Chapter 1 - Introduction

Introduction

- Business Process Management (BPM) is about how work is performed in an organisation to ensure consistent outcomes and take advantage of improvement opportunities.
- These improvements depend on the organisation's goals, it could be reducing costs, reducing errors, reducing execution times, etc.
- BPM is not about improving individual activities but about managing entire chains of events, activities and decisions that add value to the organisation (these events, activities and decisions are all **processes**).

Processes Everywhere

- Examples of processes that can be found in most organisations:

Order-to-Cash

- Performed by a vendor.
- Starts when a customer submits an order to purchase a product/service and ends when the product/service in question has been delivered to the customer and the customer made the payment.
- Related activities: purchase order verification, shipment, delivery, invoicing (sending bill), payment receipt and acknowledgment.

Quote-to-Order

- Precedes the order-to-cash process.
- Starts when a supplier receives a Request for Quote (RFQ) from a customer and ends when when the customer places a purchase order based on the received quote. The order-to-cash process starts after this.
- The combination of quote-to-order and order-to-cash is called a **quote-to-cash process**.

Procure-to-pay

- Starts when someone in an organisation determines that a given product/service needs to be purchased and ends when the product/service has been delivered and paid for.
- Related activities: obtaining quotes, approving the purchase, selecting a supplier, issuing a purchase order, receiving goods/consuming service and paying the invoice.
- Can be seen as a **counterpart to quote-to-cash** in the context of business to business interactions.
- For every procure-to-pay process there is a corresponding quote-to-cash process on the suppliers side.

Issue-to-resolution

- Starts when a customer raises a problem/issue (like complaining about a defect in a product or issue when consuming a service) and it ends only when the customer or the supplier or both (preferably) agree that the issue has been resolved.
- In insurance companies, this process has a variant called **claim-to-resolution** because they have to deal with insurance claims.

Application-to-approval

- Starts when someone applies for a benefit/privilige and ends when the benefit/privilige is either granted or denied.
- Process common in government agencies (ex: when a citizen applies for building permits or entrepeneurs apply for business licenses for opening a restaurant or admissions process in a university or approval for vacation requests in a company).
- The way processes are designed affect the quality of service the customers perceive and efficency of the service. An organization can outperform another with similar services simply by habing better processes, this is true for customer-facing processes but also for internal processes like procure-to-pay process (which fulffils an internal need).

Example of a procure-to-pay process for renting construction equipment

Example 1.1 Equipment rental at BuildIT.

BuildIT is a construction company specialized in public works, such as roads, bridges, pipelines, tunnels and railroads. Within BuildIT, it often happens that engineers working at a construction site (called *site engineers*) need a piece of equipment, such as a truck, an excavator, a bulldozer, a water pump, etc. BuildIT owns very little equipment and instead it rents most of its equipment from specialized suppliers.

The existing business process for renting equipment goes as follows. When site engineers need to rent a piece of equipment, they fill in a form called "Equipment Rental Request" and send this request by email to one of the clerks at the company's depot. The clerk at the depot receives the request and, after consulting the catalogs of the equipment suppliers, selects the most cost-effective equipment that complies with the request. Next, the clerk checks the availability of the selected equipment with the supplier via phone or email. Sometimes the selected option is not available. In these cases, the clerk has to select an alternative piece of equipment and check its availability with the corresponding supplier.

After finding a suitable and available piece of equipment, the clerk adds the details of the selected equipment to the rental request. Each rental request has to be approved by a works engineer, who also works at the depot. In some cases, the works engineer rejects the equipment rental request. Some rejections lead to the cancelation of the request, i.e., no equipment is rented at all. Other rejections are resolved by replacing the selected equipment with another equipment—such as a cheaper piece of equipment or a more appropriate piece of equipment for the job. In this latter case, the clerk needs to lodge another availability request.

When a works engineer approves a rental request, the clerk sends a confirmation to the supplier. This confirmation includes a Purchase Order (PO) for renting the equipment. The PO is produced by BuildIT's financial information system using information entered by the clerk. The clerk also records the equipment rental in a spreadsheet that is used to monitor all ongoing equipment rentals.

In the meantime, the site engineer may decide that the equipment is no longer needed. In this case, the engineer asks the clerk to cancel the request for renting the equipment.

In due time, the supplier delivers the rented equipment to the construction site. The site engineer then inspects the equipment. If everything is in order, the site engineer accepts the engagement and the equipment is put into use. In some cases, the equipment is sent back because it does not comply with the requirements of the site engineer. In this case, the site engineer has to start the rental process all over again.

When the rental period expires, the supplier comes to pick up the equipment. Sometimes, the site engineer asks for an extension of the rental period by contacting the supplier via email or phone 1 to 2 days before pick-up. The supplier may accept or reject this request.

