Data Analytics Plan

1）What is the business problem you are trying to solve?

1）What's the first step you'll take?

3）What is your approach to developing a Hypothesis? (Include your Hypothesis)

4）What data would you collect?

5）How would you analyze the data?

6）How would you present the information to the client?

7）What insights did you develop?

8）What recommendations would you make?

1）What is the business problem you are trying to solve?

To know whether Watershed Properties company should expand into the short-term rental market. Watershed is a residential property management company that manages thousands of properties in more than 60 different communities across the United States.

2）What's the first step you'll take?

To do elicitation interviews. This aims to get a more complete picture of the scope of watershed projects and what factors may need to be considered in the analysis.

3）What is your approach to developing a Hypothesis? (Include your Hypothesis)

Approach:

1. Securing the proper stakeholders

2.Brainstorming

3.Document analysis

4.Focus Group

5.Interface Analysis

6.Interviews

7.Observation (job shadowing)

8.Prototyping

9.Requirements workshops

10.Survey/questionnaire

Hypothesis:

1. There are **244 properties** owned by one client, and the **long-term rental occupancy rate** is **97.3%** (or 36/37 months).

2. The **initial capital** required to convert a long-term rental property to a short-term rental property is **$30,000** (for furnishings, linens, etc.).

3. **The depreciate year** of the capital expenditure will over **5 years**.

4. **$6000 in cash** will be needed for each property each year **after the first (conversion) year** to cover items that wear out quickly. This amount is treated as an expense and is not depreciated.

5. **Utilities** will be **$300 a month** for each property, or $3600 a year.

6. **The hospitality fee** (variable cost) for each visit　(for key service, cleaning, etc.) will be **$100**, regardless of the actual number of days of a visit.

7.**The average short-term stay** is **3 nights.**

8. All the properties have **the same capital expenditure and fixed costs.**

9. **The rental fee is 10%**, which should be budgeted for potential regulatory and legal fees.

10. **The transaction fee is 20%,** which should be budgeted for the online short-term rental provider (like Airbnb).

11. All clients **pay their rent on time**.

The ignorance of the impact of any:

1.**Weekly or seasonal changes in rent or occupancy rate.**

2.**Marketing strategies,** like discounts or coupons**.**

3.**Special events** during the year that might affect the rentals in one specific location.

4. **The loss in rent during the time interval** when properties are being converted to short-term rental properties.

4）What data would you collect?

All of the available information about Watershed's client's **244 properties**, as well as the corresponding **short-term rental information** for comparable properties in the same location and of the same type.From the capstone database:

1. The current **monthly rent Watershed charges** for all of their client's 244 properties, as well as the **property type and geographic location** of those properties.

2.Some **general information about examples of short-term rental properties**. This information can be used to get a sense of what kind of nightly rental price Watershed's client's properties could be listed for if they were converted to short-term rentals.

3.**Records about when those short-term rental properties were rented out** so that we can calculate their occupancy rates.

5）How would you analyze the data?

1.Retrieve the Data

Determine how the database is organized so that I can retrieve all of the needed and available information through Jupyter. Then, write queries to retrieve the desired data from the database.

2.**Visualize** the data to make sure I know what they are through Tableau.

3.Modeling

First, creating a predictive model – using a best-fit line on historical data for properties comparable to Watershed's – that relates nightly rents to forecast occupancy rates.

Second, using the predictive model created, along with the MS Excel "Solver" optimization tool, to find, for each property separately, the nightly rent that maximizes its forecast total revenues – the product of the optimum nightly rent and its associated occupancy rate.

4.Normalization

Applying Normalization to the comparable properties to create an effective linear model (best-fit line) that shows the strong relationship between normalized,

percentile rent and occupancy rates for short-term rental properties comparable in type and location to Watershed's properties.

5.**Optimization**

To use the excel Solver function to find the optimal rents for some specific Watershed properties.

6.**Financial Modelling**

Use excel to build up the forecasting **cash flow** and **profit** table to evaluate the overall merits of Watershed.

7. **Risk**

Take the **sensitivity analysis** through changing assumptions in excel, such as measuring cutoffs at a 40% transaction fee to consider how robust the model is – in other words, do small to medium changes in assumptions have a large impact on the overall profitability of the business opportunity?

8.Using **Tableau** for analyzing

6) How would you present the information to the client?

1.Building a **Tableau dashboard**.

2.Provide the **white paper** with details.

3.Prepare a **powerpoint presentation** to perform data analyses.

7) What insights did you develop?

Elicitation interview is very important，which might help understand the project behind the data. And you should always remember the audience and purpose of analyzing.

8) What recommendations would you make?

Be careful about the data, including the definition and the definition of the statistical caliber of data.