

Project Number: IQP KMS ABKI

DATA ORGANIZATION FOR WAY FINDERS

An Interactive Qualifying Project: Submitted to the Faculty of the
WORCESTER POLYTECHNIC INSTITUTE

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Abstract

This project helped Way Finders, a non-profit affordable housing organization based in western Massachusetts, understand its organizational and strategic data more effectively. The objectives of the project included organizing and analyzing data from existing systems and analyzing customer satisfaction data. The team produced a working Access database prototype with recommendations on how to improve it further. A set of focus group questions was drafted and submitted to Way Finders. The team also provided recommendations for Tableau data integration using Excel VBA and Salesforce server options.

Acknowledgments

The team would like to acknowledge several individuals for helping with this Interactive Qualifying Project (IQP). We would like to thank Lynne Wallace, Way Finders' Executive Vice President and Chief Operating Officer, and Lori Murphy, Lynne Wallace's Executive Assistant, for their help in our initial meeting with Way Finders and for answering our questions about the project through email. We'd also like to thank Ron Krakowiak and Michael Downs, from Way Finders' IT department, for helping to share Way Finders data with the team and showing the team how Way Finders collects data and how they use the data they have collected. The team would also like to thank the Vice Presidents of each line of business for assisting the graduate team in the setup of the project. Finally, the team would like to thank WPI Professors Kevin Sweeney and Fabienne Miller, and the WPI graduate team consisting of Leyi Hu, Tina Marie Aguiar and Fatima Varzani for helping guide the project.

Executive Summary

Way Finders is a Massachusetts based non-profit organization dedicated to creating affordable housing to help eliminate homelessness and to help those struggling to pay for traditional housing. Way Finders hopes to meet this goal using a variety of different strategies. These include: building affordable rental apartments, moving the homeless to emergency shelters, and by building the community through workshops.

There were two Worcester Polytechnic Institute (WPI) teams that worked to assist Way Finders in their mission to assist the residents of Western Massachusetts. The first was a three-person undergraduate team working on their Interactive Qualifying Project (IQP). The second team consisted of three graduate students from the Robert A. Foisie School of Business at WPI. The purpose of this graduate team is to provide additional support, in the form of their greater business management experience to the undergraduate team. During the project, the undergraduate team worked with a variety of tools to accomplish their objectives. These tools included Microsoft Access and Excel Visual Basic for Applications (VBAs), the data management softwares Salesforce and Tableau, and a set of interpersonal data collection techniques. Microsoft Access is a database management tool that can be used to construct and run databases. VBA macros are part of the Microsoft suite that can be used with various Microsoft Office products. The macros are programmable scripts that can be written to operate in Excel as desired. Salesforce is a major customer relationship management service. It stores data on the cloud for the customers. Tableau is a software that is used to generate various dashboards based on the data. The term “interpersonal data collection techniques” was used by the team to refer to three different ways to gather data: focus groups, surveys, and interviews.

The original objectives, presented by the Graduate team to Way Finders, were to “organize and analyze data from existing systems so that it can be used efficiently for reporting of metrics related to Way Finders main Success Indicators” and “gather and analyze customer satisfaction data by conducting focus group studies”; (see Section 4.1 of the Graduate paper in Appendix I). For the first objective, the team’s plan to address it was three-fold. First, the data would be organized using both Excel VBA macros and Access databases. Once these were done, the databases would be connected to Tableau using its built-in functionality. At this point Salesforce would also be connected with Tableau. For the second objective, the team’s plan was to draw up, seek approval for, and then ask a series of focus group questions that pertained to the CB&E and HOME lines of business.

For the Access database, there were two significant outcomes. The first was an Access database prototype that had been refined through three distinct versions. The second was a process by which new and existing data can be imported into the database prototype.

This plan, regarding using VBA macros in Excel, changed as the term progressed for several reasons. For one, it was brought to the team’s attention that the lines of business are transitioning to Salesforce instead of Excel for recording data. Salesforce has a built-in connection with Tableau for importing the data on the server. This would render the VBAs useless, since they are in Excel. Another factor was time. The team was unfamiliar with VBAs before the project, so to learn and implement it correctly would take a lot of time. With these two factors combined, the team decided to focus away

from implementing VBAs and more on the Access database with preliminary recommendations for data integration with Tableau.

After having created the focus group questions, the undergraduate team sent them to the graduate team to edit and review the draft of questions; (see Section 5.3 of the Graduate paper in Appendix I). The questions were left intact and the graduate team edited the format of the questions to make a step by step procedure on how to organize and run the focus group. The edited version and the original version of the focus group questions were sent to Professor Sweeney and Professor Miller for review. After receiving their review, the focus group questions were sent to Correen Carpin-Gendron, the manager of the Homeownership and Financial Education Department at Way Finders, for her approval. The questions are available for use in a focus group, run by Way Finders or another student project from WPI.

Authorship

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Introduction	Peter	Jeremy
Background	Jeremy	Jeremy
Methodology	Josh	Peter
Results and discussion	Peter	Josh
Conclusion	Josh	Peter

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Introduction

Mission Statement:

Way Finders is a large non-profit organization that assists the residents of western Massachusetts with a variety of services focused around providing affordable, permanent, and safe housing solutions. Way Finders is working to develop systems to internally monitor key success indicators. A team of graduate students from Worcester Polytechnic Institute worked with Way Finders to identify two project objectives that would serve as a first step in the development of those monitoring systems. The mission of this phase of the project is for the undergraduate team to further define the given objectives into actionable deliverables, and then deliver on those deliverables. The purpose of this work is to make it easier for Way Finders integrate themselves into communities and to ensure that their impact is positive in communities they are operating. The work will help improve how Way Finders reports their success to funders and municipalities.

Project Objectives:

The original optimal objectives for the project were laid out by the Graduate team. The first objective was to organize and analyze data from existing systems so that it can be used efficiently for reporting of metrics related to Way Finders' main success indicators. The second objective was to gather and analyze customer satisfaction data by conducting focus group studies; (see Section 4.1 of the Graduate paper in Appendix I). The team came up with three deliverables to address these two objectives. The deliverables were to provide preliminary recommendations regarding Tableau data integration, create a database in Access for new data input and implementing old data, and to run a focus group to gather data regarding customer satisfaction with Way Finders. The Tableau data integration was to create dashboards by connecting directly to a Salesforce server or by using VBA macros to import data from various Excel sheets into one master Excel file and import that file into Tableau. For the Access database, meaningful connections will be made between various tables based on the data provided. Regarding the focus group, questions will be drafted to target the HOME and CB&E lines of business. With the questions approved by the WPI board and time permitting, the group will run the focus group. Otherwise, the questions will be provided for a possible follow-up project to run the focus groups. The team worked to deliver on all deliverables by the end of the project.

Way Finders:

Way Finders is a Massachusetts based non-profit organization dedicated towards creating affordable housing to help eliminate homelessness and to help those struggling to pay for traditional

housing. Way Finders hopes to meet this goal using a variety of different strategies. These include building affordable rental apartments, moving the homeless to emergency shelters and by building the community through workshops. As a non-profit organization, or NPO, Way Finders measures its success by the impact they have had on the communities they serve, as opposed to monetary amounts. Unlike traditional companies, Way Finders believes that through their efforts, they can help prevent poverty and homelessness to such an extent that their services will no longer be needed (Gnan et al., 2013).

Way Finders is split into six different business units. House Support Services (HSS) helps those who are homeless or at risk of becoming homeless by providing them with emergency shelter. Rental Assistance (RA) helps those with low incomes assist and service those looking for affordable housing. Home Ownership and Financial Education (HOME) help those looking to buy a home. Community Building and Engagement (CB&E) provides workshops and programs to build cooperation within the communities Way Finders serves. Real Estate Development (RED) helps build houses and rental properties. Finally, Property and Asset Management (PAM) maintains and repairs the houses and apartment complexes Way Finders service (Way Finders, 2016).

Way Finders has accomplished many milestones since its founding. Since March, Way Finders has opened 23 of 70 apartments for use in its \$19.9 million apartment complex in North Hampton (Kinney, 2018). Way Finders and residents of Springfield performed a walk audit to judge the quality of walking and biking routes (Way Finders, 2017a). Way Finders recently purchased an old Peter Pan bus terminal for millions to renovate it into Way Finders new base of operations. The renovation will cost close to \$13 million (Way Finders, 2017b).

WPI Project Teams:

There were two Worcester Polytechnic Institute (WPI) teams that worked to assist Way Finders in their mission to assist the residents of Western Massachusetts. The first was a three-person undergraduate team working on their Interactive Qualifying Project (IQP). To accomplish the requirements of the IQP, the team had to consider both the technical impact of their work to assist Way Finders, as well as remaining cognizant of the social aspects of their work. With both of those considerations in mind, the team's role in helping Way Finders was centered around two main objectives. First, the team was tasked with organizing and analyzing the data Way Finders provided, so that Way Finders can easily understand if the organization is hitting the metrics it has set for itself. Completing this task will also help Way Finders in its larger efforts to combine all its raw data into one easy to manage database. Second, the team was tasked with performing focus groups to analyze customer satisfaction. Way Finders wants to improve how accurately they measure customer satisfaction, so the team plans on gathering and reporting this metric through focus groups. While both objectives don't directly help the poor and homeless Way Finders is serving, completing them both will help Way Finders run more efficiently; (see Section 4.1 of the Graduate paper in Appendix I).

Working with the undergraduate IQP team was a team of three Graduate students from the Robert A. Foisie School of Business at Worcester Polytechnic Institute. The purpose of this team is to provide additional support, in the form of their greater business management experience to the undergraduate team. The graduate team started working on the project seven weeks before the

undergraduate team. During that time, they consulted with the Way Finders' Vice Presidents from each line of business along with literature reviews. The purpose of this work was to define a project that the undergraduate team could then accomplish over their seven-week term. To that end, the graduate team established a main goal for the project. The graduate team then refined that goal into two project objectives. Finally, they proposed methodologies to address both goals. These methodologies, intended for the undergraduate team, contained recommendations regarding the software, procedures, and a proposed project timeline. After presenting this project proposal to both Way Finders and the undergraduate team, the graduate team continued to collaborate with the undergraduate team, providing them with recommendations for training software and providing feedback as the project developed.

Background

During the project, the team worked with a variety of tools to accomplish their objectives. These tools included Microsoft Access, Excel Visual Basic for Applications (VBAs), Salesforce, Tableau, and a set of interpersonal data collection techniques.

Microsoft Access is a database management tool that can be used to construct and run databases. Within Access, data is stored in data tables that are similar to Excel spreadsheets. However, Access allows for the tables to be linked together with relationships. These relationships serve a few purposes. Firstly, they provide efficient data storage since data is not repeated. Instead the data is linked using relationships to any location it is needed. The relationships also allow for greater accuracy, because data only needs to be entered once and updates can cascade through the database (Access Video Training).

VBA macros are part of the Microsoft suite that can be used with various Microsoft Office products. For the project, the team explored VBA macros in Microsoft Excel. The macros are programmable scripts that can be written to operate in Excel as desired.

Salesforce is a major customer relationship management service. It stores data on the cloud for the customers. Salesforce is used by a many companies and organizations for their data storage.

