International Journal of Engineering Trends and Technology
ISSN: 2231 – 5381 /doi:10.14445/22315381/IJETT-V69I4P211
Volume 69 Issue 4, 76-80, April 2021

A Mobile Mapping System of All Industrial Oxygen Sales Locations And Free Locations In Lima - Peru

León Carhuas Benjamin[1], Mendoza Velásquez Cinthia[1], Alexi Delgado[2], Enrique Lee Huamaní[3]
[1] *systems engineer program, Universidad de Ciencias y Humanidades, Lima-Perú*
[2] *Mining Engineering Section, Pontificia Universidad Católica del Perú, Lima-Perú*
[3]*Image Processing Research Laboratory, Universidad de Ciencias y Humanidades, Lima Perú*
[1]Cinmendozav@uch.pe, [2]kdelgadov@pucp.edu.pe , [3]ehuamaniu@uch.edu.pe,

Abstract *- At the beginning of 2020, a pandemic was declared by the World Health Organization, caused by covid-19, this being a disease that attacks the lungs and causes difficulty when breathing, hospitalized people are placed on stretchers next to an artificial respirator connected to an oxygen balloon, with the passing of the months it became difficult to get oxygen balloons due to its demand, to help in this problem a mobile mapping system was made in which it provides me with the location where I can get oxygen balloons in sales or for free, you can see the district and the exact locations where you can get oxygen balloons, you will also get the information from the supplier. The Scrum methodology was applied since it is adaptable to changes, difficulties that were on the way could be solved without affecting the progress of the project.*

Keyword: *Android Studio, Breathing difficulty, Scrum methodology, industrial oxygen.*

I. INTRODUCTION

There is currently a pandemic, declared by the World Health Organization [1], caused by Covid-19, which has generated serious health problems and new needs for society. One of these is the provision of oxygen tanks for Covid-19 patients, a key requirement for helping patients' respiratory systems [2]. In Peru, there is no comprehensive information center for distribution points.

For the creation of this project, the Scrum methodology was chosen because it is versatile and adaptable to changes; as they point out: Scrum is a framework that encourages different people to interact to maximize the value provided with the maximum guarantee of success [3].

Helping to work in a dynamic way in the team in a very natural way, fluid and with little resistance, helping to fulfill the expectations for the project [4].

Scrum does not usually instruct teams on how to carry out their work. But it gives a guarantee to the team to deliver the expected product, being a reliable methodology for the development of this project. [5]

The case study is applied with the Scrum methodology; following the procedure will develop a layout that will be divided into Sprint detailed figures; these will be developed according to the requirements that have been previously obtained from the analysis of user needs.

This project aims to develop a model for the creation of a mobile application for the search of oxygen distributors for medical use, besides allowing to see the details of each product, such as duration and price. For users to access the application will be logged in; once inside the application, observe a mapping of the points of their respective city and the closest points, showing the product and details about it, if they are for sale or free for purchase.

Chapter II will explain the methodology with which the development will be worked on, and chapter III will carry out the steps of the methodology, developing the project, chapter IV will explain why y, chapter V will explain the conclusions of the research.

II. METHODOLOGY

Scrum offers a customized way of working on different projects that have a variety of requirements and have advantages such as flexible selection of requirements for Sprint and no specific procedures to follow. Being widely used, Scrum still retains some essential elements that can give an edge to other methods [6].

In this section, the analysis of the requirements will be made following this will be able to make a prototype of the application due and give him a solution for then give him an implementation that will be based on introducing the mapping of all the places of sale of oxygen and places that are giving free.

A. Scrum methodology

Scrum is an iterative and incremental improvement approach that prioritizes flexibility and adaptability to changing and complex environments. In Scrum, project risks can be controlled, and project predictability can be optimized by applying a control mechanism. Scrum is not a standardized process consisting of several steps to be followed that would

guarantee high-quality products, on time, and within budget. Instead, Scrum is a framework for organizing and managing work that provides a foundation to which organizations can add unique implementation according to their approaches and needs [7].

SCRUM methodology has a team-oriented approach, allows and develops web and mobile systems through a collaborative functional environment, and adaptable to change, based on regular deliverables of the final product.

***a) Requirements analysis*:** SCRUM is based on incremental development of the requirements, considering prioritization of them according to the value assigned by the client. Likewise, this methodology is applicable where an empirical control of the project is required [8].

b) Development of Sprint: A sprint in a cycle or iteration that you have within a Scrum project. Allowing the time set to have a duration of four weeks per sprint. In each Sprint or work cycle to get is a deliverable or increase of the product works.

