Assignment 1 - Project Scope and Proposal

SE 639: Software Project Management

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# Work Summary

Each team member researched each question individually before meeting up to share their findings. After debating and gathering insight for each question, the parts were divided equally between team members. The team met twice to assign sections and perform a group review.

* Steven Greulich
  + 1.1.1 How the Business Works
  + 1.1.2 What Will Be Improved
  + 1.2.1 Business Goals & Differentiators
  + 4.2 Define the goals of change in business terms
  + 4.3 Define the system change objectives.
* Shaima Albugami
  + 1.2.2 Core competencies
  + 1.2.3 Key Performance Indicators
  + 3.1 System Scope
  + 4.4 Success criteria.
* Michelle Ibarra
  + 2.2 Explore new business opportunities
  + 3.2 Define IT System Objectives
  + 4.5 Assumptions, Risks, Obstacles.
  + Created file structure and provided comprehensive revision.
* Yiyun Zhang
  + 2.1 Problem Analysis
  + 2.3 Summary of the Main Priorities for Change
  + 4.1 Define the main problem(s) and opportunities for change.

# 1. Business Overview and Processes

## 1.1 Business Overview

## 1.1.1 How the Business Works

The Philadelphia Medical Group is a care clinic that has been serving the greater Philadelphia area for the past 75 years. With their operation running seven days a week, there is always a constant flow of patients that are seeking care. This section will share priority business workflows.

When a patient first decides that they need to seek medical help from the Philadelphia Medical Group, they have the option to either call during business hours to schedule an appointment or to walk right in. While walk-in appointments are always accepted, Philadelphia Medical Group prefers patients to call ahead so that they can schedule out the day compared to being overwhelmed with an influx of patients. Once a patient arrives in the office, the receptionist has the patient fill out the necessary forms prior to being seen by the medical staff. These forms could be a series of new patient forms or a questionnaire of what brings them into the office today. Once the patient completes the forms, the receptionist will begin the process of making copies of the forms for record keeping.

Once an available medical staff member is available, they will bring the patient to one of the examination rooms, in which a registered nurse will begin taking a series of vitals such as blood pressure, heart rate, temperature, pulse, etc. After the vitals are complete, the nurse will start filling out a questionnaire revolving around the patient's reason for visiting the office today. Once the form is completed, the nurse then dismisses themselves and lets the patient know that the doctor will be seeing them soon. Prior to the doctor entering the room with the patient, they review the notes taken by the nurse and will then proceed to continue in diagnosing the patient.

If a referral is needed, the doctor will provide the details of the office to the patient. The staff will then proceed to either fax or mail copies of the patients records to the referred office. If a prescription is needed, the doctor will write the prescription out to the patient. The patient will then need to bring that prescription form to a pharmacy, in which it will get filled and handed off to the patient.

Based off the course of action taken, the doctor will follow up after a predetermined time with the patient to see how they are doing and whether a follow up visitation to the office is required. Patients that are prescribed long term medication need to routinely visit the office to get a signed prescription form to get their medication refilled at the pharmacy.

## 1.1.2 What Will Be Improved

With the implementation of the new information system, the Philadelphia Medical Group will benefit from a more exact and readily available means of executing their businesses process. As seen in Figure 1, the scope of the system is shown by the red boundary. Anything within this boundary will be considered in scope of the system while anything outside will be considered as out of scope. While the overall process flow will remain relatively unchanged at the conceptual level, the ways of doing them will be re-implemented.

