Chapter 1 of Business Process Management

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Exercise 1.6 Consider the following process at a pharmacy.

Case

Customers drop off their prescriptions either in the drive-through counter or in the front counter of the pharmacy.

> Customers can request that their prescription be filled immediately. In this case, they have to wait between 15 minutes and one hour depending on the current workload.

Most customers are not willing to wait that long, so they opt to nominate a pick-up time at a later point during the day. Generally, customers drop their prescriptions in the morning before going to work (or at lunchtime) and they come back to pick up the drugs after work, typically between 5pm and 6pm.

When dropping their prescription, a technician asks the customer for the pick-up time and puts the prescription in a box labeled with the hour preceding the pick-up time. *For example, if the customer asks to have the prescription be ready at 5pm, the technician will drop it in the box with the label 4pm (there is one box for each hour of the day).*

Every hour, one of the pharmacy technicians picks up the prescriptions due to be filled in the current hour.

The technician then enters the details of each prescription (e.g. doctor details, patient details and medication details) into the pharmacy system.

As soon as the details of a prescription are entered, the pharmacy system performs an automated check called Drug Utilization Review (DUR). This check is meant to determine if the prescription contains any drugs that may be incompatible with other drugs that had been dispensed to the same customer in the past, or drugs that may be inappropriate for the customer taking into account the customer data maintained in the system (e.g. age).

Any alarms raised during the automated DUR are reviewed by a pharmacist who performs a more thorough check. In some cases, the pharmacist even has to call the doctor who issued the prescription in order to confirm it.

After the DUR, the system performs an insurance check in order to determine whether the customer's insurance policy will pay for part or for the whole cost of the drugs. In most cases, the output of this check is that the insurance company would pay for a certain percentage of the costs, while the customer has to pay for the remaining part (also called the co-payment). The rules for determining how much the insurance company will pay and how much the customer has to pay are very complicated. Every insurance company has different rules. In some cases, the insurance policy does not cover one or several drugs in a prescription, but the drug in question can be replaced by another drug that is covered by the insurance policy. When such cases are detected, the pharmacist generally calls the doctor and/or the patient to determine if it is possible to perform the drug replacement.

Once the prescription passes the insurance check, it is assigned to a technician who collects the drugs from the shelves and puts them in a bag with the prescription stapled to it. After the technician has filled a given prescription, the bag is passed to the pharmacist who double-checks that the prescription has been filled correctly. After this quality check, the pharmacist seals the bag and puts it in the pick-up area.

When a customer arrives to pick up a prescription, a technician retrieves the prescription and asks the customer for payment in case the drugs in the prescription are not (fully) covered by the customer's insurance.

Questions

1. What type of process is the above one: order-to-cash, procure-to-pay or issue-to-resolution?

It is an order to cash process.

2. Who are the actors in this process?

Customer (patient), technician, the pharmacy system, the pharmacist, the doctor.

3. What value does the process deliver to its customer(s)?

The process fulfils customer's need for drugs.

4. What are the possible outcomes of this process?

Drugs to customer,

payment to the pharmacy,

payment from the insurance company,

call to the doctor,

no prescription fulfilment.

5. Taking the perspective of the customer, what performance measures can be attached to this process?

1. Wait time for immediate fulfilment
2. Delays for planned pick-up time
3. Error rate: wrong drugs issued
4. Error rate: wrong calculation of insurance reimbursement, or misidentification of customer's insurance
5. Error rate: customer didn't pay the right sum for the drugs
6. Error rate: payments from insurance company don't match the reimbursements claimed by customers
7. Error rate: unavailability of the doctor to confirm the prescription
8. Error rate: rejection of fulfilment
9. Maker-Checker between the technician and pharmacist render mistakes in fulfilment highly unlikely.
10. Fraud by technician and pharmacist. Mismatch between the prescriptions data in the pharmacy system with other data sources.
11. Error rate: data input into the DUR system errors.

