



# SkyNet

– A business management system



Present by:

**CS 691 Capstone Project Team Three**



Josh Krinsky, Kai Wang,  
Peter McKechnie, Peter Torrente,  
Houqi Zhan, Jincheng Zou

# Agenda

- **Feedback & Improvements**
- **Team Intro**
- **Problem Statement & Project Description & Personas**
- **MVP (Minimal Viable Product): Design & Functions**
- **Technologies & Architecture Diagram**
- **Sprint 2 Recap**
- **Product Backlog**
- **Sprint Backlog**
- **Metrics**
- **Retrospective**
- **Sprint 4**

# Team Members

**Josh Krinsky**

Project Manager  
Scrum Master  
Back-end Developer



**Peter Torrente**

Front-end Developer

**Kai Wang**

Database Admin  
Back-end Developer



**Peter McKechnie**

Front-end Developer  
Project Consultant



**Houqi Zhan**

Database Developer



**Jincheng Zou**

Front-end Developer



# Improvements From Feedback

## Feedback

- Better to have a “header” sentence to describe what the bullet points.
- Add more diagram (UML, component)
- For size of the items in the Backlog, use story point instead of large, medium, small
- Call “task stories” and “user stories”
- Missing planned/committed ratio
- The speed of the presentation is slow

## Improvements

- Improved the slides’ structure
- Design diagrams that explain our project better
- Applied story point for the Backlog
- Rename the “task” to “task story”
- Create planned/committed ratio
- Rehearse before the presentation recording

# Problem Statement

## **What problem is our project aiming to solve?**

- Companies rely heavily on CRM and POS software to control the customer experience.
- These are sold as complex software platforms offering a variety of features.
- Large and expensive packages dominate the market and are tailored to larger companies.
- Many customers do not have the budget, nor the technological aptitude, to effectively employ popular CRM and POS platforms.

# Project Description

## What are we building?

- We aim to design a POS styled system with greater simplicity for customers.
- We will prioritize fundamental services for day to day operations of a small business.
- Users will be able manage inventory, track sales, compare vendors, analyze production output, organize contact info, track orders/deliveries. Record order, shipping, and vendor history.
- Easy-to-use interface means even the most novice users are capable of creating custom data visualizations and analysis.

# Personas - 1

## David:

### Who is he?

- A 43-year-old man, the owner of the retail store.
- Has a happy family: his wife has just given birth to his third child.
- Currently on sabbatical; His oldest daughter just entered college to study nursing, while his son just entered high school and is the point guard for the school's basketball team.
- To make his family's financial situation better, he started to expand his retail business last year.

### Issue:

- Spends a huge amount of time each week comparing offers from different suppliers.
- Needs to do a lot of calculations and comparisons based on stock availability and expectations of sales
- Has very little free time to spend with his wife and children, despite his off-hours.



# Personas - 2

## Mike:

### Who is he?

- A 26-year-old production manager, responsible for several different production lines
- He and his accountant fiancée got engaged this spring and the wedding is being planned!
- He and his fiancée are both hikers and usually go on weekend excursions to the countryside

### Issue:

- The traditional forms (for example, Excel or the printed forms) makes him tired of calculating the efficiency of the different lines
- Needs to provide more rational and useful advice for each quarter of production
- His factory is a traditional manufacturing factory, in the cost-effective consideration, did not use the popular production management software



# Personas - 3

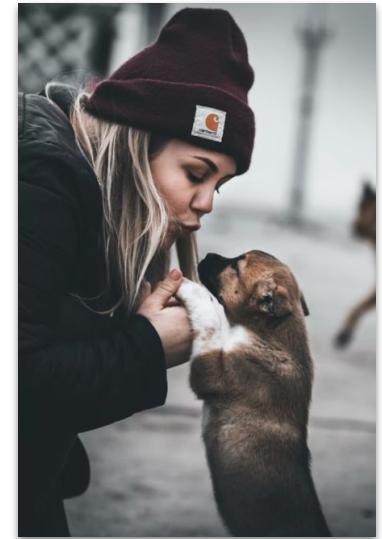
## Alexis:

### Who is she?

- A 23-year-old girl, with her college friends, founded a pet transport company
- She likes to travel with her pets. A few years ago she traveled abroad with a friend and due to the negligence of her pet transport company, her shepherd became ill upon her return.
- She is a girl who is good at dealing with people and knows many friends who are in pet services.

### Issue:

- Alexis's company needed a low-cost management software to help them calculate costs and compare suppliers.
- She needs to manage different service providers, such as transportation companies, pet nail technicians, etc.



# MVP Design

## MVP Features

- Dashboard for inventory, item, supplier, order
- Add, Edit, Delete
- Barcode scanner
- Receipt & invoice generation
- Filter results function
- Views for different level users

# Supplier

GET /supplier/

HTTP 200 OK  
Allow: GET, HEAD, OPTIONS  
Content-Type: application/json  
Vary: Accept

```
[  
  {  
    "supplierID": 1,  
    "company": "3M Company",  
    "email": "manager@gmail.com",  
    "phoneNum": "800-815-6322",  
    "country": "USA",  
    "street": "Albany St",  
    "city": "New York",  
    "state": "New York",  
    "zip": 10001,  
    "note": ""  
  },  
  {  
    "supplierID": 2,  
    "company": "The Alpine Group, Inc.",  
    "email": "manager@office.com",  
    "phoneNum": "536-459-2355",  
    "country": "USA",  
    "street": "Allen St",  
    "city": "Los Angeles",  
    "state": "California",  
    "zip": 57586,  
    "note": ""  
  },  
]
```

