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6		17.11.2021-23.11.2021	
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## ABSTRACT

Master's thesis: 187 pages, 59 figures, 15 tables, 4 appendices, 42 sources.

MODEL, AUTOMATION, REAL ESTATE SEARCH AGENCY, SALESFORCE, ACCOUNTING SYSTEM, OPERATING SYSTEMS, SOFTWARE AND HARDWARE, CRM.

The major goal of this thesis is development of functional, mathematical, algorithmic and software business process of accounting for booking based on CRM-platform Salesforce.

The object of research is the process of automating the activities of real estate agencies.

The following research methods were used in writing the work: analytical, software.

In the course of this qualification work, the problems of automating the activities of employees of real estate search agencies using modern information processing tools were considered.

The work provides a high-quality statement of the problem, created a flexible online program. Based on the business rules, a functional model of the housing reservation system was developed, software requirements were determined, software usage diagrams, and a data model were developed.

The possibilities of the software product that implements the model are described in detail, the target variant of the architecture is selected, the selected technical means are described. Developed software on the Salesforce platform for the task of automating the activities of employees of real estate agencies - a software solution to automate the entire process of finding real estate by the client and the staff of the real estate agency for rent. The construction of electronic reports on the basis of existing data has been implemented.

Scope. The developed model can be used by any commercial and non-commercial organizations that specialize in real estate and reservations.

The value of the work and conclusions. The model and software described in the qualification work provides employees of real estate companies with a set of tools that automate the main business processes of the enterprise, thus saving employees time and increasing their efficiency.

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.2	Booking	159
.3	Stock Contract Line	163
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CRM –

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( .., Customer Relationship

Management)

CRUD – 4

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» ( .., Create Read Update Delete)

CSS –

( .., Cascading Style Sheets)

DFD –

( .., Data Flow Diagrams)

HTML –

( .., Hyper Text

Markup Language)

LCF –

Salesforce ( .., Lightning Component

Framework)

SOQL –

Salesforce ( ..,

Structured Query Language)

UI –

( .., User Interface)

UML –

( .., Unified Modeling

Language)

UX –

( .., User Experience)

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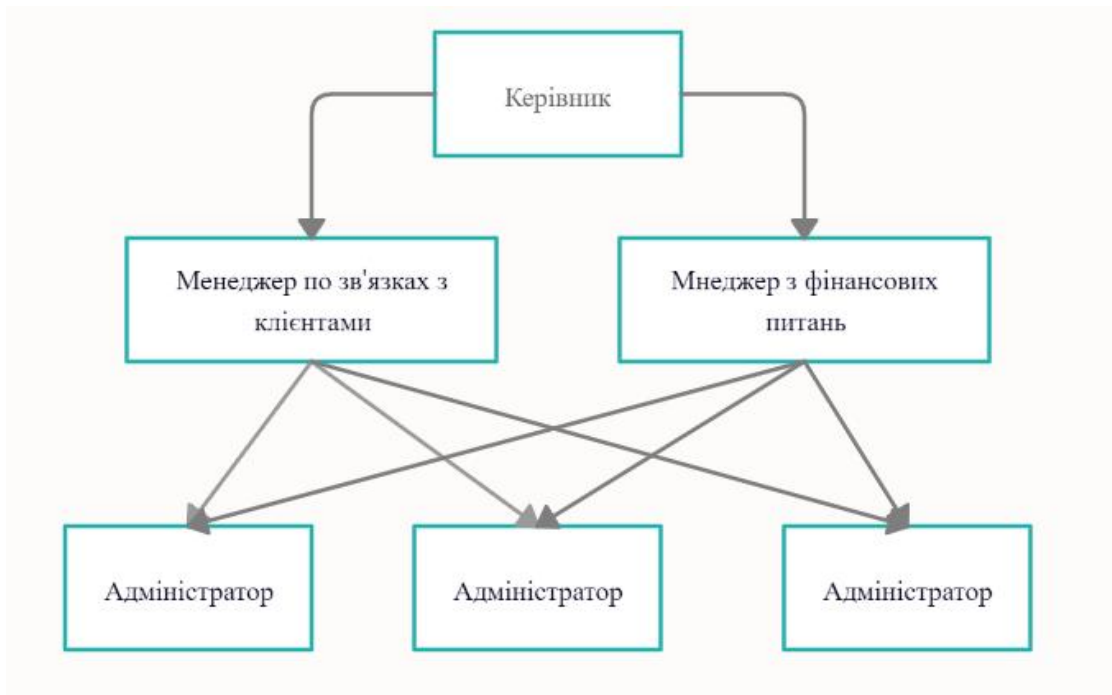
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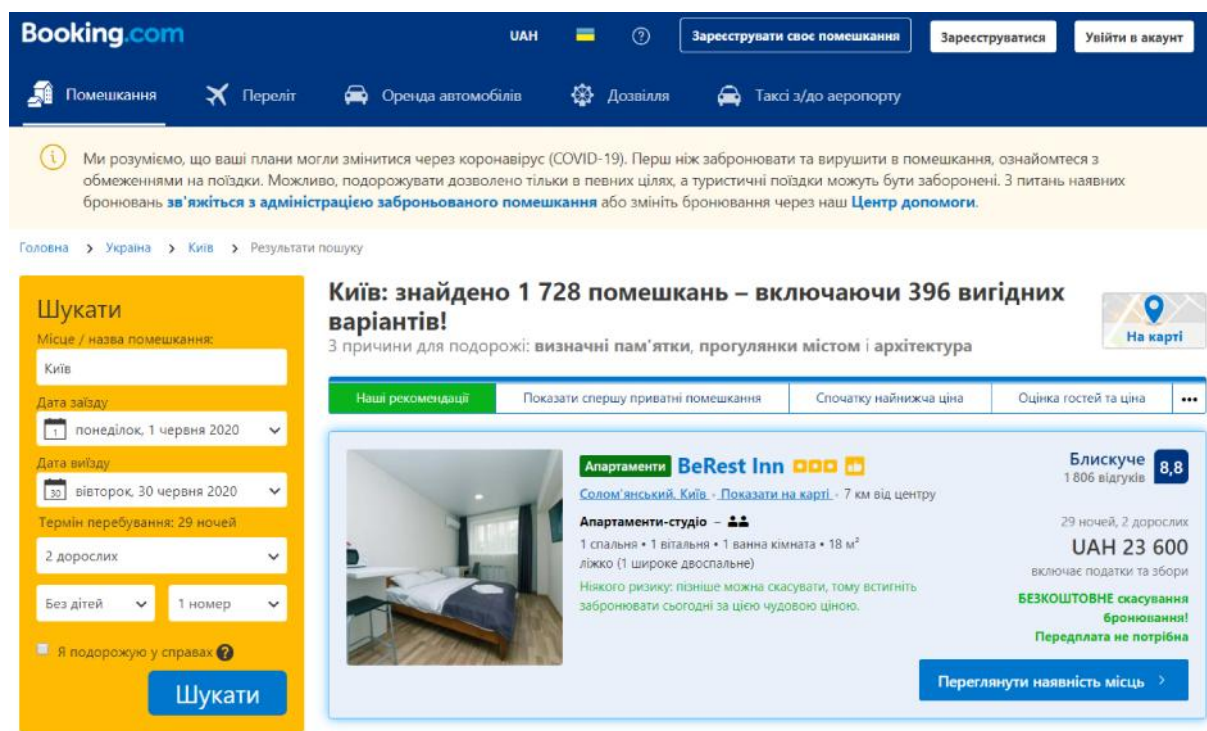
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«Booking.com» 1.2.



1.2 –

«Booking.com»

1.2.2 «Dom.ria.com»

Dom.ria.com

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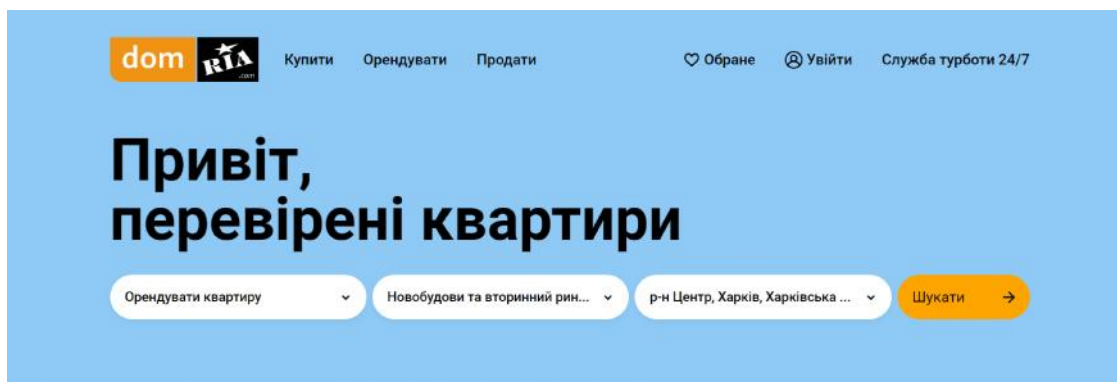
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: <https://dom.ria.com/>.

1.3.





Ми оновили DOM.RIA. Пошук нерухомості став ще зручнішим і швидшим

[Перейти до попередньої версії](#)

## Рекомендовані пропозиції



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«dom.ria.com»

1.2.3 С «Rieltor.ua»

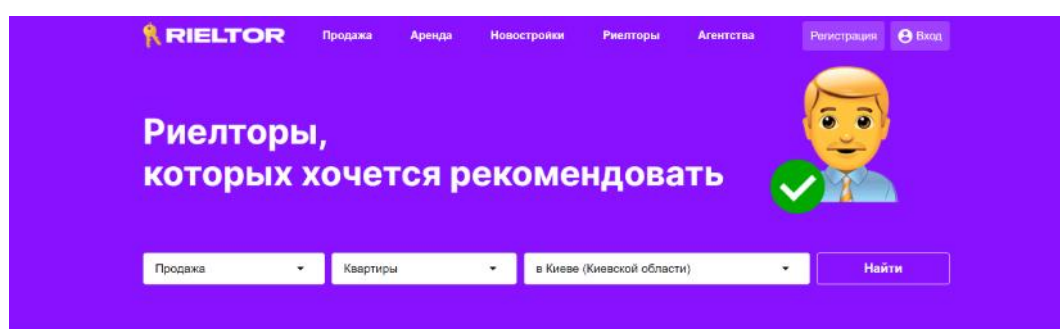
<https://rieltor.ua/> –

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Недвижимость в Киеве и Украине

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Продают  
В новостройках  
Сдают  
Посуточно

### Дома

Продают  
Сдают  
Посуточно

### Комнаты

Продают  
Сдают  
Посуточно

[+ Добавить объявление](#)

1.4 –

«rieltor.ua»

1.2.4

1.1 , .  
: booking.com, dom.ria.com  
rieltor.ua.

1.1 –

	«Booking.com»	«dom.ria.com»	«rieltor.ua»
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Microsoft Office 365,  
Google Ads, GMail, Oracle, SAP;  
CRM- CRM-  
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CRM.  
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CRM- CRM-

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HubSpot CRM

HubSpot CRM

CRM

HubSpot CRM

Marketing Hub,

Sales Hub Service Hub.

2019 HubSpot PieSync.

PieSync

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Zoho

Zoho

45 « » (SaaS),

. Zoho CRM –

(CRM)

Zoho CRM

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Freshsales CRM

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CRM.

CRM,

Freshsales

CRM

Freshworks,

Freshcaller Freshdesk,

Freshsales.

Freshsales,

Freshsuccess

2019

Freshworks



Pipedrive – CRM-

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Pipedrive,

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CRM-

Agile.

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SaaS- Agile

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Agile CRM – end-to-end CRM,

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Insightly

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CRM

Google Office 365,

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 Insightly CRM – ,  
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#### 1.4 Salesforce CRM

CRM-  
 Salesforce.  
 Salesforce.com – , CRM-  
 , software-as-a-service,  
 – SaaS. Salesforce.com,  
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 Salesforce CRM  
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 CRM .  
 Salesforce  
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 AppExchange. AppExchange, Salesforce Store,  
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 Outlook Gmail Salesforce,  
 DocuSign ,  
 Pardot Salesforce.  
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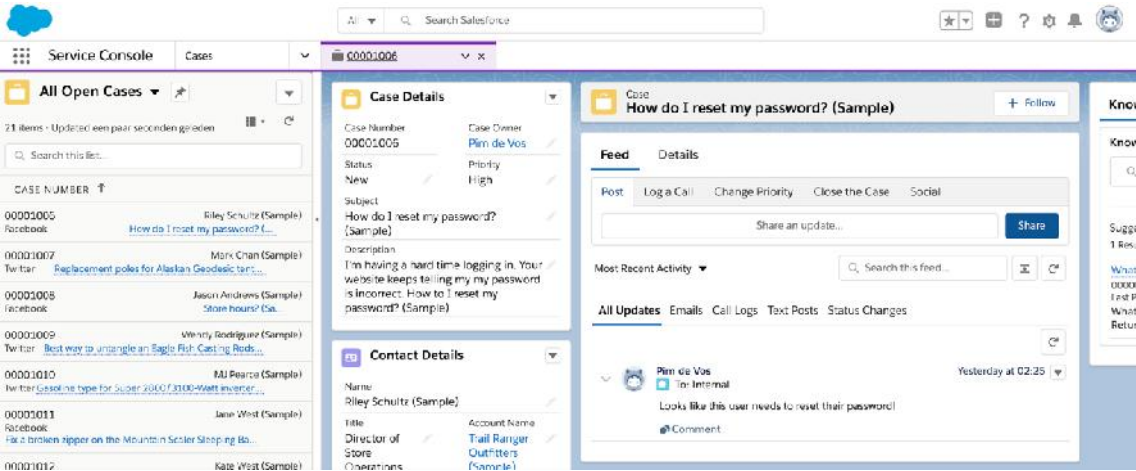
Lightning

Salesforce

Salesforce

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Salesforce CRM

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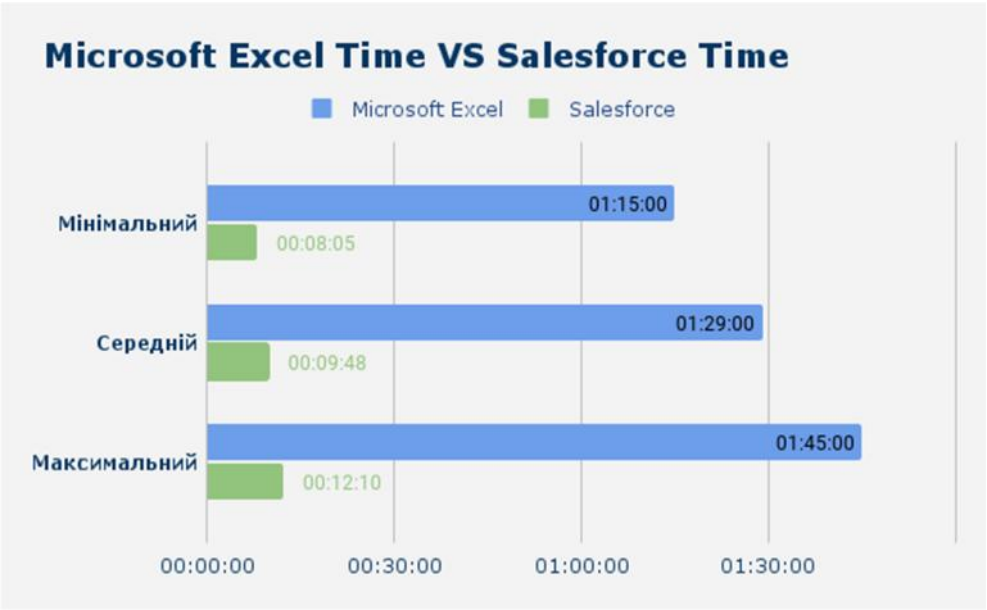
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- – Evaluated WS;
- – Target WS;
- – Difference WS %.
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– Difference WS.

