Business Process Completeness

Foundation of Business Knowledge Management

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Overview

▶ Background

▶ Related work

▶ Self-Complete Business Process
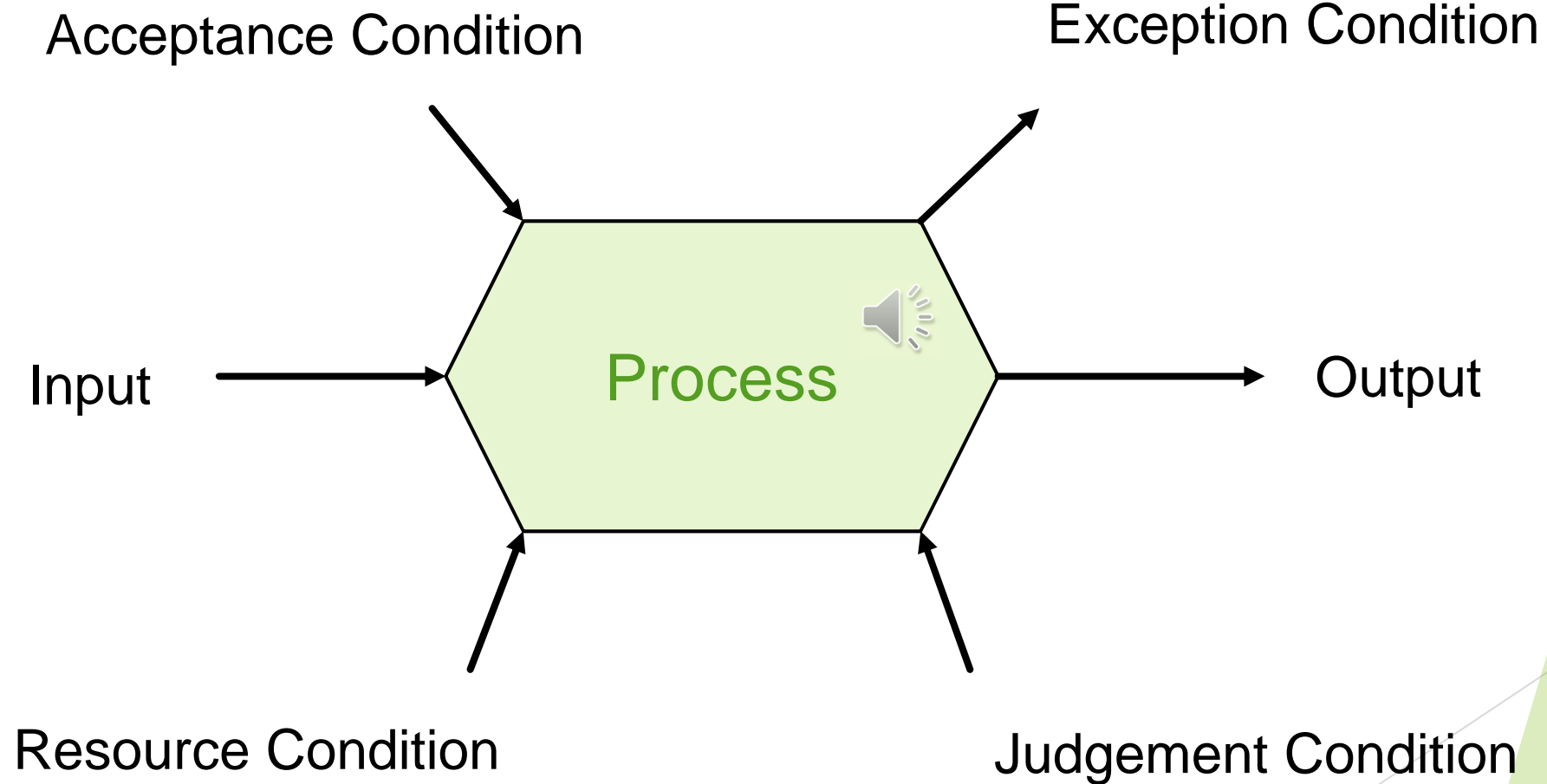
▶ Case study

▶ Discussion

▶ Conclusion

Background

▶ In Japan, several inspection test frauds of manufacturing industry have recently been discovered and have become social problems.

▶ If an organization does not know its production capability, it cannot know when the number of orders exceeds the capability.

▶ If the upper limit of production capability is known, it is possible to restrict further orders.

▶ It is important to correctly define and confirm business process as well as process execution conditions.

