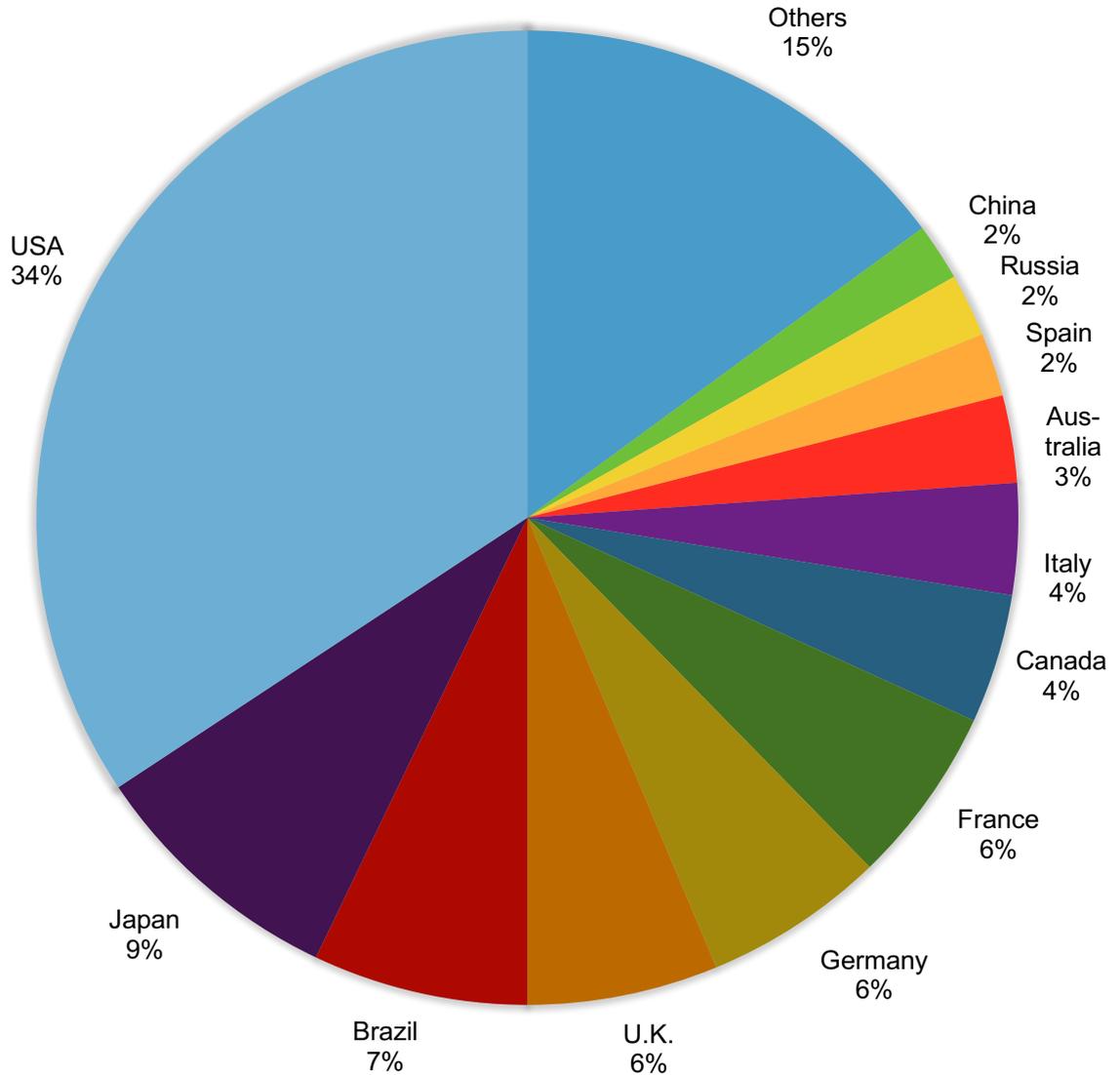


Figure 1: Share of Global Pet Food Sales

Source: Own representation, based on GfK/ Fung Global Retail & Technology, 2016.

However, technology relies on the idea of solving problems on a large scale. Considering the different possibilities, the technology could offer, pet apps entered the picture. A pet app is an intelligent solution that offers various pet-oriented services for pet owners, such as dog watching, dog going out, dog sharing. The majority of pet applications focus on dogs, as there is a large number of dog owners worldwide (cf. Khanna, n.d.).

Although there are many apps for many different services in the pet market, there is still no app that acts as a one-stop-shop. This work attempts to fill this gap. According

to a study by Forrester Research, users spend most of their time with five non-native apps. The selection of apps varies from person to person (cf. Perez, 2015). The report by App Annie shows that approximately ten different apps are used daily and approximately 30 per month, including the use of pre-installed apps such as the Weather app, compared to the Forrester Research study (cf. Perez, 2017). Offering a one-stop-shop app could make pet care even easier and more convenient for pet owners. With just one app, they could do everything they needed for their pet, make the most of their time and make their life and the life of their pet as pleasant as possible.

