Concept 1 of 6: Business Processes

BBT 3104: Advanced Database Systems
Week 1 of 13
April 2020

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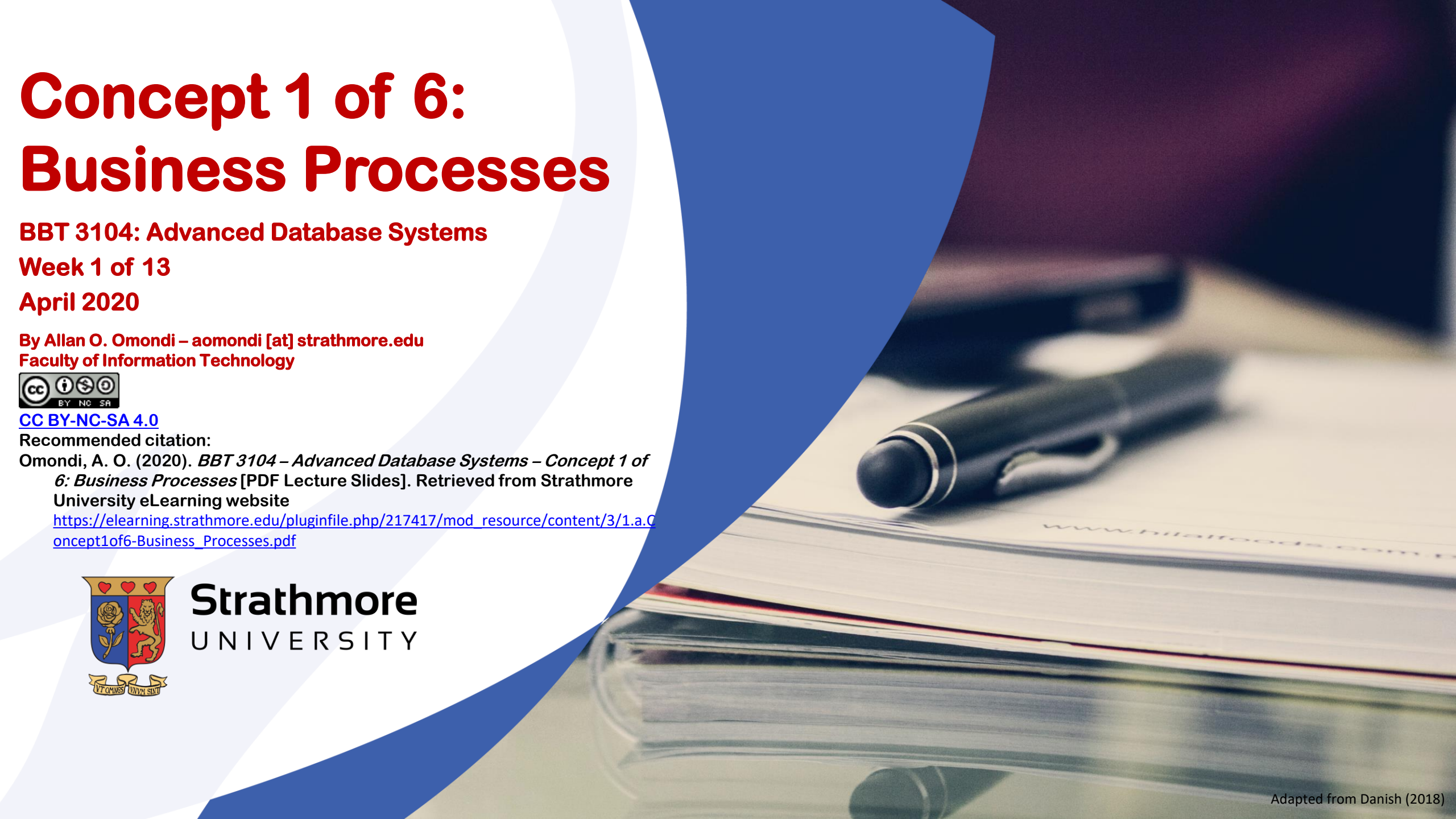

Adapted from Danish (2018)

Concept 1 of 6: Business Processes

BBT 3104: Advanced Database Systems
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Presentation Outline

- ✓ Value Chains
  - Michael Porter
  - Porter's Value Chain Diagram
  - Primary Functions
  - Support Functions
  - Value Systems
  - Activity 1: Business Idea Narrative based on Porter's Value Chain
- ✓ Business Processes
  - Coordination
  - Case Study of Zambikes Limited
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  - SOP Constraints
  - Activity 2: Business Process Identification
- ✓ Value-Added Analysis
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  - Class Discussion on Value Classification of IT Troubleshooting
  - Waste Elimination
  - Case Study on Qantas Freight
  - Activity 3: Value Classification
- ✓ Root Cause Analysis
  - Cause-and-Effect Diagrams
  - Activity 4: Identification of a -ve Effect related to NVA activities
  - Why-Why Diagrams
  - Activity 5: An IT-Based Solution to Reduce/Eliminate the Root Cause
- ✓ IT-Enabled Business Transformation
- ✓ Problem-Based Learning: Group Project

Value Chains: Michael Porter

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- The concept of a value chain was developed by Professor Michael Porter in 1985
- Click here to read Michael Porter's biography and here to see his research publications
- Value chains were developed to organize high-level business functions and to relate them to each other thus providing an understanding of how a business operates

Value Chains: Porter's Value Chain Diagram

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- **The value chain of a business subsumes (includes) all activities that the business conducts to fulfil its business goals. It can be represented in form of a diagram:**

