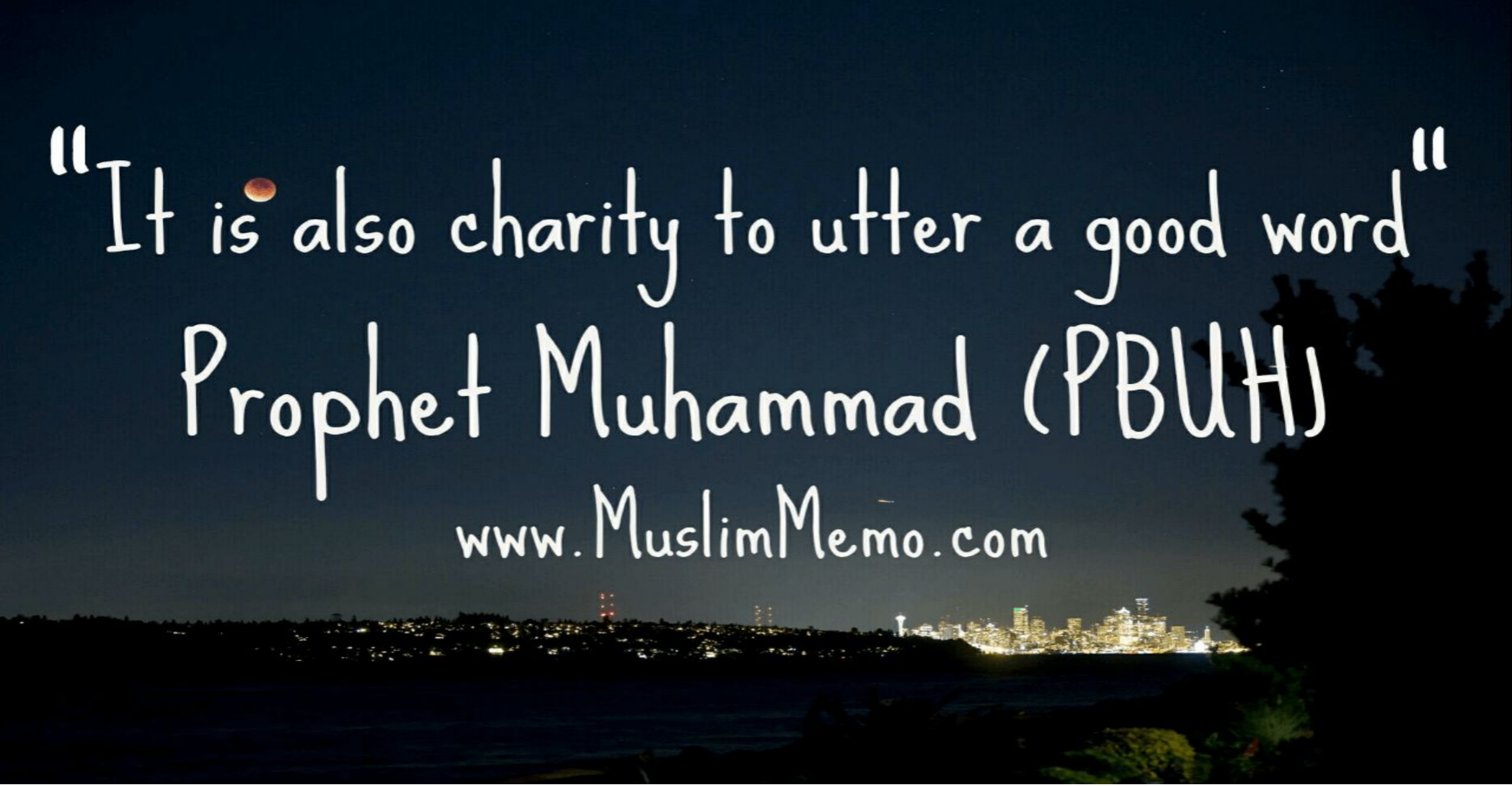
Business Process Engineering Week # 1

MOMNA ZANEB


"It is also charity to utter a good word"
Prophet Muhammad (PBUH)
www.MuslimMemo.com

Today's Agenda

- Introductory Session
- Course Objectives
- Learning Outcomes
- Administrative Items
- Fundamental Concepts
- Questions ?

