



PRACTICAL DATABASE CONCEPT

Group project proposal

ASSIGNMENT 1 (ISYS3414)

Tran Xuan Thao 3678450

Vo Khai Minh 3879953

Nguyen Phuong Nam 3877256

Nguyen Phuoc Thanh 3878144

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**1. Topic:**

The increasing demand of restaurant and catering service has led to the expansive engagement of food and beverage companies into the market recently. However, a report conducted by Marder (2020) shows that 46 percent of SMEs currently either do not even track their inventory or practice manual inventory management technique using stocktake forms or visually estimating .This old-school management approach might provide cost efficiency instantly for the businesses at the beginning but causes huge challenges in the long haul, which can be stated as labor and time costly due to physical stock counting, revenue loss due to stock outages or stock spoilage, and even higher space cost due to stock redundancy. According to …., an accessible and accurate inventory management tool on hand can empower the managers to boost their business performance up to 20% by increasing inventory turnover, obtain raw material at lower costs, and reduces the inventory holding cost, etc.

https://blog.capterra.com/inventory-management-statistics/

The Inventory management project aims to offer small manufacturing businesses an efficient web-based management system that allows inventory monitoring, electronic documentation for procuring purposes and inventory visibility reporting. The manager as a result will easily gain valuable insights into the stock level maintenance, hence improving the business running.

**2. Technology and tools**

In the particular project, we build a prototype database using the Python MySQL Database Access plugin empowered by PyCharm IDE. The SQL structure is then uploaded to Oracle APEX for further user interface development and deploying. simple and clean interface screens allowing users to interact with the database system efficiently. The basic introduction of required tools and technologies are present as following:

**PyCharm IDE** – Pycharm is one of the most popular Integrated Development Environment (IDE) dedicated for Python scripting language. The technology provides wide support for not only modern web development frameworks but also advanced database tools integrations. The **Database tools and SQL plugin** allows the developer to query and manage database when the database connection is created. Some of the data sources supported in Pycharm include MySQL, PostgreSQL, Microsoft SQL Server, SQLite, MariaDB, Oracle, Apache Cassandra, etc. As being enrolled in the accredited educational institution, we are all eligible to get a free educational licenses to use the JetBrains All Products Pack including PyCharm. Since we all have been taught and frequently practicing the DBMS using MySQL data source connectivity, in the current project, this technology is used as an environment to build and run a query to the prototype database.

**SQL -** Structured Query Language is the standard language designed for accessing and manipulating data held in the relational databases. In this project, the SQL queries were embedded in PyCharm IDE in order to manipulate data in a relational database of the store’s inventory. The knowledge of SQL basics and queries has been handed by all team members, hence enables us to easily interpret and operate database queries on our purposes.

**The Oracle Application Express** provides all tools and features that is productive for data-driven application and report development. The Oracle APEX Universal Theme functionality allows to ease the user interface design of modern web applications without any needs of extensive knowledge of HTML, CSS, or JavaScript. As we are all new to this technology, the Oracle Accessibility Guidelines is carefully taken into consideration, so that we can be more proficient in building effective UI screens using this framework.

**3. Scope**

The Inventory management for Restaurant project system is dedicated for micro manufacturing businesses, especially in food and catering industry. The project will help to manage the consistency and storage of the store’s inventory data systematically. The project scope is identified by the metrics of the system offered to the user (the store owner), of which are as follow:

* The project is a Desktop-based enabled system, which offers a simple interface platform that allows the user to quickly enter the desired inventory data.
* The system allows the manager to inspect inventory data including name, quantity, unit price, arrival date, and expiration date, etc.
* The system prints a notification of low-stock items to the manager when the stock quantity reaches lower than the safety point
* The system allows to calculate the quantity of items needed for fulfilling the desired number of purchase orders based on bill of materials and then automatically updates the stock quantity accordingly (Refer Note 1 for distinguishing between the desired number of purchase orders and the actual number of purchase orders)
* The system helps to generate purchase order for the desired amount of stock replenishment
* The employees is provided notification of obsolete/expired inventory in the oncoming days for stock clearance.
* The system helps to issue the inventory and related-expenditure report by product, category and time, etc. so that the manager is able to gain insights into the store’s inventory level

