**Botanic Garden Project**

School of Professional Studies, Clark University

Information Systems Analysis & Design

Table of Contents

1. **Business Case 2**
2. **Preferred Option – Cloud Hosted System 8**
3. **Cyber Security Concerns in Implementing New System 9**
4. **Context Diagram 12**
5. **Functional Decomposition Diagram 13**
6. **Business Requirement 14**
7. **User Stories 15**
8. **Entity Relationship Diagram 16**
9. **UI Design 17**
10. **Class Diagram 20**
11. **References 22**
12. **Appendix 23**

**Botanic Garden Project**

**1. Business Case**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Mission Statement | The mission of the Botanical Garden is to provide a serene environment where visitors and members are welcomed all seasons to engage in nature. Our commitment is to inspire learning and share botanical knowledge through events and classes to anyone who is interested in creating a beautiful and diverse garden. We inculcate life-long passion for growing plants to promote human and environmental well-being. We are adopting more modern solutions to enable hassle free experience for online membership and events registration. | | | | | | |
| Purpose of Business Case | The purpose of this business case is to present stakeholders with issues currently being faced by the organization and the solution that needs to be implemented to resolve the problems. The current infrastructure has non-integrated POS systems which work in silos, because of which accounting department is spending more time and resources to perform account reconciliation for each month. Also, the organization is not able to avail higher discounts on transaction fees from credit card company. The current company’s website is stale and does not allow members to register for events online which causes extra burden for office staffs to manually register members over the phone. Because of the lack of efficient membership as well as event management system, our members are not being presented with the best experience they could get. | | | | | | |
| General Project Information | |  |  | | --- | --- | | Submission Date | 12/19/2022 | | Requested By | Jeremy Kauffman | | Business Owner | Jeremy Kauffman | | Contact Info | jkauffman@clarku.edu | | Project Name | Botanical Garden Project | | Desired Start Date | 12/22/2022 | | | | | | | |
| Project Description | | | | | | | |
| Business Need | Botanic Garden currently don’t have any centralized system that can facilitate POS system, Membership system, and Event Management system. Miscommunication between these systems results in members not having an experience we wish to provide**.** There is a need to make a system that can integrate all these systems into one. There is also a need to have dynamic website that will be used by the members as well guest to know more about the garden and purchase tickets for the events that will be organized. This will make it possible for the organization to provide visitors with a better organized and tranquil experience, as well as the management, a better and efficient way to manage the Botanic Garden’s operations. | | | | | | |
| Goals/Scope | The goal of the project is to make the Botanic Garden’s domain to be the best fit for members as well as guests by providing them a good online as well as real life experience with the diverse gardens. Our goal is to promote nature’s beauty to the visitors so that they can learn and gain knowledge about the gardens in a convenient way. It will improve the user experience by introducing a system which will help in promoting the events that are going to happen in the garden, also it will help in growing the business. Our system will introduce new things like membership plans which will help them in gaining more benefit in the stores and cafes. By implementing these solutions, the company will be able to generate more revenue and funds to gain users and increase its high footfall. Our new system will also track member’s data and information for providing better services to them. | | | | | | |