A few days after the equipment is picked up, the equipment's supplier sends an invoice to the clerk by email. At this point, the clerk asks the site engineer to confirm that the equipment was indeed rented for the period indicated in the invoice. The clerk also checks if the rental prices indicated in the invoice are in accordance with those in the PO. After these checks, the clerk forwards the invoice to the financial department. The financial department eventually pays the invoice.

Ingredients of a Business Process

- A business process encompasses a number of **events** and **activities**.
- **Events**: things that happen automatically, they have no duration. Events may trigger a series of activities.

    - The arrival of a piece of equipment is an event.
    - When the piece arrives, the site engineer inspects it, this is an activity triggered by an event.
- **Activities**: things that take time, may be triggered by events. Referes to both fine-grained units of work and coarse-grained units of work.
    - **Task**: when an activity is simple and can be seen as one single unit of work. Refers only to fine-grained units of work.
        - If inspecting the equipment is simple (just checking that the equipment received corresponds to what was ordered) we can say the inspection is a task.
        - If the inspecting involves several checks, we call it an activity.
- **Decision points**: points in time when a decision is made that affects the way the process is executed.
    - As the result of the inspection, the site engineer may decide the equipment should be returned or that it should be accepted. This decisions affects what happens later in the process.
- **Actors**: human actors/organizations/software systems acting on behalf of human actors or organizations.
    - **Internal Actors/Process Participants**: operate inside the organization where the process is executed.
        - The clerk, the site and works engineers are all process participants.
    - **External Actors/Business Party**: operate outside the organization where the process is executed.
        - The equipment supplier is an external actor.
    - **Customer**: the one who cosumes the output.
        - The customer is the site engineer who puts the rented equipment to use. It is an **internal customer** because it is part of an organization.
        - In order-to-cash process the customer is external to the organization.
        - There can be multiple customers. For example, in the process of selling a house there is a buyer, a seller, a real estate agent, one or multiple mortgage providers and at least one notary. The outcome of the process is a sales transaction, it provides value to both the buyer who gets the house and the seller who monetizes the house, therefore they are customers and the remaining actors provide services.
- **Physical objects**: equipment, materials, products, paper documents.
- **Informational objects**: electronic documents and records.
- **Outcomes**: the execution of the process leads to one or several outcomes, it should deliver value to the actors involved in the process.
    - The equipment rental process leads to a piece of equipment being used by BuildIT as well as a payment being made to the equipment's supplier. The value is given to BuildIT and the

supplier. This is a **positive outcome**.

- The value of the outcome may not exist or only partially exist, when a piece of equipment is returned, no value is gained. This is a **negative outcome**.

For example, the equipment rental process involves three human actors (clerk, site engineer, and works engineer) and two organizational actors (BuildIT and the equipment supplier). The process also involves a physical object (the rented equipment), electronic documents (equipment rental requests, POs, invoices), and electronic records (equipment engagement records maintained in a spreadsheet).

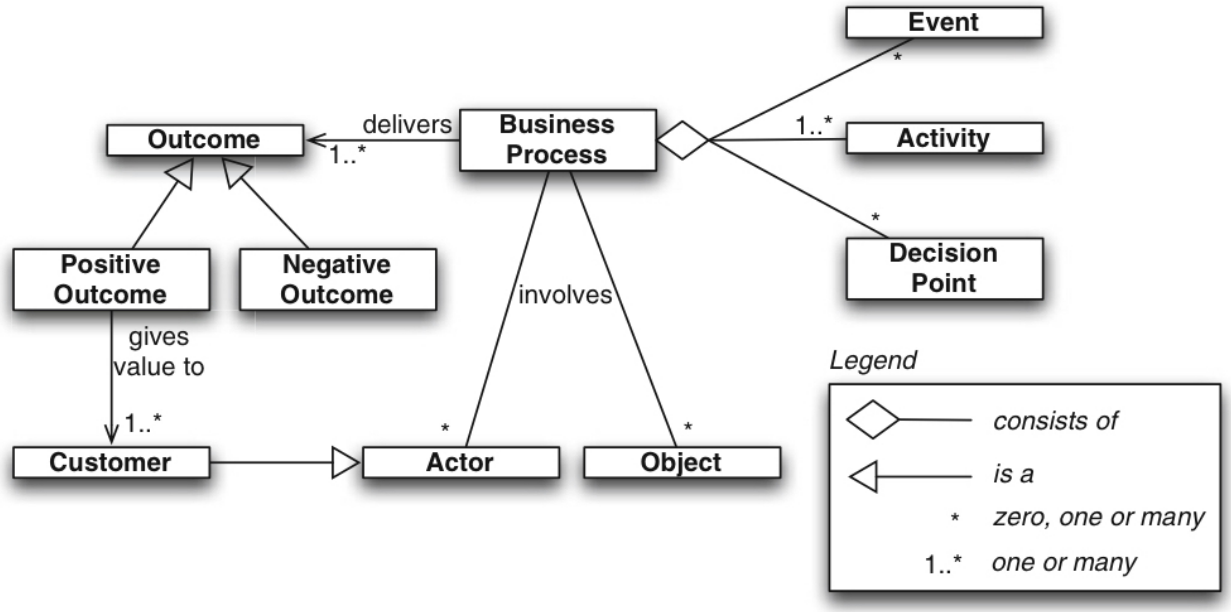


Fig. 1.1 Ingredients of a business process

- **Business Process**: collection of inter-related events, activities and decision points that involve a number of actors and objects which collectively lead to an outcome that is of value to at least one customer.
- **BPM**: body of methods, techniques and tools to identify, discover, analyze, redesign, execute and monitor business processes in order to optimize their performance.

