

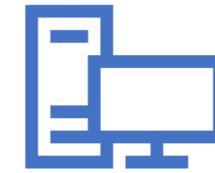
CSCI 5408



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Outline

- Recap of Modules
- Introduction to Module 5



**Module 1 --- Module 2 --- Module 3 ---
Module 4 --- Module 5**

STORYLINE – YEAR 2020 (HALIFAX)



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- Alice is a chef -- recently joined a short term management program@NSCC – wants to start restaurant
- Emily is Alice's friend – Studies MACS@DAL

STORYLINE – YEAR 2021 (HALIFAX)



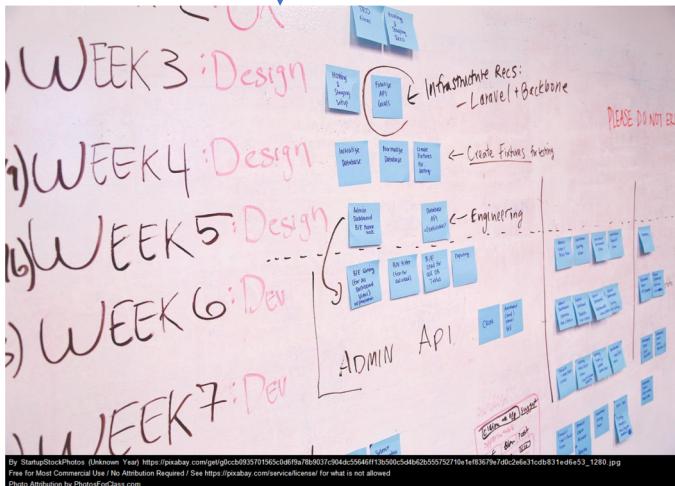
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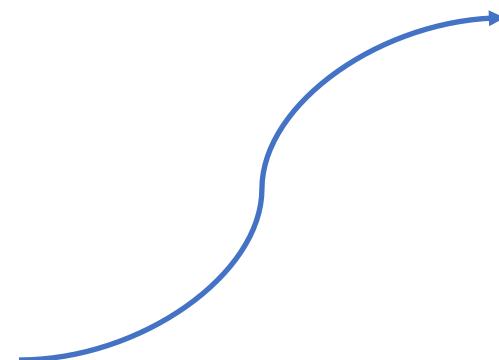
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- Alice started restaurant -- doing well in the restaurant business.
- Wanted to add computerized billing, employee, sales information (she thinks it will be good for business)
- Asks for help – Emily provides solution (**Building an IS from verbal explanation and concept**)

Solution by Emily - End of 2021 (1-3)