From these circumstances, the question arises whether a new app is actually needed for the overcrowded pet owners' app market in order to make the everyday life of pet owners easier. Furthermore, which features should offer this app and which would be the driving success factors in the acceptance of the app through the customers?

In the further course of this thesis, the concept of such an app is developed. This work consists of seven chapters. First, the research methodology used in this paper is presented. The theoretical foundations (Chapter 2) explain the theoretical models used in this work. Besides, some of the competing apps are presented in this chapter. The third chapter analyses the German pet market based on literature research. The intention is to analyze the German pet market and check out the different possibilities of success for a one-stop-shop app. On this basis, the emergence of the idea and its development are introduced. By means of the book "The Startup Owner's Manual" (2017), some steps of customer development are performed to work out which functions the app should have first according to the customers. A quantitative study is carried out on the basis of this result using the TAM 3 model. The evaluation of this study takes place in the fourth chapter. The purpose is to test the acceptance of the results achieved during the customer development steps. The empirical findings are presented in the fifth chapter. In the course of a final examination, the theoretical knowledge gained is discussed, and recommendations for practical action are derived. The paper concludes with a summary and an outlook on future research topics.

## **1.2 Research Methodology Design Science Research**

This work aims to find out whether a centrally controlled app for the satisfaction of the wishes of pet owners has a future on the market. Furthermore, it has to be filtered out which of the assumed hypotheses about the desired functions of the app are needed by customers. In addition, a quantitative study of the acceptance of the developed functions is part of this work. The following explains the research methodology - the Design Science Research (DSR) approach - this work is based on and how its three activity cycles are applied hereinafter.

There are numerous methodologies in the information systems that can be used for scientific work. In order to ensure a certain consistency in the results obtained, it is essential to be guided by clear and uniform definitions and guidelines when conducting high-quality research. The Design Science Research (DSR) approach, which is characterized by a pronounced design orientation of the research project and sufficient scientific foundation, is a recognized method for the recognition of information systems (cf. Oesterle et al., 2010, p. 2). There are two main goals DSR wants to achieve: On the one hand, it aims at advancing the scientific body of knowledge and on the other hand providing results of practical utility (cf. Otto, B., Oesterle, H., 2012, p. 3). According to March and Smith (1995) "... design science attempts to create things that serve human purposes". Unlike Behavioral Sciences, Design Science seeks to address research through building and evaluation of artifacts designed to meet the identified business needs (cf. Hevner et al., 2004, p. 78-79). The goals of design-oriented Information Systems are normative and practical guidelines for the construction and operation of information and communication systems as well as the creation of innovations (cf. Oesterle et al., 2010, p. 3). To satisfy the requirements of the research discipline of Information Systems for the highest possible rigor and relevance of the research results, the DSR approach functions as a sound framework. This work is oriented on this structured approach.

The desire to improve the environment through the introduction of new and innovative artifacts and the process for building these artifacts is the motivation of the design science research (cf. Simon, 1996). The framework designed by Hevner (2007) consists of three closely related, mutually influencing activity cycles. He distinguishes between Relevance Cycle, Rigor Cycle and Design Cycle (cf. Hevner, 2007). Hevner (2007) posits that the three cycles have to be present and clearly identifiable in a design science research project (ibid., p. 88). The cyclical and iterative methodology of the DSR approach facilitates the consideration of new findings and short-term changes in research. This approach is in line with the agility of the topic under investigation, whereby the research is determined both by a scientific foundation and by practical relevance. Taking into account the principles of abstraction, originality, justification and utility, and using suitable research methods, such as quantitative surveys, expert interviews, case studies and field experiments, artifacts in the form of constructs, conceptual models, methods and instances are to be created (cf. Oesterle et al., 2010, pp. 4-6). Figure 2 illustrates this methodology and shows the interaction of the cycles mentioned above.

The first application domain in Figure 2 consists of the people, organizational systems, and technical systems. These three components interact to reach a goal. According to Hevner (2007), good design research often involves identifying and presenting

opportunities and problems in an actual application environment. livery (2007) claims that design science is about potentiality. New opportunities might be identified to improve practice long before any problem is recognized (cf. livery, 2007, p. 52). The relevance cycle creates the basis for one's own research in the form of a problem. As a result of the identification of the problem domain, requirements for the artifact are created on the one hand, and its practical suitability is demonstrated on the other. This, in turn, can be used to derive implications for further research purposes (cf. Hevner, 2007, p. 89).

