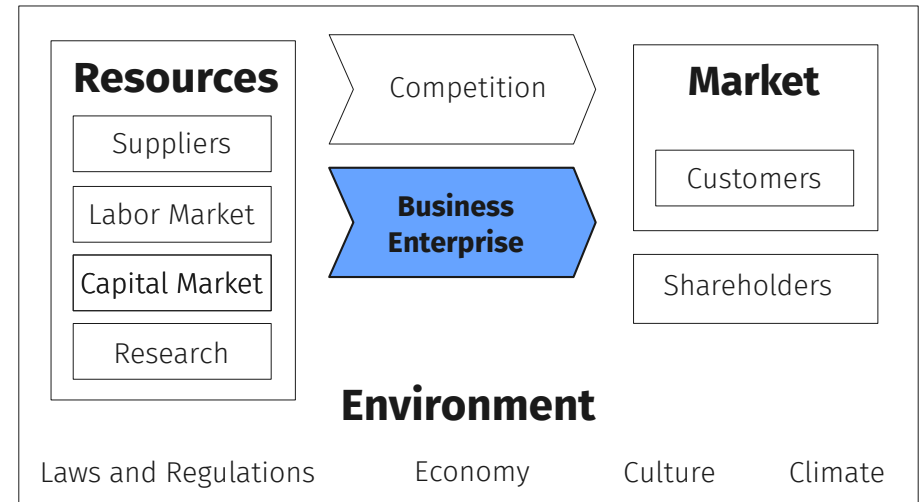


Business Process Modeling, Management and Mining

Business Process Discovery

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Enterprise Organization



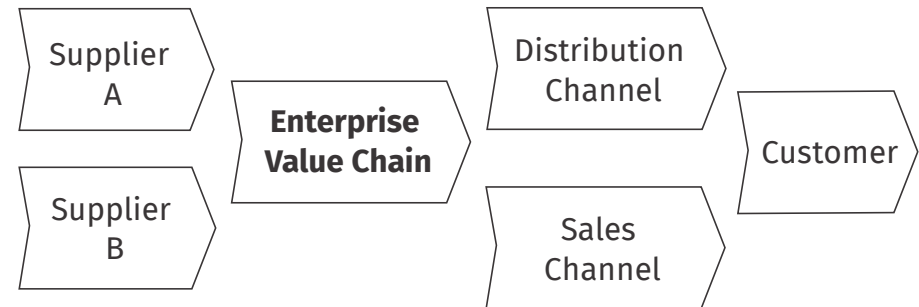
Discovery Goals

Processes are hidden in organizations, waiting to be found

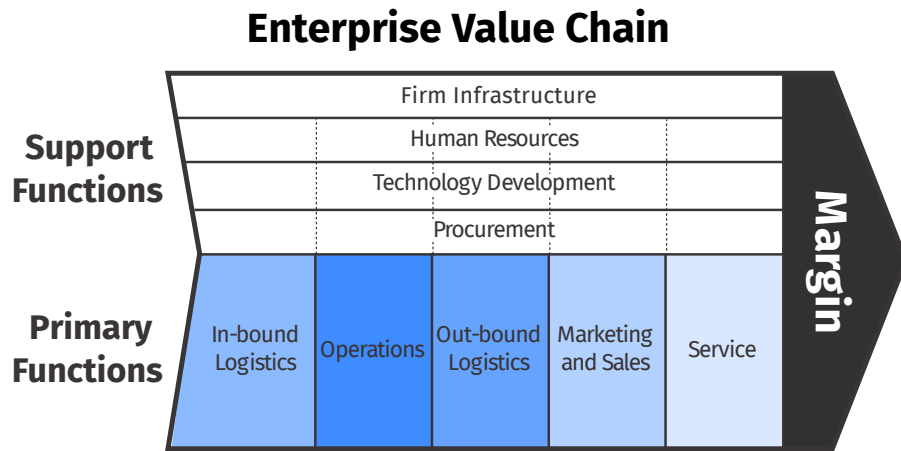
Identify Processes: distinguish processes, select the important ones

Represent Processes: gather knowledge about processes so that they can be modeled

