### CSE 5231 Software Engineering

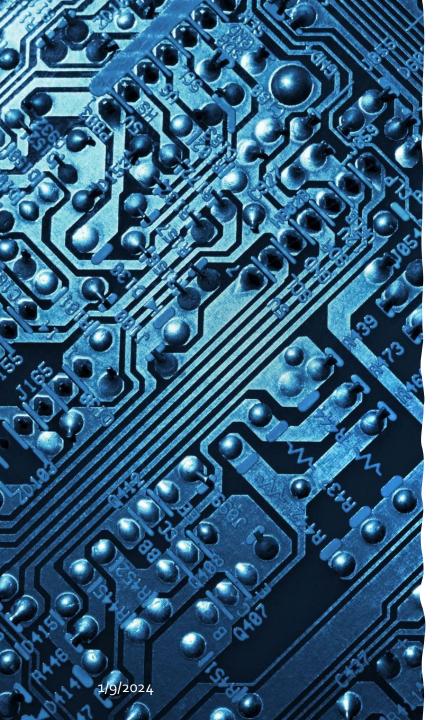
Introduction

Presented by:

Praveen Kumar

## Enterprise Software Engineering

- What are enterprise systems?
- What do they look like?
- What are they really supposed to do?
- What are they trying to achieve?
- What challenges do they encounter?
- How can you manage these challenges?



# Why Software Engineering?

- What is Engineering?
  - ➤ The branch of science concerned with the design, building, and use of engines, machines, and structures
- Share your experience what kinds of problems have you faced in building software?
- What is an enterprise?

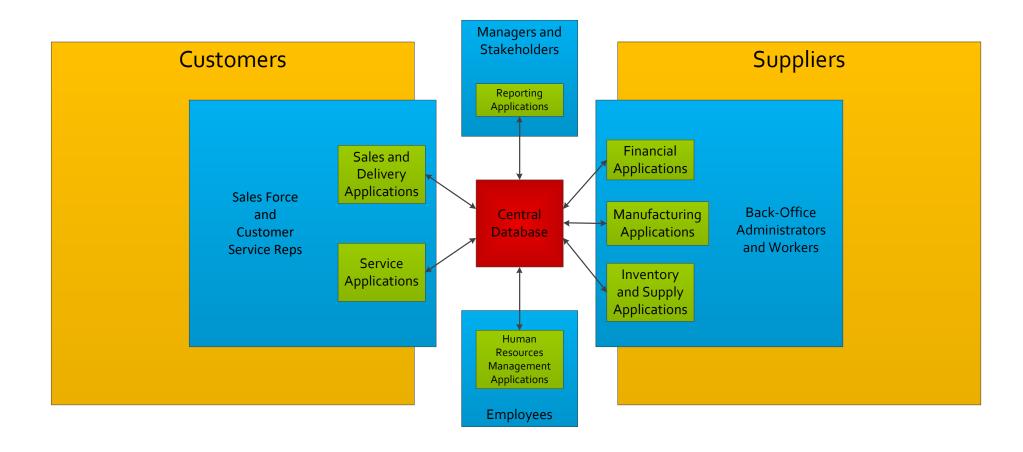
### What is an enterprise system?

### **Definition**

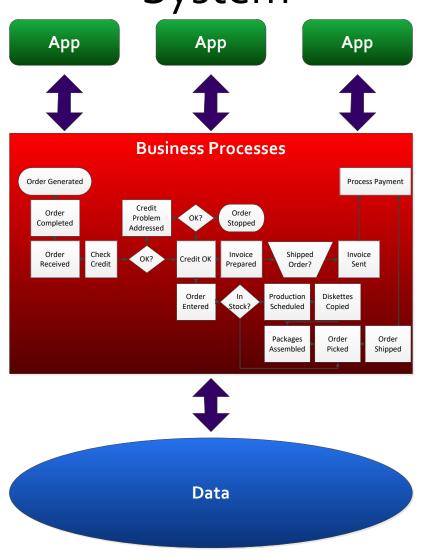
The software, processes, organizational structure, and people who interact within a business to provide business value.

