# 

# 

# 

**Real estate project sales system through agency channel**

|  | |
| --- | --- |
| Project | Real estate project sales system through agency channel |
| Group Member | Nguyễn Hoàng Lê Minh - SE140733  Nguyễn Thành Tiến - SE161020  Bùi Hoàng Phúc - SE162053  Trần Thái Sơn - SE171846  Quản Tiến Phát - SE160500  Nguyễn Mạnh Duy - SE173649 |
| Supervisor | Trần Thanh Nguyên |

Ho Chi Minh City, Jan 17th 2024

[**I.Business requirements 4**](#_10k19uii6s8x)

[1.1 Background 4](#_kf1z756zw7lv)

[1.2 Business opportunity 4](#_nihhxgwuuxf4)

[1.3 Business objectives 5](#_ydtfiqs1xuia)

[1.4 Success metrics 5](#_locy4hgria75)

[1.5 Vision statement 5](#_f0vj6w1om14v)

[1.6 Business risks 6](#_gsis6oeksv7u)

[1.7 Business assumptions and dependencies 7](#_81f9yh83iyj5)

[**II.Scope and limitations 9**](#_kfbiswnbhm4q)

[2.1 Major features 9](#_na2t4sc8o0b4)

[1. Project Management: 9](#_res1ne7pd06d)

[2. Customer Management: 9](#_a0m1ui8xto01)

[3. Agent Management: 9](#_e5hg5qh5ynxe)

[4. Customer Care: 9](#_v5co0tlfdi6i)

[5. Sales Management: 9](#_60ax5vq095ch)

[6. Reporting and Statistics: 9](#_w7tcewiw8622)

[7. Financial Management Features: 10](#_1gy541ngt9pu)

[8. Access Control Features: 10](#_ihw7d2igkuzf)

[2.2 Scope of initial releases 10](#_asdwdpwtaesd)

[1. Real Estate Project Management: 10](#_ykgb3sn6tqd1)

[2. Agent Management: 10](#_hkl0lcrllyxk)

[3. Sales Management: 10](#_ql6btzw3azdi)

[4. Interaction with Customers: 10](#_so9vxylg2oqj)

[5. Reporting and Statistics: 10](#_l3ktykrgvefj)

[6. Basic Financial Management Features: 11](#_8hnkzkihwprp)

[7. Security and Access Management: 11](#_hbq5k48ce0ng)

[8. User Interface: 11](#_yslxi2c7xguv)

[2.3 Scope of subsequent releases 11](#_magxnmfl8mdf)

[1.Advanced Project Management Features: 11](#_vgw6qjlm3k47)

[2.Agent Management Enhancements: 11](#_gvijc07hevlj)

[3.Sales Process Refinement: 11](#_8hztht372oji)

[4.Customer Relationship Management (CRM) Upgrade: 11](#_fdfg9wuo4eth)

[5.Advanced Reporting and Analytics: 12](#_8jc1ymgtsbv6)

[6.Financial Management Features: 12](#_fukmt5ndfjlu)

[7.Expanded Security and Access Management: 12](#_g0bmx5zfl951)

[8.User Interface (UI) and User Experience (UX) Improvements: 12](#_ezsk8w4te9lf)

[2.4 Limitations and exclusions 12](#_drzco2v190m4)

[1.Limitations: 12](#_mzwnema0nmmk)

[2.Exclusions: 12](#_z24bjleomgsd)

[**III.Business context 13**](#_5gvmxe19tr70)

[3.1 Stakeholder profiles 13](#_yevi5yjqab8d)

[3.2. Project Priorities 13](#_81es75x5uo07)

[3.3 Deployment considerations 14](#_v5xnbqlvc0ct)

[**IV.FUNCTIONAL REQUIREMENT 15**](#_198tpi6frbdv)

[4.1. Use Case Diagram 15](#_9sjpgsnnfgqz)

[4.2. Use Case List 15](#_7kmguadi4bbe)

# 

# 

# 

# 

# **I.Business requirements**

## **1.1 Background**

* The real estate market is developing rapidly, the demand for housing of people is increasing, especially apartments in big cities.
* The buying and selling of apartments is complex with many parties involved such as developers, real estate agents, banks, notaries, customers.
* Customers find it difficult to access information about apartment projects open for sale. They are also under time pressure to make investment decisions to buy a house.
* Investors and developers need an effective distribution channel to introduce and sell new apartments at high speed.
* Digital technology can solve the problem of connecting supply and demand, making it easier, faster and safer to buy and sell apartments.

## **1.2 Business opportunity**

* The real estate market is developing strongly, people's need to buy houses is increasing.
* Digital technology offers opportunities to connect buyers and sellers easily and quickly.
* Home buyers need to find information about projects conveniently on the internet/mobile app.
* Investors and developers need to have distribution channels and quickly promote new projects to potential buyers.
* Real estate agents can expand their market, increase their ability to reach customers at lower costs.
* Opportunity to build a community of home buyers and sellers, integrating related services such as home loans, interior design, real estate insurance,...
* Scalability, integrating AI, big data, IoT technology to personalize customer experience.

Overall, this is a potential business idea with many opportunities for development in the future.

## **1.3 Business objectives**

* Achieving apartment sales through agent channels of XXX units/year (depending on project scale)
* Achieve commission/agency contribution ratio of XX% of total annual sales revenue.
* Reduce the investor's marketing and sales costs to XX% compared to the model communication system.
* Increase the number of cooperating agents/brokers to XXX agents in the first year.
* Achieving customer satisfaction with apartment buying and selling services through agent channels at XXX%
* Attract XXX visitors and search for apartment information every month.
* Develop more related services and products to increase revenue.
* Expand the market to other provinces in the next year.

