

**New Jersey Institute of Technology
Ying Wu College of Computing
IS 684 Business Process Innovation – Fall 2023**

Modeling Assignment #1: Coordination in a Manufacturing Business

Objective:

To show an understanding of communication breakdowns using the commitment management protocol and modeling business processes with actor-transaction diagrams.

Background:

The article by Jan Dietz “The Deep Structure of Business Processes,” presented his Actor Transaction Diagram (ATD) for business process modeling, which is a term he uses in another article. Figure 1 shows two diagram types: Molecular Building Blocks and Atomic Building Blocks. Figure 3 from Dietz shows an application of his notation to a particular situation. He calls the top diagram the Essential Map (using Molecular Building Blocks) and the bottom one the Atomic Level (using Atomic Building Blocks). Let us call these the Top Level ATD and the bottom one the Detail Level ATD, respectively.

Business Scenario

Consider the following AS-IS scenario of a typical manufacturing company that receives a special order from a customer and must internally coordinate procurement of raw materials (**BUY**), production of the order (**MAKE**), and the final steps of fulfillment of the order (**SELL**). The steps below represent only the coordination steps followed (**C-Acts** in the DEMO language from Dietz).

AS-IS Steps:

1. The Customer places an order with Sales.
2. Sales commits to delivery of the order to the Customer.
3. The Planning Manager commits to Sales that the order can be processed.
4. The Planning Manager orders parts from a Supplier.
5. The Supplier agrees to provide the supply order.
6. The Planning Manager requests the Production Manager to schedule manufacturing of the order.
7. The Supplier sends an invoice for supplies
8. The Production Manager commits to the production schedule request of the Planning Manager
9. The Planning Manager pays for the supplies.
10. The Planning Manager schedules shipping with the Shipper
11. Sales sends an invoice to the customer
12. The Planning Manager acknowledges/accepts (to the Production Manager) satisfactory completion of production.
13. The Customer pays an invoice.
14. The Shipper reports (to the Planning Manager) that the Customer received the delivery.

Assignment Parts:

1. Identify the **Actors** in the Business Scenario

Ans:

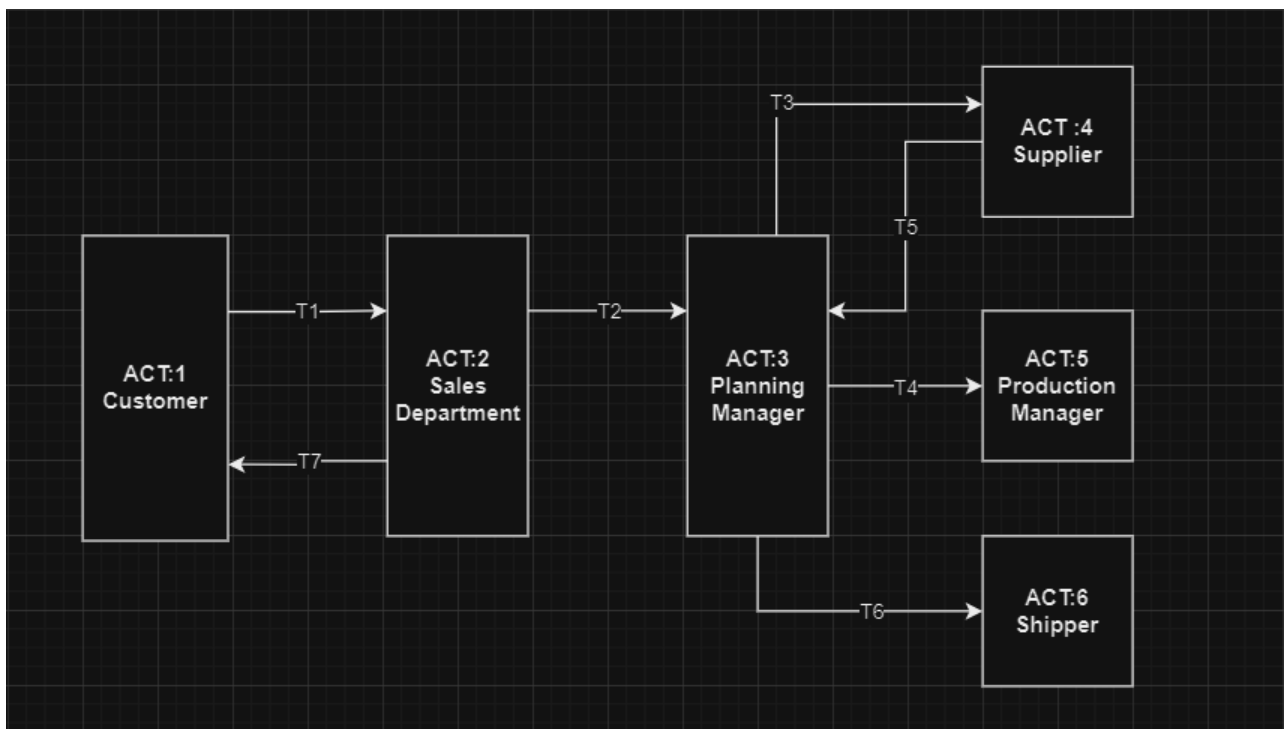
1. Customer
2. Sales Department
3. Planning Manager
4. Supplier
5. Production Manager
6. Shipper