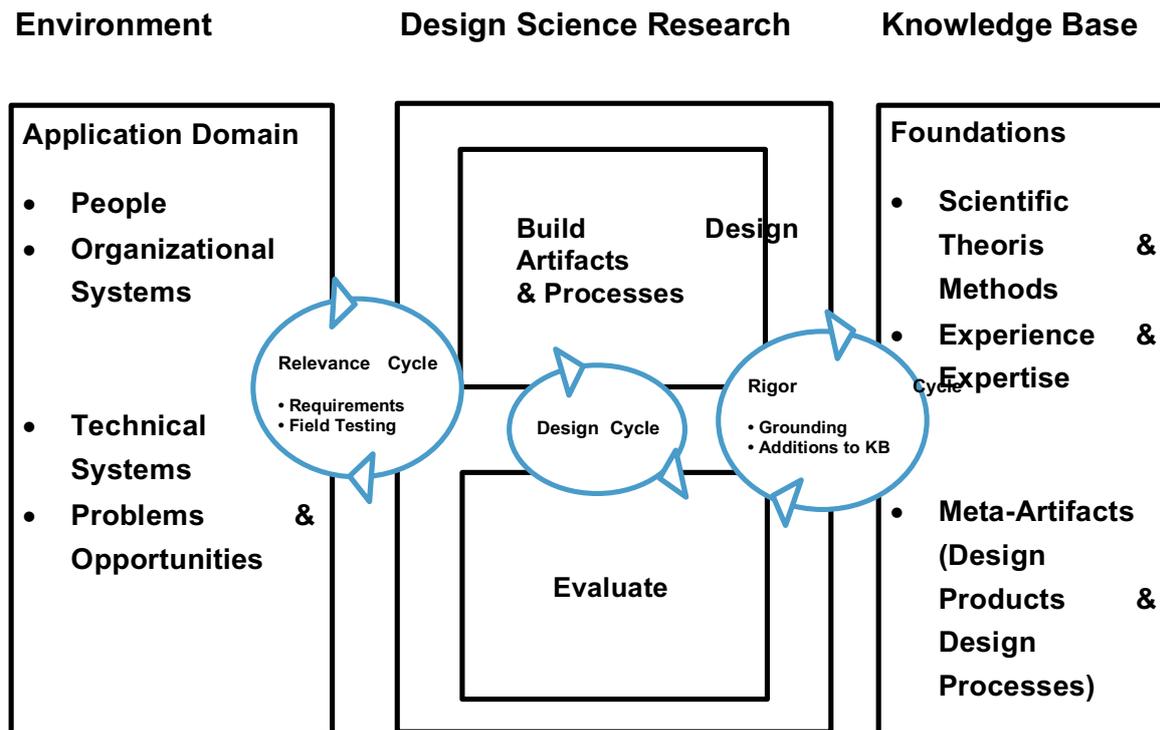


Figure 2: Design Science Research Cycles  
 Source: Own representation, based on: Hevner, 2007, p. 88.

The rigor cycle of Figure 2 forms the knowledge base through existing literature, scientific theories, methods, expertise, and other artifacts. The cycle thus combines the DSR with a scientific foundation. This makes it possible to distinguish between existing research and outlining the potential for expansion of existing approaches. It ensures that the artifact is new and is not a pure replication of the existing results (cf. Hevner, 2007, p. 90). The development of a new product is associated with many uncertainties. No literature can predict the success of new product development. Nevertheless, there is literature that provides guidelines for successful actions in the startup scene. Therefore, the following literature is used as a knowledge base in this work: The Startup Owner's Manual by Blank, Dorf, Högsdal and Bartel (2017) and The Mom Test by Fitzpatrick (2014). Also, the theoretical foundations of the TAM 3 model were explained for a further understanding of the topic. From the preceding literature

analysis, a quantitative study will be carried out, and its results will complement the rigor cycle.

The inner design cycle of Figure 2 is at the heart of the research approach and represents the relationship between the artifact creation, its evaluation, and subsequent feedback to refine the design further. During the development of such an artifact, a continuous comparison with the requirements defined in the relevance cycle is drawn (cf. Hevner et al., 2007, p. 18-19). Simon (1996) presents this cycle as an iterative procedure. In other words, a constantly repeating process until a satisfactory design is achieved that meets the previously defined requirements. In the development phase, various functions of the app are designed on the basis of the pet market. The selection of the artifact about its suitability for problem-solving is carried out through the Customer Development Model designed by Blank. In case limitations can be identified from partial results, these are used as direct feedback, and the artifact is adapted accordingly. The evaluation regarding the acceptance of the artifact is done by a quantitative study. After a successful evaluation, a conclusion is drawn, and the iteration cycle ends (cf. Vaishnavi, Kuechler, 2004).

