



Business Process

Chapter 2 & 3

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- Process modeling
- Architectural Characteristic of a business process
- Evaluating business process performance
- Champy's Business Process Reengineering



Viewing Business as a System



Business System Consisting of Business Process

- Business process: related group of activities that use *people, information, and other resources* to create value for internal or external customers.
 - Example: product delivery
- Scope: specific sub-process or activity that the business process includes.
 - Each activity also has input & output



Value Added

- Amount of value it creates for business process' customer.



Functional Areas of Business

- Large subsystem of a firm related to a specific business disciplines: Production, Sales, Marketing, Finance, Human Resource, Accounting, etc.
- Managed in terms of functional silos, tends to be inward looking
- New trend: customer focused, process based instead of functional areas.



Types of business process

- Requiring coordinated work from many functional areas
 - fulfilling customer orders
- Typically within a functional areas (however, unlikely they are islands)
 - product delivery
 - paying employees
- Sub-process and activities occurring in all areas
 - Communicating
 - planning
 - providing feedbacks

Business Processes and Functional Areas of Business

Business processes requiring coordinated work from many functional areas

- Creating a new product
- Fulfilling customer orders

Production

Purchasing materials
Assembling or fabricating
Delivering products

Accounting and Finance

Performing financial transaction
Creating financial statements
Paying taxes
Financing operations

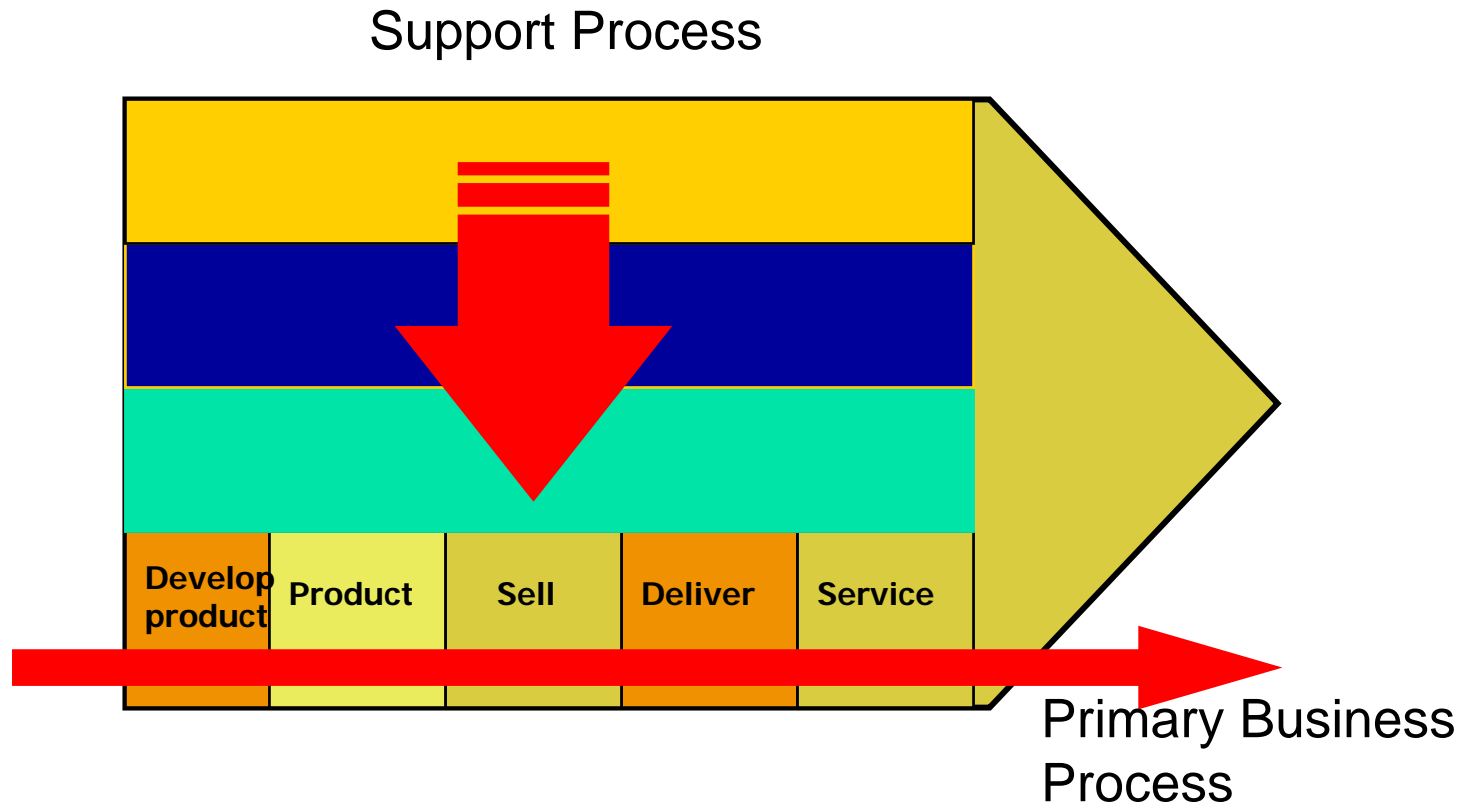
Human Resources

Determining hiring requirements
Hiring people
Introducing employees to the way the company operates
Paying employees
Administrating employee Benefit

