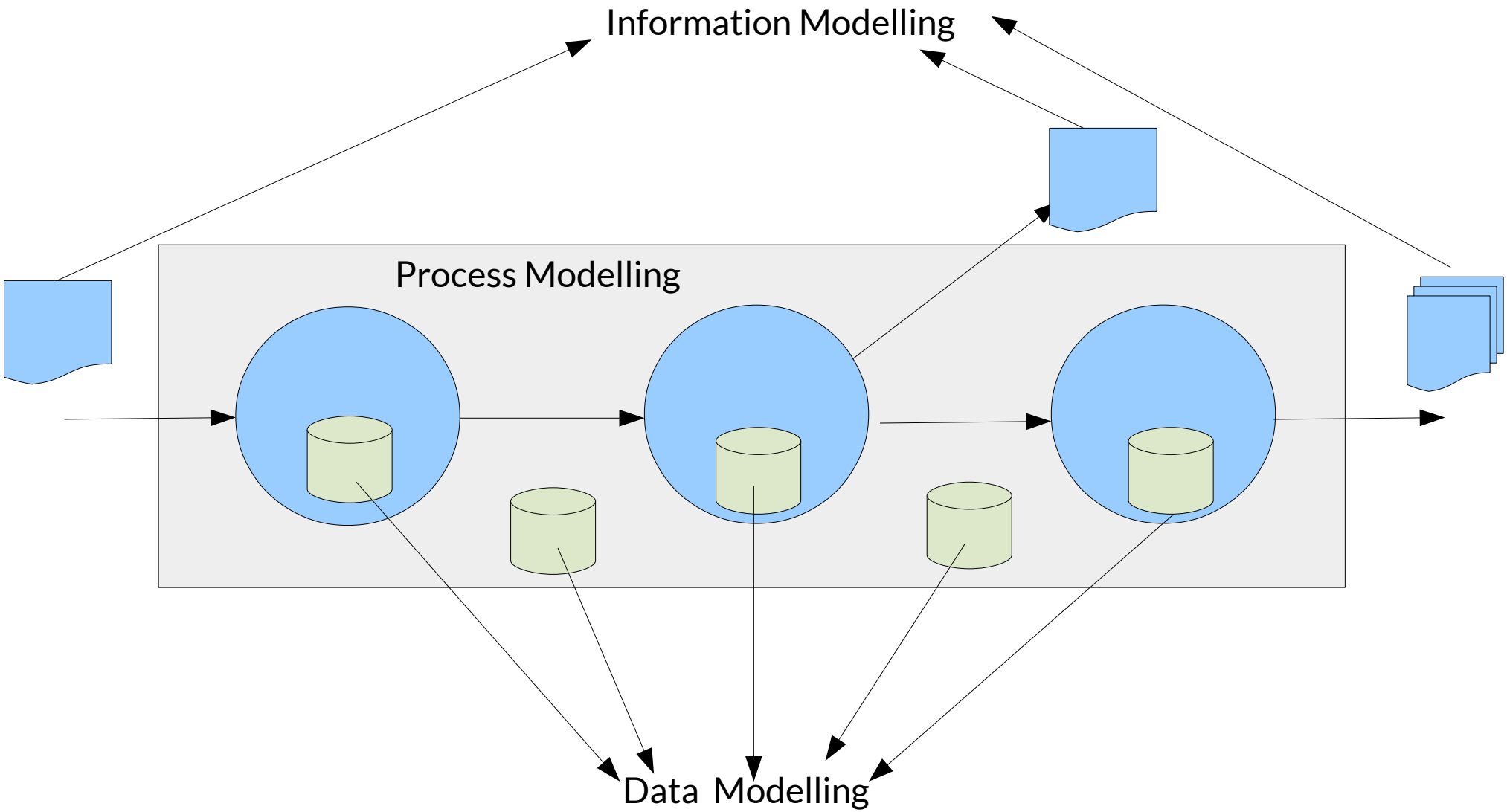
Pelatihan
Proses Bisnis dan Kamus Data

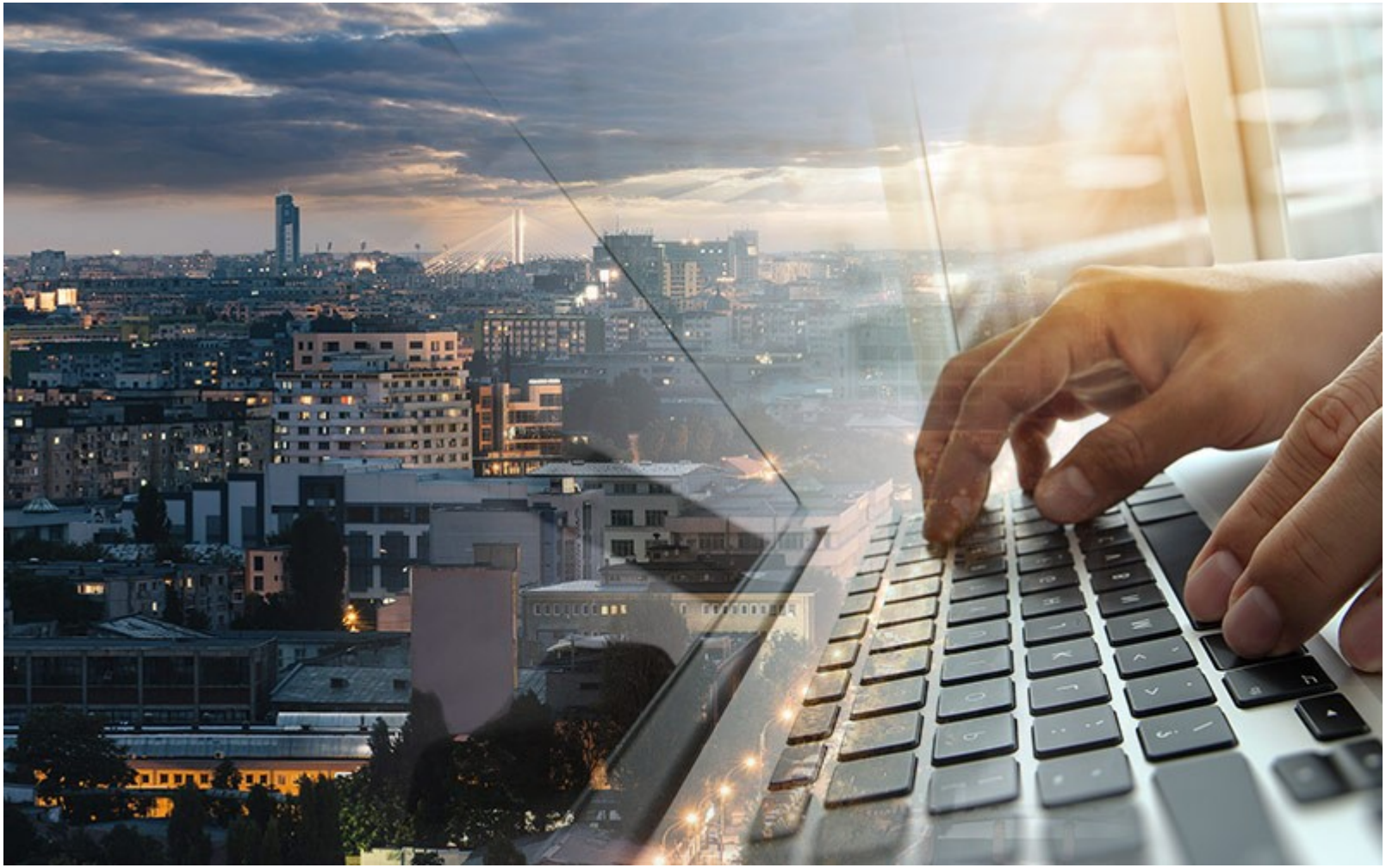
Dr. rer. nat. I Made Wiryana, SKom, SSi, MAppSc

