



Specifications/Analysis Document

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IS-445/CS-445 Group Assignment -5

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Initial Class Diagram

Stage 1: Description of the software product

The ChocAn software system allows the providers to verify member's information and member status by using the ChocAn computer terminal and then provide services to an active member. When a member receives a health care service, the provider slides the membership card and use the provider directory to bill ChocAn organization. The software product then displays information about the service provided and asks for verification. The ChocAn operator is responsible for the information required by the software system. Every Friday at midnight, the main accounting procedure is run by reading in the week's file of services and prints reports. The ChocAn manager can then request various reports at any time during the week.

Stage 2: Identify Nouns

The nouns used in the above description are listed below:

- Accounting procedure
- ChocAn
- ChocAn computer terminal
- ChocAn manager
- ChocAn operators
- ChocAn software system
- Members
- Member status
- Membership card
- Providers
- Provider directory
- Reports
- Services
- Software product

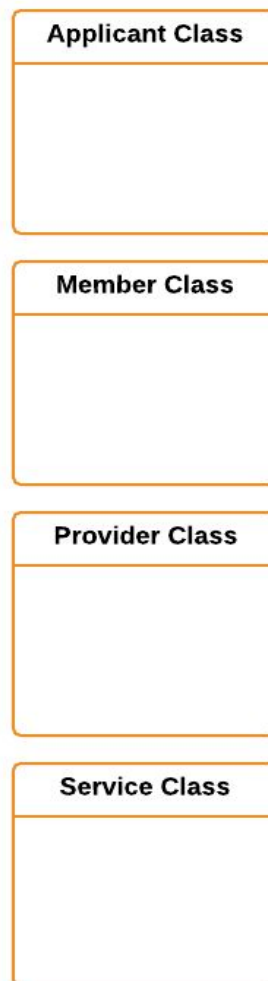


Fig 1: Initial Class Diagram of the ChocAn organization

Extracting Boundary Class:

A boundary class can be defined as the interaction between the software system and its surroundings i.e. its actors. The boundary class for the ChocAn organization are listed below:

- Account Payable Report
- Member account information
- Member Report
- Operator Input
- Provider account information

- Provider Report
- Provider Directory
- EFT Data

Extracting Control Class:

Control class can be defined as complex computations or algorithms. The control classes for ChocAn organization are listed below:

- Account payable generator
- ChocAn system
- EFT generator
- Member reports generator
- Provider directory generator
- Provider report generator
- Reports generator
- Service report generator

CRC Cards

Applicant Class
<p>RESPONSIBILITY</p> <ol style="list-style-type: none"> 1. Provide name 2. Provide Street Address 3. Provide city 4. Provide state 5. Provide zip code 6. Provide email 7. Provide phone number 8. Check applicant's request 9. Update applicant's request 10. Send message to Member Class to receive health care services 11. Send message to Provider Class to provide health care services.
<p>COLLABORATION</p> <ul style="list-style-type: none"> • Member Class • Provider Class

Member Class
<p>RESPONSIBILITY</p> <ol style="list-style-type: none"> 1. Check member information and status 2. Send message to Service Class to obtain date of service. 3. Send message to Provider Class to obtain provider name. 4. Send message to Provider Class to request a service
<p>COLLABORATION</p> <ul style="list-style-type: none"> • Provider Class • Service Class

Provider Class
<p>RESPONSIBILITY</p> <ol style="list-style-type: none"> 1. Input provider number 2. Send message to Member Class to obtain member name and number 3. Send message to Service Class to obtain date of service and time of service 4. Get date of service, time of service 5. Input fees to be paid 6. Input number of consultations 7. Input comments
<p>COLLABORATION</p> <ul style="list-style-type: none"> • Service Class • Member Class

Service Class
<p>RESPONSIBILITY</p> <ol style="list-style-type: none"> 1. Input current Date and Time 2. Input service provided date 3. Send message to Provider Class to obtain provider numbers, provider name, and comments. 4. Send message to Member Class to obtain member number, name, and other info 5. Input service code
<p>COLLABORATION</p> <ul style="list-style-type: none"> • Provider Class • Member Class