Tableau is a software that is used to generate various dashboards based on the data. The data can be imported in various ways. An excel sheet can be linked for importing the data. Also, Salesforce servers can be connected directly to Tableau for importing data as well.

The term “interpersonal data collection techniques” was used by the team to refer to three different ways to gather data: focus groups, surveys, and interviews. This terminology was used because it reflected how these techniques required interaction between people to understand a participant’s thoughts and beliefs. Each of these techniques have a similar framework of asking questions to participants to gather their reactions and thoughts. However, all three techniques have distinct formats. Focus groups ask the pre-made questions to a group of participants who discuss and debate with each other with someone moderating the conversation. Surveys ask a participant to answer questions in a written form by themselves. Interviews have a single advisor ask the questions to a single participant in a one-on-one meeting. Each interpersonal data technique has a different level of engagement with the participant, accuracy of data collected, and cost associated with it. The pros and cons of each method and which method we ultimately decided to focus on is described in the interpersonal data section in the methodology.

Methodology

Introduction:

The original objectives, presented by the Graduate team to Way Finders, were to “organize and analyze data from existing systems so that it can be used efficiently for reporting of metrics related to Way Finders main Success Indicators” and “gather and analyze customer satisfaction data by conducting focus group studies”; (see Section 4.1 of the graduate paper in Appendix I). For the first objective, the team’s plan to address it was three-fold. First, the data would be organized using both Excel VBA macros and Access databases. Once these were done, the databases would be connected to Tableau using its built-in functionality. At this point Salesforce would also be connected with Tableau. For the second objective, the team’s plan was to draw up, seek approval for, and then ask a series of focus group questions that pertained to the CB&E and HOME lines of business.

After starting the project, the undergraduate team worked with the Professors and the Graduate team to redefine the deliverables based on what data had been received from Way Finders and the undergraduate team’s skill level. For objective one, the deliverables were scaled back to include just the implementation of the Excel VBAs and an Access database prototype. The team had multiple reasons for choosing these deliverables to pursue. First and foremost was the fact that the team had little to no prior knowledge with any of the software and programs that would be required to meet the original objectives. Based on this fact the team decided that Excel and Access would be the best two to pursue because they are both part of the Microsoft office package, and have many, easily accessible tutorials available online. The team also considered that it would be better to tackle the data organization part of objective one so that it would be easier for another team to follow up on the project and immediately begin data analysis. The final factor that lead the team to consider scaling back the project was the lack of data shared with the team. For objective two, the team decided that it would be too challenging to prepare for and run the focus groups, in addition to the data organization objectives. However, the team decided that it was feasible to draft a set of focus group questions and attempt to seek official approval from the regulating body at WPI was drafted. The reason for this was that drafting the questions took only a small amount of time away from the other work being done by the team, and it would lay the groundwork for another team to complete the second objective later.

VBA:

For our project, VBA (Visual Basic for Applications) macros were explored as a way to automate appending data in Excel sheets. In Excel, VBA macros can be used to analyze scientific data, budgeting, and forecasting, create invoices and other forms, develop charts from data, and automating tasks that are performed frequently. The VBA works by enabling Developer mode in Excel, creating a VBA macro, and coding the macro to operate as desired. The advantages of VBAs are that Excel always executes that task the same way, Excel performs the tasks much faster than if done manually, and that learning to write the code in VBA is not as difficult as it seems. Since reports are being created manually,

automating this task will save time and is exactly what the VBA macro is designed to help with (Walkenbach, 2013).

The VBA macros for this project would be used to append new data to a master sheet, and then apply the newly updated master sheet to link to Tableau directly. By using the VBA macros, it prevents having to create multiple Tableau dashboards for all the potential different sheets.

Access:

Access is a Microsoft program that's primarily used in the development and management of databases. Databases are collections of data that are highly organized. Access works by first storing data in tables, similar to Excel spreadsheets. These tables are then linked through related fields. The purpose of these relationships is to allow for data to be represented in multiple locations without having to be entered in more than one location. This allows for databases to be more organized and greatly simplifies the process of adding new data. The relationships also allow for queries to be made of the data. These queries serve to answer questions such as 'How many people attended a certain event' (Access video training).

The team's intention regarding the access database was to develop a prototype layout that can be used by Way Finders' business units to inform the construction of their own databases. With the final goal of the database being to provide the CB&E business unit an easy way to generate information regarding their community engagement activities that they can make use of for their reports to federal, state, and private funders.

To help the team understand the types and structure of data that they expected to be contained in the Access database, Way Finders' CB&E business unit provided the team with several Excel spreadsheets of data pertaining to different events that had been run by CB&E. The data from these Excel documents were used to construct a prototype Access database according to the process laid out below.

- 1) Create a Master Events table with each unique event given a unique "Event ID" number
- 2) Create a "Participant-Event Link 1" table with an AutoNumber field titled "Attended ID" (this is the primary key), a number field titled "Event FID" (Event Foreign Key ID), and a short text field titled "Participant's name"
- 3) In the original excel sheet
 - a) Remove all titles, graphs, and other analysis
 - b) Add a column the length of the dataset containing the "Event ID" number for whichever event the data came from (assigned in step 1) with the heading "Event FID"
- 4) Link to excel sheets to make tables
 - a) The column headings contain field names
 - b) Do not choose a primary key
- 5) Use a "Make table" query to make a condensed table containing only the Event FID field, Participant's names, and any other desired information (e.g. address, age, etc.).
- 6) Use an "append" query to add the fields in the condensed table to the "Participant-Event Link 1" table

- 7) Use a “Make table” query to pull only unique names from the “Participant-Event Link 1” table into a new table titled “Participant Master List”
 - a) Do this by changing “unique values” in the properties menu from “no” to “yes”
- 8) Add an AutoNumber field titled “Participant ID” to the “Participant Master List”
 - a) This is now this table’s primary key, as well as a unique value assigned to each participant
 - b) One potential problem with this process is that, if a name is misspelled, then a participant ends up with more than one ID. The advantage of Access is that this error would only occur in one location, and could be corrected in all related field by an update query
- 9) Create a relationship between the unique list of participant’s names in the “Participant Master List” and the names associated with the “Event FID” in the table “Participant-Event Link 1”
 - a) This relationship can be seen in Figure 1.
- 10) Use a “Make table” query to create a table titled “Participant-Event Link 2” containing the “Event FID” from “Participant-Event Link 1” and the “Participant ID” number from the “Participant Master List”
- 11) In the new “Participant-Event Link 2” table, rename the “Participant ID” field to “Participant ID” and change its data type to number
- 12) Save the table and then add an AutoNumber field titled “Attended ID” and set it as the primary key
- 13) Make relationships between the ID fields in both master tables with the associated FID fields in “Participant-Event Link 2”

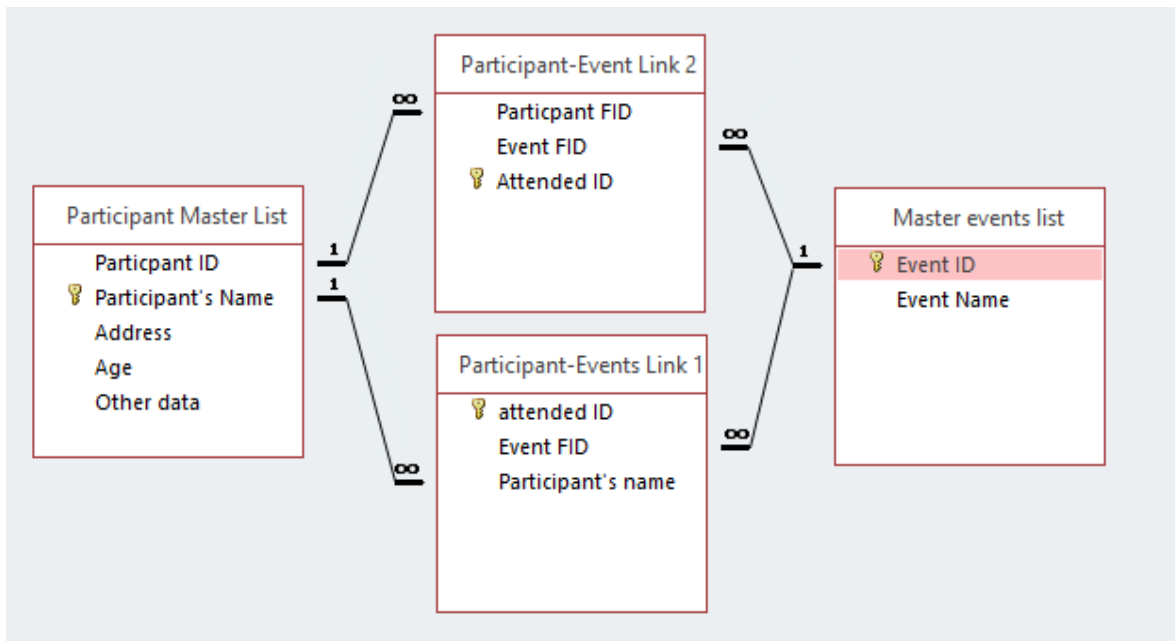


FIGURE 1. SCREEN CAPTURE OF RELATIONSHIP STRUCTURE IN ACCESS DATABASE PROTOTYPE

The Participant Master List is a table that is designed to contain a list of unique participant names and assign each name with an identification number. The Participant Master List can also contain other participant data, e.g., address, parent name, or a start date for that participant. This data is

already being collected by Way Finders. The Participant-Event Link 1 and 2 tables both serve to tie the participant information in the Participant Master List to the event that the person attended. Link 1 ties the tables together using the name of each person, while Link 2 accomplishes the same goal, but with an identification number. The cause of the difference is that, given the choice, it is preferable to use the smallest amount of data possible in any access field. Finally, the Master Events List is where the information pertaining to each event is stored.

Interpersonal Data:

For the project, the team was tasked with looking at the advantages and disadvantages of several techniques for gathering information relating to Way Finders customer satisfaction. The team decided to call the techniques used to collect data from individuals and groups of people “interpersonal data collection techniques”. The goal of the techniques is to collect data by interfacing with Way Finders customers to get their opinion, ideas, or advice. The three interpersonal data collection techniques we looked at were focus groups, surveys, and interviews.

Focus groups are an interpersonal data collection technique where a group of participants is asked a series of questions to answer and debate (Morgan, 1996). The ideal number of people in a focus group is six to eight people; (see Section 5.3 of the graduate paper in Appendix I). The format of focus groups allows for the gathering of detailed information about personal and group feelings about several subjects. They come with many of the benefits of interviews while also be cheaper and faster than interview every single person one on one. The cons of running a focus group is that it takes training and practice to manage a large group and make sure the discussion stays on track. In general, focus groups are beneficial if data collection needs to be more reliable than a survey but not as expensive and time consuming as an interview.

Surveys are series of written questions where the participant individually writes their answers down (Punch, 2003). The filled-out surveys are then collected and analyzed. Surveys are a great tool for analyzing data from large populations, this is because, they are relatively inexpensive to make and can be sent to people using a variety of different methods. For example, surveys can be online or on paper and can be sent through email, mail, fax or placed on a website. A drawback of using surveys is that they cannot ask for further clarification of answers like in interviews or focus groups. Surveys can be changed or modified after they are approved. There is also little incentive for people taking surveys to take them completely seriously, meaning some people might not answer truthfully or leave answers blank. Surveys are the best interpersonal data collection technique if collecting the data quickly and inexpensively is a priority.