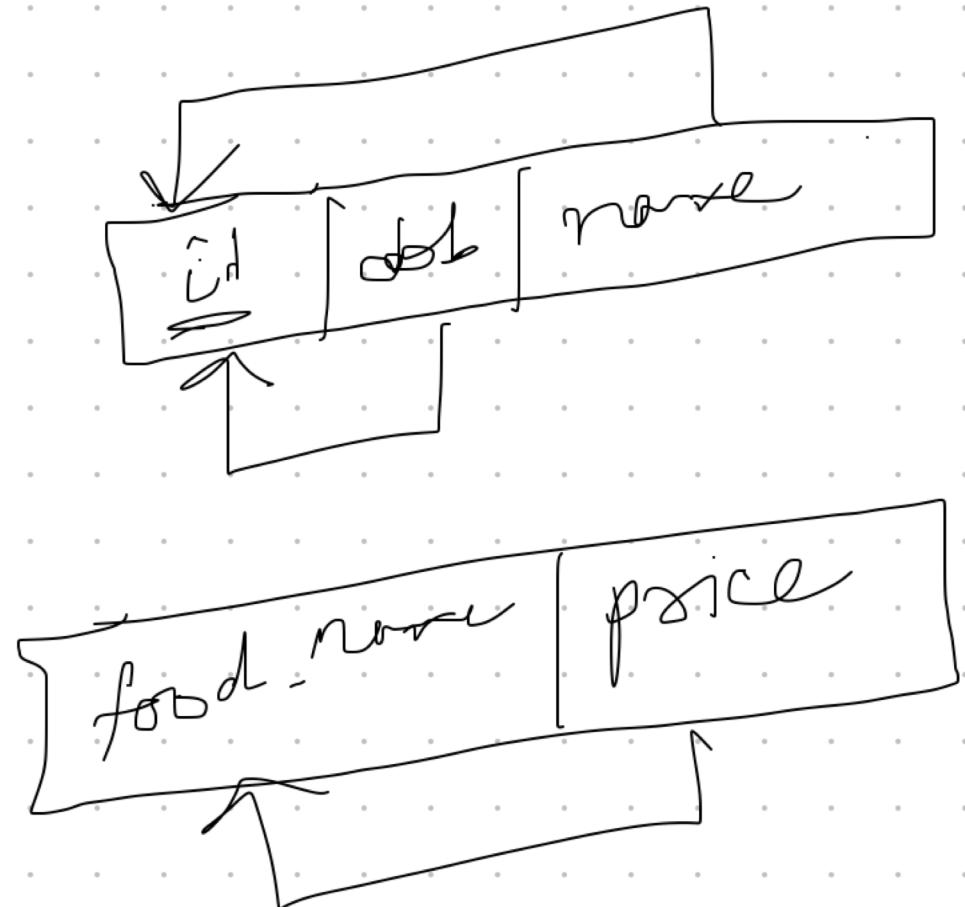
Conceptual Phase



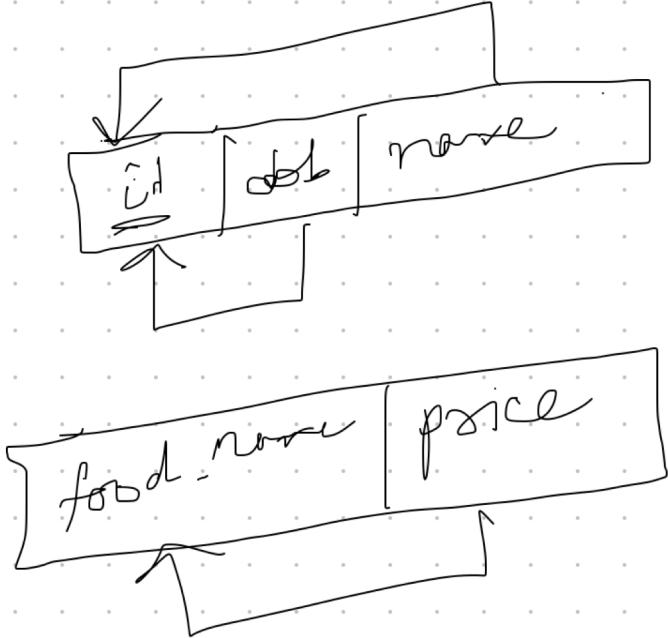
Solution by Emily - End of 2021 (2-3)



Logical Phase



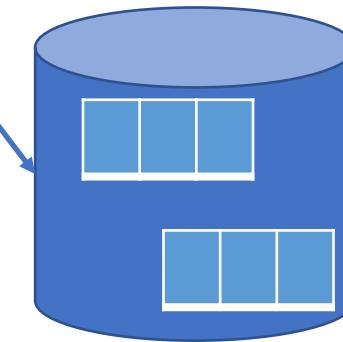
Solution by Emily – End of 2021 (3-3)