## **2 Theoretical Foundation**

### **2.1 Technology Acceptance Model (TAM)**

The introduction of new information technologies is often associated with high expectations in companies. This can range from optimizing business processes to increasing productivity and reducing costs (cf. Venkatesh et al., 2003). To meet these expectations, the new information system must be accepted by its users. Success in the introduction of information technology applications is primarily depending on the type and extent of acceptance (cf. Milchrahm, 2002).

Models of acceptance are concepts that explain which elements of this construct are involved and which factors influence acceptance. Numerous scientific studies have been carried out to ensure acceptance. One of the most common models to explain acceptance is the Technology Acceptance Model (TAM) (cf. Davis, 1989; Davis et al., 1989). It describes how new information technology is accepted by the user. In its thirty years since its introduction, the model has undergone many empirical tests and further development. The TAM indicates that the acceptance of behavior, the actual use, depends on the acceptance of attitudes (cf. Bürg/Mandl, 2004). A person with a positive usage setting is assumed to actually implement it. Behavioral acceptance, for its part, depends on the factors of perceived usefulness and perceived ease of use. Davis et al. (1986) describes perceived usefulness as “the prospective user’s subjective probability that using a specific application system will increase his or her job performance within an organizational context” (cf. Davis et al., 1986, p. 985) and

this study shows that neither Computer Anxiety nor Computer Playfulness have any influence on Perceived Ease of Use. However, it appears that respondents of this study feel comfortable using mobile phones. Finally, this study indicates that voluntariness of use has no role in moderating the relationship between subjective norm and the behavioral intention. Consequently, the impact of the subjective norm on intention does not depend on whether the app is perceived as voluntary or mandatory. However, when using the app, the decision is usually made voluntarily by individuals, who personally take all the risks and burdens associated with their adoption decisions.

## **6 Limitations and Practical Implications**

However, the current work has its limitations which may limit the impact of the results, while providing perspectives for future studies. First, the choice of subjects as respondents can be seen as a limitation of this study, since this is an app for pet owners that can be of interest to any age group. This can lead to difficulties in generalizing the results of the current study to all population groups. Future studies should expand the scope of the sampling frame to make it more representative. Second, the previous consultation with potential customers in the customer development phase may be a limitation. The selection of functions was identified on the basis of approximately 20 conversations. Although the results of the study show that the respondents accept the app with the specified functions, however, the acceptance level could be higher with a different selection. Third, some variables have been removed from the original TAM 3 model. This includes Job Relevance. In a new study in which respondents in employment also participate, this aspect can also play an important role in the acceptance of the app. Fourth, the quantitative method, in the case of this study an online questionnaire, likewise contains potential for optimization. This survey was conducted in three different languages in order to achieve a wide reach. Nevertheless, the survey sample still remained relatively small. The reason for this is that approximately 85% of respondents had to be removed from the sample, as only those respondents who completed the entire survey were admitted (and at most only have missings on socio-demographic items, respectively). Larger sample size might have provided a better overview of the population's attitudes. Finally, there is a need to examine prospective factors that may be relevant regarding the acceptance of the app, such as security - privacy, perceived risk and trust, and how gender and culture influence their impact on the acceptance of the app.

## **7 Conclusion and Outlook**

The pet market is a promising market for new business as it is growing at a dramatic rate. According to London-based global market research firm Euromonitor

International, this growth trend has increased exponentially since the early 2000s and is expected to continue. The growing global pet market is attributed to the global humanization of pets. As a result, more and more cultures treat pets as beloved family members (cf. Wolf, 2017). From 2012 to 2017, global sales of all pet care products and services, including pet food, increased by 14 percent, representing an increase in value of \$13 billion. Euromonitor International's research head, Paula Flores, said that sales last year reached \$109 billion (cf. Phillips-Donaldson, 2018). Today's technological advances enable local companies involved in pet sitting, grooming, walking, training and boarding to more easily target customers, streamline processes and scale their operations (cf. Scott, 2017).

Under the given market opportunities, this thesis developed the concept of a pet app, which is supposed to act as a one-stop-shop application in the future. For this purpose, the German pet market was analyzed and subsequently possible functions for different service areas were created. Based on the customer development approach, a closer selection of these functions was chosen. This consisted of a chat function between the pet owners and also various features related to veterinarians and the health of the pet. The selected functionalities were then tested with a quantitative study with regard to customer acceptance. The results show that potential customers accept the app in its current state. The driving success factors here are output quality, a high benefit promise of the app to the customers and social influence. However, perceptions may shift in the course of time, indicating that longitudinal studies are highly recommended (cf. Davis et al., 1989), especially when the factors influencing the intention of technology application are experience- and time-sensitive (cf. Abbasi et al., 2015; Venkatesh & Morris, 2000). Regarding Venkatesh and Davis (2000), the effect of the "Subjective Norm" on the "Behavioral Intention" decreases over time and with increasing experience. Moreover, it would be interesting to see how customers would accept the app by releasing a beta version. This would provide a realistic overview for the implementation of this innovative idea.