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FSC – FAST , NUCES Lahore Campus

- M.S(SPM) – FAST , NUCES LHR
- BS (CS) PUCIT , Lahore

- Worked in Academia and Industry
  - **Software Quality Assurance**
  - **Software Testing**
  - **Professional Practices**
  - **Visual Programming**
  - **OOAD , ICT , LT**

- Research Interests:
  - *Software Engineering*
  - *Software Process improvements*
  - *Software Processes & Metrics.*

Course Objectives

- understand the fundamental concepts of business process engineering (how they can be improved and streamlined for optimum efficiency in terms of performance.).
- learn the skills and knowledge required for:
  - describing the lifecycle of a business process.
  - modelling a business process
  - Identifying business wastes
  - mapping them into a business model.
- learn the methodologies of business process improvement
- understand how a business process could be re-engineered

Tentative Course Contents

- Business Process – Basics, Origin, History and Evolution (Hierarchy of Business, Processes and BPE, The Difference between Functions and Processes)
- Components of a Business Process
- Business Process Management life cycle
- Business Process Modelling Techniques
- Business Process Improvement
- Business Outsourcing
- Business Process Re-engineering and improvement cases

Course Material

- Lecture Slides
- Handouts/Research Papers

Plagiarism Policy

- Any form of cheating in assignments, homework problems, quizzes, and exams will result in strict action.
- Plagiarism detection tools
- All the parties involved will be awarded Zero in the first instance.
- Repeat of the same offense will result in (F) grade.

Tentative Grading Policy *

- Class Participation 5%
- Project (in phases) 20%
- Quiz 10%
- Mid Term 25%
- Final 40%

What is a Process?

Process

- Processes are a set/series of logical instructions/actions/steps to be executed from start to end to achieve a particular goal.

What is a Business Process?

Business Process

According to Gartner:

- “An event-driven, end-to-end processing path that starts with a customer request and ends with a result for the customer. Business processes often cross departmental and even organizational boundaries.”

Business Process

- A business process is an activity or set of activities that can accomplish a specific organizational goal. Business processes should have purposeful goals, be as specific as possible and have consistent outcomes.

- Is "a collection of related, structured activities that produce a service or product that meet the needs of a client.

Introduction

The first ever business process

The earliest known definition of a business process comes from Scottish economist Adam Smith. Breaking down his idea to the simplest elements, in 1776 he described a business process in place at a theoretical pin factory, involving 18 separate people to make one pin

" One man draws out the wire, another straights it, a third cuts it, a fourth points it, a fifth grinds it at the top for receiving the head: to make the head requires two or three distinct operations: to put it on is a particular business, to whiten the pins is another and the important business of making a pin is, in this manner, divided into about eighteen distinct operations, which in some manufactories are all performed by distinct hands, though in others the same man will sometime perform two or three of them."

Why should we care about how many people it takes to make the pins, or how many steps are in the process? Well, Smith found that by creating a process and assigning the steps to individual specialists, the productivity is increased .

Importance of Business Processes

- Represent how processes are performed inside a company
- Help to measure the performance of a business process
- Help in hiring the right person for an efficient execution
- Enhance coordination among various stakeholders
- Improve a process by optimizing and/or automating using a software

Essential Attributes of a Business Process

- Repeatability
  - Everyday processes of a business
  - Totally part of an organization, whether they are visible to customers or not
  - Involve multiple defined inputs, which are affected by different factors, and contribute to the final output value
- Flexibility
  - Main processes are not changed or updated by businesses but still there is always room for improvement
  - Every business process should be flexible without affecting its stakeholders

Essential Attributes of a Business Process

- Specific
  - Should be well-defined by describing the start point, end point and the series of these steps.
  - Determine the individuals that perform in every step
  - Should decide the reason why a process is automated
- Measurable
  - Should be measurable in every part to identify which part of the process works well or not
  - Nothing can be better without measuring first
  - Helps in identifying which processes have more benefits due to business process automation

On a winter morning in 1907, Henry Ford took Charles E. Sorensen to Piquette Avenue Plant, an empty building in Detroit that would go on to become the birthplace of America's first mass-produced affordable car. "We're going to start a completely new job" he told the head of production.

The Piquette Avenue Plant in Detroit, Michigan. The site of the world's most influential business process implementation.

Ford idea for a new process

Ford explained his idea for a new process. Instead of one artisan creating a product alone, everyone was taught to do one of 84 simple, repetitive jobs. With this new approach to processes, Ford cut the manufacturing time of the Model T down from 12.5 hours to 2.5 hours.