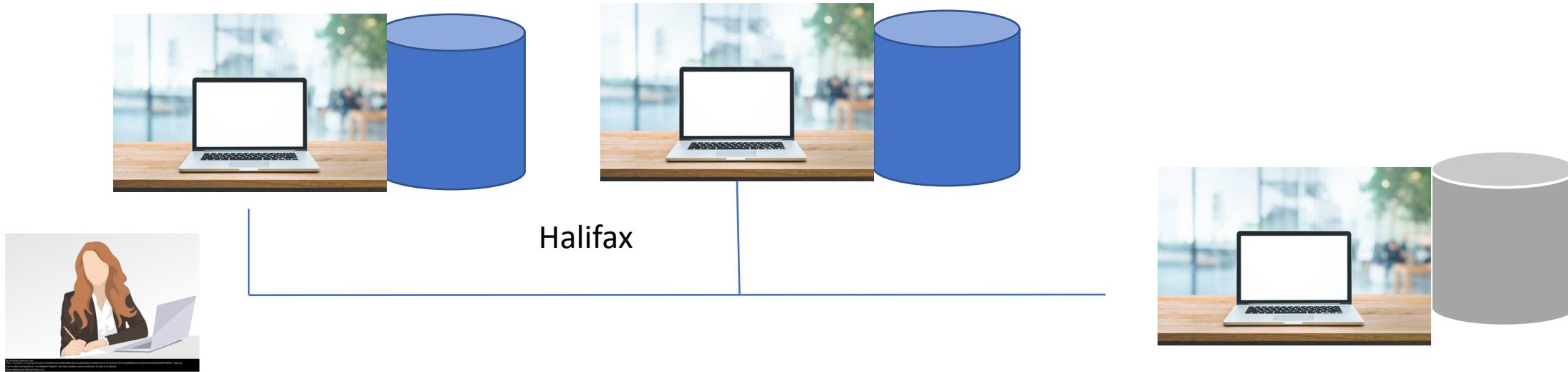
Physical Phase



End Result



STORYLINE – YEAR 2022 (MID APRIL)



- Emily joins Alice in the business.
- They got some additional \$ started **2** more restaurants in Halifax, **1** in Truro
- Emily wanted to add computers in all branches, and wants to experiment with MySQL (free), Oracle (paid) database

STORYLINE – YEAR 2022 (JUN BURGLARY)

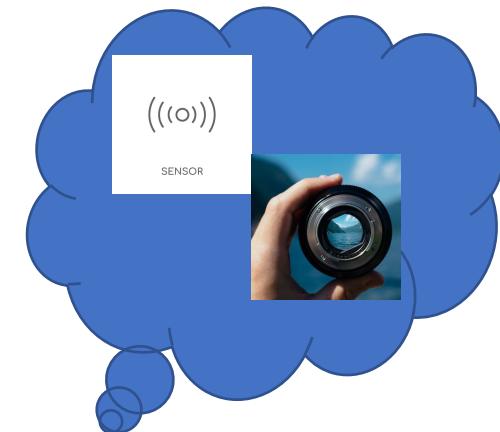


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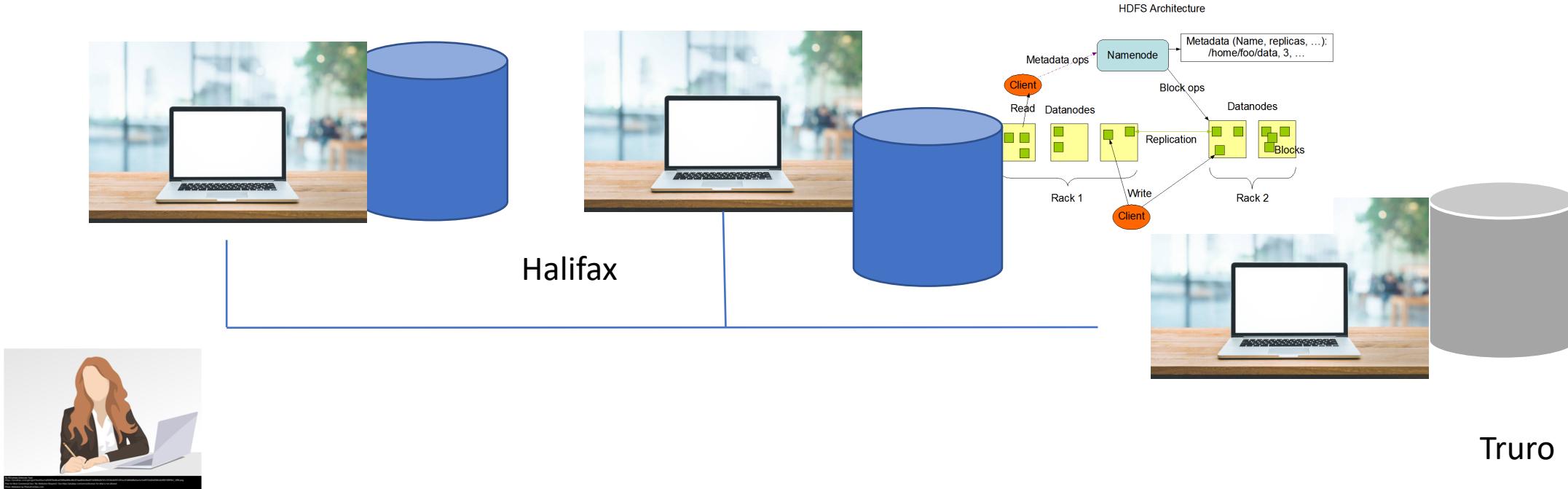
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STORYLINE – YEAR 2022 (END)