Interviews are when a person is asked questions and expected to give answers back to an interviewer (Oxford,2016). Unlike focus groups, interviews are conducted one-on-one between the interviewer and the interviewee. Interviews allow for accurate screening of individuals for their complete opinion on a given question. Since interviews involve only one person at a time, the interviewee will be more focused and engaged than during a focus group and the interviewer can document any behaviors or non-verbal gestures the interviewee may make while answering a question. The biggest problem with using interviews is that they are by far the most expensive information

collection tool, and performing interviews takes a significantly larger amount of time than performing focus groups or surveys. Data from the interview also needs to be manually entered by either the interviewer or a third party. Interviews are great if data collection needs to be thorough.

The team ultimately chose focus groups as its interpersonal data collection technique of choice. There are several reasons for this decision. First, there simply was not enough time and money to interview enough of Way Finders customers to obtain accurate results. Second, Way Finders has already performed many surveys and has found there has been little incentive from the customers to fill them out. Third, Way Finders has already set up focus groups in the past, so their employees have experience setting them up and running them.

Shown in Figure 2 below are the set of focus group questions initially drafted by the undergraduate team. Along with the questions asked, the team drafted sub-bullets for follow up questions and to explain the reasoning behind the questions. The questions were also divided into three sections: questions to ask customers of the HOME business unit, questions to ask customers of the CB&E business unit, and questions to ask customers of both business units.

Home Ownership & Financial Education:

- Do you feel as if you have a better understanding behind housing financials?
 - If they don't, why?
 - How can Way Finders help provide a better understanding?
 - Customers in this line of business should be getting a better understanding
- Do you feel more secure in your housing situation after working with Way Finders?
 - Why?
 - If they don't feel as if they are being helped, even if they are, then Way Finders needs to change something

Community Building & Engagement:

- How has Way Finders impacted your community?
 - Does this match with Way Finders goals?
- Do you feel more involved in your community?
 - Goal for this line of business is to improve involvement in community
- Do you feel safer in your community?
 - Goal for this line of business is to improve safety within community

Both:

- How is Way Finders helping you?
 - What Way Finders is helping them with. Links to are they satisfied/quality.
- Are you satisfied with Way Finders' service?
 - Why?
 - Did you encounter any difficulties working with Way Finders?
 - If people are not satisfied and had difficulties then those are places that Way Finders needs to improve.
- How can Way Finders improve their quality of service?
 - Provides suggestions from an external perspective. Links to are they satisfied/quality.
- How did you hear about Way Finders?
 - What form of advertising has gotten the most attention
- What was your view of Way Finders before and after they entered your Community?
 - Why has your opinion changed?
 - Help Way Finders address issues with their image in new communities

FIGURE 2. INITIAL DRAFT OF FOCUS GROUP QUESTIONS

Results and Discussion

Major Deliverables:

VBA's:

The team was planning on using VBA (Visual Basic for Applications) macros in Excel to automate appending new data to a master Excel sheet. This master Excel sheet was to be later linked or imported into Tableau to create various dashboards as needed. This plan changed as the term progressed for several reasons. For one, it was brought to the team's attention that the lines of business are transitioning to Salesforce instead of Excel for recording data. Salesforce has a built-in connection with Tableau for importing the data on the server. This would render the VBA's useless, since they are in Excel. Another factor was time. The team was unfamiliar with VBA's before the project, so in order to learn and implement it correctly it would take a lot of time. With these two factors combined, the team decided to focus away from implementing VBA's and more on the Access database with preliminary recommendations for data integration with Tableau. In the future, VBA's could be used to automate the process until all the lines of business transfer to Salesforce, or if the Salesforce connection proves to be difficult.

Access Database:

The objective for the team regarding the Access database was to build a working prototype of an Access database using a small sample of data from the CB&E business unit. The purpose of this database was to provide CB&E with a method for generating participation and attendance reports for all their engagement activities. These reports could then be used to improve the business units reporting to funding agencies. The prototype could also serve as a starting point for further development by other business units within Way Finders. The team's plan was to construct a series of database prototypes, with each prototype being more complex and more functional than the last. The advantage of this approach was that it gave the team time to gain experience and familiarity with Access over a series of comparatively simple steps. This approach also allowed the team to receive constructive feedback from the professors and graduate students with each step. In practice the plan worked exactly as expected. The team was able to proceed, despite having very little knowledge of Access, to the point where they were able to deliver a functional, if simplistic, database.

For the Access database, there were two significant outcomes. The first was an Access database prototype that had been refined through three distinct versions. The second was a process by which new and existing data can be imported into the database prototype. The Access prototypes progressed through three stages of development.

The first version of the prototype was very basic; it consisted entirely of the given Excel sheets that were imported directly into Access as tables. No work was done to format the sheets beforehand so that they would import correctly, resulting in tables that were unusable due to improper headings or data types. The result of this was that the database was not functional. What this database did accomplish was to give the team experience with the importation process and the general form of an Access database. This experience was then transferred to the construction of the second version of the database.

The second version of the prototype consisted of a single master Excel sheet that was assembled manually from all the available data. This manual assembly consisted of copying the relevant data from each separate event attendance sheet, e.g., participant name, parent name, and start date. These data were then pasted into a new spreadsheet with each datum under its respective column heading. The advantage of this approach was that it allowed the team to work with queries and relationships for the first time, without having to manage a large number of tables in Access. These tables and queries were functional and enabled the team to answer a series of preliminary questions that they posed to the data. These questions include: how many people attended each event, and who attended the most events, and how many events did that person attend. The drawback to this version of the database was that it required too much external manipulation before the data could be used by the database. This would cause problems because the introduction of any new data would be a complicated process and would result in a new database needing to be constructed each time, and that was not a desirable outcome for the prototype.

The goal of the third version of the prototype was to create the same participant list as the second version, but for it to be constructed entirely within Access as opposed to being manually assembled in Excel. The process by which this was accomplished was presented in the methodology section. The advantages of this final version of the prototype were twofold. First and foremost, unlike the second version of the prototype, the database's construction allows for easy importation of new datasets. The second advantage of this final version of the prototype is that it adheres to established Access conventions and formatting, with each cell holding the smallest amount of data possible, and data entries not being repeated. Once the database was constructed, a procedure was created to lay out the method by which new and existing data could be appended to the database. The procedure is as follows:

- 1) Create a new entry on the Master Events table with a new unique "Event ID" number
- 2) In the original excel sheet:
 - a) Remove all titles, graphs, and other analysis
 - b) Add a column the length of the dataset containing the "Event ID" number for whichever event the data came from (assigned in step 1) with the heading "Event FID" (event foreign key ID)
- 3) Link to excel sheets to make tables
 - a) The column headings contain field names
 - b) Do not choose a primary key
- 4) Use a "Make table" query to make a condensed table containing only the Event FID field, Participant's names, and any other desired information (e.g. address, age, etc.). This will be used to append to the Master Participant List
- 5) Use "append" query to add the fields in the condensed table to the Master Participant List

The final prototype was shared with Way Finders IT team.

While constructing the database, the team identified several challenges; however, the team was able to work around these obstacles and mitigate their impact. The greatest challenge facing the team from the start of the project was a lack of experience with the Access software. This was addressed early in the project by assigning the team to review a series of video tutorials produced by Microsoft. These tutorials gave the team an understanding of the functions and limitations of the software. This understanding then allowed the team to more accurately assess the scope of the project and lay out a project plan. As the project continued, the first versions of the database also served to give the team a chance to practice and refine their understanding of Access. These two methods worked well and served to allow the team to build a functional prototype database within the time frame of the project. Regardless of the effectiveness of the solutions to the problem of a lack of Access familiarity, the process could have been improved by identifying the need of familiarity earlier. If this had occurred, it would have allowed the team to review the online tutorials during the PQP period before the project started where any deficiencies in those tutorials could be addressed before the proper project began.

The other two challenges the team faced resulted from the data that they were provided. Primarily, the spreadsheets provided had been formatted in a way that allowed for the data to be easily presented, that is, that the sheets contained extra titles, summation columns, and graphics. All this extra formatting interfered with the process of importing the data sheets into Access. Fortunately, all that was required was the manual deletion of the extraneous objects; this is noted in the appending procedure above. The other concern regarding the data that the team received from Way Finders, was that the data sheets did not contain all the data that was requested to be in the Access database. This was addressed by creating empty fields in the final database which then served as guides for entering the data when it was gathered. The problems with the data sheets could have been mitigated if the team had had more frequent and better communication with Way Finders regarding the data the team was given to create the database.

Focus Groups:

After having created the focus group questions, the undergraduate team sent them to the graduate team to edit and review the draft of questions. The questions were left intact, but the graduate team edited the format of the questions to make a step-by-step procedure on how to organize and run the focus group. The edited version and the original version of the focus group questions were sent to Professor Sweeney and Professor Miller for approval. After receiving their approval, the focus group questions were sent to Correen Carpin-Gendron, the manager of the Homeownership and Financial Education Department at Way Finders, for her approval.

Although it was originally proposed by the graduate team, the undergraduate team was not able to conduct any focus groups. The undergraduate team decided early on that the team wouldn't have enough time in the seven-week term to be properly prepared to run focus groups and then analyze any data from them. No one on the team had been trained to run a focus group, so time would have had to be taken away to learn and train to run one. During the first meeting at Way Finders, Lynne and Lori expressed concerns that they'd have to set up reimbursement for any focus group participants and they

would have to set up a way to look after the children of any participant. Both Professor Sweeney and Professor Miller agreed the team did not have enough time to conduct the focus groups, so the team decided to focus only on drafting a set of questions to be used during the focus groups. By deciding to focus only on drafting the focus group questions, the team had time to tackle the objective of creating the Access database. However, the team could have improved on its communication with Way Finders and with researching focus groups in the PQP term in order to have sped up the process of drafting the focus group questions.

The team envisions two options for conducting the focus group. The first option is that Way Finders could conduct it internally with the questions the team drafted. The second option is that another WPI student project team could use the focus group questions the team drafted as a basis to start conducting focus groups for HOME and CB&E. A week or two would have to be set aside at the start to help prepare students to run and manage focus groups. Way Finders would need to set up a proper place to conduct the focus groups in either option, along with the necessities of providing participants with adequate compensation and a way to look after children. Depending on how long the focus groups last, a second WPI team may be needed to analyze the data from the focus groups or Way Finders could do it internally.

Minor Deliverables:

Survey Analysis:

One aspect of the project the team was not able to accomplish was analyzing data collected from surveys Way Finders had given out over the years. This was initially suggested by Lynne at the team's first meeting with Way Finders. However, the team did not prioritize this as a key objective, so no work was done on this task. The reason the team didn't prioritize this was because the team felt it would have been a lengthy process to collect and analyze surveys from Way Finders and it would have cut into the time available to work on other aspects of the project. There was confusion on both the team and at Way Finders about whether the team would be analyzing these surveys. The team did not realize this was an objective Way Finders was hoping for us to achieve until more than half way through the term. The team could have done a better job communicating with Way Finders initially so that any confusion could have been cleared.