Sub-processes and activities occurring in all functional areas

Communicating with other people, Analyzing data, Motivating employee
Planning, Providing feedback to employee

Porter's Value Chain





Process Modeling



Process Modeling: Business Process Architecture

- Process Modeling - A method of documenting process architecture by identifying major processes and subdividing them into linked sub-processes.



Types of process model

- Data flow diagram
- Flow chart
- Activity diagram



Data Flow Diagrams

- Data Flow Diagrams - represent flows of data between different processes within a business.
- Simple, intuitive, no focus on computer systems
- Use only four symbols
- focus on analysis of flows between sub-processes
- Flowcharts and other techniques can be used to talk of decision criteria and other details.
- Starting point is a Context Diagram - High Level representation



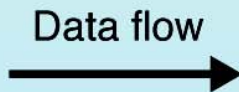
Creating Data Flow Diagrams

- The starting point for a DFD is a ***Context Diagram***, which shows *sources* and *destinations* of the data being used and generated.
- The context diagram establishes the scope of the system.
- Next identify processes, and break them down into sub-processes to describe how work is done.
- The value of DFD's is in resolving disagreements about how work is currently done, or it should be done in the future.

Symbols used in data flow diagrams



A process transforms inputs into outputs, and is represented by a rounded box. Processes are usually described by verbs such as select, purchase, calculate, decide, adjust, hire, and update.



A data flow represents movement of data between processes, data stores, and external entities. Data flows are represented by arrows, with the data identified along the arrow.

