CLINSTANCE – THE ULTIMATE CLINIC CHECK-IN AND REVIEW SYSTEM

To SDSU MIS Department

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Abstract

The healthcare debate has been a hot topic in the recent several years. The healthcare system in the U.S. is criticized for many reasons, such as expensive cost, inefficient process, and monopolized industry. The U.S. healthcare system is ranked No. 37, one of the lowest among developed countries, by the World Health Organization. Many approaches can be addressed to improve the existing healthcare industry. The scope of this paper provides an evolutional approach to improve clinic visit experience from project development perspective.

The proposed project, Clinstance, is a total clinic check-in and review system that promotes clinic's productivity and efficiency during doctor visit, and at the same time improves patient's satisfaction and experience. An overview of business requirements is provided to demonstrate viability and feasibility of the project. The development team is expected to include 22 professional engineers and developers. The estimated effort to build Clinstance is 11,042 man-hours, which translates to $490,890 estimated cost for project development. In order to achieve the goals and objectives of the system, the software requirement specification provides a semi-detail analysis of the project development with use cases and Data Flow Diagrams (DFD). The software system attributes are also demonstrated and characterized for analysis and evaluation of the quality of the system because the quality attribute requirements can be significantly influential on the software architecture and performance.

CLINSTANCE – THE ULTIMATE CLINIC CHECK-IN AND REVIEW SYSTEM

<u>Overview</u>

The healthcare industry, the largest market in the U.S., provides 13.5 million jobs and eight out of 20 fastest growing occupations according to a research paper ("Industry overview: Health care," 2012, para. 1). Munro reported that the annual national healthcare expenditure reached $3.8 trillion in 2014 and is still growing and expending ("Annual U.S. healthcare spending hits $3.8 trillion," 2014, para. 1). Because of the nature of the evergreen industry, the healthcare system is gradually transforming into a monopolized major for-profit industry as a whole. It is sad when an industry that is supposed to provide treatment and services to patients with curative, preventive, rehabilitative, and palliative care slowly change its focus on driving revenue and profits. The U.S. healthcare systems often receive its critics on its poor efficiency, low coverage, unregulated process control, and expensive cost among other developed countries. All these negative factors contribute to the outcomes of unaffordable medical bills, long waiting time for doctor visit, and service dissatisfaction.

Problem Statement

Larson, in 2015, reported that the average time waiting at doctor's office is 19 minutes and 16 seconds ("Wait Times for Doctors Decrease, Even as More Americans Enter Health Care System," 2015, para. 2). More surprisingly, the emergency doctors keep patients waiting the longest – more than 24 minutes on average ("Wait Times for Doctors Decrease, Even as More Americans Enter Health Care System," 2015, para. 5). Sometimes during a doctor visit, it takes multiple medical assistances to drop by before the patients finally get to see the real doctor. The reason for the long waiting time during a doctor visit is primarily attributed to the existing healthcare system. Doctors' primary paychecks are from insurance and Medicare. With a general sense, a bigger volume of patients will generate more money, which makes it tempting to schedule as many patients as possible into their day to maximize income. Because of unregulated supervision, unstructured process control, poor scheduling, degree of ignorance, inefficient procedure, and many other reasons, patients eventually end up piling in the waiting rooms. Unfortunately, waiting for countless minutes during a doctor visit is slowly becoming a norm in the U.S.

Proposed solution

When people consider making a purchase on Amazon, they would like to see the reviews of the products. When customers order food in a restaurant, they would like to see the reviews on Yelp. When students register for a class, they would like to see the reviews on ratemyprofessor.com. Similarly, patients would like a review system that provides the features of making an appointment, checking-in, and tracking doctor visit process. That will not only promote work ethics and improve clinic process for doctors, but also decrease waiting time and reduce medical expense for patients.

The application is called Clinstance – the ultimate clinic check-in and review system that runs on computers and mobile devices. The end users consist of members, public users, and doctors/physicians. Members are the registered and authorized users who can check in, provide reviews, and browse for clinics/doctors. Users are general publics who have access to Clinstance, and users can only browse for clinics/doctors for their reviews. Doctors are the most passive end users of the system, and they can only manage their account information.

The general functionalities of Clinstance are demonstrated in the following steps: first, patients can make appointments with the doctors on the app. During the appointment, the waiting time for the doctor is marked by the patients and recorded by the app. In the meantime, patients can provide feedback and reviews to each waiting phase of a single doctor visit. Thus, all data collected is genuine and precise, which will be processed and used for other users' information. This open application does not belong to any individual health plan, so that anyone has access to review the available information. Since now patients' satisfaction and doctors' performance will be recorded, clinics will want to manage the patient flow more wisely and use their time more efficiently. From the business standpoint, the primary revenue of the application will come from advertising service. The vision of this project is to make a difference and change the culture in the health care industry in the U.S.

Business Requirements

A total business planning process can be massive and complex, but the scope of this project is only demonstrated from system analysis and design perspective, which will not take considerations of finance, administration, or marketing.

Because of the complexity of the healthcare industry, many business constraints and technical difficulties are presented during the system development phase. Therefore, appropriate project estimation and risk assessments are necessary to mitigate the potential failure of the project. The following sections consist of various sectors in business requirements.

Administrative responsibilities

The project developers will manage the design and creation of all the various aspects of all the components needed to build the complete system. Project managers will be responsible for managing the project and tracking the timeline, resources and costs of the project to ensure that the goals of management are met.

The server administrator will be responsible for obtaining and configuring the servers and software. The database administrator will be responsible for maintaining the database and establishing the data guard standby database. The web developers will be responsible for the development of the website, the APIs needed for integrations and the creation of the mobile applications. The QA testing team will be responsible for validating the developed functionality to the requirements document.

Project standards

For the purpose of benchmarking with similar products and providing an example within the healthcare industries, the International Organization of Standardization will be incorporated as guidance for this project according to the official ISO standards website ("ISO Standards", n.d.).

1. ISO 21500:2012 – Guidance on project management
   It provides high-level description of concepts and processes that are considered to form good practice in project management
2. ISO 31000:2009 – Risk management
3. ISO 10006:2003 – Quality management systems
   Guidelines for quality management in projects
4. ISO 10007:2003 – Quality management systems
   Guidelines for configuration management

Funding source

The project funding will come from various sources. Angel investors will provide the first round of funding, which will be contributed to the first prototype. The first system will be developed under venture capital. The entire process starting from developing the first prototype to the completion of the first system is estimated at nine months.

Personnel resource estimates

To have a robust development team, the following manpower resources are expected in terms of number of people (the order has no specific meaning). A team consists of total of 22 professionals with variety of specialties are needed to complete the project. The position types include contractor, part-time, or full-time employees, depending on the importance and the stages of the project development.

- Function Analyst – 2
- Project Developers – 10
  - Front Interface – 2
  - System Architecture – 1
  - Database – 2
  - Programmers – 5
- QA Testers - 2
- IT Analyst – 2
- Server Administrator – 1
- Database Administrator – 2
- Security Administrator - 2
- Project Manager – 1

Project effort

From System Development Life Cycle (SDLC) perspective, the project is broken down into seven main phases: project design, construction, project analysis, formal reviews, system testing, configuration management, and project management. In calculating the total project effort needed, each phase's man-hours required can be represented as a percentage of construction man-hours expected because construction serves as the most important phase in the entire SDLC. The illustration of construction man-hour effort is presented by features in three categories: website construction, mobile application construction, and system and database construction. The effort estimation of construction involves 4,120 man-hours. The detailed breakdown of construction man-hour effort by feature is demonstrated in Appendix A. The total project development effort is estimated at 11,042 man-hours, which will last for approximately 9-month period. The detailed breakdown of total project development man-hour effort is illustrated in Appendix B. Due to the technical nature of the project, the actual man-hours needed will vary between +50% to -25% of the initial estimates.

