BIS 403 - Applied Systems Design

College: Peirce College

Professor: Robert Heubner

Group Members: J. Sherif & M. Morrison

Case Study: Personal Trainer Preliminary Presentation

Date: 2/5/2024

Case Study #1
(Personal Trainer)

Task # 1
Business Profile

Mission:

- To promote healthy lifestyle,
- Longevity and boost quality of life through regular, consistent exercise and nutrition
- Technology-aided fitness goals for a healthy life for all through innovation
- Expertise
- Personal care. Achieve your fitness needs with us.

Task # 1
Business Profile

Vision:

- Empower our members to transform their lives through fitness,

- Enhancing their strength

- Healthy living

- Wellness

- Personal growth through a variety of programs at all our locations

Task # 1
Business Profile

Values:

- Offering a fit and healthy lifestyle accessible to all our members in all our
  locations

- Be in the driver seat of your health

- Fitness

- Wellbeing

- Empowering individuals to take control of their health and wellness journey

- We provide programs that fit your needs

Task # 1
Business Profile

Services and products:

- Large exercise area with state-of-the-art equipment

- A swimming pool

- A sporting goods shop

- A health food store, and a snack bar

- Childcare with special programs for various ages, a teen center, and a computer café

- Online access to customized training programs and progress reports, and much more

- Exercise programs, a selection of gym exercise classes

- Knowledgeable staff

- Community events and social activities

- Nutrition counseling, and cutting-edge technology

Task # 2
Processes & Functions

Processes	Functions
To check membership	Microsoft Office, Excel and word
To grant online access	24/7 website by Patterson & Wilder
To verify payment and Accounting	BumbleBee Accounting Package
To grant gym access	Swipe or scan membership card
To excel customer service	Ask members if they need anything else

Task # 3
System Considerations

- ERP
- Transaction processing
- Business support
- User productivity and activity
- Flexibility and scalability
- Inventory control
- Google drive suite

Task # 4
B2C & B2B Opportunities

- Online signup and account creation capability
- Membership promotion
- Membership packages
- Healthy living promotion
- Market penetration

Case Study #2
(Personal Trainer)

Tasks and Duration

#	Task	Duration
1	Choosing the Right Location	5 days
2	Plan and Design, Budgeting, and Scheduling	7 days
3	Blue print preparation	5 days
4	Contractor Selection	5 days
5	Actual Construction	60 days
6	Safety review	5
7	Furnishing the gym	2
8	Grand Opening	1

Dependent Tasks

- Task 2 and 3 (Plan and Design) depend on

Task 1 (Location selection) that includes

*Researching a location

*Concentration of target audience

*Competition

*Market Gap

Dependent Tasks

- Tasks 4 and 5 (Contractor selection and actual Construction)

depend on Task 2 and 3 that include

*Contractor prior performance review

*Management approval

*Zoning License

*Regulatory requirements

Dependent Tasks

- Task 7 (Furnishing the supercenter) depends on

Tasks 5 & 6 that include:

*Completion of the construction

*Purchase, delivery and installation of equipment

*Safety Walkthrough

*Fire drill

Dependent Tasks

▪ Task 8 (Grand Opening) depends on the successful

completion of all tasks (1 - 7) that are predecessors:

* Choosing the right location

* Planning, designing, budgeting and scheduling

* Blueprint prep

* Contractor selection

* Actual construction

* Safety review

* Furnishing the supercenter

* Grand opening

Fact Finding Technique #1 (Observe Operations)

- During the preliminary investigation, both Susan & Gray should consider observing current day to day operations at other Personal Trainer locations for the below listed reasons:

  1. To get a sense of how staff interacts with the current system, with different volumes of gym goers at a facility on a day to day basis.

  2. To observe if the current system serves the needs of the current customers and whether or not the staff can effectively execute on current needs, or if the current system has bottlenecks in certain scenarios.

Fact Finding Technique #2 (Conduct A User Survey)

- During the preliminary investigation, both Susan & Gray should also consider conducting a user survey at a high volume Personal Trainer facility for the following reasons:

  1. To discover any issues the user may encounter with the current system when dealing with a high volume of gym goers.

  2. To discover if the user has to deal with minor system inconveniences on a day to day basis that may potentially affect the user's overall productivity and experience.

Employee Survey Questions

- Listed below are the three employee survey questions that will be included in the user survey.

    1. Question #1: Do you feel confident in the stability of the current system when performing various tasks?

    2. Question #2: Do you recall any instances where the current system crashed or could not complete a task?

    3. Question #3: What improvements would you like the current system to have in order to make day to day operations easier?

Operational Feasibility

1. Operational Feasibility Definition - How well a proposed system solves problems & takes advantage of business opportunities.

2. Listed below are two questions that will help determine operational feasibility of the new system:

    1. Question #1: Will this proposed system have the ability to handle a large amount of transactions, tasks and traffic at scale without degrading performance on a day to day basis?

    2. Question #2: Will the new system put any strain on the customer? In regards to billing & payment, membership renewal, membership sign up, or day to day use from their end?