Going forward, a student or an internal Way Finders team could come in and help analyze Way Finders surveys using techniques like correlation analysis and descriptive statistics. Depending on the amount of surveys that would need to be analyzed, this could be the sole focus for IQP team or a small component of one. If the surveys could be uploaded to a secure server like basecamp or sent via email, there wouldn't need to be any time spent driving to and from Springfield. Data from these surveys could also be put into a database like Salesforce, Access, or Excel for storage and analyzed via Tableau. Analyzing these surveys will help Way Finders have a better understanding of what customers would like to have improved.

Salesforce & Tableau:

The team was aware of a built-in connection between Salesforce and Tableau. This built in functionality should make linking the data with Tableau easy, since all the data from the lines of businesses are transitioning the Salesforce in the future. The team thinks the connection is as simple as directly linking the Salesforce server with Tableau. If the connection between Salesforce and Tableau does not function in the way Way Finders intends, other methods can be used to get the data to Tableau, such as VBAs in Excel.

Conclusions & Recommendations

Conclusions:

The team was able to narrow down the objectives the graduate team presented to create deliverables that will help Way Finders. The access database is a good template for Way Finders to build upon and the draft of focus group questions lay a good framework for future Way Finder's focus groups. The project serves as the beginning phase for a multi-phase project that can be completed with the help of an internal team at Way Finders or a student team. One important part of the project the team wants to emphasize is how learning to work with software like Microsoft Excel VBAs and Microsoft Access is easier than it seems. Anyone can learn to use these tools to create easy to understand databases for storing and managing information. The tools will be helpful since a basic understanding of how databases work can benefit all Way Finders employees. This understanding is especially useful when the employees start analyzing the data collected and stored on Tableau.

Recommendations:

VBAs:

The team has recommendations how to implement VBAs effectively or use Salesforce regarding the Tableau data integration. These recommendations are to use VBAs to append new data to a master Excel sheet and link that sheet with Tableau. The VBAs help automate the task of appending, making it faster and easier. Another recommendation is to use the Tableau built-in connection between a Salesforce server and Tableau. The VBAs method could be implemented until the Salesforce server is set up for all data. However, depending on the time frame for the server to be operational, VBAs might not be an effective use of the time by Way Finders.

Access:

After completing the prototype database, the team then identified the subsequent tasks that could be accomplished by another team to further improve Access integration within Way Finders. The next steps for the prototype all revolve around improving the functionality. The first major improvement that could be implemented in the next phase would be to construct separate tables for additional participant data. In the current prototype information such as age, address, and level of achievement are being stored in the participant master list. The reason that the data should be stored in separate tables is the result of Access best practices, which call for each table to be as small as possible. Rebuilding the tables in this way also allows for additional participant data to be tracked. The other major improvement that could be implemented in the next phase of this prototype would be to implement a Graphical User Interface (GUI). Such an interface would allow data input easier and faster,

instead of recording attendance data on a separate Excel sheet, and then having to import it. The data could be entered directly into Access, either by Way Finders staff, or by the participants themselves.

Other improvements that could be made include building a system that can track attendance to an event that has more than one occurrence and constructing a similar database for other lines of business. Aside from the prototype developed by the undergraduate team, Access contains a variety of database templates that Way Finders could take advantage of. These templates can allow Way Finders to quickly start using Access for data collection and management, while the prototype database is improved and tailored to their specific requirements. For a list of these templates see Appendix A-E.

Focus Groups:

The team envisions two options for conducting the focus group. The first option is that Way Finders could conduct it internally with the questions the team drafted. The second option is that another WPI student project team could use the focus group questions the team drafted as a basis to start conducting focus groups for HOME and CB&E. A week or two would have to be set aside at the start to help prepare students to run and manage focus groups. Way Finders would need to set up a proper place to conduct the focus groups in either option, along with the necessities of providing participants with adequate compensation and a way to look after children. Depending on how long the focus groups last, a second WPI team may be needed to analyze the data from the focus groups or Way Finders could do it internally.

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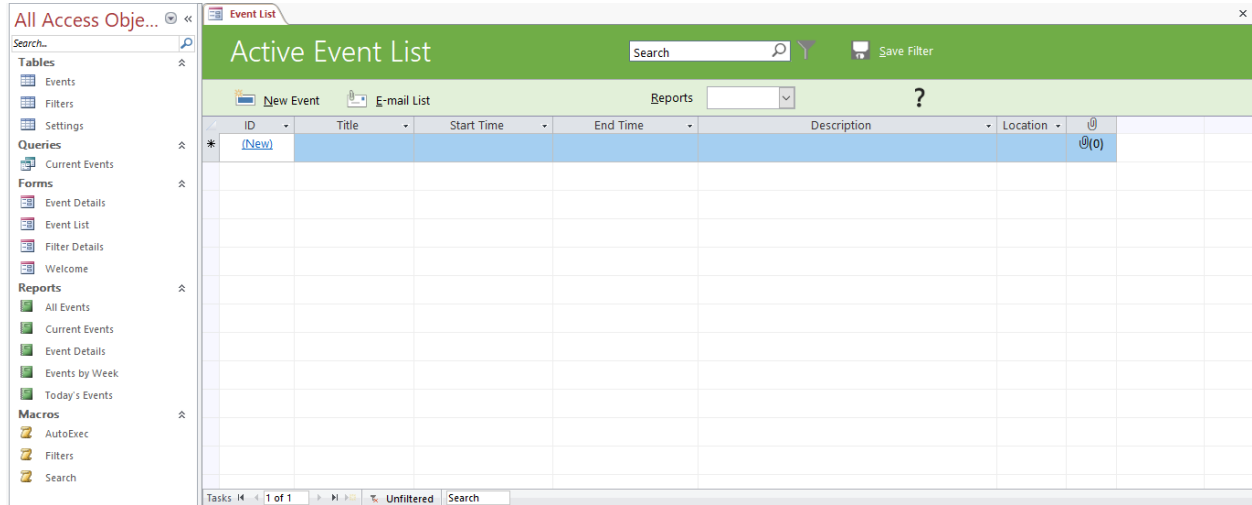
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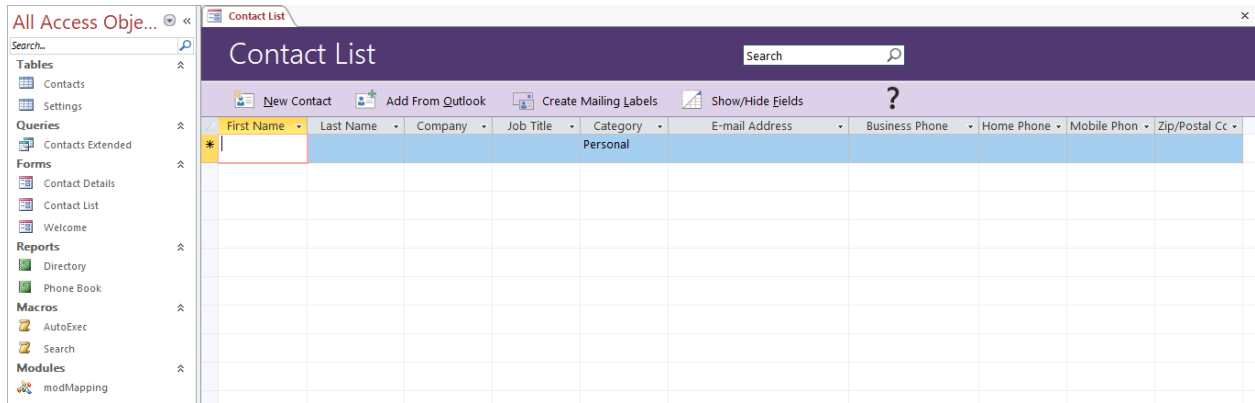
Appendix A

Access Active Event List



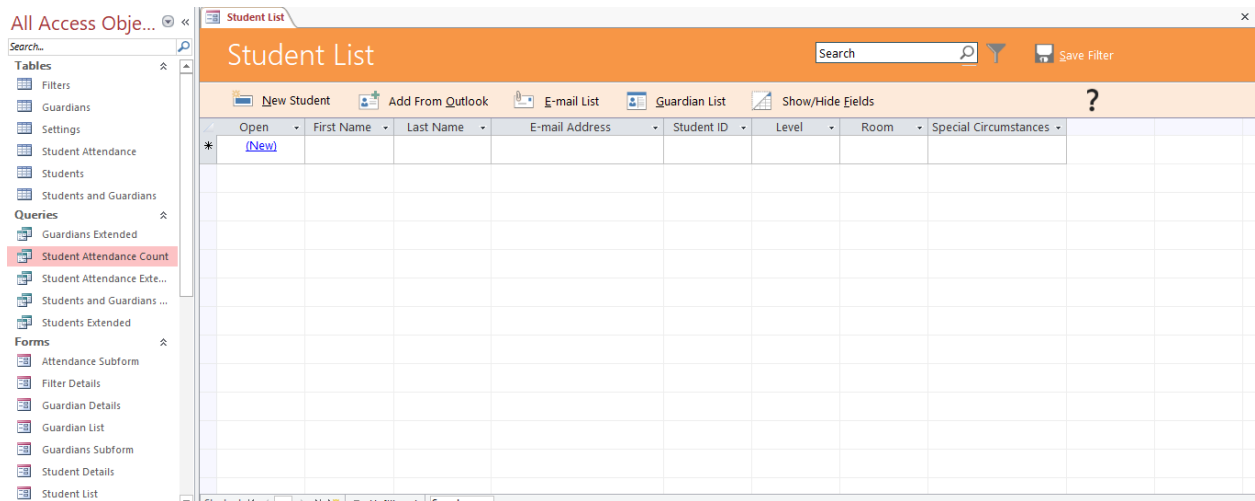
Appendix B

Access Contacts



Appendix C

Access Student List



Appendix D

Access Property List

All Access Objects << Property List

Search...

Tables

- Lease
- Payment
- Property
- Service
- Tenant
- tkpPaymentCategory
- tkpPaymentType
- tkpPropertyType
- tkpServiceProvider
- tkpServiceType

Queries

- Expiring Leases
- Property Extended
- Tenants Extended

Forms

- Lease Details
- Lease Subform
- Payment Subform
- Property Details
- Property List

Property List

New Property E-mail List Tenant List New Lease Provide Feedback

Property ID	Property Type	Address	City	State/Province	ZIP/Postal Code	Notes
* (New)						
Total		0				

Appendix E

Access Case List

The screenshot shows a web application interface for a Customer Service Case List. On the left is a navigation sidebar with a search bar and a list of menu items including 'Cases', 'Case Details', 'Report Center', and various filters. The main area displays a table with columns for ID, Title, Customer, Assigned To, Priority, Status, Category, Due Date, Opened Date, Resolved Date, and Opened By. A single row is visible with a '(New)' link in the ID column, a '0' in the Customer column, '(2) Normal' in the Priority column, 'Active' in the Status column, '(1) Category' in the Category column, and '26-Apr-18' in the Opened Date column.