Project cost estimate

The project cost for this paper is estimated from the project development perspective, which does not include any other business related cost, such as rent, marketing, finance, and etc. It is calculated by multiply total man-hour (11,042 man-hours) expected to complete the project by the average hourly salary of project developer in San Diego, which is $45 per hour according to indeed.com ("Project Developer Salary in San Diego, CA", 2016). So the total estimated cost to build the system is $496,890. The estimated cost of the project is based on the current date and location. The actual cost can vary and is expected to be within +50% to -25% of the estimation considering the size and scope of the project. The costs only include initiation of the first version of the system, which does not include any additional costs from upgrades or routine operations. A more detailed conceptual level cost estimate worksheet is attached in Appendix B.

Risks

The following is a list of anticipated risks during the project design. The corresponding solutions are also provided to mitigate the risks.

- Loss of Funding: This is mitigated by doing the project earlier in the year when budgets are set.
- Misinformation (Scope Creep): This is mitigated by adding additional functional analysts or bringing in insurance company representatives.
- Unavailability of Personnel: This is mitigated by making sure people working on the project are committed to work according to the schedule assigned to them.
- Market Competition: This is also mitigated by doing the project early before other competitors move into this market sector.
- Non-adoption: Doctors and users might be reluctant to use the app and is mitigated by performing market research and doing R&D for the project.

- User-security: This is mitigated by adding a two-step security management system and member disclaimers.

Software Requirement Specification

The purpose of the Software Requirements Specification (SRS) is to define and document the software requirements for the development of the Clinstance. It also serves as project design guidance for the project development team.

Technical scope and objectives

The objective of the project is to improve clinic process in speed, efficiency, and service quality by providing a total clinic check-in and review system. The project technical scope includes but is not limited to:

- Provide account registration and management for users.
- Provide scheduling, appointment management, and check-in service for members and public users.
- Provide entire clinic process tracking and reviewing system
- Provide insurance coverage information look-up according to member's insurance plan.
- Support iOS and Android systems with the same functionalities of the website.
- Provide search function for registered clinics and doctors in different criteria by insurance types, insurance plans, and miles within area.
- Remind members for coming appointments
- Provide centralized database location with virtual mirror database at other locations.

Product functions and purposes

To accomplish the goals and objectives mentioned above, the major functions that Clinstance will provide are categorized in the following:

- Account Registration
  Clinstance will provide total registration service for all public users. This step is designed to make public users to become a member or a doctor of the system, which provide more functionalities of the system. Members are allowed to provide clinic visit process tracking information and feedback. Doctors are allowed to create clinic profile, which is the pre-condition for other users to make an appointment, check-in, track process, provide feedback, review ratings, and other available actions.

- Account Management
  This function provides total flexibility for registered members and doctors of the system to edit profile and settings of the account.

- Insurance Coverage Look-up
  As one of the major features that Clinstance provides, it allows the patients to check their insurance coverage of the doctor visit and treatment to provide a peace of mind. The insurance coverage information is pre-stored in the database, and it is updated accordingly with the insurance providers. New insurance coverage information can be created upon establishment.

- Appointment and Check-in Service
  This function allows members to make appointment and check-in with the clinics on their fingertips, which provides easy access to compare each clinic earliest appointment time available. More importantly, it speeds up the check-in process by providing the pre-filled information and condition about the patients.

- Process Tracking Management
  As part of the feedback and review by the members, the patients are granted to provide process tracking information, including waiting time, responsible personnel (nurse, medical assistance, etc) information, process description, satisfaction, and overall experience. Since the review itself will be reviewed and rated by other members, it encourages reviewers to provide genuine and precise feedback.

- Review System
  All process tracking information will be stored in the database and provided to all users as review. The review itself will also be reviewed and rated by other members. Since the feedback is 100% from the patients' perspective, it encourages all clinic staff to strive for better services.

- Help Management
  This function provides help and support for all users of the system. Some of the most common questions and answers will be provided before users pursue for further assistance.

The detailed illustration of use cases and Data Flow Diagrams (DFD) are provided in Appendices C to P.

Software System Attributes

This part of the paper is for demonstration of quality attributes of the system for system architects. In order to analyze and evaluate the quality of the system requirements, the quality attributes have been characterized in the following:

- Reliability
  Clinstance shall be written using ISO standards to comply with application development practices. All processes within the system will be developed with controls to maintain consistency across all users and support similar use of the system by all users.

- Availability
  Clinstance shall be load-balanced across multiple servers nationwide. Users will be routed to the closest, least busy, most available server upon navigation to service.

- Security
  All communication between the end servers will be encrypted by the standard HTTPS. The connection to the website will be using a trusted server certificate, and all resources on the communication will be served privately and securely by internal security encryption and package. Clinstance will only provide users with access rights for the necessary information.

- Maintainability
  Clinstance will be developed in modules so as to limit the amount of recompiling and validation that will need to occur upon system enhancements, fixes and updates. The development team will utilize application life-cycle tools to track and record changes to the application.

- Portability
  Clinstance will be designed to run on a standard Windows server with IIS support. All web portions of Clinstance will be designed to transfer to other systems while the communication with wireless systems and smart devices may be developed with specific objects relating to Windows functions and systems.

The software requirement specification in this paper serves as a general guidance and function illustration of the system for business purposes. Further in-depth analysis and design are necessary in the development phase.

Conclusion

The purpose of this paper is not to develop a business plan but rather to produce a project development overview from system analysis and design perspective. A full report should contain a complete list of statement of work, software requirement specification, software development plan, software design specification, and the final prototype. Considering to the technical difficulty and industry nature of the project, the success criteria is extremely high but attractive. A good connection and network within the healthcare industry is crucial and beneficial to the development of the project.

Recommendation

The beauty of Clinstance is to leverage the power of community feedback and customer reviews of the healthcare services. The review system does not only encourage healthcare practitioners and workers to provide services, but also directly delivers better performance and satisfaction to customers and patients. The project is designed to deliver all aspects of value disciplines in customer intimacy, product leadership, and operational excellence, attributing to the uniqueness of the healthcare industry and the design

perspective of Clinstance. The final product of Clinstance can be an emerging force and benchmark and is recommended to any healthcare provider and clinic in the healthcare industry.

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   information/world-health-organizations-ranking-of-the-worlds-health-systems/

Appendix A: Construction Estimation of Man-hour by Feature

Website Construction Feature Point Estimation Table				
Level of Complexity	Feature Description	Derived Man Hours		
		LOW	HIGH	MOST LIKELY
Low	Database retrieval function No data input Display Only Functional Menu Interface to email	75	150	100
Moderate	Retrieval/Update Updateable pages Render tabluar data Maps Integration API for end users(Public users, members, clinics)	300	600	400
High	Website Interface Interface to SMS gateway Processing logic Non-defined search engine Complicated processing logic/algorithms	450	900	600
Total mhrs		825	1650	1100

Mobile App Construction Feature Point Estimation Table				
Level of Complexity	Feature Description	Derived Man Hours		
		LOW	HIGH	MOST LIKELY
Low	Database retrievel function No data input Display Only Functional Menu	90	180	120
Moderate	Retrieval/Update Updateable pages Render tabluar data Maps Integration Master Layout Push Notifications	600	1200	800
High	Processing algorithm Non-defined search engine API for end users(Public users, members, clinics)	675	1350	900
Total mhrs		1365	2730	1820