Economic Feasibility

1. Economic Feasibility Definition - A quantitative measurement on how the proposed system may bring an economic benefit as opposed to the total cost of ownership.

2. Listed below are two questions that will help determine economic feasibility of the new system:

   1. Question #1: What is the overall cost of building and implementing this system as well as a rough estimate of quarterly operating cost (Licensing, Hardware & Software Upgrade)?

   2. Question #2: Is the cost of the new system outweighed by better operating expenses as well as provide Personal Trainer with the ability to execute on current and future market opportunities within the industry?

Technical Feasibility

- Technical Feasibility Definition - Resources required to develop or implement an existing solution within an organization.

- Listed below are two questions that will help determine technical feasibility of the new system:

  1. Question #1: Will the current hardware, software & network infrastructure be able to handle the proposed system (Staff Computers, Network Gear, VPN Configuration)?

  2. Question #2: How will this system be supported on a day to day basis as well as for possible future organizational integration with other business products (Technical Support Staff, Network Team, Development Team)?

Schedule Feasibility

1. Schedule Feasibility Definition - The timeline of the implementation in an acceptable time frame

2. Listed below are two questions that will help determine schedule feasibility of the new system:

   1. Question #1: Are there any outlining risks that may affect the time to completion of the implementation?

   2. Question #2: What is the proposed timeline for completion?

Case Study #3
(Personal Trainer)

Fitness Center Operations

Sales and Customer Acquisition

Security

Emergency Exit Preparedness

Children's Programming & Safety

Diversity, Equity, & Inclusion (DEI)

Member Registration

24/7 Online Access

SWOT Analysis Strengths

- Excellent Customer Service

- Upgraded Facility

- 24/7 Service

- Online Access

- Specialized Equipment

- Experienced Personal Trainers

SWOT Weaknesses

- Training Newly Hired Staff

- New Location Familiarization

- Snowy Weather

- High Membership Costs

SWOT Opportunities

- Expansion in the New Location

- Diversified Staff with Different Backgrounds

- Increasing Clientele

- Digital Fitness Programs

- Partnerships

- Health and Wellness Trend

SWOT Threats

- Stiff Competition

- Government Rules

- Cost of Ownership

- At-home Fitness Trend

- Economic Fluctuations

Business Case Part 1

- Why are we doing this project?

  Expansion of Personal Trainer Supercenters that has a dozen branches

- What is the project about?

  Toronto Area modern Supercenter as part of international expansion

- How does this solution address key business issues?

  Attracting new clientele, income growth, profitability

- How much will it cost and how long will it take?

    90-day Schedule, $1M

- Will we suffer a productivity loss during the transition?

    Unlikely as it is a new store at a new location

- What is the return on investment and payback period?

    10% of $1m (i.e $100,000) and 1-year from grand opening

- What are the risks of doing the project?

    Hiring experienced manpower and stiff competition

- What are the risks of not doing the project?

    Missing of the Personal Trainer's vision and mission of expansion and each of new clientele
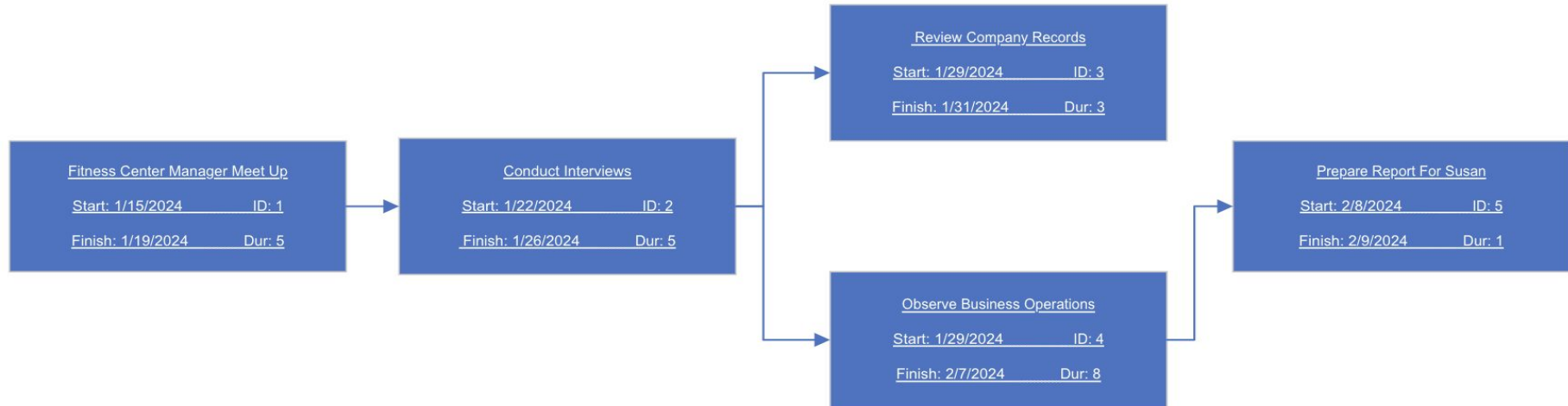
- How will we measure success?