# Item

GET /item/

HTTP 200 OK  
Allow: GET, HEAD, OPTIONS  
Content-Type: application/json  
Vary: Accept

```
[  
  {  
    "itemID": 1,  
    "description": "Bananas",  
    "cost": "0.06",  
    "sellingPrice": "0.77",  
    "note": "per lb",  
    "supplierID": "1"  
  },  
  {  
    "itemID": 3,  
    "description": "Orange",  
    "cost": "1.73",  
    "sellingPrice": "2.08",  
    "note": "per lb",  
    "supplierID": "2"  
  },  
  {  
    "itemID": 4,  
    "description": "Bread",  
    "cost": "1.75",  
    "sellingPrice": "2.10",  
    "note": "per lb",  
    "supplierID": "3"  
  },  
]
```

storefront\_item storefront\_inventory storefront\_item storefront\_order storefront\_item

1 • SELECT \* FROM backendData.storefront\_item;

itemID	description	cost	sellingPrice	note	supplierID	classification
1	Bananas	0.06	0.77	per lb	1	NULL
3	Orange	1.73	2.08	per lb	2	NULL
4	Bread	1.75	2.10	per lb	3	NULL
5	Tomato	1.90	2.28	per lb	4	NULL
6	Chicken	1.89	2.27	per lb	5	NULL
7	Eggs	2.90	3.48	per lb	6	NULL
8	Gasoline	3.88	4.66	per lb	7	NULL
9	Beef	4.89	5.87	per lb	8	NULL
10	Milk	4.18	5.02	per lb	8	NULL
11	Monitor	149.99	179.99		9	NULL
12	Speaker	69.99	83.99		10	NULL
13	USB drive	19.99	23.99		11	NULL
14	Camera	120.00	144.00		12	NULL
15	GPS	45.00	54.00		13	NULL
16	Computer	899.99	1079.99		14	NULL

# MVP

SkyNet

Dropdown Q

Dashboard

Supplier

Item

Inventory

Order

Daily Sales \$ 249.95 67%

Monthly Sales \$ 2,942.32 36%

Yearly Sales \$ 8,638.32 80%

Recent Users

User	Last Activity	Actions
Isabella Christensen Lorem ipsum is simply...	11 MAY 12:56	
Mathilde Andersen Lorem Ipsum is simply text of...	11 MAY 10:35	
Karla Sorensen Lorem ipsum is simply...	9 MAY 17:38	
Ida Jorgensen Lorem Ipsum is simply text of...	19 MAY 12:56	

Upcoming Event 34%   
45 Competitors   
You can participate in event

235 TOTAL IDEAS

26 TOTAL LOCATIONS

SkyNet

- Dashboard
- Supplier
- Item
- Inventory
- Order

## Supplier Management

Add Supplier

#	Company	Email	Phone Number	Country	Street	City	State	Zip	Note	Actions
1	The Alpine Group, Inc.	manager@office.com	536-459-2355	USA	Allen St	Los Angeles	California	57586		<button>Edit</button> <button>Delete</button>
2	Avnet, Inc.	manager@avnet.org	174-285-8907	USA	Amsterdam Ave	Chicago	Illinois	15227		<button>Edit</button> <button>Delete</button>
3	Avon Products, Inc.	manager@Avon.com	102-564-7978	USA	Canal St	Houston	Texas	18506		<button>Edit</button> <button>Delete</button>
4	Campbell Soup Co.	manager@Campbell.com	357-11-4335	USA	Carlisle St	Phoenix	Arizona	34057		<button>Edit</button> <button>Delete</button>
5	Capital One Financial Corp.	manager@Capital.com	473-824-3748	USA	Carmine St	Philadelphia[e]	Pennsylvania	18890		<button>Edit</button> <button>Delete</button>
6	Cardinal Health Inc.	manager@Cardina.com	605-455-7059	USA	Chambers St	San Antonio	Texas	61878		<button>Edit</button> <button>Delete</button>
7	Chubb Corp	manager@Chubb.com	742-994-143	USA	Delancey St	San Diego	California	62991		<button>Edit</button> <button>Delete</button>

SkyNet

- Dashboard
- Supplier
- Item**
- Inventory
- Order

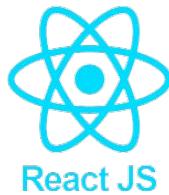
## Item

Add Item

#	Description	Cost	Selling Price	Note	Supplier ID	Classification	Actions
1	Bananas	0.06	0.77	per lb	1		<button>Edit</button> <button>Delete</button>
2	Orange	1.73	2.08	per lb	2		<button>Edit</button> <button>Delete</button>
3	Bread	1.75	2.10	per lb	3		<button>Edit</button> <button>Delete</button>
4	Tomato	1.90	2.28	per lb	4		<button>Edit</button> <button>Delete</button>
5	Chicken	1.89	2.27	per lb	5		<button>Edit</button> <button>Delete</button>
6	Eggs	2.90	3.48	per lb	6		<button>Edit</button> <button>Delete</button>
7	Gasoline	3.88	4.66	per lb	7		<button>Edit</button> <button>Delete</button>
							<button>Edit</button>