Related Disciplines

- BPM is not the only discipline concerned with improving the operational perfomance of organizations.

Total Quality Management (TQM)

- Focus on continuously imprving and sustaining the quality of products and services.
- **Similarities to BPM**: emphasis on the necessity of ongoing improvement.
- **Differences to BPM**: TQM puts emphasis on products/services, BPM focuses on improving the products/services through the improvement of the processes that create these products/services

Operations Management

- Focus on managing the physical and technical functions in an organization, particularly production and manufacturing.
- **Similarities to BPM**: use common techniques like probability theory, decision analysism, queuing theory, etc...
- **Differences to BPM**: operations management concerns itself with controlling an existing processes without necessarily changing it, BPM is concerned with changes to an existing process in order to improve it.

Lean

- Focus on elimination of waste (activities that don't add value to the customer).
- **Similarities to BPM**: the customer orientation is similar and many principles of Lean were absorbed by BPM.
- **Differences to BPM**: BPM puts more emphasis on the use of IT as a tool to improve business processes and make them more consistent and repeatable.

Six Sigma

- Focus on minimizing the defects/errors. Emphasis on meausuring the output of processes or activitities, especially in terms of quality, encourages managers to systematically compare the effects of improvement intiatives on the outputs. Not applied alone usually, but in conjunction with other approaches (ex: Lean Six Sigma)
- **Similarities to BPM**: many of the techniques of Six Sigma are applied to BPM.

BPM embraces the principles and techniques from all these and combines them with modern technology.