Value System



Enterprises add value by collaborating with suppliers and delivering to customers their products through sales and distribution channels

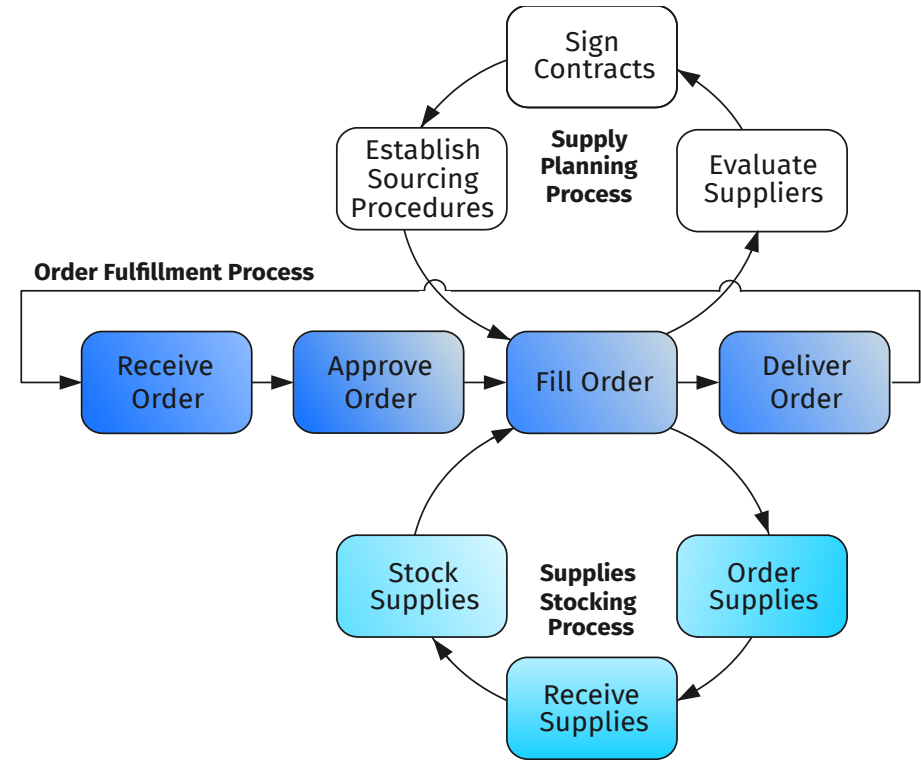


Primary Functions directly add to the value generated by an enterprise

Support Functions enable the efficient execution of the primary functions

Types of Processes

1. **Management Processes:** control and steer the organization
2. **Core Processes:** generate value, directly interact with customers
3. **Support Processes:** acquire resources



What to identify?

Process **Owner**: who is responsible?

Process **Goal**: what is the purpose?

Process **Scope**: what are the boundaries between processes?

Process **Portfolio**: what are the important processes?

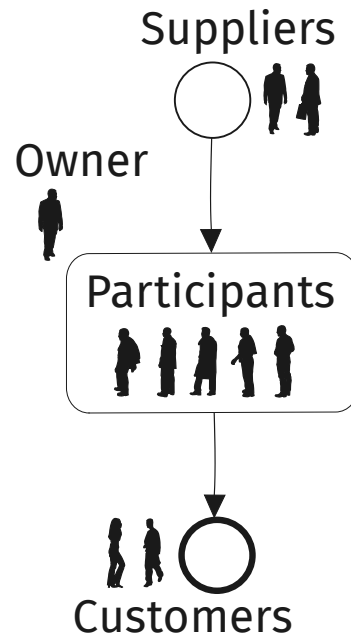
Stakeholders

Suppliers: are needed for the success of the process (provide input, involved in upstream processes)

Owner: responsible for the process success

Participants: involved directly in the process (but may have a narrow perspective about it)