    On time performance, within budget, opening the supercenter

- What alternatives exist

    Scanning other metro areas of the NE of Canada

PERT CHART

Critical Path

- The critical path is a series of tasks if delayed would affect the completion date of the overall project.

- The overall duration of this project is from 1/15/2024 to 1/31/2023 which amounts to 13 days.

- The critical path for this project include ID #2 and critical ID #3, if these tasks are delayed this will affect the completion date of the overall project.

Case Study #4
(Personal Trainer)

System Requirements

Personal Trainer system categories fall into five categories:

- Output
- Inputs
- Processes
- Performance
- Controls

Outputs

- System generation of reports on customers' unpaid balances
- FAQs and trends
- Client activity and fitness tracker log
- Exception report
- Seasonal discount and promotion plans

Inputs

- Information gathering of member preferences
- Member activity and loyalty
- Member feedback
- Continuous communications (e-mails and brochures)

Processes

- PoS (point of sale) terminals
- ID scanner
- Automated staff sign-in and sign-out
- Staff scheduling
- Time keeping

Performance

- Actual vs. Expected performance review
- Standardized forms
- Periodic employee productivity evaluation
- User and password control and expiration
- Data reconciliation
- Member retention

Controls

- Internal audit
- Facility Security
- Injury prevention
- Cameras
- Fire exits

Scalability

Definition:

Scalability is a characteristic of a system, implying that the system can be expanded, modified, or downsized easily to meet the rapidly changing needs of a business enterprise. As president of Personal Trainer, there are scalability issues that Susan should consider:

Scalability issues:

- Elasticity to handle more than usual business volume and transactions,
- company growth and branches expansion
- Projected number of customers averaged
- High and low seasons

Scalability Issues contd.

- Network capacity
- Cloud Storage
- Account and Username Security, and Password Expiration
- Cyber Security
- Manpower and staffing
- Resilience and data backup

- To conduct a proper survey of the current personal trainer members, Susan should utilize the **<u>Stratified Sample</u>** method.

- This method broadens the overall scope of the sample data, and provides an overall view of the current member population to further analyze.

- Due to the their being an estimated 300 to 500 current members in each facility, and the mean number of members being 400, 25% of that population should be analyzed. This means 100 different members will be analyzed per facility. Multiply 100 by the total number of Personal Trainer trainer facilities and you have a total number of the current member population that may be analyzed.

- To conduct a proper survey of the current personal trainer members, Susan should utilize the **Random Sample** method.

- The current rate of prospective members are currently not tracked, however utilizing the **Random Sample** method will allow Susan to generalize the population as well as make predictions.