## **1.4 Success metrics**

* Number of projects listed and marketed through the platform
* Number of leads generated for listed properties
* Lead conversion rate into sales
* Sales velocity - time from listing to sale
* Number and value of properties sold
* Agent satisfaction scores
* Developer satisfaction metrics
* Customer satisfaction metrics
* Agent enrollment and retention rates
* Market share for project sales achieved through the platform

## **1.5 Vision statement**

"Our vision is to build the foremost data-driven real estate project sales ecosystem that provides seamless closure of sales for developers, expands business for agents, and simplifies home-buying for customers. We will leverage technology to connect verified listings to quality buyers through our trusted agent network. With insightful analytics, streamlined processes and excellent service delivery, we envision closing sales in 10 days or less while achieving over 80% satisfaction across developers, agents and home-buyers on our platform."

This vision statement focuses on key goals like faster sales velocity, leveraging technology, analytics and processes to deliver results and high satisfaction for all stakeholders - developers, agents and home-buyers. Please let me know if you need any clarification or would like me to modify the metrics or statement further.

## **1.6 Business risks**

* Market Volatility:

Real estate markets can be highly sensitive to economic fluctuations and geopolitical events. Economic downturns or market crashes can impact property values and demand, affecting sales and commissions for both the agency and the developers.

* Regulatory Compliance:

Real estate transactions are subject to various regulations, and non-compliance can result in legal issues or fines. Changes in regulations or new legislation can also impact the way real estate transactions are conducted, affecting the sales process through agency channels.

* Dependency on External Factors:

The success of a real estate project can be heavily reliant on external factors such as interest rates, mortgage availability, and overall economic health. Changes in these factors can influence buyer behavior and impact the agency's ability to close deals.

* Agency Performance and Reputation:

The performance of the agencies involved in the sales process can significantly impact the success of the project. Inconsistent sales performance, unethical practices, or a poor reputation of the agency can harm the project's overall sales and image.

* Market Saturation:

If the real estate market in a specific location becomes saturated with similar projects, it can lead to increased competition among agencies. This saturation can make it challenging to differentiate the project, impacting sales and potentially lowering property values.

* Fluctuating Property Values:

Real estate values can be volatile, and unexpected fluctuations may result in properties being sold below the expected or desired price. This can affect the profitability of the project and the commissions earned by the agencies.

* Technological Risks:

Dependence on technology for sales and marketing activities introduces risks such as data breaches, system failures, or cybersecurity threats. A breach in the sales system's security can compromise sensitive customer information and damage the reputation of the project and the agencies involved.

* Cyclical Nature of Real Estate:

Real estate markets tend to follow cycles of boom and bust. If a project is launched during a downturn, it may face challenges in attracting buyers and achieving desired sales targets.

* Unforeseen Events:

Natural disasters, political instability, or other unforeseen events can disrupt the real estate market and affect the project's sales. These events are beyond the control of the agencies and developers but can have a significant impact on the overall success of the project.

## **1.7 Business assumptions and dependencies**

Assumptions:

- Market Demand: Assuming there is sufficient demand for the type of real estate being developed in the chosen location. This involves understanding the preferences and needs of the target market.

- Agency Expertise: Assuming that the selected agencies have the necessary expertise, experience, and a proven track record in real estate sales. This includes knowledge of the local market, effective marketing strategies, and a network of potential buyers.

- Economic Stability: Assuming a stable economic environment that supports real estate transactions, including factors such as low unemployment rates, favorable interest rates, and access to mortgage financing.

- Regulatory Environment: Assuming a stable and predictable regulatory environment for real estate transactions, with no significant changes that could impact the sales process or increase compliance requirements.

- Effective Marketing Strategies: Assuming that the marketing strategies employed by the agencies will effectively reach and attract the target audience. This includes a reliance on digital marketing, social media, and other promotional channels.

- Timely Project Completion: Assuming that the real estate project will be completed within the expected timeframe. Delays in construction can impact the overall sales timeline and may affect the agencies' ability to meet sales targets.

- Competitive Pricing: Assuming that the pricing strategy for the real estate units is competitive and aligns with market expectations. Pricing that is too high or too low can impact sales performance.

- Customer Financing Availability: Assuming that potential buyers have access to financing options or mortgages to facilitate property purchases. The availability and terms of financing can significantly influence the sales process.

- Positive Economic Outlook: Assuming a positive economic outlook for the region, as economic growth and stability can positively impact real estate investments and consumer confidence.

Dependencies:

- Agency Performance: The success of the real estate project sales system depends on the performance of the selected agencies. Regular monitoring and collaboration are crucial to ensuring that agencies meet sales targets.

- Market Trends and Analysis: Dependencies on accurate and up-to-date market trends and analysis to adapt the sales strategy based on changing market conditions.

- Legal and Regulatory Compliance: Compliance with legal and regulatory requirements is a critical dependency. Any changes in laws or regulations can impact the sales process and require adjustments in the business approach.

- Construction Timelines: The timely completion of the real estate project is a significant dependency. Delays in construction can lead to a delay in the availability of units for sale, impacting the overall sales plan.

- Technology Infrastructure: Dependence on a robust and secure technology infrastructure for the sales system, including customer relationship management (CRM) software, online platforms, and secure data storage.

- Customer Trust and Reputation: The success of the sales system is highly dependent on the trust and reputation of the agencies and developers. Negative publicity or poor customer experiences can significantly impact sales.

- Financing Partnerships: If the success of the sales system relies on financing partnerships with banks or other financial institutions, establishing and maintaining these partnerships is a critical dependency.

- Effective Communication: The success of the sales system depends on clear and effective communication between developers, agencies, and potential buyers. Dependencies on regular updates, feedback, and collaboration.

# **II.Scope and limitations**

## **2.1 Major features**

### 1. Project Management:

- Track detailed information about real estate projects, including location, type, amenities, and construction progress.

- Plan and track project progress to ensure time and costs meet requirements.

### 2. Customer Management:

- Store detailed information about customers, including transaction and interaction history.

- Monitor customer needs and priorities to advise on appropriate products.

### 3. Agent Management:

- Record information about agents, including sales performance, sales volume and commissions.

- Generate reports on each agent's performance to make strategic decisions.

### 4. Customer Care:

- Integrate the Customer Relationship Management system to maintain relationships with customers.

- Send announcements, updates and special promotions to customers through this platform.

### 

### 5. Sales Management:

- Monitor the sales process from customer contact to deposit and transaction completion.