| Risks/Issues | Whenever we make changes to a system or the management, risks related to them will also arise. Risks associated with implementing these solutions are:   * There will be a need to take the system offline for some time for an approximate 30 hours when integrating the system. * The system integration will take place on weekend which might results in decrease in profit since there are more members visiting the Botanic Garden on weekends only. * There might be a chance of losing members due to closing of the systems. Also, might lose a chance of attracting more new members because of system outage. * There will be a huge cost for implementation of integrating the systems which might result in below par integrated system. * The additional guidelines and policies are needed to be introduced before reopening the garden which might take additional time for restarting the system in a proper manner. * There is a risk of facing unexpected difficulties while implementing the changes which might results in extending the duration of implementation process. | | | | | | |
| High- Level Business Impact | * Integrated POS system will enable the organization to pay less transaction fees to credit card company. * Organization staffs needs to be trained for operating the new integrated system. * Office staffs’ time will be saved and can be utilized for other impactful work as members can register for events online without calling the staffs. * Accountants’ time will be saved as the integrated POS system will reconcile different accounts quickly. | | | | | | |
| Alternatives and Analysis | | | | | | | |
| Alternative A: Commercial off the shelf (COTS) | | | | | | | |
| Part 1: Blackbaud Implementation by Blackbaud consultant | | | | | | | |
| **Cost** | | | | | | | |
| Description | | | Implementation Year 2022 | Year 2023 | Year 2024 | Year 2025 | Year 2026 |
|  | | |  |  |  |  |  |
| Rackspace Hosting Cost | | | 3000 | 3000 | 3000 | 3000 | 3000 |
| Web Development Cost | | | 5000 |  |  |  |  |
| Site Maintenance Cost | | |  | 1500 | 1500 | 1500 | 1500 |
| Blackbaud Consultant Cost | | | 50000 |  |  |  |  |
| Testing Cost by Credit Card Company | | | 1000 |  |  |  |  |
| Training Cost for 27 Staffs (Assuming $60 training cost for each staff) | | | 1620 |  |  |  |  |
| System Downtime Cost (while integration) | | | 4300 |  |  |  |  |
| Interest Cost (Assuming company take loan of $60,000 from bank @3% per annum for 4 years) | | |  | 936.75 | 936.75 | 936.75 | 936.75 |
| **Total Cost** | | | 64920 | 5436.75 | 5436.75 | 5436.75 | 5436.75 |
| **Benefits**  **(Credit card savings are calculated as per Appendix-I)** | | |  |  |  |  |  |
| (Assuming Customers spending increases 1% each year in all facilities) | | |  |  |  |  |  |
| Gate and Membership credit card fees savings | | | 4080 | 4120.8 | 4162.008 | 4203.628 | 4245.664 |
| Café credit card fees savings | | | 4263 | 4305.63 | 4348.686 | 4392.173 | 4436.095 |
| Store credit card fees savings | | | 4446 | 4490.46 | 4535.365 | 4580.718 | 4626.525 |
| Events credit card fees savings | | | 3630 | 3666.3 | 3702.963 | 3739.993 | 3777.393 |
| Cost savings from office staff taking manual calls (40 hours per week) (Assuming staffs are paid @$15/hour, and it increases 3% annually) | | | 31200 | 32136 | 33100.08 | 34093.08 | 35115.87 |
| ***Total Benefits*** | | | 47619 | 48719.19 | 49849.1 | 51009.59 | 52201.55 |
|  | | |  |  |  |  |  |
| **ROI [(Net Return on Investment/Cost of Investment) \*100]** | | | 188% |  |  |  |  |
| **Payback Year (Cost of Investment/ Average Annual Cash Flow)** | | | 2nd year |  |  |  |  |
|  | | | | | | | |
| Part 2: Blackbaud Implementation by Independent consultant | | | | | | | |
|  | | |  |  |  |  |  |
| **Cost** | | |  |  |  |  |  |
| **Description** | | | **Implementation 2022** | **Year 2023** | **Year 2024** | **Year 2025** | **Year 2026** |
| Rackspace Hosting Cost | | | 3000 | 3000 | 3000 | 3000 | 3000 |
| Web Development Cost | | | 5000 |  |  |  |  |