localhost:3000/item

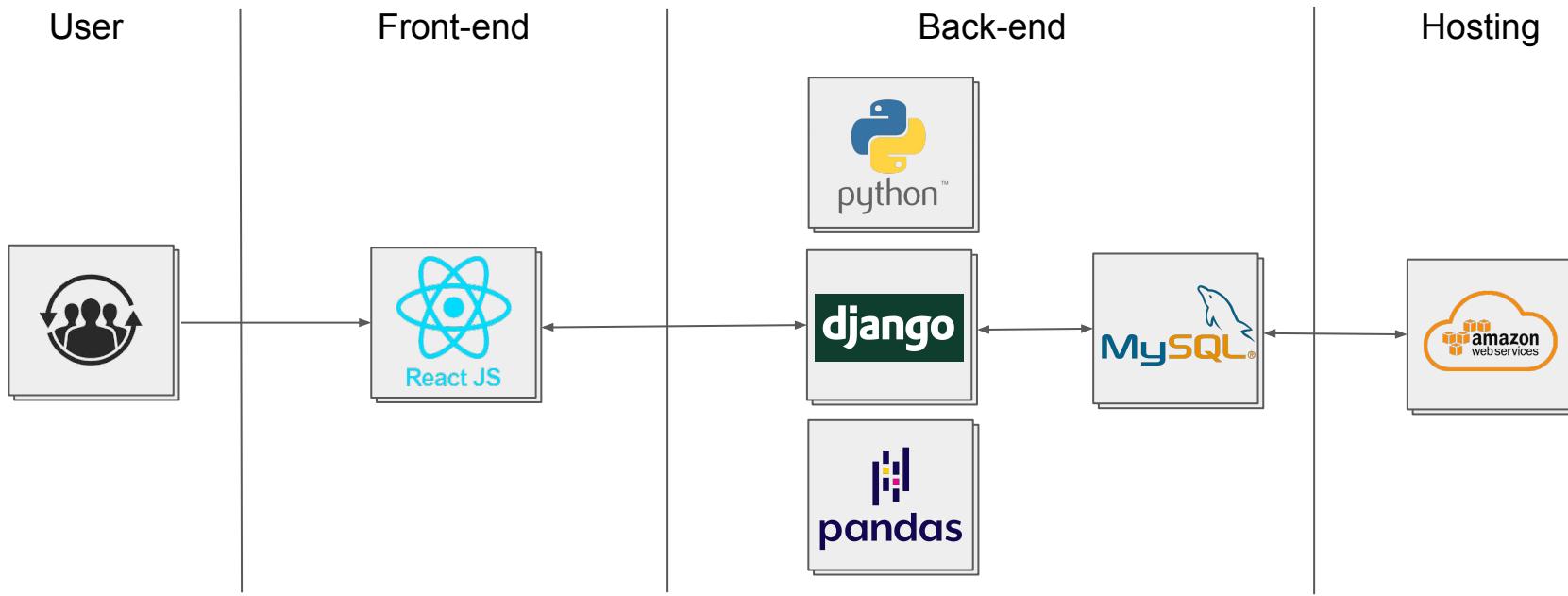
# Technologies



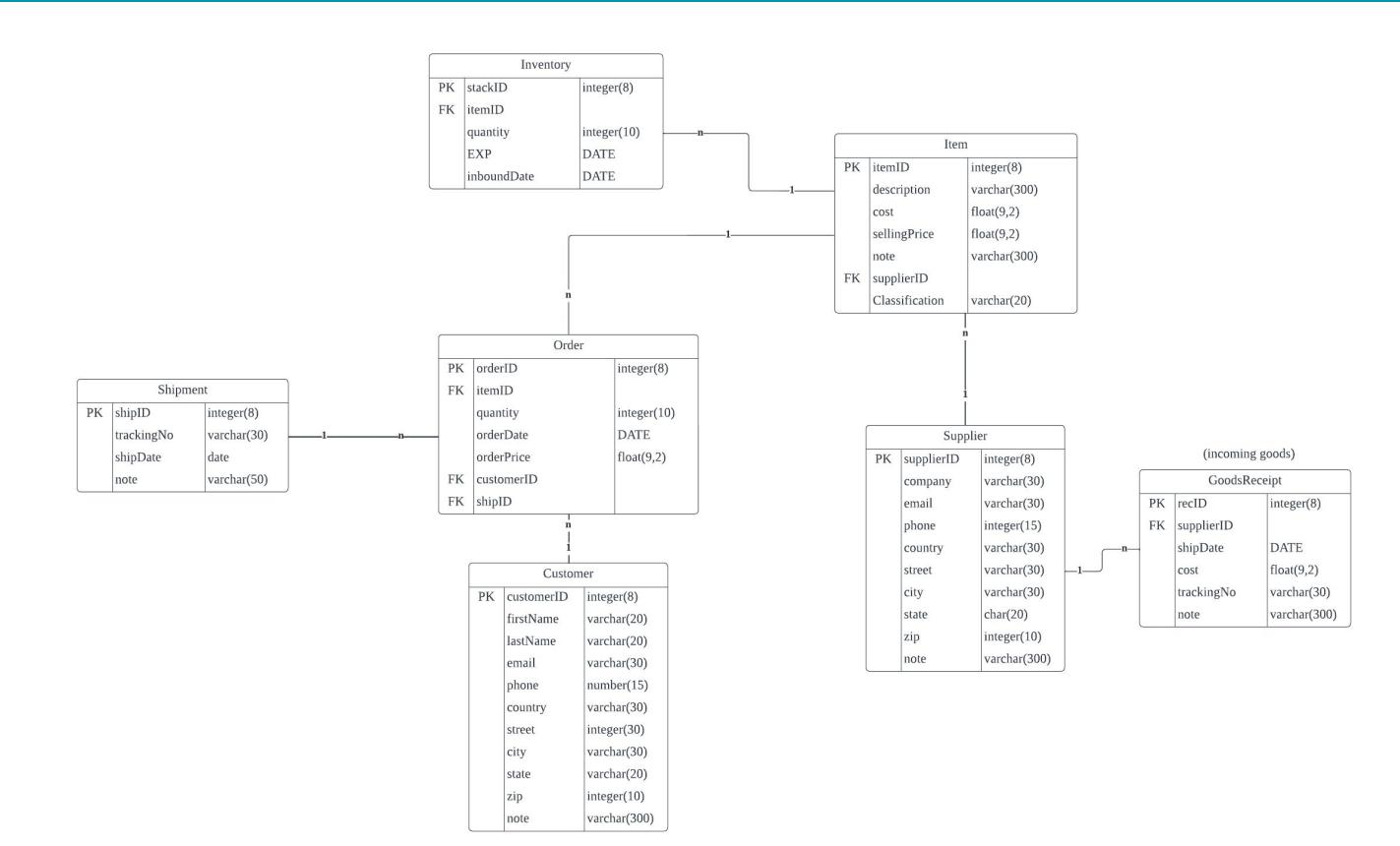
## The Purpose of the Technologies

- React - Front-end JavaScript library for building UI
- Django - Back-end Python framework that implements a restful API
- Pandas - Python based data structure & data analysis tools
- MySQL - Database Management
- AWS (Amazon Web Services) - Hosting, Relational Database Service, and Machine Learning
- Discord - Team Communication