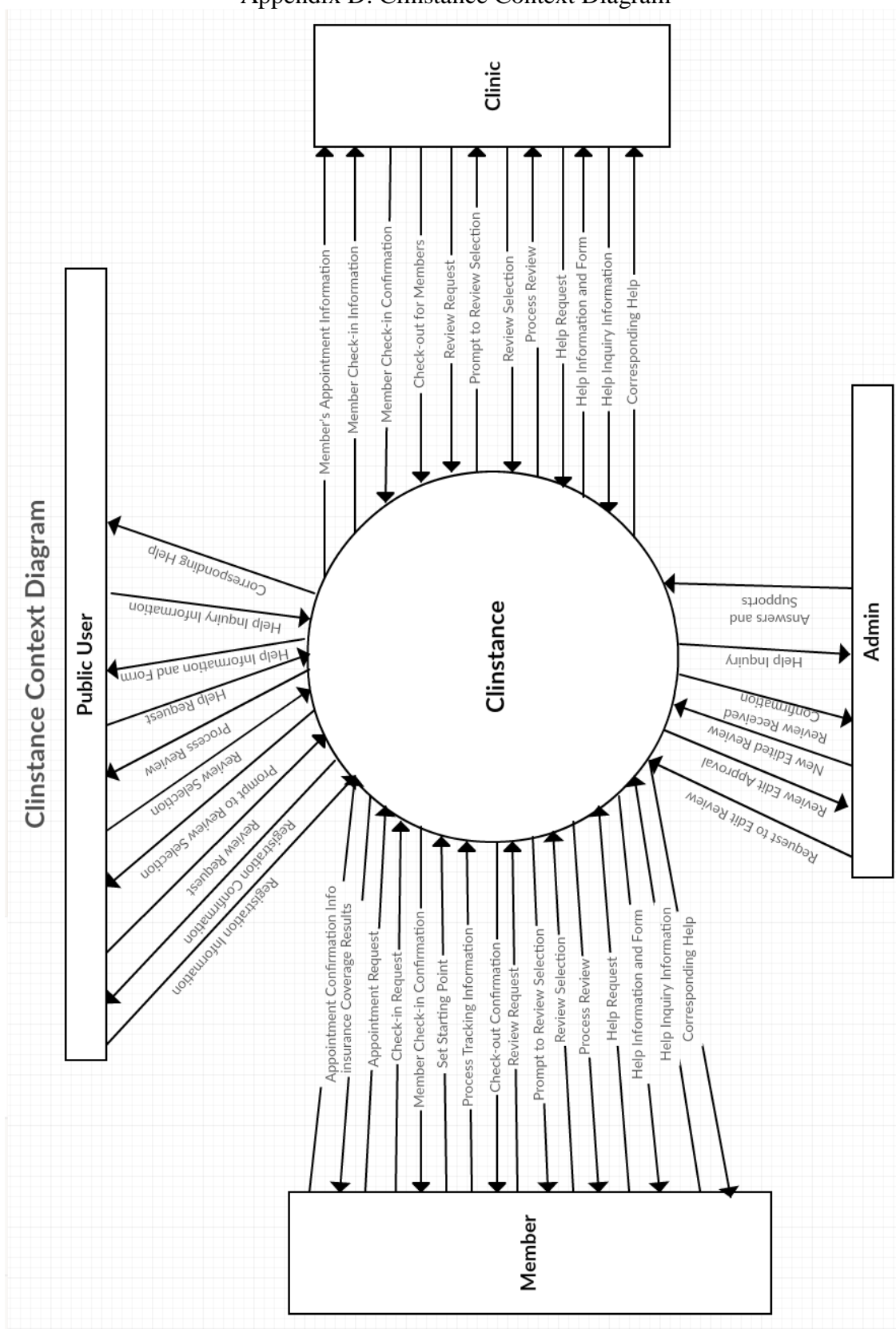| System and Database Construction Feature Point Estimation Table				
Level of Complexity	Feature Description	Derived Man Hours		
		LOW	HIGH	MOST LIKELY
Low	Database connection implementation Databse retrieval algorithm and performance	225	450	300
Moderate	Complex RDBMS Query structure design	300	600	400
High	Backup virtual machine Database security design System architecture design	375	750	500
Total mhrs		900	1800	1200
Total mhrs (total effort from website, mobile app, system and database construction)		3090	6180	4120

Appendix B: Total Project Development Estimation of Man-hour Effort

Project Man-hour Summary Estimates by Phase		LOW	HIGH	MOST LIKELY
Construction		3090	6180	4120
Analysis		2472	4944	3296
Design		1236	2472	1648
Formal Reviews		62	124	82
System Testing		1236	2472	1648
Configuration Management		31	62	41
Project Management		155	309	206
Project Totals		8281	16562	11042

APPLICATION ANALYSIS AND RELATED DOCUMENTATION EFFORT				
Application Analysis and Related Documentation Effort		Derived Man-hours		
		LOW	HIGH	MOST LIKELY
80% of construction		2472	4944	3296

APPLICATION DESIGN EFFORT ESTIMATION TABLE				
Application Design and Related Documentation Effort		Derived Man-hours		
		LOW	HIGH	MOST LIKELY
40 % of construction		1236	2472	1648

FORMAL REVIEWS EFFORT ESTIMATION TABLE				
Formal Reviews (SQA, etc) and Related Documentation Effort		Derived Man-hours		
		LOW	HIGH	MOST LIKELY
2 % of construction		62	124	82

SYSTEM TESTING EFFORT ESTIMATION TABLE				
System Testing and Related Documentation Effort		Derived Man-hours		
		LOW	HIGH	MOST LIKELY
40% of construction		1236	2472	1648

CONFIGURATION MANAGEMENT EFFORT ESTIMATION TABLE				
Configuration Management and Related Documentation Effort		Derived Man-hours		
		LOW	HIGH	MOST LIKELY
1% of construction		31	62	41

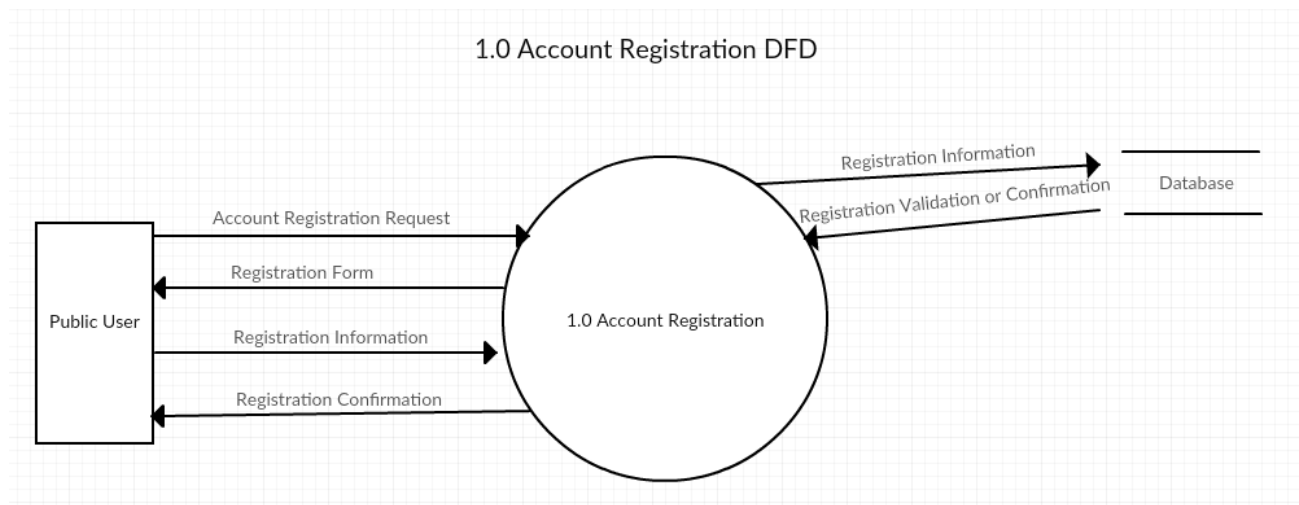| PROJECT MANAGEMENT EFFORT ESTIMATION TABLE				
Project Management and Related Documentation Effort		Derived Man-hours		
		LOW	HIGH	MOST LIKELY
5% of construction		154.5	309	206

