



SkyNet

— A business management system

Present by:

CS 691 Capstone Project Team Three



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Agenda

- Review Sprint 1
- Market Research & Analysis
- Architecture Diagram & Technologies
- Backlog & User Stories
- Acceptance Criteria & Test Cases
- MVP (Minimal Viable Product): Design & Functions
- Sprint 2: Team Velocity & Retrospective
- Plan for Sprint 3

Sprint One Review

“The purpose of the Sprint Review is to inspect the outcome of the Sprint and determine future adaptations”
(Schwaber & Sutherland, n.d.)

Outcomes

1

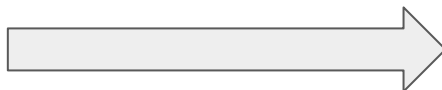
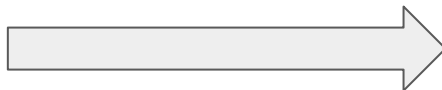
Defined our product
and key technologies

2

Developed working
knowledge of
processes

3

Timely completion of
group presentation



Adaptations

Incorporate different technologies
AWS, Python, SQL, JS, React
Machine learning
Removed HTML, CSS and Jira

Refine incorrect aspects
Personas
Team working agreement
Retrospective

Raise performance levels in future
presentation
Audio clarity
Speaker professionalism

Sprint Review (*continued*)

Future Sprint Reviews to utilize Increments

- “Selection of work is turned into Increments of value” ¹
- Product backlog refinement

Establish our Definition of Done

- “Formal description of the state of the increment when it meets quality measures required for the product” ²

DoD (Definition of Done) Requisites

1	Code completed?
2	Code peer reviewed?
3	Functional tests passed?
4	Acceptance criteria met?
5	Can product ship?

Business Management Software Market Research & Analysis

Favorable Market Conditions

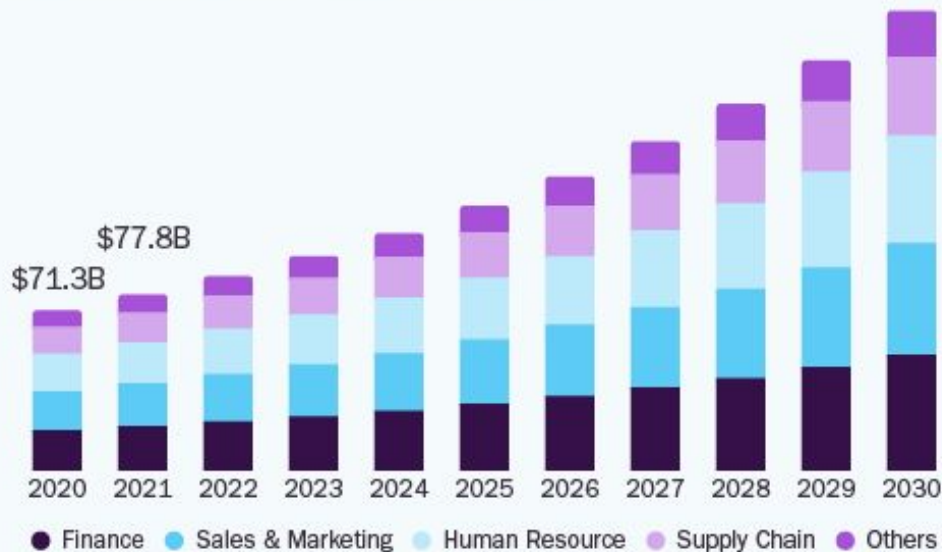
- Globally valued at over \$400 billion ³
- North American market dominates ⁴
- Significant growth expected in U.S. market ⁵

Opportunities for SkyNet

- Small and medium sized enterprises
- Growth of BPaaS ⁶

U.S. Business Software & Services Market

size, by software, 2020 - 2030 (USD Billion)



Market Research & Analysis (continued)