- These random samples should be half of the overall prospective member population per facility every month. Sample data such as what activities the perspective members are interested in, their age and their sex should be recorded.
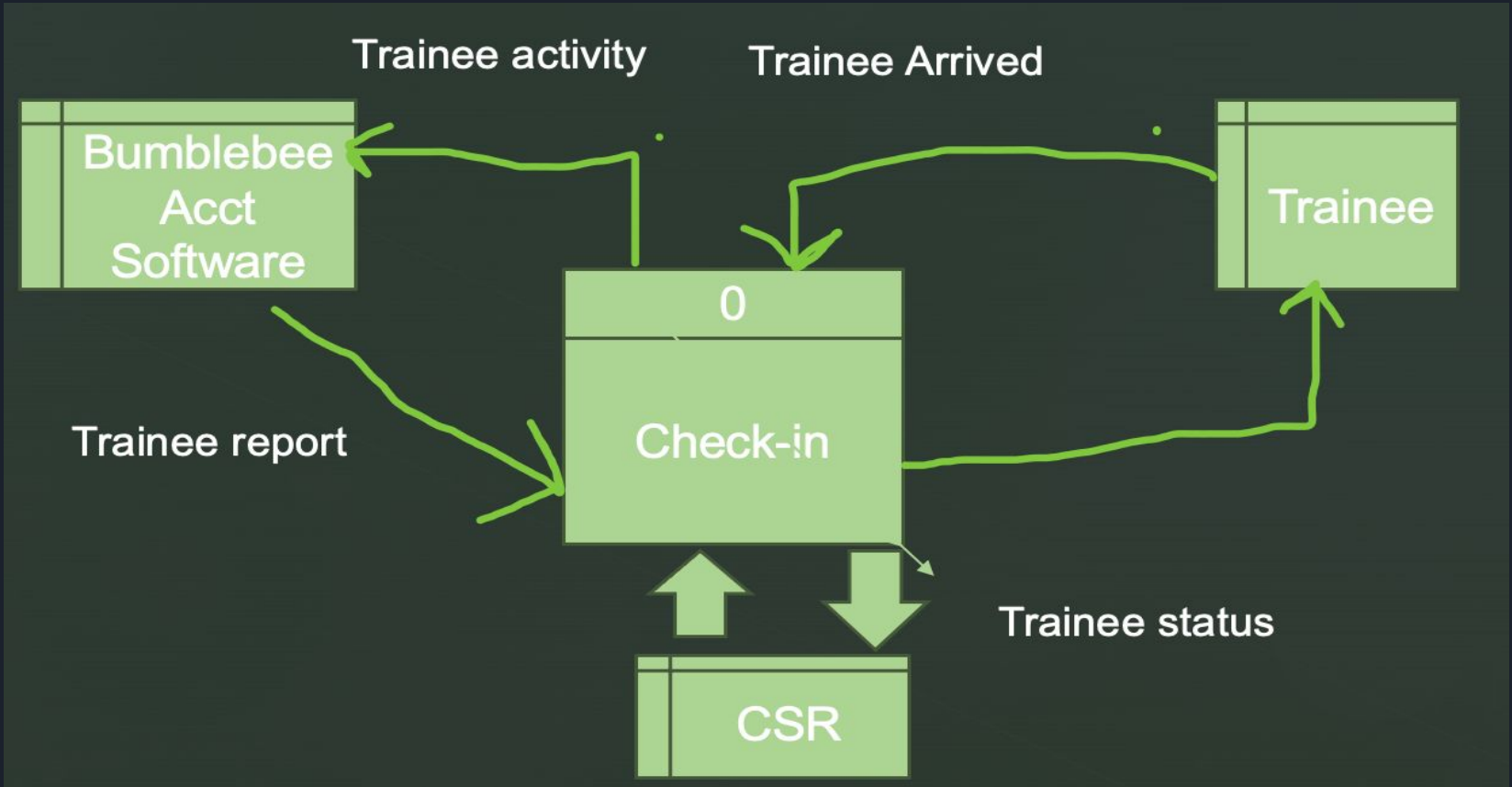
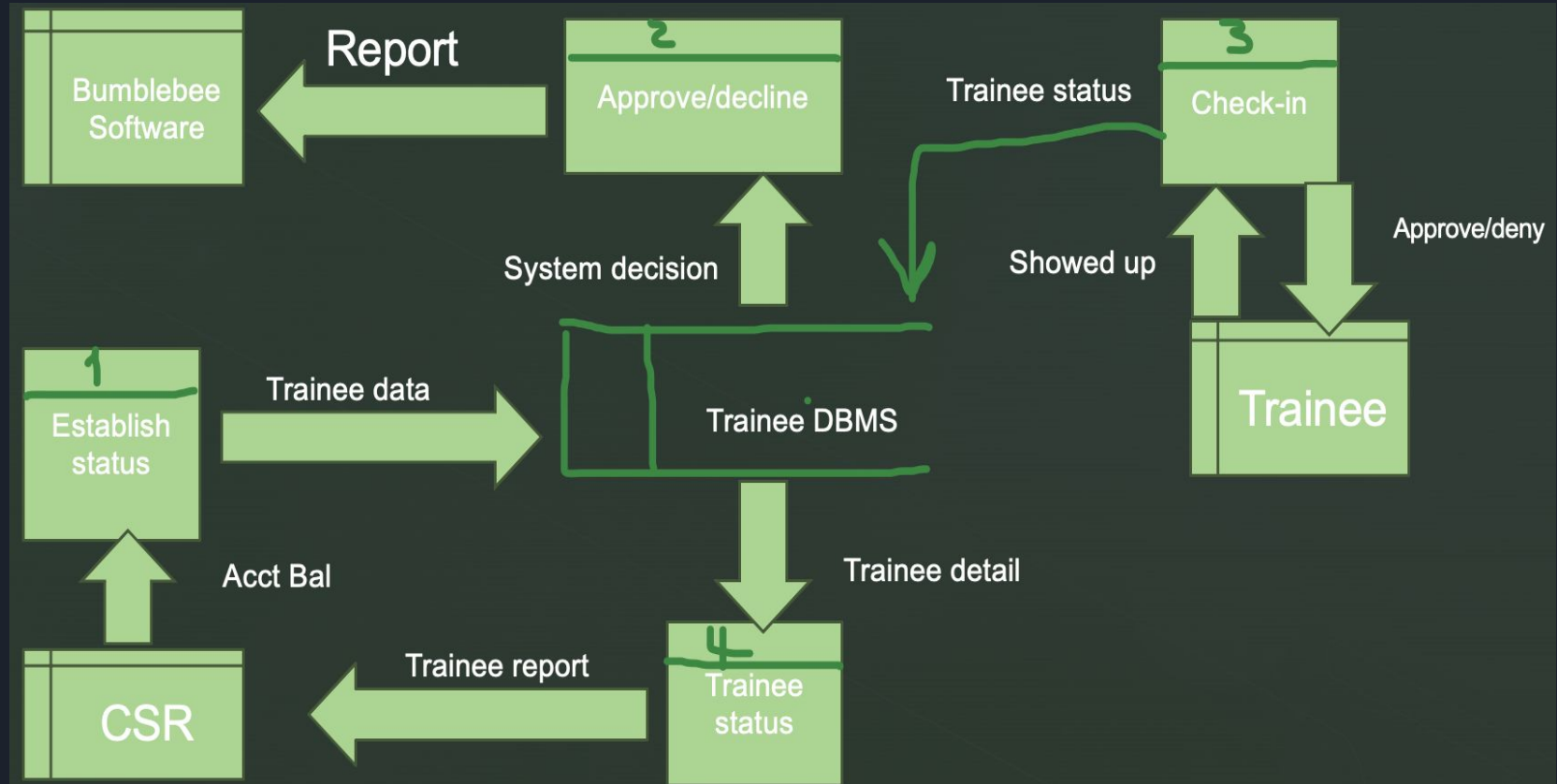# Personal Trainer Functional Decomposition Diagram
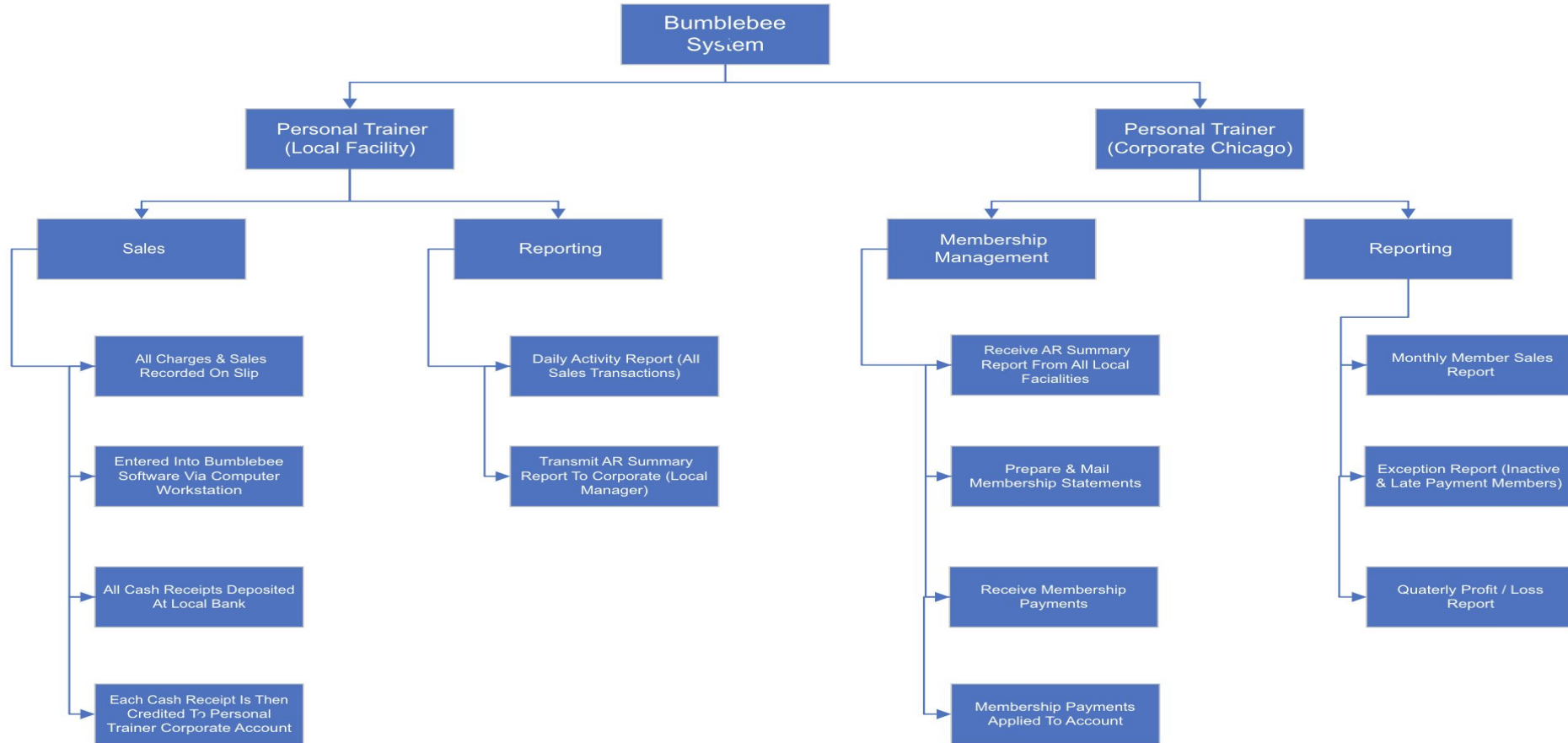
Case Study #5
(Personal Trainer)