ID	Title	Customer	Assigned To	Priority	Status	Category	Due Date	Opened Date	Resolved Date	Opened By
* (New)		0		(2) Normal	Active	(1) Category		26-Apr-18		

Appendix F

Focus Group Questions

Introduction:

1. Welcome
 - Introduction of the moderator (and assistant, if any)
2. Overview of topic and the purpose of the study
 - The results will be used for...
3. Rules or guidelines
 - No right or wrong answers, only differing points of view
 - If the discussion is being tape recorded, let the customers know
 - You don't need to agree with others, but you must listen respectfully as others share their views
 - Rules for cellular phones and pagers if applicable
 - For example, we ask that your turn off your phones or pagers. If you cannot and you must respond to a call, please do so as quietly as possible and rejoin us as quickly as you can
 - Talk to each other

Home Ownership & Financial Education

Engagement Questions:

1. How did you hear about Way Finders?
2. Have you attended any workshops or events organized by Way Finders in the past?
 - Which ones? How did that come about? What was your impression?

Exploration Questions:

3. Do you feel as if you have a better understanding behind housing financials?
 - If no, why?
 - How is Way Finders helping in providing a better understanding?
4. Do you feel more secure in your housing situation after utilizing services by Way Finders?
 - How or why?
5. What was your view of Way Finders before and after they entered your community?
 - Did your opinion change? How/why?
6. Over all, are you happy/satisfied with Way Finders' services?
 - If no, how do you think they can improve?

Exit Question(s):

7. How do you think Way Finders can improve their quality of service?
 - Any suggestions?
8. Is there anything else you want to add about Way Finders and the services they are providing?
 - Any suggestions?

Community Building & Engagement

Engagement Questions:

1. How did you hear about Way Finders?
2. Have you attended any workshops or events organized by Way Finders in the past?
 - Which ones? How did that come about? What was your impression?

Exploration Questions:

3. How do you think Way Finders is contributing to your community?
4. Can you recall any particular act by Way Finders that you think has impacted/influenced your community the most?
5. Do you think Way Finders involve the residents or customers too in community building and engagement?
 - If yes, how?
 - If no, how do you think you can add to your community?
6. Do you feel safer in your community?

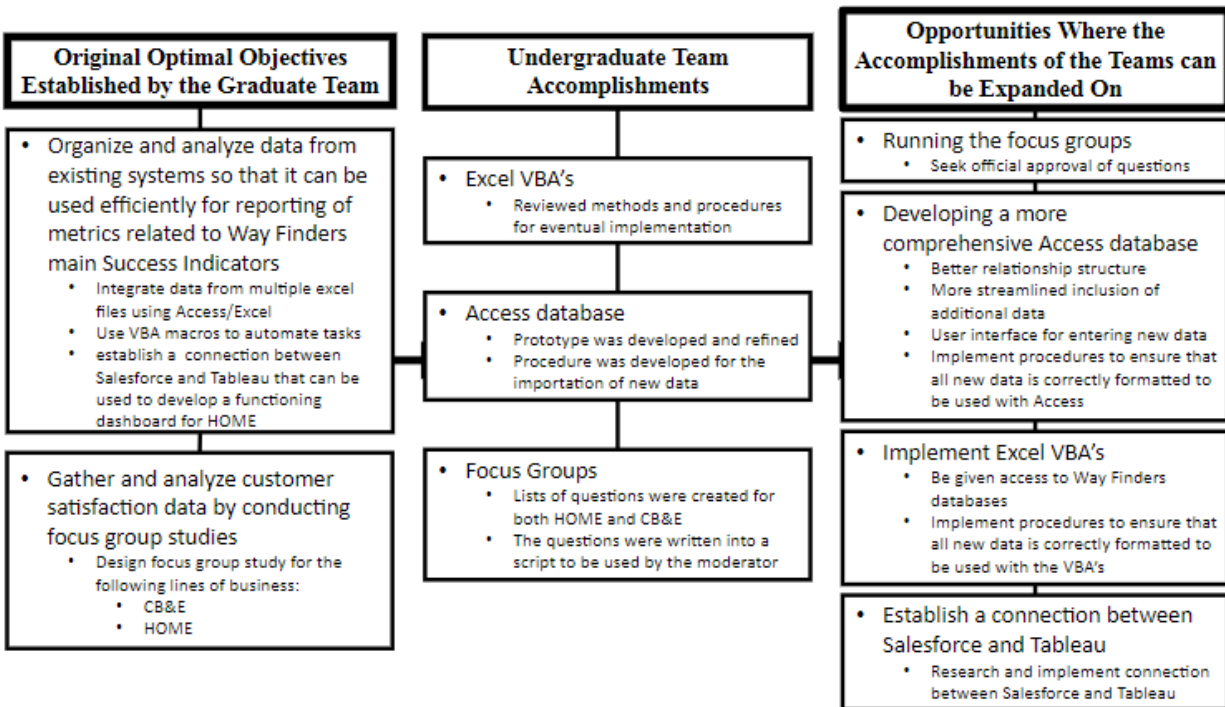
7. What was your view of Way Finders before and after they entered your community?
 - Did your opinion change? How/why?
8. Over all, are you happy/satisfied with Way Finders' services?
 - If no, how do you think they can improve?

Exit Question(s):

9. How do you think Way Finders can improve their quality of service?
 - Any suggestions? (from an external perspective)
10. Is there anything else you want to add about Way Finders and the services they are providing?

Appendix G

Project Path



Appendix H

Process Overview

Over the course of the project the team was presented with a variety of challenges and had to work diligently to solve them. The team's biggest strength was the communication and cooperation of its members. All the team members were part of every decision, and there was never a point where the team expectations agreement had to be invoked. All team members understood their roles and worked to accomplish them. The methods the team used to ensure constant and productive inter-team communication were the Groupme application and frequent regular meetings. Groupme, served as a method to facilitate fast communication between all group members, and ensures that all members were on the same page if a decision had to be made or a task had to be assigned quickly. The communication through Groupme was backed up by group meetings. The team would all meet, either in person or online, at least twice a week, but often more frequently. It was usually the case that the team would convene a meeting as soon as possible after an either an undergraduate-professor, or an all hands meeting. This was done to give the team an opportunity to review the content and minutes of the previous meeting while it was still fresh in their minds. This was so they would be able to plan out new actions items quickly and accurately. The purpose of these meetings was always, first and foremost, to review the running action item list to make sure that previously assigned tasks were being worked on and that the new action items could be assigned. The action item list was the main project management tool that the team utilized to delegate tasks so that the project stayed on track and that all team members were aware of their responsibilities. The action items were also always reviewed and assigned as a group, this made sure that all members agreed that the division of work was fair and equal. Aside from the action item list the team also made sure to prepare both meeting agendas and meeting minutes. Meeting agendas were created and disseminated at least 12 hours before any regularly scheduled meeting. These agendas helped keep the team focused and productive during the meeting times. Meeting minutes were also taken for every meeting. These minutes allowed the team to review meetings and assign action items appropriately, according to what was discussed in the meeting. Other places where the team believed they worked well were with punctuality, and quality of writing.

For all the team's planning and inter-team communication, there were still areas where they could have improved. The team ran into some challenges in level-setting expectations with the sponsor about anticipated deliverables. This became apparent at the midpoint of the project when it became apparent that the team's agreed upon deliverables did not match what the sponsor was expecting. Fortunately, the discrepancy was resolved quickly. What the team believes could have been done to improve their communication with the sponsor was to include the sponsors on more internal emails, so that they were kept informed of decisions made by the team as they happened. The team also could have arranged more meeting with the sponsors, either in person or online, to keep everyone on the same page. The final place the team believes they could have improved was with the PQP. The process by which the project was defined meant that the team was only given specific directions regarding the project after the IQP term had started. What the team believes could have made the transition into the project easier would have been for there to have been meetings with the graduate team during the PQP. During this time the team would have been able to provide input as to what they believed were realistic deliverables for the project. As well as given the team the opportunity to begin training with some of the software they were to use during the IQP.

Appendix I
Graduate Team Paper



Way Finders- WPI
Pioneer Valley Project

By

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Faculty Advisors:

Prof. Fabienne Miller

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Worcester Polytechnic Institute

Abstract

Way Finders is a nonprofit organization that works towards eliminating homelessness, improving financial stability of its customers, and community building. Measuring the impact of the services they provide is a critically important task for Way Finders. As the company entered the third year of their 2016 – 2020 strategic plan, they found it necessary to deploy a methodology for reporting on their 12 Success Indicators. The main purpose of the project was to identify methods that would help ease the process of setting up a performance management system for Way Finders. The project scope was designed to focus on the areas identified by the strategic plan including reviewing existing data and processes related to these measures, and identifying additional methods that would add value to these processes. The WPI Graduate team analyzed the current processes and identified methods that could be implemented to increase the efficiency of data management. The team determined the research questions that the project would address, analyzed existing processes and identified the methods that would be used to collect and analyze data. Subsequently, the Undergraduate team concentrated on the implementation of the identified methods and data analysis.

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1. Introduction

When it comes to health and wellbeing of families, affordable and safe housing plays a very important role. Along with food, shelter is perhaps the most basic human need. Safe housing today is not just a matter of comfort and convenience, but is also about health, childhood development, individual self-esteem, and family viability. Without adequate housing facilities, managing daily lives becomes very challenging. When families cannot afford adequate housing, it does not only make it difficult for them to maintain a healthy lifestyle, but also increases their stress level and might lead to number of health issues.

Lack of affordable housing can also impact businesses and organizations. In many parts of the country, increasing housing costs and shortages have started to impact local economies negatively. The increase in housing costs and issues related to it can encourage young professional workers to look elsewhere for jobs, threatening the continued vitality of local industries that are in dire need their talent.

Housing is the greatest monthly expense of most Americans. According to Garry Emmons of Harvard Business School (Emmons, 2000), “Housing is generally considered “affordable” when its cost does not exceed 30 percent of the median family income in a given area.” For low-income households, affordable and stable housing is a challenge for numerous reasons (JHSPH, 2017):

- A larger percentage of income must be used to make their rent or mortgage payments.
- Families may not have enough money to cover other vital needs, such as food, utilities, or health-related expenses if housing costs are too high.

Each year, about 2.5 million people are evicted in the United States due to housing costs. Moreover, for patients who are homeless, properly storing medication, maintaining a healthy diet and consistently going to the doctor are difficult to do when they are spending a good deal of time trying to find a place to sleep every night.

2. Background

2.1. About Way Finders

Way Finders is a nonprofit organization that provides housing resources and helps in building communities. Previously known as HAPHousing, Way Finders has successfully been addressing the affordable housing needs in its region for more than 40 years. Its main goal is to make sure that all people have a safe, secure place to live. The organization works towards eliminating homelessness, increasing the supply of stable, affordable housing, and helping people buy their first homes. They provide access to housing services that help people find their desired housing regardless of their income and background. The services provided by Way Finders do not only help solve the housing issues that people face, but also energize the community and neighborhoods by helping people recognize their potential to thrive.

Way Finders is also conscious of protecting the environment through sustainable work practices throughout the organization. The mission-driven organization is considered the go-to agency by funders and state officials.