2. Identify the **Transactions** in the business scenario (be sure to specify which actors the transaction takes place between).

Ans:

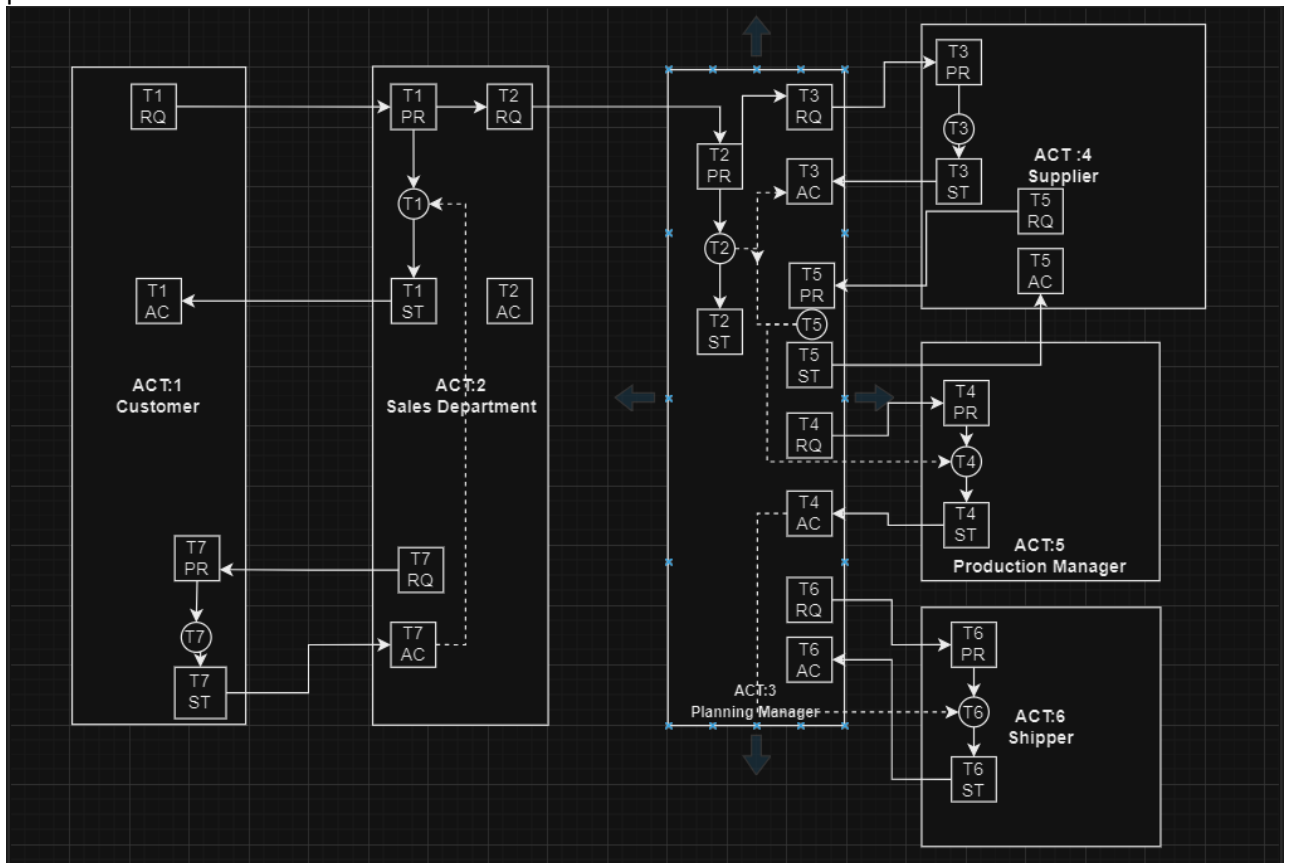
1. The customer places an order with sales.
2. Sales requests a production order to Planning Manager.
3. The planning manager will order parts from the supplier.
4. The planning manager requests the Production Manager to schedule assembly the order.
5. Supplier will request payment for parts from Planning manager
6. Planning manager will schedule shipping of products.
7. Sales requests payment from Customer.

