Deliverable 3: Oasis Health Ventures Database Operations Modeling

Created by Anu Olawale

11/1/2023

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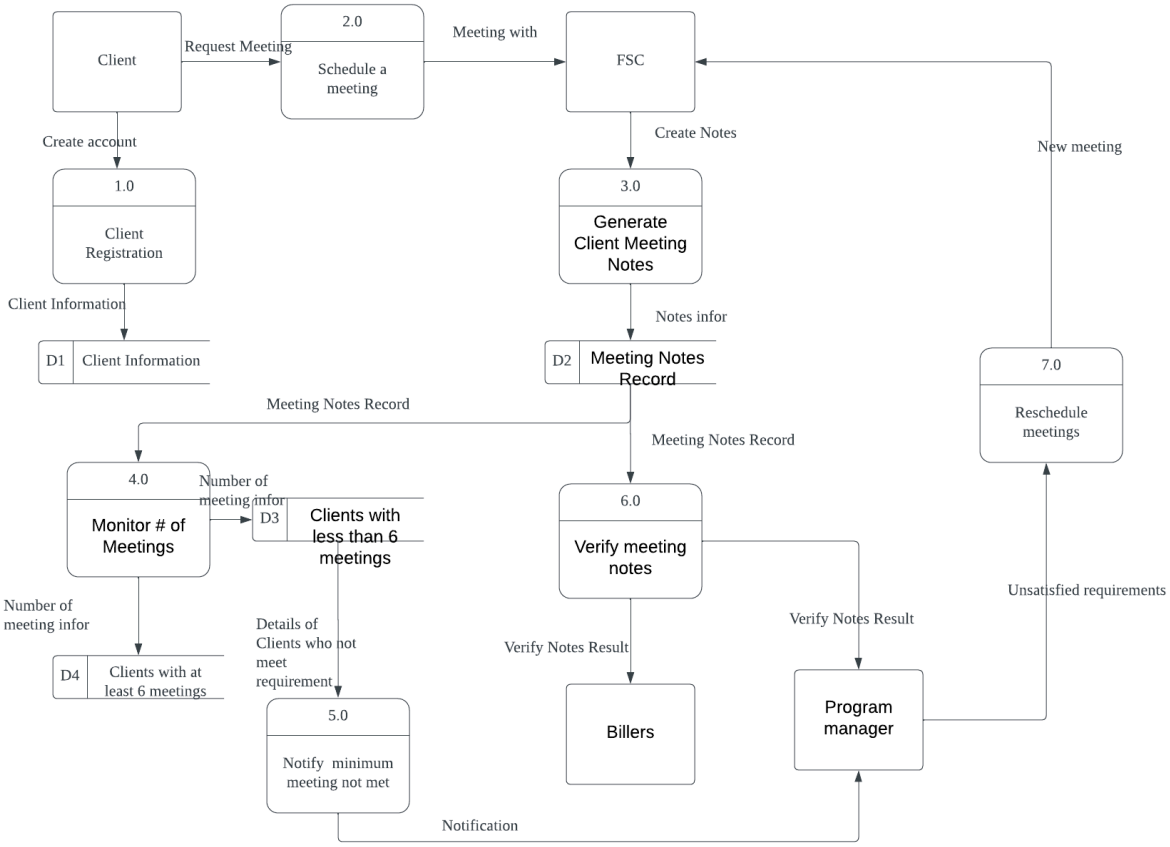
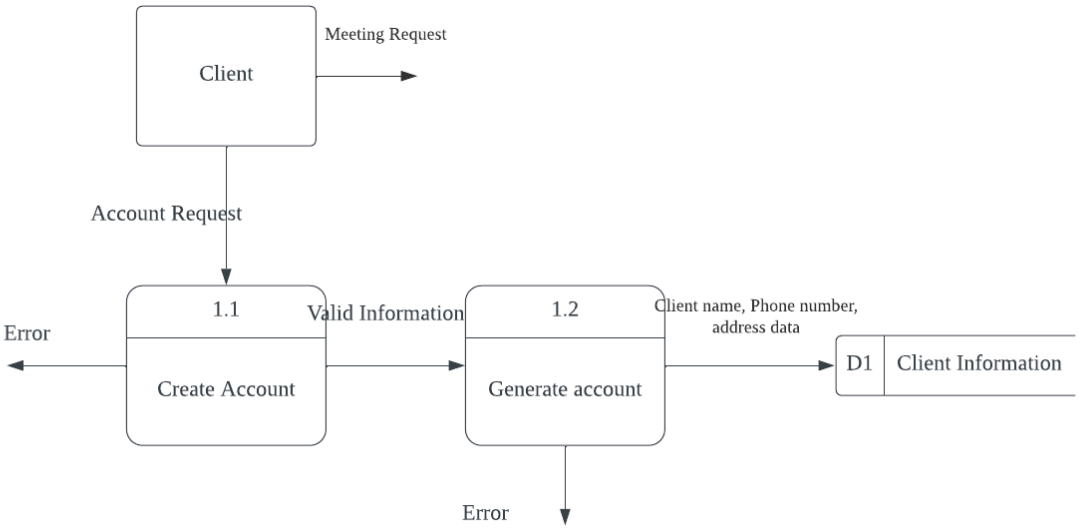
Data Flow Diagrams – DFDs