Sprints are important to progressively deliver functional versions of the software. The first sprint will contain the minimum viable version of the product, allowing users to use a version with elementary functionalities. The following sprints will contain functionalities in order of priority, the last ones being the least relevant of them.

B. Project prototype

The prototypes will be used to give a clear idea of what the final product will look like taking into account the requirements of the mobile mapping project of all industrial oxygen sales locations and free locations. The prototype is important to give the developer an overview of how the structure of the final application will be, as well as to facilitate the analysis of functionalities, giving a view of how each requirement will be structured. The prototype will be developed in Balsamiq Mockup, and it will contain a graphic sample of the structure of the application, showing the design of the startup windows, user session, general map, selected distributor, and available products. The prototype will be developed later.

C. Technological tools

The data will be obtained by a survey that will be carried out by the oxygen vendors, and they will see the freedom by the address where they are operating as well as; the data will be put in a database from which we will keep a record.

The mobile application will be developed with the Kotlin language since it is a solid language, allowing to implementation of the software in a safe way. This language will be used in the Android Studio platform, which will allow the development of the details in the prototypes, in addition to configuring the database connections and start the quality tests.

III. CASE STUDY

A. Requirements analysis

The requirements were obtained through field research or reliable sources to form the requirements, as is in Table 1 of requirements analysis.

TABLE 1: Requirements analysis

Request	Description
1	A map showing the locations of oxygen distributors is required.
2	Oxygen prices are required to be seen
3	It is required to know the stock in each store.
4	It is required to know the information of the companies and the products in a detailed way.
5	A login is required for those interested in accessing the app.
6	The system is required to have a list of users for administration.

B. Development of Sprint

Table 2 shows the Sprints that will be developed in the course of the development.

TABLE 2: Sprint development

Sprint 1:	R1: A map showing the locations of free distributors or oxygen sales is required. R2: It is required to be able to see the prices of the oxygen.
Sprint 2:	R3: It is required to know the stock in each store. R5: Login is required for people interested in accessing the app.
Sprint 3:	R6: The system is required to have a list of users for administration. R4: It is required to know the information of the companies and the products in a detailed way.

C. Project Prototype:

Below are the prototypes related to the project requirements.

To Requirement 1:

It shows us the mapping of Lima - Peru with the points where industrial sales oxygen can be found in the orange triangles and the points of free distribution in the green triangles, as shown in Figure 1.

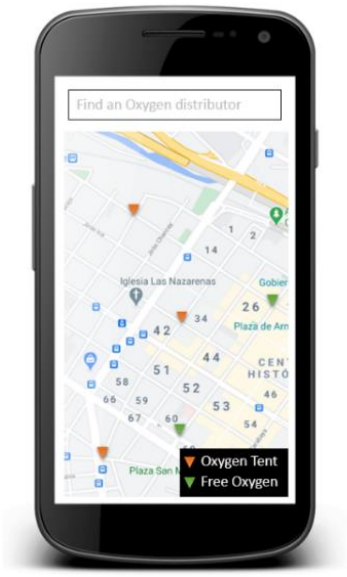

Figure 1: **Oxygen location by the district.**

Requirement 2 and 3:

It shows us the list of all available products, the quantity of each oxygen tank model, plus the price, as shown in Figure 2.

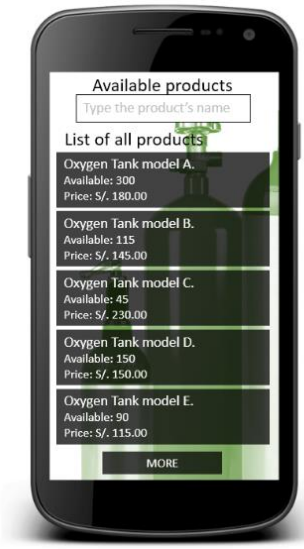

Figure 2: Product list and availability.

Requirement 4:

It shows us detailed information of the Oxygen Provider, technical information of each model, as shown in Figure 3.

