

An Agile Methodology Approach to the Development of an Inventory Management and Monitoring System for Company A

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ABSTRACT

The researchers were able to discover that Company A is experiencing difficulties in managing their inventory and purchases.

The mode of keeping track of their inventory and purchases are through MS Excel and communicating directly through apps such as Viber and Messenger. This system of theirs would not suffice their needs in the long run as they are facing problems from their current business process such as: (1) lack of data reliability, (2) lack of accessibility, and (3) lack of visibility. The researchers opt to utilize the usage of an Agile Methodology to develop an Inventory Management and Monitoring System for the company. This method would let the researchers divide tasks with the use of the Scrum framework while also maintaining continuous communications with the client regarding the development process and progress of the system. The completion of the software solution aims to provide an accessible web-based avenue for Company A to monitor their materials with the ability to restock supplies and role access in mind. In conclusion, the agile methodology was suitable for the project given the system's current state and client feedback. It enabled issue discovery and the construction of a more efficient and reliable system tailored to the company's needs.

KEYWORDS

Resource Management, Agile, Inventory, Web Development

1 INTRODUCTION

Company A, established in 2015 is a partnership company that provides engineering services. The company offers services mainly consisting of construction, trading, and subcontracting. The company is a small enterprise, catering 20 to 30 employees in the core group composed of the Admin staff, Operations, Finance Department, Logistics Purchasing, and Top Management.

One of the key operational aspects of Company A is the management of multiple warehouses located at different job sites, which store the materials required for construction or client needs. Each warehouse is overseen by an Operations Engineer who works closely with a Purchasing employee. The Operations Engineer maintains and updates a physical logbook to keep track of inventory levels, while the Accounting department uses a separate Excel file for inventory monitoring.

Additionally, the process of restocking inventory starts when the quantity of materials in a warehouse drops to an estimated level. At this point, the Operations Engineer, who is responsible for managing the inventory, informs the Purchasing Employee about the need for a purchase request. The purchase request then goes through a series of approvals, involving back-and-forth communication among various stakeholders, before it is given the go-signal for delivery.

After meeting with the client and reviewing their business processes, the researchers have listed down the different issues of their current business processes. The following are the main issues that are creating operational inefficiencies:

1. **Lack of Data Reliability.** The client's business processes involve inventory tracking through various mediums, which has resulted in data reliability issues and increased the likelihood of human error. This means that the data related to inventory levels, stock availability, and quantity may not be accurate or consistent across different systems or channels. As such, this can result in inventory discrepancies and inefficient allocation of resources.
2. **Lack of Accessibility.** Determining available stock and its quantity is a laborious task due to the reliance on the physical warehouse as the main source of information. This lack of accessibility to critical inventory information can cause delays in decision-making, slow down inventory withdrawal and acquisition, and increase the risk of stockouts or overstock situations. It also implies that employees may not have the necessary information to make informed decisions, resulting in suboptimal operational outcomes.
3. **Lack of Visibility.** All of their business processes have a one-way communication channel that only the next person in the step will receive the information. This lack of visibility across different ongoing processes makes it challenging to track the status of various tasks or orders, leading to delays, miscommunication, and potential errors. It can

also result in difficulties in identifying bottlenecks or inefficiencies in the workflow, as there is limited visibility into the end-to-end process.

In order to address the issues stated above, the researchers have adopted an Agile methodology, specifically Scrum, to develop a web-based application for inventory management and monitoring.

2 RESEARCH OBJECTIVES

From the three main issues, the following objectives will be used to determine if the system has successfully addressed the issues and created a positive change in their business processes:

1. To create a reliable record of materials and transactions that is up-to-date
2. To increase visibility in business processes guided by role access
3. To make relevant data accessible to the engineering, finance, and management departments
4. To develop a centralized database that allows for easy monitoring and tracking of previous transactions and their details
5. To enable access to relevant information from any location provided an internet connection