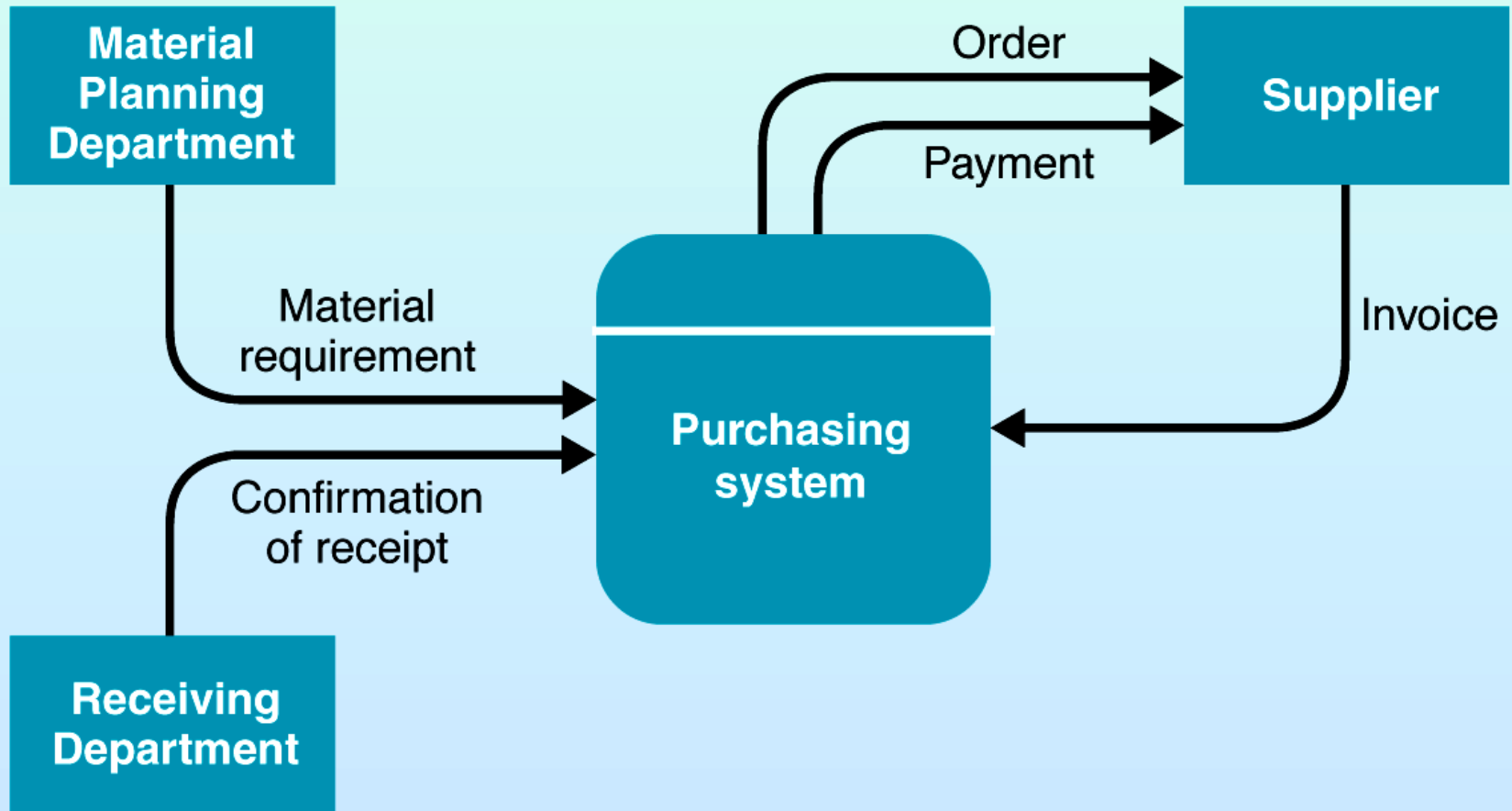


A data store is a location where data is stored. It can be a file cabinet, diskette, hard disk, answering machine, or any other place that would be the answer to the question "Where is the data?" The symbol for a data store is an open rectangle.

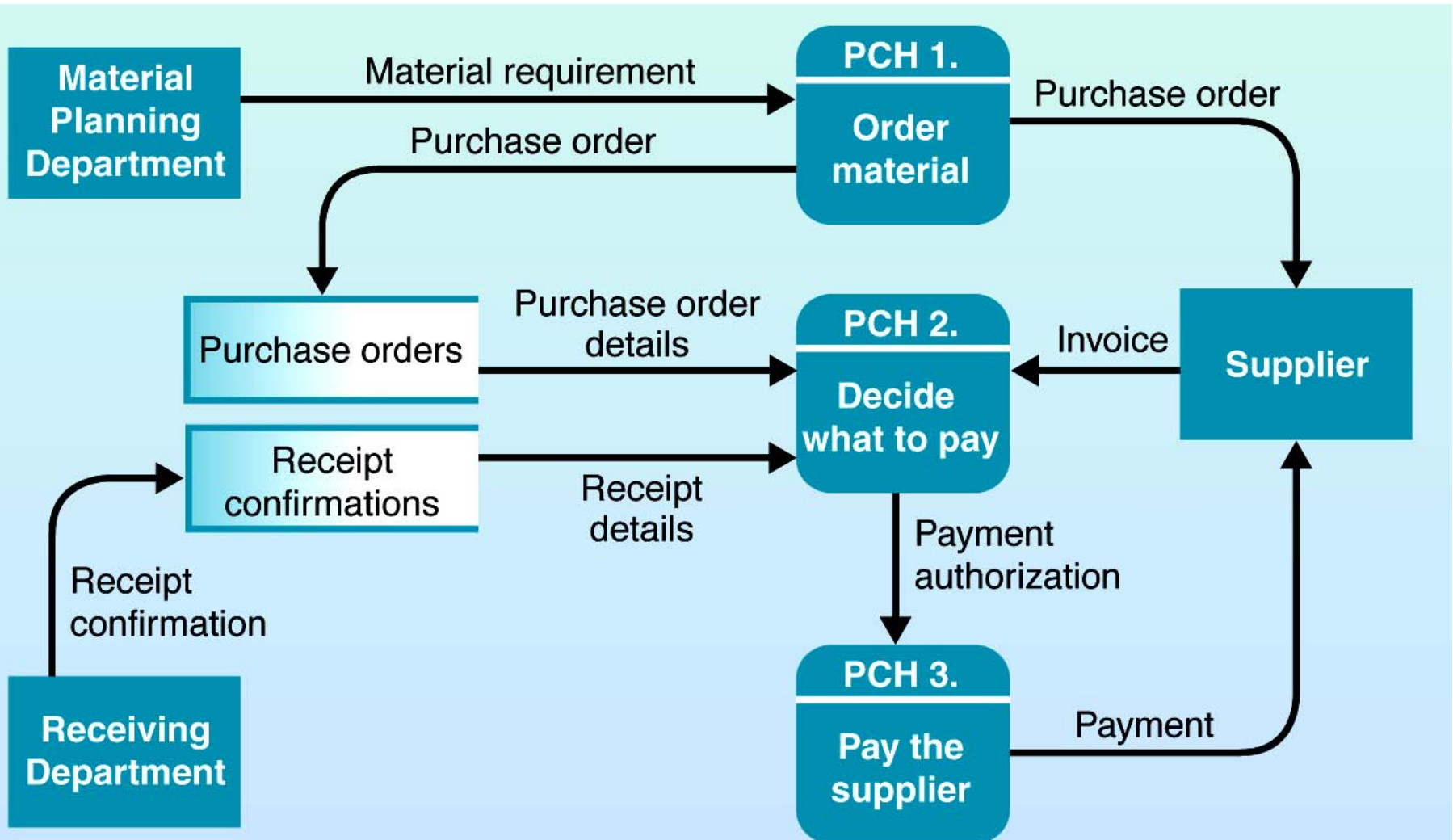


An external entity is any person or organization that provides data to a process in the system or receives data from a process. The symbol for an external entity is a square.