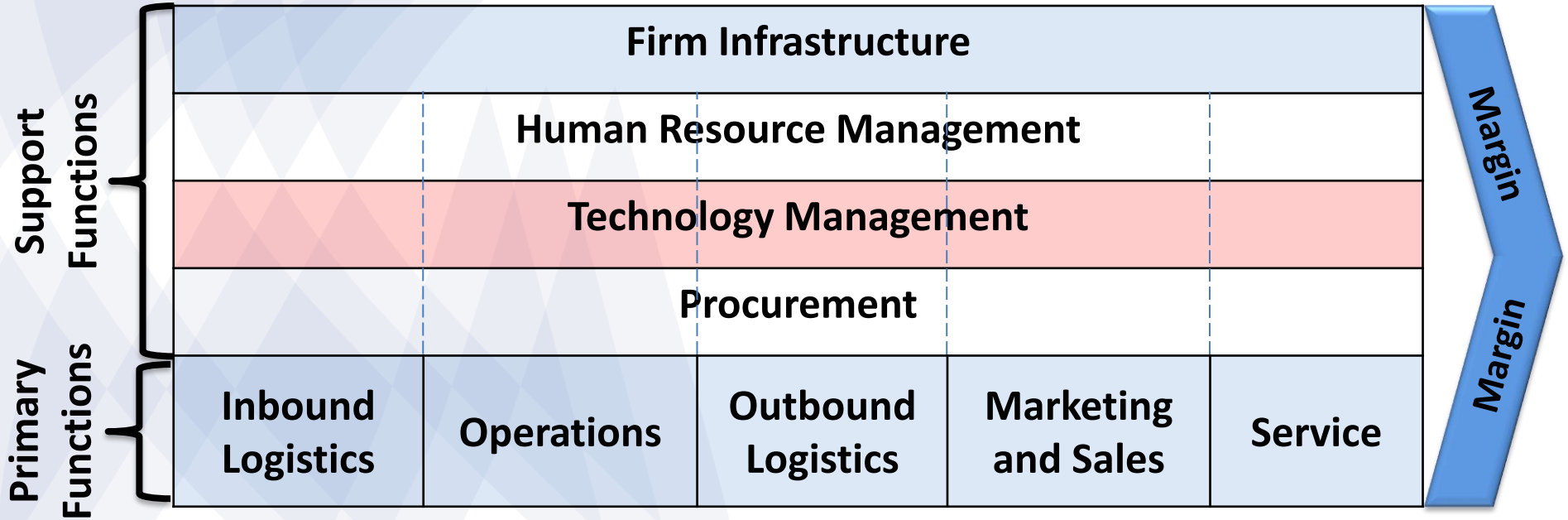

Figure 1: Porter's value chain diagram

Adapted from Johnson et al. (2008)

Value Chains: Porter's Value Chain Diagram

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- The primary functions contribute directly to the competitive advantage of the business
- The secondary functions provide the environment in which the primary functions can be performed efficiently and effectively

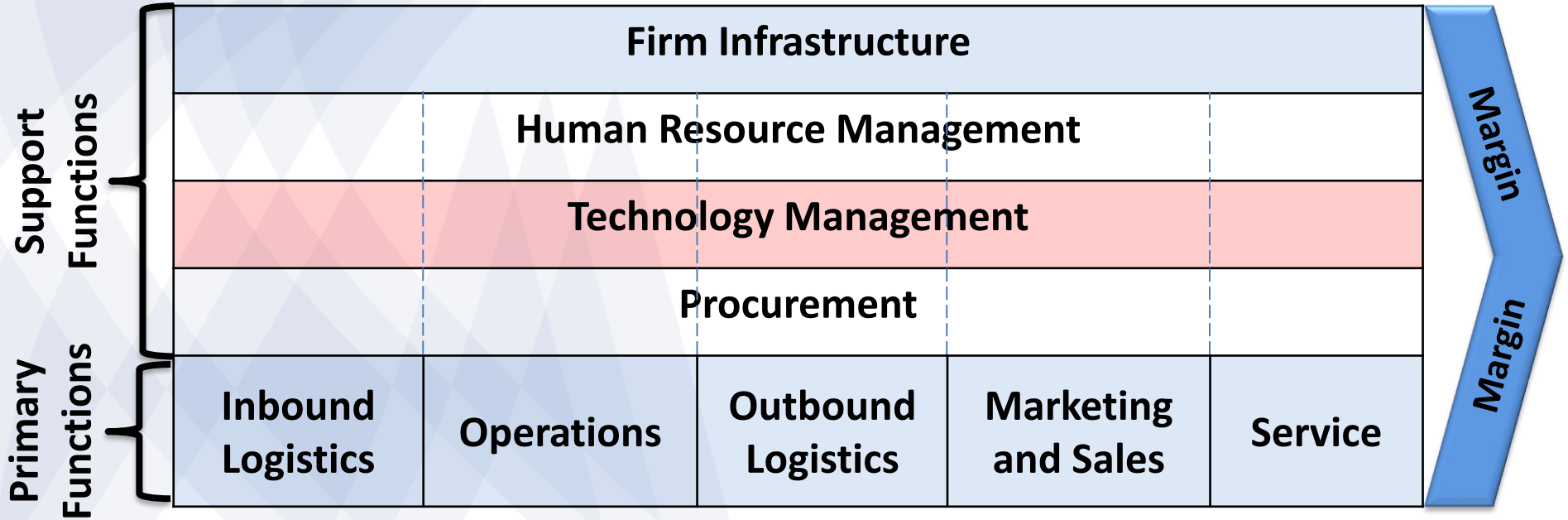

Figure 1: Porter's value chain diagram

Adapted from Johnson et al. (2008)

Value Chains: Primary Functions

- **Inbound Logistics** – involve relationships with suppliers and include all the activities required to receive, store, and disseminate inputs
- **Operations** – all the activities required to transform inputs into outputs (products or services)
- **Outbound Logistics** – all the activities required to collect, store, and distribute the output
- **Marketing and Sales** – activities that inform buyers about products or services, induce buyers to purchase them, and facilitate their purchase
- **Service** – includes all the activities required to keep the product or service working effectively for the buyer after it is sold and delivered

Value Chains: Support Functions

- **Procurement** – the acquisition of inputs, or resources, for the business
- **Human resource management** – consists of all activities involved in recruiting, hiring, training, developing, compensating and (if necessary) dismissing or laying off personnel
- **Technological development** – pertains to the information technology (hardware, software, database, procedures, and networks) and technical knowledge acquired to support the business' transformation of inputs into outputs
- **Firm Infrastructure** – serves the business' needs and ties its various parts together. It consists of functions/departments such as accounting, legal, finance, planning, public affairs, quality assurance and general management

Value Chains: Value Systems

- Businesses cooperate with each other in order to fulfil their business goals
- The ecology of the value chains of cooperating businesses is called a value system
- Value systems provide a high-level characterization of the relationship of a particular enterprise to its business environment
- A value system consists of a number of value chains, each of which is associated with 1 business

Value Chains: Value Systems

- An example of a value system:

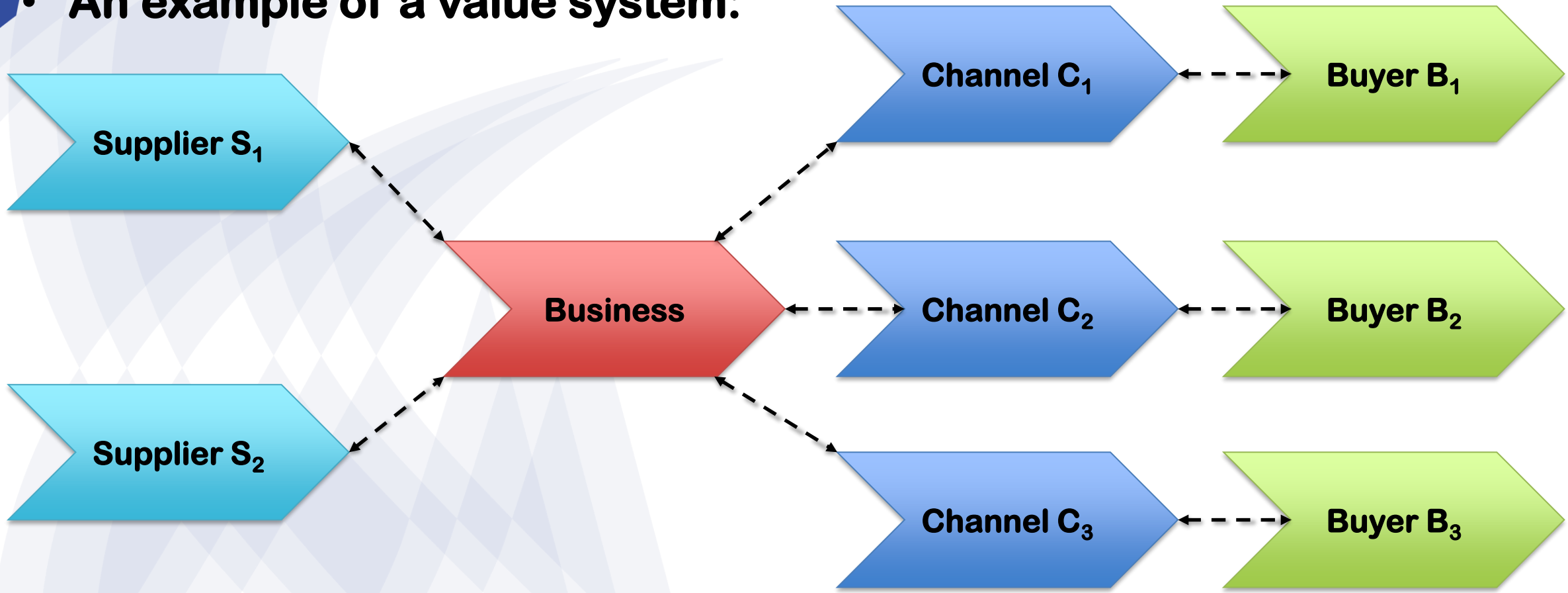

Figure 2: A value system
Adapted from Weske (2007)

Activity 1: Business Idea Narrative based on Porter's Value Chain

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- In groups of 3, identify a business idea and collaborate to create a narrative explaining each section of the business' individual value chain involved in producing its most valuable product or service.
- Post the following on this eLearning class discussion forum as one post per group:
  - The name of the business
  - The name of the team members and their positions in the business
  - A narrative explaining each section of the business' individual value chain. Use Porter's Value Chain as a guideline.
- Approximate time required (outside class activity): 30 minutes

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Business Processes

- The creation of products or services that are of value involves the execution of a number of activities that can be grouped together to form a business process

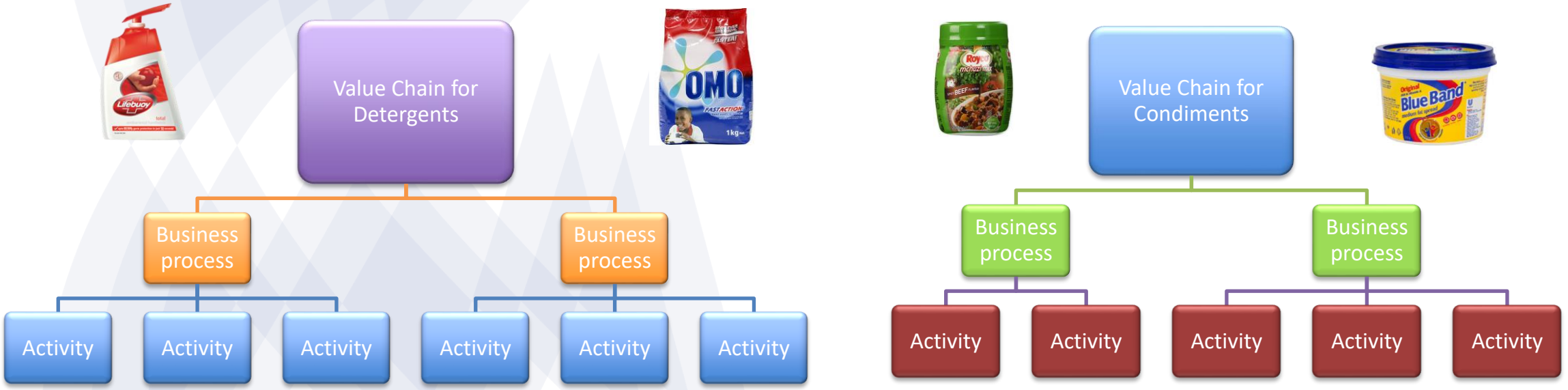

Figure 3: Sample business processes

Business Processes: Coordination

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- A business process consists of activities that are performed in coordination in an organizational environment
- These activities jointly realize a business goal
- The ordering of activities in a business process can be controlled by a business process management system as a centralized software component

Business Processes: Coordination

- **The centralized control is similar to a conductor who controls musicians in an orchestra**

Figure 4: Orchestra conductor
Adapted from Santos (2019)

Business Processes: Case Study of Zambikes Limited

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- **Case Study of Zambikes Limited produced by Enterprise Systems Education for Africa (ESEFA)**

Video 1: Case Study of Zambikes Limited

URL: https://www.youtube.com/watch?v=cm-PhEliyIQ

Adapted from Enterprise Systems Education for Africa (ESEFA) (2015)

Class Discussion of Zambikes Ltd.