- Manage contracts and documents related to real estate transactions.

### 6. Reporting and Statistics:

- Create automatic reports on sales performance, sales, and project progress.

- Provide periodic information to support strategic decisions and predict market trends.

### 7. Financial Management Features:

- Track costs and revenue from each transaction.

- Calculate commissions and profits for agents.

### 8. Access Control Features:

- Manage information access rights between user levels to ensure security.

## **2.2 Scope of initial releases**

### 1. Real Estate Project Management:

- Design and implement detailed management features of real estate projects, including location, type, amenities, and construction progress.

### 2. Agent Management:

- Build information management features about agents, including sales performance, sales volume and commissions.

### 3. Sales Management:

- Develop the sales management process from the stage of approaching customers, negotiating, depositing to completing the transaction.

### 4. Interaction with Customers:

- Integrate CRM features to track and manage interactions with customers.

### 5. Reporting and Statistics:

- Build automatic report generation features on sales performance, sales and project progress.

### 6. Basic Financial Management Features:

- Ensure basic tracking of costs and revenue from each transaction.

### 7. Security and Access Management:

- Build access management features to ensure information is protected.

### 8. User Interface:

- Develop a friendly user interface for ease of use for both agents and administrators.

## **2.3 Scope of subsequent releases**

### 1.Advanced Project Management Features:

-Implement additional project details such as floor plans, unit layouts, and virtual tours.

-Introduce a collaborative space for developers to share project updates, construction milestones, and engage with potential buyers.

### 2.Agent Management Enhancements:

-Integrate a performance leaderboard to encourage healthy competition among agents.

-Implement automated communication tools to streamline interactions between agents, developers, and customers.

### 3.Sales Process Refinement:

-Incorporate feedback mechanisms to gather insights on customer satisfaction and areas for improvement.

-Enhance negotiation and contract management features for a smoother transaction process.

### 4.Customer Relationship Management (CRM) Upgrade:

-Integrate AI-powered features for personalized customer interactions.

-Implement automated reminders and notifications for important milestones in the buying process.

### 5.Advanced Reporting and Analytics:

-Introduce predictive analytics for market trends and project performance.

-Enhance reporting tools for more in-depth insights into sales velocity, customer behavior, and agent performance.

### 6.Financial Management Features:

-Implement advanced financial tracking with real-time updates on costs, revenue, and profits.

-Introduce budget forecasting tools for better financial planning.

### 7.Expanded Security and Access Management:

-Strengthen security measures to protect sensitive data.

-Introduce role-based access control for more granular control over user permissions.

### 8.User Interface (UI) and User Experience (UX) Improvements:

-Enhance UI/UX for a more intuitive and visually appealing platform.

-Implement responsive design for better usability across various devices.

## 

## **2.4 Limitations and exclusions**

### 1.Limitations:

-The system may experience temporary downtimes during scheduled maintenance.

-The accuracy of market trend predictions and analytics is subject to external economic factors.

### 2.Exclusions:

-The system does not guarantee the availability of financing options for customers.

-Legal and regulatory changes that impact real estate transactions are beyond the scope of the system.

# **III.Business context**

## **3.1 Stakeholder profiles**

### 

| **Stakeholder** | **Major Value** | **Attitudes** | **Major Interests** | **Constraints** |
| --- | --- | --- | --- | --- |
| Investor | Financier, Project Vision | Proactive, Growth-oriented | Successful project completion, ROI, Market Reputation | Regulatory and financial constraints, Market conditions |
| Sales Agent | Sales Commission, Market Access | Sales-driven, Customer-focused | Profitable sales, Marketing Support | Market competition, Economic downturn |
| Potential and Current Buyers | Property Ownership, Quality Living | Inquisitive, Investment-minded | Location, Pricing, Property Features | Budget constraints, Economic uncertainty |