Origins and History of BPM

The Functional Organization

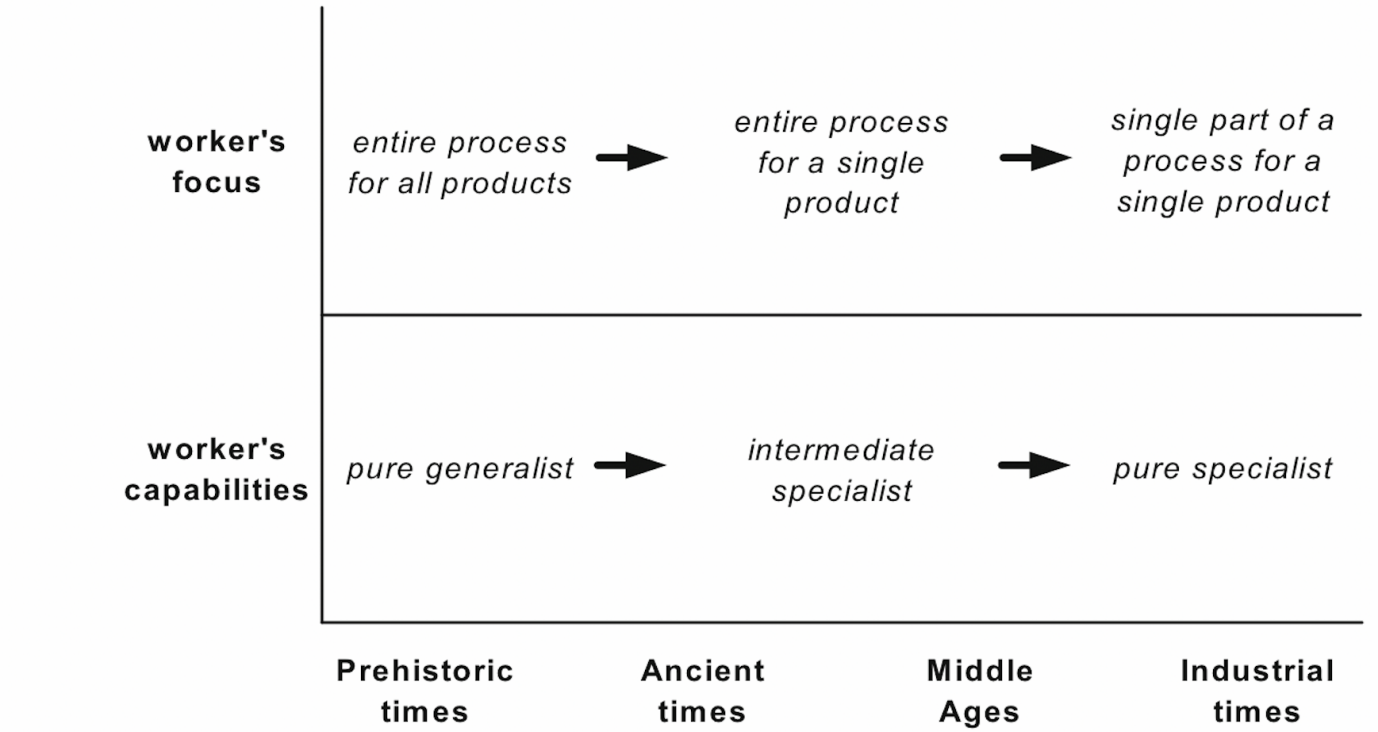


Fig. 1.2 How the process moved out of focus through the ages

- **Pure generalist**: in ancient times, people had knowledge of how to produce many different things.
- **Intermediate specialist**: people started to specialize on the art of providing one particular type of goods.
- **Pure specialist**: even higher level of specialization.

Adam Smith: Processes and Division of Labour

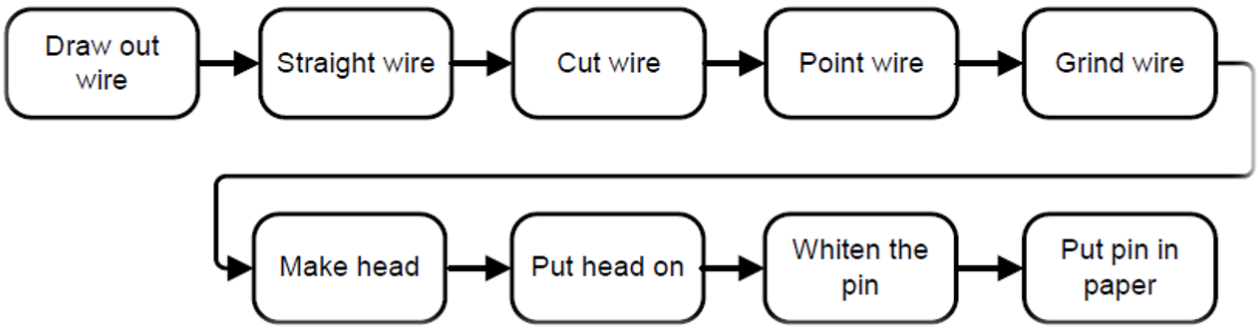
- Division of labor through an example of a manufacturing company for producing pins. Smith emphasizes division of labor but it is actually the design of the process (he calls it combination) that contributes to good performance of the manufacturer.

The process of pin-making

"To take an example, the trade of a pin-maker: But in the way in which this business is now carried on. it is divided into a number of branches:

- 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
- three operations; to put it on is a peculiar business;
- to whiten the pins is another; to put them into the paper;

and the important business of making a pin is, in this manner, divided into about eighteen distinct operations."

