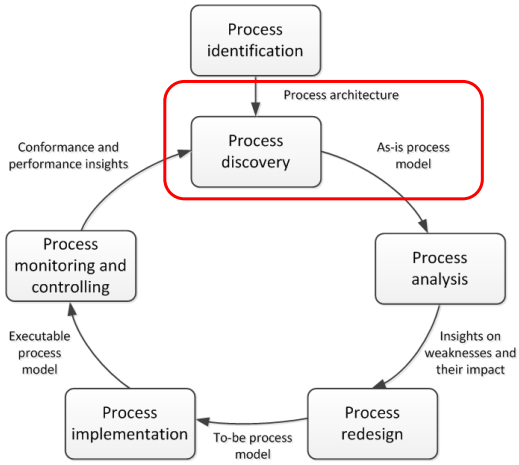
IS 2006 – Business Process Management

PROCESS DISCOVERY

University of Colombo School of Computing

Where are we in the BPM Lifecycle..



Process Discovery is…

the act of gathering information about an existing process and organizing it in terms of an as-is process model…

The Process Discovery phase of the BPM lifecycle identifies how to create models that are both correct and complete…

This is clearly more than modeling (however, modeling is a part of it.)

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The setting of Process Discovery

1. **Defining the setting**: This phase is dedicated to assembling a team in a company that will be responsible for working on the process.
2. **Gathering information**: This phase is concerned with building an understanding of the process. Different discovery methods can be used to acquire information on a process.
3. **Conducting the modeling task**: This phase deals with organizing the creation of the process model. The modeling method gives guidance for mapping out the process in a systematic way.
4. **Assuring process model quality**: This phase aims to guarantee that the resulting process models meet different quality criteria. This phase is important for establishing trust in the process model.

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Who is involved?

Domain Expert

Process Analyst

Expertise of a Domain Expert

Domain Expert has solid knowledge on how a process or activity is performed

Typically a domain expert is a process participant

- But, it can be the process owner or the manager who closely with process participants who perform the processes

Suppliers/Customers can also be considered as domain experts

E.g.

Consider the following tasks;

- The task of modeling the process of signing a rental contract in your city
- The task of modeling the process of getting a license plate for your car in Sydney as a foreigner

See the need of a domain expert??

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Expertise of a Process Analyst

Problem understanding
- Episodic knowledge available to get to root of problem
- Knowledge organisation helps to structure problem

Problem solving
- Trigger identification (problem-related cues)
- Hypothesis management (formulation and testing of hypotheses)
- Goal setting (what needs to be achieved next)
- Top-down strategy driven by analysis goals

Modelling skills
- Well-structured and laid out
- Systematically labelled
- Explicit start and end points of a process
- Appropriate granularity and decomposition

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What Makes a *Good* Process Analyst?

Getting the right people on board

Formulate and test hypotheses

Identify patterns

Pay attention to model aesthetics

Process Analyst Vs. Domain Expert

Aspect	Process Analyst	Domain Expert
Modeling Skills	Strong	Limited
Process Knowledge	Limited	Strong