- What products/services of value does Zambikes Ltd. produce?
- Describe the value chain for the products that Zambikes Ltd. produces
- What are the business processes involved in the value chain of Zambikes Ltd.?
- What are the potential causes of poor performance?
- What are the possible interventions that can be implemented to benefit the customers and the business?
- Approximate time required: 25 minutes

Business Processes: Case Study of Zambikes Limited

- **Ordering process to process incoming orders at Zambikes Limited**

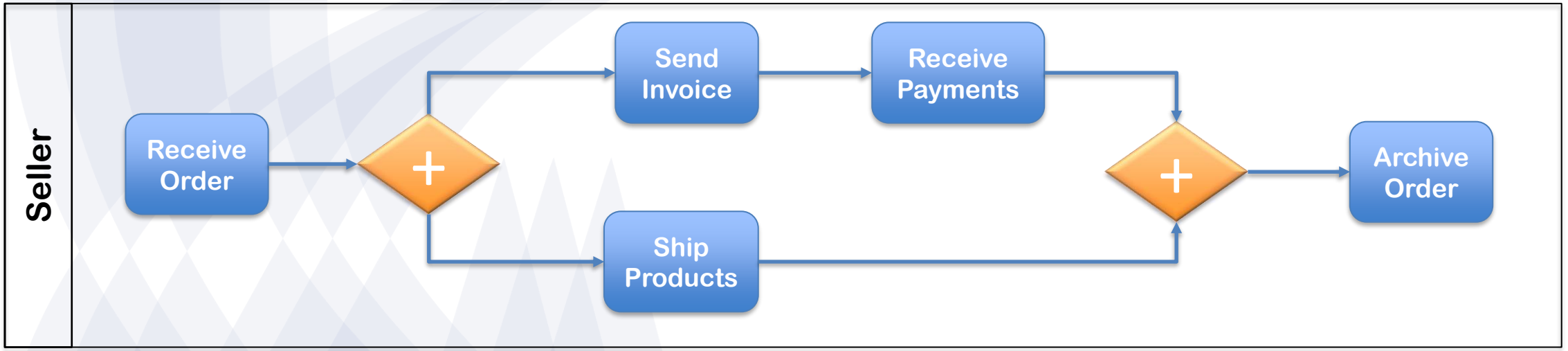

Figure 5: Ordering process of a seller

Adapted from Weske (2007)

Business Processes: Case Study of Zambikes Limited

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- **Buying process of a buyer buying from Zambikes Limited**

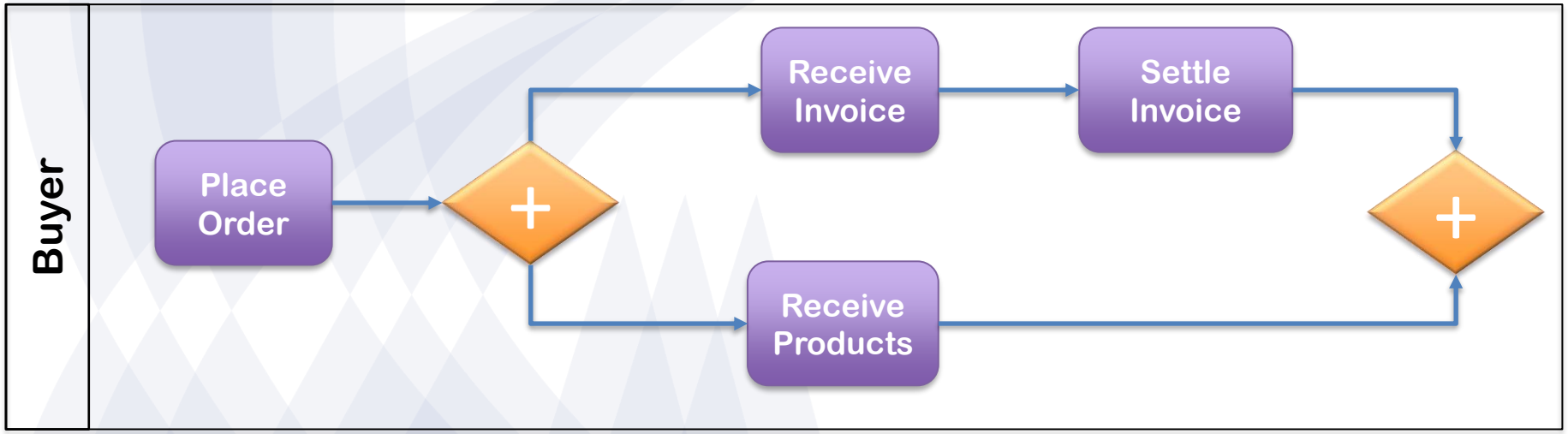

Figure 6: Buying process of a buyer
Adapted from Weske (2007)

Business Processes: Process Choreography

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- Each business process is enacted in a single organization however, it may interact with business processes performed by other organizations
- For example, the ordering business process and the buying business process can interact as follows:

Business Processes: Process Choreography

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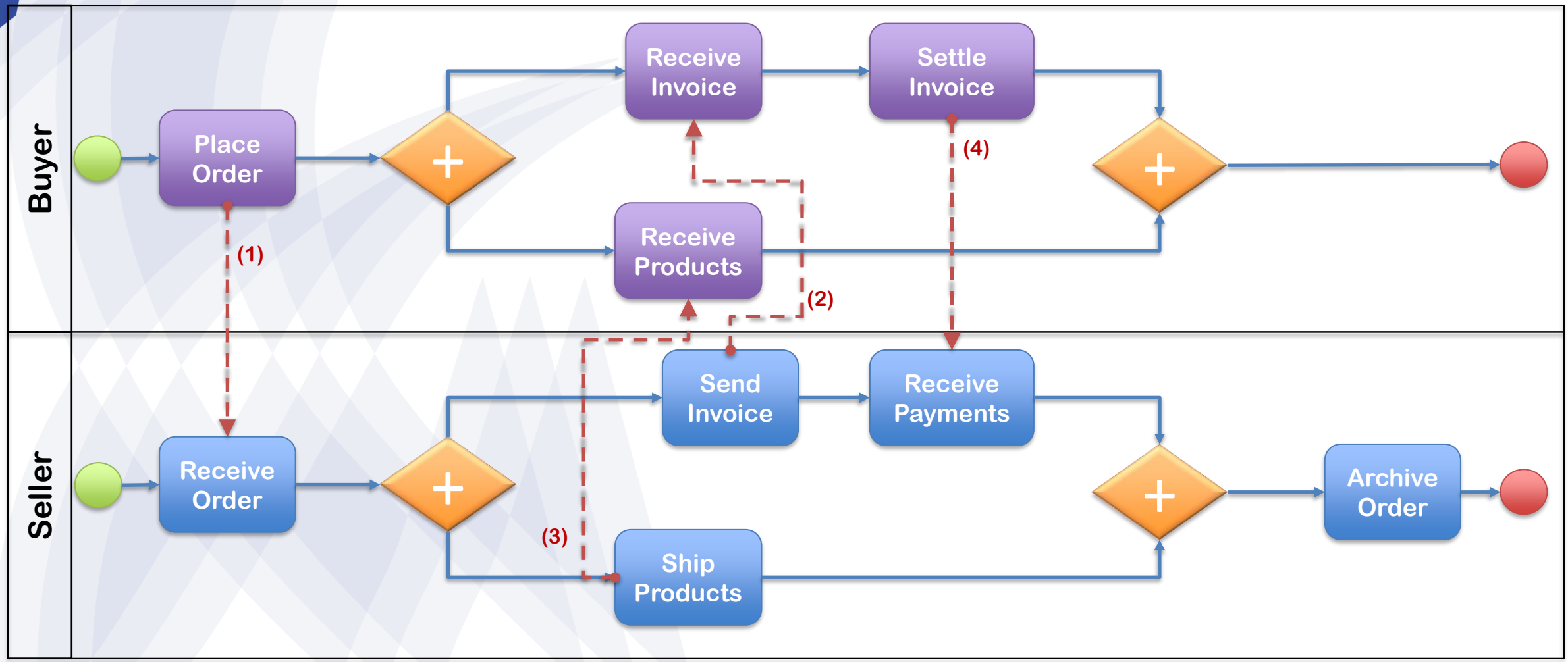