12. Error rate: required drugs are absent.
13. Error rate: data input into the insurance check system errors.
14. Error rate: DUR produced faulty result.

6. What potential issues do you foresee this process might have? What information would you need to collect in order to analyze these issues?

Availability of the doctor to immediately answer the phone is in question. Record metrics from Point 7 from the previous question.

Limited availability of drugs can mess up with the fulfilment process. Point 12.

Drug Utilization Review system may produce faulty results posing health risk to customers. Points 11, 14.

Insurance check system may produce faulty results posing financial and regulatory risk to customers and/or pharmacy, insurance companies. Points 4, 5, 6.

Technician and pharmacist running the pharmacy may commit Fraud (thanks, Citibank training sessions). Point 10.

Manual inputs into the system done by the technician pose high risk (Citigroup Copy-Paste Error Almost Sent $6 Billion to Wealth Account - Bloomberg). Points 11, 13.

7. What possible changes do you think could be made to this process in order to address the above issues?

Electronic Prescription is entered into the system by the doctor. Pharmacy reads the prescription from the system to prevent manual input and remove the need to call the doctor.

Pharmacist resolves replacements in the prescription due to the drug being out of stock, DUR alarms, or insurance reimbursement optimization through the same system.

During fulfilment of the prescription, drugs are scanned using barcodes or QRs and some system matches them vs the prescription essentially removing the need for manual check by the pharmacist.

Drug Utilization Review system is thoroughly tested and regularly updated.

Insurance check system is integrated with the insurance providers, thoroughly tested, and regularly updated.

Technicians and pharmacists have rotated working days or placement between pharmacies to make sure no pair is constantly working together to prevent Fraud.

Exercise 1.7 Consider the following process at a company of around 800 employees.

Case

Subprocess. Condition. Task. Actor.

A purchase request is initiated when an employee at the company fills in and signs a form on paper. The purchase request includes information about the good to be purchased, the quantity, the desired delivery date, the approximate cost. The employee can also nominate a specific vendor.

Quotes collection

Employees often request quotes from vendors in order to get the required information. Completing the entire form can take a few days as the requestor often does not have the required data. The quote is attached to the purchase request.

Purchase request preparation

This completed request is signed by two supervisors. One supervisor has to provide a financial approval, while the other supervisor has to approve the necessity of the purchase and its conformance with company's policy (e.g. does a requested software form part of the standard operating environment?). Collecting the signatures from the two supervisors takes on average **five days**.

If it is urgent, the employee can hand-deliver the form, otherwise it is circulated via internal mail.

A rejected purchase request is returned to the employee. Some employees make some minor modifications and try in a second attempt other supervisors in order to get approval.

Once a purchase request is approved, it is returned to the employee who initiated the purchase requisition. The employee then forwards the form to the Purchasing Department.

Many employees make a copy of the form for their own record, in case the form gets lost.

The central purchasing Department checks the completeness of the purchase request and returns it to the employee if it is incomplete.

Based on attached quotes and other information, the purchasing Department enters the approved purchase request into the company's Enterprise System.

If the employee has not nominated any vendors, a clerk at the purchasing Department will select one based either on the quotes attached to the purchase requisition, or based on the list of vendors (also called Master Vendor List) available in the company's Enterprise System.

Vendor selection

Sometimes the initial quote attached to the request has expired in the meantime. In this case, updated quote is requested from the corresponding vendor.

In other cases, the vendor who submitted the quote is not recorded in the company's Enterprise System. In this case, the purchasing Department should give preference to other vendors who are registered in the Enterprise System.

If no such vendors are available or if the registered vendors offer higher prices than the one in the submitted quote, the purchasing Department can add the new vendor into the Enterprise System.

Purchase order delivery

When a vendor is selected, a purchase order is automatically generated by the Enterprise System. Then, a fax is generated and sent to the vendor.

A copy of the purchase order is sent to Accounts Payable Office, which is part of the Financial Department, which uses an accounting system that is not integrated with the Enterprise System.