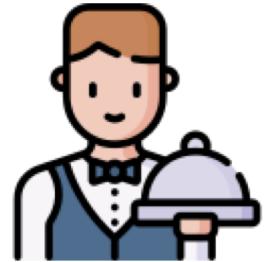


- Emily decided to build a centralized data processing infrastructure for all data
- This processing engine captures data from all sources for the purpose of cleaning, transformation, pattern detection, tagging, and relevance ranking

STORYLINE – YEAR 2023

((o))

SENSOR

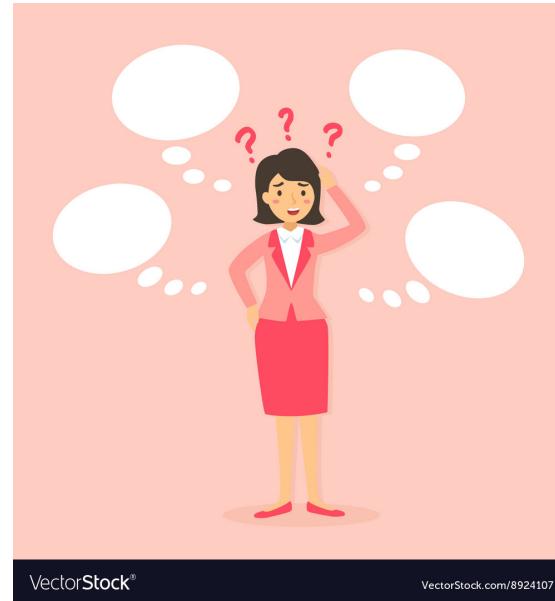


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SENSOR



- Lots of Data coming from sensors
- People are talking about food, restaurant ambience, worker etc.
- Alice and Emily did not want to miss capturing any of the data



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A screenshot of a Firestore database interface. The left sidebar shows collections: tukan-2020, restaurants, and KQDqcqevewzgtEgYCr6P. The restaurants collection has documents: Koleksiyonu başlat, Belge ekle, and Alan ekle. The KQDqcqevewzgtEgYCr6P document contains fields: locations, orders, restaurants (which is expanded to show sub-fields like extraIngredients and menuItems), users, and variants. The variants field is expanded to show items like Extra Large, Medium, Small, and name: "Pizzas". The menuItems field is expanded to show items like "It is delicious", "Steak", "Sauce", "Margarita", and variants like Extra Large, Medium, Small, and name: "Pizzas". The extraIngredients field is expanded to show items like "Cheese", "Sauce", and "Ketchup".

