

# Bay Area Innovation Day Idea

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# Background

- Used TI Internal Revenue Tool and witnessed AP/LRP being done
- Forecasting future revenue is complex due to:
  - Rapidly changing design wins
  - Variable customer volume forecasts
  - Product mix across sectors
- Excel struggles with time-based dependencies and non linear trends; not efficient

The screenshot displays a highly detailed Excel spreadsheet, likely a financial model for revenue forecasting. The spreadsheet is organized into columns representing time periods, with headers for years 2021 through 2025. The rows are densely packed with data, including various financial metrics and formulas. The interface shows the standard Excel grid with a formula bar at the top and a status bar at the bottom. The data appears to be a combination of static values and dynamic formulas, reflecting the complexity of forecasting future revenue based on multiple variables.

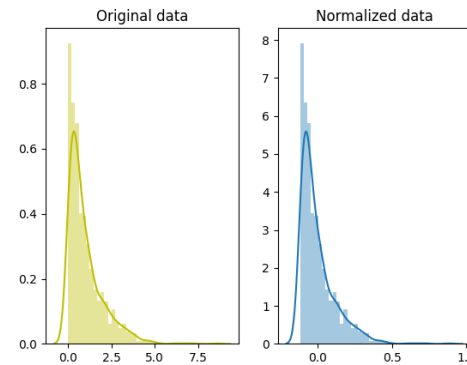
# Our Idea

- Goal: Training a Recurrent Neural Network based model to more accurately predict long term revenue for future quarters by combining:
  - Past Revenue Trends
  - Manually entered new Design wins
- Deployed on a website/GUI-User uploads CSV file on step 6,
- Analyzes market trends

# Preprocessing Data

- Categorize by Business Unit, clean up data(normalization around mean), correlate revenue per quarter to Business Unit