Goods delivery

The goods are always delivered to the Goods Receipt Department.

When a good is received, a clerk at this Department selects the corresponding purchase order in the Enterprise System.

The clerk checks the quantity and quality and (in the positive case) generates a document called goods receipt form from the purchase order stored in the Enterprise System.

The goods are then forwarded to the employee who initiated the purchase requisition.

A print-out of the goods receipt form is sent to the Accounts Payable Office.

If there are any issues with the good, it is returned to the vendor and a paper-based note is sent to the Purchasing Department and to the Accounts Payable Office.

Invoicing

The vendor eventually sends the invoice directly to the Accounts Payable Office.

A clerk at this office compares the purchase order, the goods receipt and the invoice—a task that is usually called "**three-way matching**". Three-way matching can be quite time-consuming.

If there are any discrepancies as it has to be investigated, if it was an error of the vendor or a data entry error. The duration of the payment process unfortunately takes sometimes so long that the discount for paying in a certain period expires.

A bank transfer is finally triggered and a payment notice is sent to the vendor.

Some vendors explicitly indicate in their invoice the bank account number where they want the transfer to occur. It may happen that the bank account number and name indicated in the invoice differs from the one recorded in the vendor database.

Sometimes payments bounce back, in which case the vendor is contacted by phone, e-mail or postal mail.

If new bank details are given, the transfer is attempted again.

If the issue is still not resolved, the Accounts Payable Office has to contact again the vendor in order to trace the cause of the bounced payment.

Questions

1. **What type of process is the above one: order-to-cash, procure-to-pay or issue-to-resolution?**

Procure to pay.

2. **Who are the actors in this process? Who is/are the customer(s)?**

Actors are: an employee raising the need for procurement, two supervisors, the purchasing Department clerks, the enterprise system, the accounts payable office, goods receipt department, the vendor.

Both vendor and buyer are customers since both of them receive value from the transaction.

3. **What value does the process deliver to its customer(s)?**

The buyer receives the goods and the seller makes a revenue.

4. **What are the possible outcomes of this process?**

Successful End-to-End Process: Goods delivered, accepted, and vendor paid.

Partial Success: Goods delivered but payment delayed, discounts lost.

Process Loops: Requests resubmitted, quotes revalidated, or payments reattempted.

Cancellations: Requests rejected or goods returned.

System Updates: Vendor/bank details added to the Enterprise System.

5. **Taking the perspective of the customer, what performance measures can be attached to this process?**

1. Subprocess Purchase Request Preparation

- Approval Cycle Time: Average time taken to secure approvals from both supervisors.
- First-Time Approval Rate: Percentage of requests approved without rejection or modification.
- Rejection/Resubmission Rate: Frequency of requests rejected and requiring rework.

2. Subprocesses Vendor Selection & Purchase Order

- Vendor Selection Time: Time from request approval to vendor selection and purchase order generation.
- New Vendor Registration Rate: Frequency of unregistered vendors being added to the Enterprise System (indicates flexibility).
- Quote Expiration Rate: Percentage of quotes requiring revalidation due to expiration.

3. Goods Delivery

- On-Time Delivery Rate: Percentage of goods delivered by the employee's requested date.
- Goods Acceptance Rate: Percentage of deliveries accepted without quality/quantity issues.
- Return-to-Vendor Rate: Frequency of goods rejected and returned to the vendor.
- Delivery Cycle Time: Time from purchase order creation to goods receipt.

4. Process Efficiency

- Form Loss Rate: Frequency of forms lost in transit (mitigated by employee-made copies).
- Manual Intervention Rate: Percentage of steps requiring hand-delivery, paper notes, or follow-ups (e.g., urgent requests).
- Employee Satisfaction Score: Survey-based metric assessing ease of use, transparency, and frustration levels.

5. End-to-End Process

- Total Cycle Time: Time from request initiation to goods receipt.
- Process Success Rate: Percentage of requests completed end-to-end without delays, rejections, or payment issues.
- Budget Adherence Rate: Percentage of purchases staying within the employee's estimated cost.