Figure 7: Integrated business processes of a buyer and a seller

Adapted from Weske (2007)

Business Processes: Process Choreography

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- The interactions of a set of business processes are specified in a process choreography
- The term choreography indicates the absence of a central agent that controls the activities in the business process involved
- In order to realize correct interactions, the interacting business processes need to agree on a common choreography before they start interacting
- Analogy:
  - Acrobats agreeing on a common choreography before the performance starts
  - During the performance, each acrobat behaves autonomously but in line with his/her part in the choreography

Business Processes: SOP Constraints

- Different businesses also have different pre-determine rules specified in a Standard Operating Procedure (SOP) document
- For example, a different seller may decide not to ship products before they receive the client's full payment for the product
- The business process of such a seller can be represented as follows:

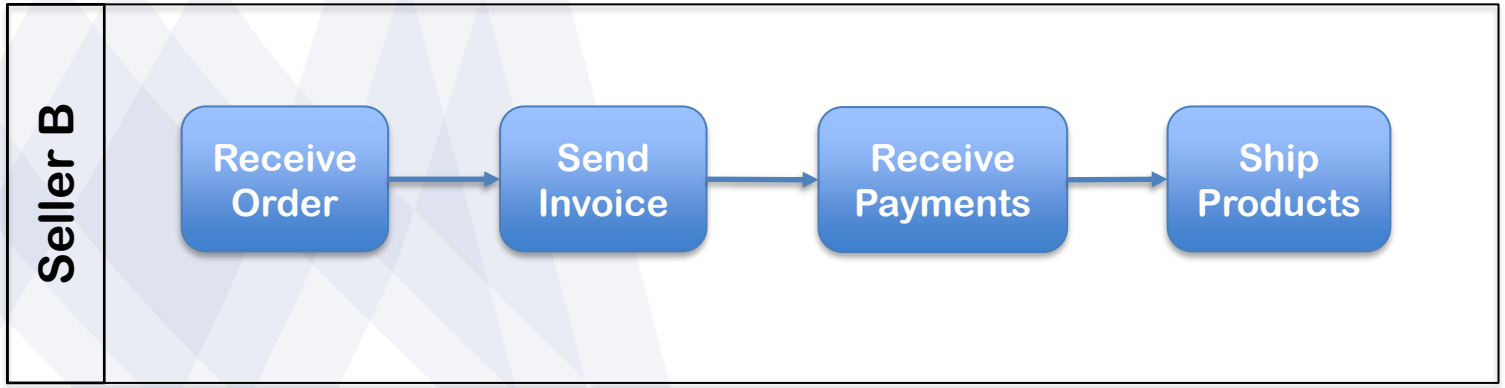

Figure 8: Business process constrained by an SOP
Adapted from Weske (2007)

Activity 2: Business Process Identification

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- In groups of 3, identify all the business processes involved in the value chain of your business idea
- Represent each individual business process in form of a diagram (one diagram per business process)
- Represent the interactions between the business processes in form of a single diagram
- **Post** (one post per group) the individual business processes and the interacting business process on this eLearning class discussion forum as a reply to your previous post on the business idea narrative
- **Approximate time required (outside class activity): 45 minutes**

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Value Added Analysis

- Value-Added analysis involves decomposing business processes into specific activities with the aim of identifying unnecessary steps (value classification stage) to eliminate them (waste elimination stage)

Value-Added Analysis: Value Classification

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- **Value classification involves:**
  - **Step I:** Identify specific activities in a business process by observation and interviewing
  - **Step II:** Identify the beneficiary of the process and the positive outcomes that the beneficiary seeks from the business process
  - **Step III:** Analyse each activity in terms of the value it adds for the beneficiary by classifying it into specific categories

Value-Added Analysis: Value Classification

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- The category can be either one of the following:
  - Value-Adding (VA): Produces value for the customer. The key questions to ask is "Would the customer be willing to pay for this activity?"
  - Business Value-Adding (BVA): These are required for the business to run smoothly or due to the regulatory environment of the business, e.g. legal requirements, control steps, steps imposed by accounting, etc.
  - Non-Value Adding (NVA): When the step cannot be classified as VA or BVA, then it is a non-value adding step, e.g. handover steps
- Note that classification into either VA, BVA, or NVA is, to some extent, subjective and depends on the context

Class Discussion on Value Classification of IT Troubleshooting

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- Classify each of the following activities involved in an IT Troubleshooting process as either VA, BVA, or NVA:
  - ❑ Step 1: Transport the IT practitioner to the client's workstation in the company's branch
  - ❑ Step 2: Transport the IT practitioner and the client's device to the IT workshop at the company's HQ
  - ❑ Step 3: Identify the problem with the client's device
  - ❑ Step 4: Establish a theory of probable cause
  - ❑ Step 5: Test the theory to determine the cause
  - ❑ Step 6: Establish a plan of action
  - ❑ Step 7: Wait for approval from the IT manager at the HQ before implementing the proposed plan of action
  - ❑ Step 8: Implement the solution

Class Discussion on Value Classification of IT Troubleshooting

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- ❑ Step 9: Verify full system functionality and, if applicable, implement preventive measures
- ❑ Step 10: Document the findings, actions, and outcomes
- ❑ Step 11: Install the latest version of VLC Media Player
- ❑ Step 12: Transport the client's device back to his/her workstation at the company's branch

- Approximate time required (inside class activity): 10 minutes

Value-Added Analysis: Waste Elimination

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- NVA steps (wastes) should be minimized or eliminated
- Sources of waste in a business process include:
  - Unnecessary transportation
  - Too much inventory (large work-in-process) → High cost of warehousing
  - Waiting time between activities
  - Over-processing: Performing what is not yet needed or might not be needed
  - Over-production
  - Defects: Link to example
  - Resource underutilization: idle resources