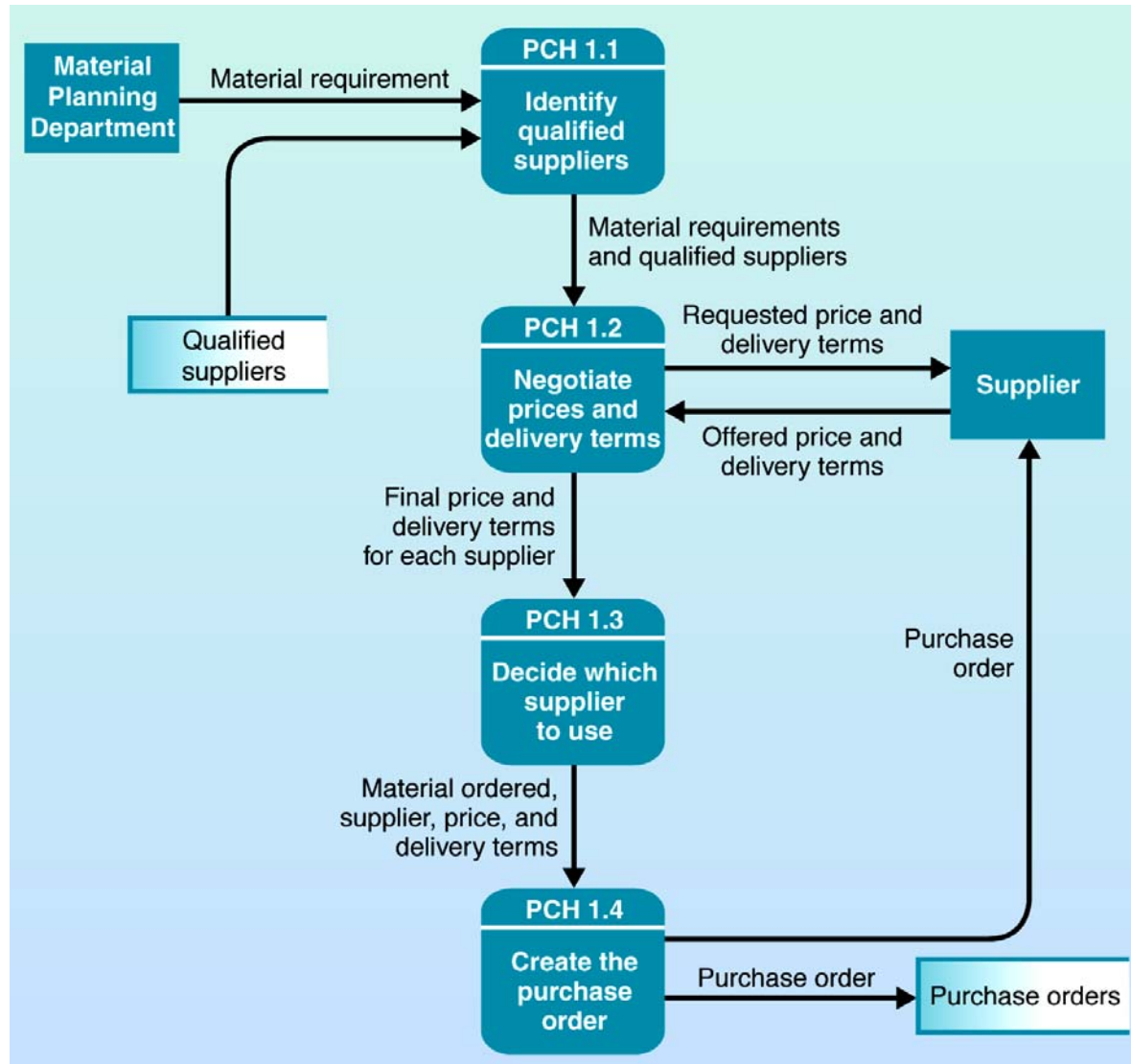
Context diagram for the Ford purchasing system



Data flow diagram showing the main processes in Ford's original purchasing system