- Policy Compliance Rate: Frequency of purchases conforming to company standards (e.g., approved vendors, software policies).

7. Vendor Payment Reliability

- Payment Discrepancy Rate: Frequency of invoice/purchase order mismatches causing delays.
- Bounced Payment Rate: Percentage of payments failing due to incorrect vendor bank details.
- Discount Capture Rate: Percentage of early-payment discounts secured (indicates timeliness of payment resolution).

6. **What potential issues do you foresee this process might have? What information would you need to collect in order to analyze these issues?**

1. **Subprocess Purchase Request Preparation**

- Delays in approvals.
- Employees resubmitting requests to approving supervisors.
- Paper forms may be misplaced during internal mail circulation.
- Employees try different supervisors to collect approvals.

Information to Collect:

- Time taken for each approval step (financial vs. policy supervisor).
- Rejection rates and reasons (e.g., policy non-compliance, budget issues).
- Frequency of form loss or resubmissions.
- Employee feedback on approval bottlenecks.

2. **Vendor Selection & Purchase Order**

- Delays if updated quotes are required.
- Registered vendors may charge higher prices than non-registered ones.
- Faxing Purchase Orders introduces errors or transmission failures.

Information to Collect:

- Frequency of expired quotes and time spent on updating them.
- Time taken to register new vendors.
- Cost comparisons between registered and non-registered vendors.
- Error rates in Purchase Orders generation/transmission (e.g., fax failures).

3. **Goods Delivery**

- Incorrect quantity/quality leading to returns.
- Paper-based notifications lead to delays in resolving issues (e.g., lost return notes).
- Goods Receipt Department manually matches deliveries to Purchase Orders and invoices in three-way matching.

Information to Collect:

- Goods return rate and reasons (e.g., damage, wrong item).
- Time lag between delivery issues and resolution.

- Error rates in manual PO matching.

4. Invoicing & Payment

- Manual reconciliation causes missed payment discounts.
- Incorrect vendor bank details lead to bounced payments and rework. Not every vendor shares the bank account number where they want the transfer to occur beforehand. Bank account number and name indicated in the invoice differ from the data recorded in the vendor database.
- Non-integrated accounting system increases manual data entry errors.

Information to Collect:

- Average time for three-way matching.
- Frequency of payment discrepancies and root causes (vendor error vs. internal error).
- Bounced payment rates and resolution time.
- Discount capture rate (percentage of early-payment discounts utilized).

5. Systemic/Cross-Functional Issues

- Paper forms, faxes, and internal mail create bottlenecks.
- Enterprise System and accounting system are not integrated.
- Supervisors may inconsistently apply policies (e.g., software standards).
- Cumbersome process discourages compliance or leads to workarounds.

Information to Collect:

- Frequency of manual interventions (e.g., hand-delivered forms, paper notes).
- Error rates due to manual data entry.
- Compliance audit results (e.g., policy adherence across departments).
- Employee satisfaction scores and feedback on pain points.

7. What possible changes do you think could be made to this process in order to address the above issues?

1. Digitize Paper-Based Workflows

2. Automate Approvals and Vendor Selection. Define Rule-based approval workflows, thresholds for auto-approval (e.g., low-cost items) or route requests to supervisors based on criteria (e.g., budget, department).

3. Integrate Enterprise System with Accounting Software. Automate data flow between procurement and Accounts Payable (e.g., purchase orders, goods receipts). Enable real-time three-way matching (invoice, PO, goods receipt) without manual reconciliation. Allow vendors to submit quotes, update bank details, and track invoice status electronically.

4. Automatically match received goods to purchase orders using scanned data. Notify Purchasing and Accounts Payable automatically if goods are rejected.

5. Trigger payments to vendors automatically after successful three-way matching. Flag invoices eligible for early-payment discounts to prioritize processing.

6. Auto-flag non-compliant procurement requests during submission.