

Recommendation Monkey

Bill.com

Team Name: Inspector Royale

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Company: Bill.com

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Problem and Importance:

There is currently no widespread method for analyzing smaller industries of a business archetype for investing purposes, but they do exist for larger businesses. Using Bayesian statistics and research data our project can offer a quantitatively and qualitatively supported recommendation to a business user.

Present Implementations:

- Salesforce: business owners can manually enter their transaction data into a paid, cloud-based application so they can easily view analytical details and generate reports.
- HubSpot: free, dashboard style hub for tracking and managing customer data.

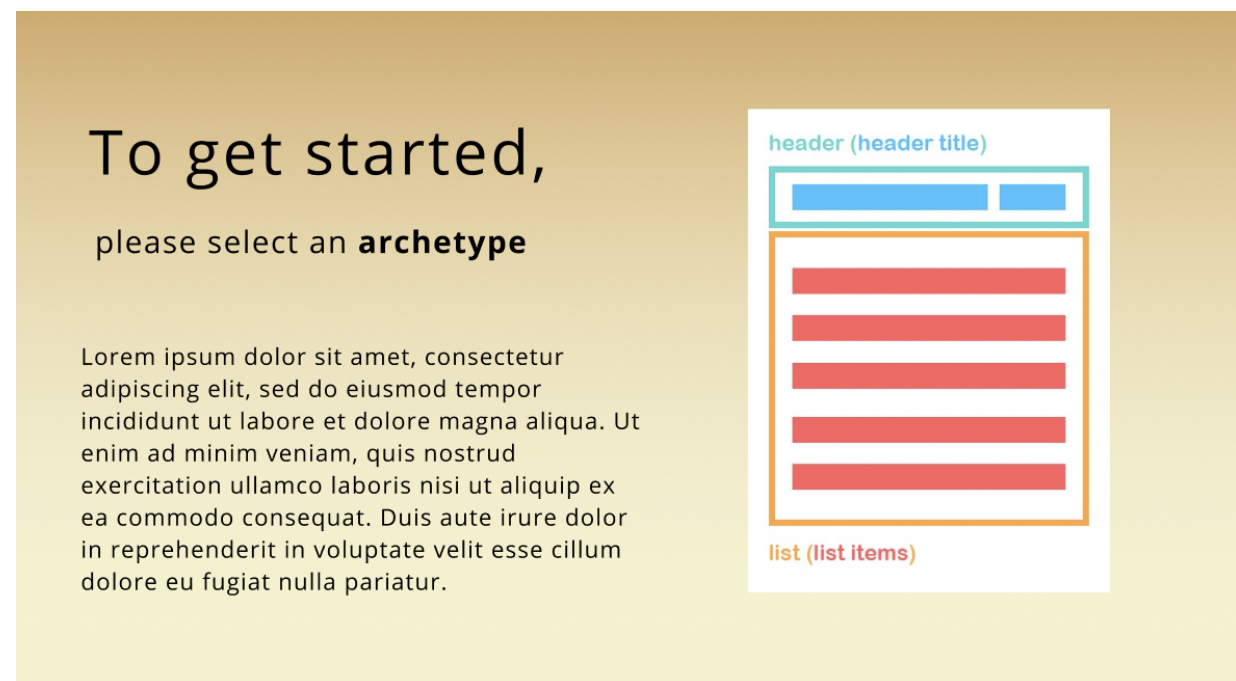
Objectives:

Deliver recommendations telling a business user whether or not they should invest time and resources into a specific set of industries and entities for a given business archetype. Provide mathematical explainability supporting the recommendations.

Identify top three quantified attributes/features derived from the customer financial data relative to industry supplied that supports or refutes investing more BDC time and money into the industry.

System Architecture:

UI Design:



The image shows a UI design mockup on a light beige background. On the left, there is a large heading "To get started," followed by the text "please select an **archetype**". Below this is a paragraph of Lorem Ipsum text. On the right, there is a white rectangular box representing a UI component. At the top of this box is a blue header bar with the text "header (header title)". Below the header is a list of five red horizontal bars, representing list items. The text "list (list items)" is positioned at the bottom of the box.