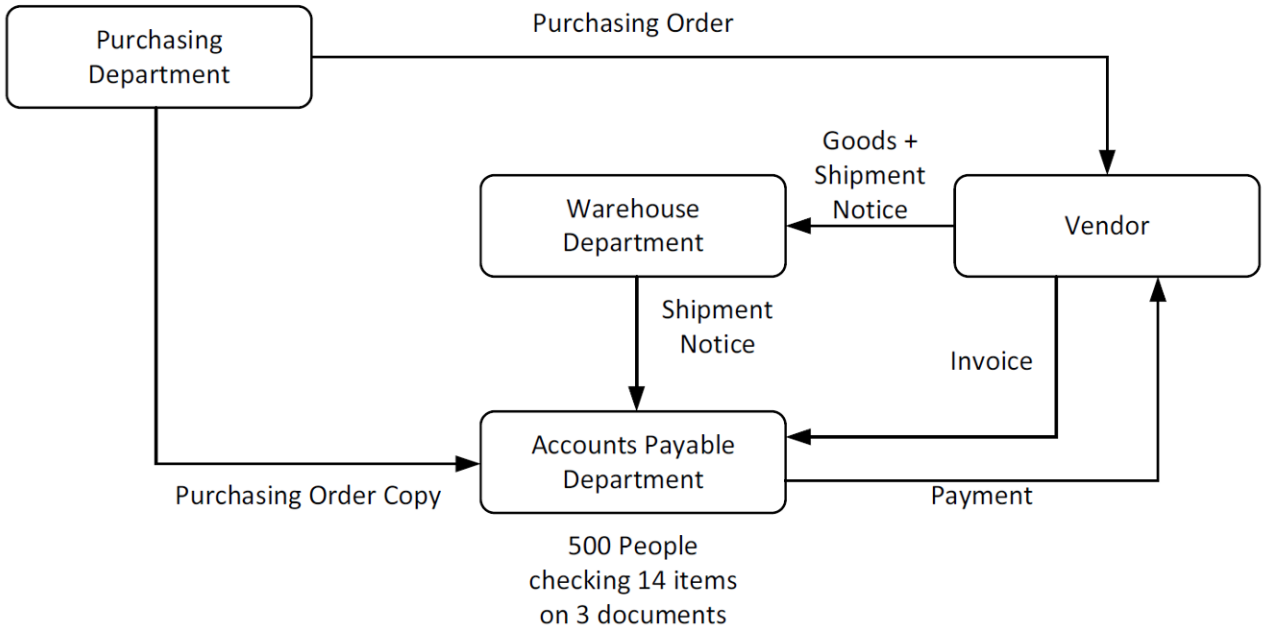


Frederick W. Taylor: Scientific Management

- Workers are involved in carrying out only one of the many steps of the production process - workers are pure specialists.
- The side effect of his idea was the creation of **managers** who oversee the productivity of the workers. Their goals include making productivity goals for individual workers, making sure those goals are met and optimizing how a job is done.
- **How to differenciate between the responsabilities of all these managers?**
  - By creating **functional units** - grouping together people with a similar focus on part of the production process - overseen by managers with different responsabilities. The units and their managers are structured **hierarchically**.
    - For example: groups are placed under departments, departments are placed under business units, etc...

The Birth of Process Thinking

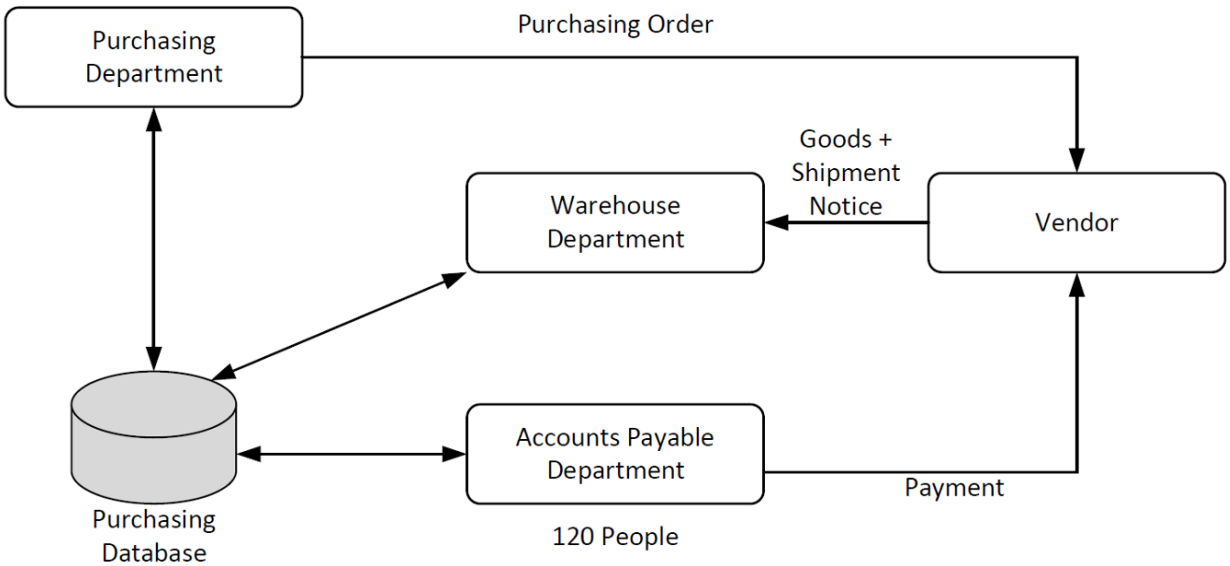
Ford's Purchasing Process: Initial Stage



- Necessity to check consistency between three documents: purchase order copy, shipping notice and invoice, each document consisting of 14 data items. The discrepancies were being discovered everyday. The discrepancies were handled one by one.

Ford's Purchasing Process: Redesign

- The key to solve the problem was to **avoid** the discrepancies altogether. Ford created a central database to store info on purchases, replacing the original paper streams, the warehouse department had a system that gave direct access to the database. The workforce went from 500 people to 126 (76% reduction).



- Note how the solution involved a lot of changes across many components: informational changes (information exchanges), technological changes (database, terminals) and structural changes (checks, policies).

Tom Davenport and James Short

- Look at the **entire, end-to-end process** when trying to improve the operations of your business instead of focusing only on one task or business function.
- Emphasis on the importance of IT that can facilitate redesign, such was the case for Ford that couldn't have made the changes without the right technologies (databases and terminals to gather all the info and grant acces to it).

The Rise and Fall of BPR (Business Process Redesign/Reengineering)

- Very popular in the 90s but faded away by the end of that decade. What happened?