| Site Maintenance Cost | | |  | 1500 | 1500 | 1500 | 1500 |
| Independent Consultant Cost | | | 35000 |  |  |  |  |
| System Integration Issues fixing cost | | | 10000 |  |  |  |  |
| Testing Cost by Credit Card Company | | | 1000 |  |  |  |  |
| Training Cost for Staffs (Assuming $60 training cost for each staff) | | | 1620 |  |  |  |  |
| System Downtime Cost (while integration) | | | 4300 |  |  |  |  |
| Interest Cost (Assuming company take loan of $60,000 from bank @3% per annum for 4 years) | | |  | 936.75 | 936.75 | 936.75 | 936.75 |
| ***Total Cost*** | | | 59920 | 5436.75 | 5436.75 | 5436.75 | 5436.75 |
|  | | |  |  |  |  |  |
| **Benefits (Credit card savings are calculated as per Appendix-I)** | | |  |  |  |  |  |
| (Assuming Customers spending increases 1% each year in all facilities) | | |  |  |  |  |  |
| Gate and Membership credit card fees savings | | | 4080 | 4120.8 | 4162.008 | 4203.628 | 4245.664 |
| Café credit card fees savings | | | 4263 | 4305.63 | 4348.686 | 4392.173 | 4436.095 |
| Store credit card fees savings | | | 4446 | 4490.46 | 4535.365 | 4580.718 | 4626.525 |
| Events credit card fees savings | | | 3630 | 3666.3 | 3702.963 | 3739.993 | 3777.393 |
| Cost savings from office staff taking manual calls (40 hours per week) (Assuming staffs are paid @$15/hour, and it increases 3% annually) | | | 31200 | 32136 | 33100.08 | 34093.08 | 35115.87 |
| ***Total Benefits*** | | | 47619 | 48719.19 | 49849.1 | 51009.59 | 52201.55 |
|  | | |  |  |  |  |  |
| **ROI [(Net Return on Investment/Cost of Investment) \*100]** | | | 205% |  |  |  |  |
| **Payback Year (Cost of Investment/ Average Annual Cash Flow)** | | | 2nd year |  |  |  |  |
|  | | | | | | | |
| **Security consideration** | | | * The sensitive transaction information will be captured and transmitted from the Blackbaud system, and it will be necessary to encrypt and then transmit the sensitive information which will help in reducing the risk associated with point-of-sale information. * Since, we are upgrading our website we have to make sure that there should be no security vulnerabilities which could lead to data breach and Blackbaud provides an extra layer of fraud management especially for the online transactions. * Since Blackbaud is integrating with the existing infrastructure, the firewall should be properly configured to secure the organization network from intruders. | | | | |
|  | | |  |  |  |  |  |
| Alternative B: Outsource development - Kindful Implementation by Independent consultant | | | | | | | |
|  | | |  |  |  |  |  |
| **Cost** | | |  |  |  |  |  |
| **Description** | | | **Implementation 2022** | **Year 2023** | **Year 2024** | **Year 2025** | **Year 2026** |
| Rackspace Hosting Cost | | | 3000 | 3000 | 3000 | 3000 | 3000 |
| Web Development Cost | | | 5000 |  |  |  |  |
| Site Maintenance Cost | | |  | 1500 | 1500 | 1500 | 1500 |
| Independent Consultant Cost | | | 35000 |  |  |  |  |
| System Integration Issues fixing cost | | | 10000 |  |  |  |  |
| Testing Cost by Credit Card Company | | | 1000 |  |  |  |  |
| Subscription Fees (Assuming Botanic Garden has 20,000 members and 1000 members registers every year) Kindly charges $100 for every 1000 members | | | 2000 | 2100 | 2200 | 2300 | 2400 |
| Training Cost for Staffs (Assuming $60 training cost for each staff) | | | 1620 |  |  |  |  |
| System Downtime Cost (while integration) | | | 4300 |  |  |  |  |
| Interest Cost (Assuming company take loan of $60,000 from bank @3% per annum for 4 years) | | |  | 936.75 | 936.75 | 936.75 | 936.75 |
| ***Total Cost*** | | | 61920 | 7536.75 | 7636.75 | 7736.75 | 7836.75 |
|  | | |  |  |  |  |  |
| **Benefits (Credit card savings are calculated as per Appendix-I)** | | |  |  |  |  |  |
| (Assuming Customers spending increases 1% each year in all facilities) | | |  |  |  |  |  |
| Gate and Membership credit card fees savings | | | 4080 | 4120.8 | 4162.008 | 4203.628 | 4245.664 |
| Café credit card fees savings | | | 4263 | 4305.63 | 4348.686 | 4392.173 | 4436.095 |