Final Class Diagram

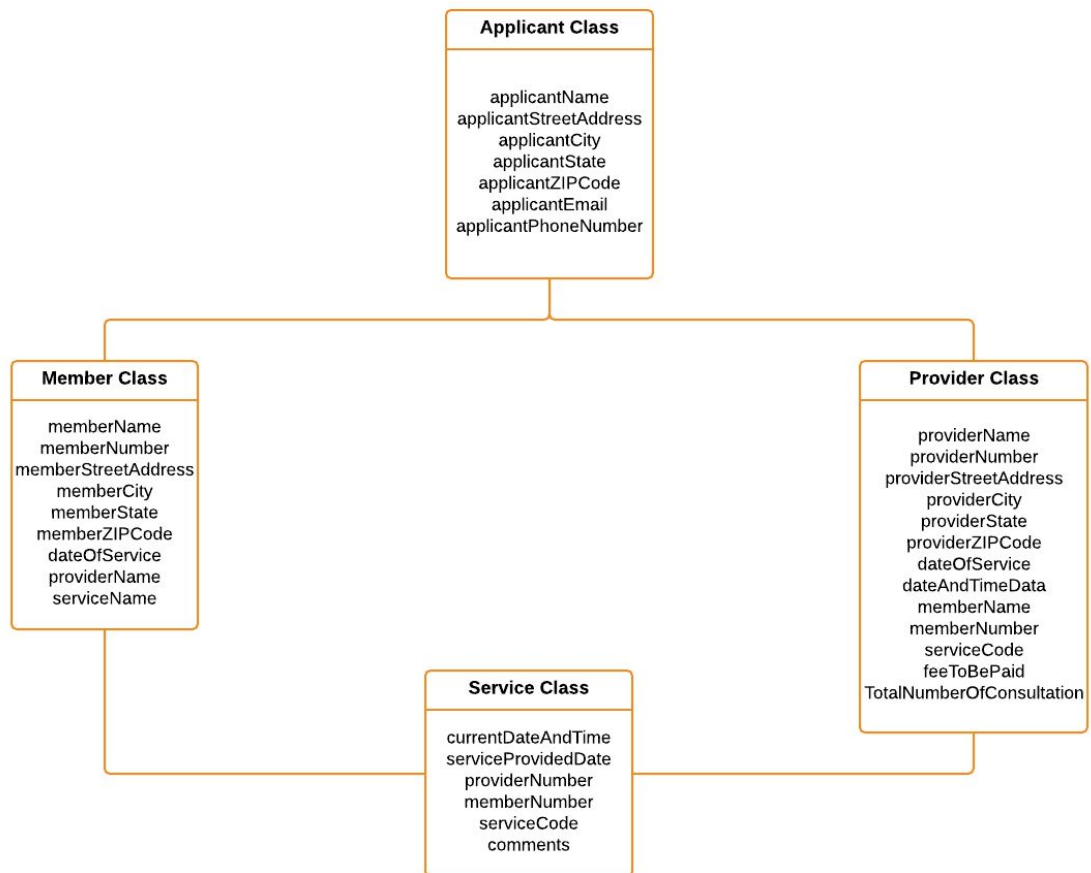


Fig 2: Final Class Diagram of the ChocAn Organization

Metrics

Iteration 1:

Number of changes made: 4

Changes:

- Updated the initial class diagram so all classes are connected.
- Created scenarios for all use cases.
- Created CRC cards for all classes.
- Created a statechart

Iteration 2:

Number of changes made: 4

Changes:

- Updated the iteration 1 class diagram so all classes have information inside them.
- Updated scenarios of use cases to include more detail.
- Updated CRC cards to tell which class it sends messages to.
- Expanded the statechart to contain all of Provider's information.

Iteration 3:

Number of changes made: 1

Changes:

- Expanded statechart to contain Operator's information.

Total number of changes made: 9

Appendix

Iteration 1 of Class Diagram:

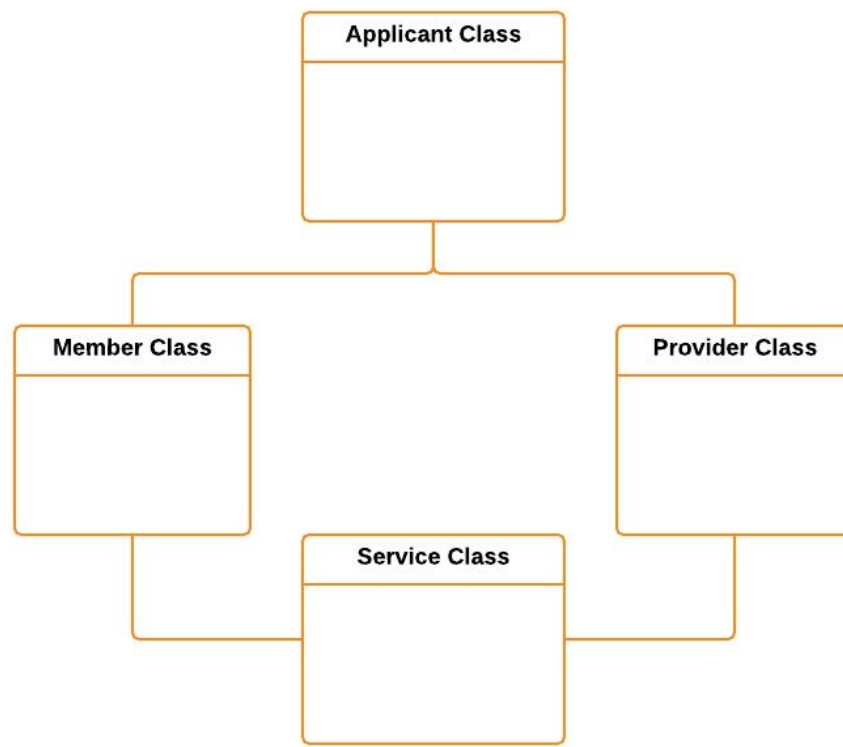


Fig 3: First Iteration class diagram of the ChocAn

Iteration 2 of Class Diagram:

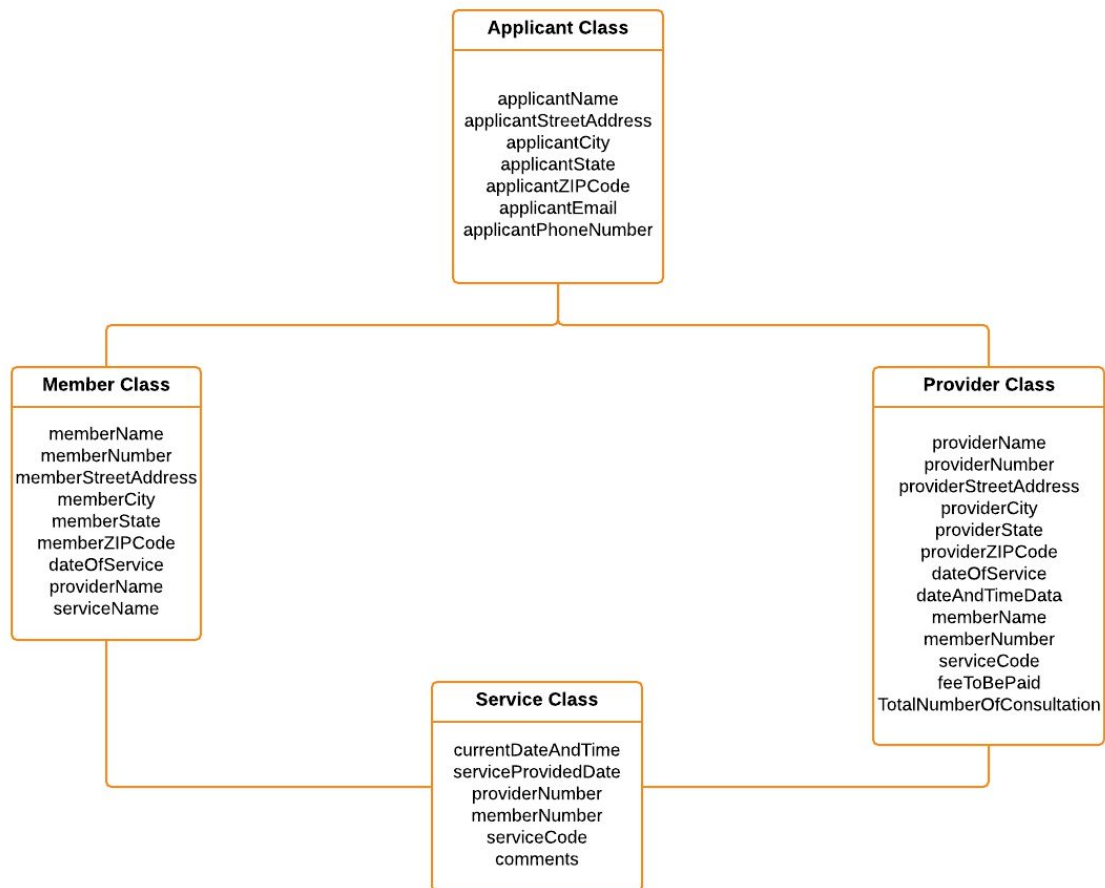


Fig 4: Second Iteration class diagram for the ChocAn

Dynamic Modelling

Iteration 1 of Statechart:

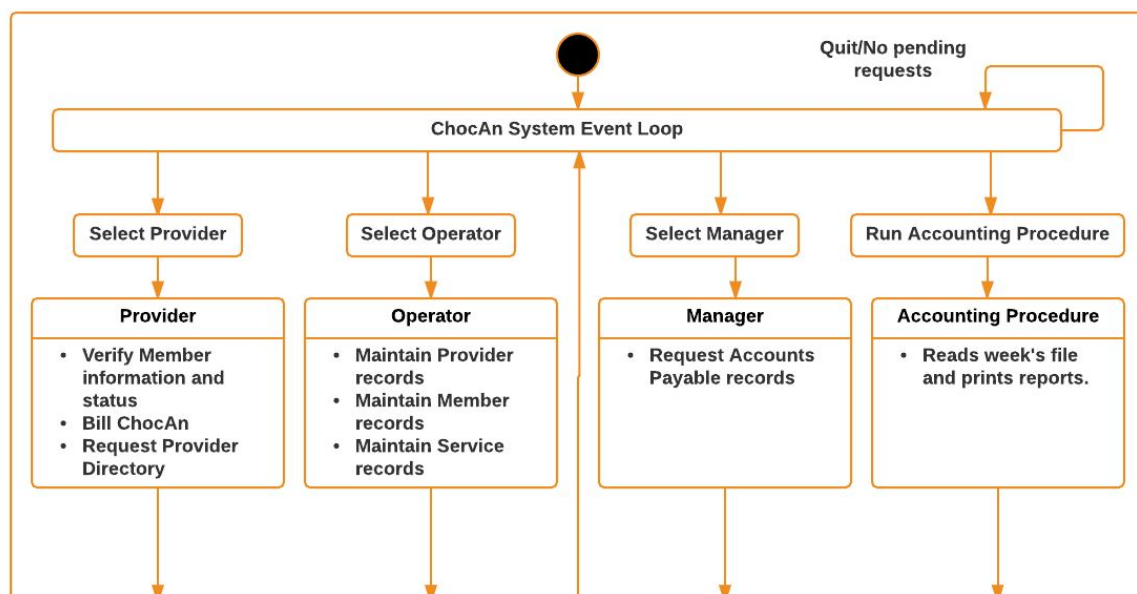


Fig 5: Iteration 1 of Statechart

Iteration 2 of Statechart:

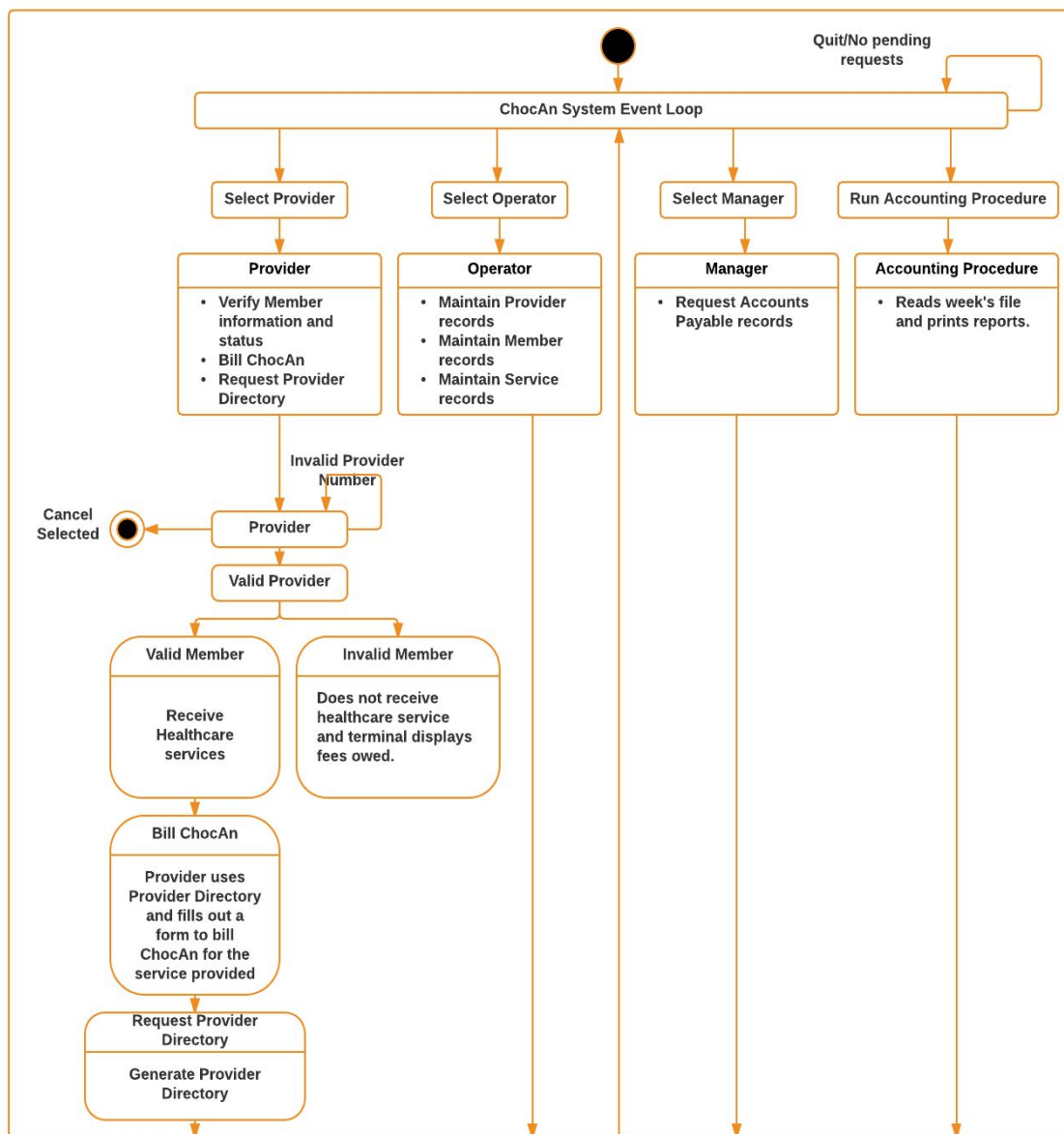


Fig 6: Iteration 2 of Statechart

Iteration 3 of Statechart:

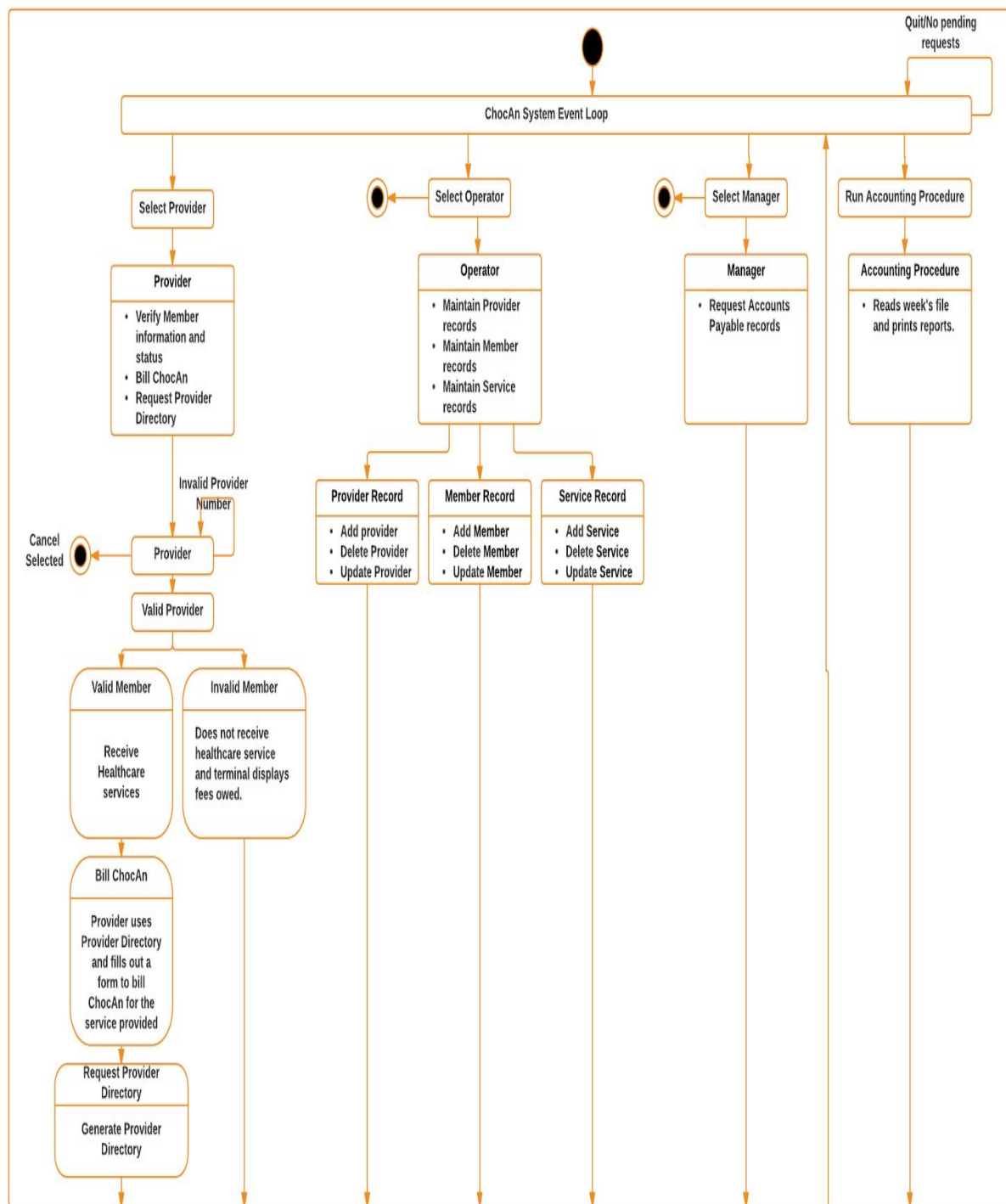
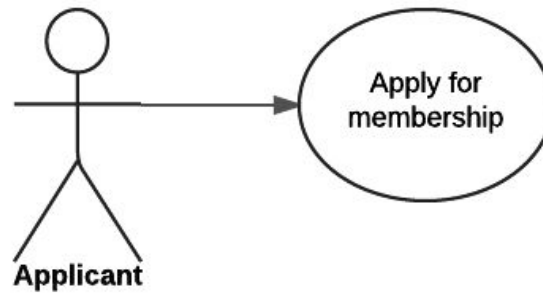