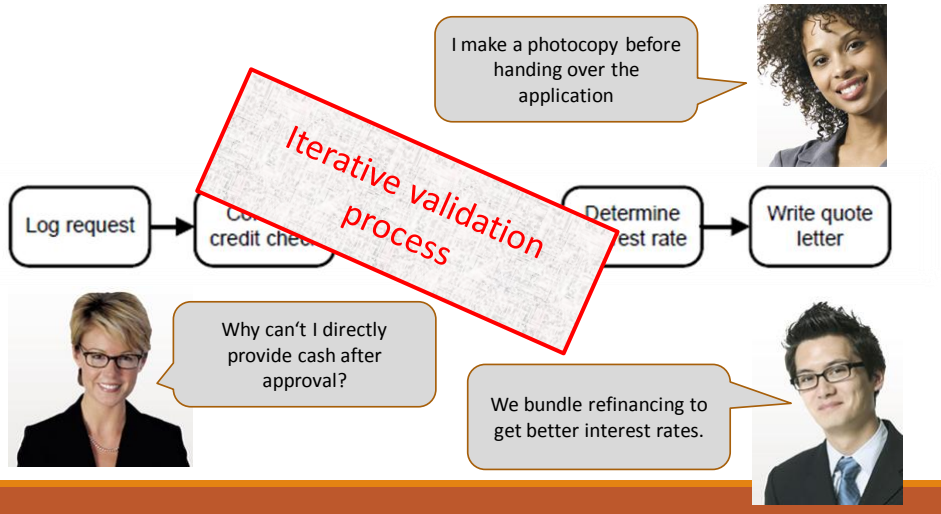
Process Discovery Challenges

1. Fragmented Process Knowledge
2. Domain Experts think on Instance Level
3. Knowledge about Process Modelling is rare

Challenge 1: Fragmented Process Knowledge

- A business process defines a set of logically related activities..
- These activities are assigned to specialized participants..
- Thus, when collecting knowledge a process analyst needs to talk to not just one domain experts but different domain experts who are responsible for different tasks..
- A domain expert typically has abstract understanding of the whole process but a very detailed understanding of their own task
- Having receiving all information from many domain analysts a process analyst will have to make proposals for resolving all inconsistencies.. Thus the process discovery needs several iterations..

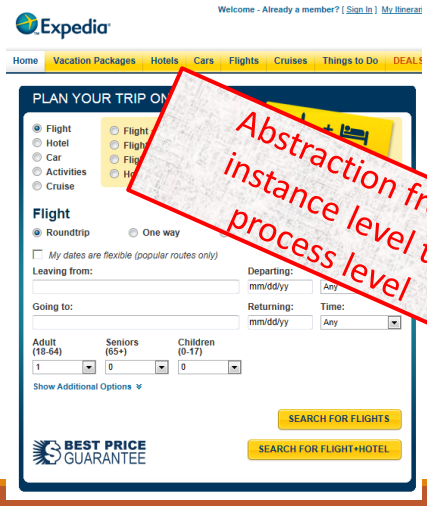
Challenge 1: Fragmented Process Knowledge (cont.)



Challenge 2: Domain Experts think on Instance Level

- Domain experts will easily describe the activities of a specific case… but they might have problems responding to general questions..
- Often said by domain experts: "every case is different"
- Process analyst will have to organize and abstract from the pieces of information provided by the domain experts

Challenge 2: Domain Experts think on Instance Level (cont.)



”Every trip is different.“

”You cannot really compare. Our customers go to different places in different seasons using different types of transportation.“

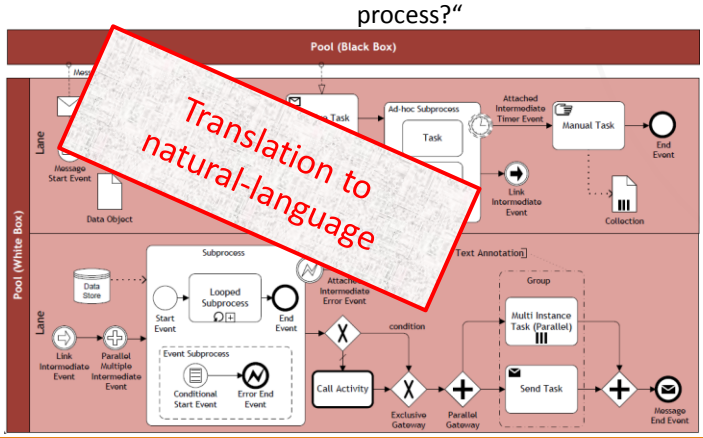
”We can never do anything exactly in the same way. There are so many special conditions.“

Challenge 3: Knowledge about Process Modelling is rare

- Domain experts are often not trained to create or read process models..
- Thus seeking feedback to a draft process model is difficult…

Challenge 3: Knowledge about Process Modelling is rare (cont.)

”Could you please tell me, whether this diagram correctly shows your process?“



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Process Discovery Techniques

Evidence-based
- Document analysis
- Observation
- Process mining

Interview-based

Workshop-based

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Document Analysis

Documents point to existing roles, activities and business objects

Formal documentation in terms of

- Organization chart
- Employment plan
- Quality certificate report
- Internal policies
- Glossaries and handbooks

Forms

Work instructions

- May not be process-oriented and trustworthy.
- Could be used to gather information before approaching domain experts.

