

Software Program Solution for a Speech Therapy Center

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Abstract — *Given the need for new alternatives to facilitate the operation of businesses, technological structures continue to be designed to promote the best workload flow. Many choose to find everyday common solutions available to everyone, but it becomes a bit complicated over time or create new needs in the future. This project is in fact a software program designed to be offered as a solution to these common needs. Methodology starts with interviewing a speech therapy center administrator, to identify several workflow issues. The program was designed with the end user in mind. It consists of six interactive modules. Results were a reduction or elimination of spreadsheet files, file cabinets, and forms in word processing programs. It will store all the data into a database, which will improve searchability, scalability, accuracy and time.*

Key Terms — *Development, Management, Program, Software.*

INTRODUCTION

While businesses are emerging, workflows are diversifying and growing. As these workflows diversify, new processes need to be created and designed to fit the operational needs. Most people would go for traditional methods. For example, if there is a need to keep records, spreadsheets are created; on the other hand, if there is a need to keep notes, people would normally choose physical notes, or create digital documents in word processors. However, when business volume is increasing, the effectivity keeps decreasing due to the difficulty of record tracking, organization difficulties, and human errors.

This is the reason why many managing software programs are created, to minimize human errors, maximize productivity, and improve business workflows and workloads.

The purpose of this project is to implement a user-friendly software program solution for a speech therapy services center to minimize or eliminate the need for physical and separate digital data storage and create a centralized system to improve business workflow.

Background

The reason the researcher chose this project is due to his nature of giving people the best solutions a computer professional can give based on academic knowledge and experience.

Since the researcher was a kid, his family bought the first computer, so he was exposed to technology. Since then, grew an ongoing interest in how these things worked. Always wondered how the internet worked, how computers worked before having what they had at that moment, and how so many processes were managed. It was all so fascinating. Having that interest, it grew the desire for learning how to use the computer.

Every day after school, the researcher sat at the computer to explore every accessory that the operating system had. At that time, researcher's father had a business which had offices with many computers. The business had subcontracted a computer technician, who gave maintenance and technical support. Some of the times researcher went to the offices, he watched how the technician worked in all the computers and was beginning to learn how to interact with each one. The technician once taught the researcher personally how to make shareable files between computers and thought that was very fascinating.

As the researcher grew up with his family, they got different computers set up and he was the one that wanted to configure the operating systems and setting up everything. If there was an issue, he

always tried to the best of his knowledge to resolve any issue that the computers had.

When finishing high school, researcher decided to study Network Technology and Software Development. When finishing his bachelor's degree, he was eager to keep learning, so went and did an internship program that introduced him to the technology industry.

When the researcher landed his first job in the study field, he focused majorly on the business needs. The researcher felt accomplished every time that a feasible solution to common problems was offered. For example, making shareable network points, making simple scripts, installing endpoints, installing, and configuring network attached storage, configuring an FTP server, etc.

He maintained the same focus between different jobs. Also strived to make his best contributions and improve the businesses workflows.

This same desire to help people and to give contributions to businesses is what drove the researcher to decide to work on this specific project. It was the researcher's way to help his sister's business, which is a speech therapy center. The research began analyzing its business profile, business needs, workflows, storage processes, scheduling processes and record keeping.

Several workflow issues were found, which are being described in the next section.

Problem

When analyzing the mentioned key points of the business, the following problems were found:

Business organizes their data in:

- Spreadsheet files
- Forms created in word processing programs
- PDFs
- Physical File Cabinets

The use of spreadsheets can be an effective way to keep patient records and document any data in an organized way. The disadvantages come when it has a high volume of data. Searchability can be a little problematic and data can be accidentally modified if not instructed programmatically.

The use of word processing programs for creating forms can be an organized way to fill essential information and store it whether digitally in PDF format or physically. It can become complicated once the volume of patients increases and begins to give space difficulties, such as buying more filing cabinets or investing on more computer storage because each individual file can incrementally fill the computer's storage.

Components

Software Components

The operating system used for the built software program was Windows 11. The system was developed in NetBeans IDE, using Java as the programming language.

It was designed with the end user in mind, so that the program could be interacted with easily. Its graphical properties were designed with Java Swing components.

Swing is a Java Foundation Classes [JFC] library and an extension of the Abstract Window Toolkit [AWT]. Swing offers much-improved functionality over AWT, new components, expanded components features, excellent event handling with drag and drop support [1]. It provides a more comprehensible design view which helps the developer build graphical window frames in much less time. It does not depend on declaring explicitly each component, but only just interacting with graphical components and designing the window as desired while the code that oversees making this window visible as designed, is being automatically generated.

The system will store its data in a local MySQL server database which was created before building the system. It will receive user input and store it in different tables which will be described in the next section.

MySQL is the most popular Open-Source SQL database management system, is developed, distributed, and supported by Oracle Corporation [2].

The reports that the built software produces were designed with JasperReports library. It receives

data from the local MySQL database, to later transfer it to the designed report.

JasperReports library is a Java library that offers an interface to the JasperReports library reporting engine. This library is the engine at the core of the iReport Designer, Jaspersoft Studio, and JasperReports Server. In addition, it is embedded in thousands of applications around the world [3].

METHODOLOGY

The first approach of designing this project was analyzing the business's workflow. Starting with the data that they collected when registering a new patient, such as, name, school, parent or legal guardian name, telephone, type of therapy, frequency of therapy, and the duration of the therapy.

The next approach was interviewing the business owner on how the appointments were scheduled. The data collected should be, name, person in charge name, telephone, desired service, date, time, available therapist, and location of therapy.