Jadwal Pelatihan

- Hari 1
  - Arsitektur Bisnis
  - Bisnis Proses
  - Business Process Modelling Notation (BPMN)
  - Camunda Modeller dan menggambar Bisnis Proses
- Hari 2
  - Information modelling dan IDEF1
  - Data modelling IDEF1x
  - Database modelling ERD, Schema, Docmodel
  - Metadata, Kamus Data
  -

Tahapan





Model Arsitektur Enterprise

Konsepsi Alur Kerja

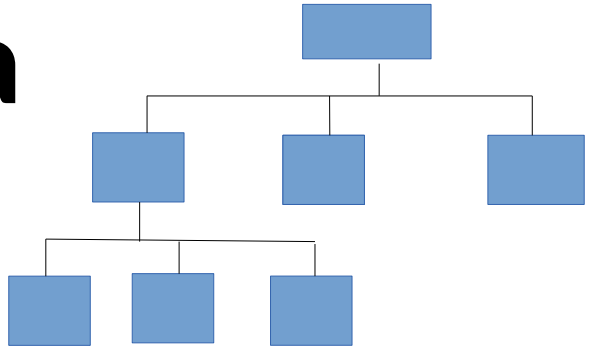
Arsitektur Business

Arsitektur Informasi
Arsitektur Data

Arsitektur Aplikasi

Arsitektur Teknologi

Tahapan pekerjaan



Struktur organisasi

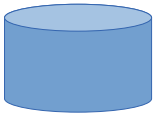
Pencocokan Model
Informasi dan Data

Survei Informasi

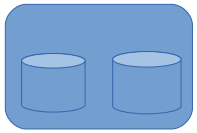
Survei Data

Survei SIM

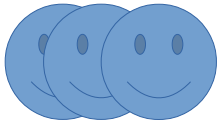
Formulir Laporan



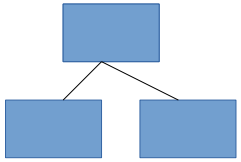
Data Elektronis



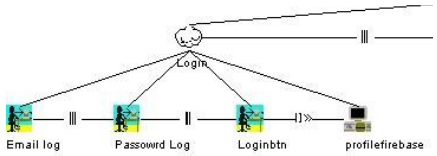
Sistem Informasi



User Model



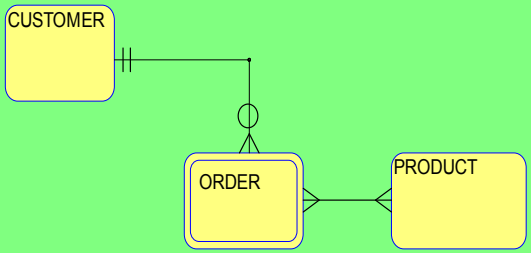
Task Model

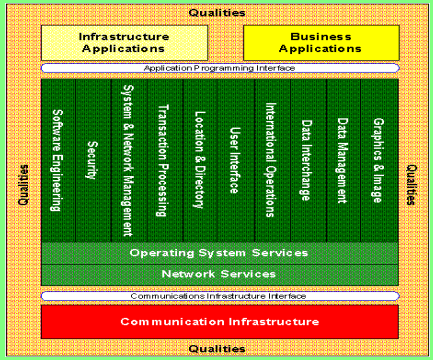


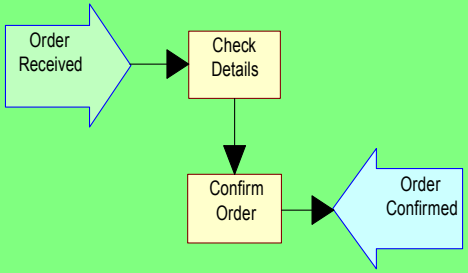
Interaction Model

Models in the Enterprise Architecture

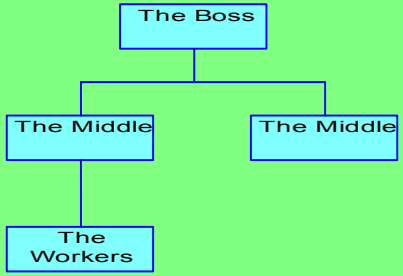
Enterprise Architecture

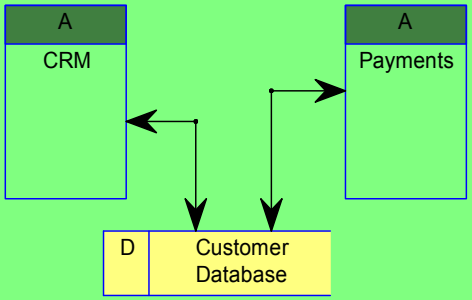






Enterprise Architecture
- principles + standards
- Common Vocabulary





ENTERPRISE ARCHITECTURE: A FRAMEWORK™

ZIFA Zachman Institute for Framework Advancement
PHONE (810) 231-0531
FAX: (810) 231-0531
www.zifa.com
10895 Lakepointe Drive
Pinckney, MI 48169

	WHAT DATA	HOW FUNCTION	WHERE NETWORK	WHO PEOPLE	WHEN TIME	WHY MOTIVATION	
SCOPE (CONTEXTUAL) Planner	List of Things Important to the Business; Entity = Class of Business Thing	List of Processes the Business Performs; Process = Class of Business Process	List of Locations in Which the Business Operates; Node = Major Business Location	List of Organizations Important to the Business; People = Major Organizational Unit	List of Events/Cycles Significant to the Business; Time = Major Business Event/Cycle	List of Business Goals/Strategies; End/Means = Major Business Goal/Strategy	SCOPE (CONTEXTUAL) Planner
BUSINESS MODEL (CONCEPTUAL) Owner	e.g., Semantic Model; Entity = Business Entity; Relationship = Business Relationship	e.g., Business Process Model; Process = Business Process; I/O = Business Resources	e.g., Business Logistics System; Node = Business Location; Link = Business Linkage	e.g., Work Flow Model; People = Organization Unit; Work = Work Product	e.g., Master Schedule; Time = Business Event; Cycle = Business Cycle	e.g., Business Plan; End = Business Objective; Means = Business Strategy	BUSINESS MODEL (CONCEPTUAL) Owner
SYSTEM MODEL (logical) Designer	e.g., Logical Data Model; Entity = Data Entity; Relationship = Data Relationship	e.g., Application Architecture; Process = Application Function; I/O = User Views	e.g., Distributed System Architecture; Node = I/S Function (Processor, Storage, etc.); Link = Line Characteristics	e.g., Human Interface Architecture; People = Role; Work = Deliverable	e.g., Processing Structure; Time = System Event; Cycle = Processing Cycle	e.g., Business Rule Model; End = Structural Assertion; Means = Action Assertion	SYSTEM MODEL (logical) Designer
TECHNOLOGY MODEL (physical) Builder	e.g., Physical Data Model; Entity = Segment/Table/etc.; Relationship = Pointer/Key/etc.	e.g., System Design; Process = Computer Function; I/O = Data Elements/Sets	e.g., Technology Architecture; Node = Hdw/System Software; Link = Line Specifications	e.g., Presentation Architecture; People = User; Work = Screen Formats	e.g., Control Structure; Time = Execute; Cycle = Component Cycle	e.g., Rule Design; End = Condition; Means = Action	TECHNOLOGY MODEL (physical) Builder
DETAILED REPRESENTATIONS (out-of-context) Subcontractor	e.g., Data Definition; Entity = Field; Relationship = Address	e.g., Program; Process = language Statement; I/O = Control Block	e.g., Network Architecture; Node = Address; Link = Protocol	e.g., Security Architecture; People = Identity; Work = Job	e.g., Timing Definition; Time = Interrupt; Cycle = Machine Cycle	e.g., Rule Specification; End = Sub-condition; Means = Step	DETAILED REPRESENTATIONS (out-of-context) Subcontractor
FUNCTIONING ENTERPRISE	e.g.: DATA	e.g.: FUNCTION	e.g.: NETWORK	e.g.: ORGANIZATION	e.g.: SCHEDULE	e.g.: STRATEGY	FUNCTIONING ENTERPRISE

