Class Project

CSDA 1030 – Data Organization for Analysis

Assigned During Week 2

Proposal is due prior to start of Week 4

Presentation is due during the class of Week 8

Final Report is due by end of Week 8

Project Objectives and Scope

The purpose of the class project is to review and analyse a business scenario and identify a set of analytic workloads that will address the business needs described in the scenario. The workloads will describe value, decisions, analytic use cases and data requirement needed to support the ownership improve their decision making and goal attainment.

Project teams will be formed in the class and you will develop requirements for data provisioning architecture options that support each of the analytic workloads you identify. Consider your project team as a consulting firm working with the client from the scenario.

You will use value chain analysis to discover data sets needed to support the types of decisions required from the scenario.

After the analysis has identified some useful data sets you will characterise the data sets in terms of properties such as structure, sparsity, format, quality and security. This information will be used to define and recommend appropriate styles of data storage and data provisioning that results in a proposed provisioning architecture.

A key learning objective is to recognize how to identify and characterise different analytic workload opportunities from a potentially vague business scenario. To add detail and to clarify issues, please feel free to make and document assumptions. Assumptions are part of the real world. They replace information that is not readily available. However assumptions must be documented and validated.

It is expected that 9 analytic workloads will be identified that span the following decision categories.

Strategic Decisions

- Supports the overall objectives for the company
- Strategic value is an increase or decrease in something the company desires
    - e.g Increase in sales, decrease in cost, increase in revenue, increase in capacity, etc

Tactical Decisions

- Supports the planning and acquisition of resources needed to support the strategic objectives
- Tactical value is described as the availability of sufficient resources needed to support the strategy
    - Eg. Leasing space, hiring staff, obtaining investment, acquiring equipment, purchasing supplies, etc.

Operational Decisions

- Supports the work carried out that depends on the available resources. Operational decisions determine how best to utilise the available resources obtained from the tactical decisions.
- Operational value is described in terms of efficiency, timeliness, utilisation, quality, security, responsiveness, etc
    - Eg. Reliability of delivery, quality of products, customer satisfaction, cost of products, etc.

Project Deliverables

It is recommended that 3 workloads be selected from each of these decision levels based on the growth objectives in the scenario.

Consider different types of analytic styles discussed in the class that can help support the value chains. Predictive, prescriptive, diagnostic and descriptive analytics work together to generate different insights all in support of a given decision.

Your value chain analysis should be specific in terms of what types of insights need to be generated that support the types of decisions needed to achieve the value in question. This allows data sets to be identified, analysed and profiled.

After the workloads are identified and characterised using value chain analysis, data requirements for each of these workloads will be defined. Categories of data requirements will be discussed in the class and can be also be referenced in the "Manager's Guide to Data Warehousing" course text book.

Data provisioning solution architectures will be proposed to address the needs of <u>each of the 9 analytic workloads and their data sets.</u>

After you develop data provisioning architectural solutions that support each of the 9 individual workloads, prepare a final recommendation that is a generalised solution that best supports all of the required workloads.

Project Proposal

Your team will create a project proposal that is due on the last day of week 3. During the project you will create a final report that describes your analysis and recommendation. The highlights of your work will be presented to the overall class during the week 8 class. The proposal should include your understanding of the project, your recommended approach, your work plan and how your team members will

participate. The proposal should provide confidence to your client that you understand the problem and have the resources and management experience necessary to complete the work successfully.

The proposal is a critical document because it shows how your work is planned and scheduled. Be careful not to actually do the work of the project in the proposal. The proposal should describe "how" and "when" the activities will be carried out and who will carry them out.

Project Scenario

The owners of a successful pizza restaurant located in a neighborhood of a large city want to generate growth in their business. They are planning to develop and launch additional pizza restaurants in the suburban areas of their city.

The owners recognize the competitive nature of the pizza restaurant business and they are working to define a business model that will differentiate their business and serve as a growth platform.

The current business model includes the following service options.

- Customer take-out
- Home delivery
- Dine-in at their current restaurant

They draw customers based on word of mouth for the "quality" and "flavor" of their offerings. The current menu includes pizza and salads. Diversifying the menu is being discussed. The restaurant also serves alcoholic and non-alcoholic beverages.

As the expansion for business growth is being planned, the owners are considering a variety of ideas to be competitive and to differentiate themselves with a new set of customers.

The owners have also made a fundamental decision about how to proceed in their growth initiative. They want to make as many decisions as possible using data-driven analysis.

Their strategy for driving growth includes the following ideas.

1. Select preferred locations for new restaurants. The intent is to acquire a lease on an existing facility and renovate it according to their customer experience criteria. They are considering opening 1 new restaurant this year followed by 2 new restaurants the following year.
2. Become more efficient in the lifecycle handling of all food and beverage ingredients leading to lower cost
3. Target an upscale market in the suburbs with gourmet pizza and additional menu items and charge a premium price

4. Provide daily ``Themed Offerings`` based on social media monitoring similar to how music playlists are created.
5. Offer nutritional advice to customers during the ordering process to help them create a healthy gourmet choice based on new smart phone applications.
6. Create a community of Pizza Lovers who also value nutrition, lifestyle and physical activity to help them manage their orders
7. React to changing flavors and tastes by regularly adding novel types of ingredients
8. Provide a loyalty program with discounts that obtain demographic customer information
9. Provide an online ordering and delivery system based on a defined preference profile that may lead to automated order placement.

Consider the intent of the ownership team in terms of the types of decisions that must be made. Identify 9 specific objectives that the company has. This will include 3 strategic objectives, 3 tactical objectives and 3 operational objectives.

Recall that strategic objectives define business outcomes that must be accomplished as part of the new strategic initiative. Tactical objectives define desired conditions related to resource development, procurement, asset development, recruiting, skills development and relationship development. Operational objectives define conditions based on utilising available resources to execute processes, projects and assignments and to deliver services and products to customers.

Discover New Data Sets

Each team is expected to research and find 6 existing data sets available in the open data community that would be useful to the project scenario. These data sets would initially be identified from your value chain analysis. Your project team is expected to analyse each of these data sets in terms of structure, format, size, quality, metadata, security, sparsity and any other relevant criteria. You will document your analysis to justify your recommended data architecture.

Assumed Existing Data Sets

Assume the following data sets exist in a tabular structure either in spreadsheets or internal relational data bases

1. Financial Information Data – 8 years
2. Staff hiring and performance data – 8 years
3. Supplier performance data – 8 years
4. Energy use data – 8 years
5. Customer satisfaction data – 8 years
6. Safety data – 8 years
7. Marketing and Promotions data – 8 years
8. Health inspection data – 8 years
9. Inventory management data – 8 years
10. Menu items data – 8 years

11. Customer order data – 8 years
12. Customer delivery data – 8 years

Sample Data Characteristics Template

Data Set Name	Description	Source	Structure	Format	Sparsity	Size	Estimated Quality

Proposal, Presentation and Final Report

Assume you are a consulting team that was hired to analyse the business scenario and make recommendations for a new Data Provisioning Architecture that will support your client's growth objectives as described in the scenario.

You will present your analysis and recommendations to the class in a power point format on week 8 of the class. The presentation should be limited to approximately 20 minutes and should be an executive summary of your work. The detailed aspects of your work will be described in your final report. Your final report will submitted in powerpoint format by the end of week 8.