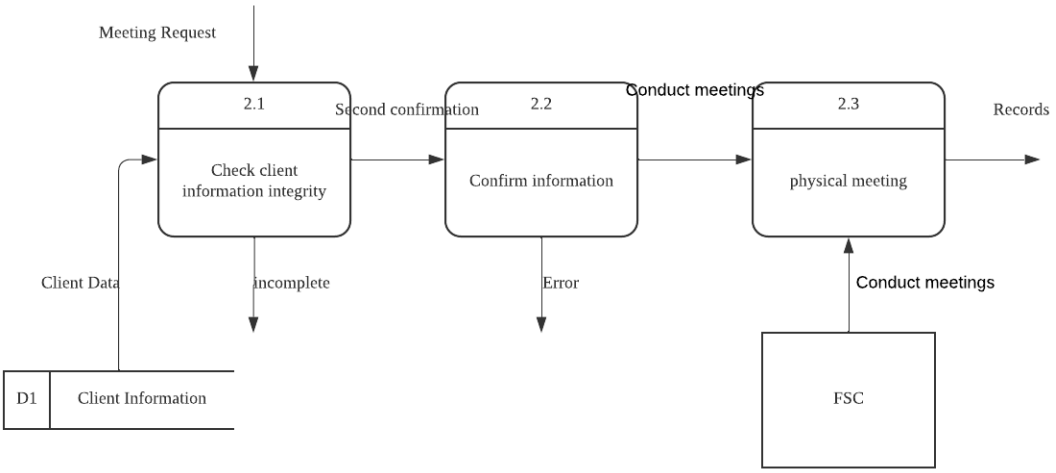
Level 0 Diagram



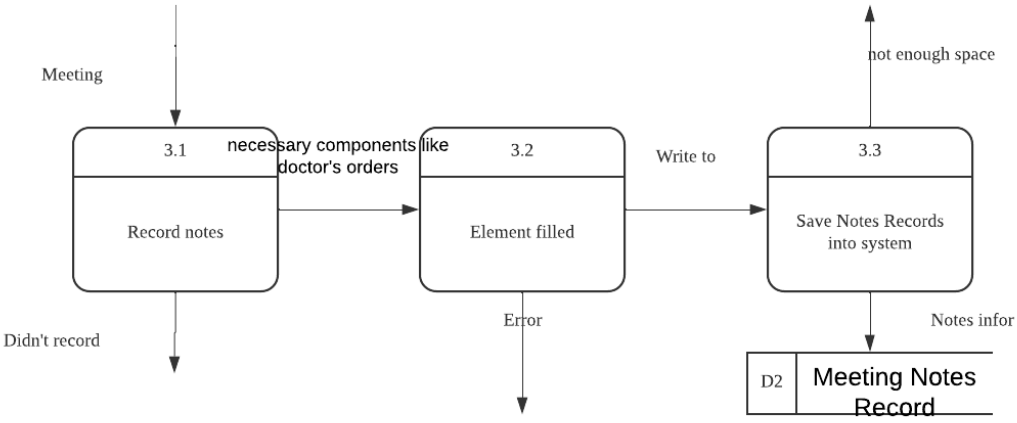
Level 1 (Child) Diagram