Value-Added Analysis: Waste Elimination

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- **There are various ways to eliminate waste in a business process.**

  For example:

  - **Eliminating the need for approvals**
  - **Eliminating the need for transportation by ensuring the manufacturing plant has all the resources it needs nearby in one place**
  - **Implementation of Computer-Based Information Systems: This is where the Advanced Database Systems unit finally comes in for a BBIT student! It can involve the development of a computer-based information system which requires the storage of the right data and the retrieval of the right information by the right employee and at the right time**

Value-Added Analysis: Case Study on Qantas Freight

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Video 2: Case Study of Qantas Freight

URL: https://www.youtube.com/watch?v=M6qMni7dEDo&feature=youtu.be

Adapted from IBM Australia and New Zealand (2014)

Activity 3: Value Classification

- In groups of 3, pick one business process from your business idea and outline all the activities involved in the business process
- Classify each activity as either VA, BVA, or NVA
- **Post** (one post per group) the name of the business process chosen, the list of activities in the business process and the value classification of each activity on **this** eLearning class discussion forum as a reply to your previous post on the business process diagram
- **Approximate time required (outside class activity): 15 minutes**

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Root Cause Analysis

- Root cause analysis is a critical component of problem solving
- If you do not treat the root cause(s) of a problem, it is likely that the problem will not go away
- By treating symptoms, the problem often manifests itself differently, offering a new set of symptoms
- For example, taking paracetamol (only) to stop the headache caused by malaria. Too much paracetamol can cause nausea and vomiting.

Root Cause Analysis

- Even "good" business processes can be made better. There is ALWAYS room for improvement.
- Root-Cause analysis presents a family of techniques designed to help analysts identify and understand the root cause(s) of problems or undesirable events
- Two techniques used to document the ideas generated during root cause analysis interviews and workshops are:
  - Cause-and-Effect/Fishbone/Ishikawa Diagrams
  - Why-Why Diagrams

Root Cause Analysis: Cause-and-Effect Diagrams

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- Cause-and-Effect diagrams depict the relationship between a given negative effect and its causes
- These causes can be either:
  - Causal: Causes that, if corrected, eliminated, or avoided, would prevent the issue from occurring
  - Contributing: These increase the chances of a given issue occurring. For example, an inefficient user-interface (UI) with no date-picker can contribute towards the effect of inaccurate data

Root Cause Analysis: Cause-and-Effect Diagrams

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- The steps to be followed when conducting root cause analysis include:
  - Step I: Brainstorming – Each member is asked, "What is the cause?"
  - Step II: Classify the causes into categories
  - Step III: Discussion continues based on classification of causes into categories
- The categories can be presented in form of the 4 Ps or 4 Ms (or both) or in form of what makes sense for the problem under discussion

Root Cause Analysis: Cause-and-Effect Diagrams

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4 Ps

- People
- Procedure
- Policy
- Plant (Equipment)

4 Ms

- Man
- Machinery
- Method
- Material

Root Cause Analysis: Cause-and-Effect Diagrams

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- Start with the problem (effect) you are addressing near "the eye of the fish" when drawing a fishbone diagram. For example:
- In this example, "no training" and "poor quality inputs, e.g. bad sugar, dirty cups, etc." appear to be common themes that require further investigation

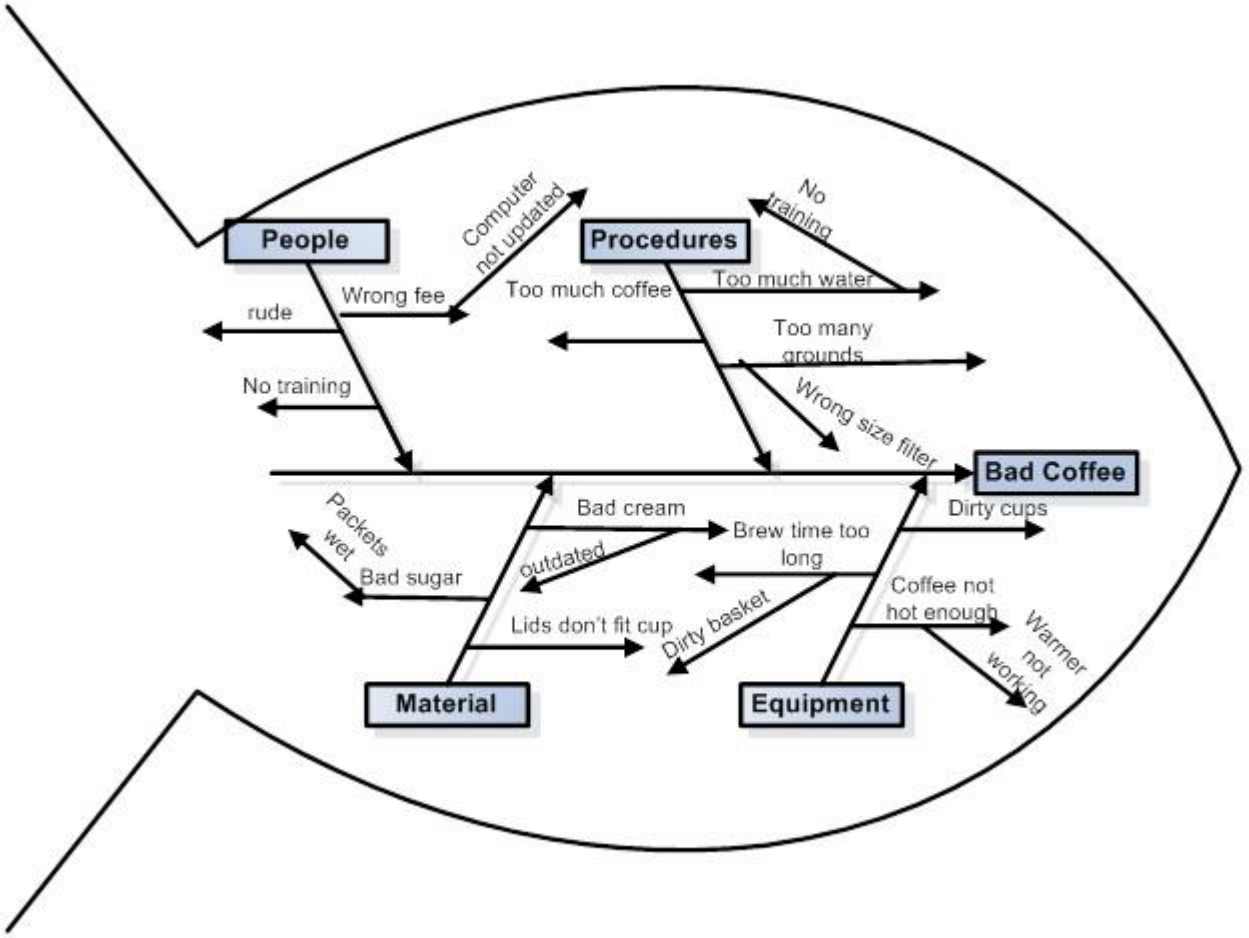

Figure 9: Fishbone diagram

Adapted from Wikimedia Commons Contributors (2016)