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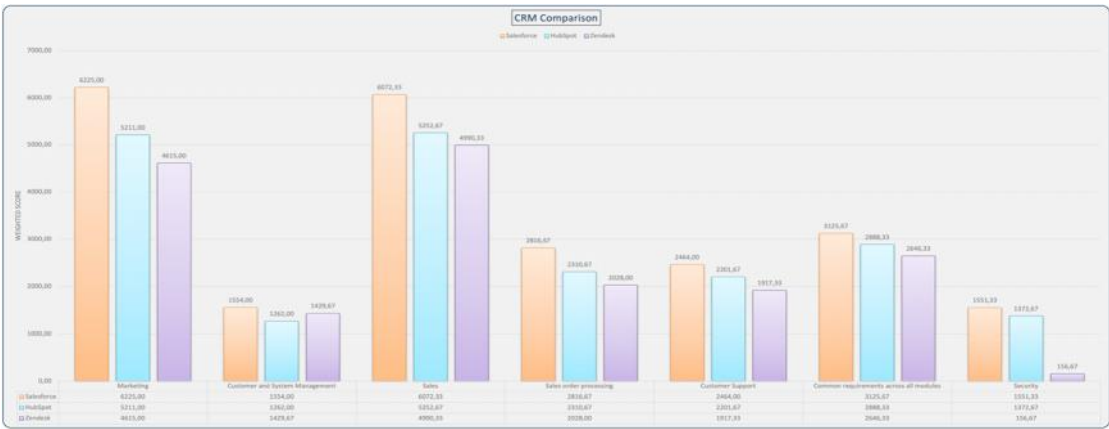
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1.10 – Evaluated WS

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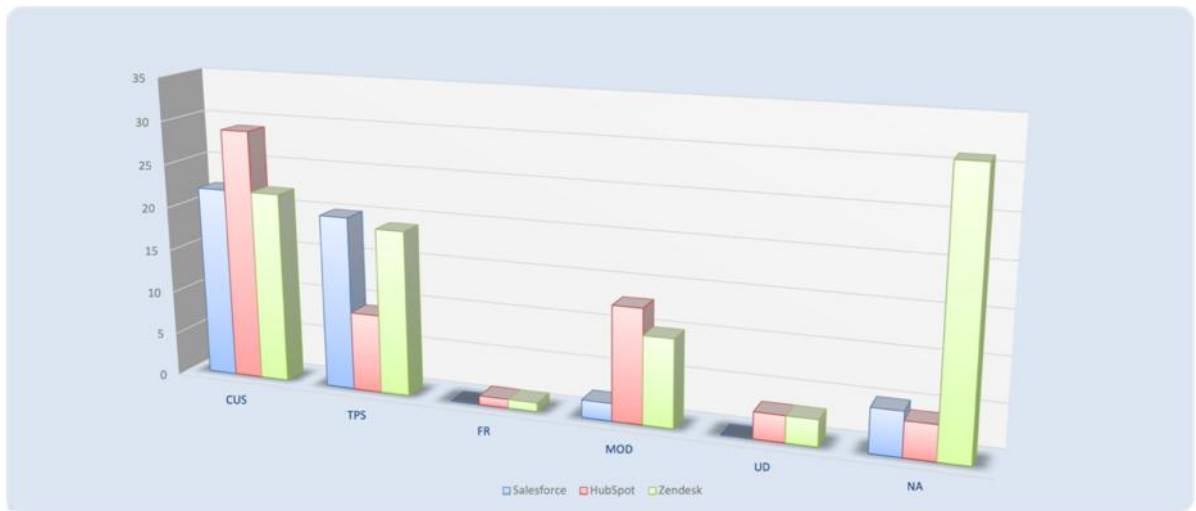
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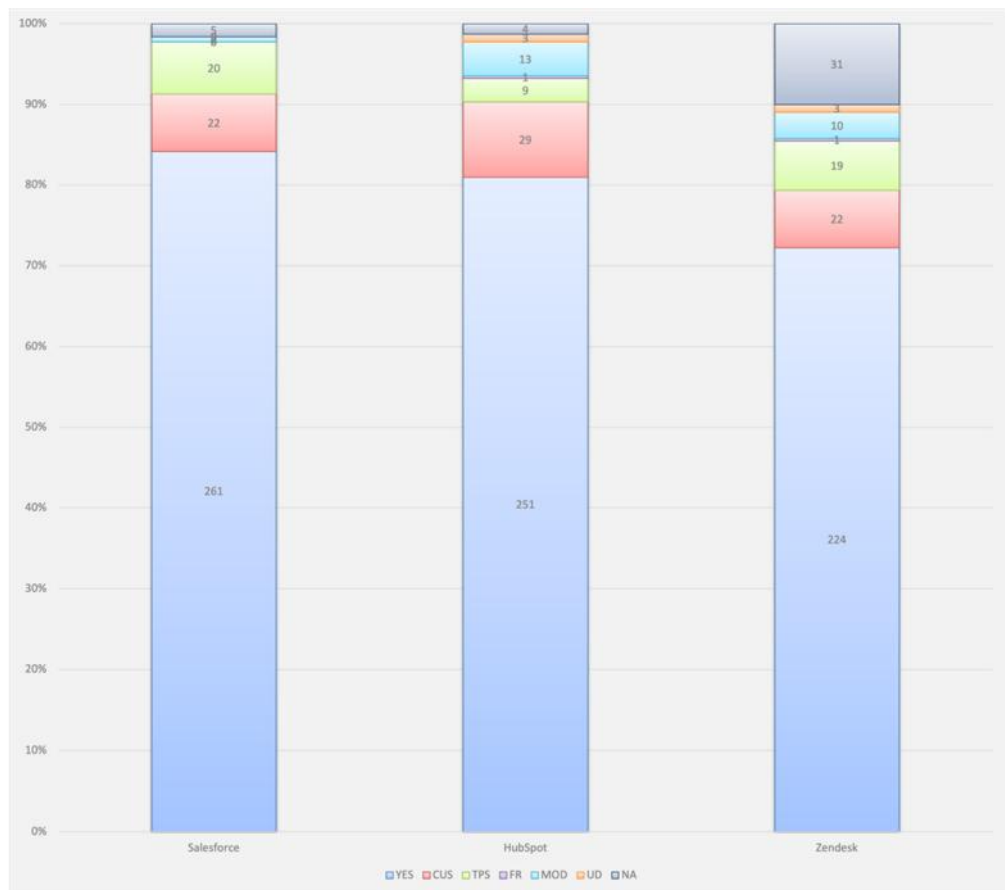
HubSpot [20].



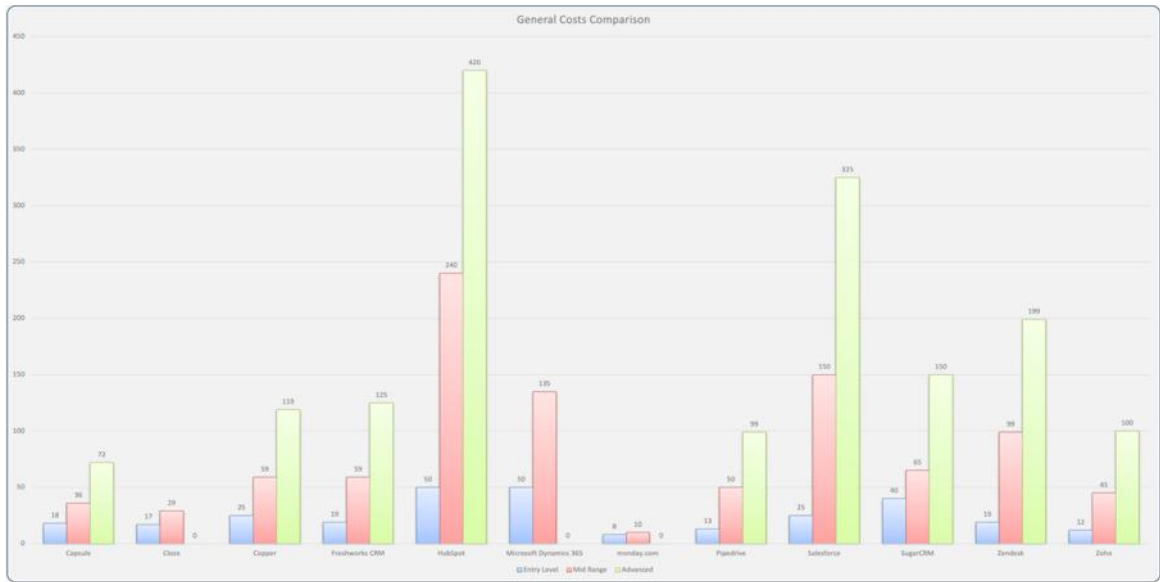


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1.13 – CRM-

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CRM- . Salesforce

Mid-Range Advanced.

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Sales CRM-

(Salesforce, HubSpot, Zendesk, Microsoft 365).

Salesforce Professional Edition.



1.14 – Sales

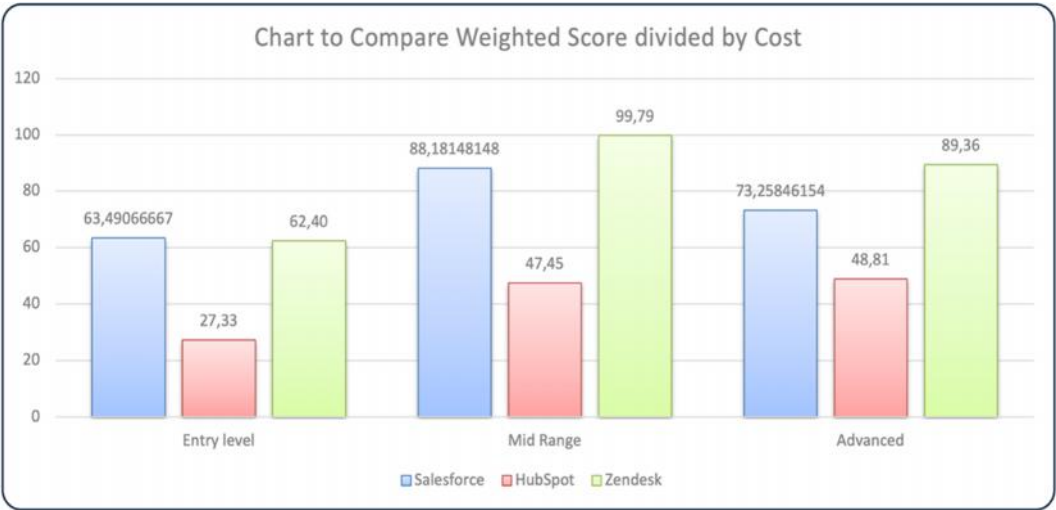
CRM-



1.15 – Service CRM- (Salesforce, HubSpot, Zendesk, Microsoft 356)

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Service CRM- (Salesforce, HubSpot, Zendesk, Microsoft 356). , Salesforce Professional Edition.



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KPI

KPI (Performance Indicator)

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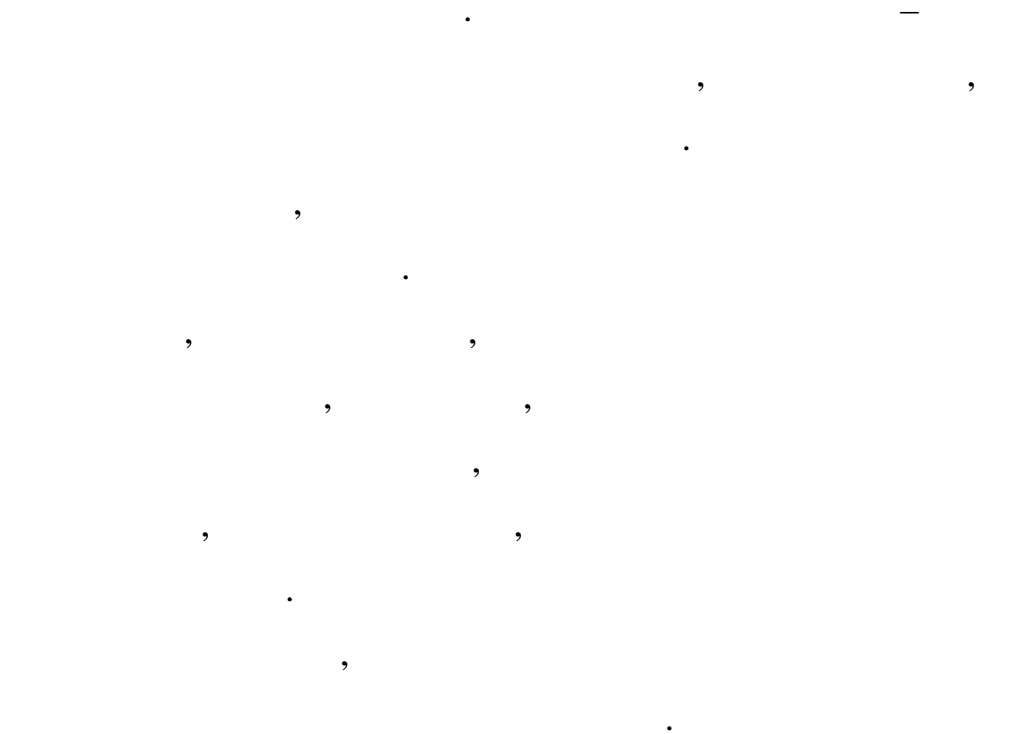
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«Open Pipeline»:

CRM?

KPI Salesforce —

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«Open Pipeline by Product Package»:

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KPI Salesforce,

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SaaS-

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KPI

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«Pipeline Value Forecast»:

CRM

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«Pipeline Value Forecast»: –

KPI

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KPI Salesforce –



(Annual Contractual Value (ACV)):

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KPI : 31% , 25%  
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15,1 %, 13,8 %, 18,3 %.