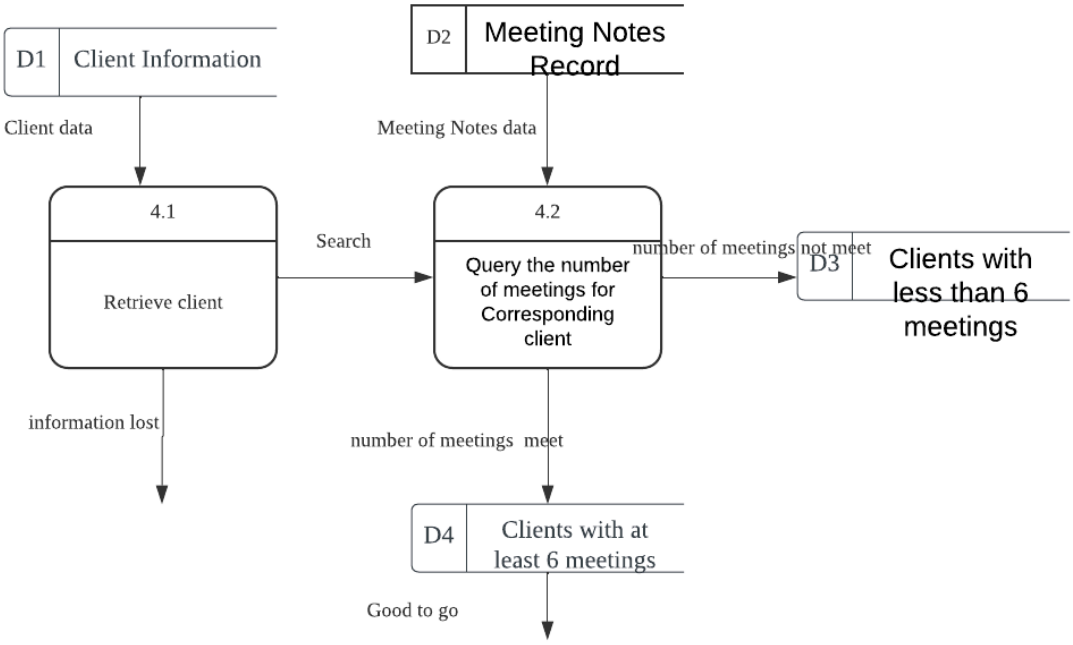
Client Registration Diagram (Level 1)



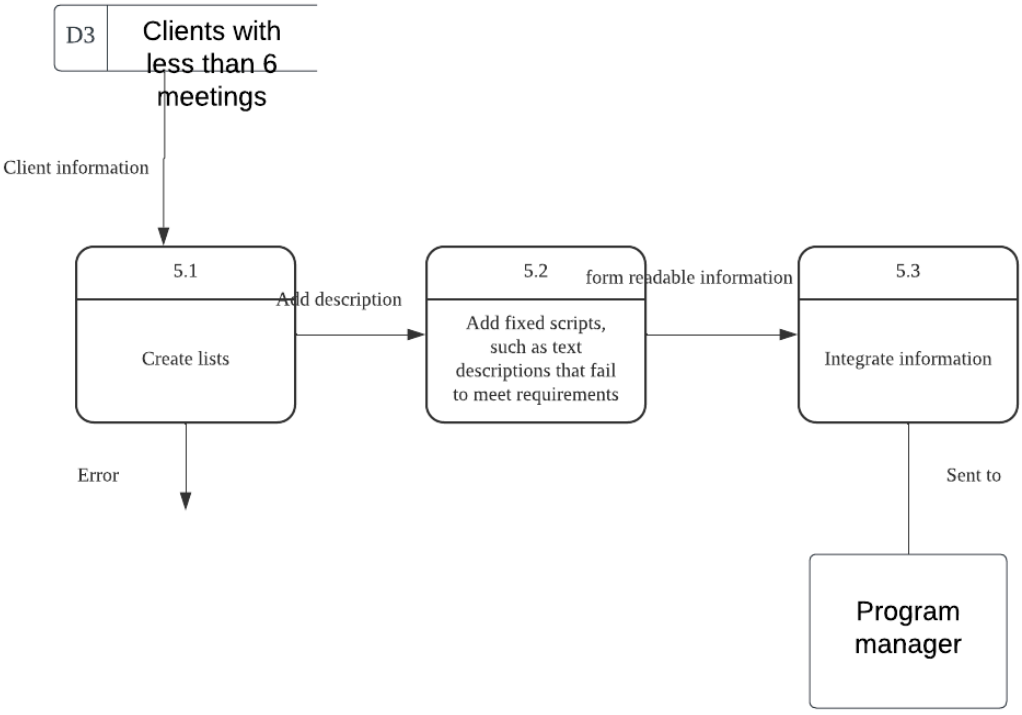
Schedule a Meeting Diagram (Level 1)