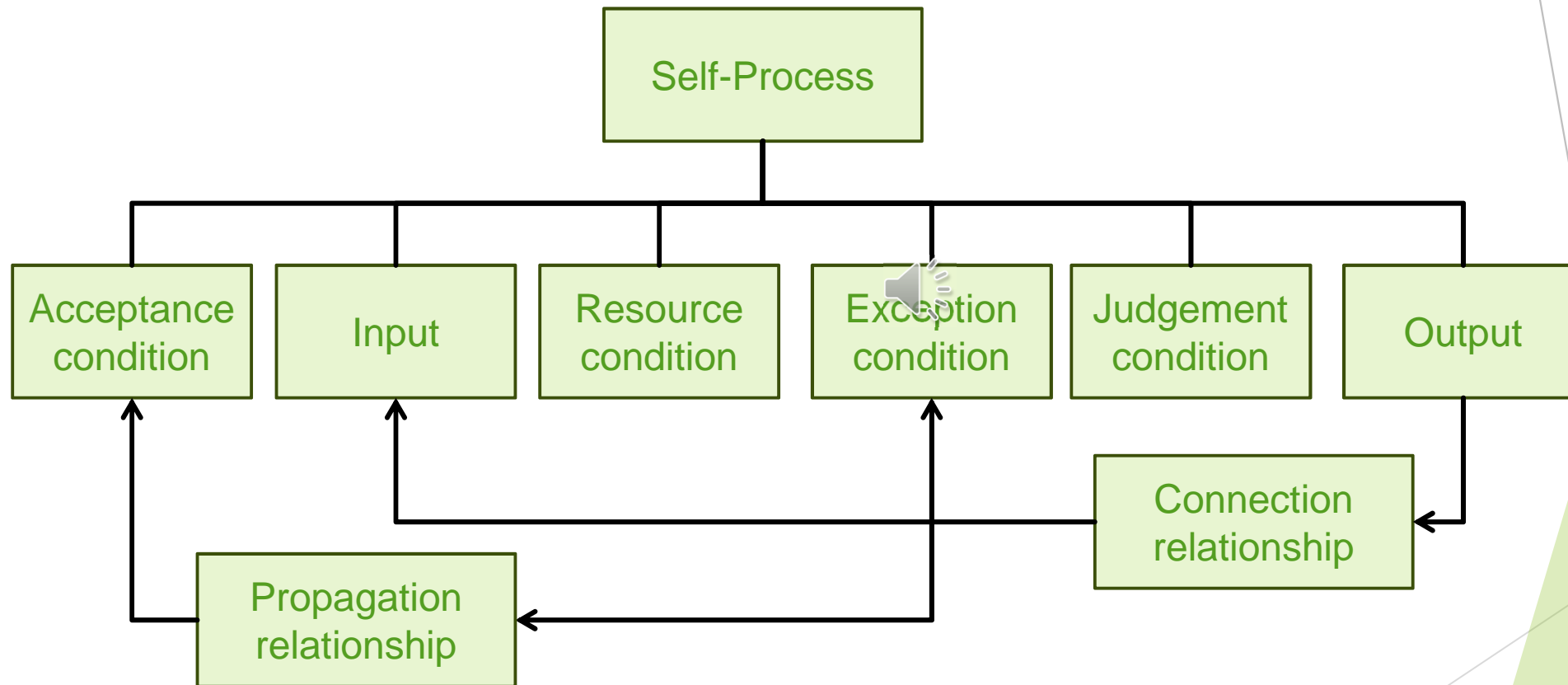▶ We propose the Self-Process Complete Diagram (SPCD) as a model for designing the production processes.

Related work

Approach	Overview	Authors
BPR Business Process Reengineering	Forget what you know about how business works, because most of it is wrong	Hammer & Champy
FBCM Fact Based Collaboration Modeling	Objective BPR method based on statistical analysis of BSC and field data	Kokune et al.
IDEF0 Integrated DEFinition	Functional connectivity is described using four arrows: input, output, control conditions, and mechanism conditions.	IEEE
BPMN Business Process Modeling Notation	A diagrammatic language for business processes that can describe logical and strict control conditions	OMG
OPM Object Process Methodology	Describe the system in terms of object requirements, physical objects, and definition, realization, and implementation processes	Dori
Mono-Koto-Analysis	Eliminate waste with the Mono-Koto Analysis Diagram that views works and objects of works	Nakamura
Ji- Koutei-Kanketsu	A method that optimizes the entire production process, not just a specific process by using business process diagrams and requirements organization sheets	Sasaki Toyota