3 REVIEW OF RELATED LITERATURE

Malik and Sharma (2022) stated that Inventory Management is critical in the construction Industry. That Inventory Management system thus has different tasks such as finding suitable materials, procurement process of materials, and transportation. They discussed that Inventory Management is important especially in the role of completing construction projects successfully and on time. Mohopadkar and Patil (2017) also discussed the importance of Inventory Management systems in construction industries, these importances were stated: (1) To economize on buying/manufacturing costs. (2) To keep pace in changing market conditions. (3) To satisfy demand during the period of replenishment. (4) To take care of contingencies. (5) To stabilize Production. (6) To prevent loss of sales. (7) To satisfy other business constraints. Monitoring System is another key factor for the construction industry, Rebolj, Čuš Babic, Magdic, Podbreznik, and Pšunder (2008) explain that construction building activities are inadequately monitored especially during ongoing construction projects. A monitoring System would help to obtain information, especially in cases of unforeseen events and conditions on-site. Rebolj et al (2008) were able to conduct a study using combined methods of Monitoring Systems such as (1) an automated system activity tracking subsystem on image recognition, (2) an automated material tracking subsystem, and (3) a mobile computing-supported communication environment. The researchers were able to conclude that partial results from their results would prove that the concept of using those monitoring systems would be able to roll out on-time information for enough time reactions to unexpected events on-site that would lead to an improvement in project performance.

According to a research conducted by Ramachandran et al. (2021), inventory systems require control, tracking, and monitoring in order to increase the efficiency of company projects while operating within a specified budget, reducing the risks of wastage and stock overflow (Ramachandran, 2021). In a research conducted by Tapado and Delluza (N.d) in Virac, Catanduanes, the company they were creating an inventory system for had excessive documents and procedures that were not being maintained, which made the accuracy of records questionable as well as inaccessible. As such, they implemented different features to alleviate this which are: (1) Personnel login and logout; (2) User-friendly user interface; (3) Database consistent with inventory; (4) Centralized database for protection, security, and reliability; (5) Report generation. After implementation, the researchers have concluded that it has simplified, defined, organized, and standardized the business processes regarding inventory of the institution. It is also important to note that although the initial cost of the development of the system is large, it has provided a positive Return on Investment for the institution.

In order to implement an effective restocking-based inventory management, Lee and Chen (2021), proposed a framework for construction companies. This framework revolves around identifying critical materials, restocking quantities and intervals, and implementing real-time monitoring. Lee and Chen (2021) said that this provides the company more control over their inventory level which reduces overstocks and ensures availability of their supplies. This is complemented by a study conducted by Smith and Brown (2022), who designed an inventory management system designed for construction projects. They found out that an optimal restocking feature minimizes inventory costs while making sure that materials are sufficiently available at construction sites.

Web based online inventory systems. They discussed web based online technology's benefits to companies such as: (1) That web-based online inventory information system is a form of innovation in terms of making it easier for human controlling and receiving information especially in terms of accuracy, speed, and concreteness. (2) There are significant effects when using information technology. (3) With the case of the study, accurate software would help speed up company performance when generating desired information. (4) Some companies define inventory as goods or resources. (5) Web services would allow centralized databases and improve sales management. (6) Many companies would use a web-based online inventory system as this would save a lot of time, energy, or large costs. This also can be applied by the usage of barcode reader platform, can also be applied through the usage of the internet, (Seogoto & Palalungan, 2020). In their study their main objective is to be able to maximize the performance of humans with the usage of the web-based online inventory system. It was concluded by them that a web-based online inventory system would be beneficial to humans in

terms of performance, cost, and exertion of energy. These benefits would further help in considering a web based online inventory system.

According to Weber et al., (2005), Paper-based systems have inherent limitations and risks associated with them. Reliability is an issue which could be compensated by double-checking and manual coding, but this poses additional effort and more potential for human error. A transition to a web-based system of data collection minimizes these risks and provides an edge for companies willing to adopt it. A web-based system ensures the reliability of data by reducing the possible points of human error and by having a singular source. Additionally, the data is available for access as long as it is hosted on the Internet. In conclusion, in transitioning to a more digitized environment, a web-based system for data management provides a competitive advantage for companies.

Cleofe, Delos Reyes, Baylon, Sarmiento, Garachico, Maligaya (2022) explained how supermarkets in the Philippines could be greatly affected by implementing inventory management systems to small-medium-sized businesses. Cleofe et al. (2022) mentioned that supermarkets would benefit from inventory management systems as it could help with keeping track of inventory, improve efficiency, and manage information regarding products.