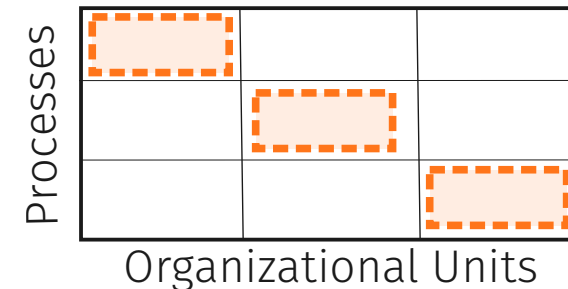
Customers: depend on the successful outcome of the process (only see the output, involved in downstream processes)



Gathering Knowledge

- **Centralized workshops** - all stakeholders present their perspective in the same meeting
 - Facilitate knowledge sharing and organizational learning
 - Conflicting views can be immediately discussed
 - Only works for small organizations
- **Distributed interviews** - multiple meetings with individual or small groups of stakeholders
 - The only practical way to learn from large organizations
 - Challenging to resolve inconsistencies

Discovering Organizations or Processes?



This indicates some confusion between mapping the organization and discovering its processes. Some processes are cross-functional, and the same units may run multiple processes.

Process Goals

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Functional: the main purpose of the process (e.g., purchase supplies, hire staff, find customers, develop new products)

Non-Functional: hard criteria for success (time, cost, quality, satisfaction, compliance) with the corresponding metrics, thresholds and priorities



Abstraction Levels

1. Make Money for the Company
2. Keep Customers Happy
3. Develop new products
4. Find customers that want to buy them
5. ensure printers have enough paper
6. close the headquarters every night

Process Scope

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Abstraction Level

coarse-grained vs. fine-grained

Boundary

separation between distinct processes



Abstraction Levels

1. Value Chains
2. Main Processes
3. Sub Processes
4. Activities

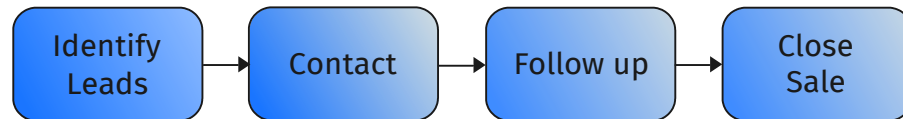
Coarse vs. Fine Grained

Coarse Grained Processes are too large to study and optimize. Too many people are involved: gathering knowledge and applying changes becomes expensive.

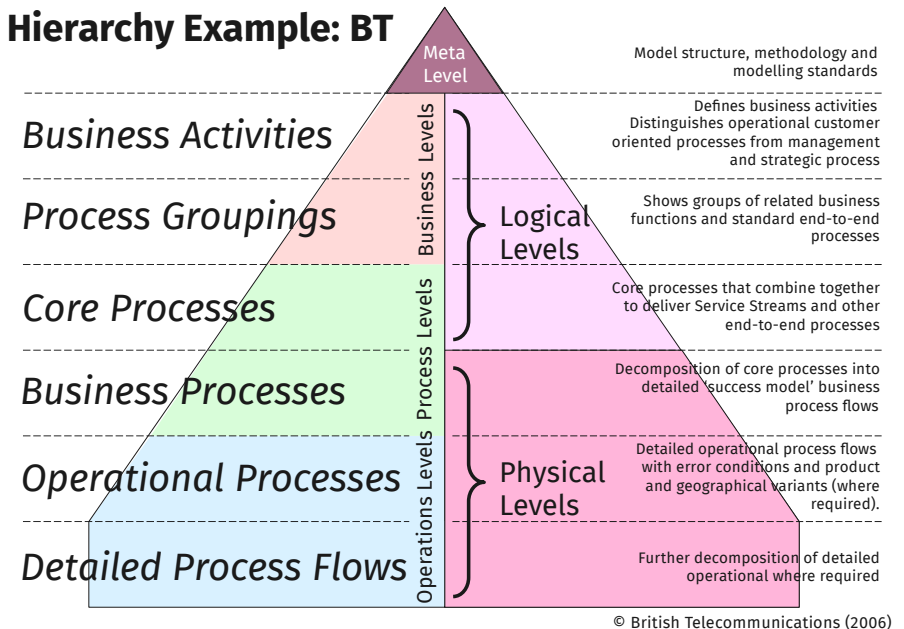
Improving **Fine Grained Processes** may lead to local optimizations where the overall performance is not improved

Activities or Processes?