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THE ZACHMAN FRAMEWORK FOR ENTERPRISE ARCHITECTURE

What = Thing of Interest (Information is a Subset)
How = Function / Process
Where = Topologies (Network)
Who = Stakeholder/Organization (Roles)
When = Timing & Sequence (Schedule & Events)
Why = Governance/Mandates (Motivations)
Z11
Z12
Z13
Z14
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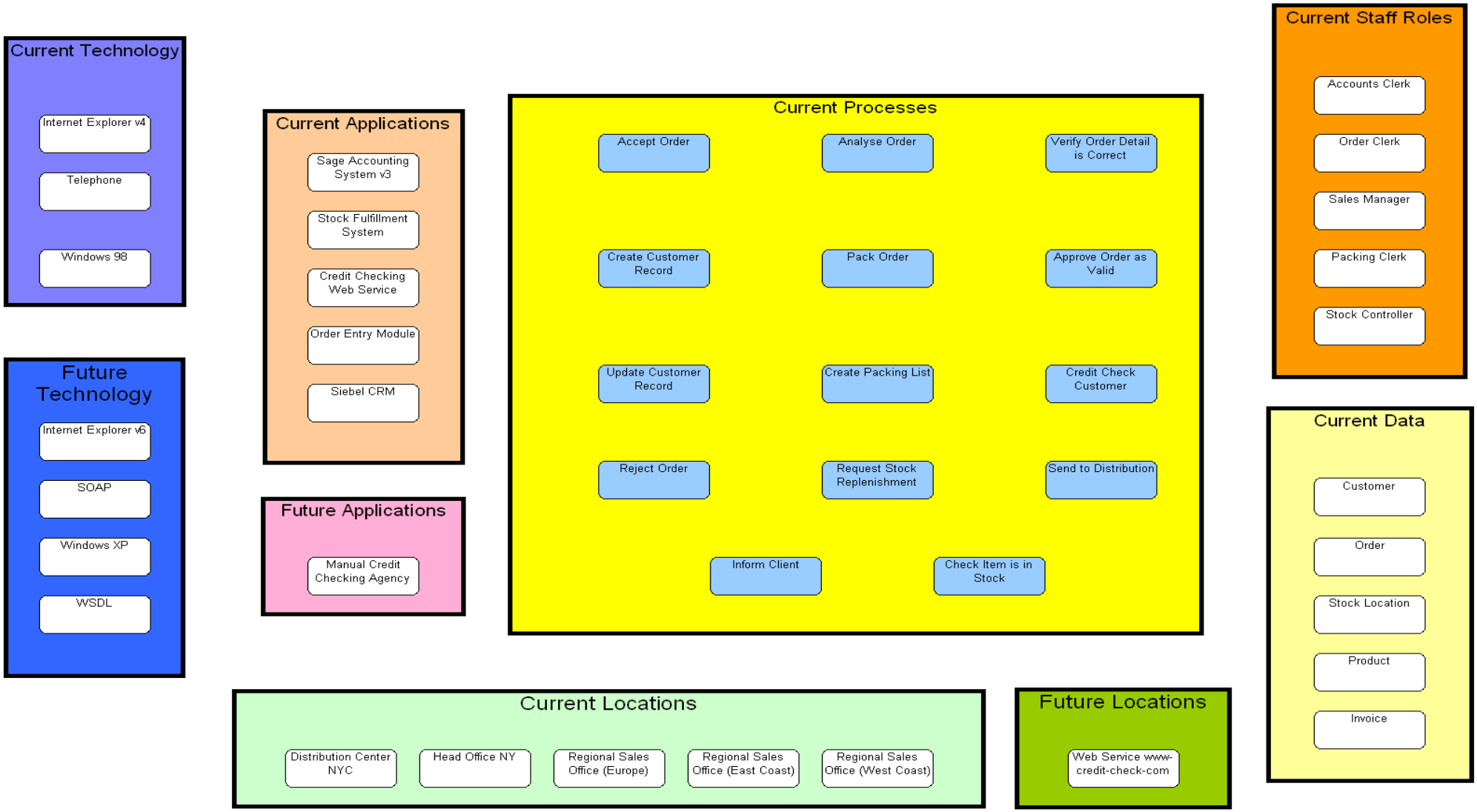
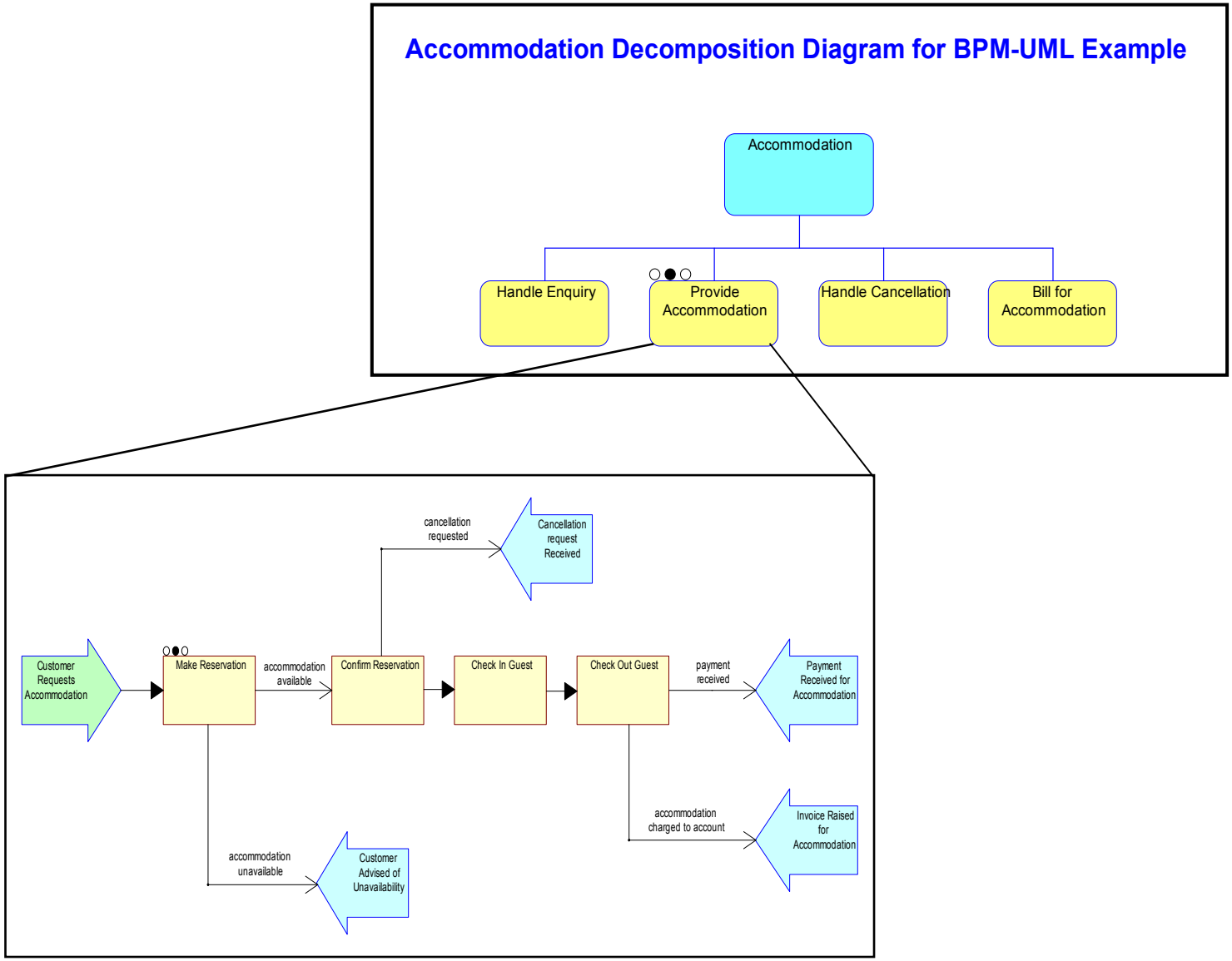
Z66
Model = External Stakeholder Role
ExternalEvent Calendar
External Governance Model
Internal Event Calendar
Internal Governance Model
VA Organization Model
IT Process Requirement/Constraint Model
Project Topological Requirements/Constraints
Project Schedule (Gantt Charts)
Project Governance Model
Design-Solution Topological Requirements
Design Solution Role Model
Devl Schedule (Gantt Charts)
Design/Solution Development Governance Model
Development-Deployment Schedule (Gantt Charts)