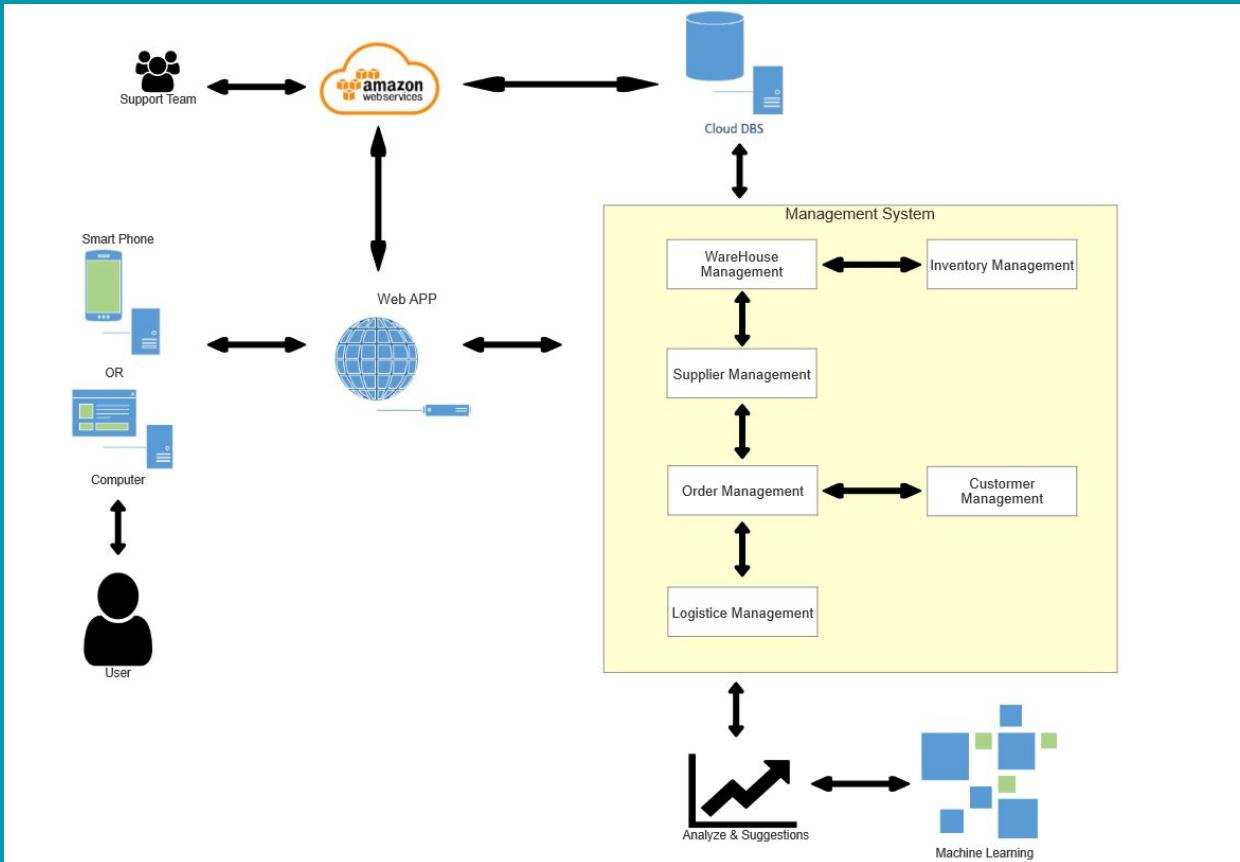
# Technologies - continue



# Database ER-diagram



# Conceptual Architecture Diagram



# Sprint 2 Recap

This is what we delivered in Sprint 2:

- Project Overview
- MVP mock-up design
- Product Backlog & Test Cases
- Sprint 3 Plan

What is new in Sprint 3:

- We designed the ERD for database, and made the database online
- MVP moves from mockup to live!
- Redefined some details in Backlog
- Built an interactive interface with the user (demo)