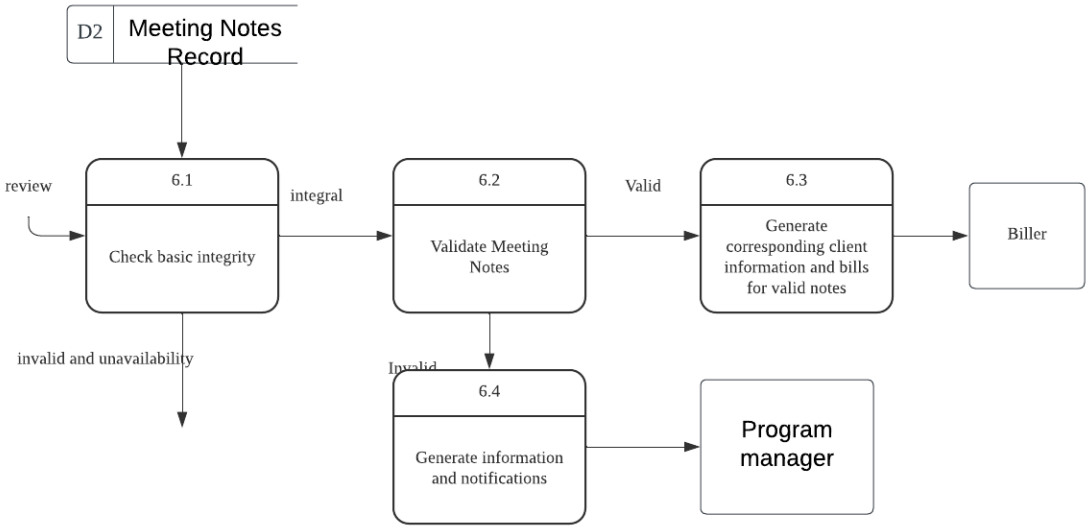
Generate Client Meeting Notes Diagram (Level 1)



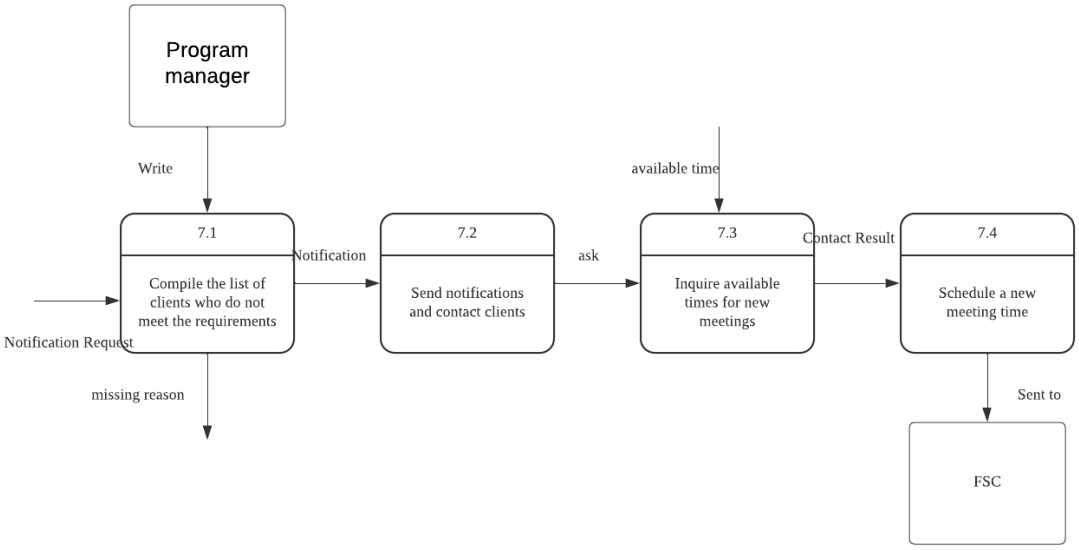
Monitor Number of Meetings Diagram (Level 1)