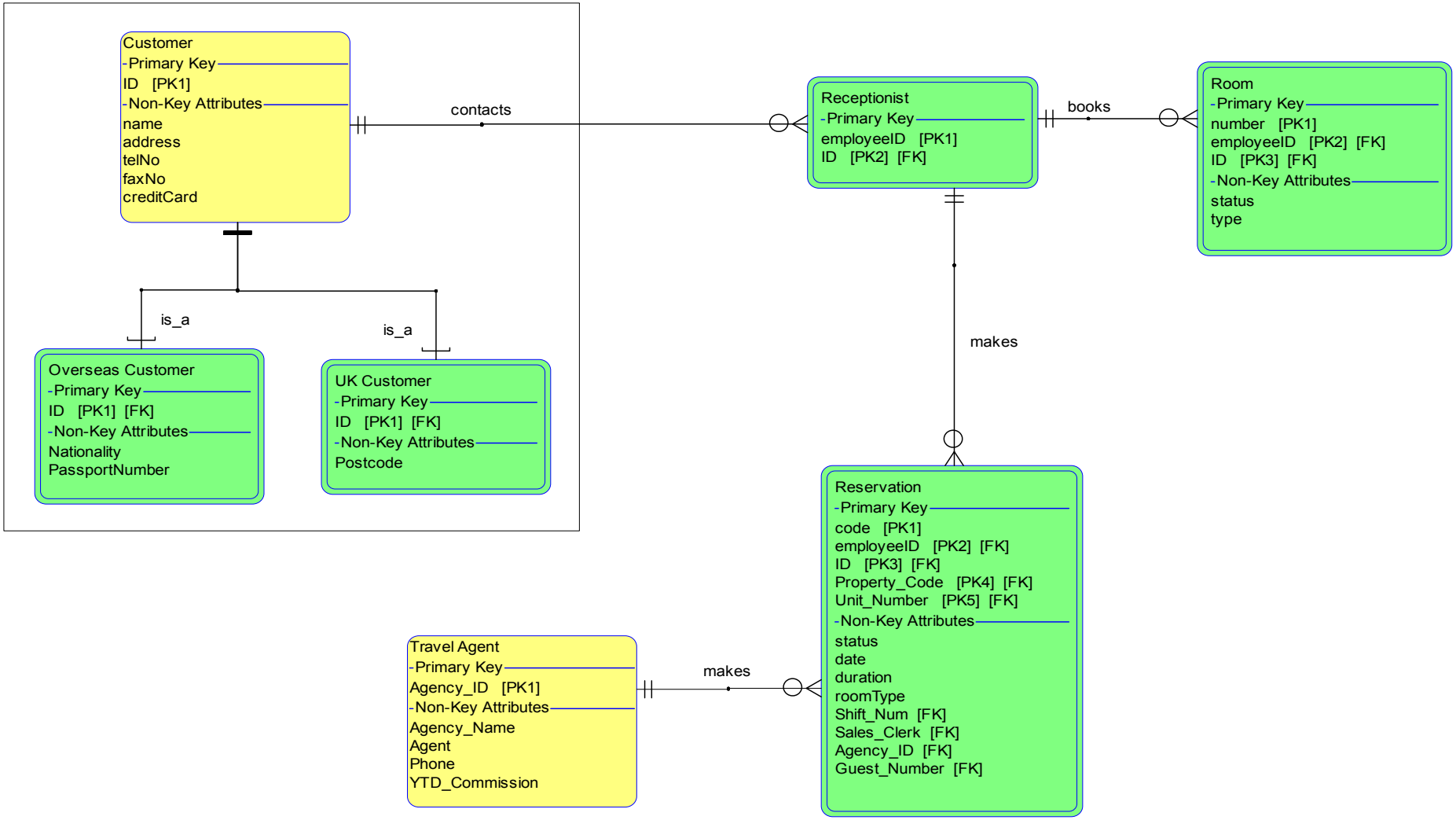
Arsitektur pada beberapa tingkat



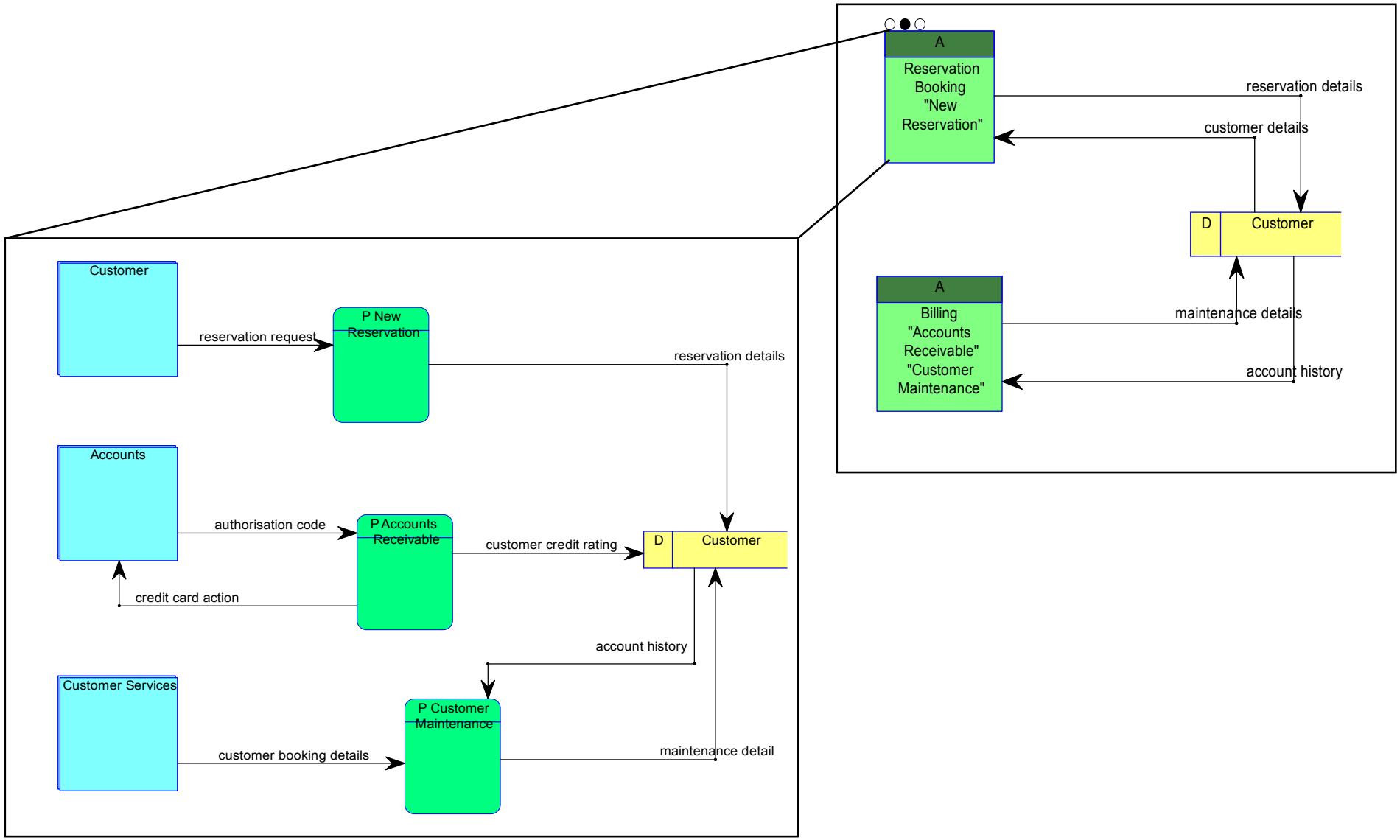
Business Process Model



Data Model

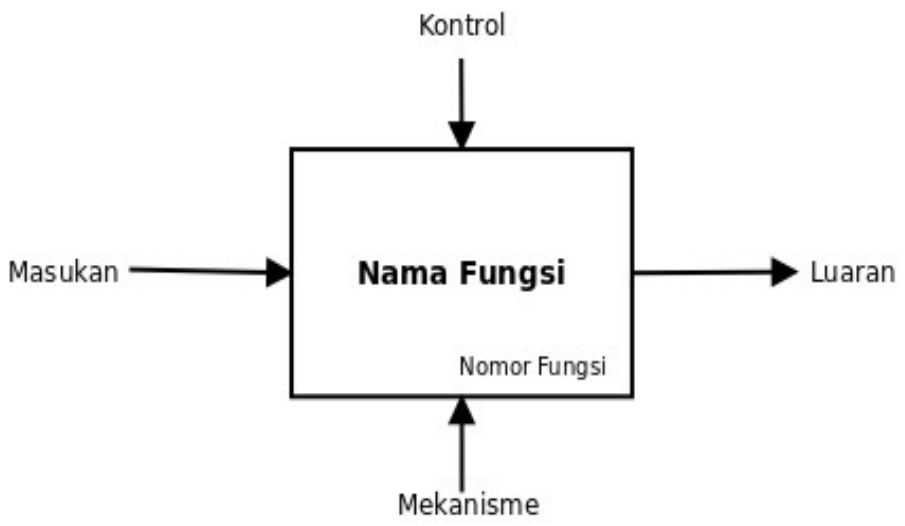

Customer
-Primary Key
ID [PK1]
-Non-Key Attributes
name
address
telNo
faxNo
creditCard
contacts
Receptionist
-Primary Key
employeeID [PK1]
ID [PK2] [FK]
books
Room
-Primary Key
number [PK1]
employeeID [PK2] [FK]
ID [PK3] [FK]
-Non-Key Attributes
status
type
is_a
is_a
Overseas Customer
-Primary Key
ID [PK1] [FK]
-Non-Key Attributes
Nationality
PassportNumber
UK Customer
-Primary Key
ID [PK1] [FK]
-Non-Key Attributes
Postcode
makes
Reservation
-Primary Key
code [PK1]
employeeID [PK2] [FK]
ID [PK3] [FK]
Property_Code [PK4] [FK]
Unit_Number [PK5] [FK]
-Non-Key Attributes
status
date
duration
roomType
Shift_Num [FK]
Sales_Clerk [FK]
Agency_ID [FK]
Guest_Number [FK]
Travel Agent
-Primary Key
Agency_ID [PK1]
-Non-Key Attributes
Agency_Name
Agent
Phone
YTD_Commission
makes