				When, And, Then)				
US1	user	I want to be able to add new inventory to my database	Keep my database accurate to my changing inventory	When a user adds data, Then the database will add a new row.	DBS_add	4	High	Done
US2	user	I want to be able to edit inventory items in my database	Make changes to inventory details and correct typos	When a user delete data, Then the database will delete the row.	DBS_edit	4	High	Done
US3	user	I want to be able to delete inventory items in my database	Effeciently utilize server space and keep data accurate	When a user edit data, Then the database will edit the row	DBS_delete	4	High	Done
US4	user	I need to sort the data in my database	analyze and track my inventory my different metrics	Given different categories, When the user selects a category, Then show the products undere that category.	DBS_sort	4	Medium	Done
US5	user	I want to be able to check my inventory with a visual chart	Get a clearer picture of my inventory	Given automatically generated charts, When the user changes the chart options or changes the date range, Then the chart is regenerated based on user behavior	DBS_visualization	7	High	Waiting
US6	user	I would like to be alerted when some items are out of stock	Replenish my inventory in a timely manner	When an item is about to expire, Then the system will automatically send a reminder.	DBS_alert	5	Medium	Waiting
US7	user	I want the system to record my sales and analyze them	Keep track of my sales and change sales strategies	Given users the option of AI analysis, When the user chooses to use this feature, Then the user's data is used as input for his analysis fuciton, Then provides analysis of the data such as the history of sales for	DBS_analyze	10	Medium	Waiting
US8	user	I want to be able to enter data via cell phone camera or			DBS_modelInput	3	Low	Waiting
US9	user	I want to be able to scan items				5	Medium	Waiting
US10	user	I want to be able to calculate the amount of money owed	Know the total amount of money owed	When there are no items remaining to be added, Then the total amount of payment due will be correctly reported	CR_amountowed	3	High	Waiting
US11	user	I want to be able to record a payment	Collect money from the customer	When payment is tendered, Then the status of the order will change from "Payment Outstanding" to "Paid"	CR_deposit	3	High	Waiting
US12	user	I want to keep track of what items the customer wants to purchase	Analyze consumer preferences	Given a list of custmore, When select a customer, Then show the history of the customer	CR_trackCusnsumer	3	High	Waiting
US13	user	I want to record and offer a receipt of the customer's purchase	Have an itemized list of items purchased by the customer	When an order is paid, Then a formatted record of the sale will be created	CR_receipt	3	Low	Waiting
US14	user	Evaluate suppliers	Create relationships with the best possible suppliers for my industry	Given a list of all suppliers, When a user filters on a detail, Then the relevant data will be shown	SRM_eval	6	High	Done
US15	user	Streamline onboarding with suppliers	Quickly establish working supply chains	Given a new supplier, When new data needs to be collected, Then a standard template will be sent and uploaded to the database	SRM_select	3	High	Done
US16	user	Manage supplier performance	Quickly and easily track supplier performance with key performance metrics that are already established for me	Given a supplier ID, When the metrics are requested, Then the database returns accurate data	SRM_kpi	6	Medium	Done
				When upload sales data, Then the				

# Backlog

# Product Backlog - What has changed

We redefined the size of each item with story point, so we can better evaluate the progress of our project:

Size	Story Point
Large	7~12
Medium	4~6
Small	1~3

We added one Task Story because we thought adding the front-end design work to the Backlog would better track our project progress

ID	Task Description	Acceptance Criteria	Task Name	Size	Priority	Status	Sprint	Notes
TS14	Design interactive interface with the user	Approved by all team members	Project_Ulidesign	9	High	Done	3	<i>added in 2022/11/01</i>

# Sprint Backlog - 1/2



Task Story										
ID	Task Description		Acceptance Criteria	Task Name	Size	Priority	Status	Sprint	Notes	
TS14	Design interactive interface with the user		Approved by all team members	Project_UIdesign	9	High	Done	3	added in 2022/11/08; And need to be improved.	
User Story										
ID	As a...	I want to...	So that I can...	Acceptance Criteria (format: use keywords <b>Given, When, And, Then</b> )	Task Name	Size	Priority	Status	Sprint	Notes
US1	user	I want to be able to add new inventory to my database	Keep my database accurate to my changing inventory	When a user adds data, Then the database will add a new row.	DBS_add	4	High	Done	3	
US2	user	I want to be able to edit inventory items in my database	Make changes to inventory details and correct typos	When a user delete data, Then the database will delete the row.	DBS_edit	4	High	Done	3	
US3	user	I want to be able to delete inventory items in my database	Efficiently utilize server space and keep data accurate	When a user edit data, Then the database will edit the row	DBS_delete	4	High	Done	3	

# Sprint Backlog - 2/2



User Story										
ID	As a...	I want to...	So that I can...	Acceptance Criteria (format: use keywords Given, When, And, Then)	Task Name	Size	Priority	Status	Sprint	Notes
US4	user	I need to sort the data in my database	analyze and track my inventory my different metrics	Given different categories, When the user selects a category, Then show the products under that category.	DBS_sort	4	Medium	Done	3	
US14	user	Evaluate suppliers	Create relationships with the best possible suppliers for my industry	Given a list of all suppliers, When a user filters on a detail, Then the relevant data will be shown	SRM_eval	6	High	Done	3	
US15	user	Streamline onboarding with suppliers	Quickly establish working supply chains	Given a new supplier, When new data needs to be collected, Then a standard template will be sent and uploaded to the database	SRM_select	3	High	Done	3	
US27	user	I want to be able to access my data from any device	Know the status of my business anytime, anywhere	Given successful login from a device, When access is attempted, Then the app is correctly rendered	DBS_cloud	3	High	Done	3	

# Test Cases

ID	User Story	Test Description	Test Data	Action	Expected Output	Actual Output	Test Result	Comments
TS1	US1	Insert a product data	2022/11/13	Enter product info(price, description...)	Product data is correctly displayed in the database	New item shown in the database	PASS	
TS2	US2	Edit a product data	2022/11/13	Change the price. update the image, re-write the description	Product database is updated with new data	Updated item info is shown in the database	PASS	
TS3	US3	Delete a product data	2022/11/13	Delete a product	The target data is deleted	The target item is deleted	PASS	
TS4	US4	Sort the data	2022/11/13	Select Classification = food	all food items are display	all food items are display	PASS	This project will need to be retested in the future. We should have a drop down list for users to select categories instead of manually typing
TS5	US16	Evaluate suppliers	2022/11/13	Select supplier which id=1	all info of supplier is shown	all info of supplier is shown	PASS	
TS6	US17	Collect supplier's info	2022/11/13	Add a new supplier to the DBS	a new supplier info is added	shows the info of the new supplier	PASS	
TS7	US31	Online realtime Database	2022/11/13	Add a new item data from device A, and check the update from device B	the new item is shown on device B	the new item is shown on device B	PASS	