1. **Concept Misuse**
    - In some organizations, every change program was labeled BPR even when business were not the core of these projects.
    - Many corporations reduced their workforces (as redesign projects) which triggered resentment against BPR.
2. **Over-radicalism**
    - "Don't automate, obliterate" by Hammer: the redesign had to be radical, a new design for a business had to overhaul the way process was organized.
    - Many situations require an incremental approach.
3. **Support Immaturity**
    - People were frustrated when they noted their efforts on process redesign were thwarted by a rigid infrastructure.
    - Necessary tools and technologies were not yet available or insufficient.
    - Much process logic had to be hard-coded in IT applications of the time.

Reshaping Process Thinking

- Two key events revived some of the ideas of BPR.
    - **Empirical studies appeared showing that organizations are process oriented**.
        - Process oriented organizations performed better than non process organizations.
    - **Different types of IT systems emerged like ERP systems and WfMSs**.
        - ERP: systems that store all data related to the business operations in a consistent manner, all stakeholders that need access can gain it - single centralized database.
        - WfMSs: systems that distribute work to various actors in a company, makes it easier to implement changes to business process (ex: change order of steps).
    - **WfMS became more sophisticated evolving to BPMSs**.

- BPMS: IT tool that supports implementation and execution of the business process.

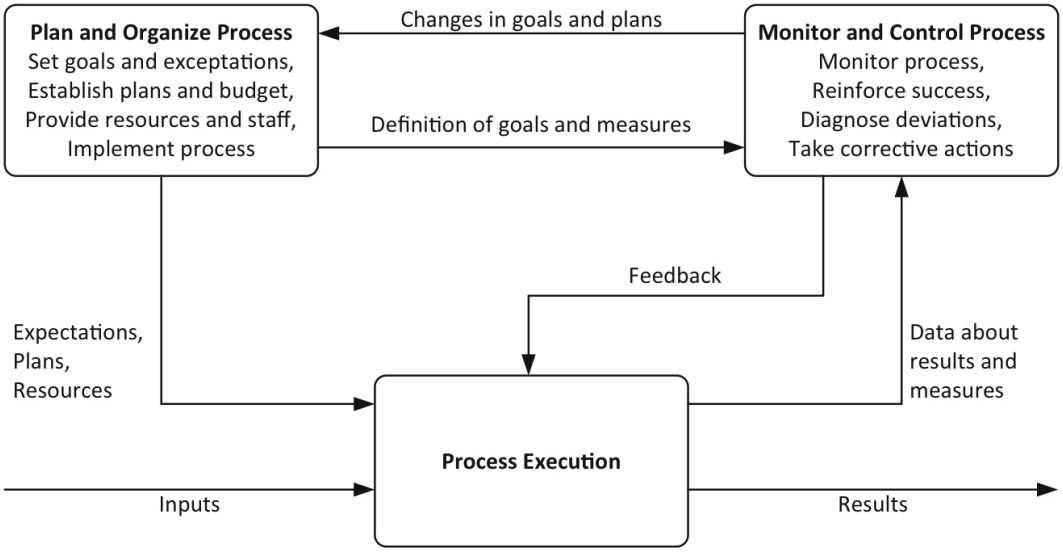


Fig. 1.5 Job functions of a manager responsible for a process (a.k.a. process owner), based on Rummler & Brache [153]

- BPR is primarily concerned with planning and organizing the process while BPM provides methods, concepts and techniques and tools that cover all aspects of a managing process (to plan, organize and monitor it).
- **BPR is a subset of techniques that can be used in the context of BPM**.

The BPM Lifecycle

- The first question we should ask: **Which business process do we aim to improve?**
- Then we need to adress things like when does the process start, when does it end?
- These questions may be harder depending on how much **process thinking** has taken place in the organization beforehand in order to define the **scope of the processes**.

Establishing Process Thinking in Organizations

- **Process Identification**: identify processes relevant to the problem, delimiting scope of the processes, identifying relations between these processes.
- **Process Architecture**: collection of interlinked processes covering the bulk of the work that an organization performs in order to achieve its mission in a sustainable manner.
- **Process Performance Measures/Metrics**: determine wether a process is in good or bad shape. Measures are like cost, time, quality and flexibility.
    - **Issues related to Performance Measures**:
        1. Cycle time and waiting time

2. Error rates

Cost-related measures are a recurrent class of performance measures in the context of BPM. For example, coming back to the equipment rental process, a possible performance measure is the total cost of all equipment rented by BuildIT per time interval (e.g., per month). Another broad and recurrent class of measures are those related to time. An example is the average amount of time elapsed between the moment an equipment rental request is submitted by a site engineer and the delivery of the equipment to the construction site. This measure is generally called *cycle time*. A third class of recurrent measures are those related to quality, specifically error rates. Error rate is the percentage of times that an execution of the process ends up in a negative outcome. In the case of the equipment rental process, one such measure is the number of pieces of equipment returned because they are unsuitable, or due to defects in the delivered equipment. Finally, flexibility measures capture the extent to which the performance of a process is maintained under changing or abnormal conditions, for example when a works engineer resigns suddenly or when a supplier goes bankrupt.