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Observation

Observe what people do at their workplace

- Active role: play a specific role, e.g. customer
- Passive role: observe participants and their environment

Trace business objects in the course of their lifecycle

Inspect the work environment

- Active role: no big picture
- Passive role: participants' bias

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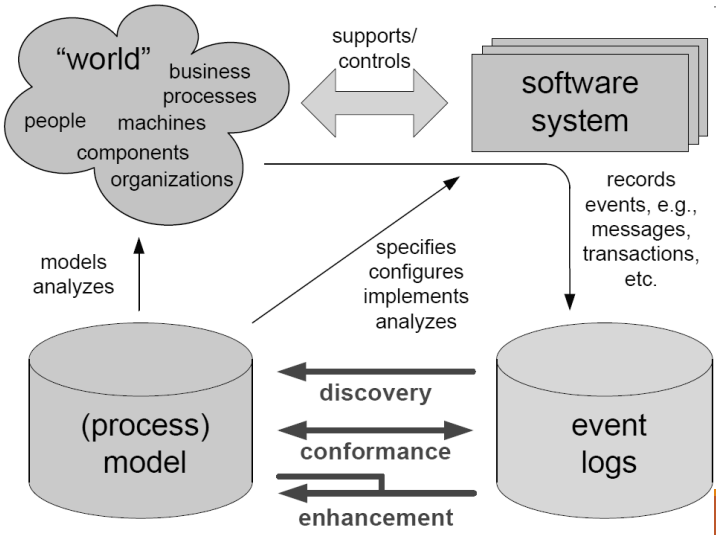
Process Mining



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Automated Discovery via Process Mining

Process mining is a process management technique that allows for the analysis of business processes based on event logs. The basic idea is to extract knowledge from event logs recorded by an information system. Process mining aims at improving this by providing techniques and tools for discovering process, control, data, organizational, and social structures from event logs.

Automatic process discovery makes use of event logs that are stored by information systems. Such data have to be recorded in a way that each event can be exactly related to an individual case of a project, specific activity of a process and a precise point in time. If these data are available Automatic Process Discovery techniques can be used to reconstruct the process model.

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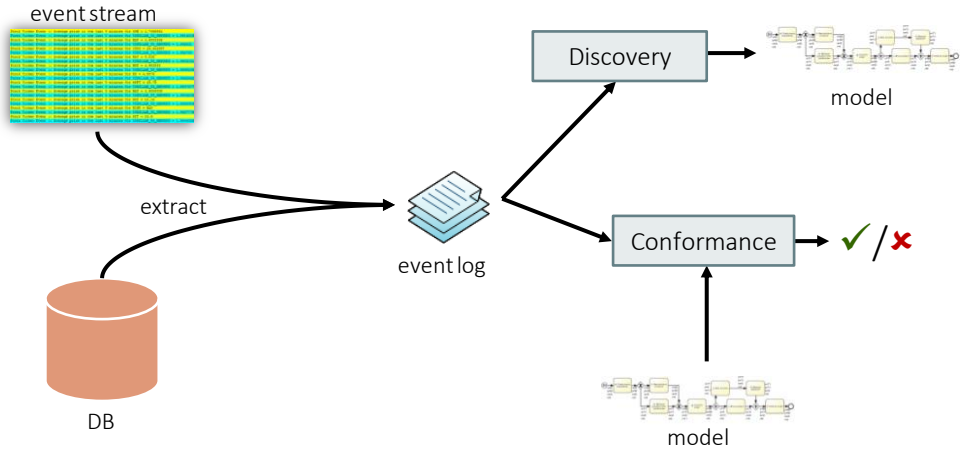
Automated Discovery via Process Mining (cont.)



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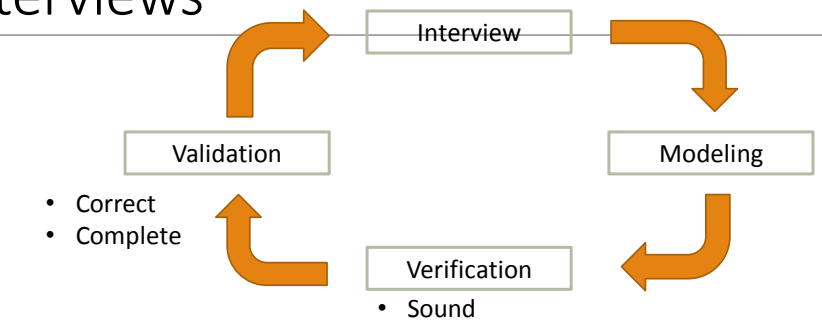
Interviews



Structured vs. unstructured interviews

Assumption: analyst and stakeholder share terminology

Questions target at identifying deviations from standard processing

Pitfall: exceptional behavior neglected

- use questions that aim to identify such behavior

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Workshops

Gather all key stakeholders together

One process analyst, multiple domain experts

Participants interact to create shared understanding

Often: software-supported, a model is directly created during the workshop (separate role)

Model is used as reference point for discussions

Alternative: brown-paper workshops

Usually 3 to 5 half-day sessions

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Discovery and Culture

Before starting with process discovery, it is important to understand the culture and the sentiment of an organization. There are companies that preach and practice an open culture in which all employees are encouraged to utter their ideas and their criticism. Such organizations can benefit a lot from workshops as participants are likely to present their ideas freely.