# Sprint 3



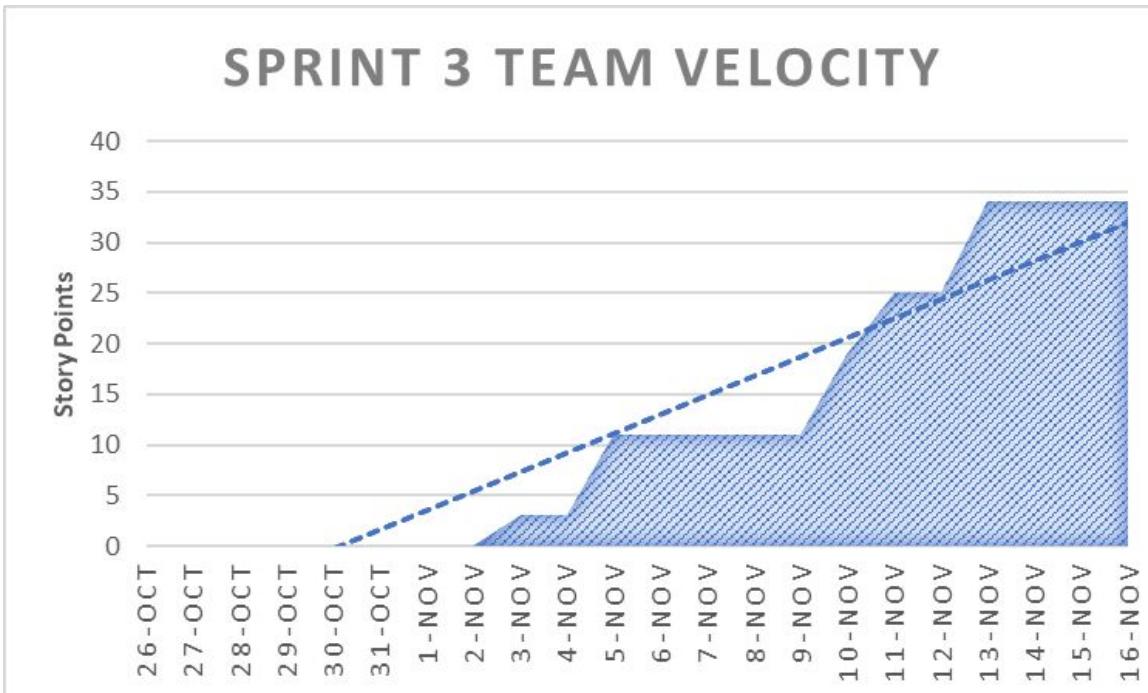
Stories completed:

ID	Story Name	Size	Status	Date
TS14	Project UI Design	9	Done	11/13
US1	DBS_add	4	Done	11/05
US2	DBS_edit	4	Done	11/05
US3	DBS_sort	4	Done	11/10
US4	DBS_delete	4	Done	11/10
US16	SRM_eval	3	Done	11/11
US17	SRM_select	3	Done	11/11
US31	DBS_cloud	3	Done	11/03

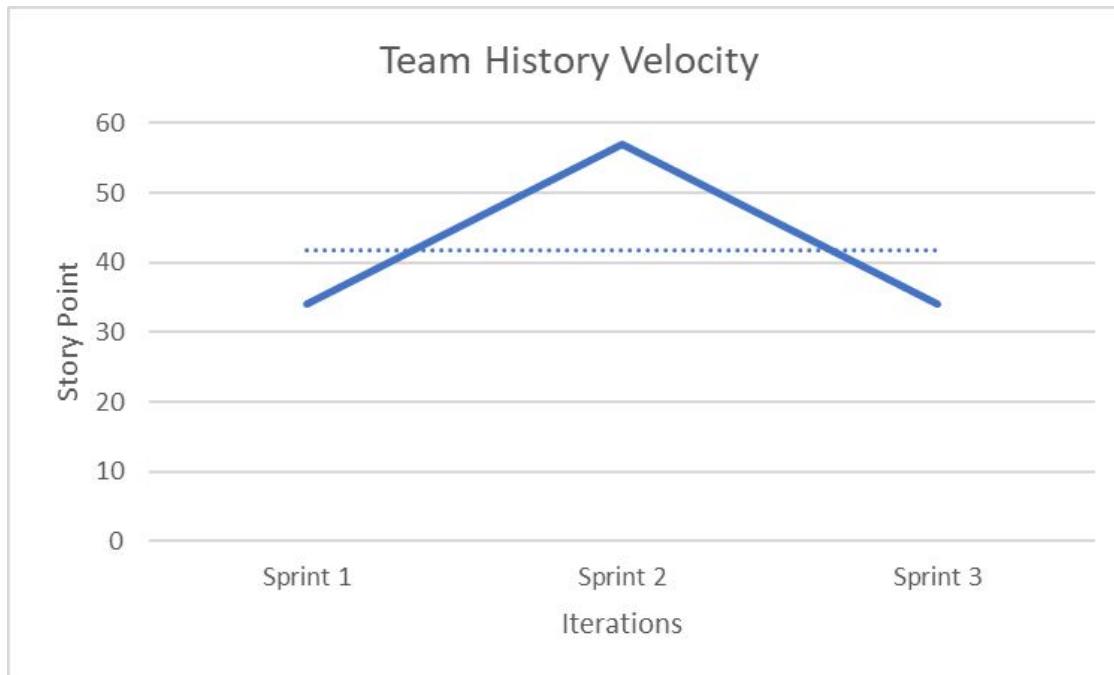
Stories completed:

ID	Story Name	Size	Reason	Note
	NONE			

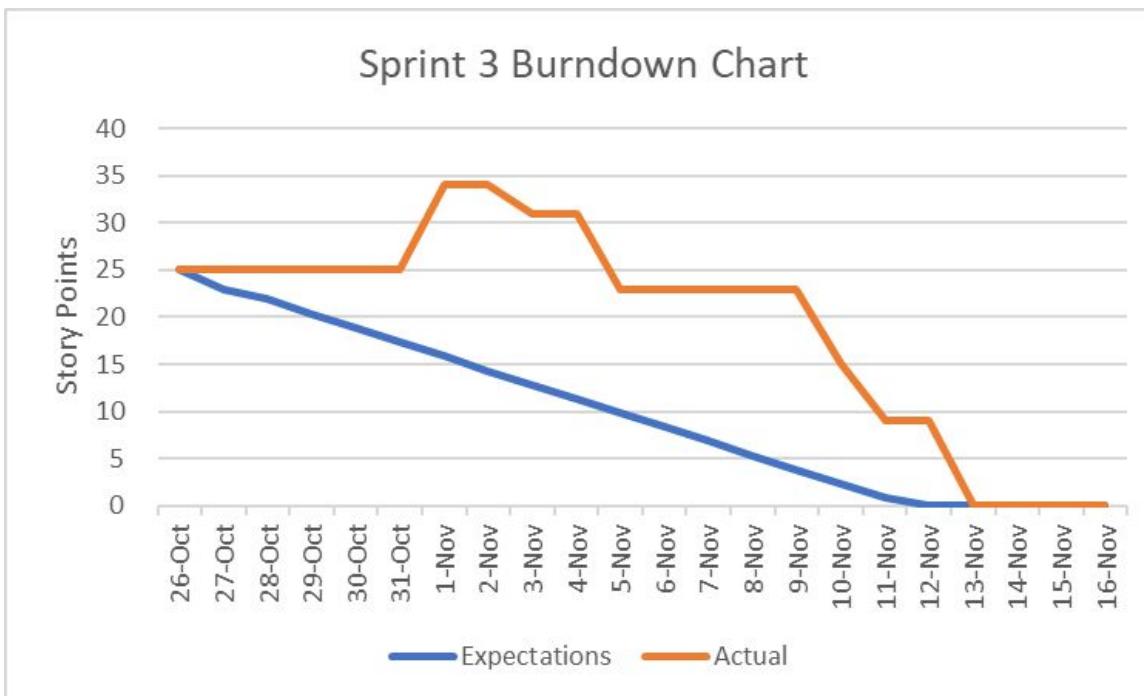
# Metrics - Team Velocity of Sprint 3



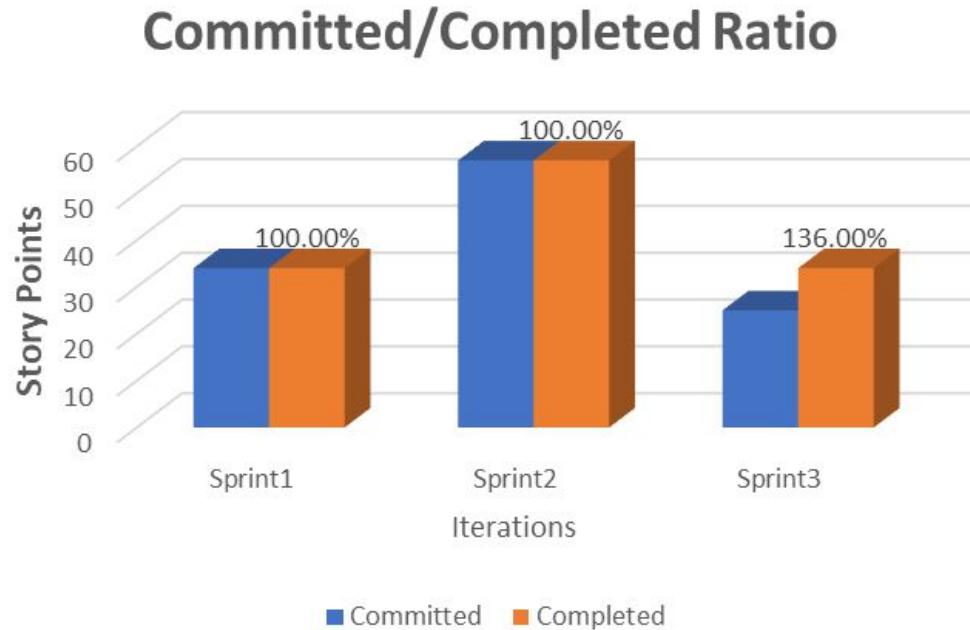
# Metrics - Team History Velocity



# Metrics - Burndown Chart



# Metrics - Committed/Completed Ratio



# Retrospective - What Went Well

## What went well in Sprint 3?

- For some subject topics, group members often provide different solutions and ideas.
- Division of labor was overall done well, with regards to frontend and backend.
- Team members helped one another out with tasks, often playing to their strengths.
- Problems that were identified were quickly remedied, before becoming massive issues.
  - For example, frontend group had some delays and issues starting, but we came together with team lead and rectified the issue.
  - We found a solution with sufficient time left to complete the necessary work.

# Retrospective - What Did Not Go Well

## What did not go well in Sprint 3?

- Attendance at meetings was not consistent.
- Development is behind schedule.
- Procrastination took hold at times. Some segments of the MVP were left late.
- Group engagement was low.
- Group often lacked initiative, lots of waiting for something to be assigned (as opposed to taking up a task and getting it done).
- Communication was occasionally lacking, for example, there seemed to be unanswered messages or questions raised on Discord.