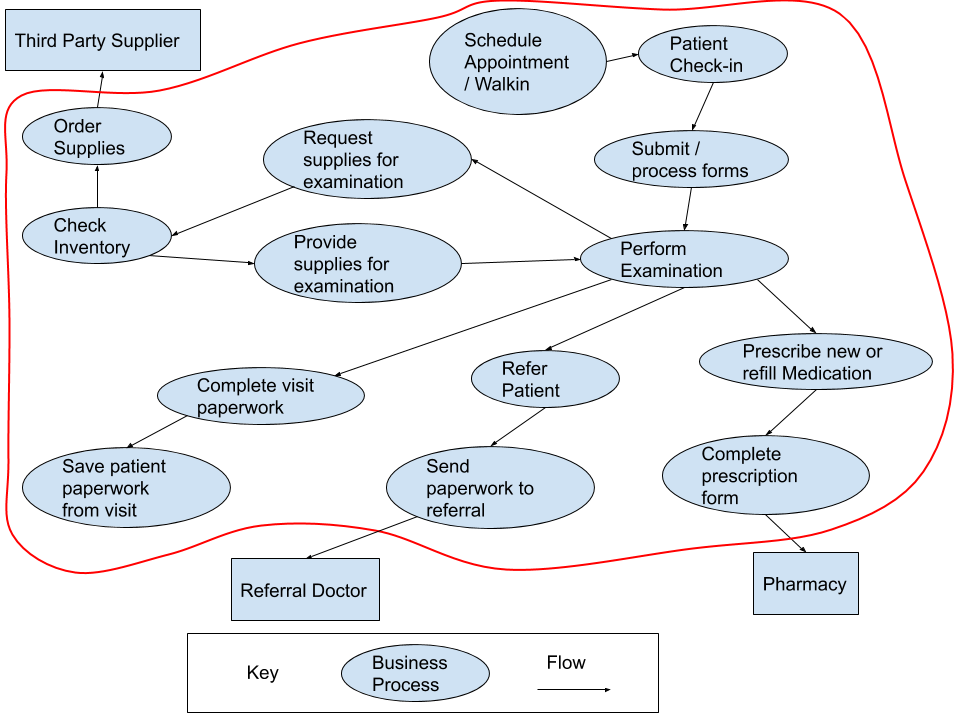


Figure 1: High-level process flow at the Philadelphia Medical Group

The way that the medical office is working today is relying on manual processes which are prone to human error and slow. These three issues can cause patients to potentially go to other offices and introduce the risk of losing business. Having a system that is readily available and digitized can minimize the amount of human errors by having a series of system validations in place.

## 1.2 Business Processes

## 1.2.1 Business Goals & Differentiators

The Philadelphia Medical Group prides itself in its friendly medical staff that always has the patient's best interest in mind. To ensure that they are always there for their patients, the Philadelphia Medical Groups business goals are:

* Making sure that all walk-in appointments are seen to in a timely manner.
* Providing the ability to schedule appointment ahead of time to minimize wait time in the office
* Being readily available to other medical offices that need information on a patient quickly.
* Ability to fill / re-fill prescriptions with minimal wait time.

## 1.2.2 Core Competencies

Doctors, nurses, and staff need to be trained to provide better patient care by respecting their patients and understanding their needs. They need to provide the patients with the healthcare and be able to communicate clearly with them. Moreover, doctors, nurses, and staff need to collaborate among themselves effectively to provide patients holistic healthcare. This can be achieved by utilizing the new system. To ensure that the system will meet all the business goals, we need to guarantee all the targeted users are involved in the transition process to validate design and development decisions. Having a good change management team is crucial to facilitate a smooth transition to the new system to ensure sure the new system meets the targeted users' needs and match their customer process. Training should be provided to doctors, nurses, and administrators to use the system and not have trouble using it in the future. Involving the targeted users in the process by having a change management team and training them will ensure utilizing the system to meet business goals. Maintenance is required to monitor the performance and fix errors, if needed. Finally, good quality management is needed to ensure better care and fewer errors.

## 1.2.3 Key Performance Indicators

The KPI's listed below will measure the success of the clinical system.

**Measure the number of patient's compliant calls and walk-ins monthly.**

Determining the number of complaints received by the patients through phone calls or in-person. Keeping track of the number of complaints will help in managing system performance. Measuring this will help us reduce the number of complaints. A survey is given to patients after calls and walks-in to have additional information.

**Generate a summary report to determine the number of patients visiting each month and their assigned doctors**

Tracking the number of existing patients and new patients visiting each month and the doctors they were assigned to. This will give Philadelphia Medical Group insight into whether we are retaining our existing patients and attracting new ones. It also helps in identifying our most valued doctors, which helps in providing incentives to retain them.