Application Model

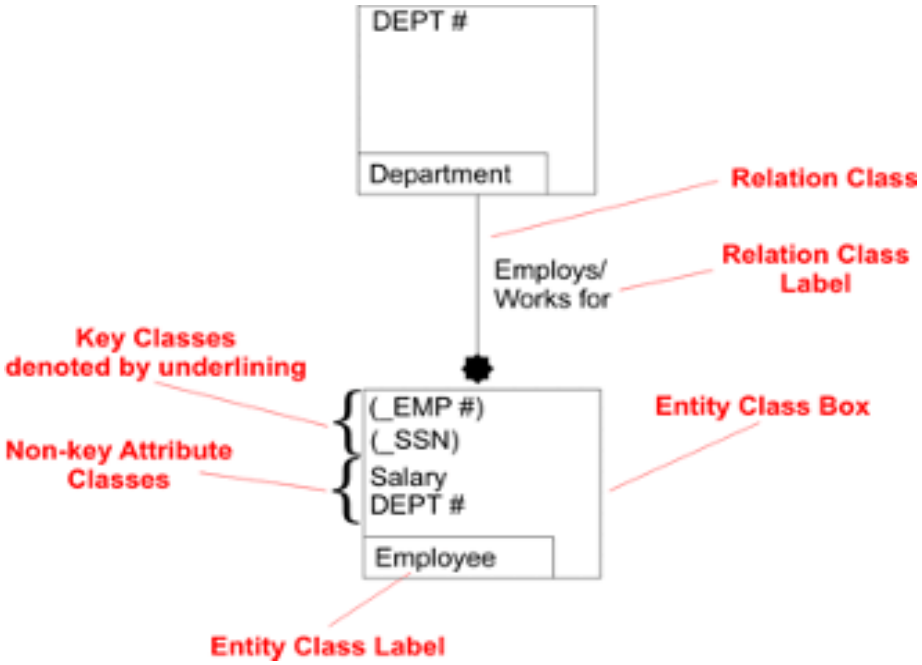


IDEF

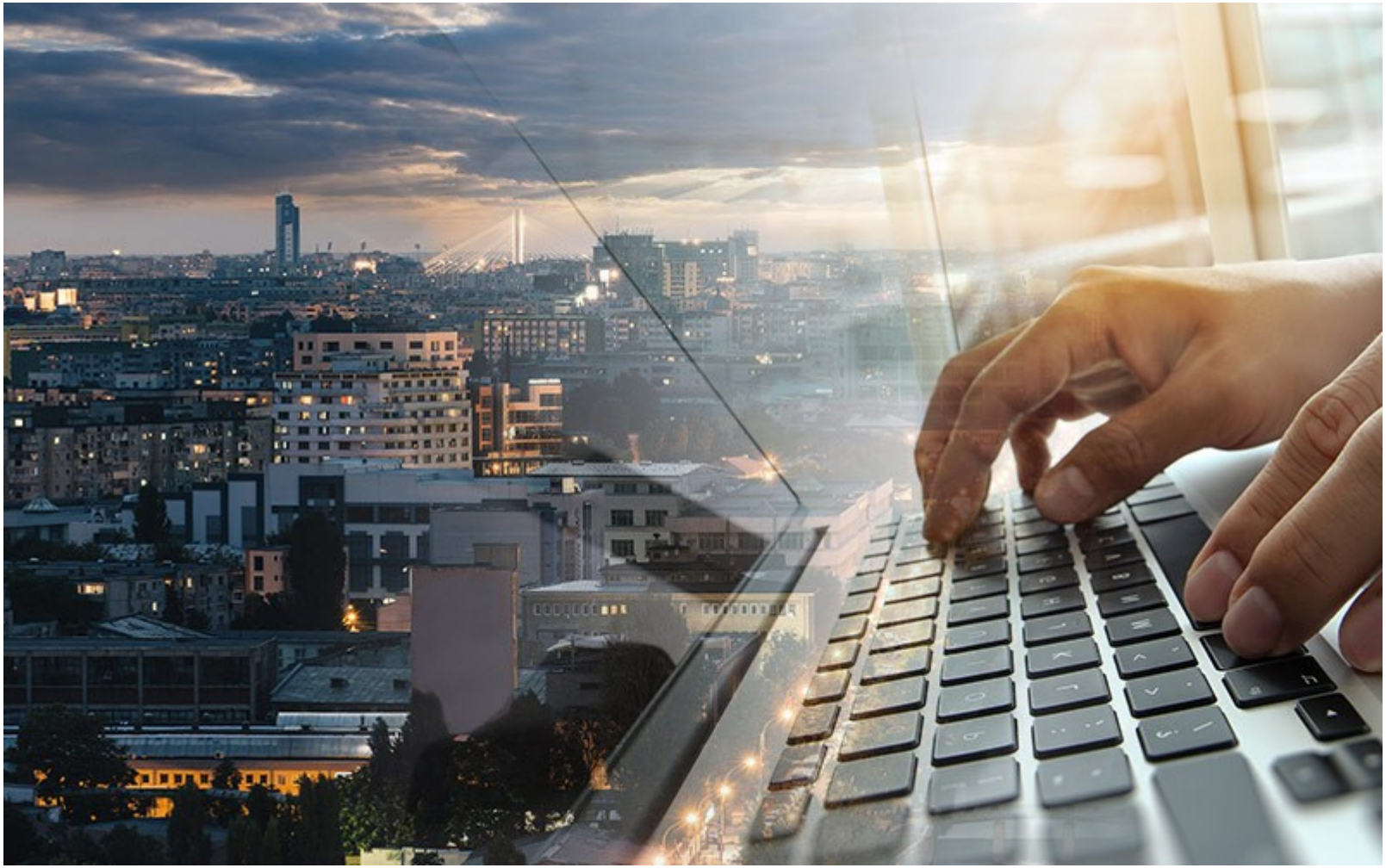
- Arsitektur informasi adalah rancangan terstruktur dari lingkungan informasi.
- Definisi Fungsi dengan IDEF0
- Definisi Informasi dengan IDEF1



Pemodelan Fungsi (IDEF0)



Pemodelan Informasi (IDEF1)