## 

## **3.2. Project Priorities**

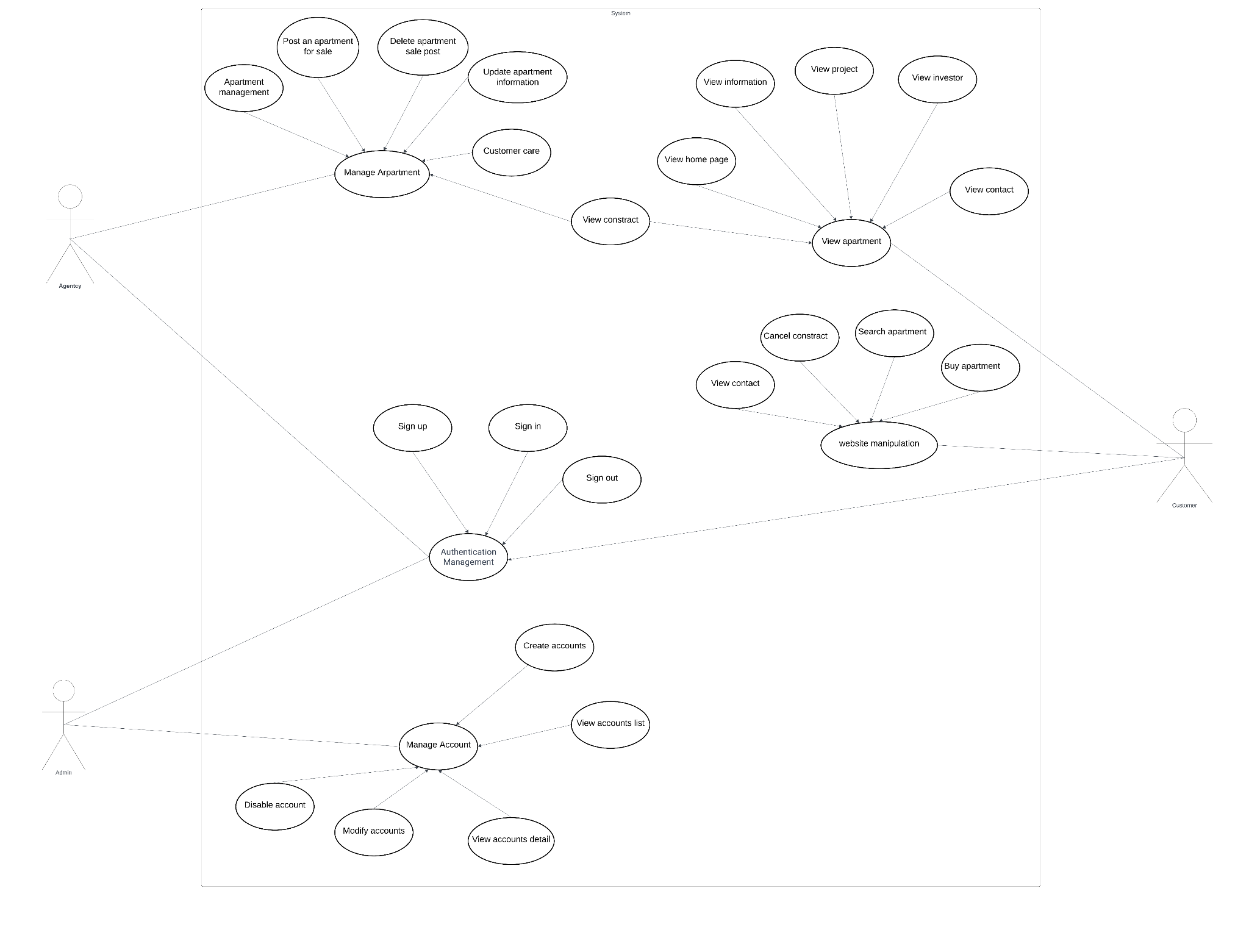
| **Dimension** | **Driver**  **(state objective)** | **Constraint**  **(state limits)** | **Degree of Freedom**  **(state allowable range)** |
| --- | --- | --- | --- |
| Schedule | Release 1.0 to be available by 10/1, release 1.1 by 12/1 | N/A | N/A |
| Features | 70-80% of high-priority features must be included in release 1.0 | N/A | N/A |
| Quality | 90-95% of user acceptance tests must pass for release 1.0, 95-98% for release 1.1 | N/A | N/A |
| Staff | Maximum team size is 1 PM, 1 BA, 6 developers + 3 testers | N/A | N/A |
| Cost | Budget overrun up to 15% acceptable without sponsor review | N/A | N/A |

## **3.3 Deployment considerations**

The system must be accessible to users during their respective working hours because they are dispersed across multiple time zones. It may be necessary to make changes to the infrastructure to support network access, data storage, capacity expansion, or data migration. It is necessary to determine the access requirements, such as those for remote access or access restricted by location. To ensure a smooth deployment of the new solution, training and business process changes should be planned ahead of time. Please keep in mind that the stakeholder profiles and project priorities provided are just that: examples. They may need to be customized to fit the precise needs and constraints of your project.

# **IV.FUNCTIONAL REQUIREMENT**

## **4.1. Use Case Diagram**



Link: <https://lucid.app/lucidchart/3b7acbbe-0ded-4f37-ae49-793ed3d67637/edit?invitationId=inv_a1812c20-efd6-42ba-a193-e5ed19261a55&page=0_0#>

## **4.2. Use Case List**

| ID | UseCase | Actor |
| --- | --- | --- |
| UC-01 | Sign in | Customer, Agency |
| UC-02 | Sign up | Customer, Agency |
| UC-03 | Sign out | Customer, Agency |
| UC-04 | View profile | Customer, Agency |
| UC-05 | Update profile | Customer, Agency |
| UC-06 | View project | Customer, Agency |
| UC-07 | Search apartment | Customer, Agency |
| UC-08 | View apartment detail | Customer, Agency |
| UC-09 | Reservation apartment | Customer |
| UC-10 | View constract | Customer, Agency |
| UC-11 | Post apartment | Agency |
| UC-12 | Update apartment | Agency |
| UC-13 | Delete apartment | Agency |
| UC-14 | View revenue | Agency |
| UC-15 | View profile account | Admin |
| UC-16 | Delete account | Admin |
| UC-17 | Post approve | Admin |
| UC-18 | Post refuse | Admin |
| UC-19 | View commission | Admin |

## **4.3. Use Case Detail**

### **UC-01: Sign in**

| **ID and Name:** | **UC-1: Sign in** | | |
| --- | --- | --- | --- |
| Created By: | PhucBH | Date Created: | 31/1/2024 |
| Primary Actor: | Agency | Secondary Actors: | Customer |
| Priority: | High | Frequency of Use: | Always |
| Trigger: | Agency and customer want to log in to the apartment on the web. | | |
| Description: | This feature allows users to log in to the system. | | |
| Preconditions: | Agency and customer have previously registered accounts. | | |
| Post-conditions: | Success: Success: Redirect to home page.  Fail: The system shows an error message corresponding to error code. | | |
| Normal Flow: | | Step | Actor Action | System Response | | --- | --- | --- | | 1 | In sign in page, Agency and customer inputs accounts and passwords |  | | 2 | Actor clicks “sign in” | System redirects to the home page | | | |
| Alternative Flow: | | Step | Actor Action | System Response | | --- | --- | --- | | 1 | In sign in page, Agency and customer clicks on the Facebook icon | System redirects to the Facebook interface and shows a confirmation message | | 2 | Agency and customer clicks “yes” button | System redirects to the home page |  | Step | Actor Action | System Response | | --- | --- | --- | | 1 | In sign in page, Agency and customer clicks on the Google icon | System shows a list of google accounts of users | | 2 | Agency and customer clicks the account they want to use to sign in | System redirects to the home page | | | |
| Exceptions: | | No | Cause | System Response | | --- | --- | --- | | 1 | The accounts or password is not correct format | System informs error message to remind user inputs correct format | | 2 | The accounts or password is not correct | System informs “accounts or password is incorrect” | | 3 | Incorrect OTP | System informs “OTP is incorrect” | | 4 | OTP number is expired | System shows error message: “Expired OTP” | | | |
| Business Rules: | * Password is not empty and at least 8 characters * If an agency and customer provides incorrect username & password 5 times, they will have to wait at least 5 mins until their next try. | | |
| Assumptions: | * Agency’s and customer’s internet connection is available * Agency and customer has signed up by phone number before or has Facebook Account or has Google Account | | |

