

Quawan Smith – IST659 Final Project Installment 1

1 Planning

1.1 Description of the Business

The business I am targeting is the cycling sales industry. Bikes are a great way to stay in top shape. And it is a sport that can be challenging to athletic professionals as well as these looking for a fun activity to get back into shape or build endurance. Small bike shops often do not concern themselves with how technology could help promote business or streamline processes. Some bike shops are so small they only consist of one or 2 bike mechanics and a sales representative. Often small bike shops do not have their full inventory online or stored in a database. Most of the business is done in person. Some shops have databases to their warehouses to determine if a bike is in stock but no sophisticated system that tracks individual parts or even a comprehensive view of past purchases. There are many online companies like Amazon that does sale cycling gear and bikes as well. But a major part of purchasing a bike is the sizing and when it comes to bikes it is not an exact science and every bike brand uses different sizing standards. So ordering a bike online can be risky if you did not test that exact make and model first. Going to a bike shop and going for a test ride is the best way to determine if it is the right fit. Some Bikes shops offer more than just the selling of different types of bikes and bike gear. Often bike shops are great rest stops for long rides. And bike shops may even offer classes on bike maintenance as well.

1.2 Business Problem

Part of why a large percentage of small bike shops may not have a sophisticated database system is that the cost of having such a system for small bike shops may be far outside the budget. But several issues come from the absence of a database system that can digitally track operations.

1. When a bike is brought in for a tune up is there a way to track its completion status or if it is behind schedule? Currently you have to call during business hours to check this.
2. If you see or find a bike that you like but that bike shop does not have the size on site they can always just check their warehouse to see if they have the size. But what if their particular warehouse does not have the size either. Maybe one of the 6 bikes shops in the area may have it? But you will have to go through this process 6 more times.
3. What if you find a bike you like but do not like the color? Or would like certain parts customized. If there were preset colors or patterns the costumer would have more choices per bike.
4. If the bike shop wanted a view of all their clients in the past year and all the services rendered for a particular customer. Did that customer come to any classes? What percentage of sales

comes from repeat customers? What category of bikes is producing the most successful sales. It is quite difficult to answer these questions without a database system.

5. Additional questions to give thought to: Is there a correlation to major cycling events and customers demand for bike services? How can this demand be better meant in a way that can generate additional revenue?

1.3 Proposed Solution

I am proposing a customized open source database system that targets small bike shops that could vastly benefit from digitalizing operations. This database will actually connect different bike shops in the area if they chose to share their inventory. Additionally it will allow bike shops to isolate portions of the business operations they do not want share like sale history. The database itself will support a variety of functions like sales reporting, event tracking, importing warehouse inventory, inventory sharing, and service & inventory tracking. Additional users will have the ability to log on to their account and track their own history. And all the bike shops using the online database would appear in the users' account. Outside the scope of the project would be the development of a frontend online interface to interact with the database. Security will be addressed but it will not be the focal point of this solution.

Each bike shop that would utilized this solution will logically have a separate database environment in which only that particular store will have access to by default. There will be a master table to track all the stores registered to use open source solution. Each bike shop will have its own group of database objects, storage, etc. But the value of this solution comes from the ability to share information that would be mutually beneficial to all bike shops that is registered to use this open source database solution. If a bike shop chooses to share their inventory with other shops in the area using this solution then a customer would know if a particular model and size is available in their area. The incentive of one bike shop directing a customer to another bike shop would be the ability for them to charge a referral fee to all the bike shops registered to use the solution. Referral fees would have the ability be tracked and adjusted. The referral fee would only be applied if that particular bike model and size is purchased at the bike shop being referred.

The focus of the project will be on creating a database that has the ability to offer inventory, customer, and service tracking. Additionally it will encompass the tracking of classes or other special events customers may be interested in. Also a table will be added that stores predefined color schemes that can be applied to all bikes within a particular category (road, hybrid, mountain, etc). Sharing of data will be driven by various views. Predefined views will be created. There will be a field to track whether these views will be open to everyone using the open source solution. The actual interpretation of this column would be an application function and the technical details of this would be outside the scope this project.

Finally several predefined reports that illustrates customer spending history and any classes that customer may have participated in. These reports will answer the question of “is there a correlation to major cycling events and customer demand for bike services? How can this demand be better meant in a way that can generate additional revenue?”