| Store credit card fees savings | | | 4446 | 4490.46 | 4535.365 | 4580.718 | 4626.525 |
| Events credit card fees savings | | | 3630 | 3666.3 | 3702.963 | 3739.993 | 3777.393 |
| Cost savings from office staff taking manual calls (40 hours per week) (Assuming staffs are paid @$15/hour, and it increases 3% annually) | | | 31200 | 32136 | 33100.08 | 34093.08 | 35115.87 |
| **Total Benefits** | | | 47619 | 48719.19 | 49849.1 | 51009.59 | 52201.55 |
|  | | |  |  |  |  |  |
| **ROI [(Net Return on Investment/Cost of Investment) \*100]** | | | 169% |  |  |  |  |
| **Payback Year (Cost of Investment/ Average Annual Cash Flow)** | | | 2nd year |  |  |  |  |
|  | | | | | | | |
| **Security Consideration** | | | * After the implementation of Kindful as a new integrated system, there can be chances of loss, theft, and misuse of data once the integrated system is operational. Kindful provides the precautions to safeguard against these unauthorized access as it is PCI (Payment Card Industry) complaint. * With the launch of new system, new account information for each user needs to be created which will only allow the authorized personal to access the system. | | | | |
| Preferred Solution | | As per the analysis, we would prefer integration of software system through BlackBaud company over other alternatives as it gives the guarantee for the system and applies no charge for correcting future issues. Some of the advantages of implementing BlackBaud software solution are:   * It is a cloud computing provider accessible through all modern browsers. * It serves the social good community such as non-profits, foundations, education institutions, and healthcare organizations. * Its products focus on website management, CRM, ticketing, event management and financial management which are the core requirements for the upgradation of botanic garden infrastructure. * It is eliminating lot of manual works of office staff such as taking calls for event registration and saving approximately $31,000 annually (Alternative A, Part 1). | | | | | |
| Financial Consideration | | * Financial consideration is a value which is given or received directly or indirectly through sales, fees, charges, contributions, and donations. * The capital cost is the fixed and one time cost incurred for the development of the business. For this project, it is the one-time cost of implementation of BlackBaud. * Operating cost are the ongoing cost incurred for the day-to-day working of the business. For the botanic garden project, the major cost of operations is Rackspace hosting cost, website maintenance cost and the interest cost paid for the loan taken from bank. * Total cost of ownership is the estimated cost of all the expenses associated with the business for the entire lifecycle. For this project, the cost estimation includes the cost from planning to implementation of BlackBaud system from end-to-end. * Implementation of BlackBaud will have impact on other projects as there will be a downtime of 30 hours to complete the integration and testing. Once the BlackBaud gets implemented it will make the task easy and centralized for event registration and accounting reconciliation. | | | | | |
| Assumptions | | * There is a less chance of new upgradation cost as the system implemented is new and of the latest version. * Assuming that the organization will get a loan from the bank at a nominal rate without any collateral as it is a non-profit organization. * Assume that the customer spending increases every year after the BlackBaud implementation as it will provide more convenient facilities to the customers. | | | | | |
| Constraints | | * The organization have a contract with the current credit card vendor and cannot be cancelled without a huge penalty. * The current card vendor can only go up to the discount of 1.2% as a service fee for transactions even if the sales increase exponentially. * Due to the implementation of new software system, the current system will be in the offline state for the complete integration and testing of the process. | | | | | |