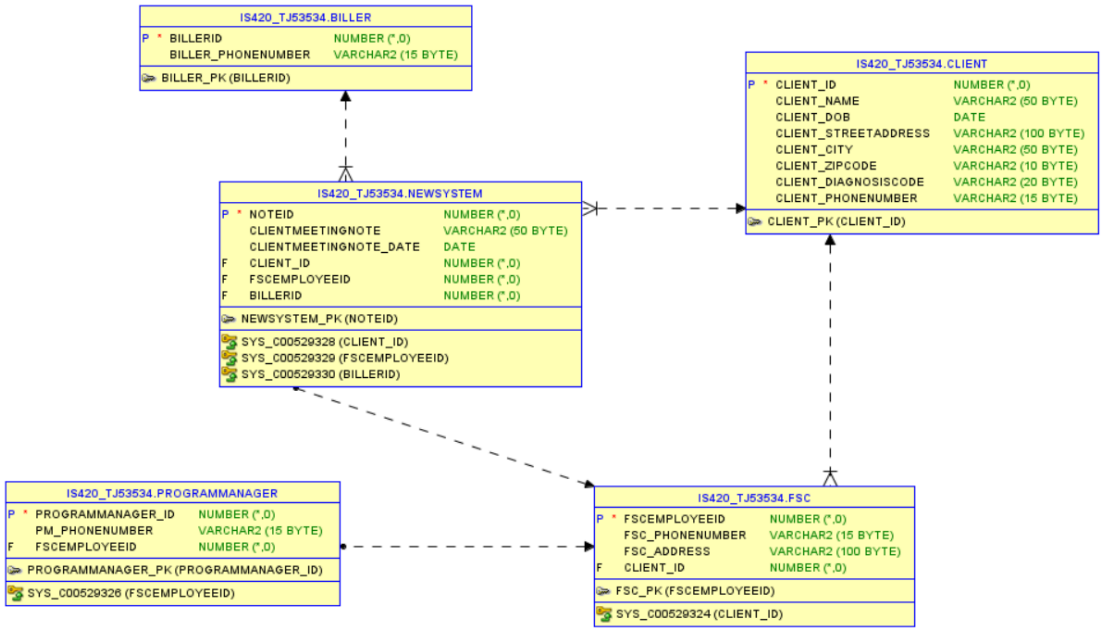
Minimum Meeting Requirement Not Met Notification Diagram (Level 1)



Verify meeting notes Diagram (Level 1)



Entity Relationship Diagram – ERD



Definitions

DFD Definitions

Billers: Biller employees responsible for managing bill expenses and statements

Client: Clients and patients participating in the oasis health ventures program

Client Registration: The client registration process requires the client's name, phone number, and address.

Client Information: Client data, stored in our new system, includes name, phone number, address

Clients with at least 6 meetings: Client information that meets the requirements and has 6 meeting records is stored by categories.

Clients with less than 6 meetings: Client information that does not meet the requirements and less than 6 meeting records is stored by categories.Ready to be attached to next process

Create account: use a website to create a client account

Create Notes:To create meeting records, there are many elements, such as client information, meeting content, doctor's order, etc.

Details of Clients who do not meet requirements: Specific information for clients who did not meet the minimum number of 6 meetings.

FSC:Family Support Counselors (FSC) employees. Including psychiatrists, therapists, and managers. Arrange meetings with clients and record meeting notes

Generate Client Meeting Notes:The process of recording notes at a meeting. FSC staff fill in the notes related to the meeting.

Notes information process of generate meeting notes, then store them into the system

Notify minimum meeting not met:Generate a notification that the number of meetings has not been met and ready for sending

Notification:A text description and a list of clients, usually sent to the program manager

Number of meeting infor:Information about the number of meetings for clients

Meeting Notes Record data flow: Use meeting notes to retrieve for the next process

Monitor # of Meetings:Check whether the number of meetings meets the requirements, the minimum number of meetings is 6

Program manager:Project sponsors, who typically keep FSC and client meetings on track monthly, will receive warnings and notifications

Request Meeting:Clients schedule a meeting with FSC staff by making an appointment

Reschedule meetings:Rescheduling a meeting with the FSC due to invalid meetings or the minimum number of meetings not being reached and more meetings need to be scheduled

Schedule a meeting:Arrange a meeting with date, location and personnel information given by FSC and client

Unsatisfied requirements:Unsatisfied requirements include less than 6 meetings, invalid and unapproved meeting notes, it means having too little content to meet the charging standards.

Verify meeting notes:Meeting notes that have gone through the verify process will get two types of notes, one is approved and can be sent directly to the biller, and the other is invalid notes.

Verify Notes Result: After verification, the results are decided to point to different roles.

Level 1 Child Diagram Definitions

Account Request: Checking to see if a patient already has an account in the system.

Create Account: Process creates a place for input of client information.

Client: Patients of Oasis Health Ventures.

Client Name, Phone number, address data: Flow of client information data from account generator to storage client information.

Client Information: Storage of client information file from account generator process.

Error: Error in the process due to missing information.

Generate Account: Creates a file of client information to be stored in a client information data store.

Meeting Request: Patient seeks out appointment with a counselor

Valid Information: flow of client data needed to complete client data information.

Client Registration Level 1 diagram
Check Client Information Integrity: Process checks client information for missing values, inconsistencies, and appointment conflicts.