Despite all those benefits of having an inventory management system, once a poor inventory management system is handled poorly, problems would arise. It could greatly affect the performance of a business. A study by Baylen (2020) regarding a small business's poorly handled inventory management system led to one of the problems which was overstocking of inventory and resulted in affecting the cash flow of the business. It could also reduce service to customers, eliminate business risk, reduce the responsibilities that an employee should be doing, Kekane and Lande (2019).

There is no doubt that there would be a different approach as to how an inventory management system would be constructed for a company. Alfeno, Rifai, and Seaepudin (2019) in their web-based system they used Django as their framework, Python as their programming language, and MySQL as their database. Their Djanong framework was utilized for the Dashboard Model of the system. In another study, the researchers were able to use Django Framework for building a laboratory inventory management system. The Django framework would allow for most backend code and would also provide along with the usage of Jinja which was used in the webpage dynamic and MySQL as a database so that researchers were able to connect with Python Django for the backend. Moreover, they've discussed that the benefit of using the Django framework is that it follows a "MVT" architecture which stands for Model, View, Template. (1) Model which is going to act as the interface of the data that is supposed to handle maintaining data and logical data structure for the whole system; (2) View which is the interface this is where we see the UI once the website is rendered, this may be represented as the

HTML/CSS/JavaScript, etc.. it is also responsible for the dynamic data that appears on the web page; (3) Template this is mainly the static parts of the front-end output, Nanda (2021). Nanda (2021) were able to conclude in their system that they have successfully created a web application with Django Framework for the backend and usages of HTML, CSS, JavaScript, and Bootstrap for the front end.

Databases are a key factor especially for data storage. A study by Yuvaraj, Oorappan, Megavarthin, Pravin, Adharsh, and Kumaran (2020) discussed the usage of SQLite, a platform for the development of databases and a means to maintain an inventory management system. According to them SQLite would create a way towards progressively from traditional applications to a more creative, flexible, customizable inventory management system. The researchers were able to utilize SQLite for GUI and relational database management system. Moreover, they've stated that SQLite is (1) simple, intuitive and fast software for simple implementing relational database management system. (2) It is a open source application making it accessible for users to use it, just by downloading it from SQLite website for free. (3) Compared to MySQL, SQLite wouldn't require the users to use a server connection to run it, and wouldn't require heavy additional configurations compared to other query languages.

Nguyen (2019) discussed that for building an e-commerce solution with Tailwind CSS was preferred for styling over CSS classes or style attributes when designing visual parts of the webpage. Tailwind CSS is more customizable compared to a low-level CSS framework making it faster to build a user interface. It was further discussed that Tailwind is a utility based framework and not built from pre-made components like bootstrap which allows a greater degree of customizability.

Sohan, Maurer, Anslow, Robillard (n.d) tackled the effectiveness of different use cases with REST API Documentation. The researchers focused on studying on WordPress Rest API V2, API then allows programmatic lists, create , update and delete WordPress data pertaining to blogs posts, comments, user images, and tags. This was then described through open-source projects the user could access to inspect the implementation and documentation of the techniques being used in WordPress REST API. The API from this is a self-documenting feature. The researchers also discussed how to use REST API, pertaining that API developers need to look into the inputs in the HTTP: (1) Request Method; (2) Request URL; (3) Request Header; (4) Request body. For them to verify the API developer could use the HTTP response header/or body.

Outziuar (2022), implemented REST API in creating an inventory management system for retailers and wholesalers. The usage of REST API on the system was implemented using Appwrite, a backend-as-a-service (BaaS), which is a self-hosted server that shortens development tasks using REST API. The researcher then further discussed that more than one

backend API has been made catering two teams for the system: Admin and Team. The admin would then have the capability to view, create, update, and delete the user accounts through another RESTful API. The researcher explained that the API used by the admin will be hosted in the server with the Appwrite container, then the API will takeover with storing, sending images of the product. These requests will then be through the HTTP protocol.