3. Draw a **Top-Level ATD** for the Existing AS-IS process.



Top Level ATD

4. Draw a Detail-Level ATD for the existing AS-IS process. You should use dashed arrows to show precedence in this AS-IS situation



5. In analyzing the Detail Level from the AS-IS situation, you will see there are some missing speech acts (coordination steps). You can improve the process by identifying the missing speech acts (coordination steps) and include them in a re-designed **TO-BE** process. You might also note that the precedence or ordering of steps is not optimal. List the missing speech acts (coordination steps) that should be added to improve coordination.

Ans:

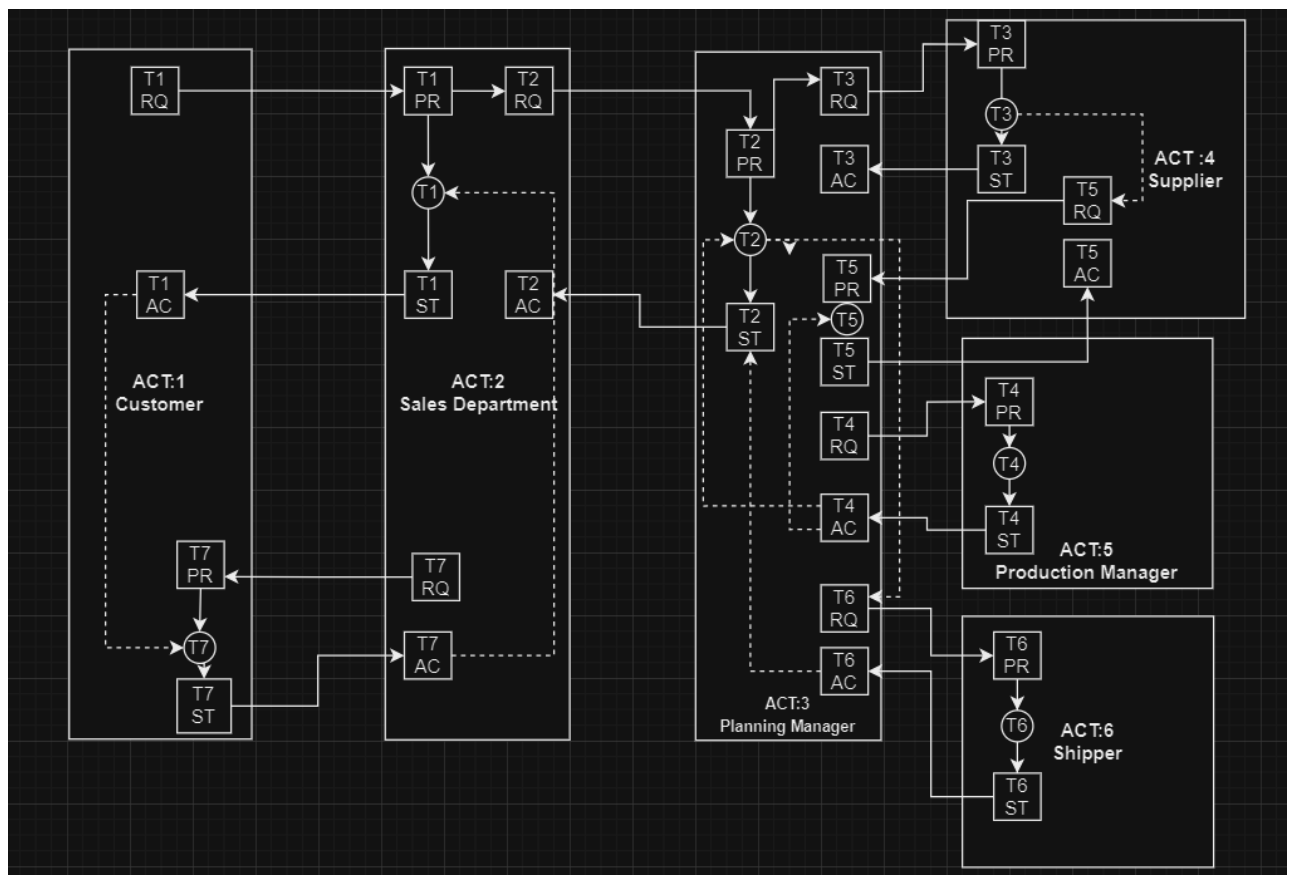
COMMENTS ON PRECEDENCE:

1. T5/RQ the supplier requesting payment for supplies cannot begin until Supplies are produced (T3 P- ACT).
2. T3(P act/Produce Order) cannot be completed without the Assembly of the Order request completion (T4/AC).
3. T6/RQ - Shipping cannot be scheduled until Production of Order is complete (T2/P-Act).
4. T7/RQ- Sales cannot request payment until order request has been completed (T1-P-Act).

Missing Speech Acts:

- T1/ST, T1/AC
- T2/PR, T2/ST, T2/AC
- T3/ST, T3/AC
- T4/AC
- T5/PR, T5/ST, T5/AC
- T6/PR, T6/AC
- T7/PR, T7/ST, T7/AC

6. Redraw the Detail-Level ATD including the missing speech acts as a re-designed TO-BE process. Be sure to use dashed arrows to show any revised precedence.



7. What-if the commitment from the Production manager to the Planning Manager cannot be made until after the Planning Manager receives the supplies and has indicated the supplies are acceptable. How does this change the diagram? Do not redraw the ATDs, just explain how the Top-Level level and the Detail-Level ATDs are changed using the transaction labels you have assigned.

Ans:

Now, in this scenario, there will be new transaction in the existing flow.

The Planning Manager requests shipping of the supplies from the supplier.

Now the new transactions will be:

- Customer requests an order with Sales
- Sales will submit the order production to the Planning Manager
- Planning Manager will request supplies from the Supplier
- Planning manager will request the assembly of the order to be scheduled by the Production Manager.
- (New Transaction) Production manager will request shipping of the supplies by the supplier.
- Supplier requests payment from the Planning Manager
- Planning Manager requests shipping from the Shipper.
- Sales requests the payment from the customer

The changes in the Top Level ATD will be:

We will insert the transaction between Shipper(act6) and Production manager(act5) and name them with the transaction T5. After that we can rename the transactions labels as T5 -T6,T6-T7,T7-T8.

Changes in Detail Level ATD:

- Insert T5 RQ , T5 PR, T5 ST, T5 AC between Production Manager and the Supplier. The RQ, AC will be in the Production Manager and PR, ST in the Supplier.
- We will rename the transaction labels as T5 -T6,T6-T7,T7-T8.

8. In discussing the Commitment Management Protocol (CMP) in Lecture Unit #2D, the simplest form of a conversation goes through the four phases of the CMP (steps of the Action Loop).

- However, note that the second phase is described as a negotiation between actors A and B. Describe a possible scenario in one of the process steps where the negotiation fails or is delayed. What other outcomes are possible? What happens to the Condition of Satisfaction (**CoS**)? Is this realistic?
- Likewise, when B states to A that the **CoS** has been met, what are the possibilities to be considered

Ans:

- The simplest form of a Conversation goes through the four phases of the CMP which is known as a Happy path in which , the customer request the order from the provider, the provider will promise or commit to fulfill their request, then the Provider will state or deliver the product that was requested by customer and the customer will accept the delivery.

Now, the second phase is described as a negotiation between two actors lets see what happens if the negotiation is failed or delayed.

- Lets assume that the supplier is not able to deliver the supplies to the Planning Manager on the day that it was supposed to deliver due to some kind of internal delay from the suppliers or any other shortage of supplies.

OUTCOME:

- The production manager has to wait until the supplies are received before starting the assembly of the order.
- Due to this the Planning Manager cannot deliver what he committed to the sales.
- Thus the Sales couldn't keep their promise to the customer to deliver their products on time.

Condition of Satisfaction: The condition of satisfaction is a conditions that must be completed or met for a transaction to be considered completed.

In this scenario, where there is delay in supply delivery from the supplier, the condition of satisfaction may need to be adjusted or clarified. If the Production Manager commits to a production schedule based on the original supply delivery date, they may need to adjust their commitment because of the delay. Sales may start negotiating to change the delivery dates to customer. The customer has option to accept this option or reject the order. Now if the customer rejects the order, then the negotiation between the planning manager and the supplier to buy the supplies will also fail. If the customer accepts this negotiation to get the products at the delayed date then the supplies are sent by the supplier.

- b. When B states to A that the CoS has been met, the possibility to consider is that whether or not will the A accept the order that is delivered by B.