Client Data: This is the flow of client data information from the Client information data store for process 2.1

Client Information: The storage of client information which includes things like name, number, and address.

Confirm Information: Confirm the client information is consistent and not missing any vital information, insurance is up to date.

Conduct Meetings: schedule meeting appointments with FSC and client. Flow of client appointment data availability and FSC availability.

Error: Insurance errors or client information errors.

FSC: Family Support Counselors, the people that meet with the clients.

Incomplete: There is missing information or conflicts with the data. This can be due to missing client information, insurance problems, or scheduling issues.

Meeting Request: Request to schedule an appointment with FSC.

Physical Meeting: FSC holds a meeting with the client where they record information about the meeting and progress.

Records: The information gathered by the FSC, includes future goals, progress with patients, and other information relating patient wellbeing

Second Confirmation: The client's information is checked again to make sure all information is up to date before the meeting takes place.

Didn’t Record: FSC did not submit information relating to meeting with the client.

Element Filled: Recorded notes like doctors orders and relevant patient meeting information was recorded and submitted.

Error: Error when submitting client information records

Meeting Notes Record: Data storage of meeting notes records from client meetings

Not enough Space: System is at maximum capacity with the amount of records it can contain.

ERD Definitons

Entities

Entity: Biller

The Biller entity is representative of the Biller employees. The Biller employees are identified by a unique identification number which is also the Biller entity’s primary key and only attribute.

Entity: Client

The Client entity is representative of the clients’ information. The clients are identified by a unique identification number which is also the entity’s primary key and an attribute. The other attributes contain

client information, including Client_FirstName, Client_LastName, Client_DOB, Client_StreetAddress, Client_City, Client_Zipcode, Client_DiagnosisCode and Client_PhoneNumber.

Entity: FSC
The FSC entity is representative of the Family Support Counselors (FSC) employees. The FSC employees are identified by a unique identification number which is also the entity's primary key and an attribute. The other attribute of the FSC entity is the FSC's number.

Entity: New System
The New System entity is representative of the New System. The New System contains the client meeting notes therefore the entity's primary key is the ClientMeetingNote. The entity's other attribute is the ClientMeetingNote_Date to easily distinguish client view dates. The New System entity holds foreign keys Client_ID, FSCemployeeID, and BillerID to connect these necessary entities to the ClientMeetingNote.

Entity: Program Manager
The Program Manager is identified by a unique identification number which is also the entity's primary key and only attribute.

Relationships
Biller —> New System: Checks Notes
The Biller checks the client meeting notes in the New System to double check that meeting requirements were met.

FSC—> Client: Checks Client Info
The FSC checks for Client information before meeting with the clients.

FSC—> New system: Enters Notes
The FSC enters the client meeting notes into the New System after meeting with the clients.

New System—> Biller: Notifies Approved Notes
The New System notifies the Biller of client meeting notes that met client meeting requirements and therefore are approved.

New system --> Program Manager: Notifies Invalid/Missing Notes
The New System notifies the Program Manager of client meeting notes that did not meet client meeting requirements and therefore are invalid. The New System also notifies the Program Manager if approved client meeting notes do not reach six in total.

Program Manager—> FSC: Checks Number
The Program Manager checks for the FSC number to contact FSC if their client meeting notes are invalid or have not reached six in total

Program Manager—> FSC: Notifies Invalid/Missing notes
The Program Manager notifies the FSC if their client meeting notes are invalid or have not reached six in total.

Program Manager—> New System: Checks Notes
The Program Manager checks the New System for the FSC's client meeting notes.

Deliverable 4: Oasis Health Ventures Systems Proposal

Created by Anu Olawale

11/20/2023

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Description

Our proposed solution is to build an in-house management software that works in tandem with ICANotes. ICANotes will hold client meeting notes and general information of the clients (DOB, SSN, address, phone number, emails, medication lists, etc) for the FSCs and also other employees (therapists, psychiatrists, social workers etc.) reference as needed.

This management software will track client meetings notes and appointment count, reduce tedious administrative tasks, and streamline the billing process. Users will be able to access the management software through the web on their mobile devices, desktop computer or laptops. The development of the software will be outsourced to a software development consulting firm. The software will run on Oasis's current PC's and servers. The data will be stored on a database server in the Oasis Health Ventures building. The organization will experience an increase in efficiency and revenue. The software's ability to track client notes will highlight clients who have not had the minimum 6 FSC visits and alert the Program Manager, at a predetermined date, on which clients still need more visits before the month ends. The software's secondary ability to catch note errors and missing note requirements in the meeting notes the FSCs enter and submit into ICANotes. This will reduce the chance of insurance claim rejections due to inadequate meeting notes, which will increase revenue and reduce time wasted on submitting appeals. Billers no longer have to wait for approval from the program manager to file claims because claims ready to be filed (approved notes) will automatically be sent to the Billers. The Program Manager no longer has to shift through all clients reports for errors, instead errors are automatically highlighted by the new software.