The study by Tapado and Delluza (n,d) provides the researchers insight on the potential hardware requirements and equipment needed for the deployment and implementation of an Inventory management system. The system that was provided is an automated management system that would capture data from as per the records equipment of the employee, track history issued for the employees, and perform an automated inventory management and generate reports. This was conducted for a University in Catanduanes which was using a manual system of conducting inventory management in the university, as they discovered lapses due to the manual system such as (1) process of the inventory was not simplified, excessive documents and long procedures are being observed; (2) Assets of the institution were not maintained properly and identified; (3) The inventory record were not accurate, updated, and it is not easily accessible, and (4) Equipments that were not used are not properly monitored. The researchers were able to implement a web-based system that resulted to improvement: (1) there is a much organized and user-friendly system; (2) there was improvement in terms of speed and efficiency in the process of identifying the equipment; (3) enhancement on being able to capture data and store into the database; (4) the system helped the school to be able to make it easier to manage wide inventory of equipments; (5) common repository of data of equipment for security and reliability; (6) full reports that would meet the necessary requirements, (Tapado and Delluza, n.d).

From the local topics that have been tackled, it can be said there is a noticeable impact inventory management systems have on small to medium sized businesses. Discussing its effects and how it leverages its strengths to overcome problems observed in the business process. Additionally, these studies discussed the transition and adoption from a manual procedure to an automated solution. These topics are significant to the Philippines as these would help as future references as well to other organizations to look into, to study, and analyze as to what is the current situation of the Philippines in terms of entering the field of technology.

From the foreign topics that has been tackled, exploring the possibility of implementing an inventory management system to their business processes. One study tackled the advantage to switching from a paper-based system to a web-based system. Another study tackled more information as to the relevance of having an inventory system to medium-larger companies. These medium-large businesses require more monitoring and inventory management as these companies would handle more materials and would take on more projects, as it would be crucial for employees to monitor and maintain these businesses due to a larger volume of data.

4 RESEARCH METHODOLOGY

This section will discuss the methods and actions taken in developing the web-based application for Company A.

4.1 Research Design

The researchers will be using the Agile Method approach to develop a resource management and monitoring system that is fitted for the needs of Company A. The Agile Method, as described by Beck et al. (2001) and Schwaber (2002), is a flexible and iterative project management framework that places emphasis on incremental development and continuous improvement. The project will follow a modified Scrum framework, with sprints lasting 3 weeks to a month, allowing for regular feedback from the client and targeted revisions to the system throughout its development. This is reinforced by daily asynchronous updates to foster accountability and track deliverables for the sprint. Some sprint lengths are extended due to inefficiency during the development of the system.

4.1.1 Planning

The researchers planned on developing an inventory management and monitoring system that is used to manage incoming and outgoing inventory, as well as facilitating the restocking process. Multiple features were thought of, such as notifications, role access, user registration, location filtering, data searching, and warehouse management.

4.1.2 Requirements Analysis

Based on the initial assessment of their business processes, the researchers have come up with a list of business requirements which are then translated into functional requirements. This list was then cross-checked with the features that were previously planned and revised to be tailored to the requirements of the company.

4.1.3 System Design

The system follows a role-based access protocol where only authorized users with specific roles could access specific parts of the system. This is done so in order to provide another layer of security for the system, as well as to both limit and guide user interaction with the system. Data models are created with object-oriented programming (OOP) in mind.

4.1.4 Coding

The researchers will create a web-based system using the following technology stack: Django, Rest API, Tailwind, and SQLite Django, a python-based web framework will be used to construct the backend. With REST API as an intermediary layer between the frontend and backend. Lastly, with Tailwind CSS for the frontend, a utility-first CSS framework.

4.1.5 Testing

The researchers will showcase a working prototype of the system to the client at the end of each sprint, in conjunction with this is a feedback survey in the form of a likert scale based on

ISO 25010. The researchers intend to administer test cases to obtain more information and insight from the end-users following the deployment of the system. This will then be accounted for in polishing the system.

4.1.6 Deployment

Regarding deployment, the company may opt to proceed to locally host the software or outsource it to a server provider. Deploying it to the end-user, the researchers will provide documentation, primers, and a training outline to the Human Resources department for dissemination to the respective departments or end-user groups.