In strictly hierarchical organizations, it is necessary to take special care that every participant gets an equal share of parole in a workshop and that ideas and critique are not hold back. It might be the case that the young dynamic company has a more open culture than the company with extensive health and security regulations. This has to be taken into account when organizing a workshop.

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Strengths and Weaknesses of Process Discovery Techniques

Technique	Strength	Weakness
Document Analysis	• Structured information • Independent from availability of stakeholders	• Outdated material • Wrong level of abstraction
Observation	• Context-rich insight into process	• Potentially intrusive • Stakeholders likely to behave differently • Only few cases
Automatic Discovery	• Extensive set of cases • Objective data	• Potential issue with data quality
Interview	• Detailed inquiry into process	• Requires sparse time of process stakeholders • Several iterations required before sign-off
Workshop	• Direct resolution of conflicting views	• Synchronous availability of several stakeholders

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Stages of Process Modeling Method

Modeling in the discovery stage is complex.. Thus to come up with a accurate model below steps should be followed;

1. Identify the process boundaries
2. Identify activities and events
3. Identify resources and their handovers
4. Identify the control flow
5. Identify additional elements.

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1. Identify the process boundaries

- Under which condition does the process start? (triggers)
- With which result does it end? (outcomes)
- Which perspective do you assume?
- What data are required as input and output to the process?

Identifying the process boundaries is essential to identifying the process scope

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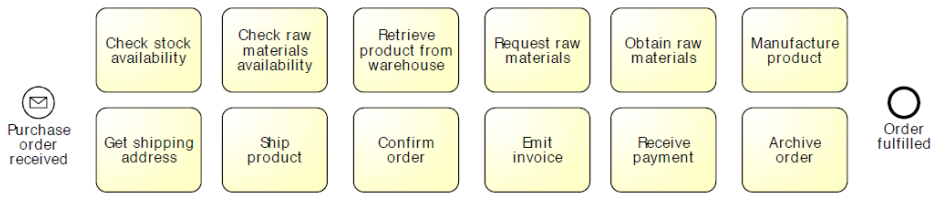
2. Identify activities and events



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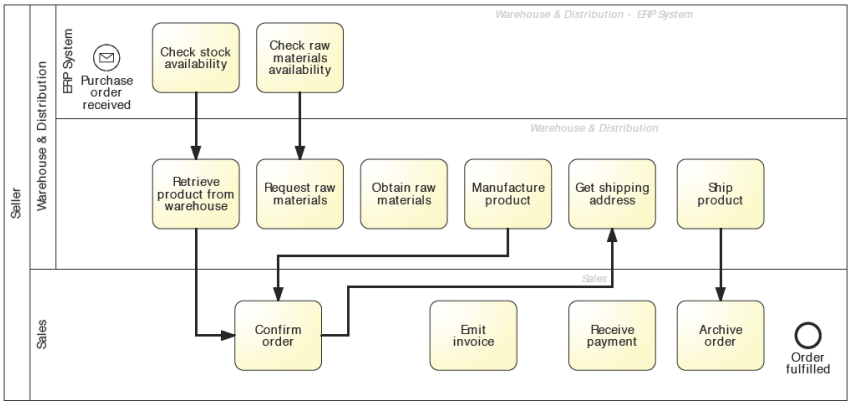
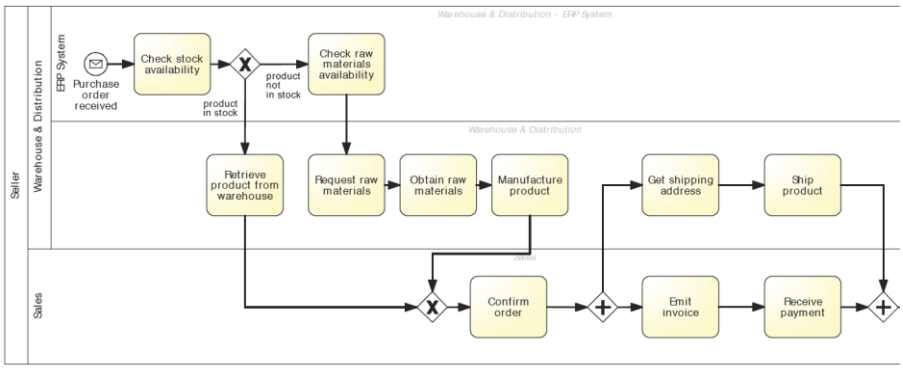
3. Identify resources and their handovers