## WHAT DO ENTERPRISE SYSTEMS LOOK LIKE?

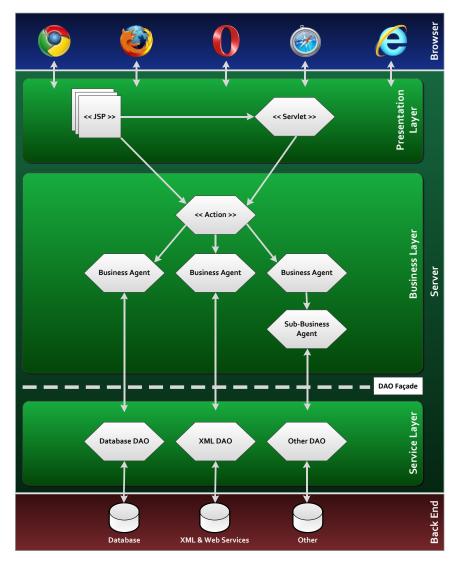
### A Conceptual View



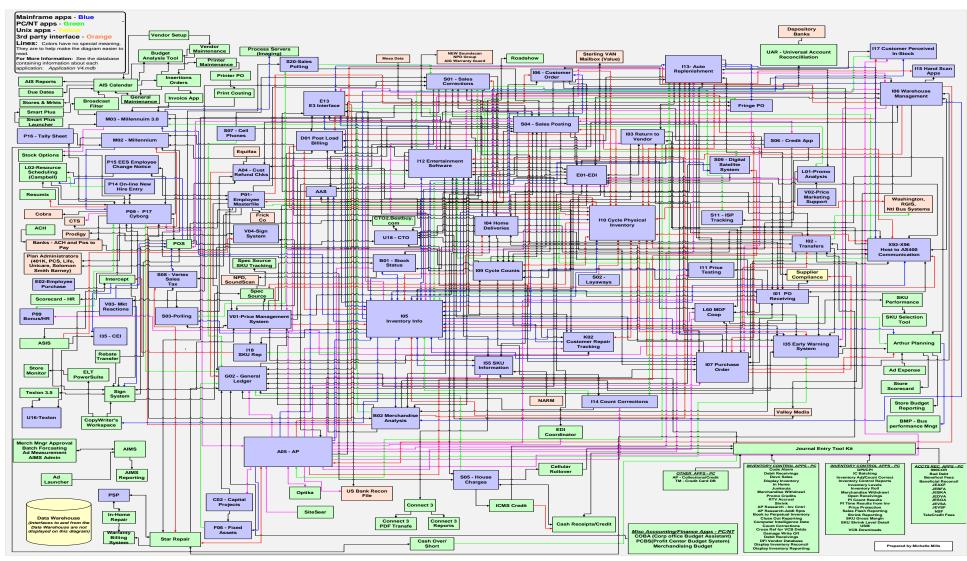
## Business Process View of an Enterprise System



## A 3-Tier View of an App



### Complexities in an Enterprise System



## The What and the How of Enterprise Systems?

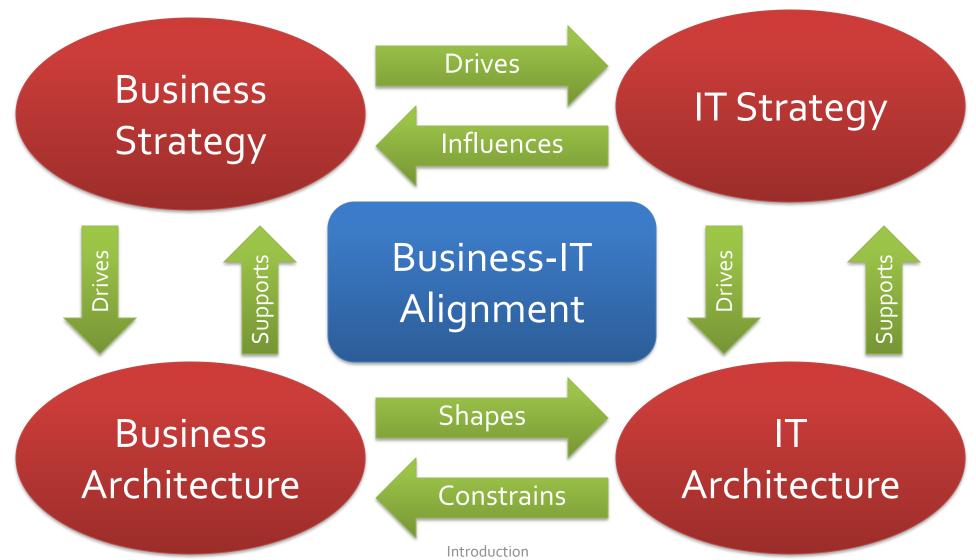
### **Functional Requirements**

- The *service* provided by the systems
- Work with the information component of all products and services
- Automate business processes
- Provide **support** services to manual processes
- Provide business intelligence to help the business adapt