The Market Saturation Fallacy

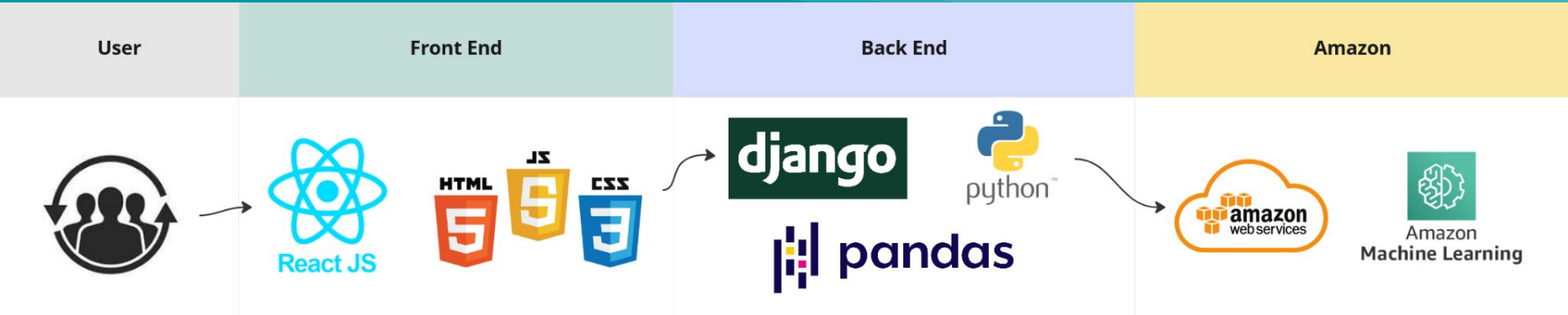
[Scott Brinker's famous collage on saturation in the software industry](#) ⁷

- Commonly-held belief that the market is overly saturated
- Industry titans such as Oracle, Salesforce, and SAP dominate across the CRM, POS, ERM markets

Reality?

- Salesforce has less than 18% of the CRM market ⁸
- Top 5 providers in the CRM market account for under 40% of total market share ⁹
- Huge % of market share is being divided amongst thousands of different businesses

Architecture & Technologies



The Purpose of the Technologies

- React - JavaScript library for building UI
- Django - Python web framework
- Pandas - Python based data structure & data analysis tools
- AWS (Amazon Web Services) - Hosting and Machine Learning

ID	As a...	I want to...	So that I can...	Task Name	Size	Priority	Status
US1	Retailers Manager	I wish I could record my inventory in the database and make changes at any time	Keep track of my inventory in real time	DBS_add	Small	High	Waiting
US2				DBS_delete	Small	High	Waiting
US3				DBS_edit	Small	High	Waiting
US4		I would like to be alerted when some items are out of stock	Replenish my inventory in a timely manner	DBS_alert	Medium	Medium	Waiting
US5		I want my inventory situation to be intelligently categorized	Track and manage inventory information by category	DBS_sort	Large	Medium	Waiting
US6		I want to be able to check my inventory with a visual chart	Get a clearer picture of my inventory	DBS_visualization	Large	High	Waiting
US7		I want the system to record my sales and analyze them	Keep track of my sales and change sales strategies	DBS_analyze	Large	Medium	Waiting
US8		I want to be able to enter/change data via cell phone camera or code reader	Input data easily	DBS_barcodeInput	Small	Low	Waiting
US9	Cashier	I want to be able to scan items	See information about the item	CR_scan	Medium	Medium	Waiting
US10		I want to be able to calculate the amount of money owed	Know the total amount of money owed	CR_amountowed	Small	High	Waiting
US11		I want to be able to status of payment	Know if the customer has paid yet	CR_paymentstatus	Small	Low	Waiting
US12		I want to be able to record a deposit	Collect money from the customer	CR_deposit	Small	High	Waiting
US13		I want to be able add items	Keep track of what items the customer wants to purchase	CR_additem	Small	High	Waiting
US14		I want to be able remove items	Change what items the customer wants to purchase	CR_removeitem	Small	High	Waiting
US15		I want to have a receipt of the purchase	Print a receipt of the purchase	CR_receipt	Small	Low	Waiting
US16	Retailers Manager	Evaluate and select suppliers	<div>Backlog</div>		Medium	High	Waiting
US17		Streamline onboarding with suppliers			Small	High	Waiting
US18		Negotiate contracts and pricing			Medium	High	Waiting
US19		Simplify communication with suppliers			Small	Medium	Waiting
US20		Manage supplier performance			Medium	Medium	Waiting
US21		Resolve issues with suppliers			Small	Low	Waiting
US22	Marketing Manager	I want to upload my sales data	Track/Maintain/Organize my data	ML_upload	Small	High	Waiting
US23		I want to use regression to train my model	Accurately forecast sales data on a constantly changing dataset	ML_runmodel	Medium	High	Waiting
US24		I want to use large amounts of data to improve the model's accuracy	So that i can be more confident in the accuracy of my forecast	ML_pulldata	Large	Medium	Waiting
US25		I want to be able to deploy the model to make sales predictions	Reduce the uncertainty and guesswork in my forecasts	ML_predict	Large	High	Waiting
US26		I want the model to predict total sales revenue by time period	Best serve my customers and maximize seasonal consumer trends	ML_timepredict	Large	low	Waiting
US27		I want the model to recommend prices and quantities of products for sale	Be leaner in my logistics and maximize profits	ML_pricequantity	Large	low	Waiting
US28		I want to check the detail of the current orders	Have idea of a delivery	DEL_details	Small	High	Waiting
US29		I want to get notification once the customers receive their product	Know the devieri is completed	DEL_notify	Medium	Medium	Waiting
US30	Stuff	I want to get notification if there a package for me is about to arrive	Be prepared for the coming package				
US31		I want to check the previous shipping information	Keep everything recorded	DEL_history	Medium	low	Waiting