Selling Ctr	Sector	MAA Name	SEC MAA Name	2023 Q1	2023 Q2	2023 Q3	2023 Q4	2023 Q1	2023 Q2	2023 Q3	2023 Q4
DIRECT S/BUILDING AUTOMATION	ARLO	ALPHA NETWORK	ALPHA NETWORK	NET T071	NET T071	NET T071	NET T071	NET T071	NET T071	NET T071	NET T071
DIRECT S/BUILDING AUTOMATION	ARLO	ALPHA NETWORK	ARLO	0	\$35,028.00	\$21,212.00	0	\$20,169.00	\$22,908.00	\$498.00	0
DIRECT S/BUILDING AUTOMATION	ARLO	ALPHA NETWORK	ALPHA NETWORK	0	\$39,600.00	\$63,800.00	\$6,960.00	\$46,980.00	\$50,460.00	\$26,100.00	0
DIRECT S/BUILDING AUTOMATION	ARLO	ALPHA NETWORK	ALPHA NETWORK	0	\$53,790.00	\$26,250.00	\$9,250.00	\$48,790.00	\$48,500.00	\$6,000.00	0
DIRECT S/BUILDING AUTOMATION	ARLO	ALPHA NETWORK	ALPHA NETWORK	0	\$3,780.00	\$6,220.00	\$720.00	\$2,880.00	0	0	0
DIRECT S/BUILDING AUTOMATION	ARLO	ALPHA NETWORK	ALPHA NETWORK	0	\$7,652.00	\$6,246.00	\$5,350.00	\$6,282.00	\$9,257.00	0	0
DIRECT S/BUILDING AUTOMATION	ARLO	ALPHA NETWORK	ALPHA NETWORK	0	\$2,970.00	\$4,500.00	\$675.00	\$3,300.00	\$4,500.00	\$1,215.00	0
DIRECT S/BUILDING AUTOMATION	ARLO	ALPHA NETWORK	ALPHA NETWORK	\$288.00	\$1,904.00	\$1,856.00	\$840.00	\$1,600.00	\$2,640.00	\$240.00	0
DIRECT S/BUILDING AUTOMATION	ARLO	CELEST	ARLO	0	\$71,000.00	\$42,120.00	\$4,560.00	\$40,780.00	\$79,340.00	\$19,960.00	3806527.5
RETAIL	BUILDING AUTOMATION	CELEST	NET T071	0	\$11,480.00	\$77,500.00	\$4,000.00	\$46,200.00	\$4,594.00	\$6,204.00	0
DIRECT S/BUILDING AUTOMATION	ARLO	CELEST	ARLO	\$224,970.00	\$39,160.00	\$183,800.00	\$9,600.00	\$87,600.00	\$122,400.00	\$42,000.00	0
DIRECT S/BUILDING AUTOMATION	ARLO	CELEST	NET T071	0	0	0	0	0	0	0	0
DIRECT S/BUILDING AUTOMATION	ARLO	CELEST	ARLO	\$13,287.15	\$6,363.00	\$27,094.00	\$1,800.00	\$8,640.00	0	0	0
DIRECT S/BUILDING AUTOMATION	ARLO	HON HAI PRECISION INDUSTRY	ARLO	0	0	0	0	0	0	0	0
RETAIL	BUILDING AUTOMATION	ARLO	HON HAI PRECISION INDUSTRY	0	0	0	0	\$9,340.00	\$39,380.00	\$9,370.00	0
RETAIL	BUILDING AUTOMATION	ARLO	HON HAI PRECISION INDUSTRY	\$213.00	\$2,002.50	\$1,612.50	\$293.00	\$3,382.50	\$227.50	\$227.50	0
DIRECT S/BUILDING AUTOMATION	ARLO	HON HAI PRECISION INDUSTRY	ARLO	0	0	0	0	0	0	0	0
RETAIL	BUILDING AUTOMATION	ARLO	HON HAI PRECISION INDUSTRY	0	0	0	0	0	0	0	0
RETAIL	BUILDING AUTOMATION	ARLO	SHENZHEN HONGYANG ELECTRICITY	\$8,874.00	\$13,710.00	\$13,158.00	\$6,942.00	\$9,809.00	\$8,976.00	\$4,272.00	0
DIRECT S/BUILDING AUTOMATION	ARLO	HON HAI PRECISION INDUSTRY	ARLO	0	0	0	0	0	0	0	0
DIRECT S/BUILDING AUTOMATION	ARLO	HON HAI PRECISION INDUSTRY	ARLO	\$17,800.00	\$10,079.00	\$77,232.00	\$19,348.00	0	\$14,804.00	\$64,098.00	0
RETAIL	BUILDING AUTOMATION	ARLO	HON HAI PRECISION INDUSTRY	0	0	0	0	0	0	0	0
RETAIL	BUILDING AUTOMATION	ARLO	HON HAI PRECISION INDUSTRY	\$411,576.32	\$489,799.08	\$402,428.15	\$194,091.80	\$4,429.80	\$295,296.96	\$295,272.84	0
DIRECT S/BUILDING AUTOMATION	ARLO	HON HAI PRECISION INDUSTRY	ARLO	0	0	0	0	0	0	0	0
RETAIL	BUILDING AUTOMATION	ARLO	HON HAI PRECISION INDUSTRY	0	0	0	0	0	0	0	0
DIRECT S/BUILDING AUTOMATION	ARLO	HON HAI PRECISION INDUSTRY	ARLO	\$440,915.00	\$473,996.80	\$393,450.00	\$278,974.00	\$186,002.80	\$281,562.80	\$298,811.00	0
DIRECT S/BUILDING AUTOMATION	ARLO	HON HAI PRECISION INDUSTRY	ARLO	0	0	0	0	0	0	0	0
DIRECT S/BUILDING AUTOMATION	ARLO	HON HAI PRECISION INDUSTRY	ARLO	0	0	0	0	0	0	0	0
DIRECT S/BUILDING AUTOMATION	ARLO	HON HAI PRECISION INDUSTRY	ARLO	0	\$553.00	\$553.00	0	0	0	0	0