### **UC-02: Sign up**

| **ID and Name:** | **UC-2: Sign up** | | |
| --- | --- | --- | --- |
| Created By: | PhucBH | Date Created: | 31/1/2024 |
| Primary Actor: | Agency, Customer | Secondary Actors: | Customer |
| Priority: | High | Frequency of Use: | Always |
| Trigger: | Agencies and customers want to create an account on the web. | | |
| Description: | This feature allows users to create an account in the system. | | |
| Preconditions: | Agency and customer do not have an account. | | |
| Post-conditions: | Success: Redirect to sign in page.  Fail: The system shows an error message corresponding to error code. | | |
| Normal Flow: | | Step | Actor Action | System Response | | --- | --- | --- | | 1 | In the sign up page, Agency and customer inputs required information. |  | | 2 | Agency and customer clicks “sign up”. | System redirects to the sign in page. | | | |
| Alternative Flow: | | Step | Actor Action | System Response | | --- | --- | --- | | 1 | In sign in page, Actor clicks on the Facebook icon | System redirects to the Facebook interface and shows a confirmation message | | 2 | Actor clicks “yes” button | System redirects to the home page |  | Step | Actor Action | System Response | | --- | --- | --- | | 1 | In sign in page, Agency and customer clicks on the Google icon | System shows a list of google accounts of users | | 2 | Agency and customer clicks the account they want to use to sign in | System redirects to the home page |      | Step | Actor Action | System Response | | --- | --- | --- | | 1 | In sign in page, Agency and customer clicks on the Phone icon | System shows a form contains:   * Inputting phone number text box * Send OTP button * Inputting OTP text box * “Login” button | | 2 | Agency and customer inputs phone number |  | | 3 | The Agency and customer clicks “Send OTP” button | System validates the phone number and invokes 3rd service to send OTP to the actor’s device. | | 4 | Agency and customer inputs OTP number |  | | 5 | Agency and customer clicks “SignUp” | System checks OTP. If correct, create new customer account and redirect to home page | | | |
| Exceptions: | | No | Cause | System Response | | --- | --- | --- | | 1 | The email or password is not correct format | System informs error message to remind user inputs correct format | | 2 | The email or password is not correct | System informs “email or password is incorrect” | | 3 | Incorrect OTP | System informs “OTP is incorrect” | | 4 | OTP number is expired | System shows error message: “Expired OTP” | | | |
| Business Rules: | * Password is not empty and at least 8 characters * If an actor provides incorrect username & password 5 times, they will have to wait at least 5 mins until their next try. | | |
| Assumptions: | * Agency’s and customer’s internet connection is available * Agency and customer has signed up by phone number before or has Facebook Account or has Google Account | | |

### **UC-03: Sign out**

| **ID and Name:** | **UC-3: Sign out** | | |
| --- | --- | --- | --- |
| Created By: | PhucBH | Date Created: | 31/1/2024 |
| Primary Actor: | Agency,Customer | Secondary Actors: | Customer |
| Priority: | High | Frequency of Use: | Always |
| Trigger: | Agency and customer want to log out from the web. | | |
| Description: | This feature allows users to log out from the system. | | |
| Preconditions: | Agency and customer are logged in. | | |
| Post-conditions: | Success: Redirect to sign in page.  Fail: The system shows an error message corresponding to error code. | | |
| Normal Flow: | | Step | Actor Action | System Response | | --- | --- | --- | | 1 | In any page, Agency and customer clicks on their profile icon. |  | | 2 | Actor clicks “sign out”. | System redirects to the sign in page. | | | |
| Alternative Flow: | | Step | Actor Action | System Response | | --- | --- | --- | | 1 | In sign in page, Actor clicks on the Facebook icon | System redirects to the Facebook interface and shows a confirmation message | | 2 | Actor clicks “yes” button | System redirects to the home page |  | Step | Actor Action | System Response | | --- | --- | --- | | 1 | In sign in page, Actor clicks on the Google icon | System shows a list of google accounts of users | | 2 | Actor clicks the account they want to use to sign in | System redirects to the home page |      | Step | Actor Action | System Response | | --- | --- | --- | | 1 | In sign in page, Actor clicks on the Phone icon | System shows a form contains:   * Inputting phone number text box * Send OTP button * Inputting OTP text box * “Login” button | | 2 | Actor inputs phone number |  | | 3 | The actor clicks “Send OTP” button | System validates the phone number and invokes 3rd service to send OTP to the actor’s device. | | 4 | Actor inputs OTP number |  | | 5 | Actor clicks “SignUp” | System checks OTP. If correct, create new customer account and redirect to home page | | | |
| Exceptions: | | No | Cause | System Response | | --- | --- | --- | | 1 | The email or password is not correct format | System informs error message to remind user inputs correct format | | 2 | The email or password is not correct | System informs “email or password is incorrect” | | 3 | Incorrect OTP | System informs “OTP is incorrect” | | 4 | OTP number is expired | System shows error message: “Expired OTP” | | | |
| Business Rules: | * Password is not empty and at least 8 characters * If an actor provides incorrect username & password 5 times, they will have to wait at least 5 mins until their next try. | | |
| Assumptions: | * Actor’s internet connection is available * Actor has signed up by phone number before or has Facebook Account or has Google Account | | |