**2. Preferred Option – Cloud Hosted System**

We would recommend going with the cloud-based system. The reason we are recommending the system to be a cloud-based system is due to the many advantages a cloud system provides to an organization.

Advantages of the cloud-based system:

* Cloud based system will helps in reducing or eliminating the cost of building infrastructure and hardware.
* Cloud based system allows us to upload the data in a flexible manner which means uploading it at any time of the day and from any location not limiting to a particular office space as seen in local hosted system.
* Security of our data will increase, as Cloud storage saves data across redundant servers, hence, even if one of the data centres collapses, the data will be managed and accessed from other data centres.
* It will have the ability to be accessed by multiple users, as the same cloud environment can have more than one user associated with it.
* We will be able to sync the cloud storage data with any devices or system that we want unlike not limited to particular device or system in locally hosted system.
* It will be flexible because cloud services are on-demand, which is based on pay what you use model.
* If the organization want to add any other system or functionality, or we want to experiment with our IT infrastructure, we can do this more easily and cost effectively with cloud resources.
* Cloud computing will save time and money for the organization, as the cost of running workload on cloud is cheaper than on-premise solution.
* Ability to scale our system if a need arises, and we can expand the operations of the organization.
* The ability for our various departments to collaborate better.

We also should look into the negatives of our proposed option, which are:

* Transferring huge amount of data is a problem as it requires a lot of time and resources.
* There is always the concern of security and privacy with cloud-based system, and although cloud providers implement best security standards and industry certifications, there are always some risks that are associated with it.
* With cloud computing, where every component is online, it exposes potential vulnerabilities. We may suffer cyber-attacks and security breaches.
* It might lose the information or data that is not backed up in a cloud storage due to any circumstances.

The value and benefits of cloud computing will continue to evolve. As the research done by Synergy Research Group in 2015, they found that IaaS/PaaS services have attained highest growth rate of 51%. This shows that many organizations have chosen cloud-based system over on-premise system. Hence, we should utilize this trend and technology to further reach our goals and achieve what we want to.

**3. Cyber Security Concerns in Implementing New System**

Every system is vulnerable to cyber threats. Cybersecurity attacks can happen to any organization at any time. As by the definition, any potential harmful assault that aims to gain unauthorized access to data, interfere with digital activities, or contaminate information is referred to as a cyber security threat.

There are many types of **Cyber Security Threats**, which are:

* **Malware**: Malware is malicious software such as spyware, ransomware, viruses and worms. It is activated when a user clicks on a malicious link or attachment, which leads to installing dangerous software.
* **Social Engineering Attacks**: It involves tricking the users into providing an entry point for malware. The victim provides sensitive information or unwittingly installs malware on their device.
* **Denial of Service:** or more commonly known as DoS attack, is a type of cyber-attack that floods a computer or network so that it can’t respond to request, resulting in its inability to work efficiently.
* **Man in the Middle**: When hackers interject themselves into a two-party transaction, a man-in-the-middle assault takes place. They can filter and take data once they have interrupted the traffic.
* **Injection Attacks**: To directly insert malicious input into the code of a web application, injection attacks take advantage of a number of vulnerabilities. Successful attacks could compromise the entire system, reveal confidential data, or launch a DoS attack.

As we will use **Cloud-based system**. Hence, we should look more into it. Cloud computing face many cyber security issues like:

* **Unauthorized Access**: Organizations are exposed when service and features are used without the knowledge of IT. Due to the ability of employees to access data from remote devices, external security threats may occur, particularly where employee negligence and misuse of credentials is involved.
* **Reduced Visibility and Control**: When an organization moves to a cloud-based system, they will lose some visibility and control, with some responsibilities of control of policies and infrastructure moving to the cloud provider.
* **Unsecure APIs and Interfaces**: Security vulnerabilities with cloud computing may be exacerbated by insecure APIs and interfaces. APIs are necessary for a tailored cloud experience, but they also pose a security risk. Data confidentiality breaches frequently result from interfaces that are poorly designed and are exploited.
* **System Vulnerabilities**: Networks with cloud infrastructure are more prone to system flaws. System flaws create a number of security concerns for cloud computing, including risky operating systems, shared memory, and resources. These frequently serve as the entrance point for harmful assaults and can turn into gateways to substantial data thefts.
* **Data Breaches, Loss, or leakage**: Data saved in cloud-based systems can be shared easily. These settings allow for easy data exchange with third parties by direct email invitations or by disseminating a public link to the data, and they are directly accessible from the open Internet. There are significant worries about data loss or leakage because of how simple it is to share data via the cloud. Anybody with knowledge of the link can access data shared over public links or made publicly available in a cloud-based repository, and there are tools designed for looking for these unsecured cloud deployments online.