The identification of performance measures (and associated performance objectives) is crucial in any BPM initiative. This identification is generally seen as part of the process identification phase, although in some cases it may be postponed until later phases.

- **Process Discovery**: the outcome is **as-is process models** that reflect the understanding that people in the organization have about how work is done. We usually use diagrams to illustrate these.
    - One example is **flowcharts** with activity nodes and control nodes.
        - **Activity Nodes**: units of work that may be performed by humans or software apps (or a combo of both).
        - **Control Nodes**: capture flow of execution between activities.
        - **Event Nodes**: tells us something may or must happen.
- **Process Analysis**: identification and assessment of issues and opportunities for process improvement.
- **Process Redesign**: after all this, we must identify and analyze potential remedies for these issues, however we need to keep in mind that a change in the process may trigger other issues, establish to-be process.
- **Process Implementation**: put the to-be process in execution.
    - **Organizational Change Management**: set of activities required to change the way of working of all participants involved in the process.
    - **Automation**: development and deployment of IT systems that support the to-be process.

- **Process Monitoring**: check how well the process is performing

Establishing Process Thinking in Organizations

- Establish BPM Team
- Describe Process Architecture
- Define Process Performance Measures
- Discover and Model Processes
- Analyze, Redesign, Implement and Monitor Processes
- Make Use of Process-Aware Information Systems

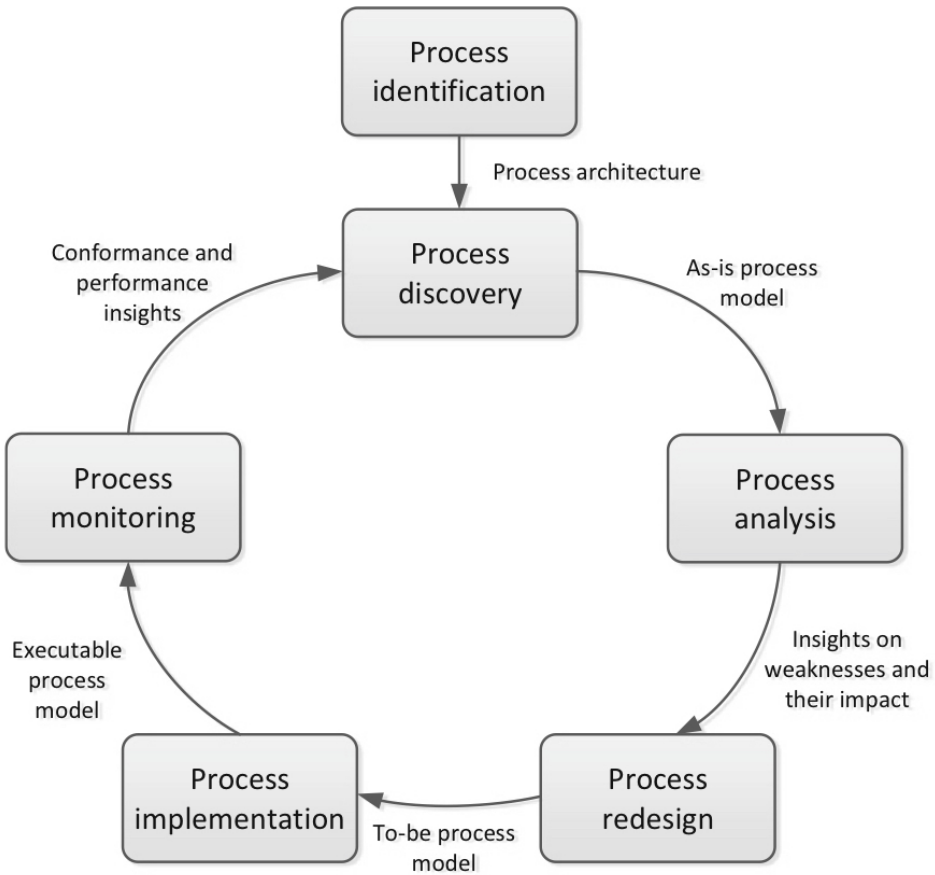
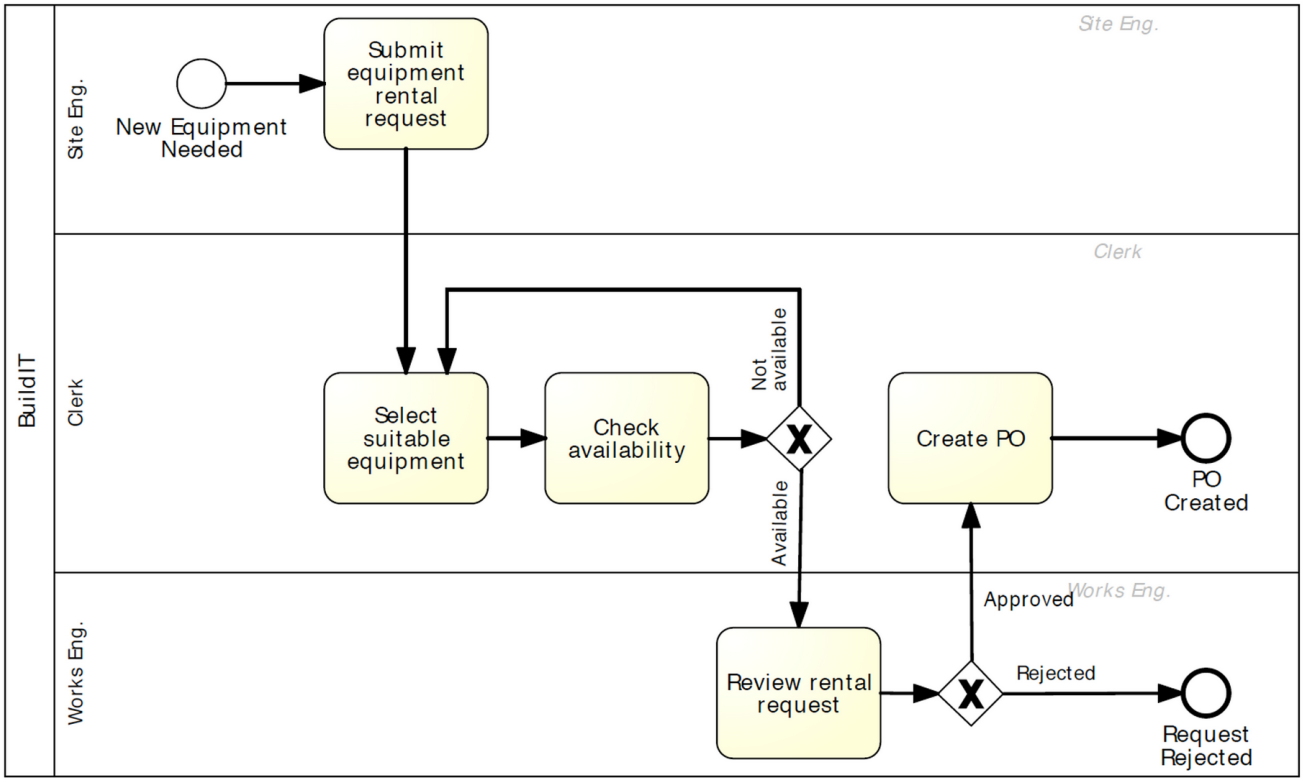