<https://stackoverflow.com/questions/60743585/firestore-food-ordering-application-database-design-questions>

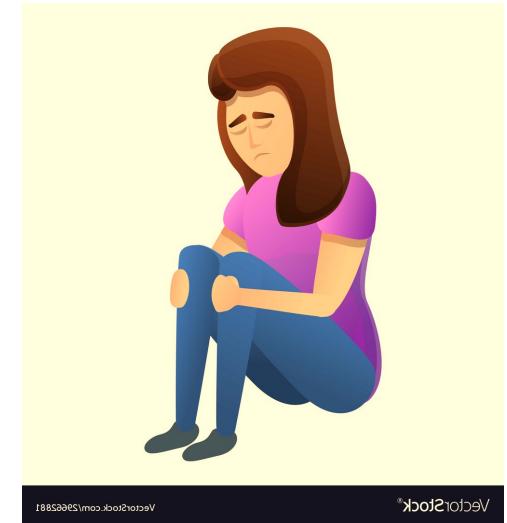
STORYLINE – YEAR 2023

- The business is doing very well. Earned good \$
 - They thought of analyzing budget optimization, employee benefits etc.



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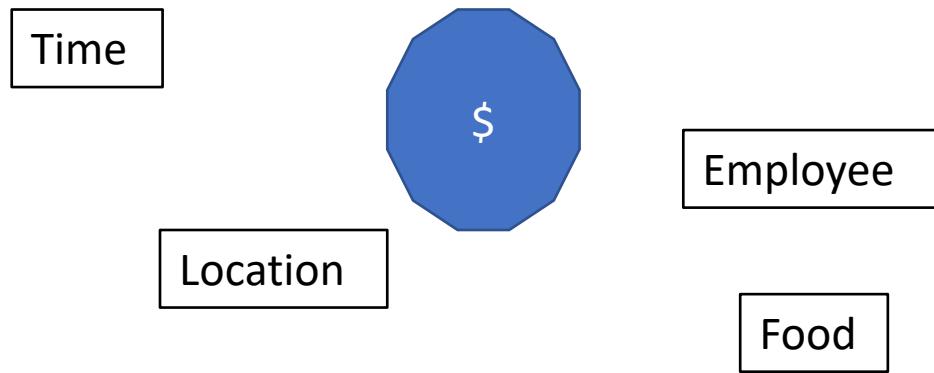


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STORYLINE – YEAR 2023 (MARCH)