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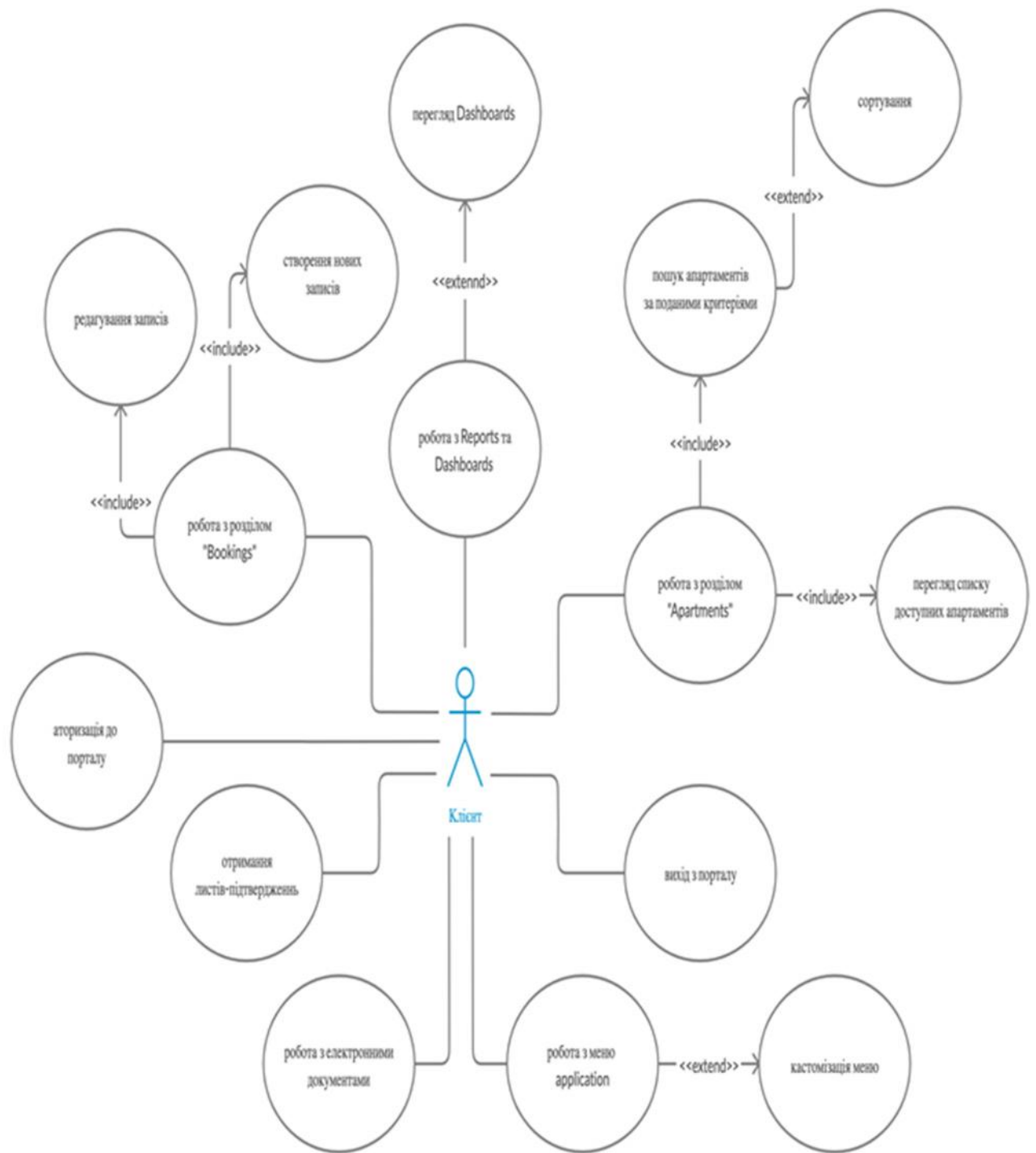
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CRM:

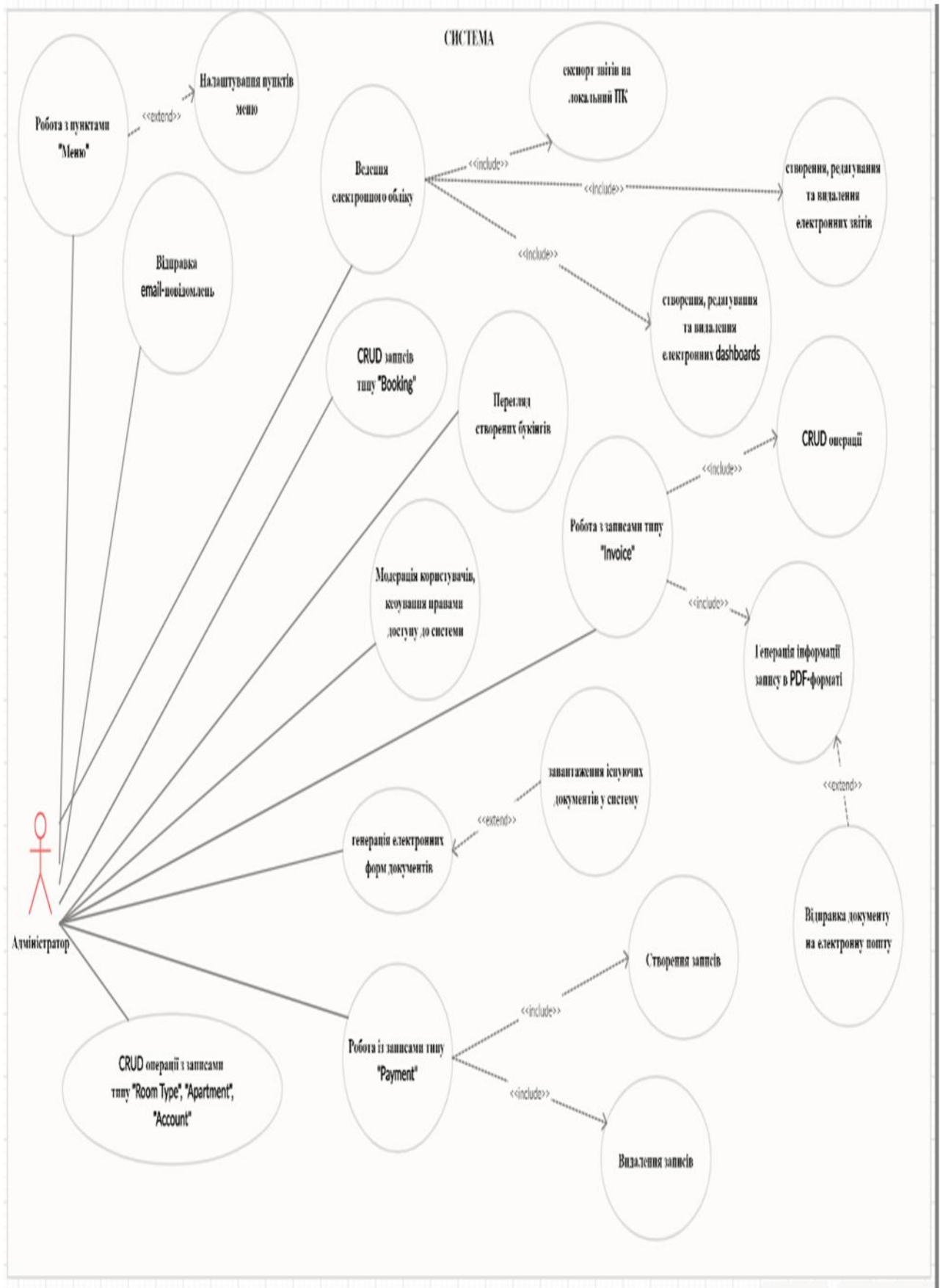
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KPI。

«Salesforce»-система, основанная на облачных технологиях, позволяет компаниям эффективно управлять своими ресурсами и клиентами. Система предоставляет широкий спектр инструментов для автоматизации бизнес-процессов, включая управление продажами, маркетингом, обслуживанием клиентов и финансами. Salesforce KPI (ключевые показатели эффективности) являются важными индикаторами успеха компании, использующей эту систему. Они помогают оценить эффективность различных аспектов бизнеса, таких как производительность продаж, уровень удовлетворенности клиентов и финансовые результаты. Salesforce CRM (система управления взаимоотношениями с клиентами) является основой для интеграции данных о клиентах и их взаимодействии с компанией. Это позволяет персонализировать обслуживание и повысить лояльность клиентов. Внедрение Salesforce CRM способствует повышению прозрачности бизнес-процессов и улучшает коммуникацию между отделами. Таким образом, Salesforce KPI и Salesforce CRM являются ключевыми элементами успешной стратегии компании, ориентированной на клиента. Внедрение этих инструментов требует тщательного планирования и обучения персонала, но результаты оправдывают затраты. Salesforce CRM обеспечивает централизованное хранение информации о клиентах, что упрощает доступ к данным и повышает качество обслуживания. Salesforce KPI позволяют отслеживать прогресс в достижении бизнес-целей и оперативно реагировать на изменения. В заключение, Salesforce KPI и Salesforce CRM являются мощными инструментами для повышения эффективности бизнеса и укрепления отношений с клиентами. Их внедрение и использование являются обязательными для компаний, стремящихся к долгосрочному успеху в конкурентной среде.

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 UML  
 2005 . UML  
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 UML  
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 2.3.1  
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2.3.2

2.1 – « »

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	, «Setup» «User».
	, «User» .
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2.2

1	2
	’ ’ ’ ’ «Cancel» .
	’ « » ’ . - .

2.3 – « »

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1	2
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	’ ” ” .
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2.3

1	2
	, , , , «Cancel» .
	, « » , . - .

2.4 – « »

	.
1	2
	«PDF» , .
	« » « ».

2.4

1	2
	<p>,</p> <p>«Template»</p> <p>Detail page (« »)</p> <p>« »),</p> <p>«PDF»</p> <p>.</p> <p>,</p> <p>«Send via</p> <p>email»</p> <p>.</p>
	<p>,</p> <p>,</p> <p>.</p>
	<p>.</p> <p>.</p>

2.5 – « »

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	« ».
	<p>Salesforce</p> <p>’, . Salesforce</p> <p>,</p> <p>.</p> <p>« ».</p> <p>,</p> <p>dashboard,</p> <p>.</p>
	’, , .
	«Reports».

2.6 – « »

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	credentials.
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2.7 – « »

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2.7

1	2
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2.8 – « « »»

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	« ». ， ， Stock Room Type – .



- (Protect the relationship): ,

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- (End the relationship): , , ,

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- (Reengineer the relationship): ,

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- (Enhance the relationship): ,

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CRM-

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Excel;

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CRM-

[33]. , , CRM

[39].

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- (Protect the relationship).

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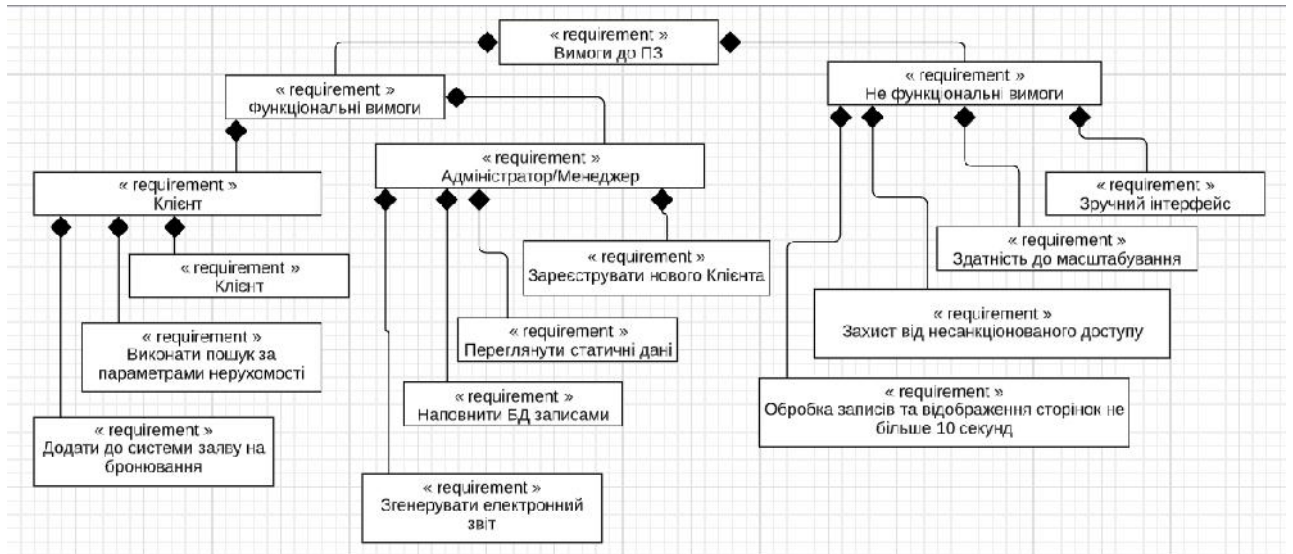
- (Enhance the relationship).

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CRM-  
CRM-  
CRM-  
Salesforce.  
Sales Cloud      Salesforce      75  
CRM-  
2 :



2.3 –

#### 2.4.1 IDEF0

IDEF0

(ICOM)

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IDEF0,

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FIPS-183

(NIST),

IDEF0

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IDEF0

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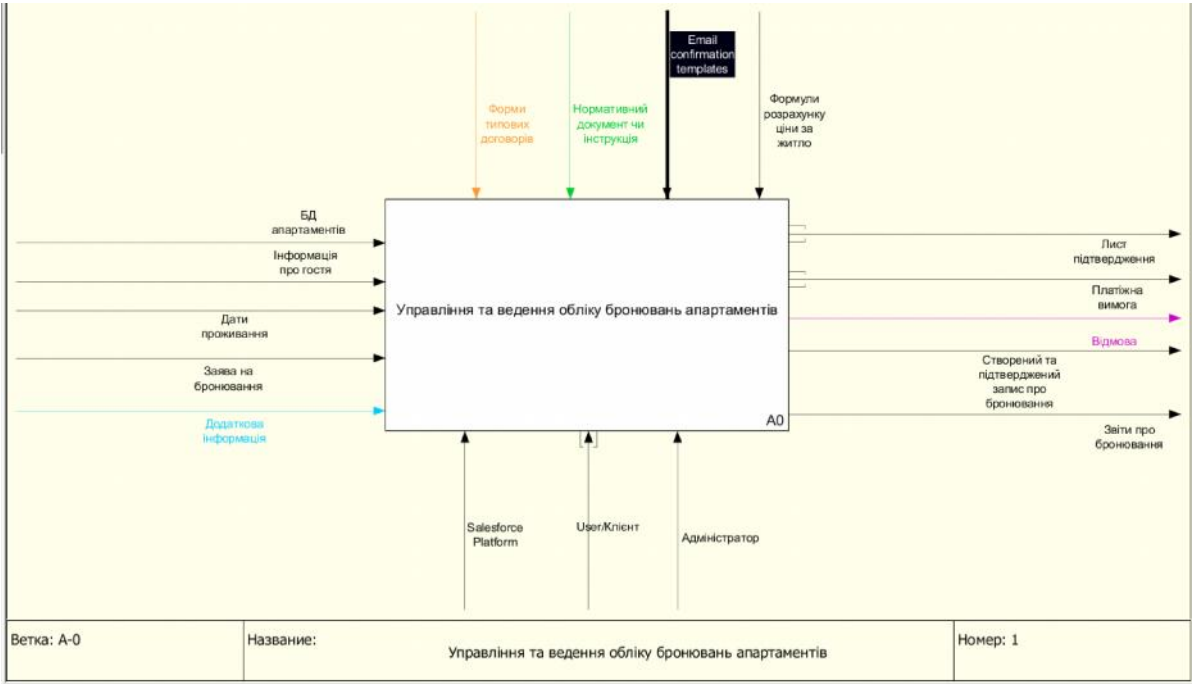
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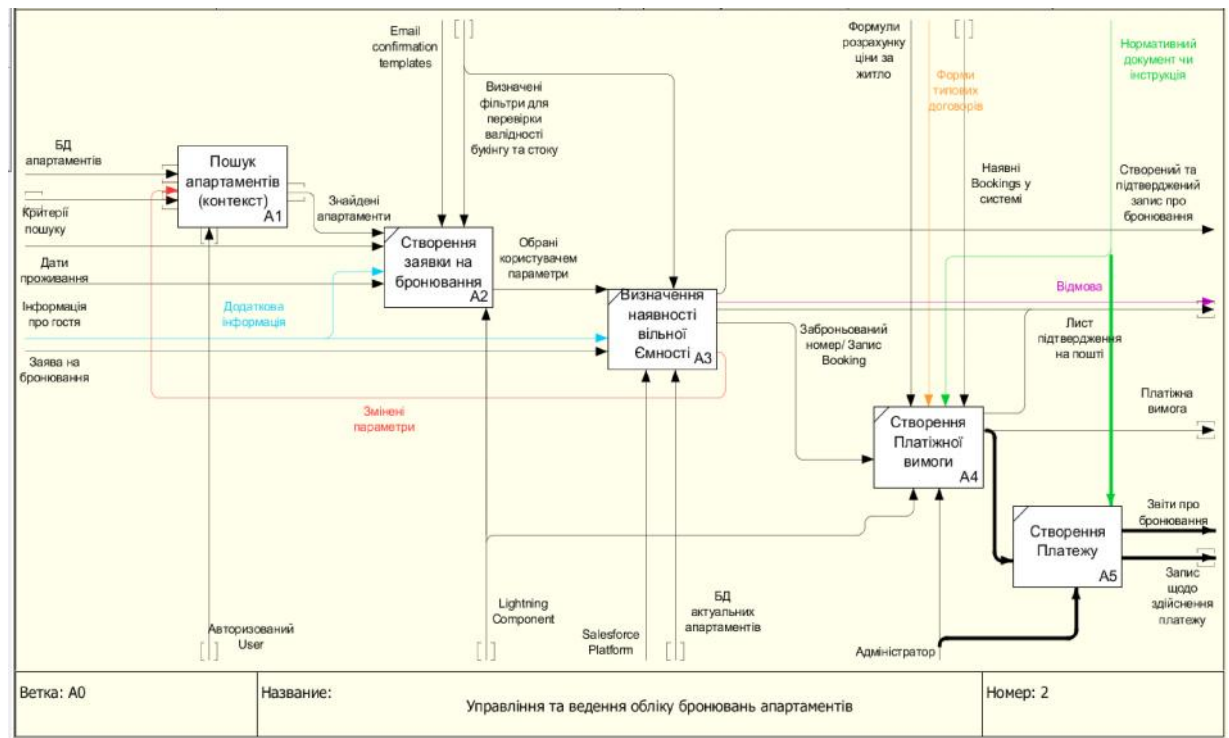
IDEF0, 2.4.