Warehouse Management

ID	As a...	I want to...	So that I can...	Task Name
US1	Retailers Manager	I wish I could record my inventory in the database and make changes at any time	Keep track of my inventory in real time	DBS_add
US2				DBS_delete
US3				DBS_edit
US4		I would like to be alerted when some items are out of stock	Replenish my inventory in a timely manner	DBS_alert
US5		I want my inventory situation to be intelligently categorized	Track and manage inventory information by category	DBS_sort
US6		I want to be able to check my inventory with a visual chart	Get a clearer picture of my inventory	DBS_visualization
US7		I want the system to record my sales and analyze them	Keep track of my sales and change sales strategies	DBS_analyze
US8		I want to be able to enter/change data via cell phone camera or code reader	Input data easily	DBS_barcodeInput

Cash register function

ID	As a...	I want to...	So that I can...	Task Name
US9	Cashier	I want to be able to scan items	See information about the item	CR_scan
US10		I want to be able to calculate the amount of money owed	Know the total amount of money owed	CR_amountowed
US11		I want to be able to status of payment	Know if the customer has paid yet	CR_paymentstatus
US12		I want to be able to record a deposit	Collect money from the customer	CR_deposit
US13		I want to be able add items	Keep track of what items the customer wants to purchase	CR_additem
US14		I want to be able remove items	Change what items the customer wants to purchase	CR_removeitem
US15		I want to have a receipt of the customer's purchase	Have an itemized list of items purchased by the customer	CR_receipt

Supplier Management

ID	As a...	I want to...	So that I can...	Task Name
US16	Retailers Manager	Evaluate and select suppliers	Create relationships with the best possible suppliers for my industry	SRM_eval
US17		Streamline onboarding with suppliers	Quickly establish working supply chains	SRM_select
US18		Negotiate contracts and pricing with suppliers	Obtain the best possible price points in the most efficient manner	SRM_contract
US19		Simplify communication with suppliers	Avoid delays and unnecessary confusion by having an all encompassing communication platform	SRM_msg
US20		Manage supplier performance	Quickly and easily track supplier performance with key performance metrics that are already established for me	SRM_kpi
US21		Resolve issues with suppliers	Flag potential issues and bring them to suppliers attention in an expedited fashion	SRM_help

Merchandising suggestions

ID	As a...	I want to...	So that I can...	Task Name
US22	Marketing Manager	I want to upload my sales data	Track/Maintain/Organize my data	ML_upload
US23		I want to use regression to train my model	Accurately forecast sales data on a constantly changing dataset	ML_runmodel
US24		I want to use large amounts of data to improve the model's accuracy	So that i can be more confident in the accuracy of my forecast	ML_pulldata
US25		I want to be able to deploy the model to make sales predictions	Reduce the uncertainty and guesswork in my forecasts	ML_predict
US26		I want the model to predict total sales revenue by time period	Best serve my customers and maximize seasonal consumer trends	ML_timepredict
US27		I want the model to recommend prices and quantities of products for sale	Be leaner in my logistics and maximize profits	ML_pricequantity