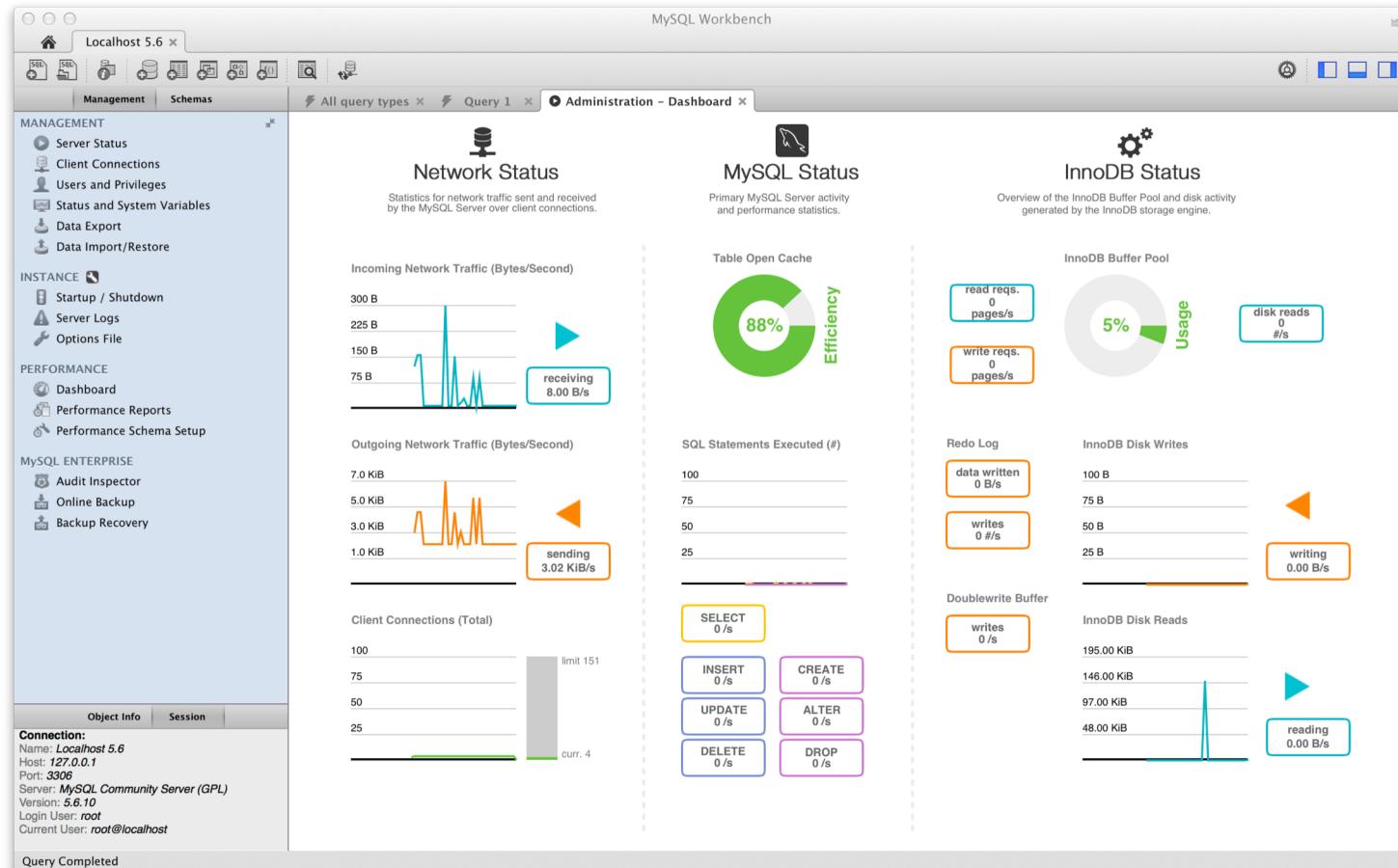
- Analytics Engine
- Data Warehouse and Star schema as dimension modelling
 - Which factor they can change to increase their profit or minimize loss

Customer



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Module 5



https://www.mysql.com/common/images/products/mysql_wb_performance_dashboard_osx.png

Database Performance

Goal of database performance is to execute queries as fast as possible

One of the main functions is to provide **timely** answers:

End users interact with the DBMS through the use of queries to generate information, using the following sequence:

1. End-user (client-end) application generates a query
2. Query is sent to the DBMS (server end)
3. DBMS (server end) executes the query
4. DBMS sends the resulting data set to the end-user (client-end) application