2.4 – IDEF0

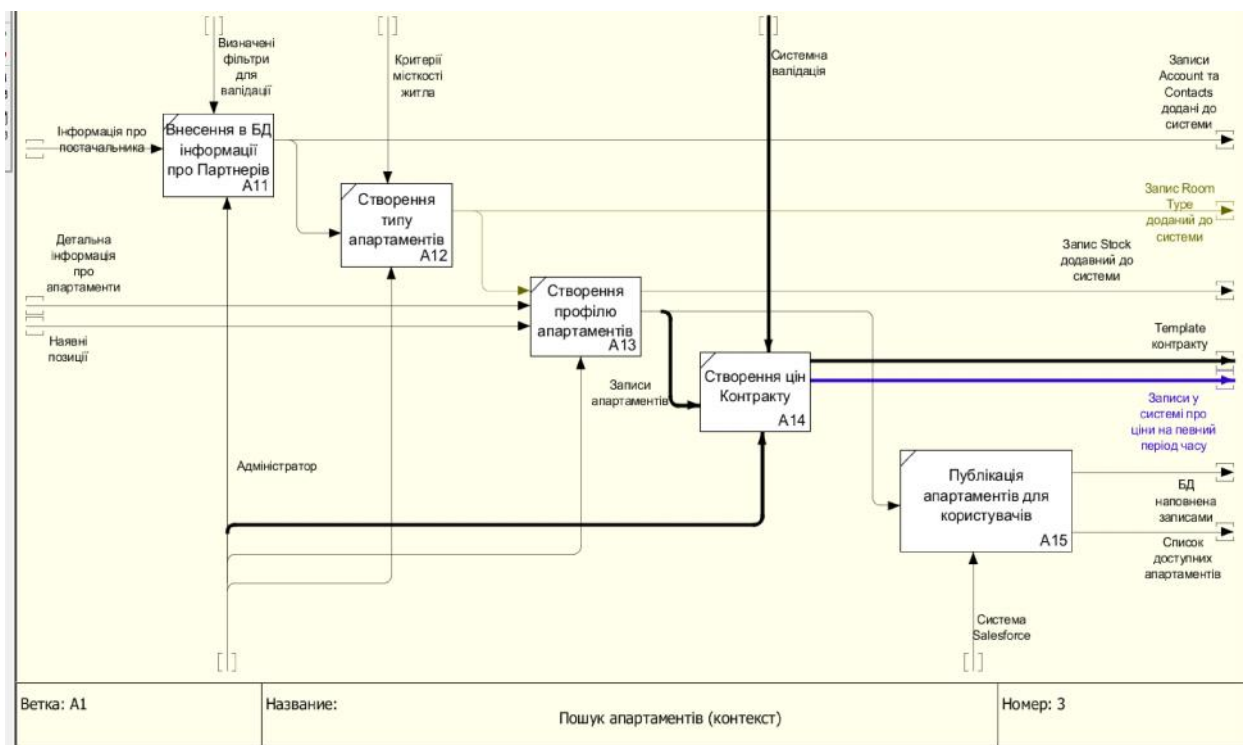
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( 2.5).





2.5 —

IDEF0



2.6 –

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&gt;&gt;

IDEF0

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2.6.

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2.4.2 DFD

(DFD) –

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DFD

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DFD

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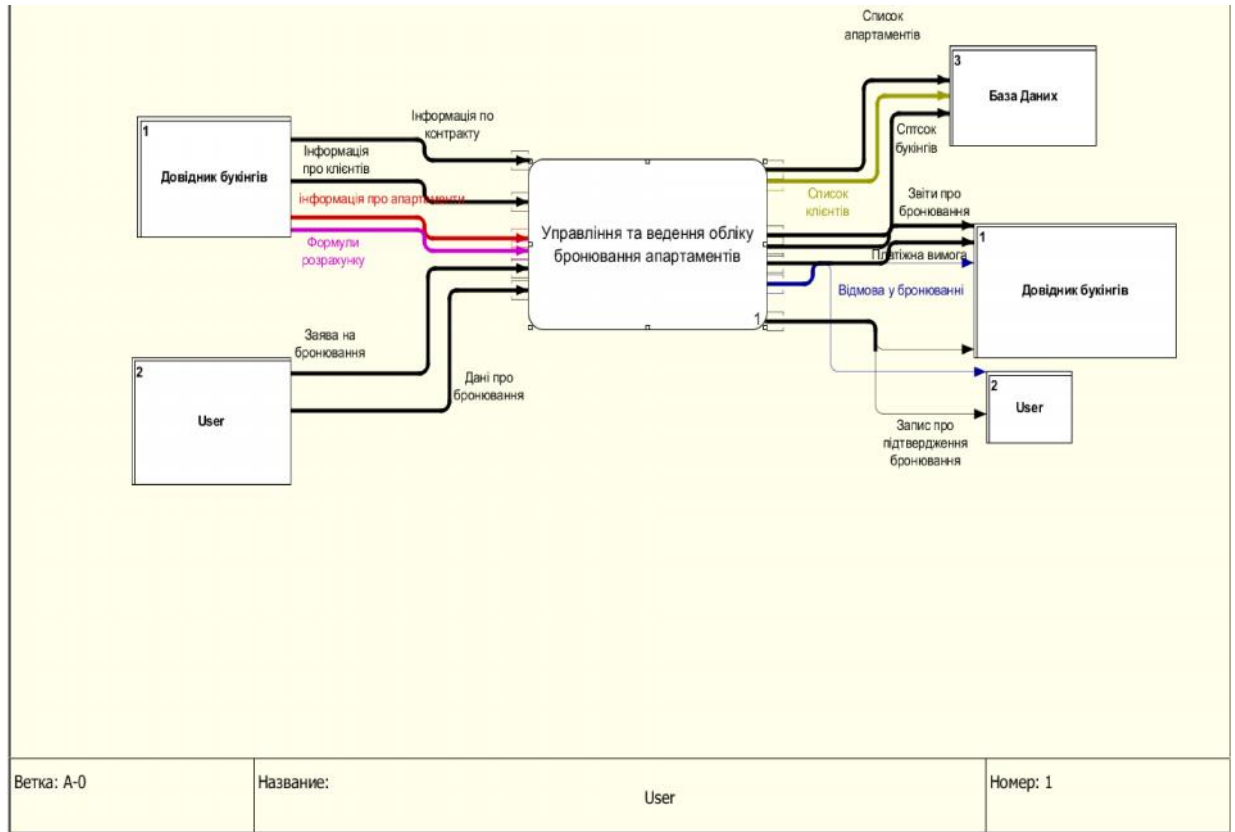
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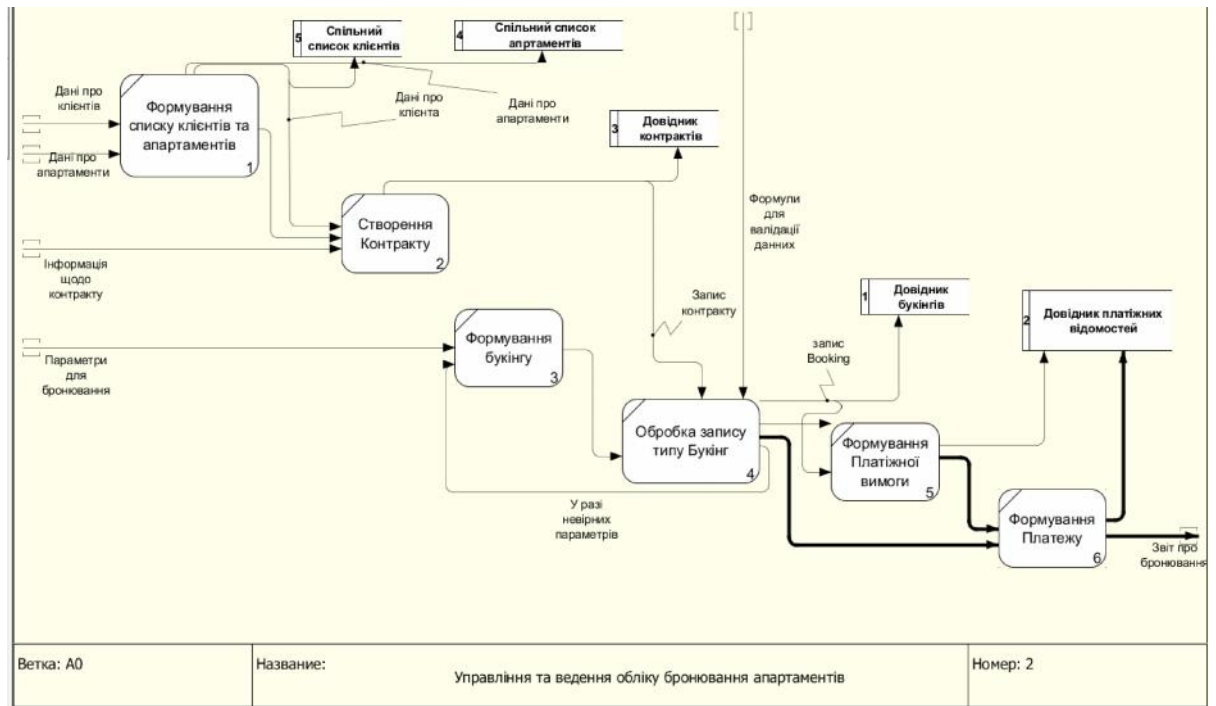
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DFD



2.8 –

DFD

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2.5

(UI) –

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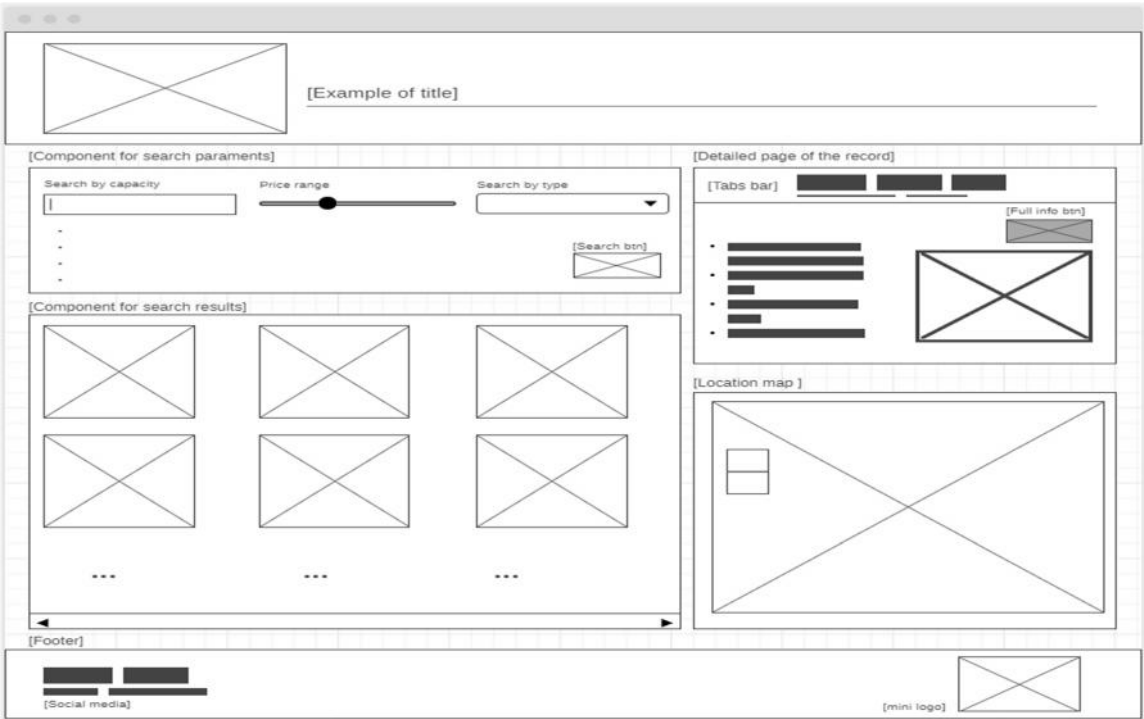
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2.9 –

Salesforce,

Lightning Experience.

Your Salesforce organization

[company logo]

[global search in org]

Org Setup

[global navigation items]

File

Edit

View

Help

Invoice creation

[search for Account]

[date of Invoice]

12 May 2016

[Invoice Name]

Search for Bookings

☒

Booking One

Client information

1000

670

☒

Booking Two

Client information

1000

1000

☒

Booking Three

Client information

1000

[Cancel]

[Create]

[Salesforce footer]

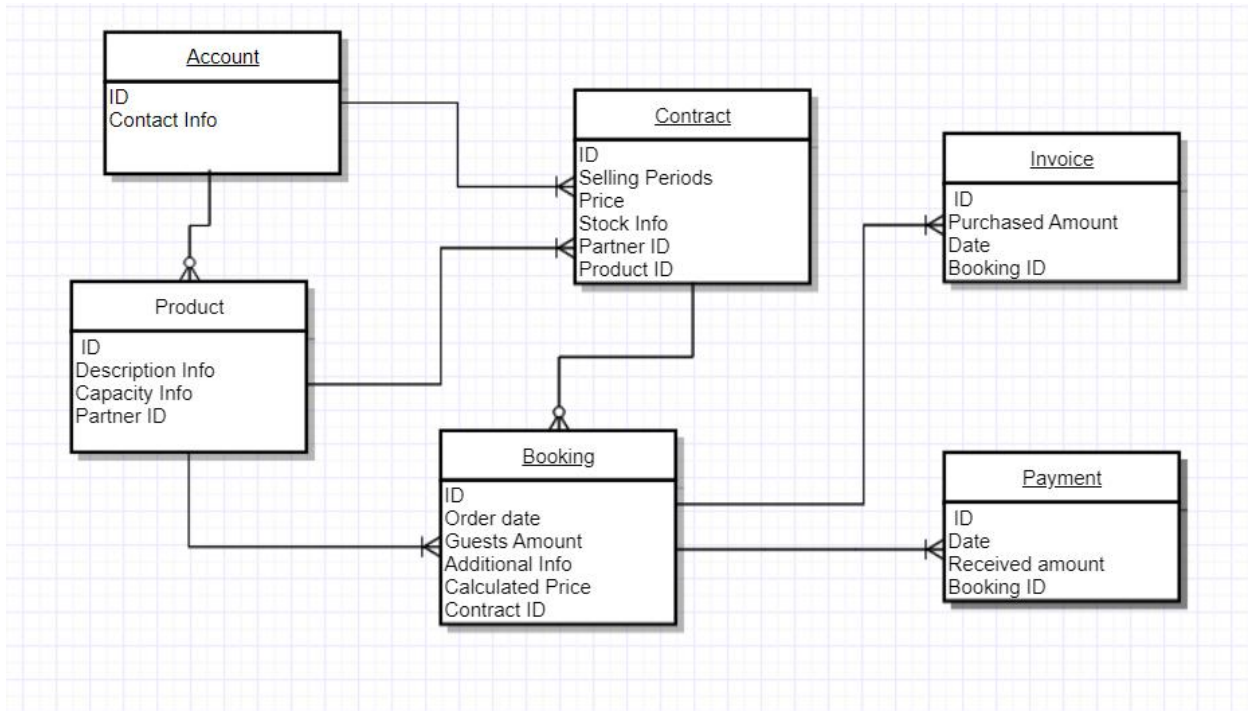
Full Banner Ad - 468x60

2.10 –

Invoice

2.9 – 2.10,





### 3.1 – ER-

( . . . 1).