Merchandising suggestions - Overview



Computer Supplies & Accessories

<u>Suggested Date</u>	<u>Suggested Amount</u>	<u>Suggested Price</u>
HDMI Cable	12/28/2022	180 \$ 10.50
Keyboard	3/9/2022	180 \$ 105.00
Wireless Mouse	9/15/2022	180 \$ 63.00
Headset	4/5/2022	180 \$ 84.00
Headphone - in ear	2/8/2022	180 \$ 47.25

Office Supplies

Stapler	49.75	34 \$ 15.75
Paper	76	55 \$ 21.00
Pencils 12	105.75	90 \$ 15.75
Pens - 6	84.55	73 \$ 11.55
Pencil Sharpener	40.4	11 \$ 29.40

Sales Suggestions

Logistics management

ID	As a...	I want to...	So that I can...	Task Name
US28	Logistics Manager	I want to check the detail of the current orders	Have idea of a delivery	LOG_details
US29		I want to get notification once the customers receive their product	Know the delivery is completed	LOG_notify
US30		I want to get notification if there a package for me is about to arrive	Be prepared for the coming package	
US31		I want to check the previous shipping information	Keep everything recorded	LOG_history

Data Security & Accessibility

ID	As a...	I want to...	So that I can...	Task Name
US32	User	I want to use two factor authorization to verify my customer's login	Prevent fraudulent login	Login_2Factor
US33		I want to strongly encrypt and store my user's data	Ensure my customers their data is safe	DBS_securiy
US34		I want to be able to access my data from any device	Know the status of my business anytime, anywhere	DBS_cloud

Acceptance Criteria

ID	Task Name	Acceptance Criteria (format: use keywords Given , When , And , Then)
US1	DBS_add	When a user add/delete/edit data, Then the database will accept the update.
US2	DBS_delete	
US3	DBS_edit	
US4	DBS_alert	When an item is about to expire, Then the system will automatically send a reminder.
US5	DBS_sort	Given different categories, When the user selects a category, Then show the products under that category.
US6	DBS_visualization	Given automatically generated charts, When the user changes the chart options or changes the data range, Then the chart is regenerated based on user behavior
US7	DBS_analyze	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 function, Then provides analysis of the data, such as the history of sales for each item.
US8	DBS_barcode input	Given barcode entry options, When the user enters product information using the barcode Then the corresponding product information, such as product name, brand, price, etc., is automatically populated.

Acceptance Criteria

ID	Task Name	Acceptance Criteria (format: use keywords Given , When , And , Then)
US9	CR_scan	When the user scans the barcode, Then the scanned product information is added to the checkout list Given a complete checkout list, including the name, quantity, price, total, tax, receivable, paid-in, and change for each item.
US10	CR_amountowed	
US11	CR_paymentstatus	
US12	CR_deposit	
US13	CR_additem	
US14	CR_removeitem	
US15	CR_receipt	

Acceptance Criteria

ID	Task Name	Acceptance Criteria (format: use keywords Given , When , And , Then)
US16	SRM_eval	Gives information about all suppliers. When the user selects to query the best supplier for a certain category of products, Then information about that supplier is displayed.
US17	SRM_select	
US18	SRM_contract	
US19	SRM_msg	When a user wishes to contact a supplier, Then a contact channel is established for both.
US20	SRM_kpi	
US21	SRM_help	
US22	ML_upload	Given the model for machine learning. When the user chooses to use this machine learning to analyze his sales and data, Then the corresponding analysis results are shown.
US23	ML_runmodel	
US24	ML_pulldata	
US25	ML_predict	
US26	ML_timepredict	
US27	ML_pricequantity	

Acceptance Criteria

ID	Task Name	Acceptance Criteria (format: use keywords Given , When , And , Then)
US28	LOG_details	Given information about all logistics. When the user selects a particular logistics, Then the details of that logistics are provided.
US29	LOG_notify	When a delivery to a customer is signed for or the user is about to receive a delivery, Then the system sends an alert.
US30		
US31	LOG_history	Given a log of all logistics information.
US32	Login_2Factor	When a user tries to log in to their account, Then ask them to provide a secondary authentication in addition to their username and password.
US33	DBS_securiy	Given as all encrypted user data.
US34	DBS_cloud	Given all the data through cloud.