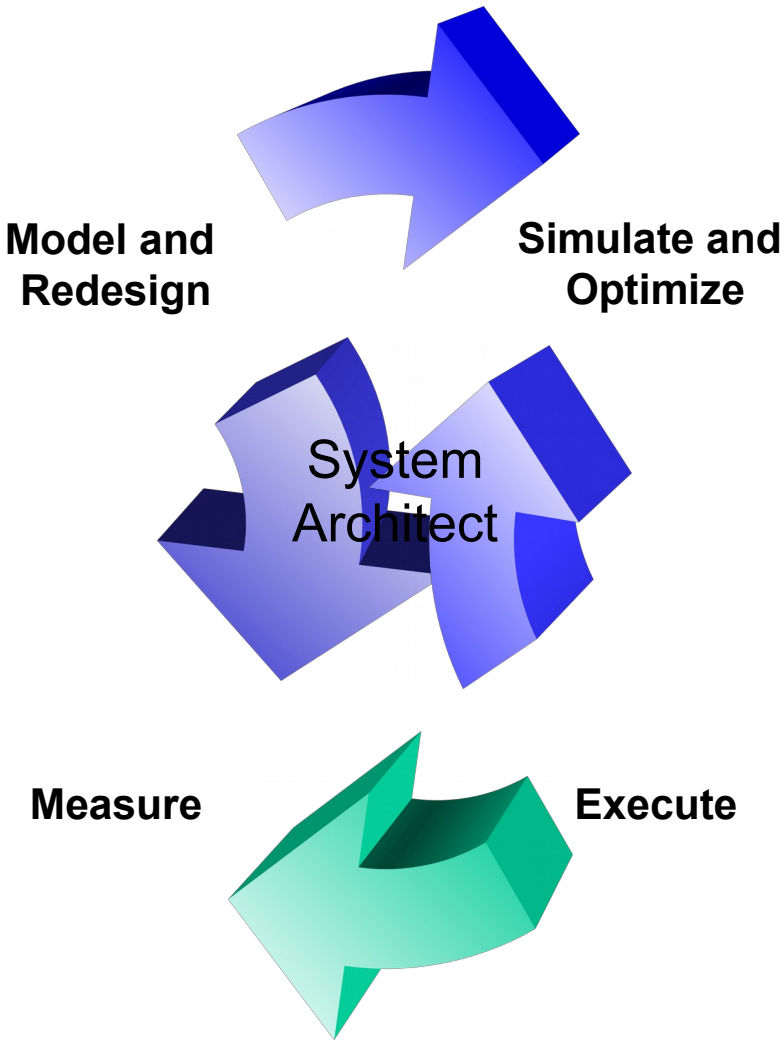


Permodelan Proses Bisnis

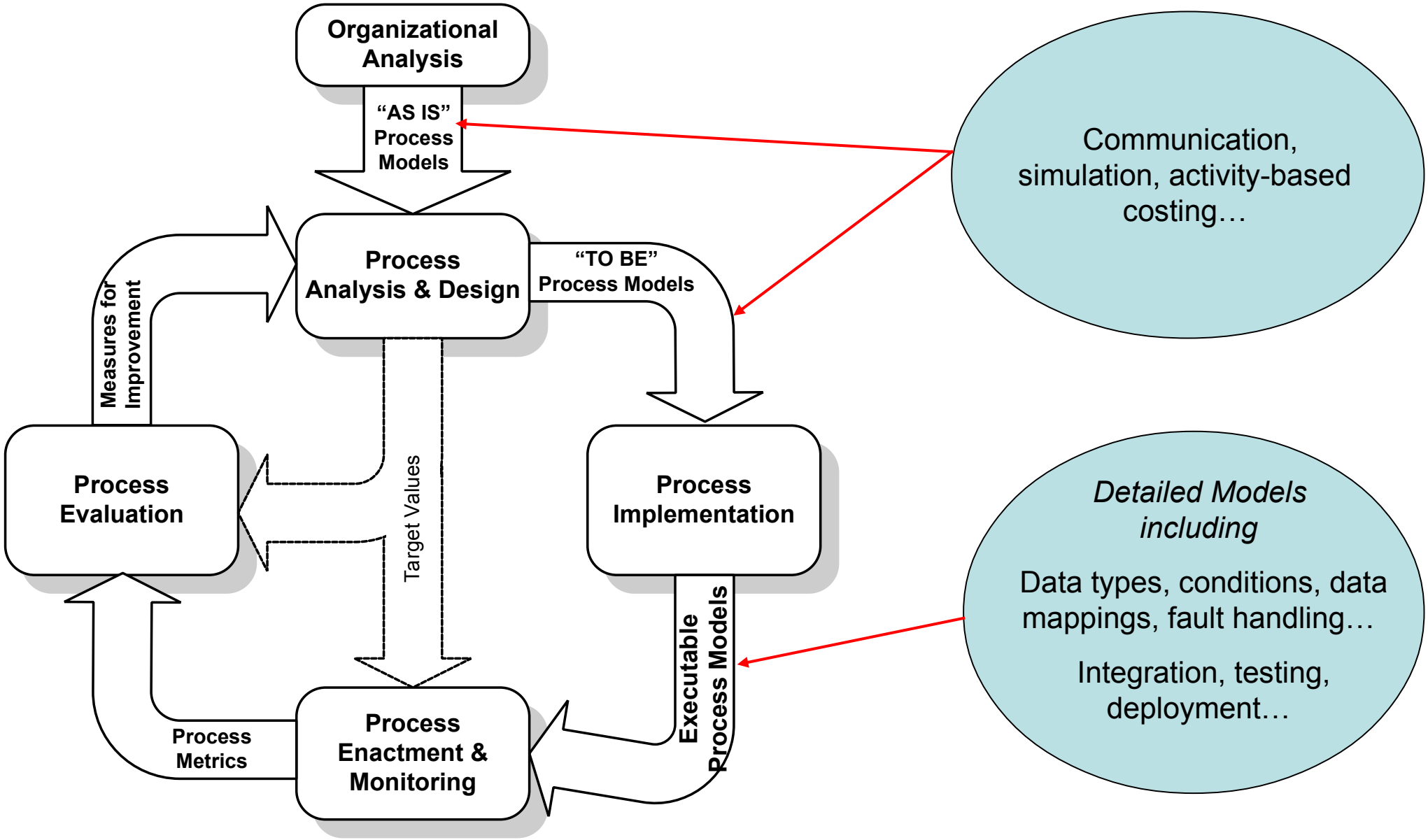
Bisnis Proses

- Proses bisnis merupakan sekumpulan pekerjaan atau aktivitas yang terstruktur dan saling berkaitan untuk menyelesaikan suatu masalah atau untuk menghasilkan produk ataupun layanan (untuk meraih sebuah tujuan tertentu).
- Jenis Proses Bisnis :
  - **Proses manajemen** merupakan sebuah proses yang mengendalikan operasional sebuah sistem. Misalnya Manajemen Strategis
  - **Proses operasional** merupakan sebuah proses yang mempunyai bisnis inti dan meliputi aliran nilai utama. Misalnya proses pembelian, manufaktur, pengiklanan dan pemasaran, dan penjualan.
  - **Proses pendukung**, yang mendukung proses inti. Misalnya rekrutmen, akunting, pusat bantuan dll.