Lastly, when creating private invoices, the information that should be on the invoices is, name, telephone, given service, cost of service and taxes.

Program Creation

The first thing created was an SQL database. This database was created installing the MySQL tool to create a local server and then configure it. Then proceeded creating a table named "registro_paciente" which will receive the following data, ID, name, age, legal guardian or parent name, telephone, therapy frequency, therapy duration, and type of therapy.

Then another table was created and named "time_schedule" which receives the following, ID, name, parent or legal guardian name, telephone, date, time, therapist name and location of therapy.

Lastly, a table was created for the invoices named "facturación" which receives the following, invoice ID, name, telephone, service, cost, municipal tax, and state tax.

When gathering all the information, the program was designed and takes form in the following modules:

- Login
- New Patient
- Find Patient
- Schedule
- Reports
- Invoice

Login

This module receives a pre-created user and password. If user or password incorrect, it will not give access to the program. Figure 1 shows the design.



Figure 1
Login Page

New Patient

This module receives input from user of all the information of patients such as Name, phone number, parents' or legal guardian information, age, school, type of service, frequency of service and duration. Figure 2 shows the design.



Figure 2
New Patient Module

Find Patient

This module can find a record stored in the patient's database. It can find a record by ID, phone number, or name. Once found, it will populate the text fields with the found information and gives the user the ability to edit and update information. It can delete records from the database. It can also jump to the Schedule module or to create a new record by jumping to the New Patient Module. Figure 3 shows the design.

Figure 3
Find Patient Module
Schedule

This module integrates the Find Patient Module and populates the Schedule module text fields depending on the selected record. It adds new data inputs, such as, date for scheduled therapy, time, location, and the name of the therapist to be stored in a different table for producing a separate and centralized schedule. Figure 4 shows design.

Figure 4
Schedule Module

Reports

This module gives the user the ability to export reports, depending on the data needed now. Figure 4 and Figure 5 show samples of reports.

Citas Coordinadas						
Nombre	Encargado	Teléfono	Fecha	Hora	Terapeuta	Lugar
Josee Maldonado	Lilian Santiago	787-494-3003	11-09-2022	5:00 PM	LUCYBETH MALDONADO	ESCUELA
Mark Mercado	Mario Mercado	787-342-0432	10-17-2022	3:00PM	DIANA RIVERA	ESCUELA
Joseph	Lilian Santiago	787-2036830	10-03-2022	8:00AM	LUCYBETH MALDONADO	CENTRO
JOSE GINTRON	WANDA CRUZ	787-943-9393	10-05-2022	5:00 PM	LUCYBETH MALDONADO	ESCUELA
Tatiana Suarez	Myma Ortiz	787-315-7661	10-09-2022	3:00 PM	LucyBeth Maldonado	CASA

Figure 5
Appointments Sample Report

Encargados		
ID	Nombre Encargado	Teléfono
1	Mario Mercado	787-342-0432
2	Lillian Santiago	787-494-3003
3	Lillian Santiago	7872036830
4	Luis Davila	787-203-6830
5	Johanna Rosario	7874843003
6	WANDA CRUZ VAZQUEZ	787-943-9393
8	Wilma Ortiz	787-777-7777
9	Myma Ortiz	787-315-7661

Figure 6
Parents or Legal Guardian Sample Report

Invoice

This module is to create private and individualized invoice. It gives the user the ability to input, name of person to which invoice is created, telephone, service received, quantity of times, and the cost of the service. And finally click on the print button to generate the invoice. Each invoice is stored in a separate table, which can be newly created, modified, but not deleted. Figure 6 shows sample invoice.

Invoice		
Therapy Center 123 Elm Street Great City PR 00000		Telephone: 787-555-5555
No. 4		Monday 03 October 2022
Bill To: Juanito Del Valle		Telephone: 787-656-6666
Description	Qty	Amount
Estudio Supervisado	1	\$ 300
Municipal Tax:		\$ 4.50
State Tax:		\$ 30.00
Total:		\$ 334.50

Figure 7
Sample Invoice

RESULTS AND DISCUSSION

As the program was finished and tested, it can be said that it brings a complete workflow when it comes to record keeping and scheduling needs.

It successfully stores the data that is entered into the MySQL database. The data can be created, edited, updated, and deleted. It can also be printed if desired.

A menu page and a report menu page were also created for the end user to interact and enter the different modules as desired. It works as intended and make the user interaction an easy and friendly experience.

It eliminates the need for using spreadsheets and migrate this workflow to this new system. It eliminates the use of invoice templates and word processing form templates for record keeping.

It be said that the project can be improved in a lot of ways, it has a good backbone, but it needs further testing for discovering issues or new needs that can improve the workflows further.

CONCLUSIONS

This project has been one of the most challenging tasks yet. It has been very fruitful and a learning cue.

The fact that this is the researcher's first exposition for a full project has driven him to dive deep into researching many details that seemed simple but required him to investigate java syntax information, installation guides, instructional videos, etc.

This project has given the confidence to tackle any project that comes by. It has given a lot of skills even though researcher's skillset is not programming oriented, but in other fields of technology, such as, networking, end user support, operating system support and so on.

Future Work

The program needs improvements as mentioned before. In the future, a more complete, secure and robust login module could be implemented along with connection to an SQL table that stores user information. A user creation module and a forgot password module would be added.

The scheduling module would be improved adding constraints to avoid overlapping appointments. More reports would be added as other data needs emerge.

The program could also be improved by adding multiuser support, for to have a server computer managing the software and implementing a centralized database that other endpoints could communicate with and store, edit, update, and delete data, depending on-demand needs.

The possibilities of improving this software program are endless.

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