Test Cases

Category	ID	Action	Test Data	Test Description	Expected Output	Actual Output	Test Result
Warehouse Management	1	Insert a product data		Enter product image, price, description	Product data is correctly displayed in the data		
	2	Edit a product data		Change the price. update the image, re-write the description	Product data is updated with new data		
	3	Delete a product data		Delete a product	The target data is deleted		
	4	Select a category		Select a start and end date	Displays a graph of the data for that time period		
	5	Add a product data		Add a product data with the database	Add product data		
	7	Item alert		Item is about to expire	Automatically send a reminder		
	8	Data visualization		Change the chart options or change the data range	Chart regenerated based on behavior		
	9	Data analyze		Analysis function	Analysis of the data		
	10	Barcode Input		Enter product information using barcode	Automatically populate product information		

Test Cases

Category	ID	Action	Test Data	Test Description	Expected Output	Actual Output	Test Result
Cash register function	11	Scan product	barcode of item	Item is scanned with the mobile app	Item is found in database		
	12	Find product details	item code	Lookup item code to pull product details	image, price, quantity, and description are displayed		
	13	Calculate order totals and change	one instance of an order	Calculate total amount due, tax, change due	correct totals calculated		
	14	Add item to order		Scan or manually add an product	product is added to order and to amount due		
	15	Remove item from order		Delete an item from order total	item is removed, amount due is reduced		
Data Security	16	verify login credentials	username and password	1) Enter correct credentials 2) Enter Incorrect credentials	login successful/ login denied		
	17	access from mobile device	front end software	Load app from mobile device	app loads and functions normally		
	18	test encryption	encrypted login credentials	1) attempt to reverse engineer password from encrypted data	correct password not found		

Test Cases

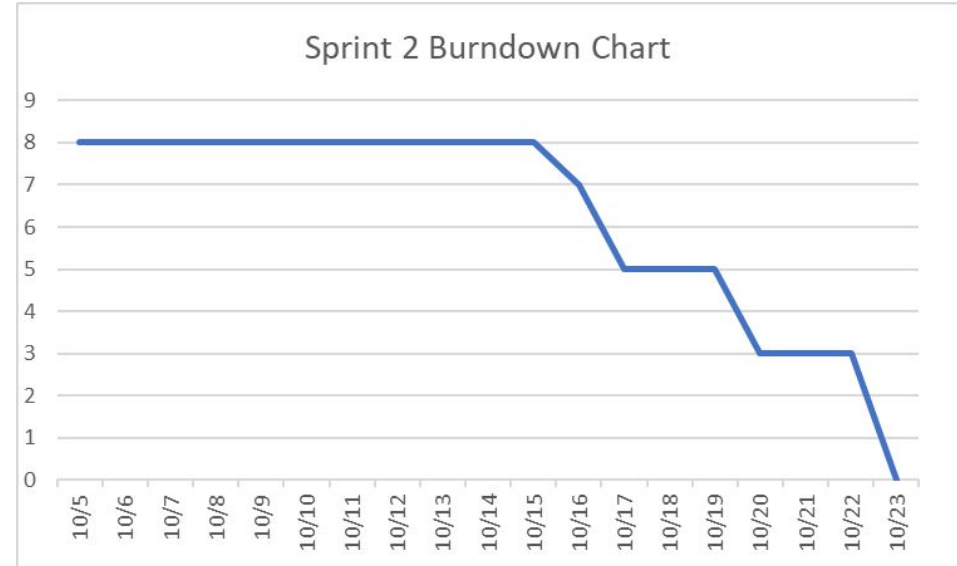
Category	ID	Action	Test Data	Test Description	Expected Output	Actual Output	Test Result	Comments
Merchandising suggestions (machine learning)	19	Add recent sales	CSV file of sales data	upload data to database	data is added to database			
	20	generate price suggestions	life to date sales data	Machine learning model reviews data and outputs suggestion	price suggestions within a 10% change in price			
	21	generate inventory suggestions	life to date sales data	Machine learning model reviews data and outputs suggestion	a list of suggested inventory amounts to stock			
	22	generate timing suggestions	life to date sales data	Machine learning model reviews data and outputs suggestion	dates in line with seasonal trends			we dont want to be seeing Easter goods suggested for Halloween