**Impact if it’s Cloud-Based and Locally Hosted System:**

**Cloud-based Security:**

Dedicated server maintenance is handled by cloud-based security technology, which is run on a network of remote servers connected via the internet. As a result, each location no longer needs a local server.

**Advantages:** As part of a comprehensive security system, a cloud-based solution has many advantages compared to on-premises systems such as:

* Remote Management: Remote modification capabilities are one benefit of a cloud-based security technology. A dashboard that can be accessed from anywhere in the world and can be configured and managed from all locations.
* Increased ROI: Cloud security solutions are more affordable for both small organizations and multi-site corporations because they require less hardware. The majority of cloud-based access control solutions operate on an open platform, allowing integration with other systems and platforms from different companies. These linkages make it possible to automate business activities at all levels, giving firms greater flexibility in responding to changing needs.
* IT teams are relieved of part of their duties because security is the responsibility of both the company and the software provider.

**Disadvantages**: A system that runs in the cloud may not be right for every organization. It has many disadvantages such as:

* Data breach is a term usually refers to leaking of information or getting an access to information by unauthorized user. Data Breach is a concern for most of the organizations.
* Loss of control gives access to the information to cloud service provider, and they have all the access to the information whereas enterprise has no or very less access to the information.

**Local Hosted System Security**

In local hosted system security organizations will have their own infrastructure to manage security and data. Organizations will have their own equipment for their management purpose.

**Advantages: -**

* **Flexible Customization: -** Organizations have their own infrastructure and management so that they can customize the system as per their needs and makes the system more reliable according to their usage.
* **Control: -** As the organizations will have their own infrastructure with no third-party involvement, they will have more control over the systems.
* **Ease of Access: -** Organizations have easy access to the resources and information as there is no other party involvement. They can access the data in offline mode at any time.

**Disadvantages: -**

* **Cost: -** Organizations have to spend more money on resources, infrastructure, and management so that they can run it in a smooth manner. All the costs will bear by organization.
* **Maintenance:**  Organizations have to spend more time, money, and resources to maintain the systems as they are the one who is responsible for the operation of the services.

**4. Context Diagram**

Diagram

Description automatically generated

Fig 1. Context Diagram for the Integrated System

**5. Functional Decomposition Diagram**

**Diagram

Description automatically generated**

Fig 2. Functional Decomposition Diagram of the Integrated System

**6. Business Requirements**

|  |  |
| --- | --- |
| **Rating** | **Description** |
| High | 1. The system shall integrate seamlessly to create the centralized accounting system for all the ventures so that the data can be processed and saved at the same time it is fed in the system.  2. The system shall have an integrated Point of Sale (POS) system to decrease the workload and avail higher volume of discounts.  3. The system shall provide the facility of a payment system where the members can do a single payment for all the purchases from different facilities such as stores and cafes.  4. The system shall update the website to add the online registration features which can automatically reduce some of the monotonous manual tasks for the staffs of botanical garden.  5. The system shall have the ability to store the data backup on regular basis for emergency and disaster recovery.  6. The system shall accommodate a process to do the regular accounting work for all the four systems so that it does not pile up while closing of the accounts at the month end.  7. The system shall provide an option to generate digital membership card in order to provide convenience to the customers. |
| Medium | 8. The system shall integrate the POS system with the website to enable online purchases and event registration payments.  9. The system shall decentralize the process of issuing new membership cards which will enable the customers to get the card from anywhere either from the garden facilities or from the website.  10. The system shall accommodate higher volume of traffic on its website.  11. The system shall link the membership with the members’ personal details so that the members can avail different membership services without carrying their membership card.  12. The system shall provide suitable access rights and permissions for each user, giving them the necessary ability to read, write, and update the information.  13. The system shall have an event management system compatible with the current website for customers to register for the events online.  14. The system shall provide discounts and coupons to their shoppers to attract more user base and revenue for the organization.  15. The system shall be able to accommodate registration for events through website rather than manually registering customer over the phone. |
| Low | 16. The system shall update the existing website with better graphics of the gardens along with a blog so that its user interface becomes more efficient and eye-catching.  17. The system shall introduce reward points to the users on the basis of their purchase history.  18. The system shall provide the facility to accommodate higher volume of events. |
| Future | 19. The system shall provide online gardening training programs.  20. The system shall organize more social and charity events to gather investments. |

**7. User Stories**

1. As a system administrator, I want a centralized accounting system for all the ventures so that the data can be processed and saved at the same time it is fed in the system.