Fig. 1.7 The BPM lifecycle

Example: Process model for the initial fragment of the equipment rental process (BPMN)



Big rectangles = Lanes (represents each participant)

Rounded Rectangles = Activities

Diamond shapes = Control Nodes

Stakeholders in the BPM Lifecycle

- **Management Team:**
  - Chief Executive Officer (CEO) responsible for overall business success.
  - Chief Operations Officer (COO) responsible for defining the way operations are set up, sometimes Chief Process Officer (CPO) or Chief Process and Innovation Officer (CPIO).
  - Chief Information Officer (CIO) responsible for operation of information system infrastructure.
  - Chief Financial Officer (CFO) responsible for overall financial performance of the company.
  - Human Resources (HR) director plays key role in processes that involve many process participants.
- **Process Owners:**
  - Process owner is responsible for efficient and effective operation of a given process, including
  - Planning and organizing, i.e. defining performance measures and objectives as well as initiating and leading improvement projects.
  - Monitoring, i.e. ensuring that performance objectives are met. and taking corrective actions.
  - Process owner is involved in process modeling, analysis, redesign, implementation, and monitoring.
- **Process Participants:**
  - Perform activities of business process on day-to-day basis.
  - Conduct routine work according to the standards and guidelines of the company.
  - Coordinated by process owner, who is responsible for non-routine aspects of process.
  - Involved as domain experts during process discovery and process analysis.
  - Support redesign activities and implementation.
- **Process Analysts:**
  - Conduct process identification, discovery, analysis, and redesign.
  - Coordinate implementation and monitoring.
  - Report to management and process owners
  - Have business or IT background.
- **Process Methodologist:**
  - Provides advice on methods, techniques and software tools.
  - Coordinates technical training.
- **System Engineers:**
  - Translate requirements into system design
  - Responsible for implementation, testing and deployment.
- **BPM Group (also BPM Center of Excellence):**
  - Responsible for preserving project knowledge and documentation.
  - Maintain process architecture.
  - Prioritize process redesign projects.
  - Align the BPM efforts with strategic goals.
  - Most common in large organizations with several years of BPM experience.