Test Cases

Category	ID	Action	Test Data	Test Description	Expected Output	Actual Output	Test Result
Logistics management (express delivery)	23	provide a logistics details		Enter a tracking number associated with an order	Details of courier transfer		
	24	Get a notification when my purchases from vendors are due to arrive soon		Test an order due to arrive in 3 days	get a notification of package with expected delivery		
	25	Get notification when a shipment arrives to customer		A notice of completion is sent from the courier	get a confirmation alert of delivery		
	26	give all logistics information		Run a history of all deliveries received and sent	a list of logistics is emailed or downloaded		

Sprint 2 - Team velocity

Task Name	Status	Date
Market Research	Done	10/16
Establishment of techniques and tools	Done	10/17
Improve project details	Done	10/17
API Research	Done	10/20
Design of project Backlog & User Stories	Done	10/20
Design Project Acceptance Criteria	Done	10/23
Designing Project Test Cases	Done	10/23
Designing MVP prototypes and sketches	Done	10/23



Sprint 2 - Stories



Stories Completed	Stories Not Completed
None <u>(Framework build 67%)</u>	All

Sprint 3 - Plan: Framework Construction and User Stories

ID	Task Name	Size	Priority	Status	Sprint
US1	DBS_add	Small	High	Waiting	3
US2	DBS_delete	Small	High	Waiting	3
US3	DBS_edit	Small	High	Waiting	3
US4	DBS_alert	Medium	Medium	Waiting	3
US16	SRM_eval	Medium	High	Waiting	3
US17	SRM_select	Small	High	Waiting	3
US34	DBS_cloud	Small	High	Waiting	3



MVP Mock-up Design

MVP - Warehouse Management

Current Inventory Incoming Orders Reports

Search

+ Add Item

Name	Current Inventory	On Hand	In Transit	Minimum required	Needs reorder	Details
------	-------------------	---------	------------	------------------	---------------	---------

Computer Supplies & Accessories

HDMI Cable	80	65	15	30		product
Keyboard	30	30	0	5		product
Wireless Mouse	80	80	0	100 !!!!		product
Headset	20	10	10	25 !!!!		product
Headphone - in ear	90	50	40	45		product

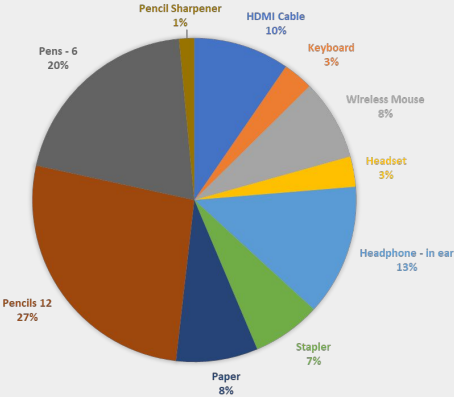
Office Supplies

Stapler	51	34	17	39		product
Paper	68	55	13	30		product
Pencils 12	177	90	87	96		product
Pens - 6	136	73	63	78		product
Pencil Sharpener	13	11	2	22 !!!!		product