4.1.7 Maintenance

The researchers will commit to a 6-month maintenance period, which includes the further refinement of features and functions provided by the software and the patching of bugs or issues that the company will encounter during its deployment.

4.2 Research Participants

The researchers interviewed the President of the Company, the Head of Finance, and an Operations Engineer Head.

4.3 Data Gathering Procedure

Due to the mobile nature of the Head Engineer's job and the other representatives of the major user groups, the researchers were unable to conduct face-to-face interviews. Meetings were conducted online via messaging and conference platforms. To ensure that the system being created was aligned and accurately reflected the operations of the company, the company shared with the researchers an MS Excel file and pictures of their physical logbooks. The file enabled the researchers to discover the parameters and characteristics of the various data entries and a deeper understanding of the business processes.

In conjunction with this, the researchers were able to interview the Head Engineer and Finance Head to better understand its use in the business process. Due to the nature of the agile approach, the project was divided into sprints. The tasks, backlog, and issues were documented and tracked using Notion. Notion is a freemium web application with a focus on providing organizational tools.

The scrum meetings were held daily at 5 PM. Additionally, during the end-of-sprint activities, a meeting were then sought with the client to showcase progress and obtain feedback through an end-of-sprint system survey. Following the recommendations and comments made by the client, the researchers would proceed to meet with the scrum master to realize the comments and apply them accordingly to the software.

4.4 Treatment of Data

The data and insights obtained from the client were used to evaluate and understand the business process along with the requirements needed to design the system. The researchers identified the various responsibilities and roles involved in the business process by holding meetings with the President of the Company, Head of Engineering, and Finance. These roles represent the end-user groups and their specific functionality in the business process and the usage of the system. Using this information, the researchers were able to specifically identify the function and non-functional requirements to build the system.

Considering the nature of the development process, at the end of each sprint the researchers sought feedback from the company to ensure that the progress being made was still aligned with the company. The contents of the survey were retrieved from ISO 25010 and used in conjunction with a Likert scale to extract opinions, attitudes, and perceptions of the functionality, performance, acceptance, and usability. Additionally, a demonstration was shown of new features implemented or revised and were evaluated through a feedback form to be able to specifically narrow down areas that need improvement or revision. Since there were only two occurrences where the company completed the feedback survey, the researchers computed the average of each section and the overall average of the form.

4.5 Validation

A prototype of the system was developed to showcase the progress being made on the system and would be presented at the conclusion of a sprint in conjunction with the company answering a feedback survey. According to ISO/IEC 250000, there are multiple quality characteristics of a system. The researchers have identified the following as important and will be measured: Functional Suitability, Performance Efficiency, and Usability.

These were the basis for creating our end-of-sprint survey after presentations with the client. These were presented in the form of a 5-point Likert scale. According to Borgo et al. (2022), Likert scales allow researchers to collect quantitative data of subjective traits. Respondents are limited to rate the characteristics from 1-5 as shown in Table 1.

Table 1: Corresponding value of each score in the survey

Likert Score	Legend
1	Strongly Disagree
2	Disagree
3	Neutral / Ok
4	Agree
5	Strongly Agree

The following characteristics were included and measured in the Likert scale:

- **Functional Stability**
 - This characteristic indicates the extent to which the system satisfies expressed and implied requirements given specific conditions and situations.
- **Performance Efficiency**
 - This characteristic indicates the efficiency of the system in terms of performance relative to the resources used given specific conditions and situations.
- **Usability**
 - This characteristic indicates whether specified users could achieve their specified goals using the system with efficiency, effectiveness, and satisfaction given specific conditions and situations.

5 RESULTS AND DISCUSSIONS

5.1 Client Feedback

Table 2 shows the mean score of the chosen criteria from the ISO/IEC 25010 standard in the end-of-sprint survey form that was administered at the end of Sprint 3. With Table 3 showing the results from the end of Sprint 2.