Fig 7: Iteration 3 of Statechart

Functional Modelling

Iteration 1 of use case scenarios:

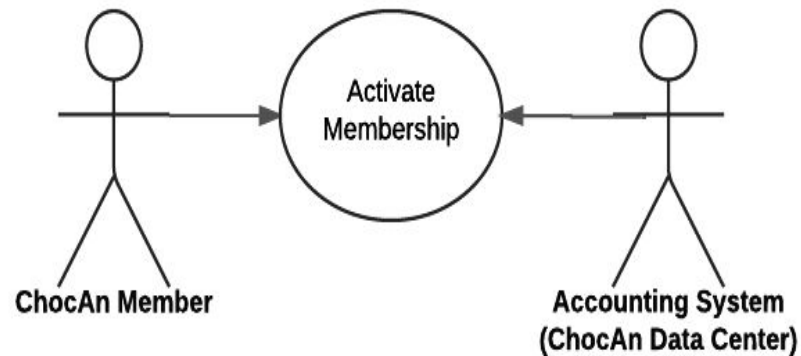


Normal Scenario for “Apply for membership” use case:

1. Applicant obtains a membership form
2. Applicant fills out membership form and hands it to ChocAn staff member
3. ChocAn staff member looks at membership form to determine eligibility
4. If eligible then ChocAn staff member asks for payment

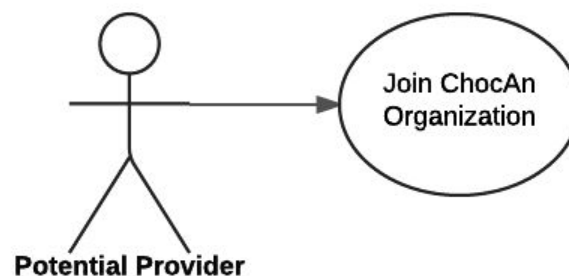
Exception Scenario for “Apply for membership” use case:

1. ChocAn staff member determines applicant is ineligible.
2. Applicant is rejected and does not give payment.



Normal Scenario for "Active Membership" use case:

1. Monthly payment is made by applicant
2. Payment is received and makes applicant a member
3. Member is given a membership card

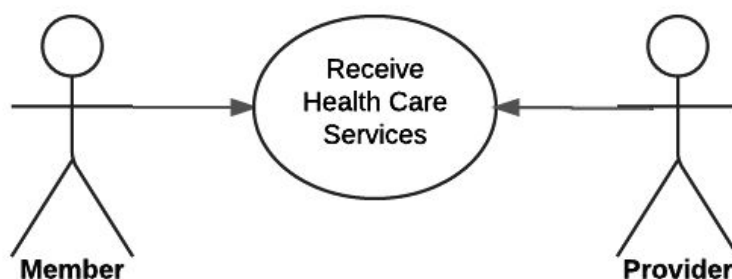


Normal Scenario for "Join ChocAn Organization" use case:

1. A potential provider obtains application to become ChocAn provider.
2. Potential provider fills out application with all required information.
3. Potential provider gives the application to ChocAn staff member
4. ChocAn staff member verifies information on potential providers application.
5. ChocAn operator uses Maintain Provider Records to record the new provider's information
6. New provider is issued a provider number

Exception Scenario for “Join ChocAn Organization” use case:

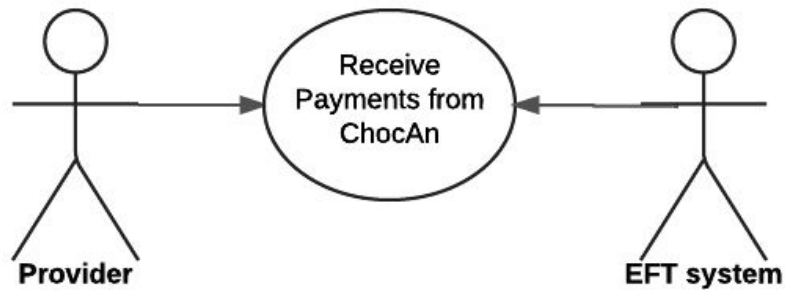
1. ChocAn staff member rejects the potential provider’s application.
2. Potential provider is not given a provider’s number.