Appendix C: Clinstance Use Case
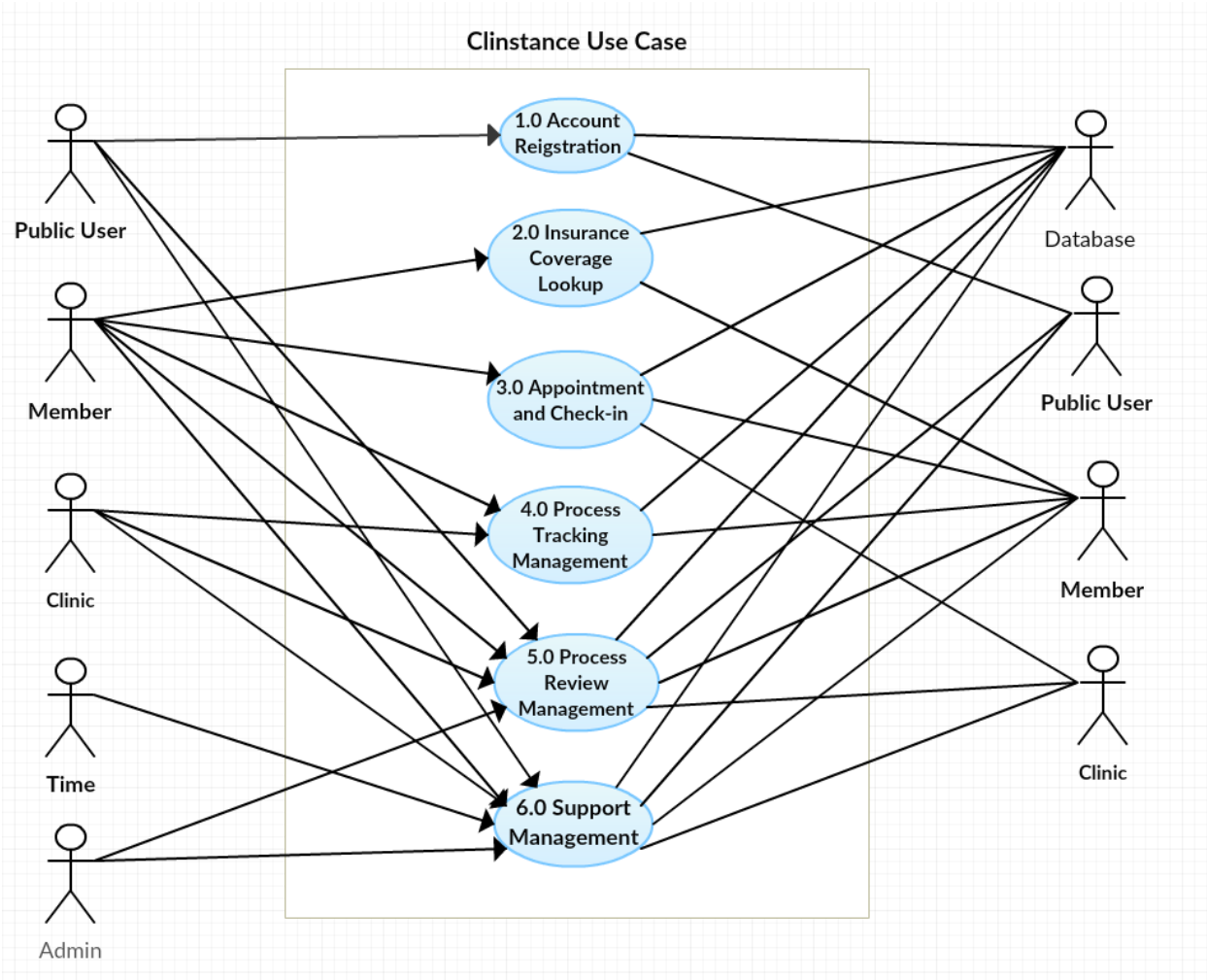
Appendix D: Clinstance Context Diagram