### **UC-04: View profile**

| **ID and Name:** | **UC-4: View profile** | | |
| --- | --- | --- | --- |
| Created By: | PhucBH | Date Created: | 31/1/2024 |
| Primary Actor: | Agency | Secondary Actors: | Customer |
| Priority: | High | Frequency of Use: | Always |
| Trigger: | The actor wants to post an apartment on the web | | |
| Description: | This feature allows actor to login the system | | |
| Preconditions: | Actor has a Account that has registered before | | |
| Post-conditions: | Success: Redirect to home page  Fail: The system shows error message corresponding to error code | | |
| Normal Flow: | | Step | Actor Action | System Response | | --- | --- | --- | | 1 | In sign in page, Actor inputs email and passwords |  | | 2 | Actor clicks “sign in” | System redirects to the home page | | | |
| Alternative Flow: | | Step | Actor Action | System Response | | --- | --- | --- | | 1 | In sign in page, Actor clicks on the Facebook icon | System redirects to the Facebook interface and shows a confirmation message | | 2 | Actor clicks “yes” button | System redirects to the home page |  | Step | Actor Action | System Response | | --- | --- | --- | | 1 | In sign in page, Actor clicks on the Google icon | System shows a list of google accounts of users | | 2 | Actor clicks the account they want to use to sign in | System redirects to the home page |  | Step | Actor Action | System Response | | --- | --- | --- | | 1 | In sign in page, Actor clicks on the Phone icon | System shows a form contains:   * Inputting phone number text box * Send OTP button * Inputting OTP text box * “Login” button | | 2 | Actor inputs phone number |  | | 3 | The actor clicks “Send OTP” button | System validates the phone number and invokes 3rd service to send OTP to the actor’s device. | | 4 | Actor inputs OTP number |  | | 5 | Actor clicks “SignUp” | System checks OTP. If correct, create new customer account and redirect to home page | | | |
| Exceptions: | | No | Cause | System Response | | --- | --- | --- | | 1 | The email or password is not correct format | System informs error message to remind user inputs correct format | | 2 | The email or password is not correct | System informs “email or password is incorrect” | | 3 | Incorrect OTP | System informs “OTP is incorrect” | | 4 | OTP number is expired | System shows error message: “Expired OTP” | | | |
| Business Rules: | * Password is not empty and at least 8 characters * If an actor provides incorrect username & password 5 times, they will have to wait at least 5 mins until their next try. | | |
| Assumptions: | * Actor’s internet connection is available * Actor has signed up by phone number before or has Facebook Account or has Google Account | | |

### **UC-05: Update profile**

### 

| **ID and Name:** | **UC-13: Delete apartment** | | |
| --- | --- | --- | --- |
| Created By: | TienNT |  |  |
| Primary Actor: | Agency |  |  |
| Priority: | Normal |  |  |
| Trigger: | The actor wants to delete apartment in web. | | |
| Description: | This feature allows actor to delete the apartment. | | |
| Preconditions: | Actor login into web with an account has an agency role. | | |
| Post-conditions: | Success: delete apartment infomation | | |
| Normal Flow: | | Step | Actor Action | System Response | | --- | --- | --- | | 1 | In the apartment tasks list page, actor clicks the button in the Action column at the row that the actor wants to delete | System shows options :  - delete | | 2 | Actor clicks “Delete” | System shows a message is “Delete success!” | | | |
| Alternative Flow: | N/A | | |
| Exceptions: | N/A | | |
| Business Rules: | N/A | | |
| Assumptions: | Actor’s internet connection is available | | |

UC-6:

### **UC-11: Post apartment**

| **ID and Name:** | **UC-11: Post apartment** | | |
| --- | --- | --- | --- |
| Created By: | TienNT | Date Created: | 1/2/2024 |
| Primary Actor: | Agency | Secondary Actors: | N/A |
| Priority: | Normal | Frequency of Use: | Often |
| Trigger: | The actor wants to post apartment in web. | | |
| Description: | This feature allows actor to post the apartment | | |
| Preconditions: | Actor has a Agency role Account that has registered before | | |
| Post-conditions: | Success: Post apartment listings  Fail: The system shows error message corresponding to error code | | |
| Normal Flow: | | Step | Actor Action | System Response | | --- | --- | --- | | 1 | In home page, actor clicks on post button. | System redirects to the post detail page | | 2 | In the post detail page, actor inport indomation of apartment(price, or creage) | System checks the number of that apartment and displays the increase or decrease number corresponding to the field. | | 3 | In the page detail page, actor clicks on “Post” | System saves apartment information. | | | |
| Alternative Flow: | N/A | | |
| Exceptions: | N/A | | |
| Business Rules: | N/A | | |
| Assumptions: | Actor’s internet connection is available | | |

### **UC-12: Update apartment**

| **ID and Name:** | **UC-11: Update apartment** | | |
| --- | --- | --- | --- |
| Created By: | TienNT | Date Created: | 1/2/2024 |
| Primary Actor: | Agency | Secondary Actors: | N/A |
| Priority: | Normal | Frequency of Use: | Often |
| Trigger: | The actor wants to update apartment in web. | | |
| Description: | This feature allows actor to update the apartment. | | |
| Preconditions: | Actor login into web with an account has an agency role. | | |
| Post-conditions: | Success: Update apartment infomation | | |
| Normal Flow: | | Step | Actor Action | System Response | | --- | --- | --- | | 1 | In the apartment tasks list page, actor clicks the button in the Action column at the row that the actor wants to update( price,...) | System shows options :  - Update | | 2 | Actor clicks “Update” | System shows a message is “Update success!” | | | |
| Alternative Flow: | N/A | | |
| Exceptions: | N/A | | |
| Business Rules: | N/A | | |
| Assumptions: | Actor’s internet connection is available | | |

### **UC-13: Delete apartment**

| **ID and Name:** | **UC-13: Delete apartment** | | |
| --- | --- | --- | --- |
| Created By: | TienNT | Date Created: | 1/2/2024 |
| Primary Actor: | Agency | Secondary Actors: | N/A |
| Priority: | Normal | Frequency of Use: | Often |
| Trigger: | The actor wants to delete apartment in web. | | |
| Description: | This feature allows actor to delete the apartment. | | |
| Preconditions: | Actor login into web with an account has an agency role. | | |
| Post-conditions: | Success: delete apartment infomation | | |
| Normal Flow: | | Step | Actor Action | System Response | | --- | --- | --- | | 1 | In the apartment tasks list page, actor clicks the button in the Action column at the row that the actor wants to delete | System shows options :  - delete | | 2 | Actor clicks “Delete” | System shows a message is “Delete success!” | | | |
| Alternative Flow: | N/A | | |
| Exceptions: | N/A | | |
| Business Rules: | N/A | | |
| Assumptions: | Actor’s internet connection is available | | |