Salesforce Object

Manager

3.2 3.3.

Enable Reports
✓
Track Activities
✓
Track Field History
✓
Deployment Status
Deployed
Help Settings
Standard salesforce.com Help Window

## 3.2 –

## Salesforce Object Manager

## Description

Сутність для відстеження заяв клієнтів на бронювання наявної у компанії нерухомості.

## API Name

Booking\_\_c

## Custom

✓

## Singular Label

Букінг

## Plural Label

Букінги

## 3.3 –

## Salesforce Object Manager

## 3.1.1

,

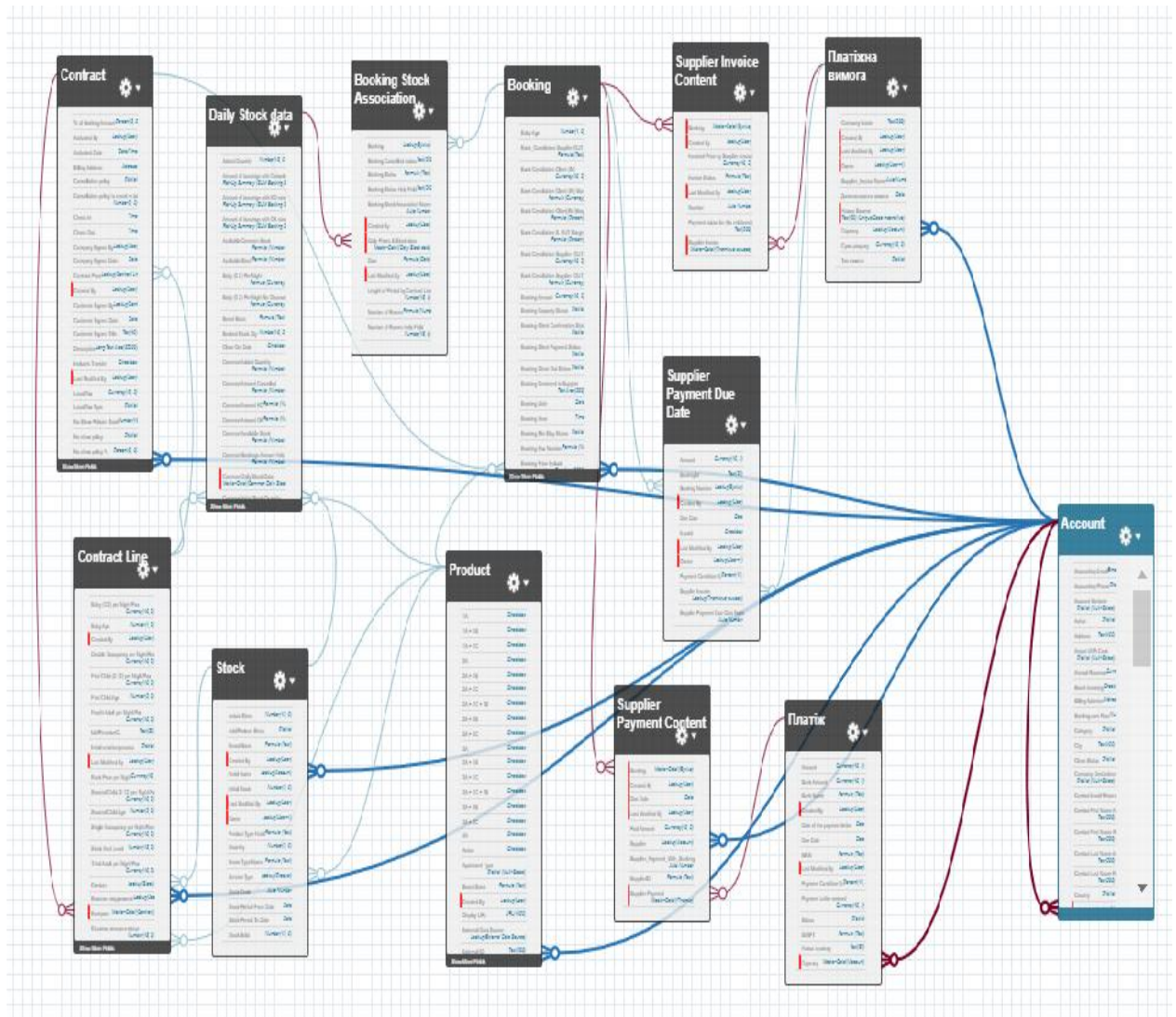
Booking,



Salesforce.

3.1.

3.4.



3.4 –

3.1.2

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，  
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，  
[13] ( . . .2- .4).  
，  
Daily Stock Data.  
，  
junction objects Daily Stock  
Data, Process Builder  
Contract Line  
Currency.

3.1 – /Product2

/	( )		
1	2	3	4
， : , ApartmentName			
-	Text Area(255)	，	-
， : , Supplier			
-	Lookup( )	，	-
， : WiFi , , , ?			
-	Checkbox	-	-

## 3.1

1	2	3	4
,	:	,	Rooms_Amount
	Number(18, 0)	,	
,	:	,	City
	Text(40)	,	-
,	:	,	State
-	-	,	-
,	:		, Board_Basis
Room Only Bed & Breakfast Half Board Full Board All Inclusive Ultra All Inclusive	Picklist	,	-
,	:		, Postal_Code
-	Text(20)	-	-
,	:	,	Country
-	Text(80)	,	-
,	:	PictureID	, PictureID
-	URL(255)		-

3.1

1	2	3	4
, : , Type_of_apartment			
Studio Loft Junior 1 Bedroom Basement apartment Officetel Luxury apartment House	Picklist	,	-
, : Iframe , Iframe_Link			
-	URL(255)	-	-

Checkbox, true  
false.

« » .  
Capacity Status.

, /Contract .

- . , :
- Contract\_Date – ;
  - Contract\_Target – , ;
  - AccountId Lookup ( ) – , ;
  - StartDate – ;
  - EndDate – ;

- Status –

.

,

/Rating

,

,

:

- Apartment –

Lookup ( );

- Comment – Comment Rich Text Area(32768),

;

- Rating – , 1 5 ,

Number (1, 0).

/Invoice

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,

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.

:

- Invoice\_date;

- Supplier\_Invoice\_Number, Text(50)

(Unique Case Insensitive);

- Supplier, Lookup , , ;

- Invoiced\_Amount

Currency (16, 2);

- , junction

object Supplier Invoice Content.

.

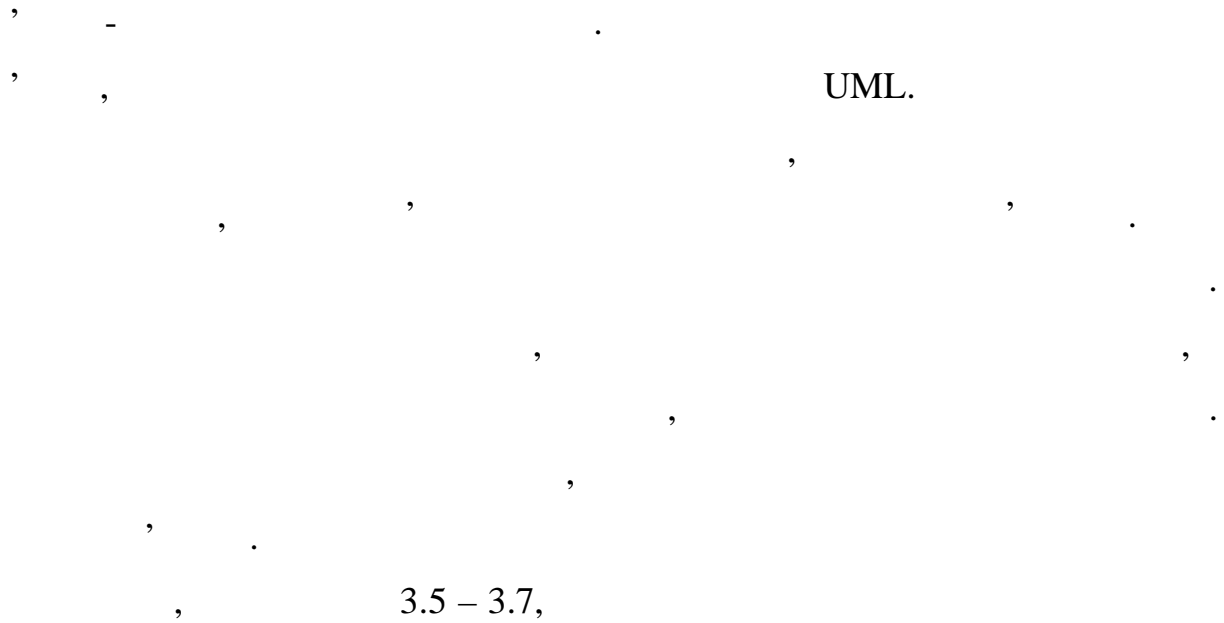
/Payment

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.  
:  
- , Name – ;  
- Supplier, Master-detail , , ;  
- Status;  
- Payment Letter amount – ,  
Currency (16, 2);  
- IBAN, SWIFT Bank Name  
.  
,  
junction  
object Supplier Invoice Content. ,  
.  
Custom Labels.

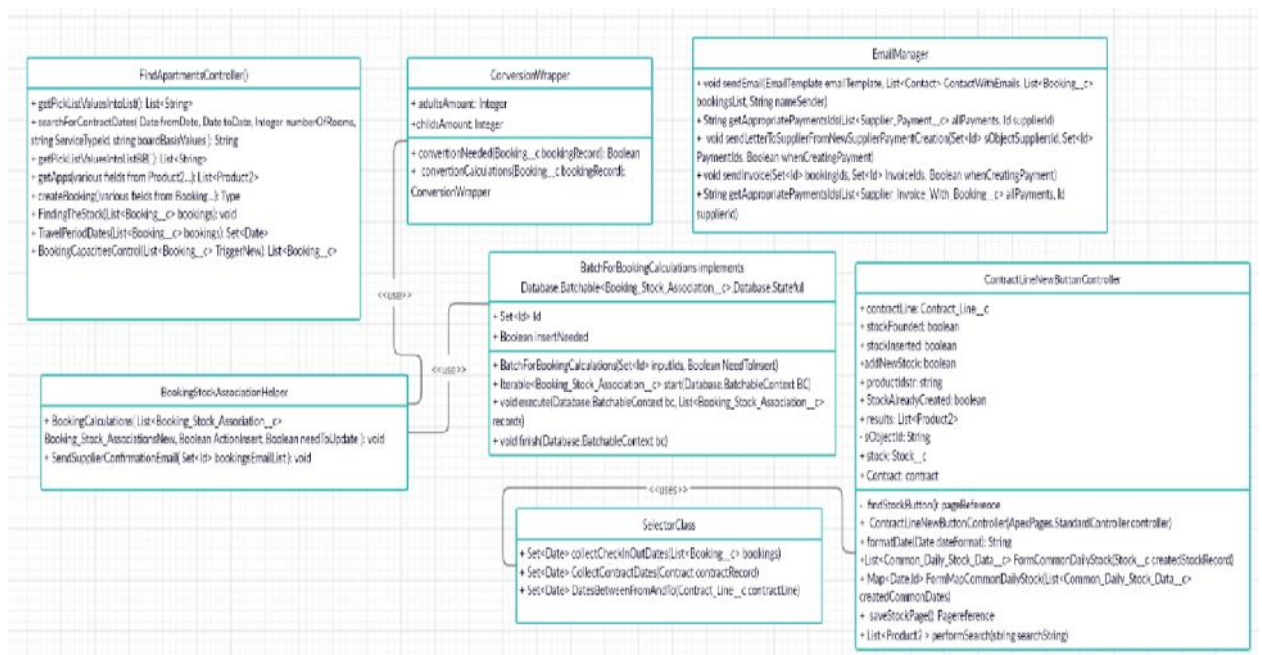
3.1.3  
-  
, (Class Diagram)  
,  
.  
UML , UML  
, .