***Note 1****: In most of F&B businesses, the firms store raw items as on-shelf stocks, which then need to be processed to be served on dishes (called work-in-process (WIP) items). Typically, these WIP items are pre-prepared based on the estimated sales (the desired amount of purchase orders) in a given period of time. As a result,* ***the desired number of purchase orders*** *will be not always consistent with* ***the actual number of purchase orders*** *in most F&B cases unless Make-to-order (MTO) business. The MTO businesses who require the order placement from customers first before their manufacturing step will have the identicalness between the desired amount of purchase orders and the actual amount of purchase order.*

Out of scope:

* Automatic inventory updating when they arrive/ remove from the storage (The inventory level entry needs to be manually recorded by associated staffs)
* Automatically calculating the optimal reorder point (The reordered point (safety stock level) for each item must be established manually by the manager)
* Automatically calculating the optimal inventory replenishment (The amount of inventory replenishment needs to be manually entered for generating purchase order)
* The recorded of actual number of purchase order is out of the scope of this project
* Billing and accounting functionality is out of the scope of this project

**4. People**

**4.1. Project team member introduction**

Based on personal relevant technical skills of each individual team member, the team roles and responsibilities will be dedicated accordingly. The brief profile of each team member as well as their responsibility to the project is introduced as follow:

|  |  |  |
| --- | --- | --- |
| **Title** | **Relevant skills** | **Name** |
| **Project Leader** | Even though being an outsider of IT school, Thao’s project management skills are advantageous in this project. As a senior student of a business program, she has obtained strong problem-solving and management skills through business flagship internships, which allows her to interpret and structure the project requirements easily. She also has some basic understanding of UI design and Python programming language through relevant general elective courses in the school. | **Thao Tran** |
| **Responsibilities** | | |
| Provides functional expertise in an administrative process including:   * Leading the group meeting * Direct and guide a group in completing tasks and attaining goals. * Research and provide information need for completing the project. * Documents and analyses current and future processes. * Work with each team member to ensure the project deadline. * Contribute to the system’s interface screen building | | |

|  |  |  |
| --- | --- | --- |
| **Title** | **Relevant skills** | **Name** |
| **Database developer** | Thanh grew up with innovation; he had created and found his love with data science field. He has completed some offline database management-related courses before officially stepped to the university environment. His extensive database skills are put to good use in this project at the end. | **Thanh Nguyen** |
| **Responsibilities** | | |
| * Design logical and physical data models along with collaring, preparing and presenting statistical information for both internal and external use. * Ensure database optimization, integrity, consistency, security and privacy. * mapping the logical database design into a set of tables and integrity constraints. * selecting specific storage structures and access methods for the data to achieve good performance. | | |

|  |  |  |
| --- | --- | --- |
| **Title** | **Relevant skills** | **Name** |
|  | As an admirer of database structure and count headway for business purposes, Minh is keen on modelling and inspecting data to gain insights supporting decision-making. Driven by his interest in the background of privileged insights, he is self-training data visualization skills using different scripting programming. Minh currently has some basic understanding of programming languages namely SQL, Python and C++. | Minh Vo |
| **Responsibilities** | | |
| * + defining the detailed database design, including tables, indexes, views, constraints, triggers, stored procedures, and other database-specific constructs needed to store, retrieve, and delete persistent objects.   + develop a *view* of the database that meets the data and processing requirements of this groups. | | |

|  |  |  |
| --- | --- | --- |
| **Title** | **Relevant skills** | **Name** |
| **Tester and Interface developer** | Nam has developed a strong interest in learning how the algorithms and applications work programmatically. He has attended some online courses on Coursera, Ucademy, etc. to forest his knowledge of programming and database structure as well as information security. Furthermore, he has the intensity to spend times learning on this business field. | **Nam Nguyen** |
| **Responsibilities** | | |
| * Collecting and illustrating data from outsources and step up campaign based on founded information. * Identifying possible problems, trying to solve individually or report to the group for solutions. * Bridging ambitions between group and costumers through testing their ideas. | | |