Identify who is responsible



4. Identify the control flow

When and why activities are executed



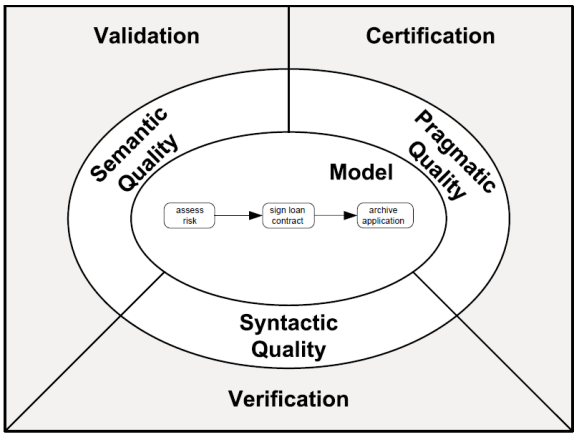
5. Identify Additional Elements

Extend the process model by capturing artifacts and exception handlers..

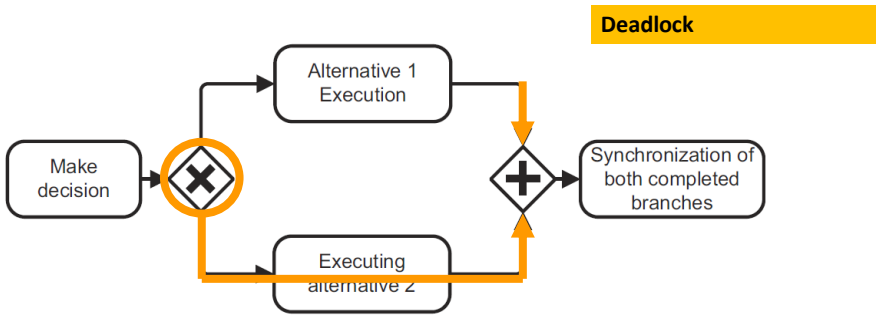
- Artifacts – data objects, data stores and their relations to activities and events via data associations
- Exception Handlers – boundary events, exception flows and compensation handlers

Process Modeling Quality Assurance

- Gathering information and organizing it in a process model is often sequential..
- Thus needs various steps of quality assurance



Is this model in good quality?



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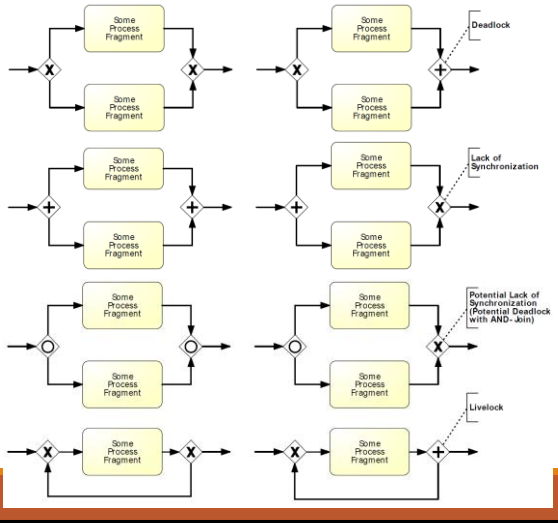
Syntactic Quality: Verification



Syntactic quality relates to producing a process model that confirms to syntactic rules and guidelines defined by the process modeling language

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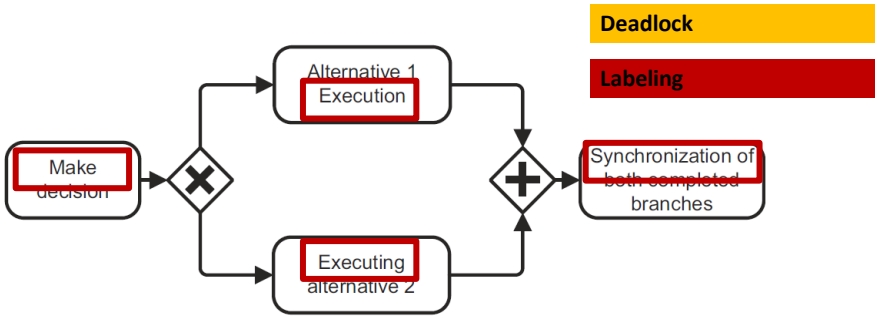
Is this process model of good quality?