Self-Process Complete Diagram

Acceptance Condition

Exception Condition

Input

Process

Output

Resource Condition

Judgement Condition

Self-Process metamodel

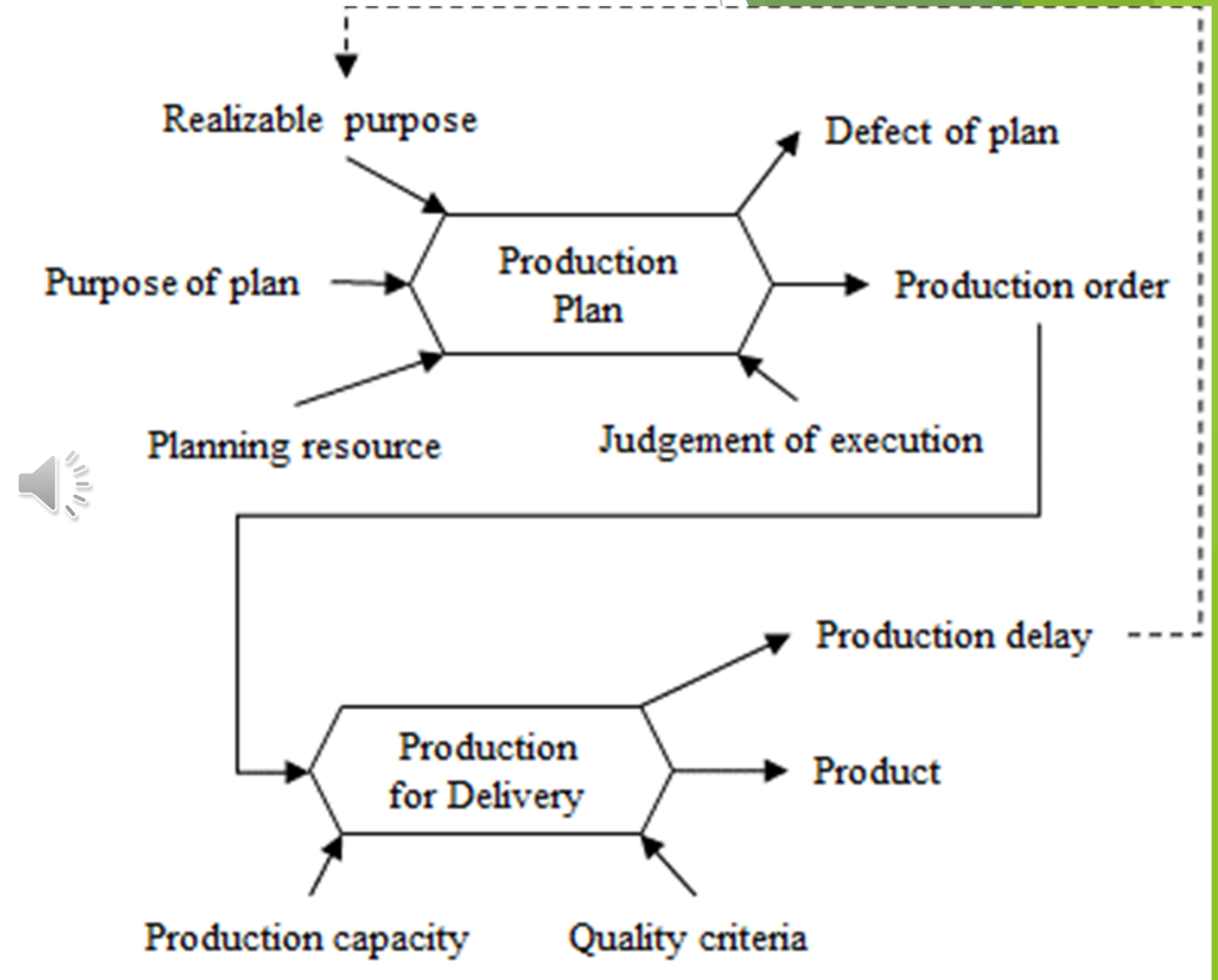# Self Process Completeness Conditions

▶ If the acceptance conditions are not satisfied, the process will not start.

▶ Unless the resource conditions are satisfied, the process will not start.

▶ If the result of the process does not satisfy the judgment conditions, it will not be output.

▶ Generates an exception condition when the process cannot start or when the output does not satisfy the judgment conditions

▶ When the resource conditions are satisfied for the input that satisfies the receiving conditions, generate an output that satisfies the judgment conditions of the process.

Example of Self-processes Complete Diagram

► There are two processes of a production plan and a production for delivery.