Root Cause Analysis: Cause-and-Effect Diagrams

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- A small subset of causes are likely responsible for the largest share of a given effect
- The 80-20 rule: 20% of causes are responsible for 80% of effects

Activity 4: Identification of a -ve Effect related to NVA Activities

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- In groups of 3, identify the most significant negative effect related to NVA activities in your chosen business process
- Place this effect near "the eye of the fish" in your fishbone diagram
- Conduct a root cause analysis to identify all the potential causes of the negative effect
- Post (one post per group) the fishbone diagram on this eLearning class discussion forum as a reply to your previous post on value classification of activities
- Approximate time required (outside class activity): 30 minutes

Root Cause Analysis: Why-Why Diagrams

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- While it is easy to jump to a solution, it is often more difficult to pinpoint WHY something occurred
- Pinpointing the cause can be done by recursively asking the question "WHY?" i.e. "Why has something happened?"
- A general guideline in the quality management field is to apply the 5 WHYs principle: Ask why at least 5 times
- This makes the assumption that by the time you are asking the 5th WHY, you should have identified the root cause of a given negative effect
- For example, "Why are you late?", "Why was there traffic?" "Why did you oversleep?" "Why did you go to bed late?" and so on

Root Cause Analysis: Why-Why Diagrams

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- **A diagram can be used to represent the answers to the WHY questions. For example:**

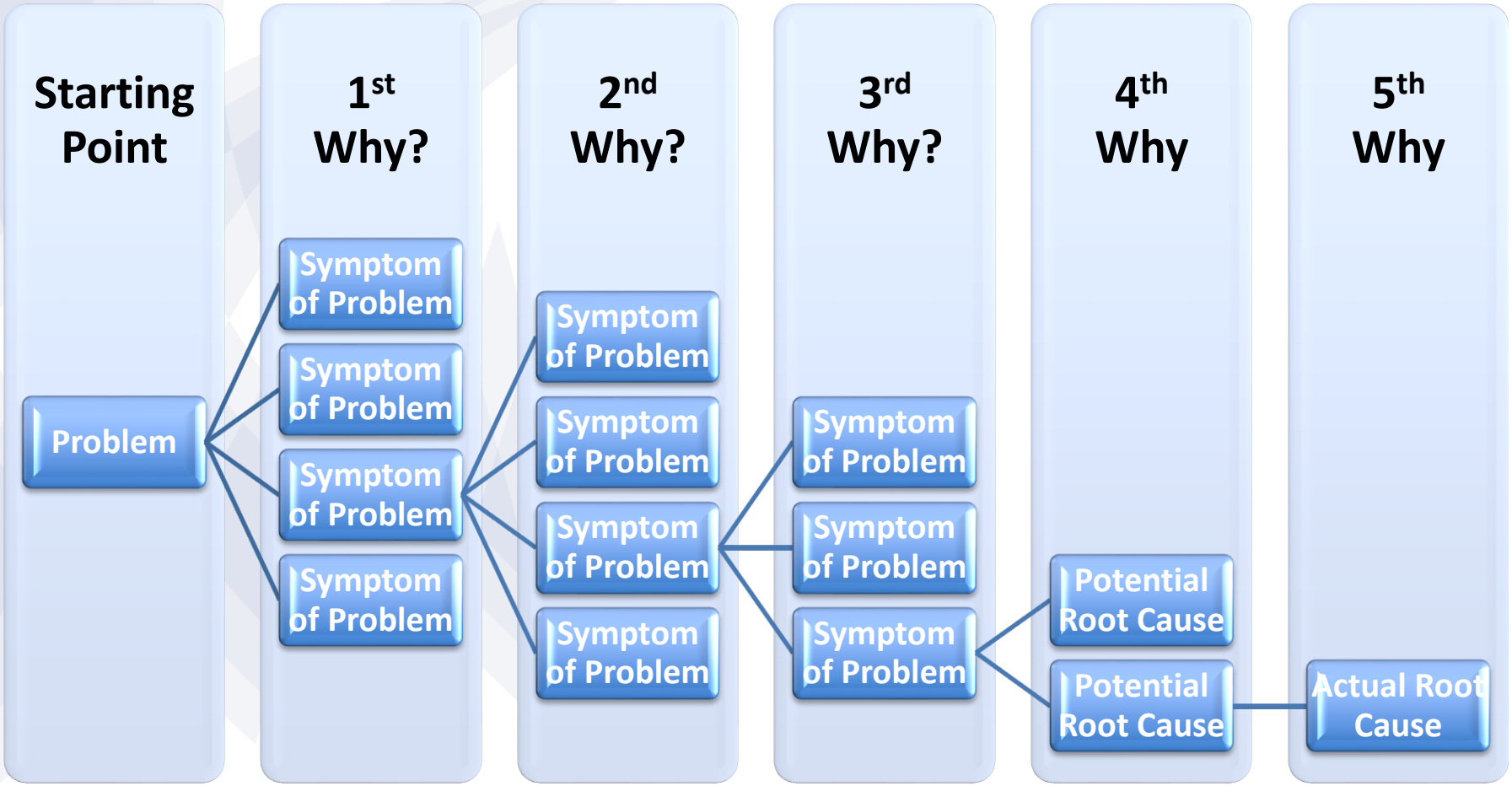

Figure 10:
Why-Why Diagram
Adapted from
Dumas (2013)

Activity 5: An IT-Based Solution to Reduce/Eliminate the Root Cause

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- In groups of 3, out of all the potential causes of the negative effect, identify the actual root cause using a why-why diagram
- Identify a possible IT-based solution that can eliminate or reduce the negative effect by addressing the root cause
- Specify the data that the IT-based solution needs to store and the information it needs to retrieve
- **Post** (one post per group) on **this** eLearning class discussion forum a description of the IT-based solution and the data and information it requires as a reply to your previous post of the fishbone diagram
- **Approximate time required (outside class activity): 30 minutes**