Feasibility Analysis

Economic feasibility analysis

Cost

Cost of construction and implementation of the new software (one time): $150,000- $180,000
Cost of Part-time IT admin salary (recurring): $55,000-$65,000

Benefits

All clients having a minimum of 6 FSC meetings per month: $160,000 -$200,000
Clients continues with Oasis services due to satisfaction (1 year): $2,000,000 - $2,500,000

Intangible costs/Estimation Evaluation

The intangible costs are better quality of services and customer satisfaction. Estimation of costs is relatively certain because we received quotes from software engineers and experienced IT admins. Cost of all clients having a minimum of 6 FSC meetings per month is relatively accurate because we calculated the standard monthly estimated profit using predictive analysis and patterns. Variation From predicted analysis and patterns (loss of customers, addition of

customers, number of days in month, minimum of 6 meetings not met, etc) could vary the estimated monthly profit cost. Cost of clients continuing with Oasis services due to satisfaction for a year is relatively accurate because we calculated the standard yearly estimated profit using predictive analysis and patterns. Variation from predicted analysis and patterns (loss of customers, addition of customers, minimum of 6 meetings per month not met, etc) could vary the estimated yearly profit cost.

Technical feasibility analysis

This solution will require the business to outsource the production of the software. The software engineers given this task will be responsible for technical requirements, design, prototyping, implementation, and testing. An experienced IT admin will be needed to manage the servers and software. The software needs to be compatible with ICANotes's software so that it can access client notes and count the number of notes submitted to ICANotes. A new database server will need to be purchased to house the software. Little to no training is required for most employees except for the Program Manager and FSC team manager, who will be utilizing the management software. The Program Manager and FSC team manager will also be needed in the development process to evaluate prototypes.

Organizational feasibility analysis

i. There are no strong constraints on the schedule but it would be ideal for the software to be completed within 3-6 months.

ii. The software will be a big cost to the Oasis Health Ventures, some employees might have other thoughts about where money should be spent. There shouldn't be too much change in the power dynamics in the organization, other than less interaction between Billers and Managers due to the automatic notifications of ready to file claims.

iii. The Program Manager's (and FSC team manager) job will change significantly because they are no longer spending hours going into each client's file, counting the number of client meeting notes per month, and reviewing the validity of notes. Instead, Managers will be notified when client meeting notes have errors and can view a chart displaying client meeting note count per client per month. Billers will have the benefit of receiving a list of approved notes more rapidly than waiting on the Managers' approval of notes. This will enable Billers to file for claims quicker. There is little to no evidence that employees will resist the change the software offers.

iv. There are legal concerns on making sure the software is HIPAA and 42 CFR Part 2 compliant. Ensuring the software is compliant with both involves implementing technical safeguards, such as encryption, and access control to protected health information and records. A technical legal expert might be needed to make sure the software adheres to these technical legalities.

v. The solution might not solve the problem if the software isn't able to detect errors and lack of note requirements in claims and report effectively. The cost of implementing the software might become too expensive for the business to handle in a fiscal year.

Alternative Solutions

Alternative Solution 1: Excel spreadsheet

Low end and Low Tech

Instead of using a new software to record and track the number of billable meetings per client per month, Program Manager may consider inputting the billable meetings on Excel. If used correctly, Excel has the capability to track the number of billable meetings per client, per month but will not be able to connect with ICANotes and check for client meeting note requirements in notes. Excel is relatively easy to use and learn and would be a cheaper alternative than adding another feature that would increase the new software costs.

Major features and findings:

- Over the course of the business day, the billable (or approved) meetings times will be entered into the Excel spreadsheet instead of into a new software database
- Excel can track billable meetings directly
- The actual client meeting notes will still be stored in ICANotes
- Program Manager must look through Icannotes first for client meeting notes, dis/approve notes, then document number of approved client meeting notes into Excel
- Estimated one-time costs: $0
- Familiar software to Managers
- Excel spreadsheets needs to updated daily or weekly
- Learning to set up Excel spreadsheets can be achieved through free resources
- Some employees are unhappy about learning a new system (Excel) while still having to use the old system (for querying notes).
- The data on each Excel spreadsheets will likely be stored by month. The Excel spreadsheets per year will likely be stored by files. This may take up large amounts of storage.