**Survey employees to get their feedback on the system in use**.

To know the new system's impact, we will survey our employees to get their feedback on the business processes before and after using the system. Three surveys will be administered. One before the release of the new system. Once the new system is release, two surveys will be sent out three months and six months after.

**Calculate the churn rate of patients returning to the clinic and patients who choose another clinic monthly.**

By calculating the churn rate, we will understand the impact of the system on our patients, whether positive or negative. Churn Rate = (Expected Visit Count – Actual Visit Count) / (Expected Visit Count x 100) (Smith, J.,2020)

**Calculate the Average Inventory monthly**

This will help in analyzing inventory management performance. It helps calculate the inventory in the stocks at a particular time to avoid sudden overstock or understock: Average Inventory = (Current Inventory + Previous Inventory) / Number of Periods (Average Inventory, 2020)

# 2. Opportunity and Problem Analysis

## 2.1 Problem Analysis Table

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Problem | Affected Business Processes | Affected People & Groups | Consequences | Work process changes needed | IT Support Functions |
| Lost Medical records | Doctor’s writing order; healthcare staff fulfilling doctor’s order | Customers (Patients); Doctors | There is no backup or any efficient way to find missing medical records. Doctors must ask patients many questions again and again. Impacts patients' satisfactions and diagnostic efficiency. It may cause the violation of privacy and HIPPA laws, lawsuits and conflicts between patients and clinic cause revenue loss. | Recordkeeping of Doctor’s order; updating records with results from doctor’s order | Patient records module: integrate the CRUD database operation of medical records |
| Time consuming  process to schedule a patient appointment | Admin staff scheduling appointment | Admin staff; Customers (Patients) | Lose potential customers as callers don't want to be on hold for a long time in order to make an appointment | Creating an appointment portal for patients; Creating an appointment portal for Admin staff | Scheduling module: integrate the online appointment system with staff portal and patient portal |
| Long waiting times for walk-in appointments | Admin staff scheduling appointment | Customers (Patients) | Lose potential customers as walk-in patients don’t want to wait for a long time in order to receive treatment | Creating a check-in portal for patients | Scheduling module: integrate employee schedule system with patient portal |
| Inability to check which staff members are available at any time | Admin staff scheduling appointment | Customers (Patients); Doctors; healthcare staff | Lose potential customers as we cannot give an estimated waiting time | Creating an appointment portal for Admin staff | Employee records module:  integrate Doctor or Healthcare staff availability calendar |
| Wrong prescriptions and medications due to unclear handwriting | Prescribing medicine; Sending medicine; Filling prescription; Refilling prescriptions | Customers (Patients);  Pharmacist | Lose customers as patients no longer trust our services | Creating a prescription portal for doctors; Creating a patient portal to view open/closed prescriptions | Patient records module: integrate the CRUD database operation of prescriptions |
| Patients cannot review their medical record and referral information at any time | Doctor writing patient referrals to other Healthcare Specialists | Doctor; Customers (Patients); Healthcare Specialist | Patients must come to the clinic in person or call us to get their records or make modifications. This causes long waiting time during peak hours. Impact visit efficiency and customer satisfaction | Recordkeeping of Doctor’s order; updating records with results from doctor’s order. | Patient records module: integrate the CRUD database operation of medical records |
| Patients cannot receive their test results immediately | Sending test results; Filing test results | Customers (Patients) | Impact patients' satisfactions | Creating patient portal | Patient portal module: integrate the CRUD database operation of test results |
| Slow process for patients to pay their bills | Sending medical bills; Paying medical bills | Customers (Patients) | Lower budget every month due to smaller cash flow | Creating a bill portal for patients. | Payment and accounting module: integrate payment system with patient portal |
| Cannot check which medical equipment or medication is available | Doctor’s writing order; Healthcare staff fulfilling doctor’s order; Inventory management | Doctors; Healthcare staff; Pharmacist | Inability to perform exams and provide care to patients. | Creating an inventory management system.  Creating an inventory portal for doctors, staff and pharmacists | Inventory management module: integrate inventory reordering with staff portal |
| No Healthcare Performance Management Module | Doctor’s evaluation of Patient’s; Medicine, care, and treatments recommended or ordered by doctor | Doctors; Healthcare staff; Healthcare provider | Both doctors and patients have no way of knowing the overall treatment plan | Centralized and consistent record keeping of patient care, treatment and prescribed medicine | Report generation module: integrate treatment reporting across all processes |