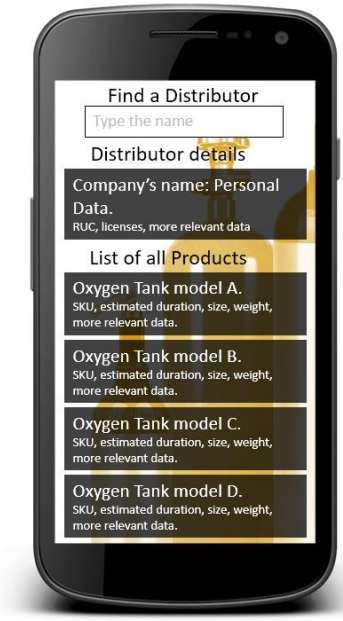

Figure 3: **Oxygen provider**

Requirement 5:

It shows us that the person needs to log in with his or her username and password to access the application or register in the application in order to log in, as shown in Figure 4.

Figure 4: **Oxygen App Login.**

Requirement 6:

Figure 5 shows basic and recorded information on the application of the people who sought and received industrial oxygen.

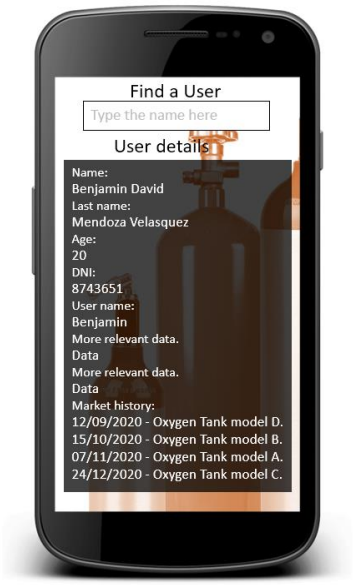

Figure 5: User details

IV. CASE STUDY

The Scrum methodology refers to an iterative process for managing products or software development; if diligently applied, several benefits: reduced costs, better return on investment, fast results, delighted customers, more joy, and confidence to succeed in a complex world [10].

Software development is a framework designed to achieve effective team collaboration in projects, which uses a set of rules and artifacts and defines roles that generate the necessary structure for its proper functioning [11].

One of the facilities of the methodology used in the meetings, in which it facilitates the decisions to be taken since in each meeting we have a retrospective of what was advanced until that moment, also solving the problems that were found in the process of the development of the project and thus the whole team raises solutions and corrects the problem, and thus in each deliverable or sprint, it is improved to what was developed in the previous sprint.

A. About the case study

The Scrum methodology was applied to the project, resulting in a list of Sprint, which should be developed in order for the software to have a progressive development.

The first sprint contains the oxygen distributor location data and the prices, detailed in Figures 1 and 2, respectively. Knowing the location of the distributors is the most important function of the application since it allows customers to go to the premises in the early stages of development. Displaying prices is another important functionality since it allows users to choose where to go.

On the other hand, the second sprint contains the stock of oxygen available in each distributor, and the list of users for the administrator, detailed in figures 2 and 4. The stock is important so that users can know the remaining number of units available, allowing them to estimate the time they have before the model they want in the distributor runs out, or, if there are very few of them, to look for another distributor, as they may have already run out when they arrive. In addition, the login is relevant for collecting information from users, such as products purchased, searches by model, etc.

Finally, the third Sprint, developed in Figures 3 and 5, contains the user list functionality and distributor details.

The list of users is necessary for the information reports to know which distributors sell more, which prices users prefer, who buy more, etc. The distributors' information adds information about licenses, years of experience, list of tank models available, as well as technical details of each model they distribute, being of great importance if any user needs a specific model of an oxygen tank.

B. About the methodology

From the point of view of the Scrum methodology, it is a framework where a set of practices and tools are applied to work in self-directed cooperative teams in order to obtain the best result from a project [12]. However, it is not feasible to talk about universal methodologies that can be successfully applied in any software project, but any methodology must be adapted to the context in which the project is located as the time of development, human resources, among others [13].

One of the facilities found were the meetings since they make the decisions giving them a facility, were made a retrospective of the progress scheduled, also resolved the difficulties encountered in the process, the team poses solutions thus helping to solve the problem more efficiently. The issues addressed during the process were discussed by team members helping to improve progress and resolve difficulties encountered in the development path, giving us the facility to adapt to changes that are found and not delay with the deliverables.

C. About Comparison between SCRUM and traditional methodologies

The current agile development methods, formalized in the Agile Software Development Manifesto, were known during their evolution as light methods, as opposed to traditional, heavy, or bureaucratic methods. One of the principles of the Agile Manifesto is to welcome changes in requirements, no matter when they occur. An obvious difference between this type of method (agile) and traditional (or heavy) methods is that they generate much less documentation. Agile methods are code-centered so that the code becomes the main documentation of the project [14].