Not only was that a triumph for Ford's bank account, it was one of the most revolutionary moments ever to occur, not just in the history of cars or manufacturing, but in the entire history of business.

Business Process Categorization

- Every business is different with the types of business processes varying depending on the business nature.
- A specific type of task could be a support process in one business and a core process in another.
- The output of a process and its contribution towards the business determine the type of business process.

Two major types : 1.Core 2.Support

Further categorizes includes

- Management processes
- Operational processes
- Supporting processes

Types of Business Processes

- Core Processes: How you deliver a value
  - Directly serve external clients and generate income
  - Also known as Primary Processes
  - How does my business generate value and make its income?
  - What does my business primarily do?
- Examples of Core Processes
  - Developing and creating a product or service
  - Marketing the product or service and conveying it to the buyer (for a marketing firm)
  - After–sales service and support also add value and are part of core processes (i.e. software maintenance team)

Types of Business Processes

- Supporting Processes
  - Support the management and operational processes. The company relies on these processes to prop up the planning and doing parts of the business. It's processes like tech support, employee onboarding or hiring an intern.
  - While these aren't what the company does to make money, they facilitate the main revenue stream and make it so the management processes have something to manage, and that the operational processes are as friction-free as possible.

Types of Business Processes

- Management Processes
  - Optimize income generation
  - Ensure the continued survival of the business as a whole
  - Involve planning, coordination, monitoring and control of core and support processes
  - Deal with opportunities and threats that could help or harm the business
  - Ensure meeting:
    - Regulatory compliance needs
    - Financial targets and budgets

Types of Business Processes

Support Processes: Making Value Delivery Possible

- Serve internal clients and do not generate income in themselves
- Make it possible to carry out core processes effectively

Example

- HR activities have nothing to do with customers, and they don't directly generate money, but without them the business couldn't function
- IT department doesn't directly generate money, but without the systems it oversees, the value-generation part couldn't function

Types of Business Processes

- Operational Processes
  - Operational processes concern your core business process. If your in a t-shirt company, one of your core operational processes is taking orders over the phone. Another would be getting manufactured t-shirts off to be shipped.
  - Whatever your business does at its core, there should be watertight processes in place to make your business scalable and efficient.

Types of Business Processes

An example of a management process might be a CEO planning out how best to organize the marketing team's time and energy for a PR launch campaign. The process part would be allocating resources, defining timeframes and checking that the systems are in place and optimized

The Problems Solved By Processes

In The Checklist Manifesto — a book we can't stop talking about — Atul Gawande talks about how he implemented a safety process at Johns Hopkins hospital.

It seemed simple, and it wasn't as cool as the other ideas they'd had, like robotic surgery. But in reality it was the most effective tool that could have been implemented, and it was just a sheet of paper.

Surveyed after the checklist's implementation, 78% of medical staff at the hospital said they noticed the checklist preventing an error. And, the ultimate proof: 93% of surgeons would want the checklist to be used on them if they were in the operating theatre undergoing surgery.

This is the process:

World Health Organization

SURGICAL SAFETY CHECKLIST (FIRST EDITION)

Before induction of anaesthesia ▸▸▸▸▸▸▸▸▸ Before skin incision ▸▸▸▸▸▸▸▸▸▸▸▸▸ Before patient leaves operating room

SIGN IN

☐ **PATIENT HAS CONFIRMED**
- IDENTITY
- SITE
- PROCEDURE
- CONSENT

☐ **SITE MARKED/NOT APPLICABLE**

☐ **ANAESTHESIA SAFETY CHECK COMPLETED**

☐ **PULSE OXIMETER ON PATIENT AND FUNCTIONING**

DOES PATIENT HAVE A:

KNOWN ALLERGY?
☐ NO
☐ YES

DIFFICULT AIRWAY/ASPIRATION RISK?
☐ NO
☐ YES, AND EQUIPMENT/ASSISTANCE AVAILABLE

RISK OF >500ML BLOOD LOSS (7ML/KG IN CHILDREN)?
☐ NO
☐ YES, AND ADEQUATE INTRAVENOUS ACCESS AND FLUIDS PLANNED

TIME OUT

☐ **CONFIRM ALL TEAM MEMBERS HAVE INTRODUCED THEMSELVES BY NAME AND ROLE**

☐ **SURGEON, ANAESTHESIA PROFESSIONAL AND NURSE VERBALLY CONFIRM**
- PATIENT
- SITE
- PROCEDURE

ANTICIPATED CRITICAL EVENTS

☐ **SURGEON REVIEWS:** WHAT ARE THE CRITICAL OR UNEXPECTED STEPS, OPERATIVE DURATION, ANTICIPATED BLOOD LOSS?