## 2.2 New Business Opportunities

Transforming Philadelphia Medical Group’s manual business process into digital process introduces numerous opportunities to go after. The key is not selecting any opportunity, however, selecting the opportunities that will provide the best quality healthcare for its patients and help increase efficiencies in providing that care to patients. The table below describes the primary business opportunities identified at this time.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Opportunity | Affected Business Processes | Affected People & Groups | Consequences | Work process changes needed | IT Support Functions |
| Online Prescription Management | Prescribing medicine, sending medicine, filling prescription, refilling prescriptions | Customers (Patients), Doctors, Pharmacists | Shorter time lapse from prescribing to filling or refilling prescription. | Creating a prescription portal for doctors; creating patient portal to view open/closed prescription. | Integrating the doctor and pharmacy prescription systems; create, read, update, delete (CRUD) database operation of records; access and authentication method for verifying user prescribing and filling prescription. |
| Online Doctor’s order (e.g. bedrest, exam, bloodwork) | Doctor’s writing order; healthcare staff fulfilling doctor’s order | Doctor, Healthcare staff, Customer (Patient) | Shorter time lapse from the doctor issuing doctor’s order | Recordkeeping of Doctor’s order; updating records with results from doctor’s order. | CRUD database operation of records. |
| Online appointment | Admin staff scheduling appointment. | Admin staff, Customer (Patient). | Shorter time lapse of Patient booking appointment; risk in not scheduling the correct Physician or exam | Creating an appointment portal for Customer (patients); creating appointment portal for Admin staff. | Integrating the Doctor or Healthcare staff availability calendar with the online appointment system; CRUD database operation of records. |
| Online referral system | Doctor writing patient referrals to other Healthcare Specialists | Doctor, Customer (Patient), Healthcare Specialist | Faster care for patients | Connecting network of doctors to manage referrals. | CRUD database operation of records. |
| Healthcare Dashboard | Doctor’s evaluation of Patient’s; Medicine, care, and treatments recommended or ordered by doctor. | Doctor, Patient, Healthcare providers. | Providing more consistent care to patients. | Centralized and consistent recordkeeping of patient care, treatment and prescribed medicine. | Database management and data analysis services. |
| Increasing security and privacy of patient and healthcare records | Storage of patient and healthcare records. | Admins and Doctors | Access barriers to Personal Identifiable Information (PII) and private health data. | Determine what records are stored and what information is collected. | Access and authentication controls, Roles and Responsibilities, and Rules and Behavior documents. |
| Self-service check-in | Admins, Customer (Patients). | Admins and Patients. | Streamline patient check-in. | How Admins pivot to supporting self-service check-in. | Device for check-in, document check-in flow, and help service. |
| Virtual doctor appointment | Doctors and Patients going to the office to do patient evaluations. | Doctors and Patients. | Increase patient safety (e.g. incapacitated) and more appointments. | Service for doctors and patients to communicate. | Video and mic capabilities for the doctors and patients to communicate. |
| Online payments | Admins using carbon receipt books and reporting patient to insurance companies. | Admins, Insurance Companies, and Patients. | Minimizing lost payments receipts, increase speed of billing insurance companies, and payment to doctors. | Documenting patient care records and sending records the insurance companies for payment. | Creating billable patient care records for the insurance company and viewing payment status (e.g. paid or outstanding). |

## 

## 2.3 Summary

Based on our problem analysis, our priority is to establish an online appointment system. By implementing an online appointment system, we can process appointments from all customers at the same time. This way, walk-in patients will not leave due to the long waiting time and patient callers will not hang up due to the long hold times. The online appointment system is a key tool for us to prevent potential customer loss. After we deal with the customer loss problem, our next goal is to use technology to retain our current customers.