Table 2: Post-Sprint Survey Evaluation Table of Sprint 3

Criteria	Mean Score (Out of 5)
Functional Suitability	4.33
Performance Efficiency	4.67
Usability	4.67
Overall	4.56

Table 3: Post-Sprint Survey Evaluation Table of Sprint 2

Criteria	Mean Score (Out of 5)
Functional Suitability	4.33
Performance Efficiency	4.00
Usability	4.33
Overall	4.22

As seen in the table, the mean score of the most recent end-of-sprint survey is 4.56; with Performance Efficiency and Usability ranking the highest and Functional Suitability ranking the lowest. Given that the functional suitability score is the lowest and has not improved between sprints, the researchers aim to deploy the software on a live platform to obtain specifics on how to improve this characteristic in the software. As for the other two characteristics, an improvement can be observed and as development continues the researchers strive to maintain this trend and improvement in the quality of the software.

Additionally, aside from the end-of-sprint survey the clients filled out the following comments were given during the meetings held with the researchers. From Sprint 2, the President of Company A noted that from initial judgment the software appears effective and looks forward to a hands-on demo to review at a later time to be able to provide more in-depth comments and feedback. Following this, on Sprint 3, the Head of Engineering recommended that additional information be added surrounding the materials delivered section as it is in his experience wherein the goods are delivered in multiple batches as they order in bulk. Overall, consistent feedback has been given throughout the sprints of good and steady progress.

6 CONCLUSION AND RECOMMENDATION

Company A has encountered difficulties with regards to the visibility, accessibility, and reliability of their data in terms of inventory management. As such, the researchers intend to solve these problems through the development of an inventory management and tracking system.

Based on the results and insights from previous meetings, the company views the system as usable and efficient, while satisfying the functional requirements they needed for their business processes. Through the use of an Agile approach, the researchers were able to closely work with the clients as well as dividing chunks of work to more manageable tasks that allowed for incremental and guided improvements for the system.

Given the current state of the software solution, in conjunction with the latest feedback from the client, the researchers aim to satisfy the research objectives and recommend that work continues employing the use of an agile methodology for the continual development of the software solution.

The researchers also note that following the completion of minor revisions to features following the comments of Sprint 3, a live deployment of the software will take place to provide to the clients a hands-on experience of the software in order to administer test cases and more specific feedback surrounding the software. These tests will cover functional and performance cases. Furthermore, these will be administered with the goal in mind of determining the network conditions the software can operate under and to objectively discover the its operational compatibility given varying browsers (iOS and Android).

REFERENCES

- Alfeno, S., Rifai, D., & Saepudin, M. (2019). Utilization of the Django Framework as a Dashboard Model Information System for Raw Material Inventory on PT Bimasakti Karyaprima. *Aptisi Transactions on Technopreneurship (ATT)*, 1(2).
https://www.academia.edu/40257285/Utilization_of_the_Django_Framework_as_a_Dashboard_Model_Information_System_for_Raw_Material_Inventory_on_PT_Bimasakti_Karyaprima
- Baylen, L. N. L. (2020). Analysis of Inventory Management Systems of Selected Small-Sized Restaurants in Quezon Province: Basis for an Inventory System Manual. *Al-Kindipublisher.com*, 2(3). <https://al-kindipublisher.com/index.php/jbms/article/view/852>
- Beck, K., Beedle, M., van Bennekum, A., Cockburn, A., Cunningham, W., Fowler, M., Grenning, J., Highsmith, J., Hunt, A., Jeffries, R., Kern, J., Marick, B., Martin, R. C., Mellor, S., Schwaber, K., Sutherland, J., & Thomas, D. (2001). Manifesto for Agile Software Development. Agile Alliance. <http://agilemanifesto.org/>
- Borgo, R., Marai, G., & Schreck, T. (2022). Effective Use of Likert Scales in Visualization Evaluations: A Systematic Review. *Eurographics Conference on Visualization (EuroVis)*, 41(3).
- Cleofe, R. V. D., Delos Reyes, R. J. J. B., Baylon, J. R. A., Sarmiento, K. M. S., Garachico, A. N. A., & Maligaya, K. C. C. (2022, March 28). Supermarket Sales and Inventory Management System: A Complete Case Study. SlideShare; Scribd.
<https://www.slideshare.net/RenzGaming3/supermarket-inventory-management-system-developmentpdf>
- ISO/IEC 25000:2014. ISO. (2020, June 11). Retrieved April 28, 2023, from <https://www.iso.org/standard/64764.html>
- Kekane, M. A., & Lande, R. D. (2019, January). Advantages and disadvantages of Inventory Control . http://www.ijme.co.in/paperadmin/images/files/Fle_1551946045.pdf
- Lee, C. H., & Chen, Y. H. (2021). A Framework for Implementing Restocking-based Inventory Management System in Construction Projects. *International Journal of Construction Management*, 21(3), 257-273.
- Malik, H., & Sharma, P. K. (2022, May). Inventory Management in Construction Industry. ResearchGate.
https://www.researchgate.net/publication/361023219_Inventory_Management_in_Construction_Industry