Clinstance Context Diagram

Appendix E: 1.0 Account Registration Use Case and DFD

1.0 Account Registration Use Case

Initiate Registration

Add Account Information

Validate Account Information

Account Registered

Public User

Database

Public User

1.0 Account Registration DFD

Public User

Account Registration Request

Registration Form

Registration Information

Registration Confirmation

1.0 Account Registration

Registration Information

Registration Validation or Confirmation

Database

Appendix F: 1.0 Account Registration Use Case Business Requirements

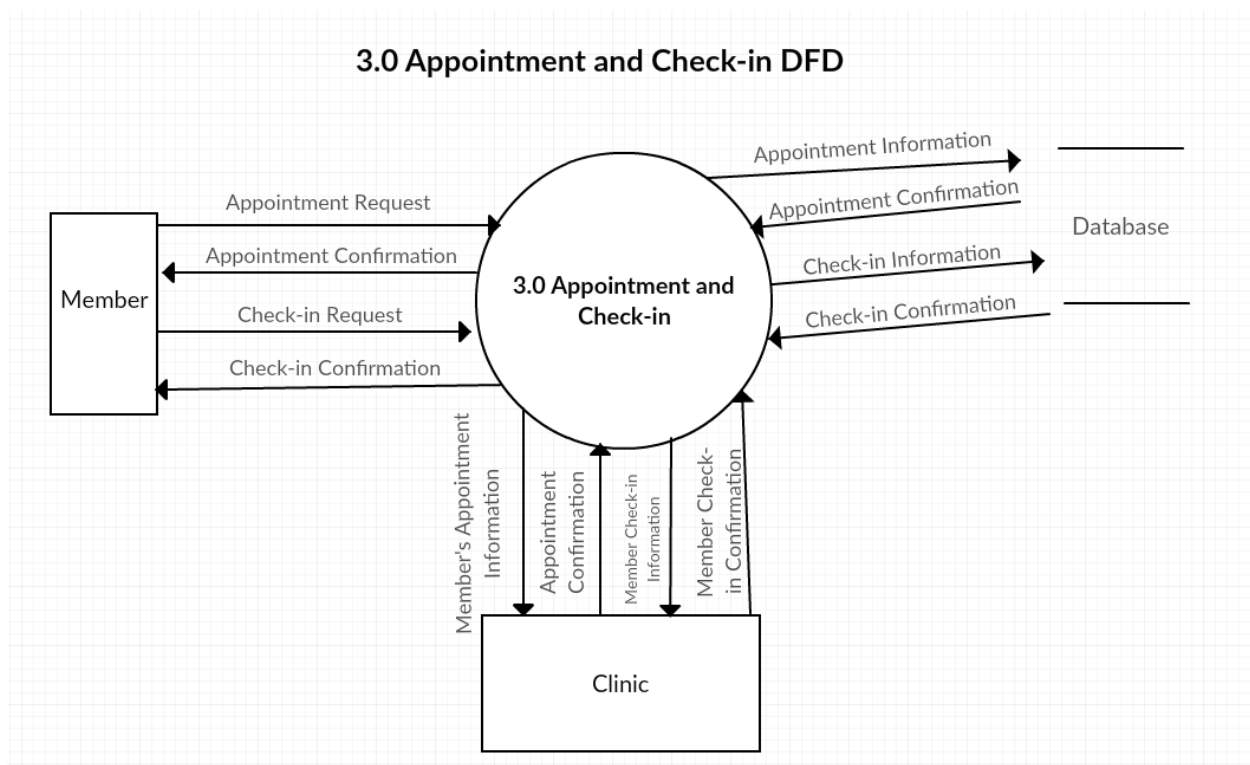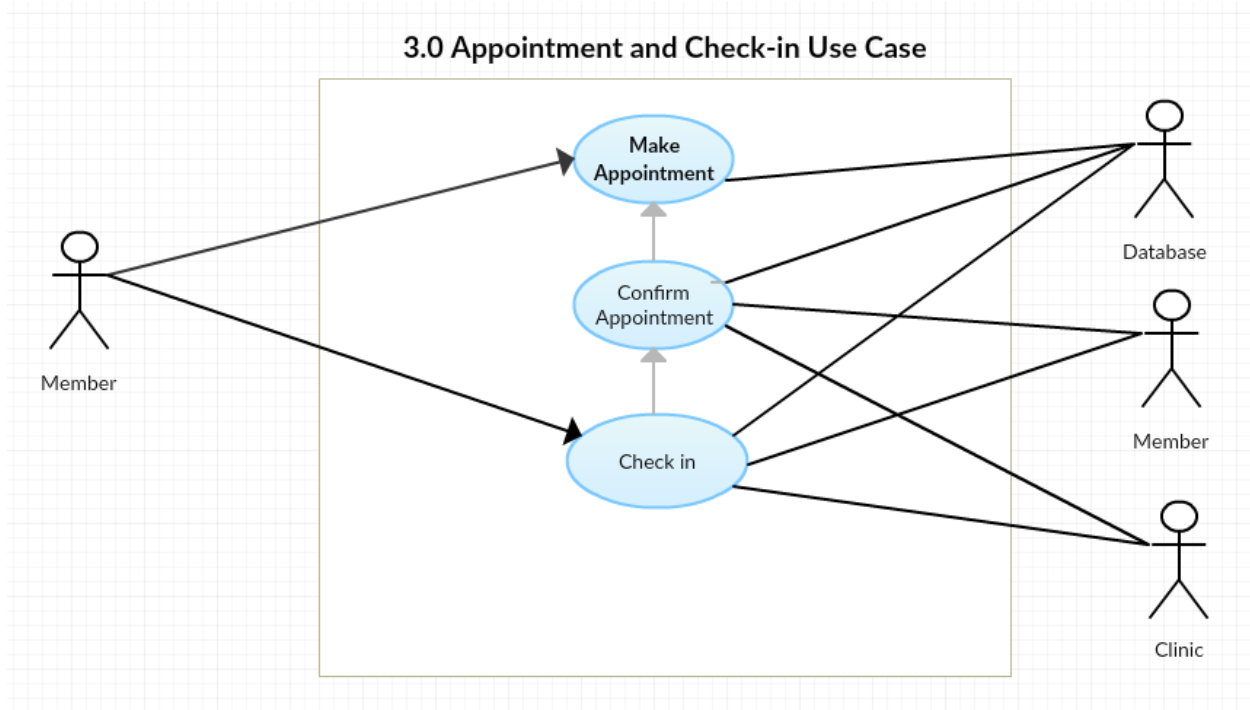| USE CASE NAME:	Account Registration	
USE CASE ID:	Clinstance 1.0	
PRIORITY:	High	
SOURCE:	Functional Analyst	
PRIMARY BUSINESS ACTOR	Public User	
PRIMARY SYSTEM ACTOR	Database	
OTHER PARTICIPATING ACTORS:	None	
DESCRIPTION:	This use case describes the event during registration process	
PRE-CONDITION:	The user is not yet registered.	
TYPICAL COURSE OF EVENTS:	**Actor Action**	**System Response**
	Step 1: The user fills and submit registration information	**Step 2**: The system validates the registration information
		Step 3: The system sends the registration confirmation to the user
ALTERNATE COURSES:	**Alt-Step 1:** If the actor enters an invalid name and/or password, the system displays an error message. The actor can choose to either return to the login setup or cancel the login, at which point the use case ends. **Alt-Step 2:** If the user is already registered, the system will not let the user register again with the same credentials. **Alt-Step 3:** If the user submits invalid information, the system will prompt the user to fill the information again according to the registration requirement.	
CONCLUSION:	The public user is issued with username and password	
POST-CONDITION:	The public user is registered as a member in the system	
BUSINESS RULES	• Account username must be unique • Password must contain at least one upper case, one lower case, and one numerical character	
ASSUMPTIONS:	The user should not be already registered in the system.	

Appendix G: 2.0 Insurance Coverage Lookup Use Case and DFD

2.0 Insurance Coverage Lookup Use Case

Member

Appointment Confirmation

Insurance Coverage Lookup

Insurance Coverage Illustration

Database

Member

2.0 Insurance Coverage Lookup DFD

Member

Appointment Confirmation Info.

2.0 Insurance Coverage Lookup

Account Information

Insurance Coverage Results

Database

Insurance Coverage Results
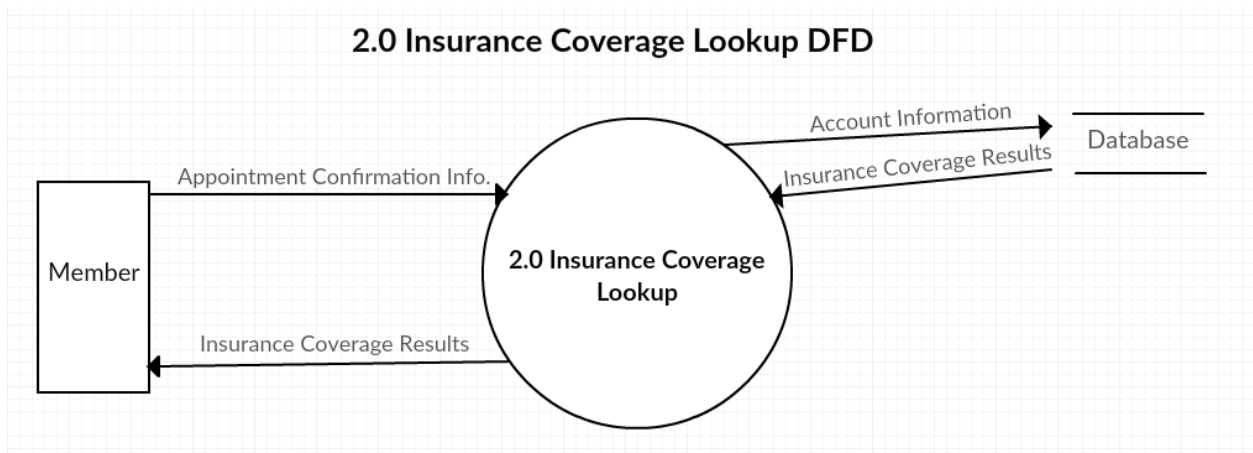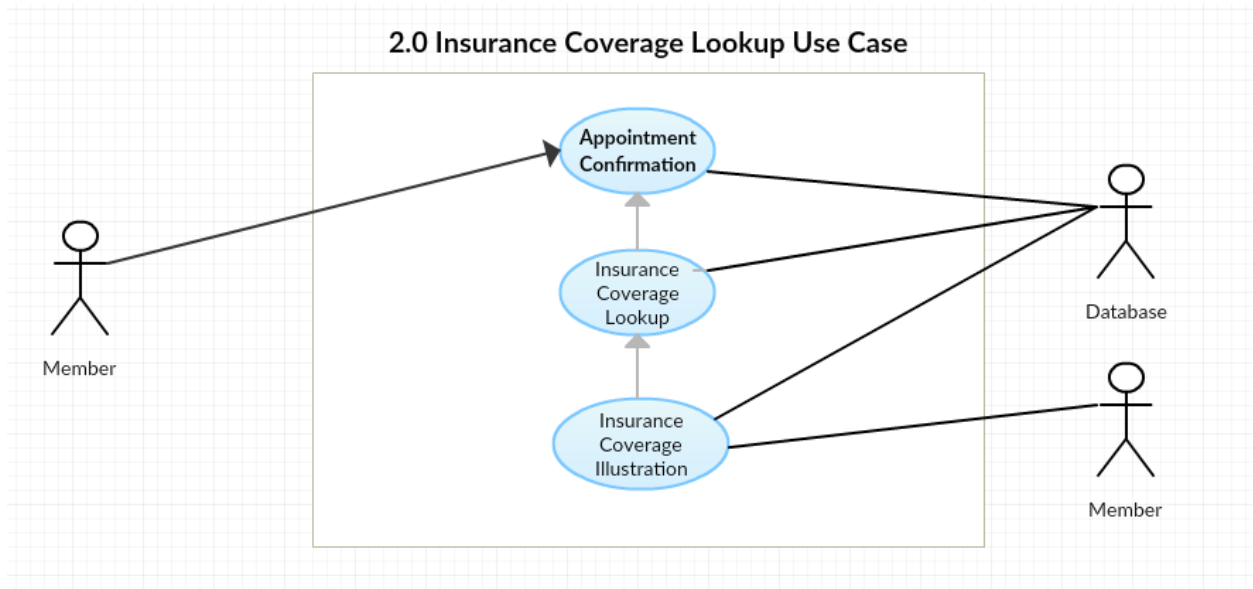
Appendix H: 2.0 Insurance Coverage Lookup Use Case Business Requirements