Building an online records management system (i.e. patient records) will be our second priority. An online records management system allows patients to review their medical records. Unlike paper-based medical records, we can back-up the records for a low cost in a short period time. Customers’ records will be safe from unauthorized personnel. Digital patient records will give patients the ability to review them at any time. This is key to increase our customers’ satisfaction and loyalty.

The next priority is to establish an online Doctor’s order system. Doctor’s would use this to prescribe medicine, order treatments or tests as well as make referrals. Patients can review their prescriptions and referrals at any time. After this implementation, an online payment system is our key to accelerate the post-visit process. Customers no longer need to wait for couriers to deliver paper-based bills to their homes and spend time following the payment instructions. Patient will be able to pay the medical bill online at anywhere, anytime.

An inventory management system would work if the previous two systems are successfully established. Moreover, doctors, healthcare staff and pharmacists will be able to check which equipment and medication is available at any time. This will create yield more order fulfillments, sales, and ability for patients to use the equipment or medication immediately. This inventory system will initiate the patient treatment process sooner. The report generation system will be a good tool for performance management based on doctors. Our last priority will be to maximize all individuals’ performance through generating a report from the system. This report will summary what can be improved, such as treatment methods, patient numbers, use of medications, etc. In conclusion, there are nine major problems defined in our business process. Our proposal is to computerize the existing data and develop a system which contains several subsystems able to perform corresponding functions - medical record, report generation, inventory management, online scheduling, accounting, and performance management.

# 3. Define the Scope of Change

## 3.1 System Scope

The project will develop a clinical system to computerize the existing paper-based system. The target users for this system are doctors, nurses, administrators, and patients. The new clinical system includes a range of modules that are needed to satisfy the clinic's needs. These modules are the patient records module, the employee records module, report generation module, inventory management module, appointment module, and payment and accounting module. The patient record module will include digitizing patient medical records, diagnosis, prescriptions, test results, and referrals. The employee records module will digitize the employee's scheduling and payroll. The report generation module will generate reports from the existing information to help in performance management. The inventory management module will digitize the inventory of medical equipment, vendor ordering supplies, invoicing, and payments. The appointment module will include appointment scheduling, appointment history, and virtual appointments. The payment and accounting module will consist of invoicing, payment history, and insurance claims. Moreover, we are not processing payments or invoicing.

The scope reflects the clinic’s need to digitize the paper-based system that is currently in use. These modules were chosen to be digitized based on the current issues that the clinic is facing. We believe that by digitizing these modules, the clinic will have better business processes with fewer errors. We also believe that it will help them expand quickly and manage their processes in a timely manner. The out-of-scope processes don't significantly impact how the clinic is performing now and can be done using their traditional approach. An example of that is the education and the training for the employees, which can be managed by the clinic administrators.

## 3.2 Define IT System Objectives

The defined objectives will help guide, provide parameters and help prioritize our design, development and business analysts' decisions. These IT System objective prioritize the primary business workflows that would increase efficiencies among the staff providing healthcare. Furthermore, these objectives align with our goal to reduce or remove communication barriers between healthcare provider in and outside of Philadelphia Medical Group. Lastly, these objectives will help Philadelphia Medical Group to increase the capacity of patients the company can provide healthcare to.

1. Ability for Patients to independently create, reschedule or delete appointments.
2. Accelerate patient check-in to increase capacity to see more patients.
3. Establish consistent documentation and recordkeeping of patient and healthcare records.
4. Increase transparency and access of patient healthcare records to the patients.
5. Create efficiencies of prescription process from the doctor writing the prescription to patient pickup.
6. Create efficiencies of doctors writing patient referrals.
7. Ability to inventory and order equipment and supplies for the care clinic.
8. Tracking how doctors are managing healthcare of patients such as reflecting patient history, administering tests or bloodwork, recommending treatment, etc.
9. Ability to view up-to-date payment status.
10. Implementing access and authorization security controls to maintain the privacy of patient and healthcare records.