Way Finders encompasses the following six lines of business:

1. Home Ownership and Financial Education
2. Real Estate Development
3. Community Building and Engagement
4. Rental Assistance
5. Housing Support Services
6. Property and Asset Management.

Each of these lines of business operates independently. (“About Way Finders,” 2018)

2.2. Customers

The customers of the various lines of business are detailed in Figure 1 below.

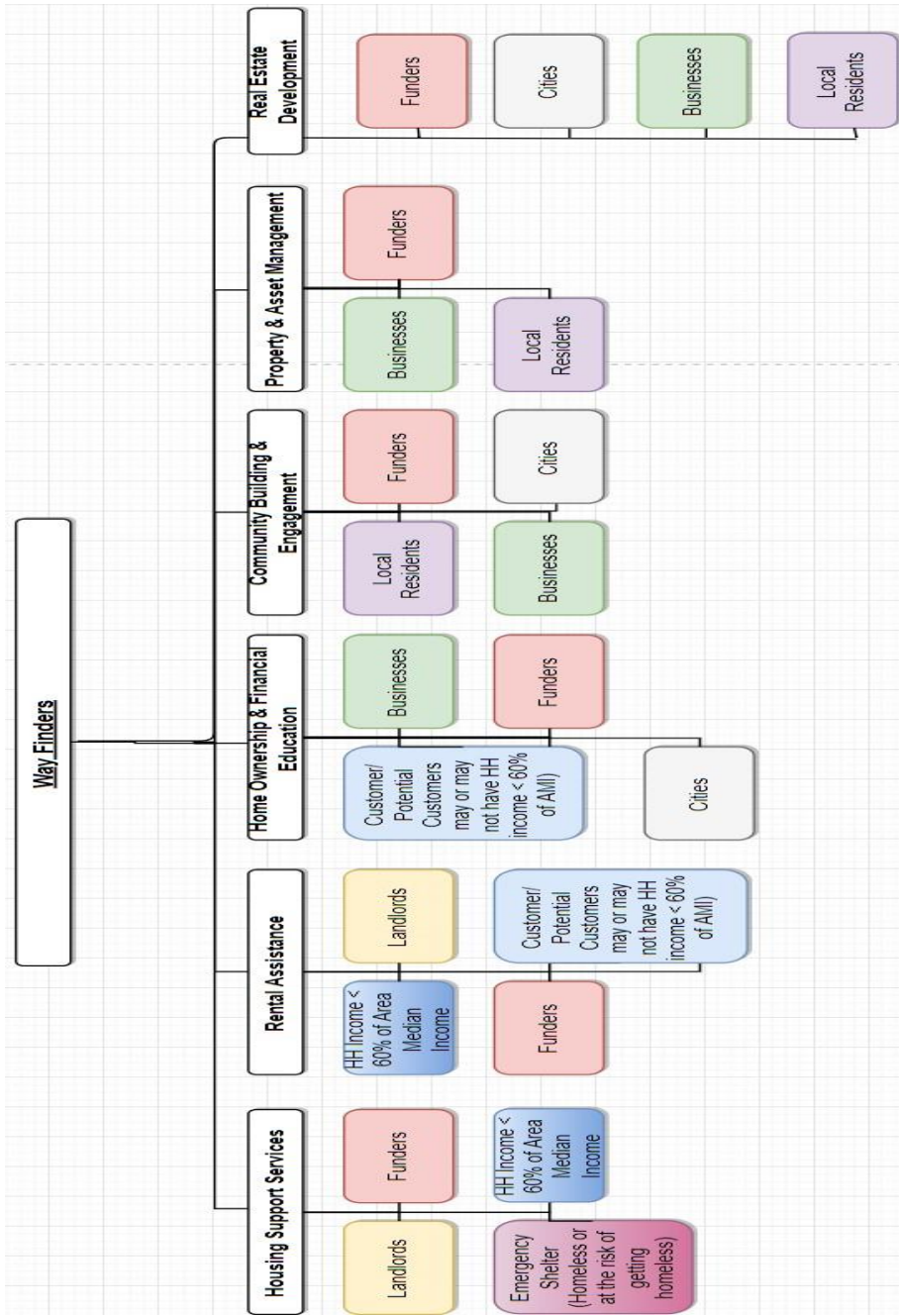


Figure 1. Way Finders - Customers

2.3. Mission and Goals

Way Finders' mission statement as stated in their Strategic Plan is:

“Way Finders lights pathways and opens doors to homes and communities where people thrive.” The organization's main goals are:

Goal I: Service Delivery: *Engage clients, residents, and communities in exceptional services that move people toward greater housing stability, financial security, and improved well-being.*

Goal II: Sustainability: *Demonstrate strong subject matter expertise, well-prepared and diverse leadership and staff, and streamlined systems and practices that facilitate organizational excellence and financial strength.*

Goal III: Partnerships and Collaboration: *Engage diverse partners and collaborators in exceptional service delivery to increase collective impact while serving the missions of partner organizations meeting the needs of the entire region.*

Goal IV: Presence and Visibility: *Influence the region's leaders to embrace affordable housing as an asset to the region's economy, especially when coupled with supportive services for residents.*

- Strategic Plan (Way Finders, 2016)

2.4. Key Performance Indicators

Way Finders identified 12 key performance indicators. For the scope of this project, four key performance indicators were selected. They are critically important for Way Finders since they directly measure the impact the organization has on its customers:

1. Number of clients who improve their housing stability, and the level of improvement they accomplish, through one or more pathways: Move to better quality housing that is affordable, and/or reduce their housing cost burden, and/or move to communities of opportunity where there are increased options for jobs, educational opportunities, or access to community resources.
2. Positive trends in financial security for clients who are assisted by Way Finders and its network of partners, as evidenced by such changes as: improvement in housing stability; achievement of a GED or high school diploma or other education and training goals; secure employment with an above-minimum wage that offers future earning potential; or improvement in credit scores.

3. Increased number of residents in target communities who share information, help each other and work together to influence and sustain long-lasting community change and revitalization efforts.
4. Percentage increase in positive feedback from clients, residents, and employees relative to being treated with respect and dignity in every contact with Way Finders.

3. Literature Review

3.1. Performance Management in Nonprofits

Performance management refers to a process nonprofit organizations (NPOs) can use to develop performance measures, report on performance and discover the changes the organization needs to make to improve overall performance (Gandhi, 2009). Performance management is often mistaken for performance appraisal or review, but involves much more than that. An effective performance management process enables businesses and organizations to measure their performance and productivity by:

- Aligning an employee's daily activities to the organization's strategic values and objectives,
- Making performance expectations clear and transparent, ○ Hold the employees accountable for their actions, ○ Focusing on skill development and learning activity choices, ○ Documenting necessary actions for legal purposes to avoid disputes.

- (MacMillan, 2017)

In for-profit organizations, performance management generally focuses on creating wealth for stakeholders and has three basic objectives. First, it allows the organization to recognize performance, more particularly through compensation. Second, to evaluate and manage every individual's performance, the performance needs to be *seen* clearly through process evaluations, project ratings, consensus meetings, etc. Third, goals and methods to track progress should be set for every team and individual by the team leader.

Nonprofit organizations, on the other hand, focus on achieving their social mission. Although nonprofit organizations must be money conscious, profitability and financial considerations are not their ultimate goal. Nonprofits are mission-driven. This mission focuses the organization on the impact of their action on their stakeholders. Because of this, they define specific strategies that are needed to attain their goals or mission. Their strategies, however, are often inclined towards the interests of donors and funders because they are the ones who provide funds to the organization. Funders may have their own legitimate interests, but if the organization's goals and interests do not align with them, then it becomes a real problem for these organizations (Buckingham, 2015).

Another way in which performance management is different from business enterprises is that businesses have agreed-upon financial metrics, such as profits and revenues, or share prices and market capitalization, which anticipate the value of the firm. Nonprofits, on the other hand, do not have the same degree of agreement and metrics to evaluate their value. As a result, performance management can be more challenging for them (Hanna, 2011).

4. Research Questions

4.1. Project Goal and Objectives

For this project, the main goal was to assist Way Finders in creating a performance management system that monitors the performance of the four key success indicators in the four lines of business (HOME, HSS, RA, CB&E) listed above. It can be extended further to the remaining success indicators and lines of business in the future.

This goal was further broken down into two objectives:

1. Organize and analyze data from existing systems so that it can be used efficiently for reporting of metrics related to Way Finders main Success Indicators.
2. Gather and analyze customer satisfaction data by conducting focus group studies.

4.2. Research Questions

Once the success indicators had been determined, the team met with all the lines of business to understand how they currently measure these indicators and the data sources they use to collect and analyze data. Based on this information, the team decided to focus on 4 lines of business for this project: HSS, RA, HOME and CB&E. This decision was made because these lines of business worked closely with the selected success indicators and had volumes of useful data to create processes that could then be replicated for all other lines of business. Below are the research questions that were identified to address each of the four key performance indicators:

1. Is Way Finders helping clients improve housing stability in the areas they serve?
2. Is Way Finders helping improve financial security of clients through the services they offer?
3. Is Way Finders encouraging residents in target communities to collaborate and work together towards community change and revitalization?
4. Are customers satisfied with the services provided by Way Finders?

The research design process is summarized in Figure 2 below.

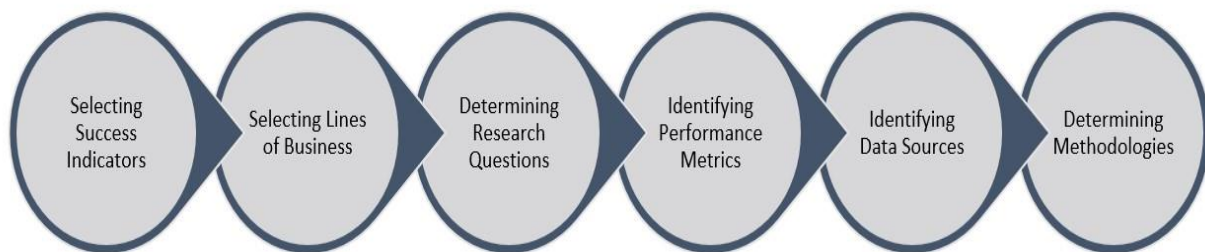


Figure 2. Research Design Process

5. Methodology

Related performance metrics were identified for each of the proposed research questions and the relevant datasets were selected for analysis.

Figure 3 depicts the performance metrics and data sources that were selected for each research question.