Mohopadkar, J. S., & Patil, D. P. (2017). Application of Inventory Management in Construction Industry. Application of Inventory Management in Construction Industry, 5(6).
https://www.academia.edu/36932899/Application_of_Inventory_Management_in_Construction_Industry

NANDA, V. S. V. S. (2021). LABORATORY INVENTORY MANAGEMENT SYSTEM [Review of LABORATORY INVENTORY MANAGEMENT SYSTEM].
https://sist.sathyabama.ac.in/sist_naac/documents/1.3.4/b.e-cse-batchno-184.pdf

Nguyen, L. (2019). BUILDING E-COMMERCE SOLUTIONS WITH WOOCOMMERCE.
http://www.theseus.fi/bitstream/handle/10024/261146/Linh_Nguyen.pdf?sequence=2&isAllowed=y

Notion Labs Inc. (2018). Notion. Retrieved April 28, 2023, from <https://www.notion.so/>

Outzioura, A. (2022). INVENTORY MANAGEMENT SYSTEM FOR RETAILERS AND WHOLESALEERS .
<http://www.aui.ma/sse-capstone-repository/pdf/fall-2022/INVENTORY%20MANAGEMENT%20SYSTEM%20FOR%20RETAILERS%20AND%20WHOLESALEERS.pdf>

Ramachandran, R., Raj, J., & Gandhi, M. (2018). INVENTORY MANAGEMENT SYSTEM IN BUILDING CONSTRUCTION. International Research Journal of Engineering and Technology (IRJET), 8(4), 843–846. <https://www.irjet.net/archives/V8/i4/IRJET-V8I4170.pdf>

Rebolj, D., Babič, N. Č., Magdič, A., Podbreznik, P., & Pšunder, M. (2008). Automated construction activity monitoring system. Advanced Engineering Informatics, 22(4), 493.
https://www.academia.edu/23936996/Automated_construction_activity_monitoring_system

Schwaber, K. (2002). Agile project management with Scrum. Microsoft Press.

Soegoto, E. S., & Palalungan, A. F. (2020). Web Based Online Inventory Information System. IOP Conference Series: Materials Science and Engineering, 879, 012125.
<https://doi.org/10.1088/1757-899x/879/1/012125>

Sohan, S., Maurer, F., Anslow, C., & Robillard, M. (n.d.). A Study of the Effectiveness of Usage Examples in REST API Documentation. Retrieved May 24, 2023, from
<https://ase.cpsc.ucalgary.ca/wp-content/uploads/2018/05/A-Study-of-the-Effectiveness-of-Usage-Examples-in-REST-API-Documentation.pdf>

Smith, J. T., & Brown, A. R. (2022). Optimizing Inventory Management in Construction Projects with Restocking Features. *Construction Management Journal*, 45(2), 123-137.

Tapado, B. M., & Delluza, M. E. T. Equipment Inventory Management System (EIMS). *IJHSS .NET*, 76.

Weber, B. A., Yarandi, H., Rowe, M. A., & Weber, J. P. (2005). A comparison study: paper-based versus web-based data collection and management. *Applied Nursing Research*, 18(3), 182-185.

Yuvaraj, K., Oorappan, G. M., Megavarthini, K. K., Pravin, M. C., Adharsh, R., & Ashwath Kumaran, M. (2020). Design And Development Of An Application For Database Maintenance In Inventory Management System Using Tkinter And Sqlite Platform. *IOP Conference Series: Materials Science and Engineering*, 995, 012012.
<https://doi.org/10.1088/1757-899x/995/1/012012>