2. As a system administrator, I want an integrated Point of Sale (POS) system so that it can decrease the workload and avail more discounted transaction rate.

3. As a customer, I want a single payment system so that I can do the payment at a single place at once.

4. As a system administrator, I want the website to have the online registration features so that the monotonous manual tasks get reduced which will increase the efficiency of the staff.

5. As a system administrator, I want a strong backup facility for the system data so that we can recover company’s data in case of emergencies and disasters.

6. As an accountant, I want to have all the account related work in a centralized system, so that the work doesn’t pile up at the end of month.

7. As a customer, I want to have a digitalized membership card, so that I don’t have to present a physical membership card everywhere I go.

8. As an administrator, I want to have a common POS system for websites, events registration, so that it will be easier for customers to pay as well as accountants to have ease of processing the data.

9. As a customer, I want to have the option to get my card online, so that I can get my card from the botanic garden stores or from the website.

10. As a system administrator, I want the system to be flexible and scalable, so that it can handle large volume of traffic of users.

11. As a customer, I want my membership card to be linked with the system, so that I don’t have to carry the membership card whenever I visit the botanic garden.

12. As a system administrator, I want the system to allow only authorized members to have control over what they can read, write, and update in system, so that there will be no unauthorized access of the information.

13. As a customer, I want to register for the events and get the details of the events through the website, so that I don’t have any inconvenience of going to the organization’s office to purchase event tickets.

14. As a management, I want to provide discounts and coupons to customers so that organization can earn more revenue from the customers.

15. As a system administrator, I want online registration for the events so that it will be easy for the customers as well as organization employees.

16. As a customer, I want the website to have more graphics and content, so that I can use it to get more information about gardens conveniently.

17. As a customer, I want reward points so that I can use my rewards points while purchasing the items.

18. As a management, I want more events so that organization will be recognized in the society by the customers which can help us to earn more revenue for the organization.

19. As a customer, I want more knowledge online on gardening, so that I can implement them in my home.

20. As a management, I want to organize more charity and social events so that the organization can receive funds and investments from the charity members.