# 4. Project Overview Statement (POS)

|  |  |  |  |
| --- | --- | --- | --- |
| Project Overview Statement | Project Name: PMG-Digitization | Project Number: PMG-001 | Project Manager: William James |
| Problem / Opportunity Philadelphia Medical Group, a healthcare provider, currently managing paper-based medical records and accepting appointments from both phone call and walk-in. Managing paper-based medical records is a huge challenge, accessing and storing those papers makes lost records unavoidable. They are also not accessible at any time. The slow process of calling to schedule an appointment and long wait time for walk-in appointments causes potential customer loss.  Administrators cannot check which staff is available at any time, while the doctors and pharmacist cannot confirm which medication or medical equipment is available at any time.  It is also clear that paper-based prescriptions often have unclear handwriting, sometimes it causes damage and revenue loss. Furthermore, paper-based test results and bills need to be picked up or sent out, the feedback and payment process often takes several weeks to complete. Another problem is both Doctors and pharmacists are not able to check the availability of medical equipment and medications.  There is also a problem, as there is no way of obtaining overall treatment plan and performance data.  There is an opportunity to solve these problems by introducing a computer-based information system to manage medical records and healthcare processes. | | | |
| Goal To provide interactions and information to its users when they need it. Whether it is a patient trying to make an appointment, a staff member looking up a patient's medical history, or an admin performing an inventory check, they will be able to perform their necessary tasks when it is convenient for them. The ability to interact with the Philadelphia medical group should not only permitted during business hours. | | | |
| Objectives With the computer-based system in place, we can expect the Philadelphia Medical Group and its patients to perform the following:   1. Patients to be able to book online appointments 2. Patients to be able to fill out and submit forms to the admins prior to coming to the office. 3. Ability for patients to check in upon arrival to the office 4. Ability to provide virtual visits for patients that prefer to remain in their dwelling 5. Staff members to be able to assess current inventory and order new supplies 6. Doctors to send prescriptions straight to patients' pharmacy 7. Ability for patients to view a history of their visit 8. Ability for Admins and patients to view payment status 9. Ability for doctors to send other medical office patient referrals | | | |
| Success Criteria  * Increasing patient satisfaction by 30% in the first 6 months by measuring patient satisfaction score from the surveys that are distributed online and in person. * The scheduling module will reduce the scheduling wait time to < 5 minutes * The system will provide accurate data by reduce the number of data error by 99% * Increase employee satisfaction by 50% in the first year of using the system by calculating the employee satisfaction score. * Increase the number of new patients by 10% in the first year. * Utilizing the employees time by 80% by spending less time on paperwork and more on patient care. * Retaining our patients by 60% in the first year by providing better customer services through faster appointments scheduling and better patient care. Calculating the churn rate will in identifying how many patients are returning to the clinic and how many did not finish their treatment plan. * Better inventory management and asset losses in the first six months by 80% by calculating the Inventory average | | | |
| Assumptions, Risks, Obstacles Assumptions - Michelle  1. Historical patient paper records will be scanned with optical character recognition (OCR) then attached to patient profiles.  2. Microservice strategy will be establish Application Program Interfaces (APIs) for exchanging of data between internal services (e.g. scheduling appointment, staff availability) and external services (e.g. referrals, send pharmacy prescriptions).  3. Doctors, Admins, Patients, and Healthcare Providers and users need little to no training to use new digital system.  4. External services (e.g. Pharmacy APIs) exist and function for data exchange purposes.  5. This system only takes the payment status into account. The payment, invoice, account processing performed by third party.  Risks  1. There is a potential for data inconsistencies if there are issues with the scanning of paper records with the OCR software.  2. An over extension of funds while maintaining existing business processes and developing digital business processes.  3. Inability to perform sufficient usability testing to validate digital business processes.  4. Failure to prioritize mission critical business processes for design and development.  Obstacles  1. Managing transition from analog business processes to digital business processes.  2. Streamlining a variety of analog business processes into efficient digital experiences.  3. Effectively communicating clinical and healthcare language to patients.  4. Effectively providing insurance companies the proper patient care records for payment. | | | |
| Prepared by: John Smith | **Date: 9/28/220** | **Approved by: Jane Doe** | **Date: 10/4/2020** |

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