# Retrospective - Action Plan

## What we need to improve for next Sprint?

- More thought needs to be given to the planning process, such as allowing more time for review and presentation preparation
- Team members need to take more self initiative
- Follow the timeline to be able to spread out the work across the entire sprint
- Hold team members accountable for getting their work done

# Sprint 4 - Plan 1/2

User Story										
ID	As a...	I want to...	So that I can...	Acceptance Criteria (format: use keywords Given, When, And, Then)	Task Name	Size	Priority	Status	Notes	
US12	User	I want to keep track of what items the customer wants to purchase	Analyze consumer preferences	Given a list of customer, When select a customer, Then show the history of the customer	CR_trackCunsumer	3	High	Waiting		
US13	User	I want to record and offer a receipt of the customer's purchase	Have an itemized list of items purchased by the customer	When an order is paid, Then a formatted record of the sale will be created	CR_receipt	3	Low	Waiting		
US21	User	I want to check the detail of the current orders	Have idea of a order detail	Given information about all order. When the user selects a particular order, Then the details of that order are provided.	LOG_OrderDetails	3	High	Waiting		
US22	User	I want to get notification when delivery of an order is imminent	Be prepared for the coming package	Given information about all logistics. When the user selects a particular logistics, Then the details of that logistics are provided.	LOG_comingTrack	6	Medium	Waiting		
US23	User	I want to check the previous shipping information	Ensure accurate shipping details	When shipping details are entered, Then a check against the previous details is run	LOG_history	5	Low	Waiting		

# Sprint 4 - Plan 2/2

User Story									
ID	As a...	I want to...	So that I can...	Acceptance Criteria (format: use keywords Given, When, And, Then)	Task Name	Size	Priority	Status	Notes
US24	user	I want to see shipping history filtered for specific details	Review and analyze my shipment efficiency and timeliness	When a filter is added, Then data matching that filter is returned	LOG_filter	3	Medium	Waiting	
US25	user	I want to use two factor authorization to verify my customer's login	Prevent fraudulent login	Given a new device, When login is successful, Then the secondary security check will be sent	Login_2Factor	4	Medium	Waiting	
US26	user	I want to strongly encrypt and safely store my user's data	Ensure my customers their data is safe	Given a database of customer data, When unauthorized entry is attempted, Then request will not be returned	DBS_security	7	Medium	Waiting	

Total Story Points: 34

# Project Demo - Screenshot

SkyNet

Dashboard Supplier Management Item Inventory Order

Dropdown Q

Recent Users

Upcoming Event

Total Ideas

Daily Sales: \$ 249.95 (67%)

Monthly Sales: \$ 2,942.32 (36%)

Yearly Sales: \$ 8,638.32 (80%)

Isabella Christensen (11 MAY 12:56) Reject Approve

Mathilde Andersen (11 MAY 10:35) Reject Approve

45 Competitors (34%)

You can participate in event

235 TOTAL IDEAS

# Project Demo - Screenshot

SkyNet

Dashboard

Supplier Management

Dropdown ▾ Q

Suppliers

## Supplier Management

Add Supplier

#	Company	Email	Phone Number	Country	Street	City	State	Zip	Note	Actions
1	3M Company	manager@gmail.com	809-815-6322	USA	Albany St	New York	New York	10001		<button>Edit</button> <button>Delete</button>
2	The Alpine Group, Inc.	manager@office.com	536-459-2355	USA	Allen St	Los Angeles	California	57586		<button>Edit</button> <button>Delete</button>
3	Avnet, Inc.	manager@avnet.org	174-285-8907	USA	Amsterdam Ave	Chicago	Illinois	15227		<button>Edit</button> <button>Delete</button>
4	Avon Products, Inc.	manager@Avon.com	102-564-7978	USA	Canal St	Houston	Texas	18506		<button>Edit</button> <button>Delete</button>

# Project Demo - Screenshot

Address

Dropdown Email

Phone Number

Country

Street

#

City

1

State

2

Zip

3

Note

4

[Save changes](#) [Cancel](#)

Alert ×

State	Zip	Note	Actions
New York	10001		<a href="#">Edit</a> <a href="#">Delete</a>
California	57586		<a href="#">Edit</a> <a href="#">Delete</a>
Illinois	15227		<a href="#">Edit</a> <a href="#">Delete</a>
Texas	18506		<a href="#">Edit</a> <a href="#">Delete</a>

# Project Demo - Screenshot

SkyNet

- Dashboard
- Supplier
- Item
- Inventory
- Order

## Add Supplier

X

ID	Supplier Name	Stock Level	Action
18	Starbucks Corp.	54311	Edit Delete
19	Symbol Techno	20840	Edit Delete
20	Synovus Financ	24650	Edit Delete
21	Sysco Corp	15272	Edit Delete
22	Systemax Inc.	50398	Edit Delete
23	Target Corp.	14772	Edit Delete
24	Tiffany & Co	41298	Edit Delete
25	Toro Company	65320	Edit Delete
26	Tower Automot	12652	Edit Delete

Company  
Target Corp.

Email  
customerRelations@Target .com

Phone Number  
762-591-6434

Country  
USA

Street  
Union Square E

City  
Las Vegas

State  
Nevada

Zip  
14772

Note  
Note

Save changes Cancel

# Project Demo - APIs

Bootstrap

Django rest framework

Django CORS(Cross-origin resource sharing)

Django also comes equipped with many APIs in its standard library, some examples include a Database API, Model-View-Template APIs, HTTP request and Response, and URL utility API.

ScandIT - barcode library

# Github Link

**<https://github.com/CarviS0302/Pace-MS-Capstone/wiki>**

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# Live Demo



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Thank you for watching!