Database Performance-Tuning

Set of activities and procedures that reduce response time of database system

Fine-tuning the performance of a system requires a holistic approach

- All factors must operate at optimum level with minimal bottlenecks

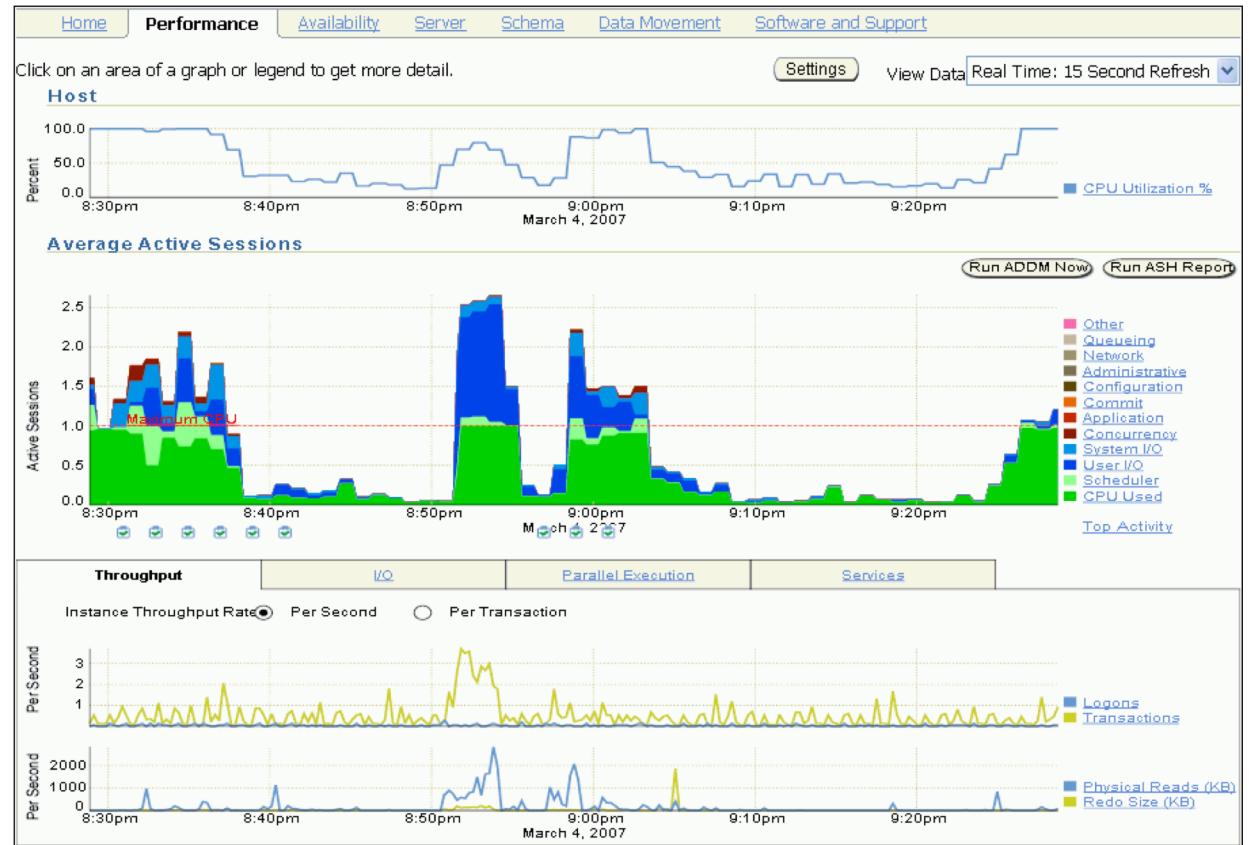


Image Source: https://docs.oracle.com/cd/B28359_01/server.111/b28275/tdppt_realtime.htm#TDPPT034

GENERAL GUIDELINES FOR BETTER SYSTEM PERFORMANCE

	SYSTEM RESOURCES	CLIENT	SERVER
Hardware	CPU	The fastest possible Dual-core CPU or higher "Virtualized Client desktop technologies could also be used."	The fastest possible Multiple processors (quad-core technology or higher) Cluster of networked computers "Virtualized server technology could be used"
	RAM	The maximum possible to avoid OS memory to disk swapping	The maximum possible to avoid OS memory to disk swapping
	Storage	Fast SATA/EIDE hard disk with sufficient free hard disk space Solid state drives (SSDs) for faster speed	Multiple high-speed, high-capacity disks Fast disk interface (SAS / SCSI / Firewire / Fibre Channel RAID configuration optimized for throughput Solid state drives (SSDs) for faster speed Separate disks for OS, DBMS, and data spaces
	Network	High-speed connection	High-speed connection
Software	Operating system (OS)	64-bit OS for larger address spaces Fine-tuned for best client application performance	64-bit OS for larger address spaces Fine-tuned for best server application performance
	Network	Fine-tuned for best throughput	Fine-tuned for best throughput
	Application	Optimize SQL in client application	Optimize DBMS server for best performance

Questions to Consider

- Does data management always require building a relational database or a NoSQL database?
- What technology/tool are used for storing huge volume of structured and unstructured data?
- Can we avoid building a data warehouse or data lake for a BI framework?