## UML

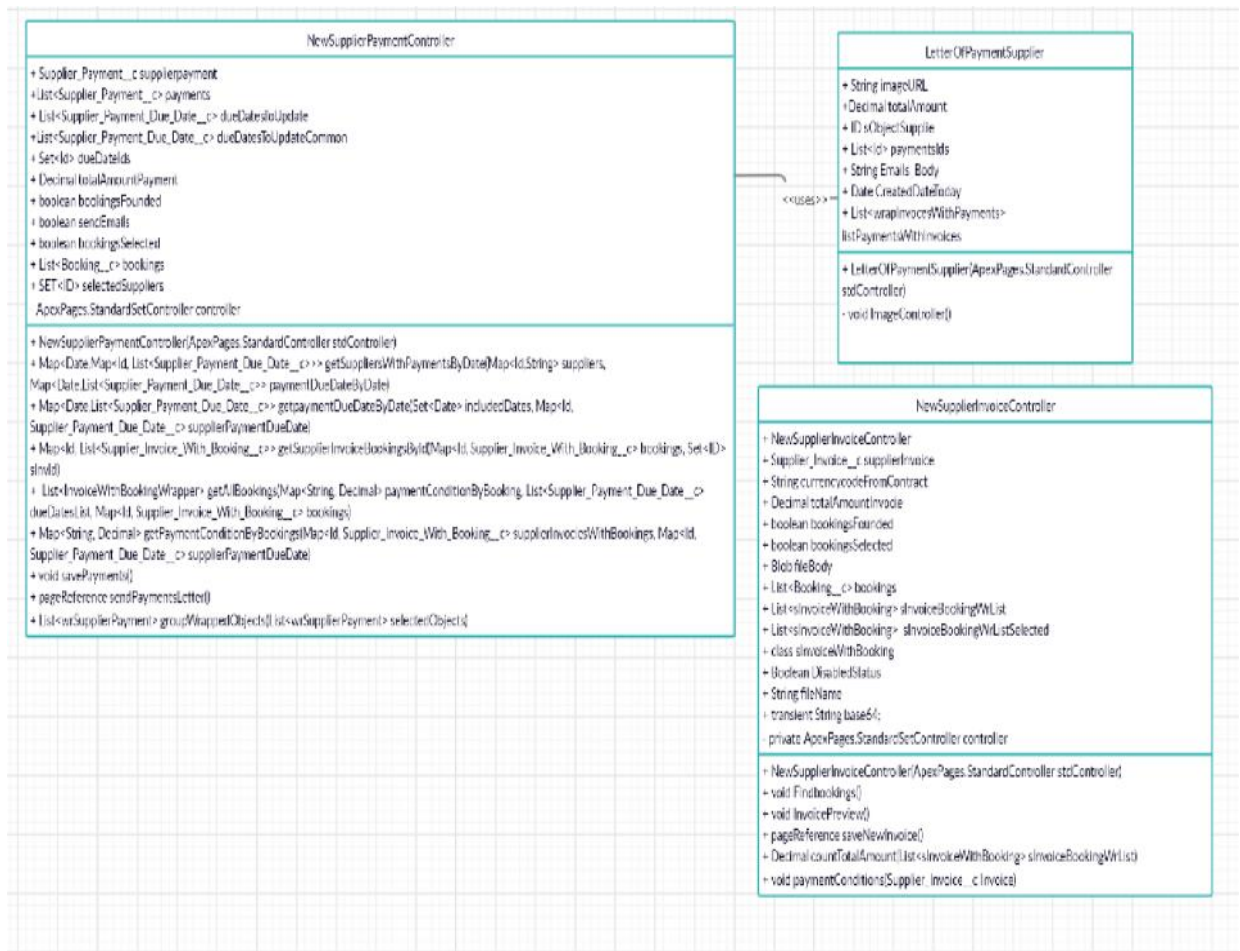


## UML.

web-



3.5 –



3.6 –

Findapartmentcontroller()),

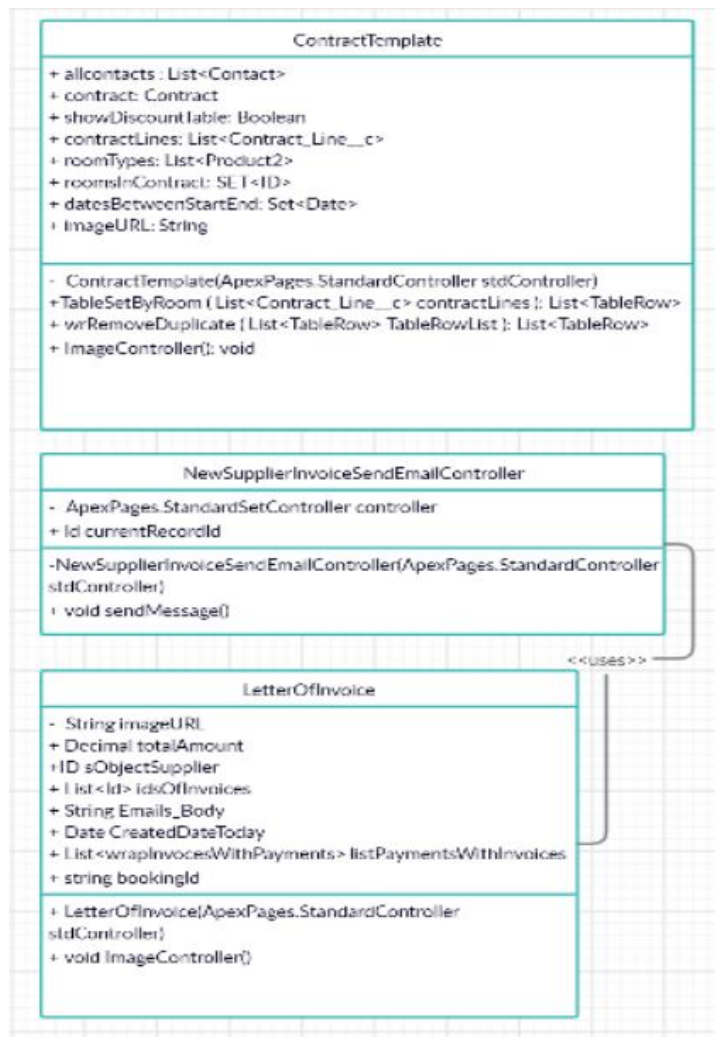
(LetterOfPayment()).

Apex

email

(BookingStockAssosiationHelper()).





3.7 –

Lightning Component Framework.

, : component.cmp, controller.js, helper.js, style ( css) .

3.1.4

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UML

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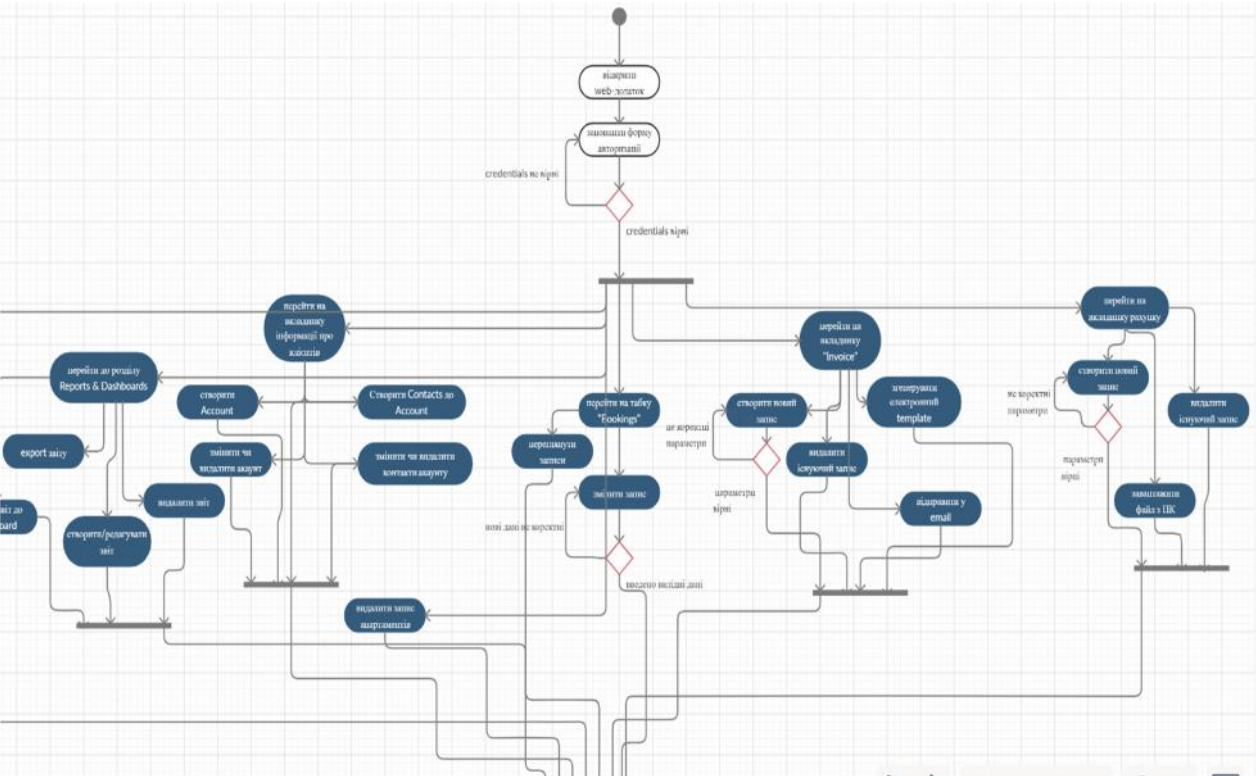
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web-

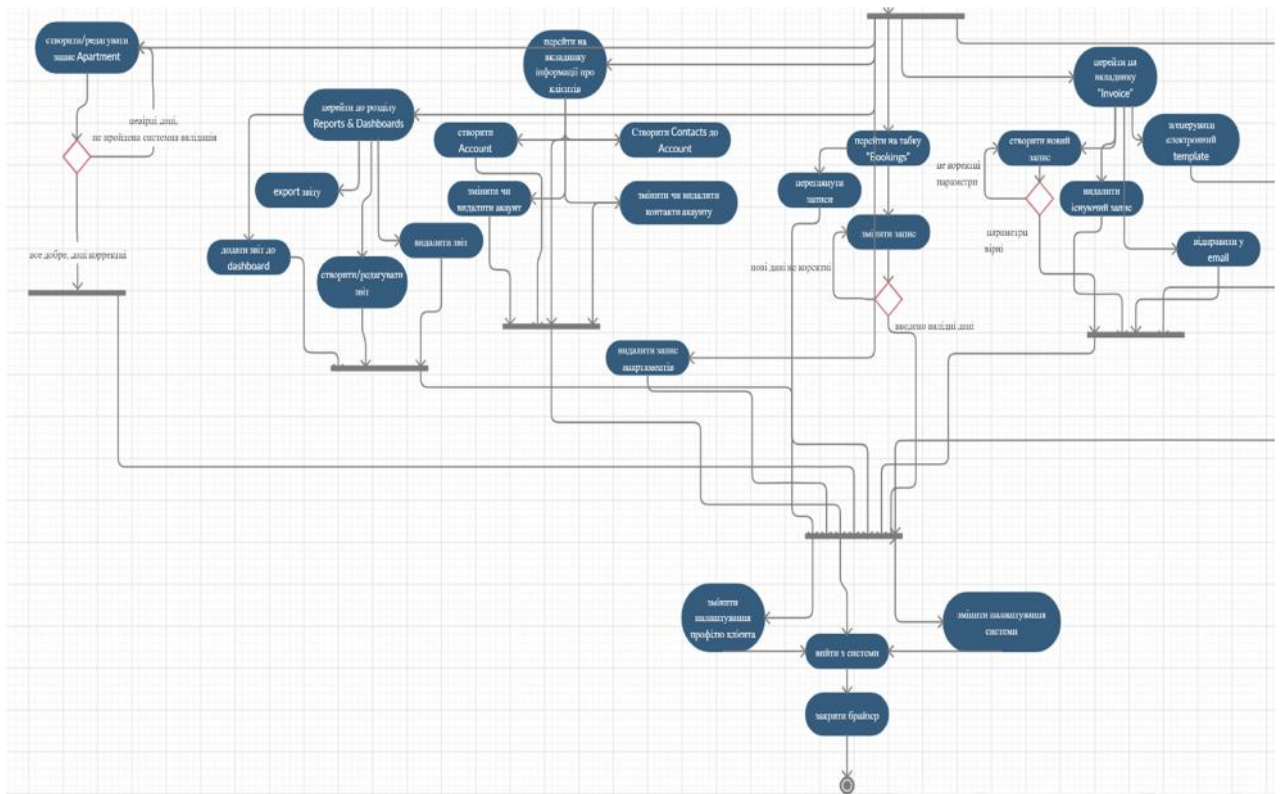
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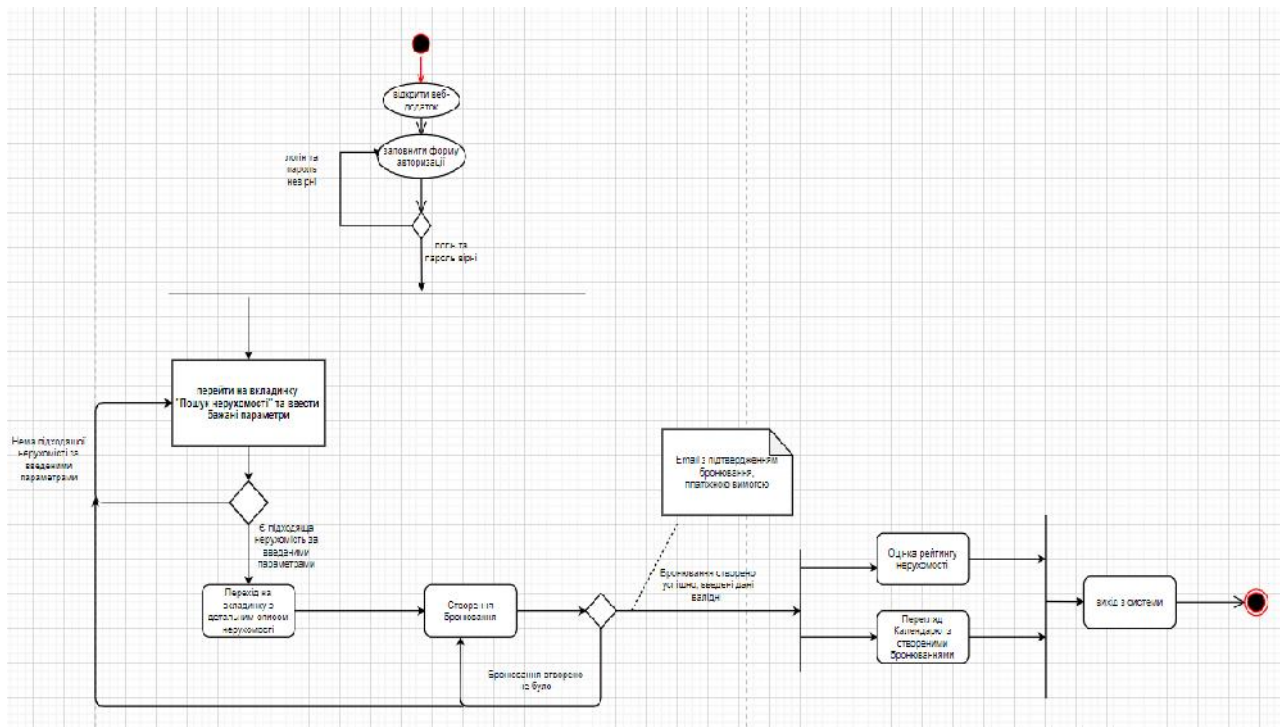
3.8- 3.9.