Personal Trainer Diagram 0 DFD Task #2

BumbleBee Software Corporate Reporting Attributes (Memo)

DATE: 1/30/2024

TO: Project Stakeholders

FROM: Susan Park

SUBJECT: Bumblebee Software Corporate Reporting Attributes

Greetings Stakeholders,

This memo is to list and standardized the current attributes that should utilized for the three corporate reports that is ran by headquarters. These reports are monthly member sales report, the exception report (Inactive & Late Payment Members), and the quarterly profit / loss report. Listed below are the attributes that should be utilized for each report.

1. **Monthly Member Sales Report**
   - Member ID Number - To identify who the member is. This attribute will be crossed referenced with a name when the report is generated.
   - Personal Trainer Facility ID Number - To determine the facility of origin. This provides insight on facility performance.
   - Membership Type - Provides insight on the highest selling membership type.
   - Membership Fee - Provides a total amount on their membership fee which is based off of their membership type.

1. **Exception Report (Inactive & Late Payment Members)**
   - Member ID Number - To identify who the member is. This attribute will be crossed referenced with a name when the report is generated.
   - Personal Trainer Facility ID Number - To determine the facility of origin. This provides insight on facility performance.
   - Days Inactive - Shows how many days a member may be inactive.
   - Days Past Due - Shows how many days a member is past due on their membership payment.
   - Days Past Due Total Fee - Shows how much a member owes in order to get their account reinstated and back active. This depends on their membership type.

1. **Quarterly Profit / Loss Report**
   - Personal Trainer Facility ID Number - To identify who the member is. This attribute will be crossed referenced with a name when the report is generated.
   - Personal Trainer Facility Lead Manager Number - To identity the lead manager that is in charge of a designated facility.
   - Total Revenue - Identifies the total revenue generated for a location. This includes membership sales, merchandise sales as well as service sales.
   - Total Expense - Identifies the total expense for a location. This includes facility rent, utilities, and overhead.
   - Total Profit - Identifies the the total profit generated for a location. Revenue minus all expenses at that location.
   - Merchandise Sales Total - Identifies total merchandise sales for a specific location.
   - Service Sales Total - Identifies total service sales for a specific location.

BumbleBee Software Entity Attributes (Memo)

DATE: 1/30/2024

TO: Project Stakeholders

FROM: Susan Park

SUBJECT: Bumblebee Software Entity Attributes

Greetings Stakeholders,

This memo is to list and standardized the current attributes that should utilized for entities that interact with the BumbleBee Software system directly or indirectly. Think of an entity as something that has some form of data associated with it and can affect the system. An example of this would be a Personal Trainer member. That member would be an entity because that individual has data related to them. Their age and sex for example. Listed below are two of the various entities as well as their attributes that will interact with the Bumble Bee software.

1. **Personal Trainer Member**
   - Member ID Number - To identify who the member is. This number is unique. Even if a member is inactive and is reinstated, they will their original member id number.
   - First Name - To identify the first name of the member.
   - Middle Name - To identity the middle name of the member. This also helps distinguish between members who may have the first and last name.
   - Last Name - To identify the last name of the member.
   - Age - To identify the age of the member. This plays a factor in service promotions.
   - Address - To identify the address of the member, for distinguishing purposes.
   - State - To identify the address of the member, for distinguishing purposes.
   - Zip Code - To identify the address of the member, for distinguishing purposes.
   - City - To identify the address of the member, for distinguishing purposes.
   - Email - For promotional purposes as well as account authentication, sign in, and communication.
   - Membership Type - Determines the level of membership the member has when utilizing the facility.
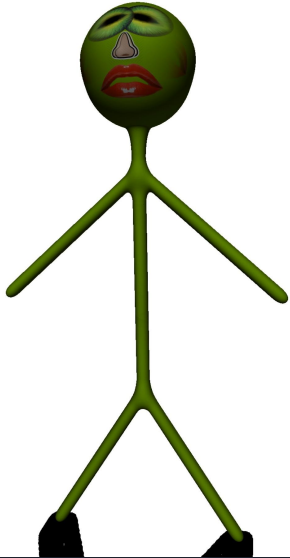
1. **Personal Trainer Local Facility Manager**
   - Personal Trainer Work ID Number - To identify who the Personal Trainer team member is. This number is unique throughout the organization.
   - Personal Trainer Facility ID Number - To determine what facility the manager manages. Each manager may only manage one facility. One to one relationship.
   - AD Username - For active directory sign on purposes.
   - Work Email - For company communication purposes.
   - First Name - To identify the first name of the employee.
   - Middle Name - To identity the middle name of the employee. This also helps distinguish between employees who may have the first and last name.
   - Last Name - To identify the last name of the employee.
   - Tenure - Identifies the seniority of the employee. Based on hire date.
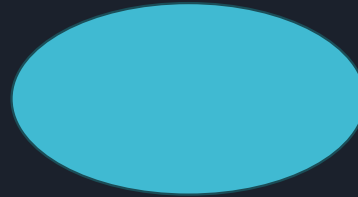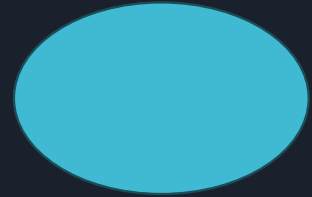
Case Study #6
(Personal Trainer)
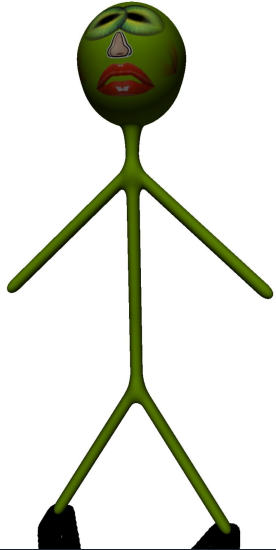
Trainee
(Actor)