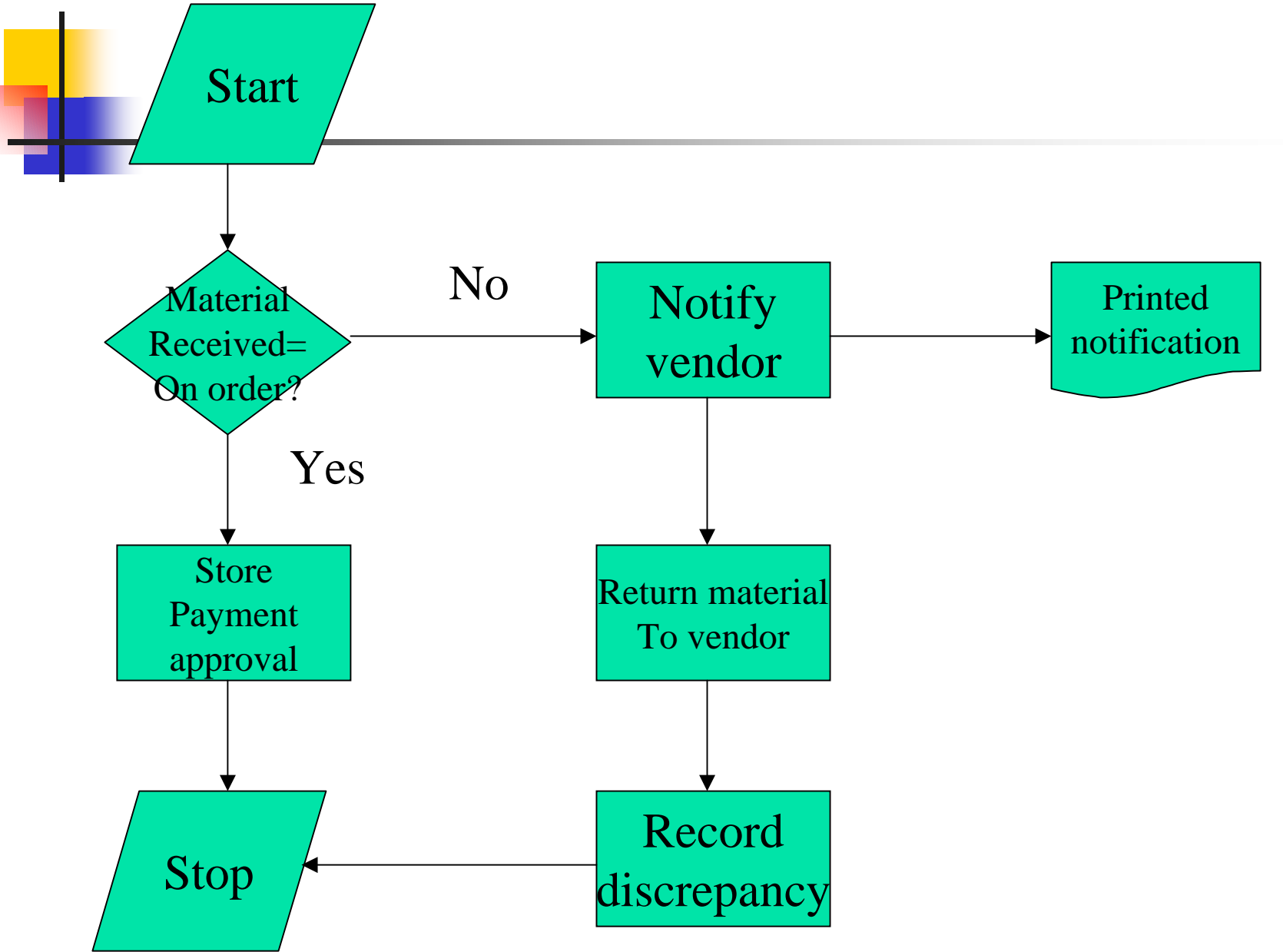
Data flow diagram dividing PCH 1 into four subprocesses





Other Process Modeling Techniques

- **DFD's** are used extensively. However, other techniques can also be used to fill in some details not expressed by DFD's.
 - DFD's do not express the sequence and timing of processes nor the detailed logic of processes.
- **Flowcharting** - represent the sequence and logic of procedures
- **Structured English** - "pseudo-code" - represent the precise logic of a procedure by writing it down.





Structured English

Retrieve the purchase order

For each item on the purchase order

If quantity received = quantity ordered

Then item code is "match"

If item code = "match" for all items in the purchase order

then purchase order receipt code is "match"

If purchase order receipt is "match"

then approve payment for order

else return material received

Architectural Characteristics of a Business Process





Architectural Characteristics of a Business Process

- Seven Characteristics that often affect business process performance:
 1. Degree of Structure
 2. Range of Involvement
 3. Level of Integration
 4. Complexity
 5. Degree of Reliance on Machines
 6. Prominence of Planning and Control
 7. Attention to Errors and Exceptions



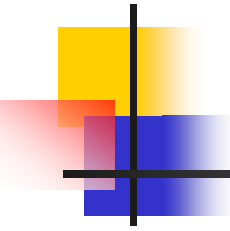
Degree of Structure

- The degree of structure of a business process is the degree of predetermined correspondence between its inputs and outputs.
 - ATM: highly structured
 - It is completely governed by rules stating how it will respond to each possible input
 - Marketing kit development: highly unstructured
 - Fact: many involved both kind



Characteristic of highly structured task

- It is possible to say exactly how to perform and how to evaluate
- Examples:
 - Totaling the previous month's invoices



Characteristics of highly structured task

- Information requirements are known precisely
- Methods for processing the information is known
- Desired format is known
- Decisions and steps are clearly defined
- Criteria for making decisions are understood precisely
- Performance can be measured precisely



Semi-structured Task

- Information requirements and procedures are generally known, although some aspects of the task rely on judgement of person doing the task.
- Example:
 - The way a doctor diagnoses an illness
 - It contains some structure because the physician understands common medical facts and diagnosis methods
 - Also, many medical situations are ambiguous and require judgment and intuition.