To get started,
please select an **archetype**

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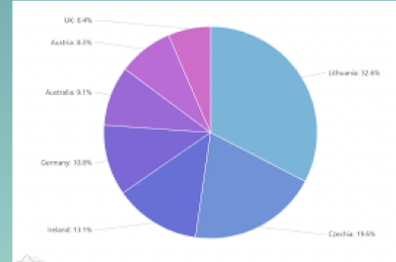
header (header title)

list (list items)



TAM by Archetype

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GET A REPORT

Please select the

number of industries within
the archetype `archetype_name`

Feature	Explanation
Yield	Amount of grain per unit of land
check yield	Commercial variety's yield used as performance
yield difference	Difference between yield and check yield
Year	Year in which the variety was planted
planting date	Planting date
geographic coordinates	GPS latitude and longitude of the farm or plot
temperature	Sum of daily temperatures in $^{\circ}C$ in growing period
precipitation	Sum of daily precipitations in mm in growing period
solar radiation	Sum of daily solar radiation in W/m^2 in growing period
CEC	Cation exchange capacity
pH	log of H^+ concentration in soil
organic matter	Percentage of soil made up of organic matter
Soil class	Soil class category
Clay	Percentage of clay in soil
Silt	Percentage of silt in soil
Sand	Percentage of sand in soil
Area	Probability of growing soybeans in the study area
PI	Soil productivity index

Features in the Experiment dataset are listed in the left column, while their explanations are listed in the right column.

[10.1371/journal.pone.0184198.t001](https://doi.org/10.1371/journal.pone.0184198.t001)

User Stories

1. **As a business user, I want to select a business archetype so I can see a list of industries in that archetype.**

Acceptance Criteria: I should be able to click on the "archetype" button to be presented with a menu listing all business archetypes, that will display a sub-menu containing the archetype's industries upon mousing it.

Github Issue: <https://github.com/DerpDerek/InspectorRoyale/issues/1>

2. **As a business user, I want to select any number of industries in an archetype so I can see statistics for those industries.**

Acceptance Criteria: I should be able to check any boxes in the industries sub-menu and receive graphs of statistical analysis.

Github Issue: <https://github.com/DerpDerek/InspectorRoyale/issues/2>

3. **As a developer, I want to be able to view a mock database so that I can practice querying databases and work with data for statistical analysis.**

Acceptance Criteria: Developers are given a MOCK.db SQLite file that is openable via DB browser and will have 6000 randomized rows of data in the same format the real database will assume.

Github Issue: <https://github.com/DerpDerek/InspectorRoyale/issues/9>

4. **As a developer, I want to be able to view Bill.com data via DB browser on a SQLite server so I can access historical financial data.**

Acceptance Criteria: Developers are given a SQLite database file that will contain a very high volume of historical financial data when opened in DB browser.

Github Issue: <https://github.com/DerpDerek/InspectorRoyale/issues/10>

5. **As a developer, I want to be able to view a sub-table that contains a subset of data from the main table.**

Acceptance Criteria: Developers are given a different version of the Bill.com database file that contains a much smaller table of data based on the dimension requested.

Github Issue: <https://github.com/DerpDerek/InspectorRoyale/issues/11>

6. **As a business user, I want to zoom in on graphs to see individual data points and associated labels.**

Acceptance Criteria: Using conventional zoom keys I should be able to interact with a graph API that will allow me to view finer detail.

Github Issue: <https://github.com/DerpDerek/InspectorRoyale/issues/3>

7. **As a business user, I can select a single business archetype to display a graph showing all industries that are increasing at an increasing rate.**

Acceptance Criteria: Having only one archetype selected at a time will give me the option to generate a graph showing all industries with a positive second derivative.

Github Issue: <https://github.com/DerpDerek/InspectorRoyale/issues/4>

8. **As a business user, I can input a threshold percentage for the second derivative graph that will automatically update it to only include industries with a second derivative greater than or equal to the given threshold.**

Acceptance Criteria: Upon generation of a second derivative graph there is an input bar for me to enter a threshold percentage that on typing will update the graph real time to only include pertinent industries.

Github Issue: <https://github.com/DepDerek/InspectorRoyale/issues/5>

9. **As a business user, I want to generate a simple summary TAM report so I can visually see how many customers I currently have in a specific industry compared to the entire industry.**

Acceptance Criteria: I can select the “Simple” option for the “Generate Report” button to generate a TAM report that will display data about the industries selected in the industry drop down menu.

Github Issue: <https://github.com/DepDerek/InspectorRoyale/issues/6>

10. **As a business user, I want to generate an advanced summary TAM report so I can visually see data about specific customers.**

Acceptance Criteria: I can select the “Advanced” option for the “Generate Report” button to generate a TAM report that will display data only about customers tagged “advanced”.

Github Issue: <https://github.com/DepDerek/InspectorRoyale/issues/7>

Technologies

- Jupyter Notebook
- Python
- SQLite
- DB browser