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IT-Enabled Business Transformation

- IT is a mandatory strategic weapon for any business
- IT is capable of changing the way we do business as stipulated in Venkatraman's (1994) 5 levels of IT enabled business transformation

IT-Enabled Business Transformation

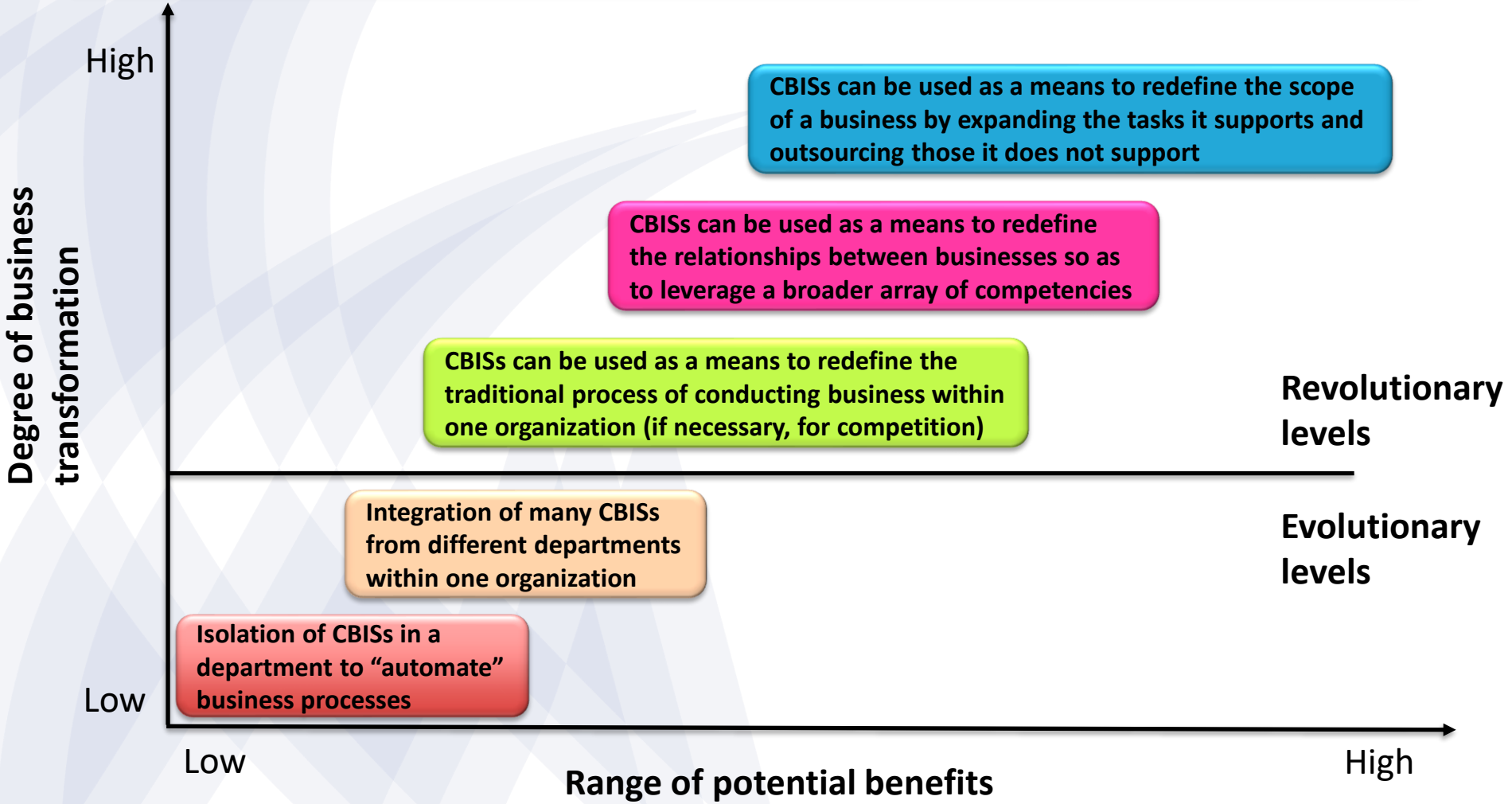

Figure 11: The 5 levels of IT-enabled business transformation

Adapted from Venkatraman (1994)

IT-Enabled Business Transformation

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- A crucial part of the IT is the computer-based information systems (CBISs) which rely on storing the right data and retrieving the right information
- A common phrase today is "information is the intellectual capital of a business"
- A business cannot function efficiently without high quality management of information

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Problem-Based Learning: Group Project

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- **Part 1:** In groups of 3, choose any case study from the list provided under Concept 1 of 6 on the eLearning page
- Create a flowchart that represents the business process involved in producing the business' main product/service
- Upload your work as part of the System Requirements Specification (SyRS) document via the eLearning link provided under Concept 1 of 6.
- **Approximate time required (outside class activity): 30 minutes**

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- **Part 2:** In groups of 3, create a Data Flow Diagram that represents the flow of information through the business organization in the case study
- Upload your work as part of the System Requirements Specification (SyRS) document via the eLearning link provided under Concept 1 of 6.
- **Approximate time required (outside class activity): 30 minutes**

Presentation Outline

- ✓ Value Chains
  - Michael Porter
  - Porter's Value Chain Diagram
  - Primary Functions
  - Support Functions
  - Value Systems
  - Activity 1: Business Idea Narrative based on Porter's Value Chain
- ✓ Business Processes
  - Coordination
  - Case Study of Zambikes Limited
  - Class Discussion of Zambikes Ltd.
  - Process Choreography
  - SOP Constraints
  - Activity 2: Business Process Identification
- ✓ Value-Added Analysis
  - Value Classification
  - Class Discussion on Value Classification of IT Troubleshooting
  - Waste Elimination
  - Case Study on Qantas Freight
  - Activity 3: Value Classification
- ✓ Root Cause Analysis
  - Cause-and-Effect Diagrams
  - Activity 4: Identification of a -ve Effect related to NVA activities
  - Why-Why Diagrams
  - Activity 5: An IT-Based Solution to Reduce/Eliminate the Root Cause
- ✓ IT-Enabled Business Transformation
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Recap

- 20% of causes are responsible for 80% of effects
- If you do not treat the root cause(s) of a problem, it is likely that the problem will not go away
- A business can be transformed by implementing IT-based solutions
- However, do not rush to implement IT solutions before you identify the root cause
- An IT-based solution can contain hardware, software, a database, procedures, and a computer network
- The focus of this unit is the database component of an IT-based solution
- The database component should store the right data and support retrieval of the right information

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Further Reading and References

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