Join Personal
Trainer

<<uses>>

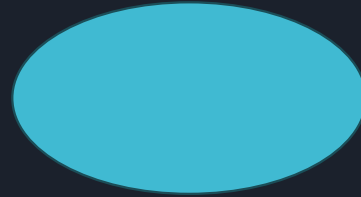Personal Trainer
Training Services

Task #1 Actors and Use cases

Check hours
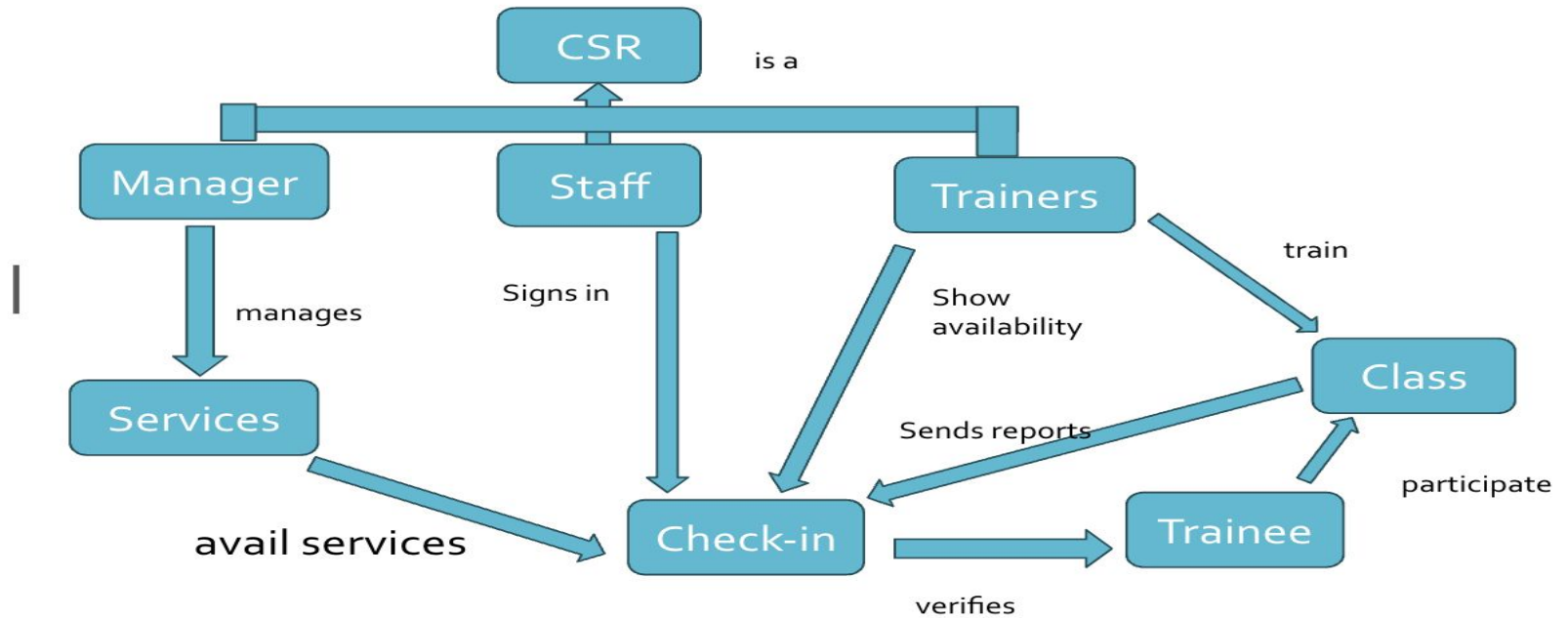
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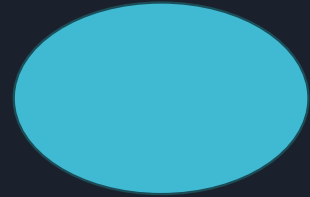
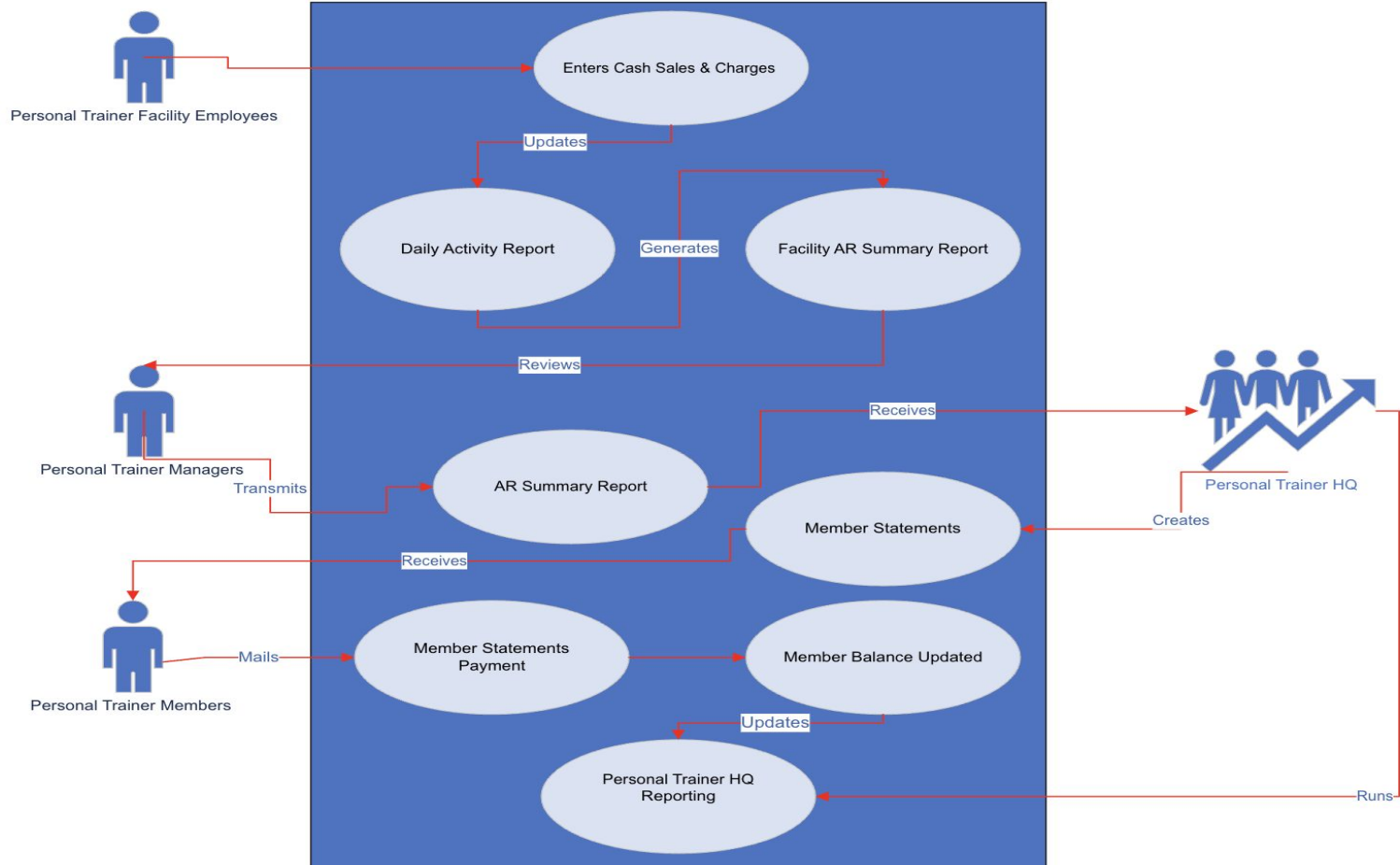Trainer's Schedule