☐ **ANAESTHESIA TEAM REVIEWS:** ARE THERE ANY PATIENT-SPECIFIC CONCERNS?

☐ **NURSING TEAM REVIEWS:** HAS STERILITY (INCLUDING INDICATOR RESULTS) BEEN CONFIRMED? ARE THERE EQUIPMENT ISSUES OR ANY CONCERNS?

HAS ANTIBIOTIC PROPHYLAXIS BEEN GIVEN WITHIN THE LAST 60 MINUTES?
☐ YES
☐ NOT APPLICABLE

IS ESSENTIAL IMAGING DISPLAYED?
☐ YES
☐ NOT APPLICABLE

SIGN OUT

NURSE VERBALLY CONFIRMS WITH THE TEAM:

☐ **THE NAME OF THE PROCEDURE RECORDED**

☐ **THAT INSTRUMENT, SPONGE AND NEEDLE COUNTS ARE CORRECT** (OR NOT APPLICABLE)

☐ **HOW THE SPECIMEN IS LABELLED** (INCLUDING PATIENT NAME)

☐ **WHETHER THERE ARE ANY EQUIPMENT PROBLEMS TO BE ADDRESSED**

☐ **SURGEON, ANAESTHESIA PROFESSIONAL AND NURSE REVIEW THE KEY CONCERNS FOR RECOVERY AND MANAGEMENT OF THIS PATIENT**

This next example is a more tangible, disastrous one. On the morning of the hottest day of the year — July 17, 1865 — two trains packed mostly with children collided in Whitemarsh Township, Pennsylvania, killing around 60 and injuring over 100.

A painting of The Great Train Wreck of 1856 by an unknown artist

The cause? Wikipedia has it listed as ‘human error’.
The trains were pulling far more carriages than they could handle, meaning the drivers had to stop periodically to regain the engine pressure they needed to continue. With this erratic behavior, the train wasn’t on schedule and didn’t communicate that to the surrounding stations.
The driver thought he could make up for lost time and stay on schedule, so he gunned the engine, taking an alternative track and thinking that he’d be clear of the Aramingo, another train pulling out of Wissahickon around the same time.

On a blind bend, the boilers of the two trains impacted and caused an explosion heard up to 5 miles away. The three carriages closest to the boilers were blown to splinters, and the rest caught fire and derailed.

In response to this disaster, North Pennsylvania Railroad adjusted their processes. They ruled that no two trains traveling in two directions will share the same track, and telegram communication with nearby stations was made mandatory.

Examples of Business Processes

1. Order-to-cash
2. Quote-to-order
3. Procure-to-pay
4. Issue-to-resolution
5. Application-to-approval (document approval)

A business process is an activity or set of activities that can accomplish a specific organizational goal. Business processes should have purposeful goals, be as specific as possible and have consistent outcomes.

IS "A COLLECTION OF RELATED, STRUCTURED ACTIVITIES THAT PRODUCE A SERVICE OR PRODUCT THAT MEET THE NEEDS OF A CLIENT.

Business Process Engineering

Why do we need Business Process Engineering?

The field of business engineering developed primarily to fill the gap between the management and technical or administrative teams within a company.

Management may have difficulty translating their plans to technical teams, who may in turn find it challenging to develop products and solutions to carry out these plans in the real world.

Business Process Engineering

Business engineering acts as a bridge between these two areas, and is designed to help a company not only develop effective goals, but also techniques for carrying out these goals as efficiently as possible. This may require changes in every area of the company, from marketing to administration, to computer systems

Unique aspect of BPE

Another unique aspect of the business engineering field is that it can be applied to a company at any stage of development.

Individuals who wish to form a new business can use these principles to select the best product or market, or to refine an existing idea.

It can also be used to **improve an existing business**. This may mean **increasing profit or cutting cost**, but it can also refer to improving **employee satisfaction** or retention rates.

This process may involve making small changing or incorporating new technologies, or may require a complete redesign of the company and all its processes.

Business Process Engineering and Software Engineering

In many software engineering methods approaches to requirements engineering involve a detailed modeling of different aspects such as system structure data or behavior these models are an essential means of communication between system developers and expert users

Business Process Engineering and Software Engineering

Furthermore they are the basis from which system design and implementation are derived in later stages of the development process

As the quality of requirements specifications is a decisive factor for software quality and correction costs day by day much effort is usually spent on system modeling in the early stages of the software development process.