| USE CASE NAME:	Insurance Coverage Lookup	
USE CASE ID:	Clinstance 2.0	
PRIORITY:	High	
SOURCE:	Clinstance 1.0 Clinstance 3.0	
PRIMARY BUSINESS ACTOR	Member	
PRIMARY SYSTEM ACTOR	Database	
OTHER PARTICIPATING ACTORS:	None	
DESCRIPTION:	It provides insurance coverage information for members on appointments	
PRE-CONDITION:	The member has an appointment	
TYPICAL COURSE OF EVENTS:	**Actor Action**	**System Response**
	Step 1: The member selects the appointment accordingly	**Step 2**: The system looks up insurance coverage information from the database
		Step 3: The system sends insurance coverage information to the member
ALTERNATE COURSES:	**Alt-Step 2:** If no available information can be retrieved from the database, the system will ask the insurance providers for the corresponding coverage. The system will also provide the insurance providers' contact information to the member.	
CONCLUSION:	The insurance coverage information is sent to the member	
POST-CONDITION:	The user is registered in the system	
BUSINESS RULES	The member can only select one appointments to look up at one time	
ASSUMPTIONS:	The insurance providers still exist	

Appendix I: 3.0 Appointment and Check-in Use Case and DFD

3.0 Appointment and Check-in Use Case

Make Appointment

Confirm Appointment

Check in

Member

Database

Member

Clinic

3.0 Appointment and Check-in DFD

Appointment Request

Appointment Confirmation

Check-in Request

Check-in Confirmation

Member

3.0 Appointment and Check-in

Appointment Information

Appointment Confirmation

Check-in Information

Check-in Confirmation

Database

Member's Appointment Information

Appointment Confirmation

Member Check-in Information

Member Check-in Confirmation

Clinic

Appendix J: 3.0 Appointment and Check-in Use Case Business Requirements

USE CASE NAME:	Appointment and Check-in	
USE CASE ID:	Clinstance 3.0	
PRIORITY:	High	
SOURCE:	Clinstance 1.0	
PRIMARY BUSINESS ACTOR	Member	
PRIMARY SYSTEM ACTOR	Database	
OTHER PARTICIPATING ACTORS:	Clinic	
DESCRIPTION:	It allows member to make an appointment and check-in for the clinic visit	
PRE-CONDITION:	The user must be a member	

	Actor Action	**System Response**
TYPICAL COURSE OF EVENTS:	**Step 1**: The member sends appointment request to the server	**Step 2**: The server validates the appointment information with the database and the clinic
		Step 3: The system sends the appointment confirmation to the member
	Step 4: The member checks in at the clinic	**Step 5:** The system sends member's check-in information to the clinic
	Step 4: The clinic confirms the check-in information	**Step 6**: The system confirms the member with successful check-in notice.

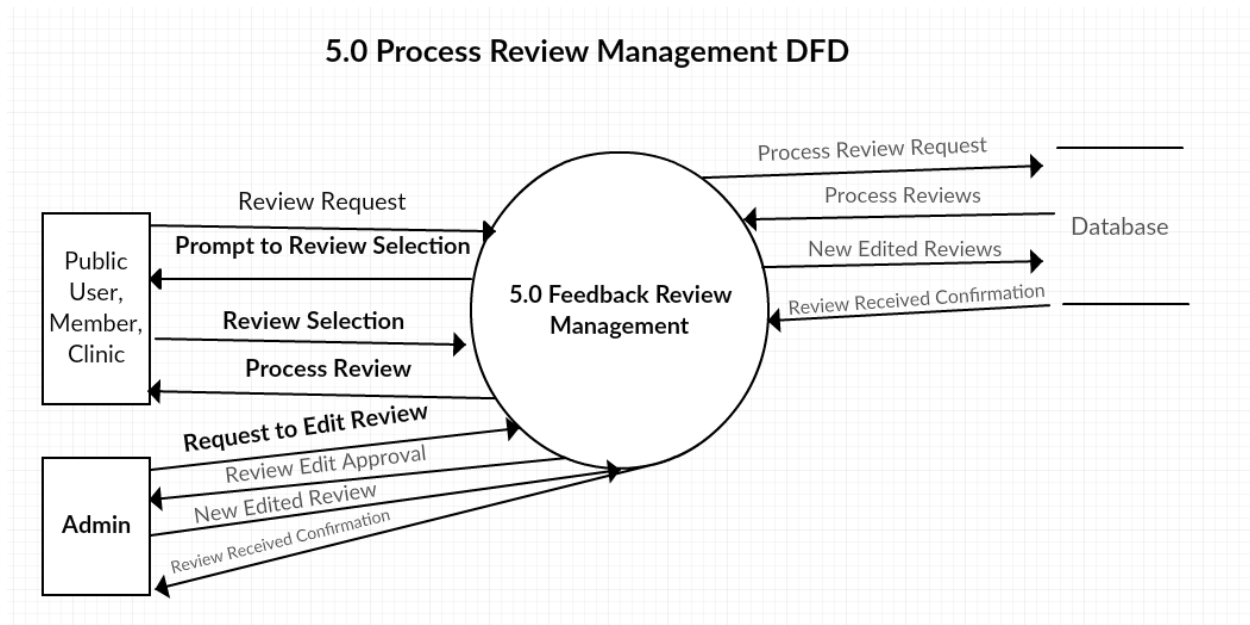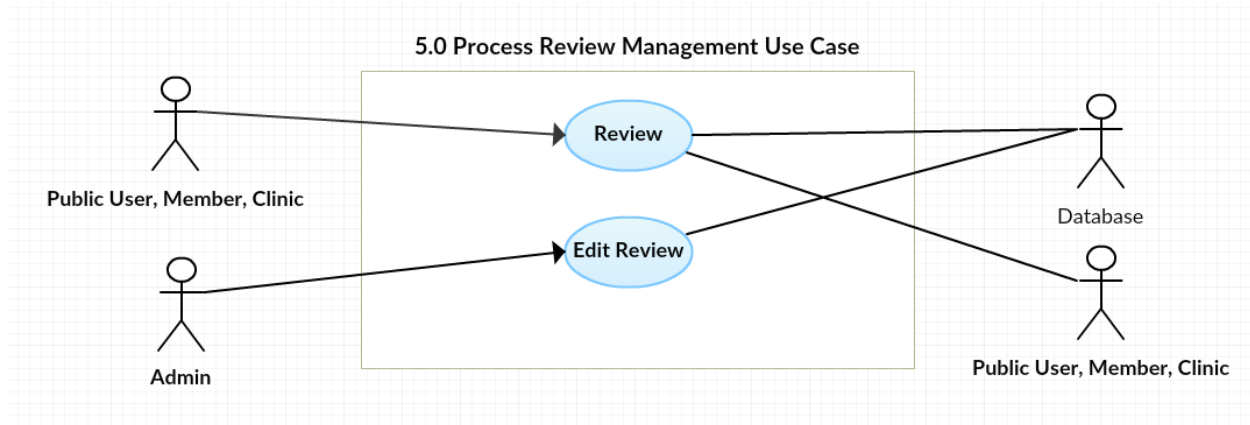| ALTERNATE COURSES:	**Alt-Step 3:** The system sends rejection notice to member's appointment request, and prompt the member to contact clinic directly with appointment arrangement **Alt-Step 6:** The system sends rejection notice to member's check-in request, and prompt the member to contact clinic directly with check-in.
CONCLUSION:	The appointment is made successfully or the check-in is successfully confirmed
POST-CONDITION:	The member then can proceed to the next stage.
BUSINESS RULES	The appointment and check-in must be confirmed on the clinic end
ASSUMPTIONS:	The clinic responses accordingly