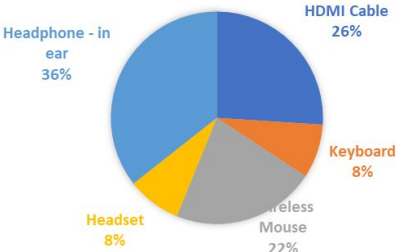
MVP - Warehouse Management

Current Inventory Incoming Orders **Reports**

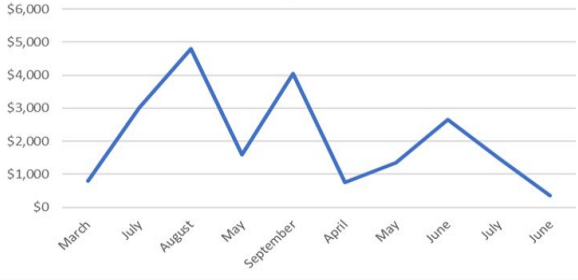
CURRENT INVENTORY - ALL ITEMS



CURRENT INVENTORY - COMPUTER SUPPLIES



Order Amount by Month: 2022



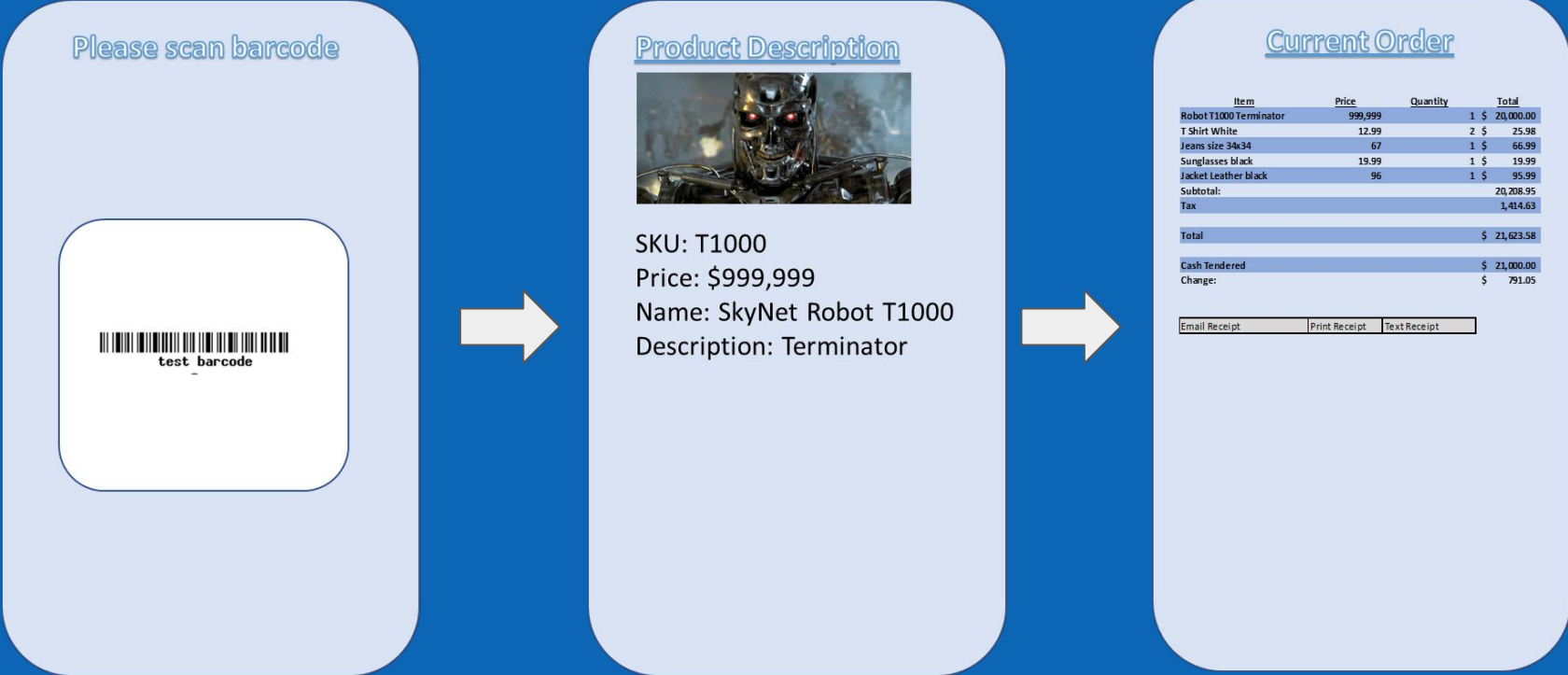
MVP - Logistics

Outgoing Orders Incoming Purchases

+ Create Order

<u>Order Number</u>	<u>Carrier</u>	<u>Tracking number</u>	<u>Customer Order date</u>	<u>Date Shipped</u>	<u>Status</u>
4818	USPS	4277773635	10/12/2022	10/15/2022	In Transit
9475	USPS	2260046483	11/23/2022	11/26/2022	Shipping Label Created
4820	FedEX	1050177552	12/18/2022	12/21/2022	Customer Order Received
2571	FedEX	8936296095	7/6/2022	7/9/2022	7/14/2022
8454	FedEX	5725178347	1/15/2022	1/18/2022	1/23/2022
8205	UPS	4234501648	9/21/2022	9/24/2022	9/29/2022
5110	UPS	382081867	8/11/2022	8/14/2022	8/19/2022
6378	UPS	5605213813	3/10/2022	3/13/2022	3/18/2022
6793	UPS	6508533019	10/4/2022	10/7/2022	In Transit