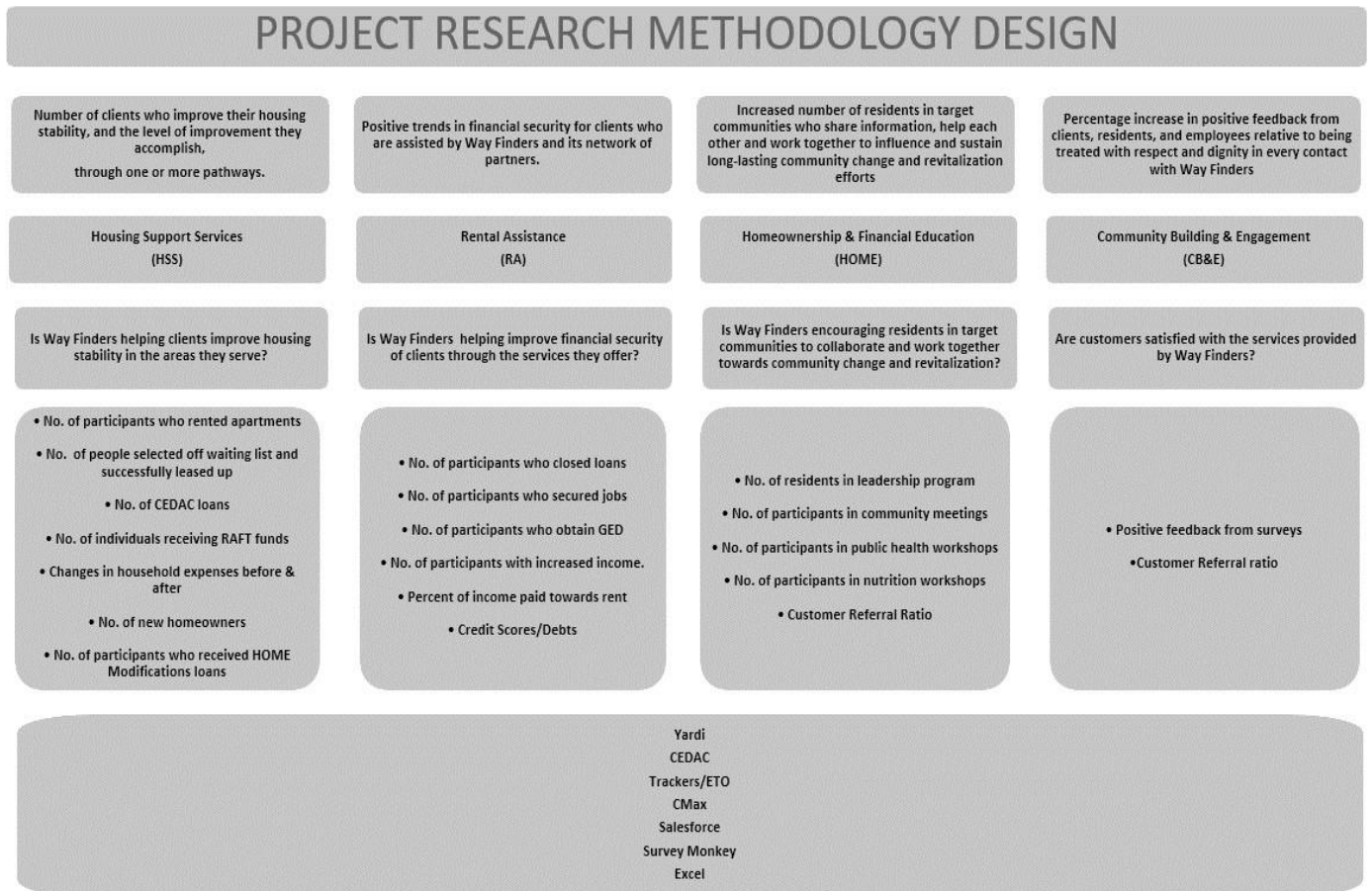


Figure 3. Selection of metrics and data sources based on research questions

5.1. Archival Research

Once the performance metrics and relevant datasets had been agreed upon, the next step was identifying the methods that would be used for data collection. The team chose archival data research as the primary method for data collection from the existing data sources. Archival research is a method of collecting data from sources that already exist. Way Finders has approximately 28 different data bases that store large volumes of data related to customers and the services that they provide. For this project, it was determined that data from six of the existing data sources would be analyzed: Yardi, CMax, CEDAC, Trackers/ETO, Salesforce and Survey Monkey. In addition to this, data from manually created Excel sheets would also be reviewed and analyzed for information related to CB&E workshop attendance.

A series of actionable deliverables was then proposed. These deliverables would use data from these sources to create processes that would make it easier to organize and analyze data.

This would be done primarily using Excel VBA and an Access database. Excel VBA scripts would be used to automate the data integration process and create single sources of data from the multiple existing excel sheets that Way Finders uses to track data. The Access database would be created using data from CB&E events and would be used to track participants and their attendance at the various workshops conducted by Way Finders. Since this is currently done manually for each event, the database would provide a single unified view of all events and participants, making it easier to track and analyze this data for visualization and reporting purposes.

5.2. Observation

Observation is defined as the method of viewing and recording the actions and behaviors of participants. There is no experiment conducted and no variables are manipulated. The observations are made without disturbing, influencing or altering the environment or the participants in any way. We proposed the observation method in addition to archival research to understand how users at Way Finders gather and use data from the multiple data sources on a daily basis. Although the method was selected for several lines of business including HOME, HSS, RA, CB&E, the plan was to observe how the Way Finders IT team accessed and managed data related to the various metrics for these lines of business.

It was also proposed that observation would be used as a method to understand the current use of Salesforce and the possibility of its integration with Tableau. Since Way Finders is in the process of migrating all their business process to Salesforce, the team identified that this would be a critical process to establish for the organization. HOME has currently moved to Salesforce. Hence, we had initially planned to observe how this line of business used Salesforce to input and extract data for reporting or other purposes. The processes laid out for HOME could then be replicated for other lines of business in future projects.

5.3. Focus Groups

In order to gather information related to customer satisfaction, the team planned to incorporate focus group studies in the project. A focus group or focus interview is commonly defined as a method of collecting research data through moderated group discussion based on the participants' perceptions and experience of a topic decided by the researcher (Carlsen, 2011). In any research report, transparency and accountability are the key elements. Focus groups assess the quality and relevance of the study. The focus group was designed for two lines of business of Way Finders: Home Ownership & Financial Education, and Community Building & Engagement.

These two lines of businesses have conducted focus group studies in the past, and had similar initiatives lined up in the near future. We decided this could be used as an opportunity to build on existing platforms and Way Finders could integrate the focus group questions from this project into their existing initiatives. Furthermore, these two lines aligned with other research objectives and other research methods.

We planned to recruit 6-8 participants for each focus group. According to research, the adequate number of participants in a focus group should be a minimum of 4 and maximum of 12 (Carlsen, 2011). We believed 6 to 8 was a good number for this study because if the group size is too small, we might not get enough information, and a larger group size will be harder to manage. However, since we had time constraints, we only designed the study along with the questions so that either Way Finders or the next student team from WPI working on this project can conduct the study. For the list of questions, please refer to Appendix A.

Through this study, we expected to explore customers'/potential customers' subjective experience and attitude towards Way Finders' services. The result of this survey will also allow the organization to prepare surveys and trial studies in the future.

6. Recommendations

Based on our experience while working on this project, the team has come up with a set of recommendations that could help Way Finders create efficient data tracking systems that can be used to measure and manage performance and transform into a data driven organization.

6.1. Aligning Strategic Objectives with Initiatives

The strategy map is a visual framework of the cause and-effect relationships among the components of an organization's strategy, and it is used to integrate the four perspectives of a BSC — financial, customer, internal, and learning and growth (Kaplan & Norton, 2004). Although the generic, commonly used version of the strategy map places the financial objectives at the top of the structure, for Way Finders, we believe the customer related objectives should appear at the top.

Based on our understanding and using the data provided, the WPI team has created an initial version of the Strategy Map for Way Finders (Appendix B). For each of the perspectives we have listed the strategic objectives, measures and targets used to track performance, and the initiatives undertaken to achieve these targets. The strategy map is a simple, yet powerful tool that can be used to help employees understand what the company is trying to accomplish and how their actions can contribute to the organization's mission. It can also help identify areas that are lacking initiatives to help support the identified goals of the organization.

Way Finders has a well-defined strategic plan that lays out the organization's main goals and objectives. The strategy map highlights the metrics that can be used to track the company's progress in achieving each of these goals. The initiatives state the actions that have been taken towards achieving these goals. Using this map, Way Finders can focus their attention on areas that are underperforming by not meeting the defined targets, identify areas that need additional initiatives and, as a result, trigger improved performance within the organization.

6.2. Data Management

Once the strategic objectives and initiatives have been identified, the next step is focusing on the data required to measure performance against these objectives. This means identifying the questions that need to be answered in order to achieve these goals. For the four success indicators included in this project, the team has already identified the research questions that need to be answered. Similar questions need to be identified for the rest of the success indicators. Identifying the research questions helps hone in on the data that is then required to answer these questions. Once the required data has been collected and datasets have been identified, it is necessary to make sure they are properly managed so that they are easy to use for reporting and analysis. While the multiple sources of data at Way Finders serves as an added advantage, in the sense it provides access to a wide variety of readily available data that can be used for reporting and analysis, it also makes the data management process more complex.

Data management is the practice of organizing and maintaining data processes to meet ongoing information lifecycle needs (Enterprise records management strategy guide). Way Finders currently has around 28 data sources that are used by the different lines of business to store and track data. In addition to these databases, several lines of business also use Excel to collect and store data. While this means they have large volumes of useful data, it also makes the process of integrating related data spread across multiple sources more challenging. The move to Salesforce will help resolve most issues related to data integration.¹ In the interim, a few simple methods could be used to integrated related data from these sources.

One of the quickest ways that the WPI team has identified to do this is using VBA Macros. While there are more advanced tools available in the market for data integration there are two major reason why the team has proposed using Excel VBA for Way Finders data integration:

- 1) Familiarity with Microsoft applications: Since Way Finders is already using Excel and other Microsoft applications, VBA will be easier to implement without disrupting any existing processes.
- 2) Migration to Salesforce: Way Finders is in the process of migrating to Salesforce and since the way they collect and store data is soon changing, VBA will serve as an interim solution and requires minimum investment with respect to time and money.

VBA macros are simple and easy to implement once data points have been identified. They can be used to develop integrated, automated solutions within Excel and can be integrated with other Microsoft applications, like MS Access.

Microsoft Access is another application that would help manage data more efficiently. MS Access is a better choice for storing data that needs to be tracked and recorded on a regular basis. For Way Finders, migrating from Excel to Access would involve:

- 1) Identifying areas that use Excel as the primary source for data collection.
- 2) Determining how much historical data needs to be stored in the databases and prioritizing the order in which the datasets need to be migrated.
- 3) Making sure individual data sheets are in the same format.
- 4) Exporting data into Access; while this can be done using the Access import feature, the more efficient way to do this would be through the use of VBA to automate the entire process.

¹ Data Integration refers to the process of combining data from multiple sources so that it is easy to use for analysis and reporting.

- Deciding on best way to input new data into the database. This is further discussed in the next section.

For the scope of this project, CB&E data was used to create a prototype of an Access database to track participation at workshops and events. Once this has been converted into a fully functional database, similar procedures can be carried out for other lines of business.

6.3. Data Entry

Excel and Access both have an inbuilt form feature that allows these applications to be used as a front end for data entry.

Way Finders is in the process of migrating to Salesforce and ideally, this would make the process of data entry simpler and more efficient. In the interim, the organization can optimize the data entry process by using simple forms that can be easily designed in Excel or Access. A data form provides a convenient way to enter or display data. Using forms helps maintain the integrity of the data as the file size grows.