Business Process Engineering and Software Engineering

However, the models developed quite often only aim at providing the system developer with a better understanding of the system to be developed rather than producing a set of unambiguous consistent and semantically integrated documents, which support an at least half automated derivation of subsequent results in the development process such as design or implementation documents thus the high effort spent on modeling is often not used efficiently.

Business Process Engineering and Software Engineering

1. **Process Automation:**
    1. BPE involves analyzing and optimizing business processes for efficiency and effectiveness.
    2. Software Engineering plays a crucial role in automating and implementing these optimized processes through the development of software solutions. Workflow automation, through the creation of custom software applications, helps in streamlining and managing business processes.
2. **System Integration:**
    1. BPE often requires integrating various systems and technologies to ensure seamless business operations.
    2. Software engineers design and implement integration solutions, connecting different software applications and systems to work together harmoniously. This integration helps in achieving a cohesive and efficient business environment.
3. **Custom Software Development:**

- BPE may identify the need for custom software solutions to address specific business process requirements.
- Software engineers are responsible for designing, developing, and maintaining these custom software applications tailored to meet the needs of the optimized business processes identified in BPE.

Business Process Engineering and Software Engineering

4. Continuous Improvement:

- Both fields share a common goal of continuous improvement. BPE focuses on optimizing business processes over time, while Software Engineering follows agile methodologies and DevOps practices to iteratively improve and enhance software systems.

5. Data Analysis and Decision Support:

- BPE often involves data analysis to identify bottlenecks and areas for improvement in business processes.
- Software engineering plays a role in developing data analytics tools and decision support systems that facilitate informed decision-making based on the insights gained from the analyzed data.

6. Change Management:

- BPE and Software Engineering both require effective change management strategies when implementing new processes or software solutions.
- Professionals in both fields collaborate to ensure a smooth transition, addressing issues related to user adoption, training, and communication.

Business Processes – Historical Perspective

Hundreds of years ago, work was the domain of each individual

- They completed all parts of the end-to-end process
- They researched, created, sold and distributed their products

Drawbacks

- Variations in the quality of produced/manufactured product
- Least productive
- Expensive
- Person dependent

Division of Labour

In 1776, Adam Smith wrote a book "The Wealth of Nations" and introduced the world to the Industrial Revolution

He defined the concept of "Division of Labour" similar to what is known as function today

Smith explained the concept with an example of making metal pins:

> "Each person making a 10^{th} part of 48,000 pins might be considered as making 48,000 pins in a day. But if they had all wrought separately and independently, and without any of them having been educated to this peculiar business, they certainly could not each of them have made 20, perhaps not 1 pin in a day."

Division of Labour & Business Process

Adam Smith's definition of 'Division of Labour' formed the basis of modern day working methodology

Functions are designed to complete specific tasks

As companies, products and marketplaces became more complex and segmented, there is a need to have more complex and specialized functions within organizations

Organizations face challenges to manage the flow of work across functional specialties

Business Processes need to be defined properly to represent the functional specialties

Industrial Revolution (1760-1840)

- Era of transition from the traditional hand based manufacturing to machines
- New chemical manufacturing and iron production processes were introduced
- Increased usage of steam power and water power for industrial processes
- Development of machine tools gave rise to mechanized factory system
- Business Processes need to be defined properly to represent the manufacturing and industrial processes

Scientific Management

- In 1911, Frederick Winslow Taylor published "The Principles of Scientific Management" for the American Society of Mechanical Engineers
- Taylor advocated "enforced standardization of methods, enforced adoption of the best implements and working conditions, and enforced cooperation" in order to improve efficiency
- Taylor's focus was on scientific study of work, standardization of process, systematic training and sound structure of employees and management.
- The work was hugely unpopular with workers
- Taylor's work laid foundation for modern industrial engineering

Assembly Belts and Statistical Process Controls

- An assembly line production was used to produce the first affordable automobile, Ford Model T, by Ford Motor Company in 1908
- In 1913, Henry Ford introduced moving assembly belts into plants producing Model T cars to increase efficiency
- By 1916, the car costed less than half than it was in 1908
- In 1920, Walter A. Shewhart at Bell Laboratories pioneered the use of Statistical Process Control to detect and prevent manufacturing issues before they could become problems.

Questions?