### **UC-14: View Revenue**

| **ID and Name:** | **UC-14: View Revenue** | | |
| --- | --- | --- | --- |
| Created By: | TienNT | Date Created: | 1/2/2024 |
| Primary Actor: | Agency | Secondary Actors: | N/A |
| Priority: | High | Frequency of Use: | Often |
| Trigger: | The actor wants to view revenue of apartment. | | |
| Description: | This feature allows people to track the revenue of each apartment project. | | |
| Preconditions: | Actor login into web with an account has an agency role. | | |
| Post-conditions: | Success: The system displays revenue details | | |
| Normal Flow: | | Step | Actor Action | System Response | | --- | --- | --- | | 1 | In home page, actor clicks on profile section | System redirects to profile page containing view history action. | | 2 | Actor clicks “View revenue” button | The page navigation system displays the apartment listing and its revenue | | | |
| Alternative Flow: | N/A | | |
| Exceptions: | N/A | | |
| Business Rules: | Revenue must be displayed accurately and clearly based on customer deposit contracts | | |
| Assumptions: | Actor’s internet connection is available | | |

### **UC-15: View Profile Account**

| **ID and Name:** | **UC-15: View Profile Account** | | |
| --- | --- | --- | --- |
| Created By: | TienNT | Date Created: | 1/2/2024 |
| Primary Actor: | Admin | Secondary Actors: | N/A |
| Priority: | High | Frequency of Use: | Often |
| Trigger: | The actor wants to view detailed information about Accounts. | | |
| Description: | This feature allows actor to view details such as Name, Phone, Address, … | | |
| Preconditions: | The account publicises their profile. | | |
| Post-conditions: | Success: Show detail information of accounts  Fail: Show not found page if the account does not exist or the account is not public. | | |
| Normal Flow: | | Step | Actor Action | System Response | | --- | --- | --- | | 1 | Click on Account detail’s card in page “Manage Account”.  **[Alternative 1]** | Redirect to enterprise detail information page showing enterprise detail information such as:   * Name * Phone * Address * Date of Birth * Contact information (if any) | | | |
| Alternative Flow: | 1:   | Step | Actor Action | System Response | | --- | --- | --- | | 1 | In browser search box, actors enter a links of account detail | System redirects to candidate detail information page. The website shows candidate detail information such as:   * Name * Job title * Address * Educations * Work experiences * Awards   **[Exception 1]** | | | |
| Exceptions: | | No | Cause | System Response | | --- | --- | --- | | 1 | Result is empty | System informs “Rất tiếc chúng tôi không tìm thấy kết quả theo yêu cầu của bạn.”. | | | |
| Business Rules: | Accounts display for actor must allow publish status and status of account must be active. | | |
| Assumptions: | Actor’s internet connection is available | | |

### **UC-16: Delete Account**

| **ID and Name:** | **UC-16: Delete Account** | | |
| --- | --- | --- | --- |
| Created By: | TienNT | Date Created: | 1/2/20224 |
| Primary Actor: | Admin | Secondary Actors: | N/A |
| Priority: | Normal | Frequency of Use: | Often |
| Trigger: | The actor wants to remove account from list | | |
| Description: | This feature allows actors to remove selected accounts from the user list | | |
| Preconditions: | Actor has signed in as “Admin” | | |
| Post-conditions: | Success: The Account is remove. | | |
| Normal Flow: | | Step | Actor Action | System Response | | --- | --- | --- | | 1 | In the Users list page, actor clicks the button in the Action column at the row that the actor wants to delete | System shows options :  - delete | | 2 | Actor clicks “Delete” | System shows a message is “Delete success!” | | | |
| Alternative Flow: | N/A | | |
| Exceptions: | N/A | | |
| Business Rules: | N/A | | |
| Assumptions: | Actor’s internet connection is available | | |

### **UC-17: Post Approve**

| **ID and Name:** | **UC-17: Post Approve** | | |
| --- | --- | --- | --- |
| Created By: | TienNT | Date Created: | 1/2/2024 |
| Primary Actor: | Admin | Secondary Actors: | N/A |
| Priority: | Normal | Frequency of Use: | Often |
| Trigger: | The actor wants to approve the apartment post details. | | |
| Description: | This feature allows Admin to approve apartment post. | | |
| Preconditions: | Actor has signed in as “Admin” | | |
| Post-conditions: | Success: System shows a dialog with a successful message when the apartment has been approved successfully in the database.  Fail: System shows a dialog with specified error message. | | |
| Normal Flow: | | Step | Actor Action | System Response | | --- | --- | --- | | 1 | Click on post apartment page. | * System shows a form with these fields: * name project: text * type apartment: text * quantity: int * status: text | | 2 | Admin fills information, then clicks on the “Approve” button. | System modifies the fields and redirects to the project screen interface. | | | |
| Alternative Flow: | N/A | | |
| Exceptions: | N/A | | |
| Business Rules: | Account just only can be updated by the Admin that created it. | | |
| Assumptions: | Actor’s internet connection is available | | |

### **UC-18: Post Refuse**

| **ID and Name:** | **UC-18: Post Refuse** | | |
| --- | --- | --- | --- |
| Created By: | TienNT | Date Created: | 1/2/2024 |
| Primary Actor: | Admin | Secondary Actors: | N/A |
| Priority: | Normal | Frequency of Use: | Often |
| Trigger: | The actor wants to refuse the apartment post details. | | |
| Description: | This feature allows Admin to refuse apartment post. | | |
| Preconditions: | Actor has signed in as “Admin” | | |
| Post-conditions: | Success: System shows a dialog with a successful message when the apartment has been refuse successfully in the database.  Fail: System shows a dialog with specified error message. | | |
| Normal Flow: | | Step | Actor Action | System Response | | --- | --- | --- | | 1 | Click on post apartment page. | * System shows a form with these fields: * name project: text * type apartment: text * quantity: int * status: text | | 2 | Admin fills information, then clicks on the “Refuse” button. | System modifies the fields and redirects to the project screen interface. | | | |
| Alternative Flow: | N/A | | |
| Exceptions: | N/A | | |
| Business Rules: | Account just only can be updated by the Admin that created it. | | |
| Assumptions: | Actor’s internet connection is available | | |