Alternative Solution 2: AWS Simple Notification Service

High end and high tech

Instead of using new software to send notifications out to the Program Manager, the Program Manager may consider using AWS Simple Notification Service. With AWS Simple Notification Service, notifications can be sent via SMS text and email as opposed to just the SMS text on the new system. Notifications concerning notes that do not meet the billable requirements can be sent to both the Program Manager's phone and email. The Program Manager could also configure the Notification Service to send notifications to the FSCs phones and emails instead of alerting the FSCs manually through phone calls. This service would be a cheaper alternative than adding another feature that would increase the new software costs.

Major features and findings:

- Program Manager must initiate or set-up the notification alerts
- Notifications regarding insufficient 6 minimum meetings can be sent to FSCs immediately or at predetermined times
- Notifications regarding client meetings notes not meeting billing standards can be sent to FSCs quickly
- Estimated one-time set costs: $650
- Estimated monthly costs: $300, depend on SMS amount
- Installation is easy and learning to use software is relatively easy
- Troubleshooting is provided with AWS subscription
- Could expand to send announcement notifications or reminders to all FSCs or even clients
- Potential security risks but low

Alternatives Matrix

Criterion 1: Understandability

Type: Risk

Everyone can learn and adapt to using the software system

A low rating (1): A certain level of technical foundation is needed to understand and use the new software

A high rating (5): Anyone could understand and use this system

Criterion 2: Degree of Automation

Type: Requirement

Software enables less manual operations. New software includes automatic notifications, automatic tracking of client meeting counts, and client meeting notes requirement scan.

A low rating (1): Manual operation is necessary

A high rating (5): All operations can be automated

Criterion 3: Cost

Type : Requirement

New software requires one time construction and implementation cost and the cost for an IT administrator for software troubleshooting.

A low rating (1): Cost of new software construction, implementation, and IT administrator is expensive.

A high rating (5): Cost of new software construction, implementation, and IT administrator is inexpensive.

Criterion 4: Integration Compatibility

Type: Requirement

The new software's ability to integrate seamlessly with ICANotes is crucial for its success. The goal is to ensure that data exchange between the new management software and ICANotes is smooth and both systems work in tandem without causing conflicts or data inconsistencies.
A low rating (1): Challenges with the ICANotes integrating with new software leading to potential disruptions in the overall business processes
A high rating (5): No challenges with the ICANotes integrating with new software; seamless integration

Solutions Analysis

Evaluation Criteria	Weight	First Solution 1: A new Integrated software	Score (1-5)	Weighted Score	Alternative Solution 1: Excel spreadsheet	Score (1-5)	Weighted Score	Alternative 2: AWS Simple Notification Service	Score (1-5)	Weighted Score	Total Weighted Score
Criterion 1: Understandability	25	Program Manager can learn and understand how to use the new system relatively easily but has some struggles	3	75	Program Manager can easily understand and use Excel	5	125	Program Manager can easily understand and use AWS Simple Notification Service with limited struggles	4	100	300
Criterion 2: Degree of Automation	25	Limited manual operations. New software includes automatic notifications, automatic tracking of client meeting counts, and client meeting notes requirement scan.	5	125	Program Manager must document the number of approved client meeting notes into Excel. Must update spreadsheets daily or weekly.	2	50	Software sends out mass notifications. Program Manager must still initiate or set-up the notification alerts.	3	75	250

Criterion 3: Cost	20	Cost of construction and implementation of the new software (one time): $150,000-$180,000 Cost of Part-time IT admin salary (recurring): $55,000-$65,000	5	100	There are free resources for installing and learning to use Excel. Free to install.	1	20	Estimated one-time set cost: $650 Estimated monthly costs: $300, depend on SMS amount	2	40	160
Criterion 4: Integration Compatibility	30	Possible to integrate with ICANotes.	5	150	Not possible to integrate ICANotes to Excel spreadsheets. Program Manager will have to manually count approved meeting notes from ICANotes and input data to Excel. Excel spreadsheet will document and record client meeting count.	2	60	Not possible to integrate ICANotes with AWS Simple Notification Service. Program Manager will have to manually initiate or set-up the notification alerts. AWS Simple Notification Service will send mass notifications to appropriate parties.	3	90	300
Totals:	**100**			**450**			**255**			**305**	**1000**

Conclusion

The solutions analysis suggests that the first and original solution, building a new software from scratch, would be the best solution to address Oasis Health Venture's need for a database upgrade.