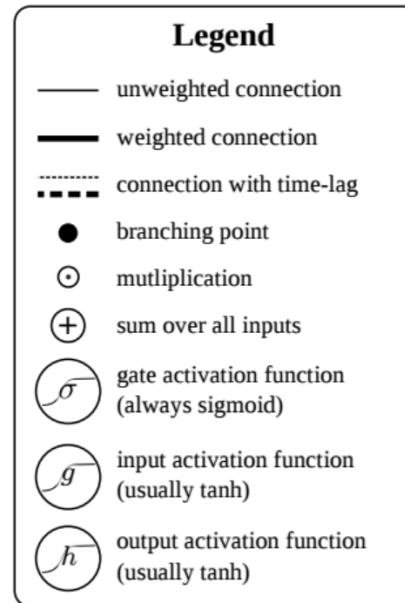
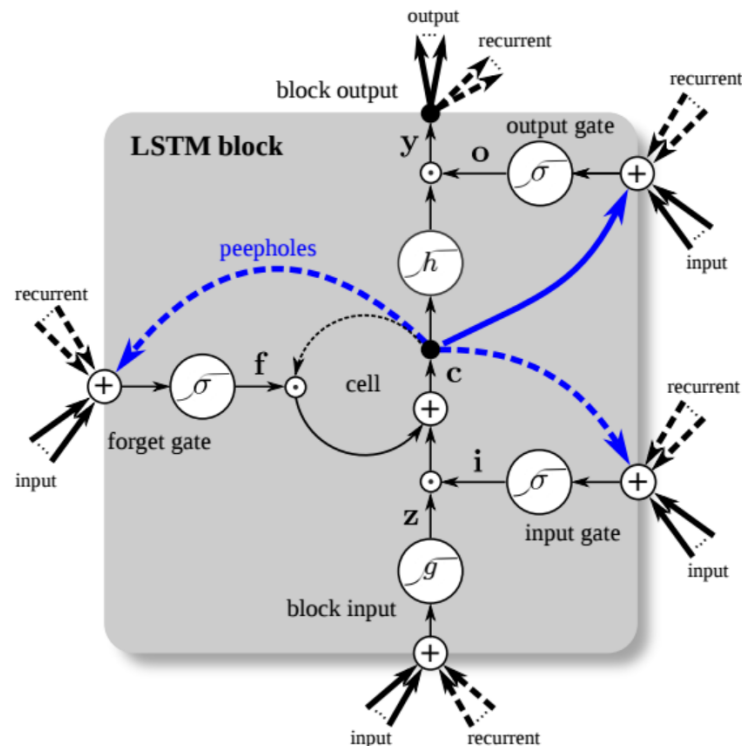


SBE-1 vs. Quarter Revenue

# Model Architecture

- LSTM Layer-Best for remembering past patterns, handling sequential data, learning long-term dependencies(ex. Q1 affect on Q4)
- Benefit-Deals with vanishing gradient problem in RNN

Input → Forget Gate → Cell State  
Memory → Input gate → Update → Output Gate



Each gate-Fully connected layer with sigmoid activation

# Output/Deployment

- All in one GUI/website deployment
- Sales Team can input their own projected quarter 5 years out, and their desired Business Unit, add new devices expected to win, price per new device and the model will output the past revenue trends as a histogram with the expected revenue for the selected quarter and Business Unit

Model Output-LTSM  
output+(new socket won  
revenue)



Upload CSV

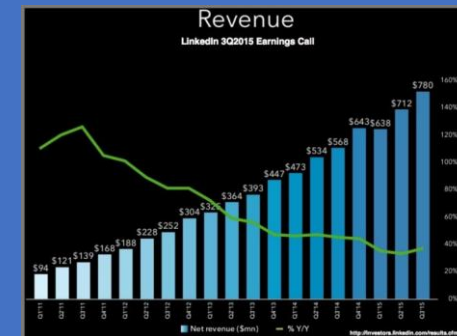
Dropdown: Select SBE-1

Dropdown: Select Future year and Quarter  
within the next 5 years

Dropdown: Enter total price expected # new  
of sockets won per next device per this  
quarter

Dropdown: Enter expected volume of devices  
sold per this quarter

Shows how  
revenue is  
expected to  
grow based on  
past years



# How is this better than what is currently being done?

- LTSM learns complex relationships, handles sequential patterns, more efficient with all in one GUI interface, Works with multiple inputs
- Excel can be tedious with lots of data, not as efficient

# Future Work

- Train ML model based on different sectors of business like Industrial, Personal Electronics, etc.
- Experiment other RNN/time-series forecasting models- GRU, Stacked LSTM, Echo State networks
- We will continue to train model to project revenue from other classifications such as Product, so the sales team can ideally forecast revenue predictions based on certain categories per account simply by uploading CSV into the GUI