3.8 –



3.9 –



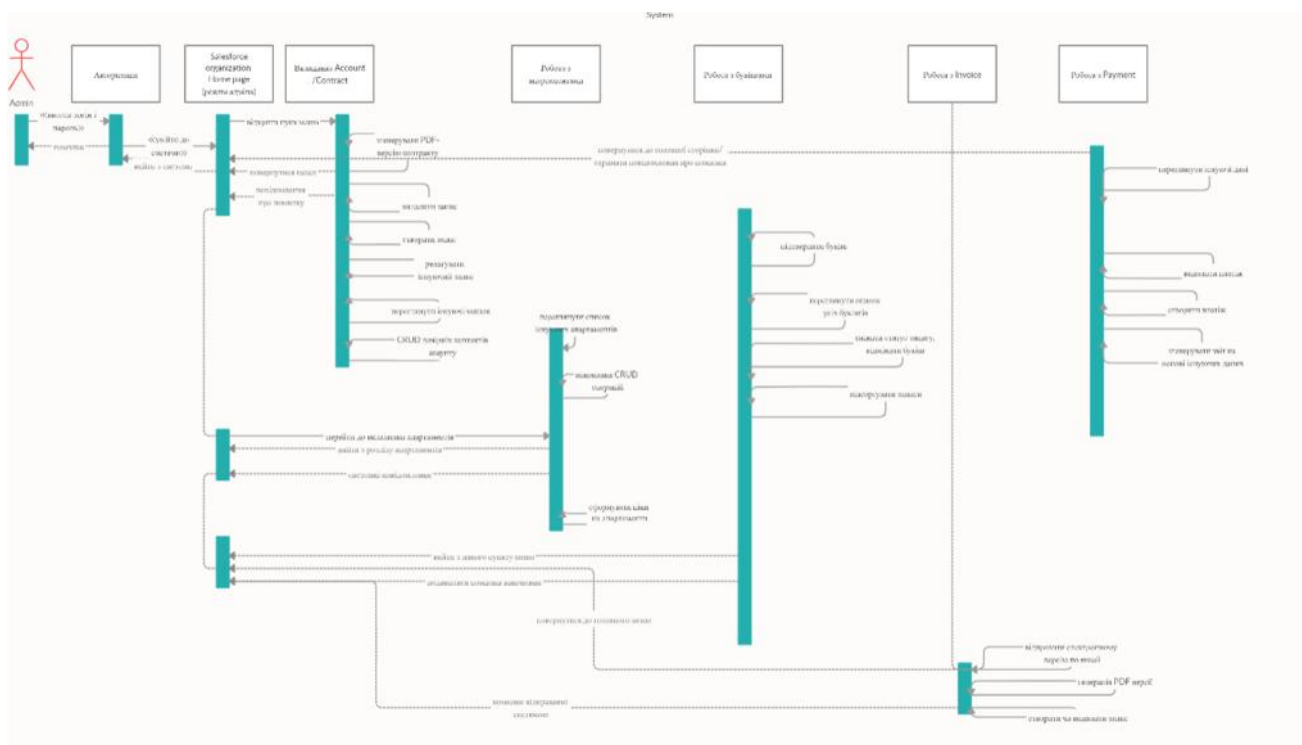
3.10 –

3.1.5

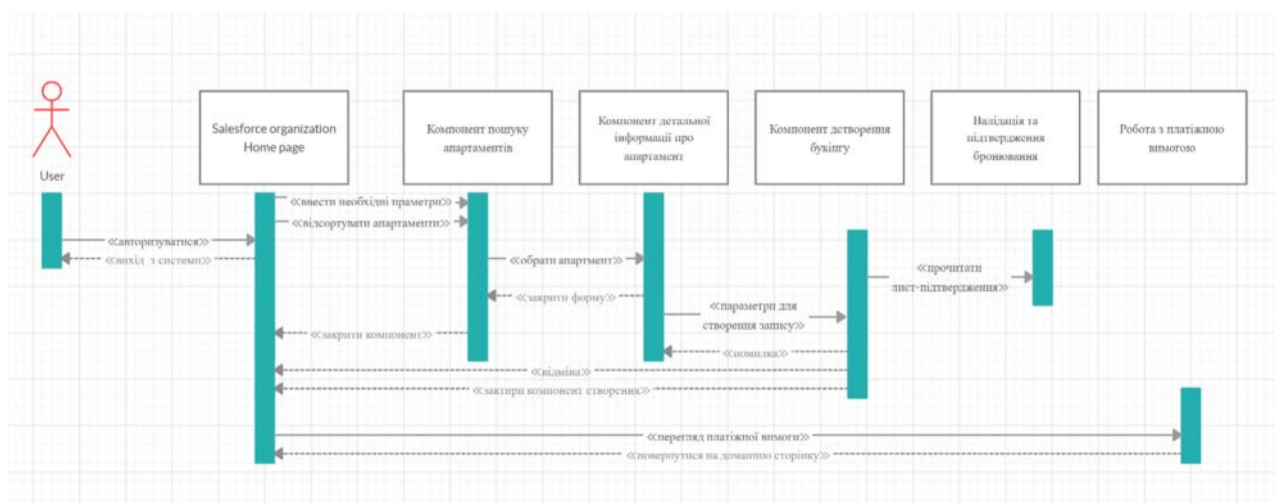
( . sequence diagram) –

UML,

[49].



3.11 –



3.12 –

## 3.2

### 3.2.1 Apex

Apex –

Salesforce

API.

Java,

. Apex

Visualforce.

Apex

Apex

Lightning,

:

(DML),

INSERT,

UPDATE

DELETE,

DmlException;

- Salesforce Object Query Language (SOQL) Salesforce  
Object Search Language (SOSL), sObject;

- ,  
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- , ;

- API,  
Apex;

- , , , ,  
Apex.

Apex Java,  
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, . , Apex ,  
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Lightning. Apex ,  
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Apex , DML  
Salesforce.  
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, Apex  
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Apex – ,  
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Apex.

Apex ,  
Lightning.

## Lightning, Apex

Apex

Apex

## . Salesforce

Apex

### 3.2.2 JavaScript

## JavaScript –

HTML CSS

# JavaScript

## JavaScript,

Amazon,

The New York Times,

Twitter.

# JavaScript

# JavaScript

# JavaScript

## JavaScript:

# JavaScript

# JavaScript

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JavaScript  
JavaScript –  
JavaScript,  
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JavaScript React, React  
Native, Angular Vue. Node.js,  
JavaScript, JavaScript V8 Google Chrome.  
Paypal, LinkedIn, Netflix Uber!  
- ,  
JavaScript -  
Node.js.  
JavaScript  
JavaScript.  
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JavaScript :  
- JavaScript , -  
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- JavaScript ;  
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3.2.3

HTML Visualforce

HTML ( Hypertext Markup Language) –

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HTML

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HTML -  
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HTML:  
HTML- ,  
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HTML

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- - . HTML  
, Microsoft Word.  
, HTML -  
. World Wide Web Consortium (W3C)  
HTML, .

CSS –

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, . CSS

HTML

XML.

HTML CSS

Visualforce – ,

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Lightning. Visualforce ,

HTML, « » ,

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Visualforce Visualforce

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Salesforce, ,

, Apex.

Visualforce

Visualforce.

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- Visualforce;
- Visualforce.

Visualforce Visualforce, HTML, JavaScript

- - , <apex:page>.

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Visualforce – , ,

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Visualforce, ,

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Lightning, ,

Apex.

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Salesforce.

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Visualforce,

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Salesforce ( );

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Salesforce.

### 3.2.4 SOQL

SOQL Salesforce Object Query Language.

SOQL ,

. SOQL SQL (

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SOQL Apex

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SOQL:

- SOQL ;

- SOQL SQL;

- SOQL ;
- SOQL ;
- , Excel SOQL;
- SOQL APEX;
- SOQL .
- SOQL:
- , Salesforce APEX;
- Visualforce ;
- Schema Explorer IDE Force.com.
- , Salesforce (SOQL) ,
- ,
- .
- Salesforce
- SOQL , .
- SOQL, ,
- .
- , , salesforce
- , Salesforce (SOQL).

### 3.2.5 Lightning Component Framework

#### Lightning Component Framework –

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- .
- ,
- , JavaScript
- Apex .
- Lightning Lightning Framework
- . Lightning
- .

JavaScript    Java    Swing.

## Lightning Component

# Aura

## Aura

Salesforce.

Salesforce.

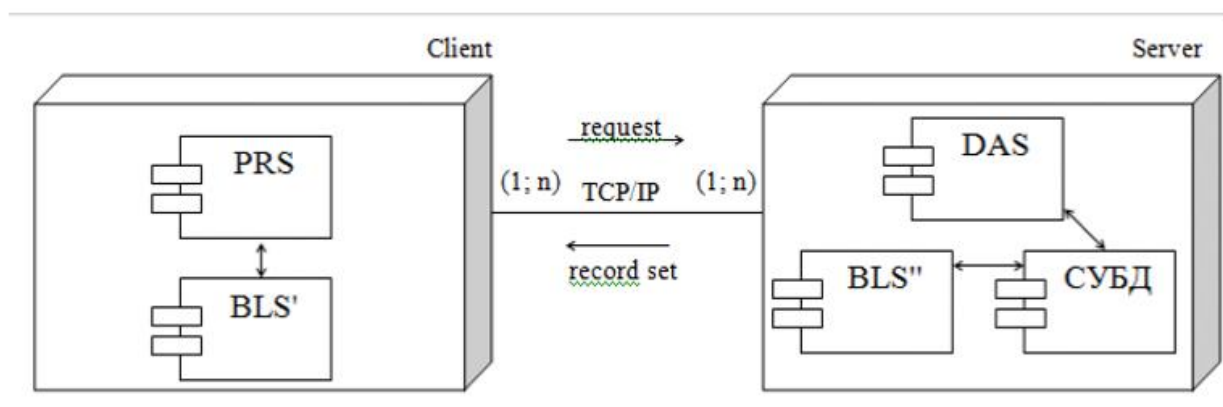
Lightning.

### 3.2.6

(richclient) –

[44].

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3.13 –

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« » (thinclient) – , -

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[45].

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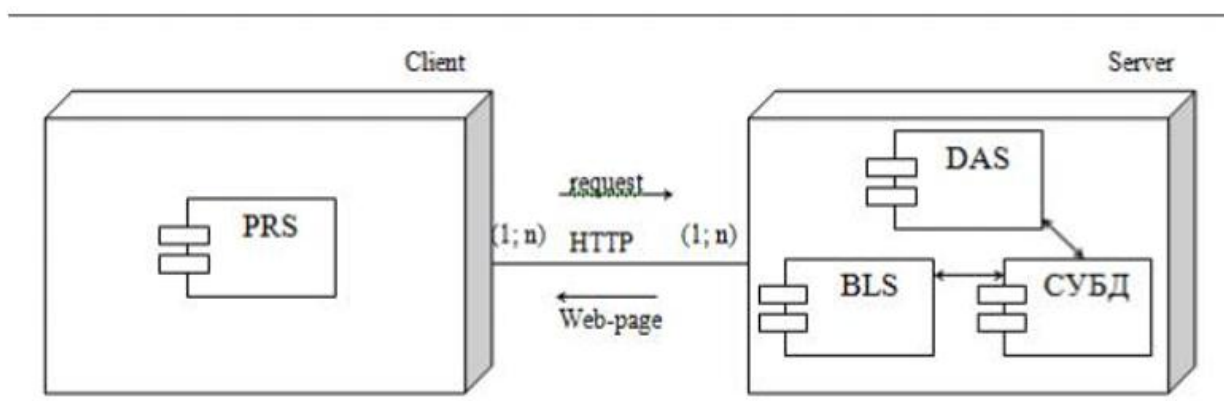
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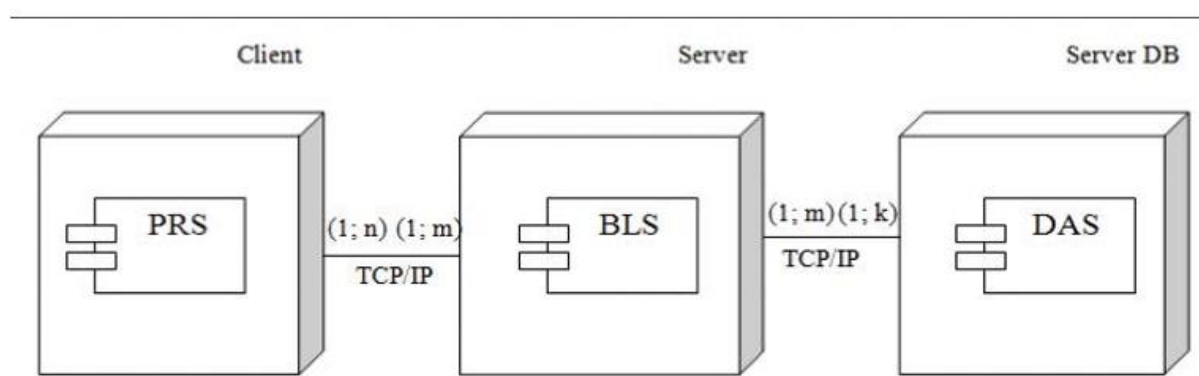


3.14 –

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3.15.



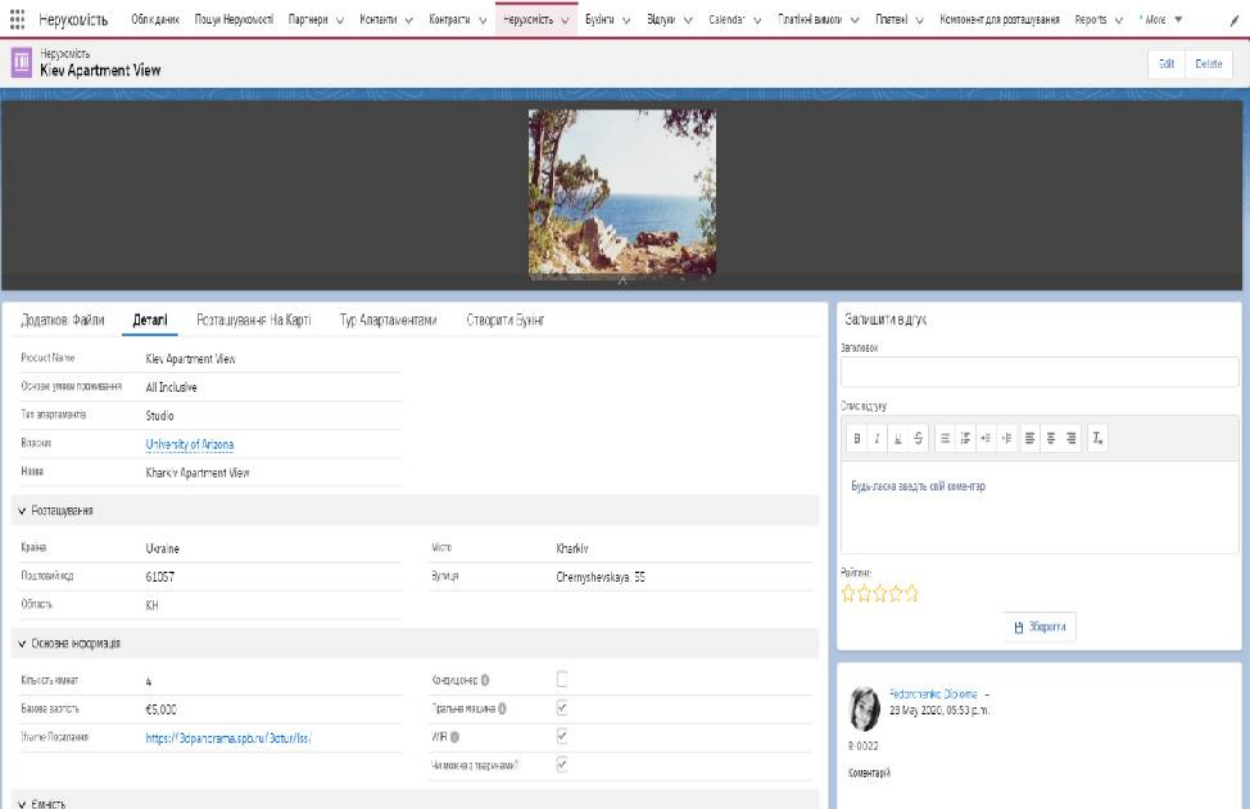
3.15 –

« - »

« » ,

3.3

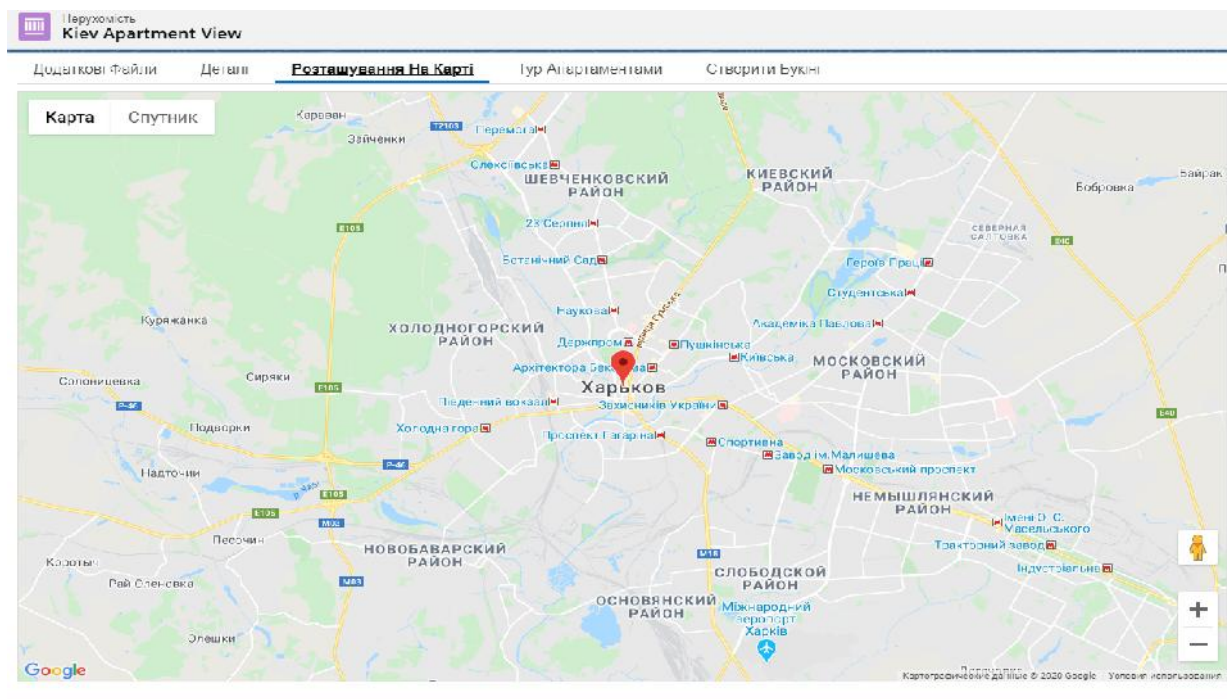
3.16.