Unstructured Task

- It is so poorly understood that the information to be used, method of using the information,
- Criteria for deciding when task is done cannot be specified.
- Unstructured tasks are performed based on experience, intuition, trial and error, rules of thumb, and very qualitative measures.
- Example:
 - The selection of a company president

One way to Structure Loan Authorization

Homeowner (y/n) _____
Years on job _____
Years at this address _____
Bank balance _____
Type of education _____

Total Point

```
graph LR; A[Homeowner (y/n) _____  
Years on job _____  
Years at this address _____  
Bank balance _____  
Type of education _____] --> B((Total Point)); B --> C[More than 75 points  
Grant loan]; B --> D[60-75 points  
Loan officer decides]; B --> E[Less than 60 points  
Reject loan];
```

More than 75 points
Grant loan

60-75 points
Loan officer decides

Less than 60 points
Reject loan



Using Information Systems to Impose Structure

- Highest: substitute technology for people
 - replace the person with technology
 - Example: ATM
 - automate much of the work
 - example: A construction company uses a program to generate bids for construction contracts. The computerized bids are usually changed only slightly.



Cont ...

- High: Enforcement of rules and procedures
 - Control each step in the work
 - Example: loan approval system
 - Provide real-time guidance for work steps performed by people
 - Example: An interactive shop-floor control system tells workers what machine settings to use and warns them when exceptions occur



Cont ...

- Low: Access to information or tools
 - Use model to find potential solution
 - A pharmaceutical company uses a model to help allocate funds among research proposals. People make the decision.
 - Provide tools that helps people do their work
 - An architecture firm uses a computer-aided design system to help design buildings.
 - Provide information that is filtered, formatted, and summarized to make it useful.
 - A management information system provides performance information for managers
 - Provide a general purpose tool to help people do work
 - Provide a telephone, spreadsheet, or word processor



Range of Involvement

RANGE OF INVOLVEMENT

- too many participants or too few
- the organizational span of people involved in a process.

RANGE OF INVOLVEMENT

Problem if the level is too high:

- Work is slowed down because too many people get involved before steps are completed.

Problem if the level is too low:

- Work is performed based on narrow or personal considerations considerations, resulting in decisions that may not be the best for the overall organization.

The Role of Information Systems:

- Information systems can be designed to broaden or constrict the range of involvement.
- Executive Information Systems
- Case Manager Approach

•TQM: Reduce involvement and empower workers

- Note separation of duties from an internal audit perspective.**



Level of Integration

Integration is the mutual responsiveness and collaboration between distinct activities or processes.

In general, the extent of integration between two processes or activities is related to the speed with which one responds to the other.

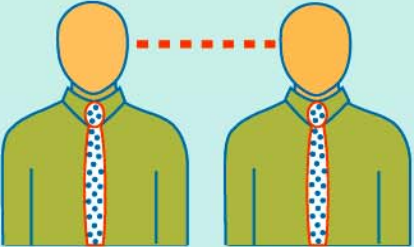
The speed depends on the immediacy of communication and the degree to which the process responds to the information communicated.



Integration of business process (5 Level of Integration)

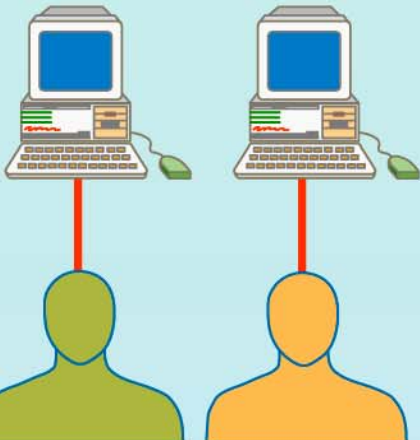
- Common culture
- Common standards
- Information sharing
- Coordination: exchange of messages of different process to respond each other's needs & limitations
 - coordination between sales & production
- Collaboration
 - product development

Five levels of integration between business processes



Common culture: *shared understandings and beliefs*

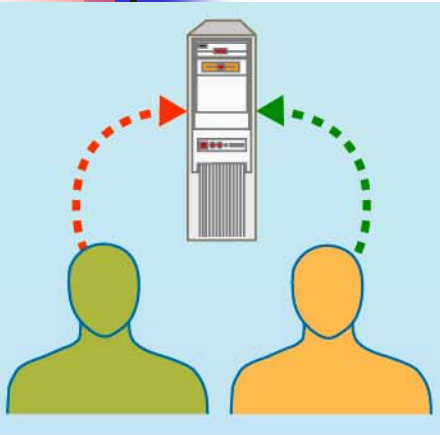
People involved in two independent processes share the same general beliefs and expectations about how people communicate and work together. These shared beliefs make it easier to work together and resolve conflicts whenever necessary.