Appendix K: 4.0 Process Tracking Management Use Case and DFD

4.0 Process Tracking Management Use Case

4.0 Process Tracking Management DFD
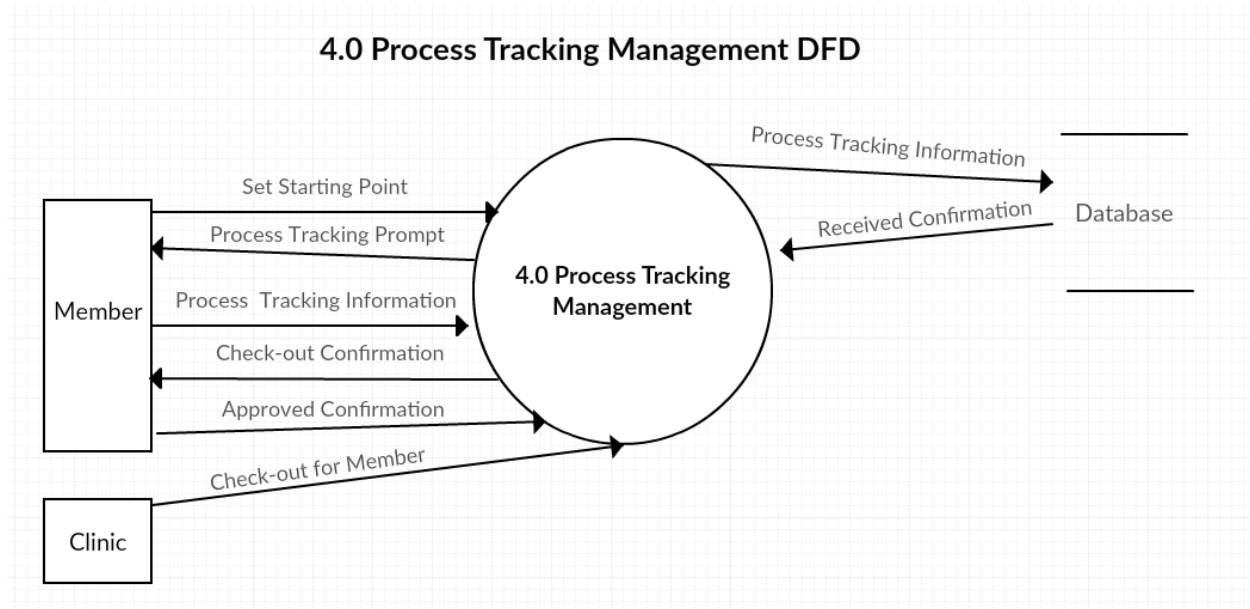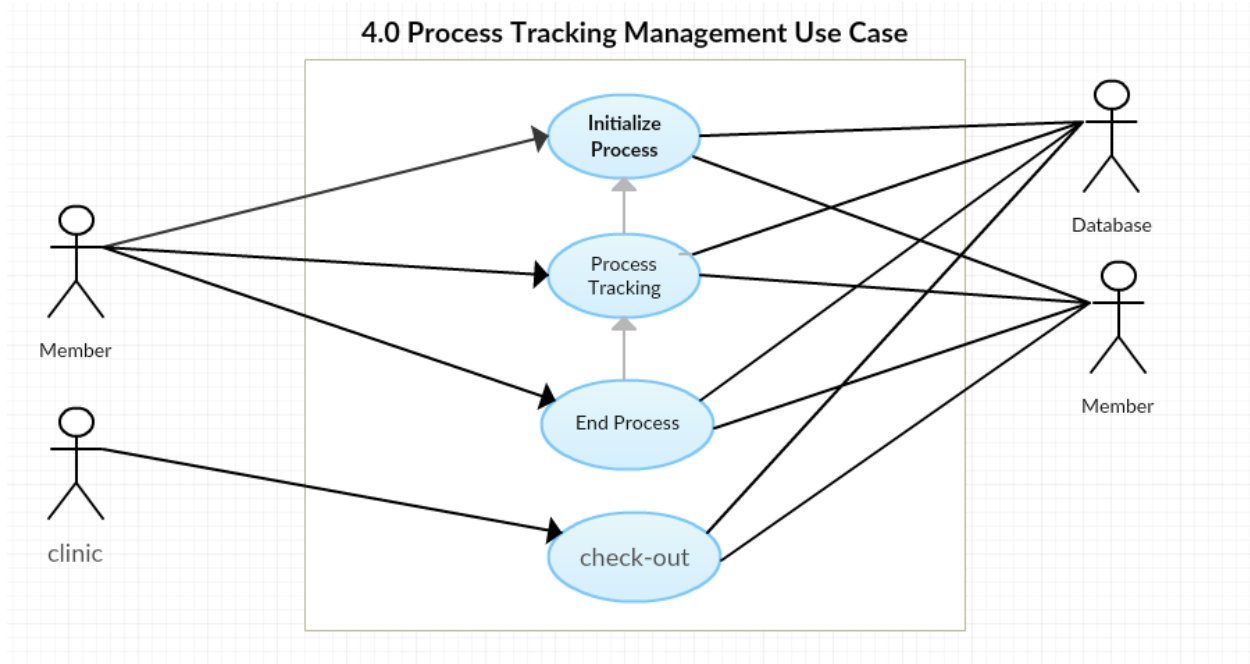
Appendix L: 4.0 Process Tracking Management Use Case Business Requirements

|		
USE CASE NAME:	Process Tracking Management	
USE CASE ID:	Clinstance 4.0	
PRIORITY:	High	
SOURCE:	Clinstance 3.0	
PRIMARY BUSINESS ACTOR	Member	
PRIMARY SYSTEM ACTOR	Database	
OTHER PARTICIPATING ACTORS:	Clinic	
DESCRIPTION:	It provides total flexibility for members to track process during clinic visit	
PRE-CONDITION:	The member is checked in with appointment	
TYPICAL COURSE OF EVENTS:	**Actor Action**	**System Response**
	Step 1: The member sets start point	**Step 2**: The server prompts the member to track process with corresponding questions and procedures
		Step 3: The system stores process tracking information to the database
	Step 4: The clinic checks out for member	**Step 5:** The system asks members for check-out confirmation
	Step 6: The members approves check-out confirmation	
ALTERNATE COURSES:	**Alt-Step 6:** If the member does not agree with the check-out information, the system will ask the member to directly contact the clinic.	
CONCLUSION:	The member approves the check-out confirmation sent by clinic.	
POST-CONDITION:	The member is successfully checked out.	
BUSINESS RULES	The process tracking information can also be added or edited by the member later after the process ends.	
ASSUMPTIONS:	The information and feedback that the member enters is genuine and precise.	