3.16 –

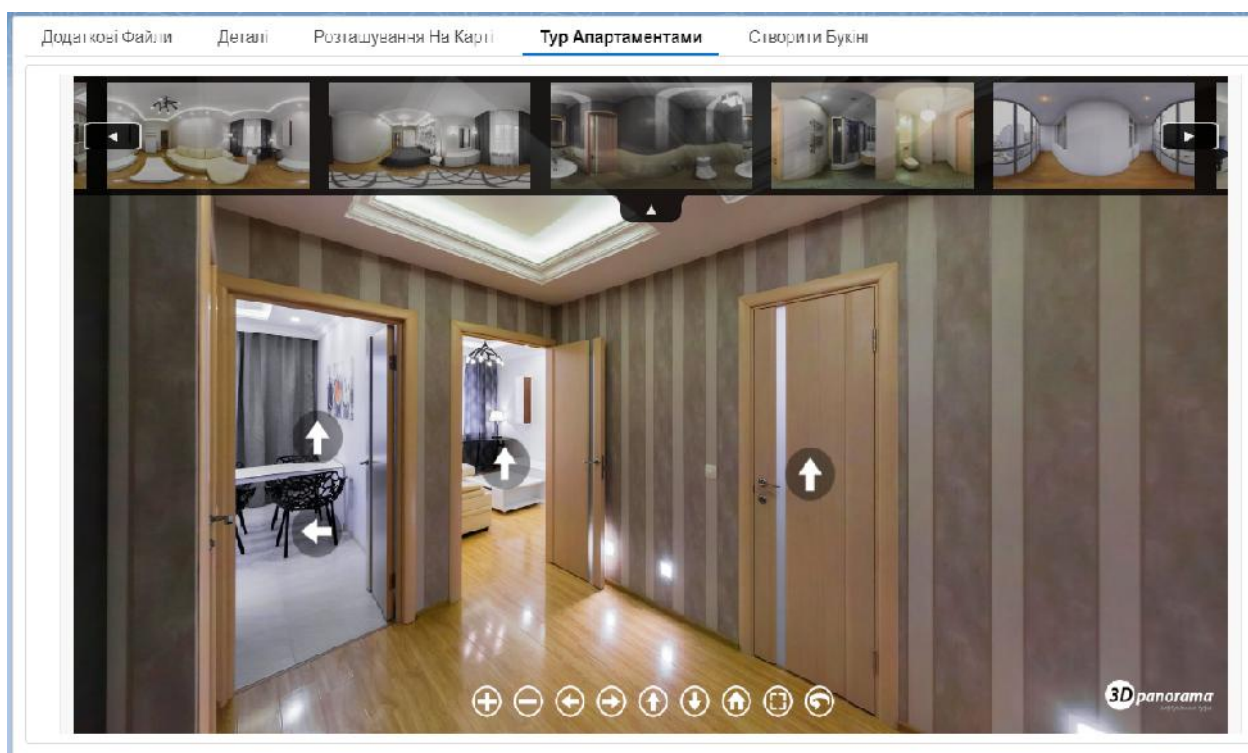
/Product

3.17.



3.17 –


Google map




3.18 –

3D

## Detail


**Tapmap**  
**MY PARTNER**

[+ Follow](#)
[Edit](#)
[Delete](#)
[View Website](#)

Type: Customer - Direct    Phone: (785) 241-6200    Website: dickenson-consulting.com    Tapmap Owner:  Vlad Fedorchuk (Diploma)    Tapmap Site: mysite.com    Industry: Consulting

Related    **Details**    News

Common Information

Tapmap Name	MY PARTNER	Category	3*
Tapmap Site	mysite.com	Type	Customer - Direct
House Number	UK761B		

Ratings & Description

Rating	Warm	Employees	120
Booking.com Rate	5.00	Website	dickenson-consulting.com
Trip Advisor Rate	4.00		
Tapmap Number	CC634267	Phone	(785) 241-6200
		Fax	(785) 241-6201

Bank Info

House Bank	UK761B
IBAN	123456789
SWIFT	123456789
Net House	123456789

Contacts

Activity    Chatter

Email

[Compose](#)


Filters: All time • All activities • All types

[Refresh](#) • [Expand All](#) • [View All](#)


Upcoming & Overdue

No next steps  
To get things moving, add a task or set up a meeting.

June • 2020    This Month


**Booking**

You had an event with Vlad Fedorchuk on [April 30 \(000\)](#)


**Booking BN-0000 Booking confirmation - 06/06/2020**

You sent an email to [Vlad Fedorchuk](#)

No more past activities to load.

**Контракт** 00000102 Edit Create Завершити роботу

Partner Name: MY PARTNER Status: Approved Початок дії: 05/06/2020 Кінець дії:

Approved contract signed Mark Change as Complete

**Зв'язані Записи** Основна Інформація

Partner Name	MY PARTNER	Початок дії контракту	05/06/2020
Дата укладення контракту	04/06/2020	Кінець строку дії контракту	30/06/2020
Назва контракту	Contract with Dickenson	Детальна інформація за контрактом	
Очікуваний прибуток	€1,000.00		
Статус	Approved		

**Activity**

Email  Write an email... Compose

Filters: All time • All activities • All types Refresh Expand All View All

**Upcoming & Overdue**

No next steps.  
To get things moving, add a task or set up a meeting.

No past activity. Past meetings and tasks marked as done show up here.

3.20 –

**Зв'язані Записи** Основна Інформація

**Ціни на період контракту (2)** New

Назва	Нерухомість	Основні умови проживання	Початок дії
<a href="#">CL-0006</a>	Kharkiv	Ultra All Inclusive	05/06/2020
<a href="#">CL-0005</a>	Kharkiv	Half Board	05/06/2020

[View All](#)

**Бронювання (1)** New

Назва бронювання	Booking Status	Booking Stock Status	Основні умови проживання
<a href="#">BN-0060</a>	OK	OK Stock	Half Board

[View All](#)

3.21 –

Related Lists

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**Information**

Контракт: 00000102	Владелец недвижимости: MY PARTNERS
Недвижимость: Kharkiv	Сгенерировать документ: Room Only

---

**Prices**

Минимальный тариф проживания: 15	Максимальный тариф проживания: 22
Периоды: 05/06/2020	Конец: 30/06/2020

Double Occupancy per Night/Room * 100.00	First Child (2-12) per Night/Rm 10.00
Single Occupancy per Night/Room 70.00	Second Child (2-12) per Night/Rm 25.00
Baby (0-2) per Night/Rm 0.00	Third Adult per Night/Rm 35.00
Rank Price per Night * 50.00	Fourth Adult per Night/Rm 35.00

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**Information**

Сумма: 57K\$	Количество документов: 5
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Close Save

3.22 –

Contract Line

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Information

Partner: COMMON PARTNER

Company Name: COMMON PARTNER

Date of invoice: 07/06/2020

Invoice Version: Платные выписки v2.1

Type of invoice: Invoice

SELECT	BOOKING NUMBER	PAX FIRST NAME	PAX LAST NAME	CALCULATED PURCHASING PRICE AMOUNT
<input checked="" type="checkbox"/>	BN-0056	Olya	Opa	210.00

Next

Close

3.25 –

Error:

Total Invoice Amount = 0

Warning:

Select the bookings.

Information

Partner: COMMON PARTNER

Company Name: COMMON PARTNER

Date of invoice: 07/06/2020

Invoice Version: Платные выписки v2.1

Type of invoice: Invoice

SELECT	BOOKING NUMBER	PAX FIRST NAME	PAX LAST NAME	CALCULATED PURCHASING PRICE AMOUNT
<input type="checkbox"/>	BN-0056	Olya	Opa	210.00

Next

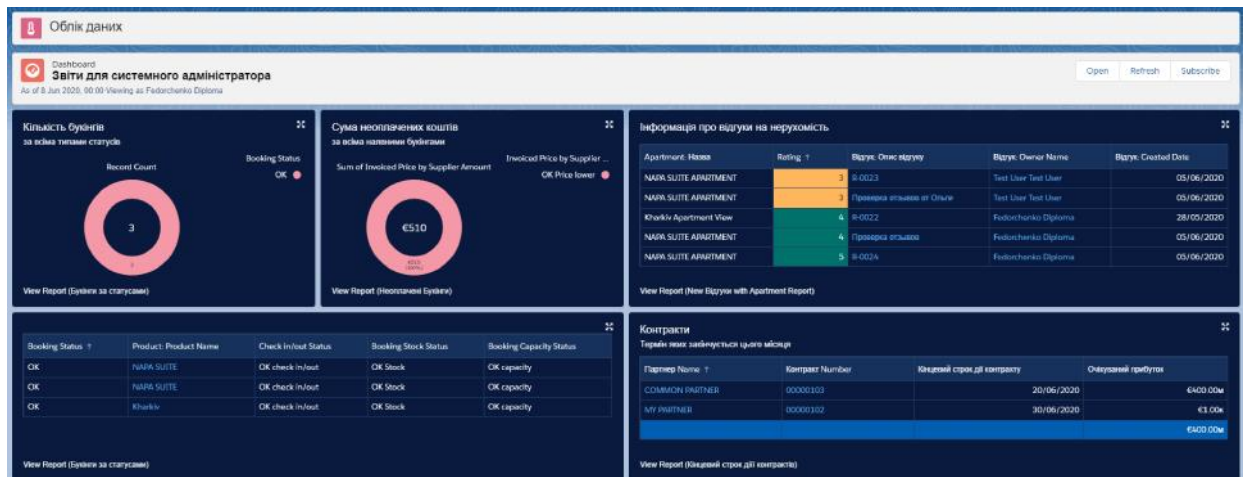
Close

3.26 –

Dashboard

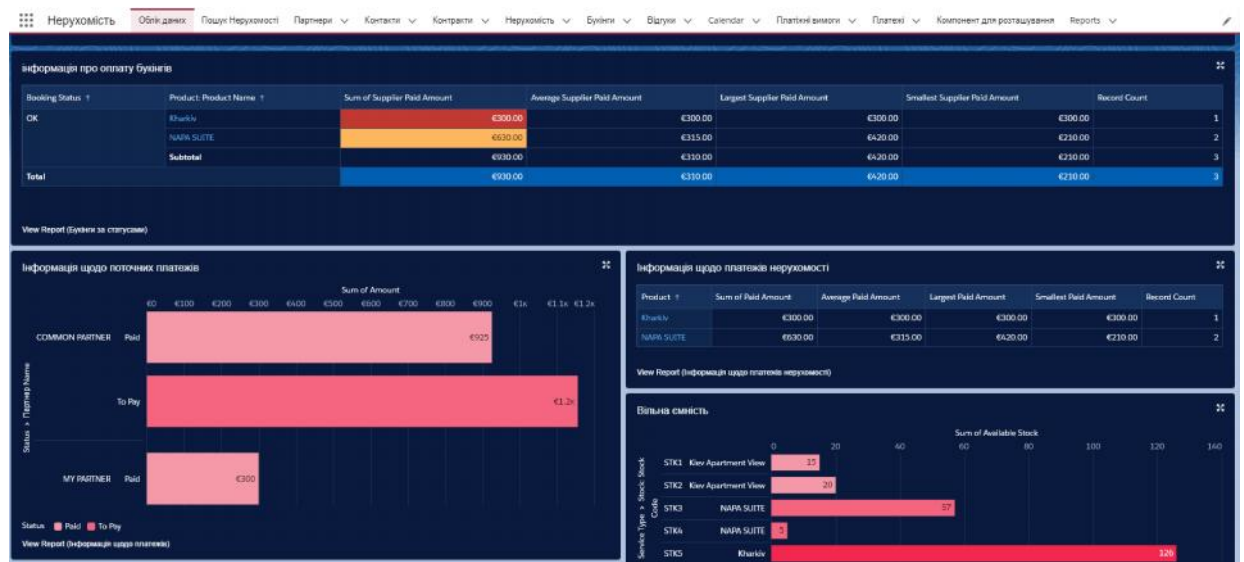






3.28 –

Dashboard



3.29 –

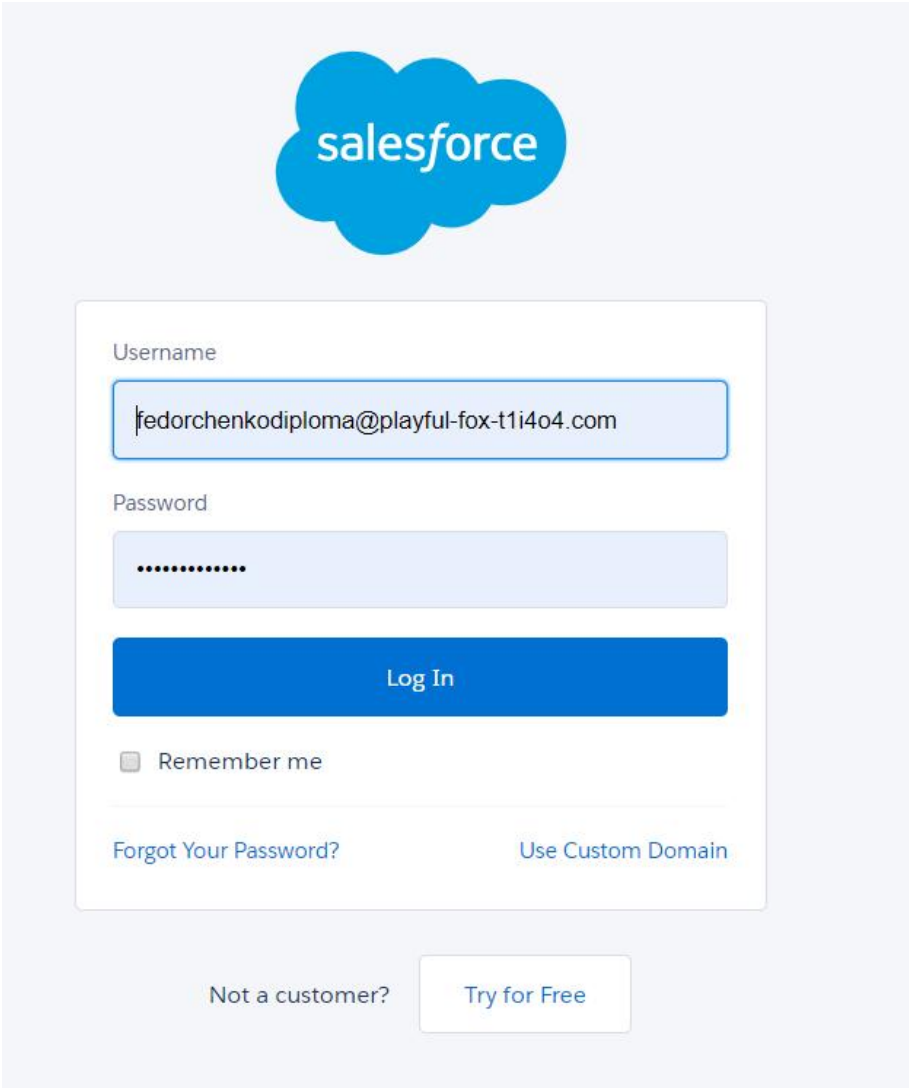
Dashboard

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