SCRUM, unlike traditional methodologies, is adaptable to

changes, allowing improvements and corrections to the initial model throughout the development of the project. On the other hand, traditional methodologies adhere to the initial model, preventing rapid changes, which, if made, require a complicated process to be accepted.

A traditional methodology only delivers the project when it is finished, whereas an agile methodology such as SCRUM delivers functional versions of the software constantly, allowing the organization to obtain value from an early stage of the application.

V. CONCLUSIONS

A conclusion section is not compulsory, but we The mobile mapping system's main objective is to provide the location where you can obtain oxygen balloons, through the mobile application, the user can know the exact location where you can get oxygen balloons, in the mobile platform you can view in detail the history of people who received oxygen, as well as shows us the information of people who provide oxygen, the sale price of the balloons or if it can also be obtained for free, depending on the district where you are.

The Scrum methodology was applied throughout the development, achieving an adaptive process, which was fundamental for this project since there was no fixed path for development.

For future projects, it is recommended to extend the service to more relevant products for the medical treatment of patients of Covid-19, also implement functionality to buy or order oxygen online, avoiding the need to go to the establishment to obtain the product.

REFERENCES

[1] Mahalakshmi, M. and Sundararajan, M., Traditional SDLC Vs. Scrum Methodology: a comparative study. International Journal of Emerging Technology and Advanced Engineering, 3(6)(2013) 192-196.

[2] Srivastava, A., Bhardwaj, S., & Saraswat, S., SCRUM model for agile methodology. In International Conference on Computing, Communication and Automation (ICCCA)(2017) 864-869. IEEE.

[3] Cadavid, A. N., Martínez, J. D. F., & Vélez, J. M., Review of agile methodologies for software development. Perspective, 11(2)(2013) 30-39. Network of Scientific Journals in Latin America, the Caribbean, Spain, and Portugal.

[4] ft n il Ionel, N., Critical analysis of the Scrum project management methodology. The Academy of Economic Studies Bucharest., (2008).

[5] A. N. Cadavid, J. D. F. Martínez, and J. M. Vélez., Revision of methodologies´agiles for software development, Prospectiva, vol. 11(2)(2013) 30-39.

[6] Srivastava, A., Bhardwaj, S., & Saraswat, S., SCRUM model for agile methodology. In International Conference on Computing, Communication and Automation (ICCCA) (2017) 864-869. IEEE.

[7] Rahayu, P., Sensuse, D. I., Fitriani, W. R., Nurrohmah, I., Mauliadi, R., & Rochman, H. N., Applying usability testing to improving Scrum methodology in developing an assistant information system. In International Conference on Information Technology Systems and Innovation (ICITSI) (2016)(1-6). IEEE.

[8] Ariza, H. M., Mozo, V. R., & Quintero, H. M., Methodology for the Agile development of software based on a guide for the body of knowledge of scrum (SBOKTM Guide). International Journal of Applied Engineering Research, 13(14)(2018) 11479-11483.

[9] MEX-ALVAREZ, D. C., HERNANDEZ-CRUZ, L. M., CAB-CHAN, J. R., & ROMERO-HERNÁNDEZ, O. F. Development of the Sisconve website with the Scrum methodology Journal of Information Technology, 17.

[10] Vogelzang, J., Admiraal, W. F., & van Driel, J. H., Scrum methodology as an effective scaffold to promote students' learning and motivation in context-based secondary chemistry education. EURASIA Journal of Mathematics, Science and Technology Education, 15(12)(2019) em1783.

[11] Godoy, D. A., Design of a Dynamic Simulator for Software Development Projects using Scrum methodology (Doctoral dissertation, Universidad Nacional de La Plata)., (2015).

[12] Becerra, J. C. A., & Vanegas, C. E. D., Proposal for a method to develop Geographic Information Systems based on the agile development methodology-SCRUM. Cuaderno Activa, 10(2018) 29-41.

[13] Kuz, A., Falco, M., & Giandini, R. S., Understanding the applicability of SCRUM in the classroom: tools and examples. Revista Iberoamericana de Tecnología en Educación y Educación en Tecnología, (21)(2018) e07-e07.

[14] Armijos, A. F., Ordoñez, A. F., Villavicencio, M., & Abad, C. L., Application of Scrum in the construction of a Redis simulator. Revista Tecnologica-ESPOL, 28(5)(2015).