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Formulate labels adequately

- Activities as Verb-Object
- Events as Object-Passive-Participle
- Conditions with reference to Object

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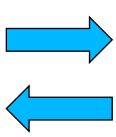
Semantic Quality: Validation

Validity

Completeness

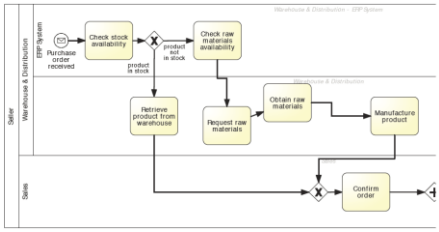


Domain Expert

Process Analyst

Semantic quality refers to the goal of producing process models that make true statements about the considered domain, either for as-is or for to-be model

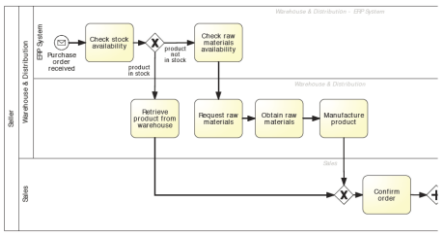
Pragmatic Quality: Layout



Pragmatic quality refers to the goal of building a process model of good usability.

Certification is the process of checking the pragmatic quality of a process model by investigating its useage.

Models must look nice



7 Process Modeling Guidelines

G1 Use as few elements in the model as possible
G2 Minimize the routing paths per element
G3 Use one start and one end event per path
G4 Model as structured as possible
G5 Avoid OR routing elements (OR gateways)
G6 Use verb-noun activity labels
G7 Decompose a model with more than 50 elements

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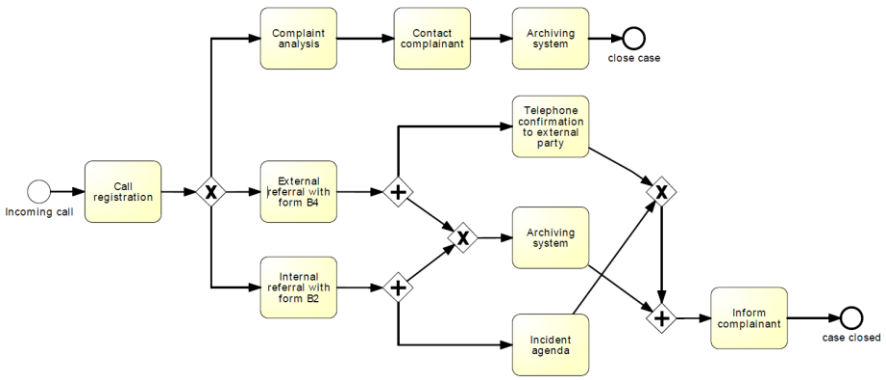
Remodel the process applying the process modeling guidelines



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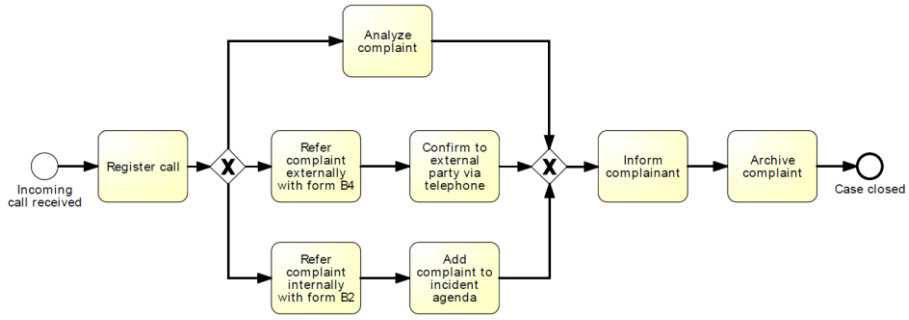
Answer..



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