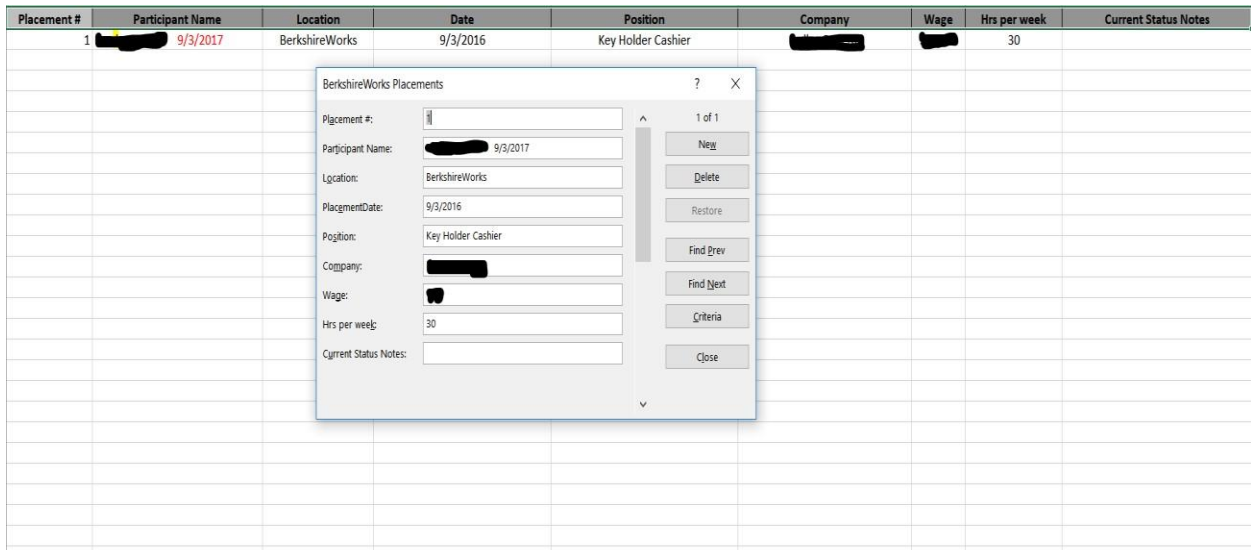


Figure 4. MS Access input forms

6.4 Tableau Integration

Tableau is a powerful Business Intelligence tool that can be used to create interactive data visualizations. In addition to being easy to use, one of the big advantages of Tableau is that it allows integrations with many third-party applications, including Salesforce.

Since Way Finders is soon migrating to Salesforce, this feature would be especially useful for them and eliminate the need for managing or maintaining any additional data sheets.

6.5 Critical Success Factors for Data-driven Analysis

There are a number of factors that play a key role in the success and repeatability of an actionable, data driven performance measurement system. Way Finders has experienced firsthand the effectiveness of data visualization and seen the benefits of being able to make quick decisions driven by data. In order to make these wins more frequent the organization needs to focus on what are critical success factors for any data analytics system.

1. Goals must be Specific, Measurable, Attainable, Realistic, and Time-bound. Way Finders has a well-defined strategic plan and goals. Breaking down these larger goals, into smaller S.M.A.R.T goals would bring structure and traceability to the goals and objectives and set clearly measurable milestones for the organization.
2. Way Finders has large volumes of data stored across multiple sources.
3. In order to use this data to their advantage, it is necessary that they have the right resources and skills to convert this data into meaningful performance metrics. This is best accomplished when a dedicated data analyst can set up processes to render access and analysis of existing data and recommend additional data collection.
4. This technical knowledge should be combined with organizational knowledge to identify how data might be most helpful and where it can be obtained.
5. To execute a successful data management system, organization's need data-oriented knowledge and skills among staff. This helps develop data-centric processes. Data centric processes view data as an important part of the process and not just the output of the process. The data created from such processes is of higher quality and easier to analyze.
6. Business alignment is the understanding of the business purpose for the activity and assessment and recognition of the value that the activity provides to the organization (O'Neal, 2016). In order to succeed, Way Finders needs to ensure that each line of business supports its data analytics efforts and understands the value added to the organization through these efforts.

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Appendices

Appendix A

Focus Group Questions

Project Way Finders Worcester Polytechnic Institute Focus Group Questions

Introduction:

1. Welcome
 - Introduction of the moderator (and assistant, if any)
2. Overview of topic and the purpose of the study
 - The results will be used for...
3. Rules or guidelines
 - No right or wrong answers, only differing points of view
 - If the discussion is being tape recorded, let the customers know
 - You don't need to agree with others, but you must listen respectfully as others share their views
 - Rules for cellular phones and pagers if applicable
 - For example, we ask that your turn off your phones or pagers. If you cannot and if you must respond to a call, please do so as quietly as possible and rejoin us as quickly as you can - Talk to each other

Home Ownership & Financial Education Engagement

Questions:

1. How did you hear about Way Finders?
2. Have you attended any workshops or events organized by Way Finders in the past?
 - Which ones? How did that come about? What was your impression?

Exploration Questions:

3. Do you feel as if you have a better understanding behind housing financials? - If no, why?
 - How is Way Finders helping in providing a better understanding?
4. Do you feel more secure in your housing situation after utilizing services by Way Finders? - How or why?
 - If they don't feel as if they are being helped, even if they are, then Way Finders needs to change something
5. What was your view of Way Finders before and after they entered your community? - Did your opinion change? How/why?
(This can help Way Finders address issues with their image in new communities)
6. Over all, are you happy/satisfied with Way Finders' services? - If no, how do you think they can improve?

Exit Question(s):

7. How do you think Way Finders can improve their quality of service? - Any suggestions? (from an external perspective)
8. Is there anything else you want to add about Way Finders and the services they are providing? - Any suggestions?

Community Building & Engagement

Engagement Questions: (These can be the same as HOME, since the point of these questions is increase the comfort level of the participants)

1. How did you hear about Way Finders?
2. Have you attended any workshops or events organized by Way Finders in the past? - Which ones? How did that come about? What was your impression?

Exploration Questions:




3. How do you think Way Finders is contributing to your community? (Do the answers match with Way Finders' goals?)
4. Can you recall any particular act by Way Finders that you think has impacted/influenced your community the most?
5. Do you think Way Finders involve the residents or customers too in community building and engagement?
 - If yes, how?
 - If no, how do you think you can add to your community?
6. Do you feel safer in your community?
(Goal for this line of business is to improve safety within community)
7. What was your view of Way Finders before and after they entered your community? - Did your opinion change? How/why?
(This can help Way Finders address issues with their image in new communities)
8. Over all, are you happy/satisfied with Way Finders' services? - If no, how do you think they can improve?


Exit Question(s):

9. How do you think Way Finders can improve their quality of service?
 - Any suggestions? (from an external perspective)
10. Is there anything else you want to add about Way Finders and the services they are providing?

Way Finders Strategy Map Draft

Way Finders Mission: <i>Way Finders lights pathways and opens doors to homes and communities where people thrive.</i>			
Theme	Objective	Measurement	Target
Customer	<p>Help clients access geographically diverse affordable housing choices and resources, and achieve greater housing and financial stability.</p>	<p>Number of clients who improve their housing stability, and the level of improvement, through one or more pathways:</p> <ul style="list-style-type: none"> Move to better quality housing that is affordable, and/or Reduced housing cost burden, and/or Move to communities of opportunity with increased options for jobs, education opportunities, or access to community resources. 	<p>Residential Assistance for Families in Transition (RAFT)</p> <ul style="list-style-type: none"> Shelter Diversion Financial Education Workshop Workforce Development Programs First Time Home Buyers Workshop Foreclosure prevention Secure Jobs Initiative SNAP Employment & Training Healthy Hill Initiative Resident Leader Program Holyoke Action Plan Move-In Resident surveys HSS Housing Center Front Door Satisfaction Survey
	<p>Improve lives with comprehensive, long-lasting change initiatives that revitalize communities</p>	<p>Positive trends in financial security for clients who are assisted by Way Finders and its network of partners, as evidenced by such changes as:</p> <ul style="list-style-type: none"> Improvement in housing stability (see #1) Achievement of a GED or high school diploma and/or other education or job training goals Securing employment with an above-minimum wage that offers greater future earning potential Improvement in credit scores <p>Increased number of residents in target communities, who share information, help each other and work together to influence and sustain long-lasting community change and revitalization efforts.</p> <p>Percentage increase in positive feedback from clients, residents, and employees relative to being treated with respect and dignity in every contact with Way Finders.</p> <p>Increased number and variety of affordable and mixed-income, geographically diverse housing opportunities created and managed by Way Finders and/or its collaborators and partners.</p>	<p>Design and implementation of mobile and Internet-based applications</p>

Way Finders Mission: <i>Way Finders lights pathways and opens doors to homes and communities where people thrive.</i>			
Theme	Objective	Measurement	Target
Stakeholder   	<p>Engage diverse partners and collaborators in exceptional service delivery to increase collective impact while serving the missions of partner organizations meeting the needs of the entire region.</p> <p>Influence the region's leaders to embrace affordable housing as an asset to the region's economy, especially when coupled with supportive services for residents.</p>	<p>Improve client services with enhancements in technology, staff training, and leadership development.</p> <p>Increased connections with partners and collaborators advancing the Way Finders mission and the respective missions of its partners.</p> <p>Percentage growth in financial resources that result from and support activities with collaborative partners.</p> <p>Increased number and variety of affordable and mixed-income, geographically diverse housing opportunities created and managed by Way Finders and/or its collaborators and partners.</p> <p>Percentage growth in discretionary financial resources.</p>	<p>Initiative</p> <ul style="list-style-type: none"> • Six Corners engagement • Meet the Leaders • New partnerships with Northampton Community Legal Aid • Behavioral Health Network and Project Fit • Mental Health Association's Tenancy Preservation program • MA Department of Higher Ed (health care job pipeline) • Department of Transitional Assistance (DTA) • MA Workforce Board • Western MA Network to End Homeless' (WMNEH) Homeless Family Resource Fair.

Way Finders Mission: <i>Way Finders lights pathways and opens doors to homes and communities where people thrive.</i>			
Theme	Objective	Measurement	Initiative
<p>Internal</p> 	<p>Strengthen and sustain satisfaction of clients, partners, and employees by applying model practices to business and organization administration, customer service, collaboration, and staff recruitment and retention.</p> <p>Protect the natural environment with sustainable design principles that include integration of environmentally-friendly materials and energy efficiency measures in housing development, community plans, and Way Finders business operations.</p> <p>Cultivate an asset-oriented, positive organizational culture through which clients are partners, encouraged and empowered to impact their own outcomes, with shared responsibility for the results.</p> <p>Increase organizational agility and ability to achieve its mission, utilizing discretionary financial resources from social enterprise and philanthropic support.</p>	<p>Increased net income over expense, contributing to Way Finders' financial bottom line.</p> <p>Increased financial value of investments in energy-efficient, "green" or environmentally friendly measures.</p> <p>Satisfactory or higher ratings for program performance, regulatory compliance, and/or meeting key indicators.</p> <p>Progress implementing the multiple strategies of the strategic plan.</p> <p>Percentage growth in discretionary financial resources.</p>	<ul style="list-style-type: none"> Customer Facing Technology (CFT) development