**8.** **Entity Relationship Diagram**

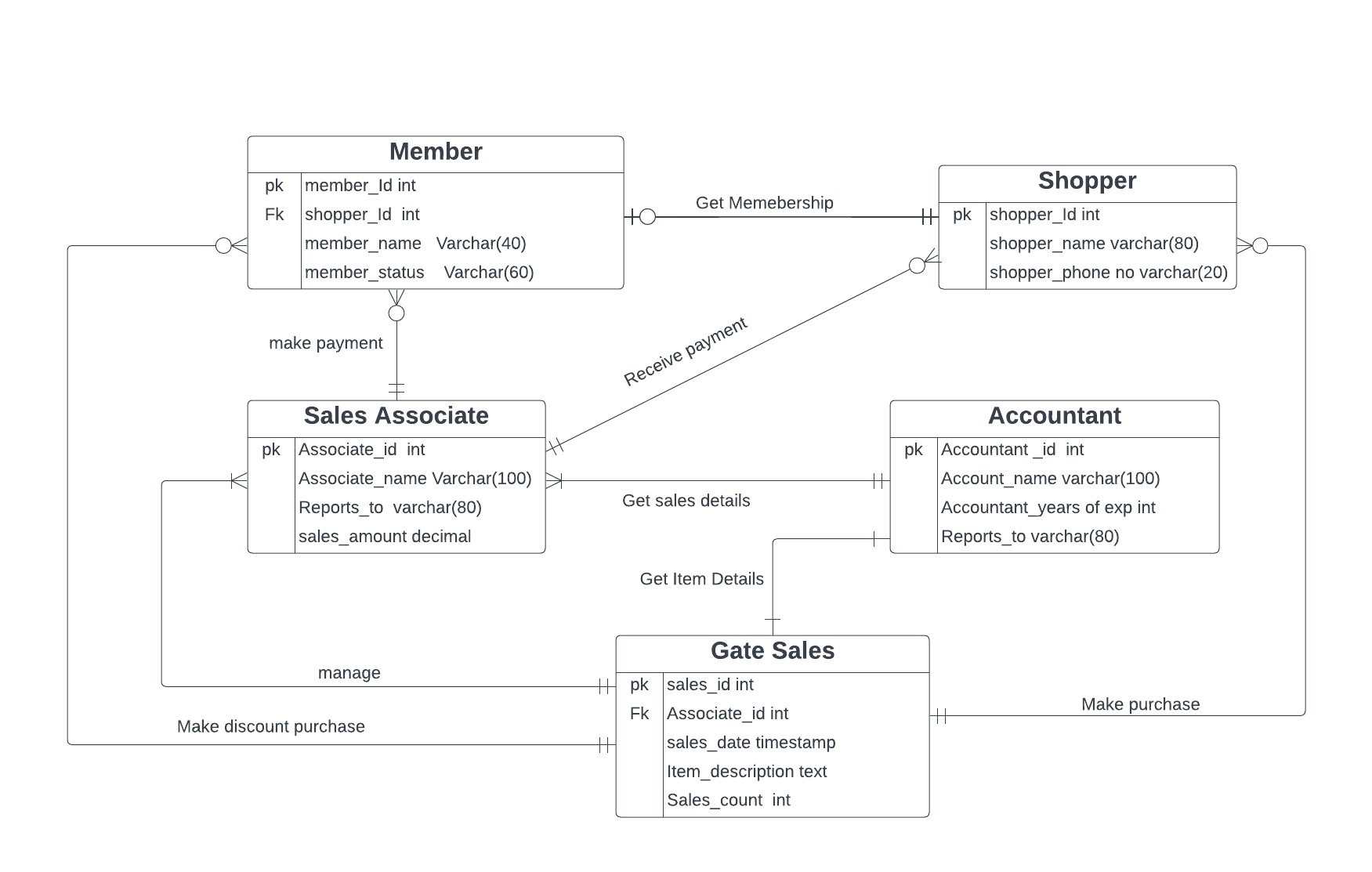


Fig3. Entity Relationship Diagram

\*pK stands for Primary Key

\*Fk stands for Foreign Key

**9. User Interface Design**

**A screenshot of a video game

Description automatically generated with low confidence**

Graphical user interface, website

Description automatically generated

Graphical user interface

Description automatically generated with low confidence

**10. Class Diagrams**

A. Shopper

图示

描述已自动生成

Fig 4. Class Diagram of Shopper

B. Member

图示

描述已自动生成

Fig 5. Class Diagram of Member

C. Sales Associate

Diagram

Description automatically generated

Fig 6. Class Diagram of Sales Associate

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**Appendix – I**

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| --- | --- |
| **Cost saving calculation for Summer and Non-Summer Months: Credit card fees are charged at lowest 1.2% because of all POS integrations and volume of sales is greater than $80,000 per month round the year** |  |
| Non-Summer Months (Assuming 9 months) |  |
| Gate and Membership credit card fees savings | 3960 |
| Café credit card fees savings | 2871 |
| Store credit card fees savings | 3762 |
| Events credit card fees savings | 2178 |
| Summer Months (Assuming 3 months of summer) |  |
| Gate and Membership credit card fees savings | 120 |
| Café credit card fees savings | 1392 |
| Store credit card fees savings | 684 |
| Events credit card fees savings | 1452 |

\*All the Calculations are mentioned in the attached excel sheet named Cost Benefit Analysis\_Botanic Garden Project\_Group 3.