Instructors

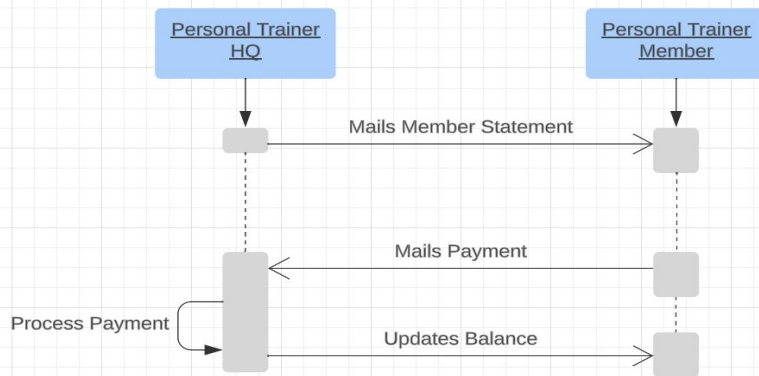# BumbleBee Accounting Software Full Use Case Diagram

Use Case Diagram: Bumblebee Accounting Software

BumbleBee Software Sequence Diagram (Member Balance Update)

Member Balance Update Use Case Sequence Diagram

Morrese Morrison | February 3, 2024

Personal Trainer HQ

Personal Trainer Member

Mails Member Statement

Mails Payment

Process Payment

Updates Balance

Bumble Accounting Software Use Case State Transition Diagram

Member Balance Update Use Case State Transition Diagram

Morrese Morrison | February 3, 2024