► The production plan process accepts a purpose of plan and generate the production order.

► If the production for delivery process accepts the production order, then it generates the product.

► In case of production capacity is not sufficient, the production delay occurs as the exception in the process.

► The exception is propagated to the acceptance aspect of former process.

► Then the former process is noticed that the purpose of the plan is no more realized.

Delivery of Japanese alcoholic beverages

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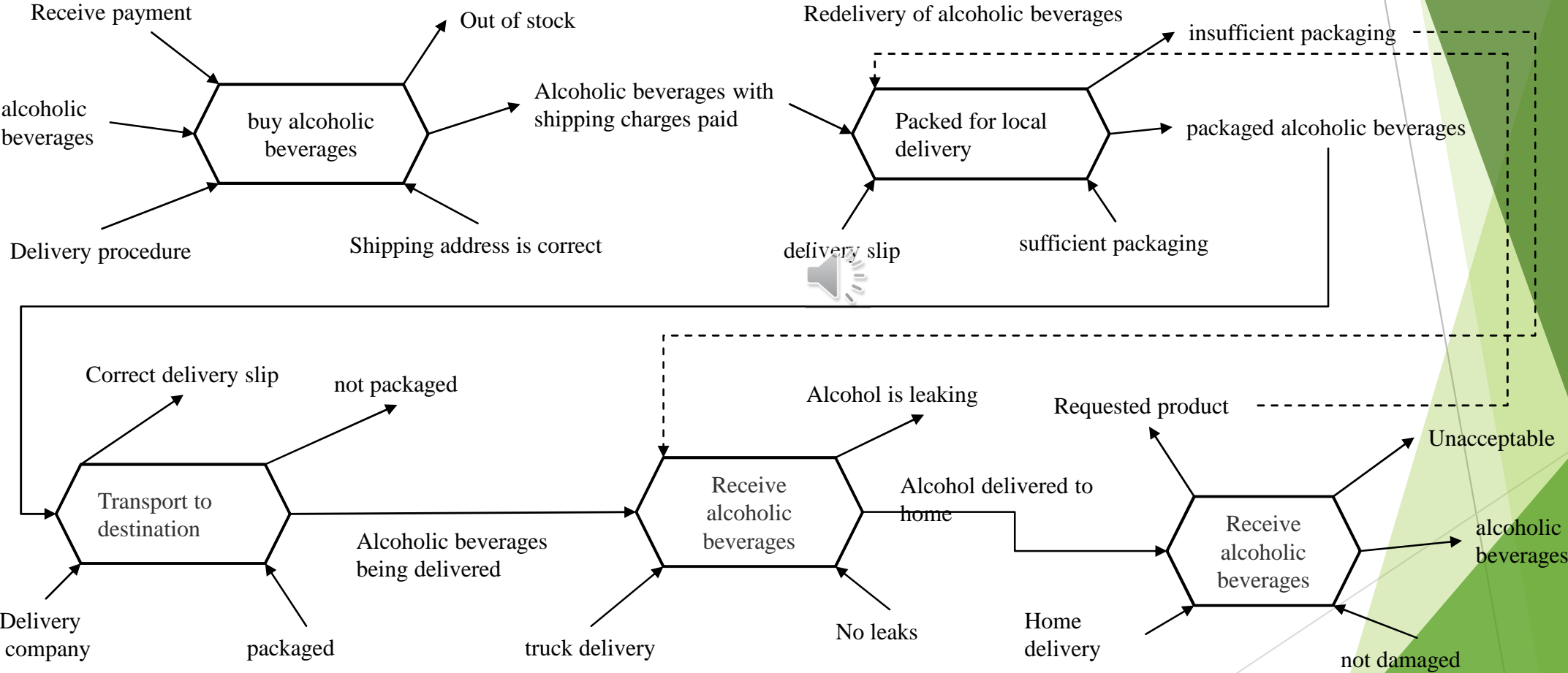
Strawberry cake shipping
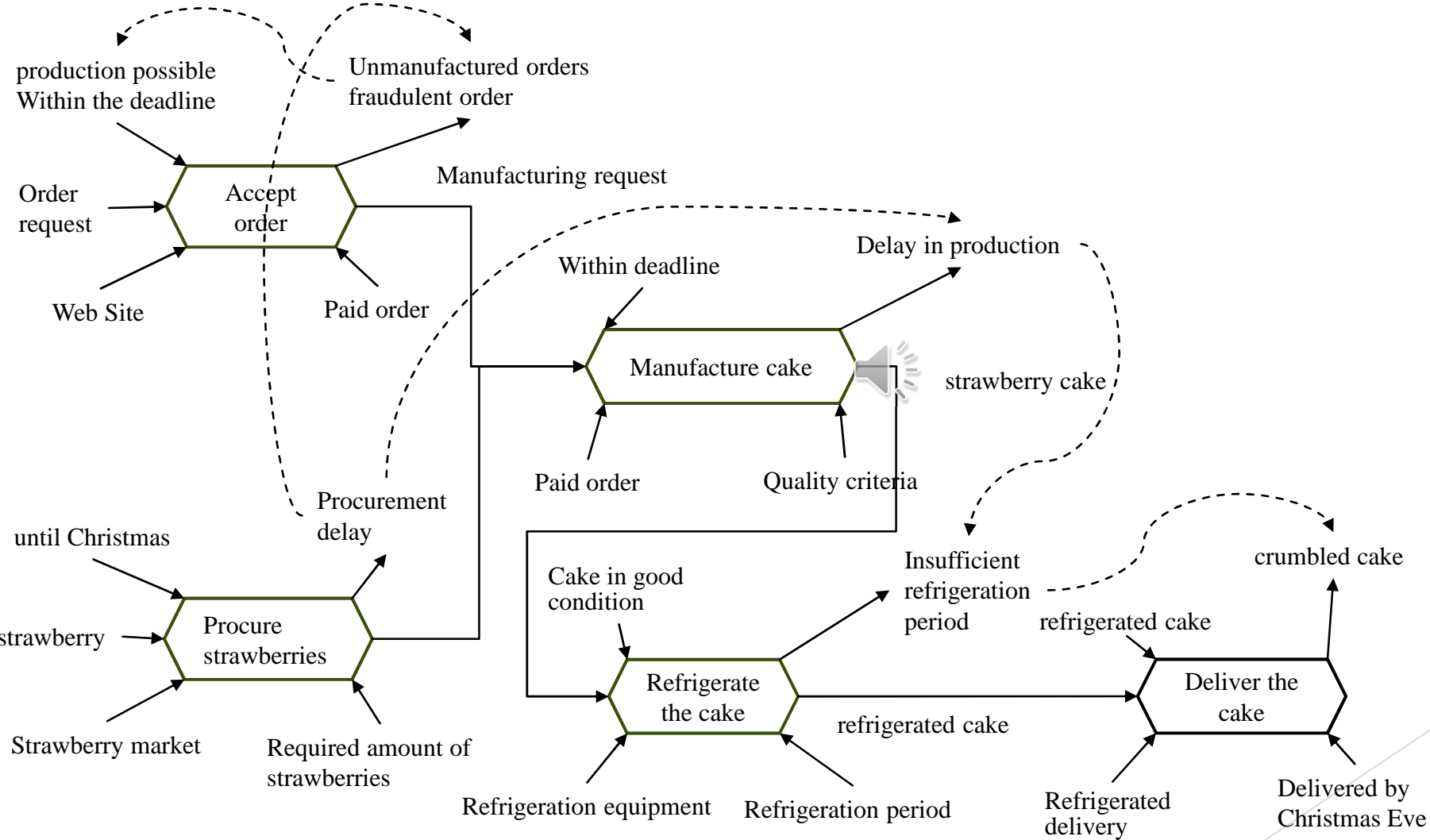
Discussion -- Novelty

▶The SPCD is designed to clarify comprehensive business process completeness by using six aspects.

▶Exception propagation relationship has been proposed to countermeasure the failure risk of business processes. Acceptance conditions can block further failures by recognizing that an exception has occurred during the course of subsequent processing.

▶The completeness of business processes has also been defined by using SPCD aspects.

Discussion – Effectiveness

▶ SPCD proposed as a method of analyzing the completeness of business processes.

▶ SPCD had successfully applied to the simple service delivery and manufacturing examples.

▶ It was also revealed that the completeness of business processes can be confirmed by propagating exceptions.

Future work

▶Experiment on evaluating the proposed method can be designed to compare SPCD with JKK, BPM, and IDEF0.

    -- productivity and quality

    -- qualitative capability

▶Digital Twin of business organizations using SPCD

    -- digital twin architecture to control exception events

    -- data-driven business management

Conclusion

Self-Process Complete Diagram (SPCD) had proposed for describing business processes in industry.

As a result, we clarified the following.

(1) SPCD can represent the business process using six aspects

(2) SPCD can represent the defect propagation process

(3) SPCD has the potential to integrate business process design and data driven business management