**Normal Scenario for “Receive Health care Services” use case:**

1. ChocAn member wants to receive some health care service
2. ChocAn member finds a ChocAn provider
3. ChocAn member hands membership card to ChocAn provider
4. ChocAn provider slides card through card reader on terminal
5. Terminal dials ChocAn Data Center
6. ChocAn Data Center verifies the member number
7. If member number is valid the terminal displays “Valid”
8. ChocAn provider can then give health care service

Exception Scenario for “Receive Health care Services” use case:

1. If member number is invalid the terminal displays “Suspended” or “Invalid Number”
2. If “Suspended” then the terminal displays the fees owed by the ChocAn member



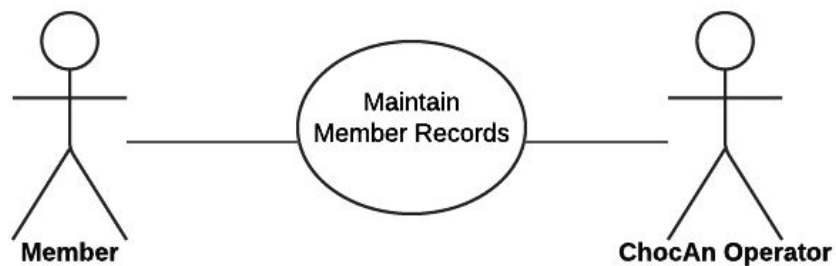
Normal Scenario for “Receive Payments from ChocAn” use case:

1. ChocAn provider's bills ChocAn once a health care service is provided to ChocAn member.
2. ChocAn provider slides membership card through the card reader or keys in the number.
3. ChocAn provider uses the provider directory to lookup the appropriate 6 digit service code.
4. ChocAn provider keys in the appropriate 6 digit service code that corresponds to the services provided.
5. The name of the service corresponding to the code is displayed.
6. ChocAn provider verifies if it is the correct service.
7. ChocAn provider enters comments
8. The software product writes the record to disk.
9. The ChocAn system displays the amount owed to the provider for the service provided to the ChocAn member.
10. The ChocAn provider fills out the provider's form that contains the displayed information.



Normal Scenario for "Receive Provider Directory" use case:

1. ChocAn provider can request the software product for a provider directory at any time.
2. ChocAn provider requests the software product for a provider directory.
3. The ChocAn provider receives the provider directory via email
4. The provider directory contains an alphabetically ordered list of service names and the service code along with the fee.



Normal Scenario for "Maintain Member Records" use case:

1. ChocAn Data Center runs software in interactive mode.
2. Operators are now allowed to change records of members
3. Operators can add members
4. Operators can delete members
5. Operators can update members



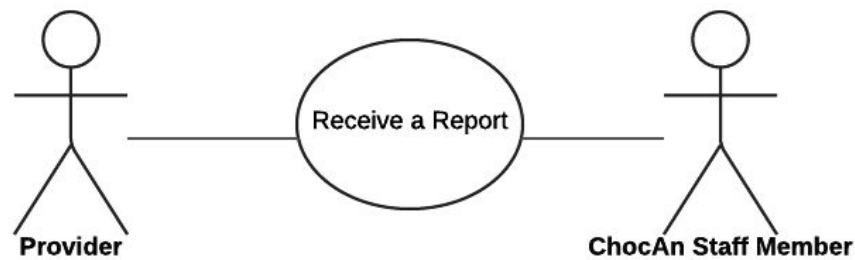
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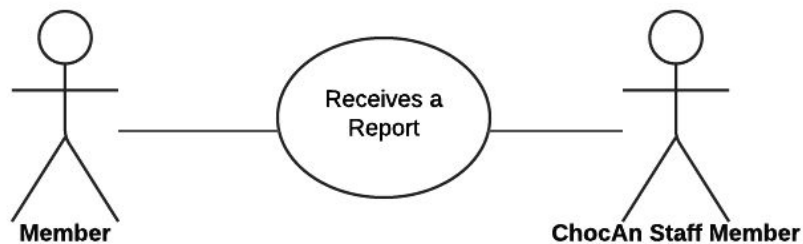
Normal Scenario for "Maintain Service Records" use case:

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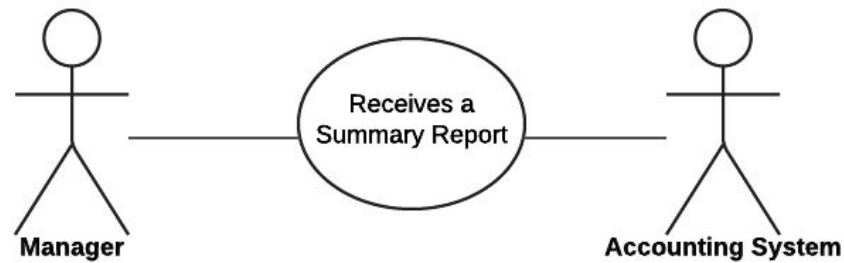
Normal Scenario for “Receive a Report” use case:

1. Each ChocAn provider that billed ChocAn during the week gets a report
2. The report is sent over email to the ChocAn provider, which contains the list of services the provider provided to ChocAn members.
3. For verification purposes the information in the report is the same entered on the provider’s form.
4. The end of the report has a summary that contains information about the member, provider, and service provided.