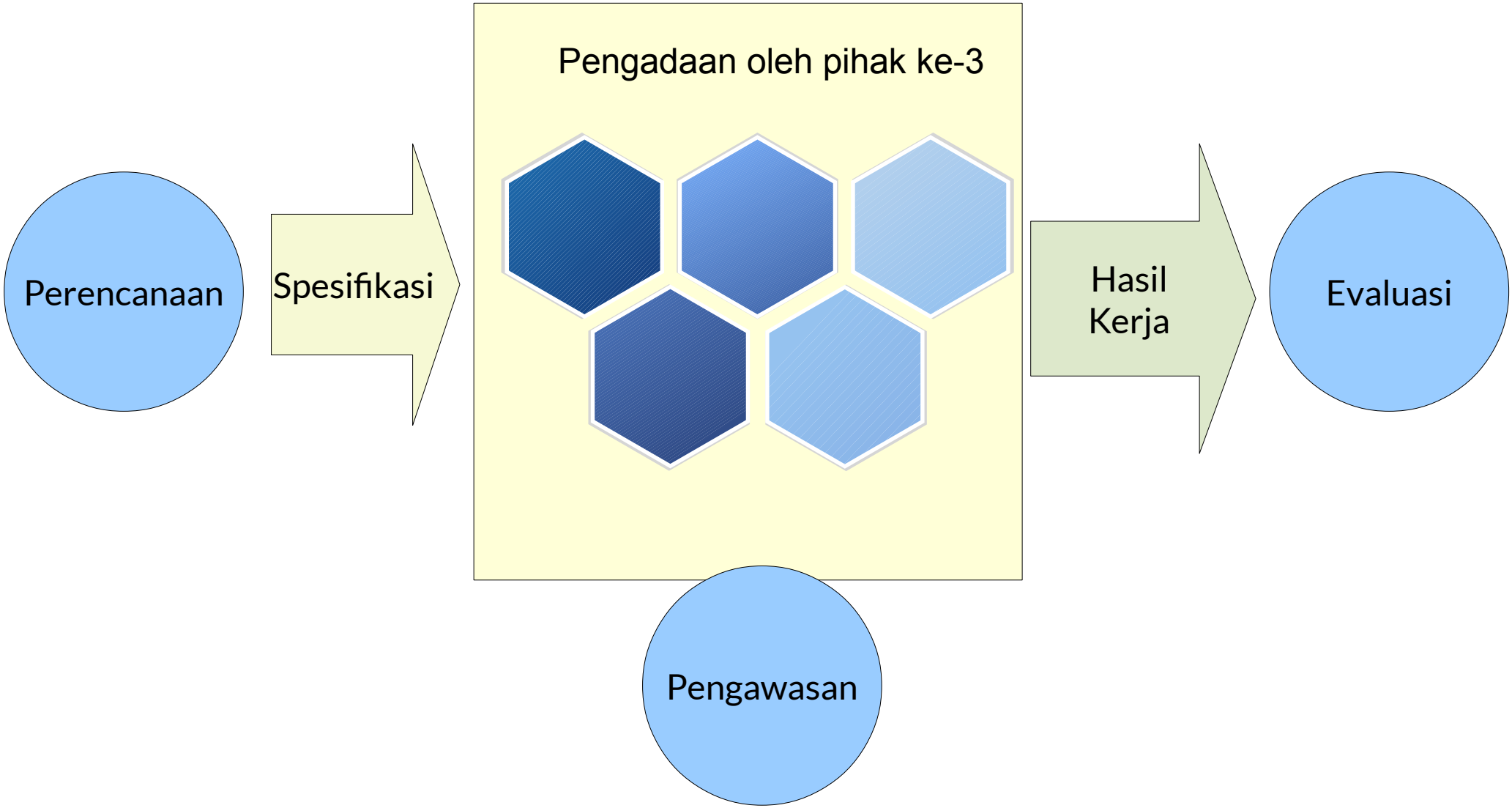
Business Process Lifecycle



Purposes of Process Modeling

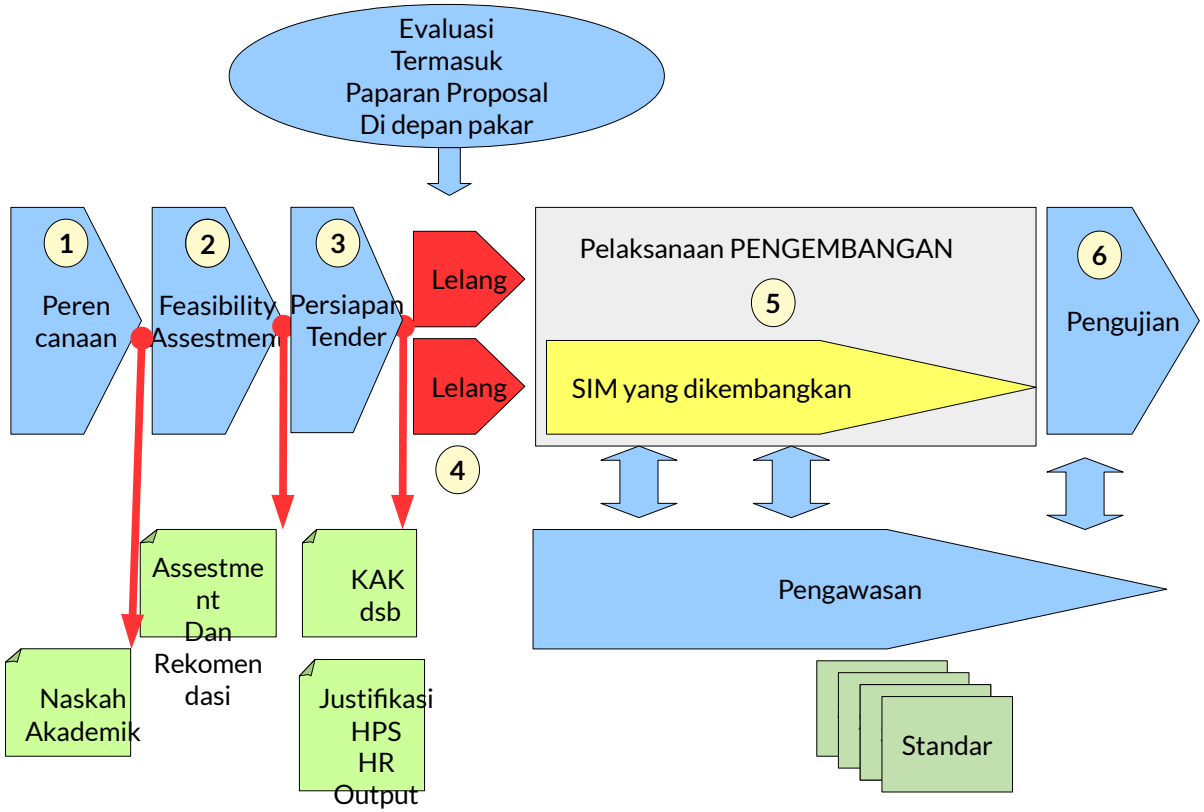