Common standards: *using consistent terminology and procedures to make business processes easier to maintain and interface*

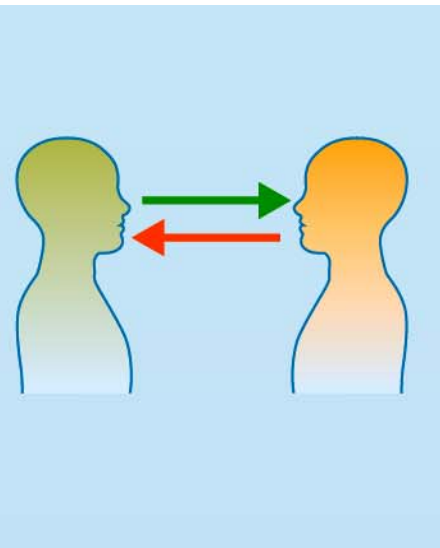
Two different business processes use the same standards but otherwise operate independently. For example, two different departments may use the same type of personal computer or the same word processing software. Operating with agreed upon standards of this type may create economies of scale for the technical staff, who may be able to learn and service a smaller number of technical options. It also may enhance the possibility of other forms of integration in the future.

Five levels of integration between business processes - continued



Information sharing: *access to each other's data by business processes that operate independently.*

Two different business processes share some of the same information even though the information sharing does not directly involve mutual responsiveness. For example, a sales department and a manufacturing department might share the manufacturing database so that sales would know what capacity was still available for additional orders.



Coordination: *negotiation and exchange of messages permitting separate but interdependent processes to respond to each other's needs and limitations*

Different business processes maintain their own unique function and identity, but pass information back and forth to coordinate their efforts toward a common objective. For example, sales tells manufacturing what they can sell; manufacturing responds with a tentative output schedule; they negotiate to come up with a mutually feasible plan and then go about their individual work.

Five levels of integration between business processes – continued



Collaboration: *such strong interdependence that the unique identity of separate processes begins to disappear*

Two different business processes merge part or all of their identity to accomplish larger objectives of the firm. For example, based on the need to get more easily manufacturable products to market sooner, many firms have moved toward product development processes that involve close collaboration between marketing, engineering, and manufacturing.



Complexity

Systems that are too simple don't handle the complexity of the problem; systems that are too complex are hard to understand, maintain, and fix.

Complexity can be measured by the number of elements it contains, and the number and nature of their interactions

Reduce Complexity by reducing low value variations, reducing the number of interacting components, and simplify the nature of interactions.

COMPLEXITY

Problem if the level is too high:

- Participants, managers, and programmers have difficulty understanding how the system operates or what will happen if it is changed.

Problem if the level is too low:

- The system cannot handle the different cases that it should be able to handle.

Degree of Reliance on Machines



Not everything can be automated!

DEGREE OF RELIANCE ON MACHINES

Problem if the level is too high:

- People become disengaged from their work.
- People's skills may decrease.
- Mistakes occur because people overestimate what the computers are programmed to handle.

Problem if the level is too low:

- Productivity and consistency decrease as bored people perform repetitive work that computers could do more efficiently.



Prominence of Planning and Control

- Participants in a business process need to know what to do, when to do it, and how to make sure it was done right.
- **Planning** - decide what work to do and what outputs to produce when.
- **Controlling** - use information about past work performance to assure goals are attained and plans carried out.



Attention to Errors and Exceptions

Exceptions: The system does not handle special cases properly.

Operational failures: The system fails to operate as intended.

Bugs: The system does not correctly reflect the ideas of the system designers.

Design errors: The system does what the designers intended, but they failed to consider certain factors.

Capacity shortfall: The system cannot meet current output requirements.

Displacement of problems: The system creates problems that must be absorbed and fixed somewhere else.

Computer crime: The system is used for theft, sabotage, or other illegal purposes often based on fraudulent data inputs.

Evaluating business process performance





Evaluating Business Process Performance

PROCESS PERFORMANCE VARIABLES:

- Activity Rate
- Output Rate
- Consistency
- Productivity
- Cycle Time
- Downtime
- Security



Activity Rate

- Problem if the level is too high
 - Wasted effort and build-up of unneeded inventory
- Problem if the level is too low
 - Inefficient resource usage and imbalanced work-in-process
- Typical measures: Number of work steps completed per day
- IS role:
 - Track the rate at which work steps are occurring
 - Help in deciding which steps to do when, thereby keeping the inventory balanced and the work flow steady



Output Rate

- Problem if the level is too high
 - Lower productivity and consistency by increasing rates of errors and rework
- Problem if the level is too low
 - Lower productivity due to the cost of unused capacity
- Typical measures:
 - Amount of output it actually produces in a given time period
 - Example: peak, average units / hour



Cont ...