Appendix M: 5.0 Review Management Use Case and DFD

Appendix N: 5.0 Review Management Use Case Business Requirements

USE CASE NAME:	Review Management	
USE CASE ID:	Clinstance 5.0	
PRIORITY:	High	
SOURCE:	None	
PRIMARY BUSINESS ACTOR	Public user, Member, Clinic	
PRIMARY SYSTEM ACTOR	Database	
OTHER PARTICIPATING ACTORS:	Admin	
DESCRIPTION:	It allows all users to access the clinic process review information	
PRE-CONDITION:	None	
TYPICAL COURSE OF EVENTS:	**Actor Action**	**System Response**
	Step 1a: The user send review request to the server	**Step 1b**: The server prompts the users to select desired clinic
	Step 1c: The user sends back the desired clinic selection	**Step 1d:** The system returns the clinic review to the user.
	Step 2a: The admin requests to edit review	**Step 2b:** The system validates admin's identity and grant permission to edit review
	Step 2c: The admin submits the change to the review	**Step 2d:** The system accepts, updates, and confirms the change to the database.
ALTERNATE COURSES:	**Alt-Step 2b:** The system will not grant permission if the requester fails to identify itself as an admin. **Alt-Step 2c:** If the connection is interrupted during the submission of the change, the server will keep the most recent submitted reviews in the database.	
CONCLUSION:	The reviews are presented or updated	
POST-CONDITION:	The users are able to see the reviews	
BUSINESS RULES	Only one detailed clinic process can be reviewed at one time.	
ASSUMPTIONS:	The disclosure of the clinic process provided by members does not violate any legal code in privacy in healthcare industry.	

Appendix O: 6.0 Support Management Use Case and DFD

6.0 Support Management Use Case

6.0 Support Management DFD
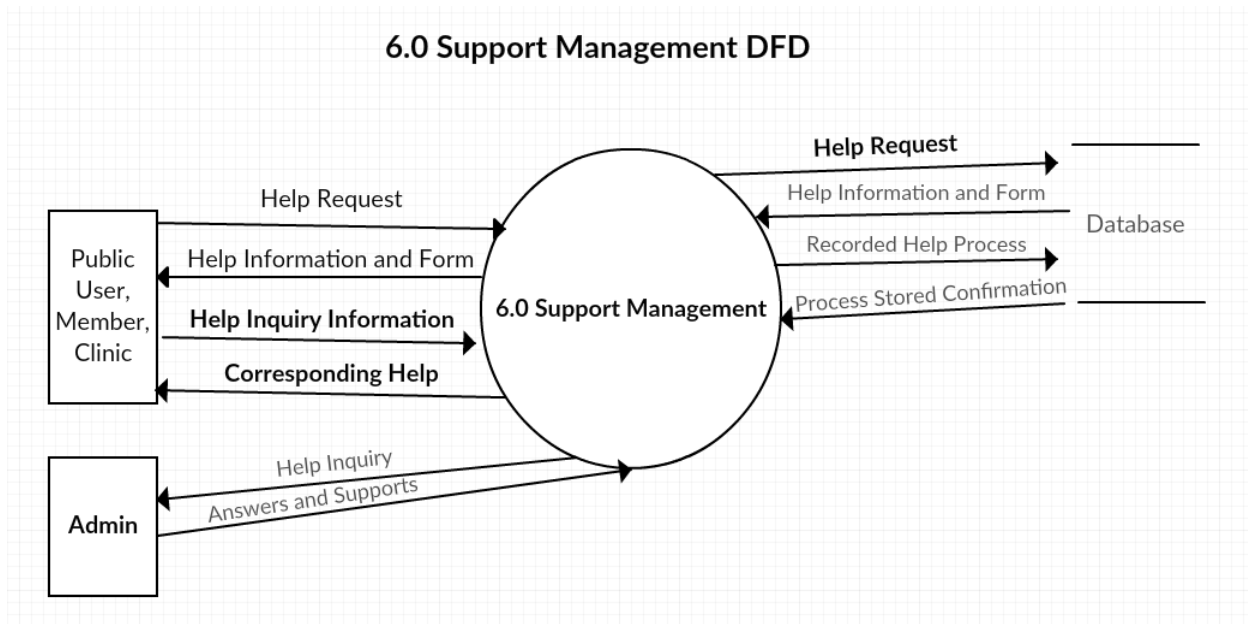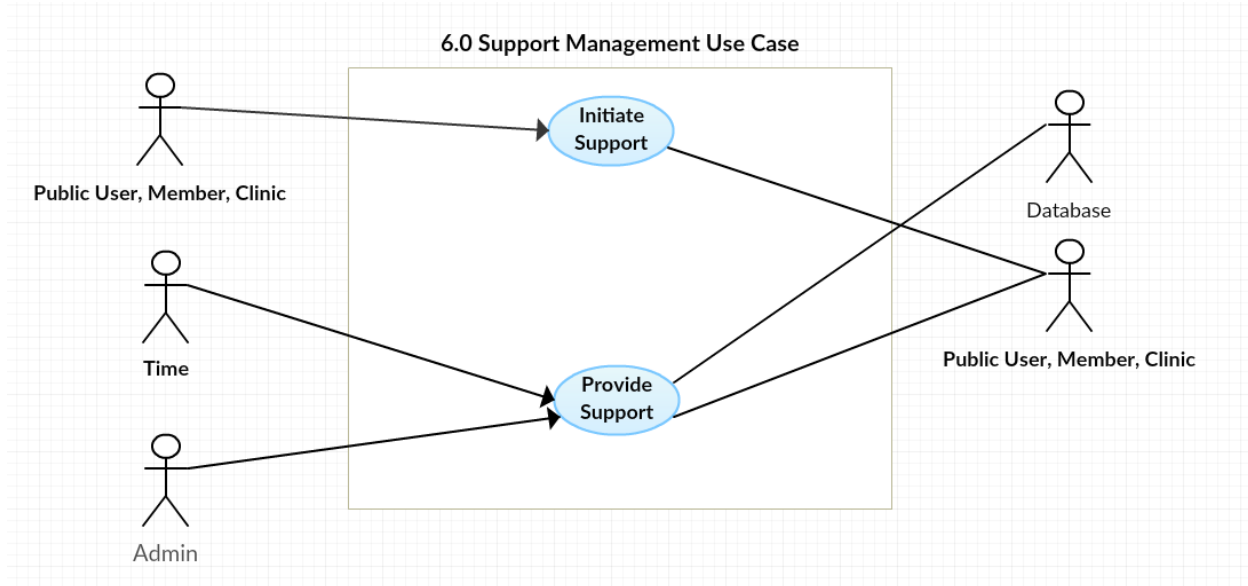
Appendix P: 6.0 Support Management Use Case Business Requirements

USE CASE NAME:	Support Management	
USE CASE ID:	Clinstance 6.0	
PRIORITY:	Medium	
SOURCE:	None	
PRIMARY BUSINESS ACTOR	Public user, Member, Clinic	
PRIMARY SYSTEM ACTOR	Database	
OTHER PARTICIPATING ACTORS:	Admin	
DESCRIPTION:	It creates support for users to look for help when needed	
PRE-CONDITION:	None	
TYPICAL COURSE OF EVENTS:	**Actor Action**	**System Response**
	Step 1: The user requests for help	**Step 2:** The server provides existing help information and prompt the user to complete the help form
	Step 3: The user submits help form with inquiry	**Step 4:** The system sends help inquiry to the admin
	Step 5: The admin submit answers and supports to the system	**Step 6:** The system delivers admin's help and support to the user.
ALTERNATE COURSES:	**Alt-Step 3:** The user can cancel the request for additional help at any time.	
CONCLUSION:	The system successfully responded the user with support	
POST-CONDITION:	The user receives the support	
BUSINESS RULES	Admin must have the ability to retrieve help history of each member	
ASSUMPTIONS:	None	