Speaking Notes
Dr. Neubauer
Week 4

WHERE WE ARE

This is our fourth class meeting.
The material relates to chapter 3 of our textbook.
It also relates to my notions of convergent engineering of modern organizations and organizations of the future.

QUICK REVIEW FROM LAST WEEK

Computing hardware and software have evolved together since about 1960. This has indeed been an evolutionary process. It is a process of continually building upon existing resources and being constrained by past decisions. We are basically modeling computing resources in our own "image," regarding what we believe and understand about human brains and minds.

Administrators need to know enough about computers and networking to meaningfully participate in important decisions about the use of them in organizations. I believe in convergent design, meaning that social networks and computer networks need to be designed together to leverage the best combinations of natural intelligence and artificial intelligence.

Computers support business process in organizations and ERPs are better than collections of stovepipe applications because ERPs include databases that are shared among applications used within an organizations.

NEW MATERIAL THIS WEEK

SO, HOW DO COMPUTERS STORE DATA?

The review above sets up the discussion of data and databases.

"Datum" is the singular of "data."

A datum is a fact without context. Each of the following can be a datum.

- blue
- RZB 8421
- 1997
- Georgia
- medium
- Janet
- Nissan
- Smith
- Atlanta

- stolen
- April 14, 2020

A datum has no meaning because it has no context. Each of the items above has no meaning. Is "Georgia" a state or someone's name? All the entries above might appear in a database but have no practical value because they are data and not information.

Say that a state trooper (Sally) stops a speeding car to the side of a road in Griffin, Georgia and uses her mobile computing devices to "run a check" on the vehicle as she prepares to approach the driver of the speeding vehicle. "Running a check" is a BUSINESS PROCESS for the State Highway Patrol organization. They do it all the time, and the process is automated.

Sally opens the application on her mobile computer, enters the license plate number into a form and almost immediately learns that a blue 1997 Nissan was reported stolen in Atlanta, Georgia by its owner Janet Smith on April 14, 2020.

Whoa! This is not likely to be the usual, "What's your hurry, sir?" roadside conversation.

DATA in a database somewhere has been aggregated up into INFORMATION that is valuable in a context.

Information becomes knowledge in a human mind, and may save Sally's life, knowing that the person driving this vehicle may have stolen the vehicle in Atlanta and may be a dangerous person.

When Sally enters data into a form on her computer, the software application (probably running on a Windows operating system (OS) and a personal computer (PC) engages a wireless network to send request (formatted in Structured Query Language - SQL) to a database server "somewhere" running Oracle (or another database management system -- DMS) to "hit" a RELATIONAL DATABASE which then returns a set of structured data (information) back across the network to the PA and displays INFORMATION on the screen of Sally's computer.

The information enters Sally's mind and alerts her to the possible situation and becomes the basis of decisions she will make.

She may then immediately "call in backup" which might be automated as another BUSINESS PROCESS, available to happen at the click of a button.

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RELATIONAL DATABASE MANAGEMENT SYSTEMS (like Oracle) are very valuable to organizations. They help people like Sally make good decisions. They enable Amazon.com to keep track of what products are available, and how many are available. They help CarMax become the largest used car dealer in the world.

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When most people imagine a database they think of one huge table.

Many people think Microsoft Excel is a database**. It is not. It is a spreadsheet and it is designed to provide a different function.**

"Flat file databases" are very clumsy and inefficient.

Invoice Number	Invoice Date	Sales Person Name	Sales Person Phone	Produce Number	Product Name	Customer Name	Shipper Name
114	12/19/2003	Alice Smith	222-2323	84	executive desk	Ben Nice	Allen Lines
114	12/19/2003	Alice Smith	222-2323	88	side chair	Ben Nice	Trucks R Us
115	12/22/2003	Jim Hill	123-9898	84	executive desk	Jack Miles	Allen Lines

An office furniture store trying to keep records of its sales using the "database" above would soon run into major problems.

The following model is more in the spirit of a relational database. Alice owns a dog named Daisy. If Daisy dies and someone removes a line from the Pet table, information about Alice is not deleted (unless the DMBS is set up to remove owners with no pets).

Owner

OwnerId	**Name**	**Telephone**
1	Suzanne	555-1234
2	Henry	123-5555
3	Alice	125-1234

Pet

PetId	**OwnerId (fk)**	**Name**	**Species**	**Weight**
1	2	Rover	dog	15
2	3	Daisy	dog	12
3	1	Bob	cat	10
4	2	Fido	dog	12
5	1	Fuzzy	cat	8

CONCLUSIONS

Modern organizations run on data because data can be aggregated up into information using modern technologies, including database management systems.

Governments must deal with huge amounts of data because they have many needs for information.

Business process that run of stovepipe applications are limited because they maintain their own data collections.

ERP systems are good because many applications share one common relational database.

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Different kinds of databases are designed for different purposes. TRANSACTION PROCESSING SYSTEMS need databases that store "right now" data.

DECISION SUPPORT SYSTEMS require databases that store historic data and can answer questions like, "How many pairs of yellow sandals did all of our store locations in California in sell in 2016."