Assumptions and Constraints

The ideal database environment to use to architect this open source solution would be MySQL since it is an open source relational database. But utilizing MS SQL or any other relational database will not change the logical design. In order to be a fully usable solution careful design of the web based front end will have to be considered. I will be basing my design under the assumption that there is a separate development initiative to create a web application and/or mobile application that will use my database solution.

Since my solution is open source the online community will contribute to maintenance concerns like backup and recovery. I wanted to design a solution that would also not require bike shops to hire any in-house IT support. So using my solution is no cost to register. Storage costs will be evaluated as the bike shop database grows. Data will be stored in the cloud.

2. Analysis

2.1 Methodology

The SDLC will be utilized to implement this solution. A special emphasis will be on user feedback and understanding the business of how bike shops operate. In the Planning phase an understanding of how current operations are done will be evaluated. Multiple bike shops will be sampled. Additionally cyclist will be interviewed to understand what would make their shopping and overall interaction with bike shops more streamlined. A conceptual design will be created at this stage. The Analysis phase will focus on the mapping requirements out and matching them with the appropriate entities and relevant attributes. A significant amount of time will be spent on evaluating the logical model to confirm it incorporates all the functions the bikes shops will need to enhance their operations and cyclists’ shopping experience. The physical design will encompass the tables, tablespaces schemas, indexes, indexespaces etc. Implementation phase will include any reports specifically engineered to give information that will assist in the business decision making process. Training will be administrated via a help page on the website. There will also be a forum page on the website where questions can be posted. (Once again the actual design of the website will not be detailed in this project)

2.2 Processes Supported

The customized database environment will support several major operations of the bike shops.

1. Customer information along with purchase history and classes attended will now be stored.
2. The bike shop will have the ability to record major events. This will allow reports to be generated to determine if there are increase demand surrounding the dates of these events.

3. Service on bikes brought in can now be tracked. The mechanic can update the database on when the bike repairs are in progress and when they are completed. The user will be able to create an account and see this information.
4. The database will support the ability to store preset design patterns that can be applied to certain categories of bikes.
5. Bikes shops will be able to tracked what their referral fee is and charge it when they direct a customer to a different bike shop and the customer decide to purchase the bike or product

2.3 Key Personnel

Any employees and customers of the bike shop would be the key stakeholders of this project. The sale representatives will be updating the database with new customers and events. The bike mechanics will be updating the status of the various bikes being worked on. If that shop supports repainting frames then the mechanics will be able to use the database to determine if a particular preset color scheme is available for a particular bike. This information will also be used by the sale representatives to inform customers if their desired color can be applied to a particular bike. Customers will have the ability to track the latest status of the service they will be purchasing. The owner of the bike shop would also be identified as a key stakeholder as he or she will determine how the business will change after having a deeper level of tracking and reporting of the critical business operations.

2.4 How Work Changes

The bike mechanic will now track his or her work via the new database system. He or she will have the ability to determine how many bikes were worked on given a particular time frame. The sale representative has the ability to instantly determine what products are in stock within multiple stores in the area. The mechanic will have to have a computer or a tablet close to his or her workstation to make sure entering data in the database is not a burden. The store owners will have to determine formal ways to review monthly metrics with employees. As it stands currently there are bike shops that use Excel to track costumers. Others only use computers to print receipts and nothing beyond that.

2.5 Benefits

At the end of every year all the bike shop employees can look back and see what bikes were the most popular. This can translate into the bike shop's owner stocking up on these bikes for the next fiscal year. Also the employee can suggest an onsite classes based on the most popular type of service I.E. tune-ups, gear adjustments, and customize fittings. Since the database tracks contact information all these former customers can be engaged via email. If a particular event drew more demand during a particular time frame then perhaps it was be worth extending store hours during that time. Ultimately the information offered will lead to better a customer engagement model and have products in stock that cyclist have a high probability of purchasing.

2.6 Management Problems

Naturally there will be a high learning curve for those shops that do not currently leverage heavily a computer environment that requires employees to constantly interface with it. Basic computer concepts would be required to successfully use this solution. Employees will have to take the time to determine how to utilize all the functions before interacting with a customer to confirm that the use of the database system is not slowing down productivity. Some bike shops may be reluctant to offer their inventory to be viewed by other bike shop for fear of losing customers. But the suggested referral fee can offer another stream of revenue.

Sources

2 Bibliography

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