### Non-Functional Requirements

- The quality of service provided by the system
- Must evolve as the business evolves
- Must be secure, scalable, high performing, usable, maintainable and always available

### Business-IT Alignment



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### Business-IT Alignment Challenges



## People Challenges



Process Challenges



Technical Challenges



Environmental Challenges

## People Challenges

**Business Culture** 





## Process Challenges

Requirements

Design

Implementation

Verification

Maintenance

Structured processes don't enable change.

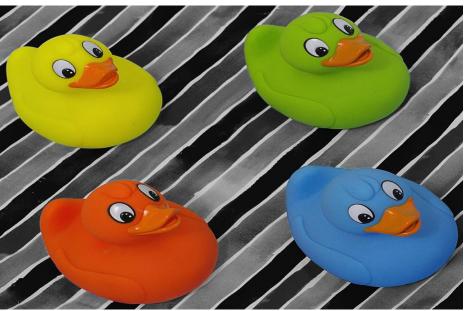
Change is necessary to evolve with the business.

Introduction

## **Technical Challenges**







### Technical Challenges Arise From Evolution

These challenges are **not by design**.

They come from the **evolved nature** of the system.



### **Environmental Challenges**

Nationwide used to provide standard insurance products.

These are **routine requests**.

Now they stay competitive by serving clients with special risks.

These are **non-routine requests.** 





## Addressing These Challenges - Frameworks

### **Frameworks**

Representations, principles and **techniques** capable of illustrating and **guiding practice** and **measuring performance**.

They accomplish this by defining and **framing complex problems**, as well as **evaluating solutions** to these problems.

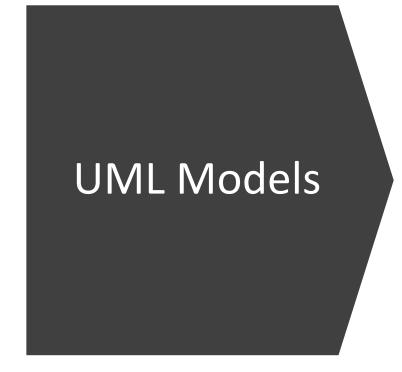
### **Equations of Motion**

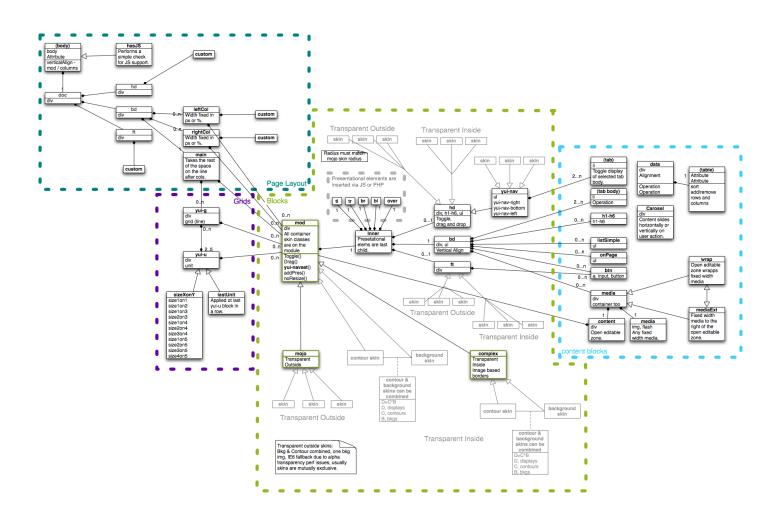
$$v = v_i + a\Delta t$$

$$s = s_i + v_i \Delta t + \frac{1}{2} a (\Delta t)^2$$

$$v^2 = v_i^2 + 2a(s - s_i)$$







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### What have we learned?

• What are enterprise systems and what do they look like?

• What are enterprise systems supposed to do?

• What are enterprise systems trying to achieve?

What are the four types of challenges posed to enterprise systems?

• How do we address these challenges?

How will we evaluate your learning for this course?

## Image Credits

### **People Challenges**

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#### **Process Challenges**

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