- Common role of IS:
 - Increase rate of output by performing some of the work automatically
 - Increase rate by systematizing the work



Productivity

- Relationship between amount of output produced by a business process and the amount of money, time and effort it consumes.
- Measures: output per labor hour, scrap rate, ratio of output vs input (in \$)
- Common role of IS:
 - Help people produce more output with the same effort
 - Schedule work to improve resource utilization



Cont ..

- Problem if it is too high: too much emphasis on cost per unit and too little emphasis on quality
- Problem if it is too low: output is unnecessarily expensive to produce



Consistency

- Measures: Defect rate, percentage variation, and rework rate
- Common IS role:
 - Controls production
 - Analyze cause of variability
 - Systemize work to reduce variability of the product
- Problem if the level is too high:
 - Inflexibility, making it difficult to produce what little emphasis on quality of the output
- Problem if the level is too low:
 - Too much variability in the output, reducing quality



Cycle time

- Measures: elapsed time from start to finish
- Common IS role:
 - perform data processing faster
 - parallel processing of work steps
 - systemize work to reduce waste
(production target schedule will be met faster)



Downtime

- Measures: total time out of operation compared to length of the time period; total time out of operation compared to scheduled uptime
- Common role of IS:
 - Track the process and equipment to identify things that are going out of spec
 - Perform backups and provide recovery methods



Security

- Measures: number of breaches, mismatches
- Common IS role:
 - track irregular request & changes
 - track inconsistencies & irregularities
 - logs usage & access

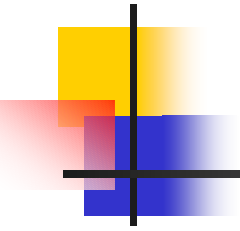


Champy's BPR



Business Process Reengineering

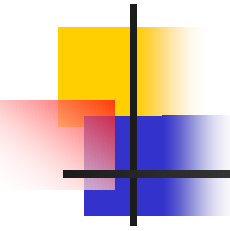
- Menurut Hammer & Champy (1993) ada beberapa karakteristik BPR:
 - Beberapa pekerjaan digabung jadi satu
 - Staf banyak melakukan decision making
 - Delinearisasi: proses tidak harus sekuensial, tapi mungkin ada yang bisa diparelelkan

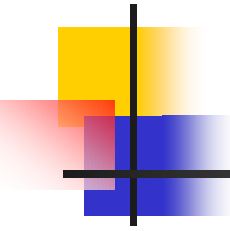
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- Relokasi pekerjaan ke lokasi yang paling tepat
 - Meminimalkan kontrol dan pemeriksaan
 - Rekonsiliasi diperkecil, bisa dengan cara meminimalkan jumlah point of contact
 - Melakukan kombinasi sentralisasi dan desentralisasi
 - “Single point of contact” untuk customer



Memilih proses bisnis

- Menggunakan intuisi bisnis (langsung dipilih)
- Melakukan SWOT
- *Process effectiveness analysis*: untuk mengetahui efektifitas proses mana yang paling menunjang tujuan bisnis.

- 
-
- Menggunakan **perspektif “core customer”**, sebagai penentu keberhasilan proses bisnis (dari Turban, McLean, 1999), contoh:
 - ketepatan waktu: “Masih diproses, Pak!”
 - biaya: “Wah, harganya memang segitu”
 - akurasi: “Tapi dalam catatan kami, koneksinya 10 menit”
 - inkonsistensi: “Wah dia tadi tidak benar, yang betul...”
 - responsiveness: “Maaf, telpon 1 menit lagi bisa?”
 - ketersediaan: “Aduh stoknya baru ada minggu depan”
 - kualitas: “Kok koneksinya lambat sekali sih?”
 - tunnel vision: “Wah, coba bapak tanya bagian instalasi!”
 - Esensinya melihat dari sudut pandang customer!

- 
-
- Data bisa diperoleh dari:
 - rekaman komplain customer di help desk
 - hasil survey yang telah dimiliki
 - focused group discussion
 - Dari proses-proses tersebut, kemudian jika diperlukan dapat dibuat prioritas
 - proses bisnis inti
 - proses bisnis penunjang



Membuat Pengukuran

- Jargon “Nothing happens until we measure”
- Untuk mendapatkan pengukuran, kita perlu umpan balik dari setiap proses bisnis
- Nanti akan bermanfaat untuk:
 - pengendalian proses
 - audit manajemen mutu
 - perbaikan proses di masa depan



- Jenis pengukuran

- berdasarkan output kepada customer, misal: downtime, network reliability
- berdasarkan proses internal, misal: kecepatan pengolahan
- berdasarkan input dari supplier, misal: ketersediaan inventory