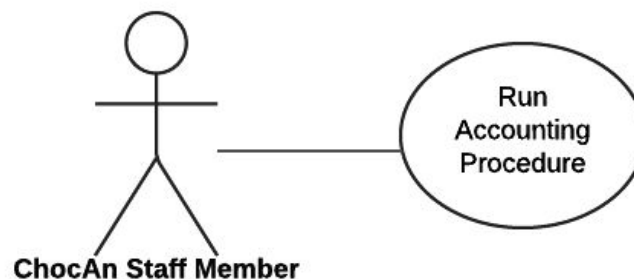
Normal Scenario for “Receive a Report” use case:

1. Each ChocAn member that consulted a ChocAn provider gets a report.
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Normal Scenario for “Receive a Summary Report” use case:

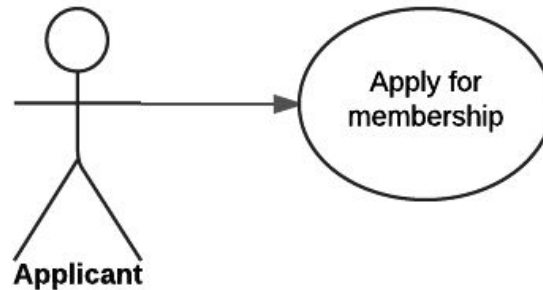
1. Each week on Friday at midnight at accounting procedure is run at the ChocAn Data Center.
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3. The report is automatically generated and is sent to the ChocAn manager each week and the report contains what every provider was paid, their number of consultations, total fee, total number of providers who provided services, total consultations, and overall total fee.



Normal Scenario for “Run Accounting Procedure” use case:

1. The ChocAn Data Center runs the accounting procedure on Friday at midnight every week.
2. The accounting procedure reads the week’s file of services provided.
3. The accounting procedure then prints a number of reports.

Iteration 2 of use case scenarios:

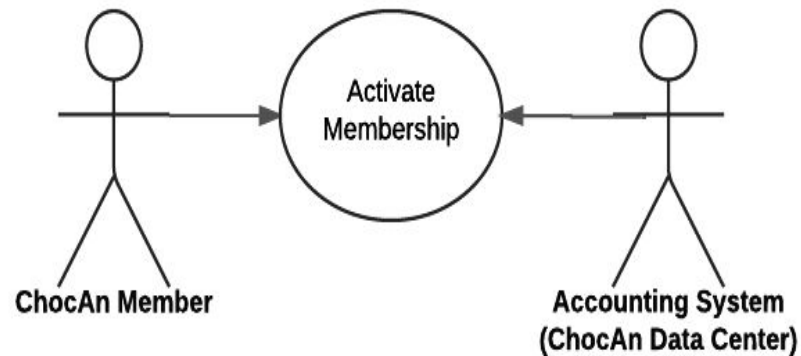


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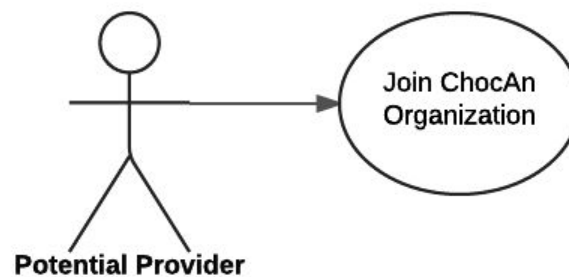
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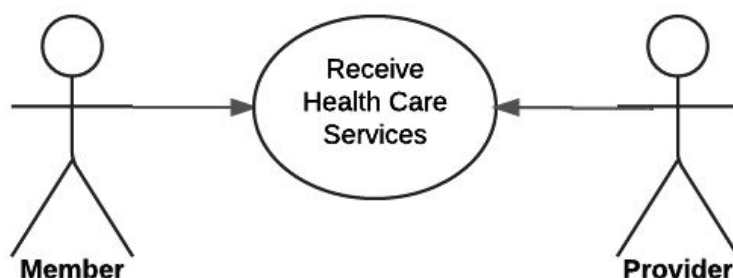


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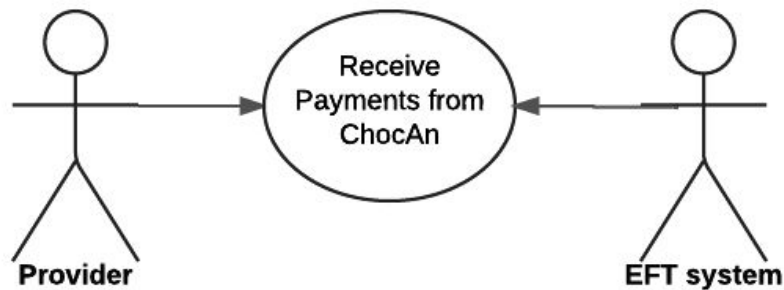
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8. ChocAn provider can then give health care service

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8. If "Suspended" then the terminal displays the fees owed by the ChocAn member