**4.2 Contact Details**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Names** | **S.Number** | **Email** | **Address** | **Personal**  **Number** | **Major** |
| Nguyễn Phương Nam  (sem1) | S3877256 | namnp2002@gmail.com | Block E Saigon South residences, Nguyen Huu Tho, district 7 | 0968705050 | Information technology |
| Võ Khải Minh  (sem1) | S3879953 | Vokhaiminh0811@gmail.com | 1C3-8, skygarden 1, Nguyen Van Linh, district 7 | 0782490065 | Information technology |
| Nguyễn Phước Thành  (sem1) | S3878144 | hanhnguyen.hcmiu@gmail.com | 737/28 CMT8, Tan Binh district | 0911724600 | Information technology |
| Trần Xuân Thảo  (sem9) | S3678450 | s3678450@rmit.edu.vn | 1002 Ta Quang Buu, district 8 | 0843689817 | Logistics & supply chain management |

**5. Communication**

In the initial stage of the project, the team is mainly communicated through Facebook Messenger in order to determine on which problem the project will try to focus as well as tailor tasks to each team member compatibly. As agreed, every twice a week, we will hold two group meeting consisting of an offline meeting at the school yield after the tutorial class and an online meeting through Messenger video call at the weekend so that we can review each other’s tasks as well as discuss problems that people are confronting during their task performing, which hence allows us to improve the project accordingly. Other than Messenger, Google Drive is also chosen as a tool to help the team store and share project-related files and information. Due to the impacts of covid pandemic, we all agree to digitalize maximally the team conversations as long as it is possible for the health safety of each other.

In order to make sure the process is on the forward flow, each team member is required to provide personal contact details as well as make a verbal agreement for taking responsibility to deliver the qualified results for the assigned tasks right at the draft deadline. If any member comes with a delay or failure in producing the work at the due date without a reasonable excuse, the peer evaluation will be conducted in order to review the contribution of that member to the overall project so that appropriate actions will be catered to tackle this issue.

**6. Risks**

Obviously, there are problems in coffee shop maintenance, especially things related to data management. It is claimed that risks can be divided into three categories (Heldman, 2003, p. 148):

♣ Known risks

♣ Known risks with unknown consequences

♣ Unknown risks

There are several problems that we have already identified, but from my perspective, our group with four newbies will definitely face difficulties when developing a coffee shop project because we have to decide which database software to use due to the fact that there are mix variety of those (such as MySQL, SQL developer, Couchbase, AmazoneRDS) and then starting to learn it due to the lack of experiences four new database system learners. However, we decided to use MySQL, a language, up to a point, complicated but easy to learn and practice as well as its wide availability of learning online websites. Next, despite of the fact that we have investigated thoroughly, some are not fully understood or properly measured. For example, we will need to maintain additional management programs just in a period of time to cope with the situation if our project expands extensively. The most threatening aspect is unknown risks since they are unpredictable, appear when nobody expects it such as the disappearance of members or the outdated of the chosen language. More may come up when we are working on business and most sufficient way to address them are calm down and solving step-by-step.

**7. Project time framework**

The project timeframe is broken down into 2 phrases: Project proposal and Project Implementing. The project milestones for each stage is present as follow:

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Stage 1: Project Proposal** | | | | | | | | | |
| **Week** | **Activity** | **Expected output** | **Time frame** | | | | | | |
| **Mon** | **Tue** | **Wed** | **Thu** | **Fri** | **Sat** | **Sun** |
| **2** | Hold a group meeting about topic selection and task definition and allocation | Determine:  1. Problem statement and requirements  2. Project goals/deliverables  3. Members relevant exp and skill  4. Task delivery |  |  |  |  |  |  |  |
| **2** | Relevant material and project samples researching | 1. Guideline of IT project report writing  2. Student’s project from previous courses & online resources  3. Members obtains knowledge relevant to their task for the next presentation in group meeting |  |  |  |  |  |  |  |
| **2** | Online meeting to discuss the project’s overall content to make sure the coherence of the project | 1. Each member presents general ideas of how their work flows  2. Unify the overall project flow  3. Set draft deadlines of the project |  |  |  |  |  |  |  |
| **3** | Hold meetings to discuss problems confronting during the writing job | 1. Member presents problems facing during work if happens  2. Discuss and propose the solution |  |  |  |  |  |  |  |
| **4** | Personal work submission | 1. Members submit qualified works on time |  |  |  |  |  |  |  |
| **4** | Assemble, proofread and rewrite unqualified parts | 1. Idea and workflow of the project checking by the leader  2. Grammar checking by the leader  3. Linking separated parts to a finalized report by the leader  4. Discuss and rewrite unqualified parts by relevant team members |  |  |  |  |  |  |  |
| **5** | Personal work re-submission | 1. Members submit qualified works on time |  |  |  |  |  |  |  |
| **5** | Proofread, format and finalize the written document | 1. Idea and workflow of the project checking by their leader  2. Grammar checking by the leader  3. Rewrite unqualified parts by the leader  4. Linking and formating the project by the leader  5. Peer evaluation |  |  |  |  |  |  |  |
| **5** | Submit the project proposal on canvas | 1. Submit the project on the canvas on time |  |  |  |  |  |  |  |
| **Stage 2: Project Implementing** | | | | | | | | | |
| **Week** | **Activity** | **Expected output** | **Time frame** | | | | | | |
| **Mon** | **Tue** | **Wed** | **Thu** | **Fri** | **Sat** | **Sun** |
| **6** | Analyse and design the conceptual data model | A logical schema includes:  1. Meaningful and adequate attributes for data structure  2. Detailed relational specifications (columns, primary keys, foreign keys, constraints) that satisfy the desired data requirements |  |  |  |  |  |  |  |
| **7** | Realise the database design by using SQL to create tables and constraints on PyCharm Database tools and SQL plugin (MySQL connectivity) | Tables and constraints satisfy the logical schema description |  |  |  |  |  |  |  |
| **8** | Import files of data from industrial business to populate the database | Files of data can be copied directly into a table |  |  |  |  |  |  |  |
| **9** | Create user interface on Oracle APEX | Friendly user interface  Tailored subsets of the entire database content is accessible by involved groups of user processes |  |  |  |  |  |  |  |
| **10** | Testing and project releasing | -Detect and cover all errors in the design and implementation of the database, its structure, constraints and associated user and management support. |  |  |  |  |  |  |  |
| **11** | Prepare project documentary | 1. Tasks are delivered and completed on time by all team members  2. Qualified individual work |  |  |  |  |  |  |  |
| **12** | Prepare project documentary (continuous) |  |  |  |  |  |  |  |
| **12** | Prepare slides and rehearsals | 1. Informative and professional slides  2. All team members practice well in the rehearsals |  |  |  |  |  |  |  |
| **12** | Project presentation and submit final report on Canvas | 1. All aspects of the project are presented adequately evenly by all team members  2. Submit the project on the canvas on time |  |  |  |  |  |  |  |

**8. Writing plan**

Since most of our team members are completely new to the IT school, it seems to be impossible for people to complete their assigned task actively and independently as the fresh students have no clue of the project templates as well as their research and report writing skills are also in proficient. As a result, the workflow has to be directed and guided by a senior student. In this project report, the senior student, who took the team leader role, will be fully responsible for identifying the project goals and requirements, analysing required tasks and allocating the tasks evenly to the right members in accordance with their relevant skills and setting project schedule as well. The team members need to be all agreed on taking care of assigned parts of the project and committed to submit their work on time at the draft deadline for the leader to review and feedback their job. Unqualified parts will be asked to improve following the leader’s relevant supporting materials. However, during the work span, if the leader thinks one not putting enough effort to complete his task, the peer review then will be conducted so that his contribution will be evaluated fairly avoiding personal bias reflection.