### **UC-19: View Commission**

| **ID and Name:** | **UC-19: View Commission** | | |
| --- | --- | --- | --- |
| Created By: | TienNT | Date Created: | 1/2/2024 |
| Primary Actor: | Admin | Secondary Actors: | N/A |
| Priority: | High | Frequency of Use: | Often |
| Trigger: | The actor wants to view commission of apartment. | | |
| Description: | This feature allows admins to view commissions for each apartment project. | | |
| Preconditions: | Actor has signed in as “Admin” | | |
| Post-conditions: | Success: The system displays commission details | | |
| Normal Flow: | | Step | Actor Action | System Response | | --- | --- | --- | | 1 | In project page, actor clicks on profile section | System redirects to profile page containing viewcommission. | | 2 | Actor clicks “View commission” button | The page navigation system displays the apartment's commission | | | |
| Alternative Flow: | N/A | | |
| Exceptions: | N/A | | |
| Business Rules: | Commission must be displayed accurately and clearly based on customer deposit contracts | | |
| Assumptions: | Actor’s internet connection is available | | |

## **4.4. Business Rules**

### 

| **ID** | **Rule Definition** | **Example** |
| --- | --- | --- |
| BR-01 | Each project must have a unique identifier (e.g., project ID, name), descriptive and identifiable name, accurate location (address, city, state), and clearly defined type (residential, commercial, mixed-use). | * Project ID: PDS-001, Project Name: Eco Green Residence, Location: 123 Main Street, Anytown, CA, Type: Condominiums |
| BR-02 | Maintain a list of available amenities for each project, with clear descriptions and any relevant details (e.g., size, capacity). Track inclusion/exclusion of specific amenities for each project. | * Amenities: Swimming pool (500 sq ft), fitness center (modern equipment), children's playground (safe, engaging). * Included: All units have access. |
| BR-03 | Define construction phases (e.g., planning, foundation, framing, finishing), establish and track milestones for each phase, and record completion percentages for each phase and overall project. | * Phases: Planning (100%), Foundation (75%), Framing (50%). * Milestones: Complete foundation by December 31, 2023. |
| BR-04 | Create a WBS for each project, breaking it down into manageable tasks with clear descriptions, estimated durations, and assigned resources. Identify and manage dependencies between tasks. | * Work Package: Foundation construction. * Tasks: Prepare site (1 week, Construction Team 1), Excavate foundation (2 weeks, excavator),... |
| BR-05 | Create a project schedule with planned start and end dates for each task. Track actual start and finish dates, compare them to planned dates, analyze and address schedule variances. | * Task: Prepare site (Planned: Nov 1-7, Actual: Oct 31-Nov 5, Variance: +4 days). * Cause: Inclement weather. * Action: Adjust dependent tasks' schedule. |
| BR-06 | Develop a project budget with estimated costs for each task and resource. Track actual costs, compare them to the budget, analyze and address cost variances. | * Project Budget: $100 million. Task: Prepare site (Planned: $5,000, Actual: $5,200, Variance: +$200). * Cause: Material cost overrun. * Action: Tighten cost control on other tasks. |
| BR-06 | Customer information accuracy: All customer data must be accurate, complete, and up-to-date. | * Validate email addresses and phone numbers.Allow customers to update their information easily. |
| BR-07 | Transaction and interaction history: Record all customer transactions and interactions, including date, time, amount, product/service, channel (online, in-store, phone), and customer representative involved. | * Track purchase history, returns, complaints, and service requests. representatives. |
| BR-08 | Customer segmentation and profiling: Segment customers based on demographics, purchase behavior, and engagement levels. | * Identify high-value customers and offer personalized incentives. * Group customers with similar needs and preferences for targeted marketing campaigns. |
| BR-09 | Customer communication: Communicate with customers in a timely, personalized, and relevant way. | * Segment communication channels based on customer preferences (email, SMS, push notifications). * Tailor messages to individual customer needs and interests. * Send relevant offers and promotions based on purchase history and browsing behavior. |
| BR-10 | Privacy and security: Protect customer data from unauthorized access and ensure data security compliance. | * Implement data encryption and access control measures. * Comply with relevant privacy regulations (GDPR, CCPA). * Allow customers to control their data and opt out of marketing communications. |
| BR-11 | Customer satisfaction measurement: Regularly measure customer satisfaction and identify areas for improvement. | * Conduct customer satisfaction surveys and track feedback from social media and reviews. * Analyze customer service interactions to identify pain points. |
| BR-12 | Agent information accuracy: Maintain accurate and up-to-date information for all agents, including contact details, skills, certifications, and training records. | * Verify information during onboarding and regularly update it. * Track agent completion of certifications and training courses. |
| BR-13 | Performance data collection: Automatically capture and store relevant agent performance data, including sales volume, conversion rates, customer satisfaction scores, and average resolution time. | * Integrate data from CRM, helpdesk, and other relevant systems. * Track performance across different products, services, and customer segments. |
| BR-14 | Commission structure: Define clear and transparent commission structures based on agreed-upon metrics (e.g., sales volume, revenue generated, customer satisfaction). | * Offer tiered commission structures to motivate high performance. * Adjust commission structures based on market conditions and business goals. |
| BR-15 | Performance reporting: Generate comprehensive reports on individual and team performance, including trends, benchmarks, and areas for improvement. | * Allow filtering and drill-down into specific metrics by agent, product, customer segment, and time period. * Compare performance against individual and team goals. |
| BR-16 | Legal compliance: Stay informed about and adhere to legal and regulatory changes that may impact real estate transactions. | * Regularly update the system to reflect any legal changes. * The system aligns with current laws and regulations governing the real estate industry. |
| BR-17 | User access control: Implement role-based access control to restrict system access based on user roles | * That sensitive information is accessible only to authorized personnel. * Regularly review and update access permissions based on organizational changes and user responsibilities. |