MVP - Cash Register (mobile view)



MVP - Supplier Management

Example User

+ Add Vendor

Supplier	Main Contact	Email	Phone
FaceBox	Mike Zokerin	ZokerinMike@FaceBox.com	555-0123
Tosla	Elon Tusk	Etusks@tosla.com	555-0123
Glamazon	John Beezo	John.Beez@Glamazon.com	555-0123
Oranges Inc	Steph Works	SteWorks@Oranges.com	555-0123

FaceBox

[Issue Log](#) [Contract](#)

+ Generate Purchase Order

Order History

Order Number	Total	Ordered by	Date Placed	Date Shipped	Expected Delivery	Date Received	Status	Notes
001	\$ 8,080.00	Sara Connors	12/1/2015	12/17/2015	12/31/2015		In Transit	
002	\$ 1,520.29	Jon Connors	10/2/2015	11/17/2015	12/1/2015	12/1/2015	Complete	
003	\$ 7,225.95	Sara Connors	8/3/2015	10/18/2015	11/1/2015	11/1/2015	Complete	
004	\$ 2,508.37	Sara Connors	6/4/2015	9/18/2015	10/2/2015	10/2/2015	Complete	
005	\$ 1,272.31	Bilbo Baggins	4/5/2015	8/19/2015	9/2/2015	9/2/2015	Complete	



SkyNet



Retrospective

Wishes	Risks	Appreciations	Puzzles
All goals accomplished on time	Most teammates have busy schedules, the project was done close to due date	Slides look professional and present our ideas well	How should we allocate the front-end and back-end work?
Have a clear idea of exactly what needs to be done, and who will do it	Work cannot be completed and nothing gets done	Market research is well planned and presented	Should we split the deadline into two dates for drafts and final approval?
Follow the timeline so work can be spread over the sprint	Wasting time learning new technologies and fall behind schedule	MVP images are a good representations of the final product	As we create more files and documents is there a better way we could stay organized?
	Backlog has a lot to do	User stories are well defined	
	Sometimes a person has to wait for another person to finish his part before he can start his work	We know what technologies we are using and how they work together	

Github Link

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

References

- ^{1 & 2} Schwaber, K & Sutherland, J (n.d.) *The Definitive Guide to Scrum: The Rules of the Game*. Retrieved October 22, 2022, from <https://scrumguides.org/scrum-guide.html>
- ^{3, 4, & 5} Grandview Research. (2020). *Business Software And Services Market Size, Share & Trends Analysis Report By Software, By Service, By Deployment, By Enterprise Size, By End Use, By Region, And Segment Forecasts, 2022 - 2030*. <https://www.grandviewresearch.com/industry-analysis/business-software-services-market>
- ^{8 & 9} Kratchounova, L. (2020, July 15). *Council post: In a saturated software market, what does it mean to be interoperable?* Forbes. Retrieved October 20, 2022, from <https://www.forbes.com/sites/forbesagencycouncil/2020/07/16/in-a-saturated-software-market-what-does-it-mean-to-be-interoperable/?sh=660f9f562e08>

References (continued)

- ⁷ Brinker, S. (n.d.). *Marketing Software*. Chiefmartec. Retrieved October 23, 2022, from <https://chiefmartec.com/2022/07/think-the-martech-landscape-is-big-heres-the-size-of-the-software-industry-overall/>.
- ⁶ *BPaaS market size, share and global market forecast to 2022*. MarketsandMarkets. (n.d.). Retrieved October 20, 2022, from <https://www.marketsandmarkets.com/Market-Reports/business-process-as-a-service-bpaas-market-986.html>



Thank you for watching!