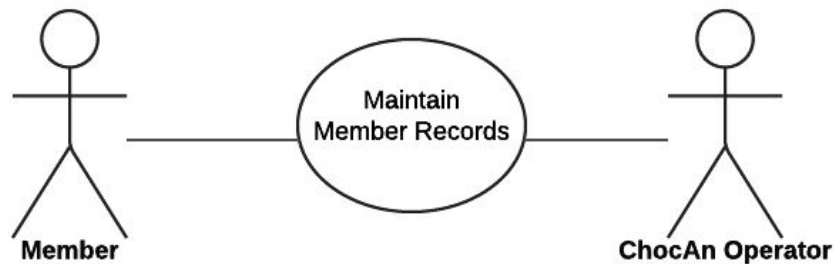
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5. The name of the service corresponding to the code is displayed.
6. ChocAn provider verifies if it is the correct service.
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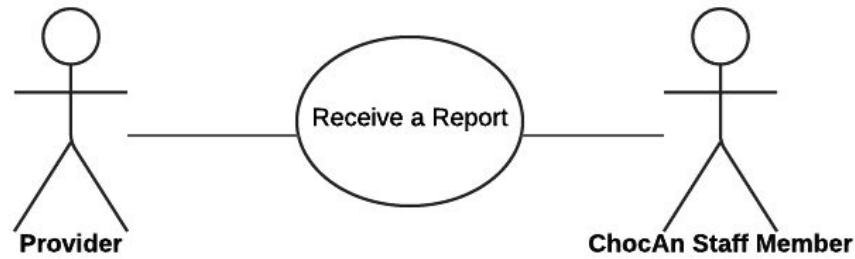
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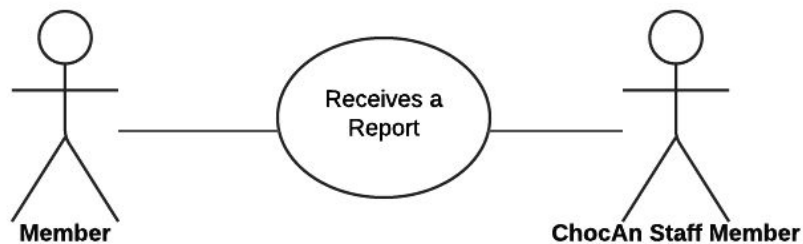
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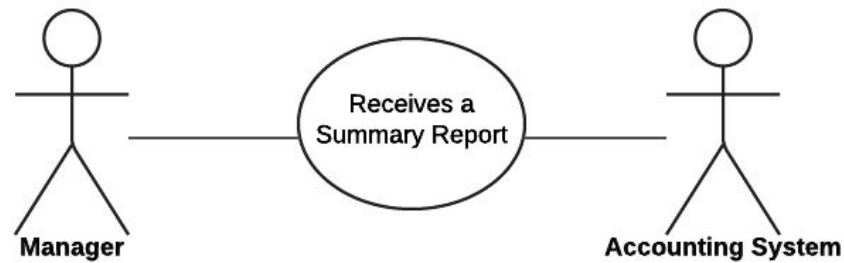
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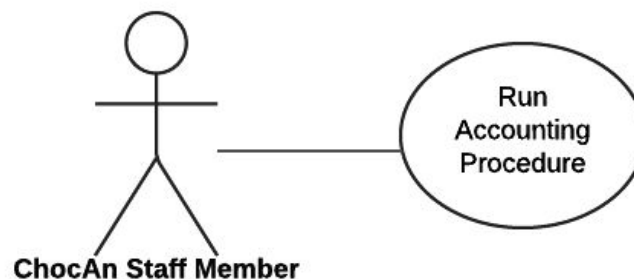
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3. The report is automatically generated and is sent to the ChocAn manager each week and the report contains what every provider was paid, their number of consultations, total fee, total number of providers who provided services, total consultations, and overall total fee.



Normal Scenario for “Run Accounting Procedure” use case:

1. The ChocAn Data Center runs the accounting procedure on Friday at midnight every week.
2. The accounting procedure reads the week’s file of services provided.
3. The accounting procedure then prints a number of reports.

Iteration 1 of CRC Cards:

Applicant Class
<p>RESPONSIBILITY</p> <ol style="list-style-type: none"> 1. Provide name 2. Provide Street Address 3. Provide city 4. Provide state 5. Provide zip code 6. Provide email 7. Provide phone number 8. Check applicant's request 9. Update applicant's request 10. Move to member class 11. Move to provider class
<p>COLLABORATION</p> <ul style="list-style-type: none"> • Member Class • Provider Class

Member Class
<p>RESPONSIBILITY</p> <ol style="list-style-type: none"> 1. Check member information and status 2. Get date of service 3. Get provider name 4. Request service
<p>COLLABORATION</p> <ul style="list-style-type: none"> • Provider Class • Service Class

Provider Class
<p>RESPONSIBILITY</p> <ol style="list-style-type: none"> 1. Input Provider number 2. Get member name and number 3. Get service code 4. Get date of service, time of service

5. Input fees to be paid 6. Input number of consultations 7. Input comments
<div>COLLABORATION</div> <ul style="list-style-type: none">• Service Class• Member Class

Service Class
<div>RESPONSIBILITY</div> <ol style="list-style-type: none">1. Input current Date and Time2. Input service provided date3. Get provider number and comments, providers name4. Get Members number5. Input service code
<div>COLLABORATION</div> <ul style="list-style-type: none">• Provider Class• Member Class

Iteration 2 of CRC Cards:

Applicant Class
<p>RESPONSIBILITY</p> <ul style="list-style-type: none"> 12. Provide name 13. Provide Street Address 14. Provide city 15. Provide state 16. Provide zip code 17. Provide email 18. Provide phone number 19. Check applicant's request 20. Update applicant's request 21. Send message to Member Class to receive health care services 22. Send message to Provider Class to provide health care services.
<p>COLLABORATION</p> <ul style="list-style-type: none"> • Member Class • Provider Class

Member Class
<p>RESPONSIBILITY</p> <ul style="list-style-type: none"> 5. Check member information and status 6. Send message to Service Class to obtain date of service. 7. Send message to Provider Class to obtain provider name. 8. Send message to Provider Class to request a service
<p>COLLABORATION</p> <ul style="list-style-type: none"> • Provider Class • Service Class

Provider Class
<p>RESPONSIBILITY</p> <ol style="list-style-type: none">8. Input provider number9. Send message to Member Class to obtain member name and number10. Send message to Service Class to obtain date of service and time of service11. Get date of service, time of service12. Input fees to be paid13. Input number of consultations14. Input comments
<p>COLLABORATION</p> <ul style="list-style-type: none">● Service Class● Member Class

Service Class
<p>RESPONSIBILITY</p> <ol style="list-style-type: none">6. Input current Date and Time7. Input service provided date8. Send message to Provider Class to obtain provider numbers, provider name, and comments.9. Send message to Member Class to obtain member number, name, and other info10. Input service code
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