Sales Process



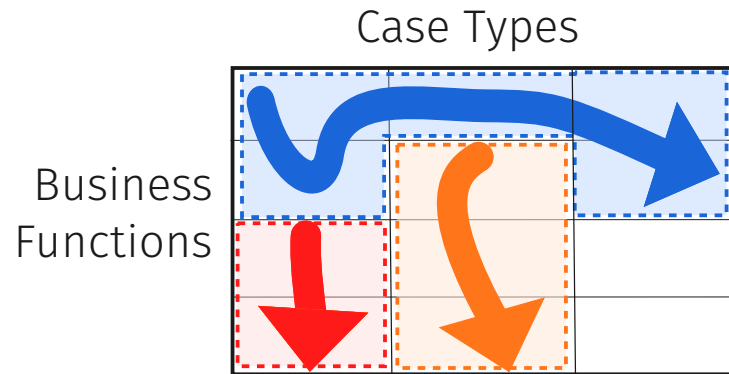
Hierarchy Example: BT



Gathering Knowledge

- **Top-Down** - start from the top of the organization (strategic view) and refine the knowledge progressively moving towards operational processes
- **Bottom-Up** - observe people while they work, follow the progress of specific pilot cases as they move through the involved business functions, reconstruct processes from partially overlapping views with the risk of incomplete information

Scoping: Case/Function Matrix



Define process boundaries depending on organizational aspects (which business functions are involved) and a classification of cases (which way different products/services are handled)

Case Types

Product Types: life vs. health insurance, book vs. magazine, software vs. hardware

Service Type: prepaid vs. contract subscriber

Geographic Location: Continent, Country, Regional Markets

Channel: in person, telephone, email, Web

Customer: new, returning, frequent flyer

Case types can be a combination of any of the above classification dimensions

Business Functions

Define what the organization does to handle the various case types

- 4. Deliver Product and Services
 - 4.2. Procure Materials and Services
 - 4.2.4. Manage Suppliers
 - 4.2.4.4. Monitor Quality of Product Delivered

Functions are refined and decomposed up to a level of detail that can help discover organizational units that can play different **process roles**

See the [APQC Process Classification Framework](#) reference model

Aside: Reference Models

Why can't we use reference process models instead of going through all the effort of process discovery?

1. Overwhelming due to extremely fine granularity
2. Early stakeholder involvement in discovery helps to get buy-in later with process improvement
3. Adapting a complex reference model may take even more work than discovering processes from scratch

Reference Models help to prepare the discovery process and ensure that important details have not been overlooked

Case/Function Matrix

		Case Types	
Business Functions			X
		X	
	X		

Function is performed on Case Type

1. Determine which functions are performed for each case type
2. Aggregate related functions and case types into the same process boundary

Coarse grained

		Case Types	
Business Functions	X		X
		X	X
	X	X	
	X	X	X

One big process covers all functions and all case types

Fine grained

		Case Types	
Business Functions	X		X
		X	X
	X	X	
	X	X	X

A process every time a function can be performed for each case type

Medium grained

		Case Types	
Business Functions	X		X
	X	X	X
	X	X	
	X	X	X

Tradeoff between broad scoping and narrow focus, some functions collaborate over more than one case type, but not all.

		Bachelor	Master	PhD
Administration	Promotion			
	Registration			
	Admission			
	Graduation			
Professors	Evaluation			
	Instruction			
	Testing			
	Curriculum Development			

References

- Porter, Michael E., "Competitive Advantage". Ch. 1, pp 11-15. The Free Press. New York, 1985
- Geary A. Rummler, Alan P. Brache, Improving Performance: How to Manage the White Space in the Organization Chart, Jossey-Bass, May 1995
- Marlon Dumas, Marcello La Rosa, Jan Mendling, Hajo Reijers, [Fundamentals of Business Process Management](#), Chapter 2, Springer, 2013, ISBN 978-3-642-33142-8
- M. Rosemann, "Process Portfolio Management", BPTrends, April 2006