Penyusunan Sistem

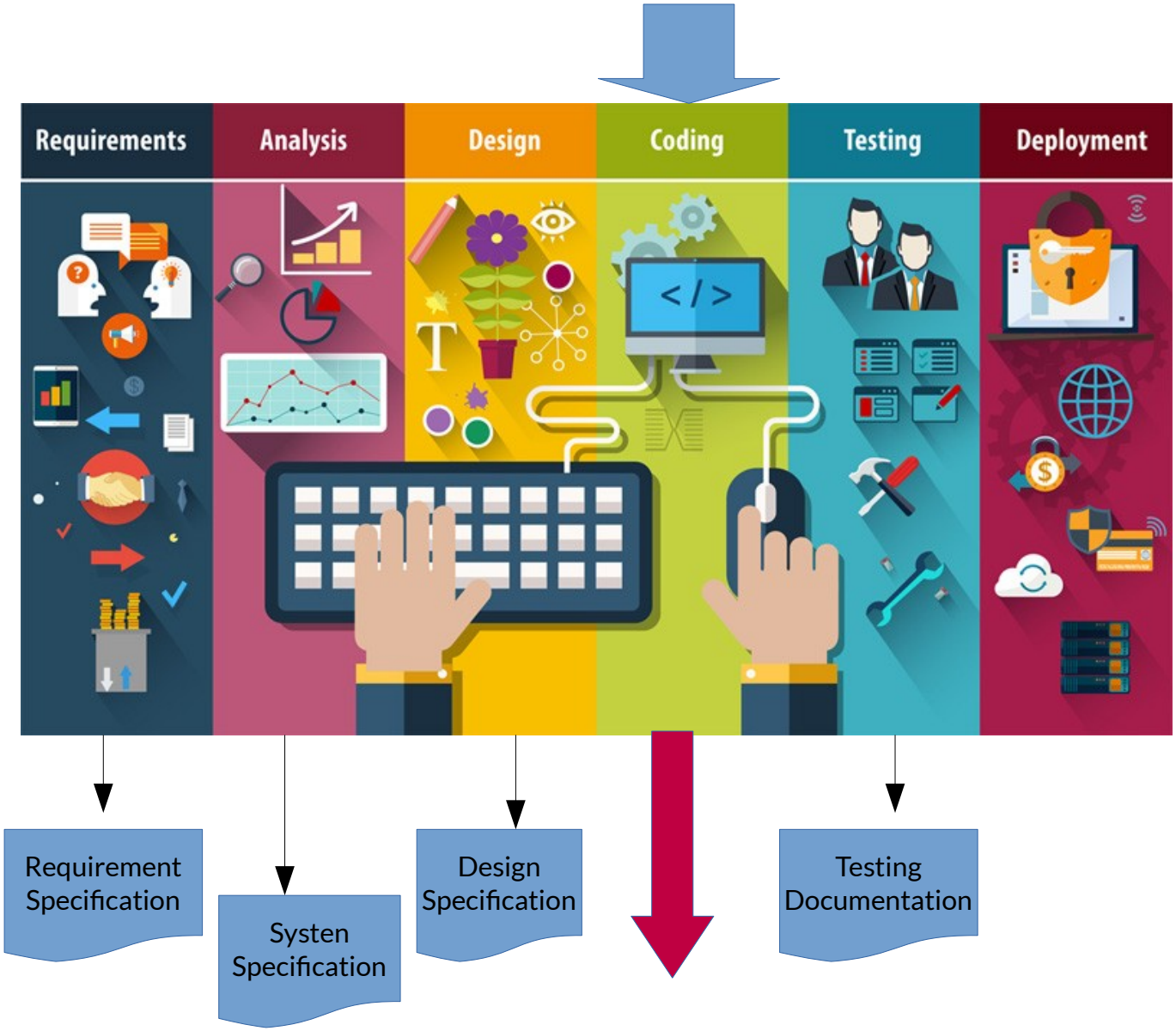


Pelaksanaan pengadaan lelang

- **Tahap 1. Perencanaan** dilakukan penulisan naskah akademik, berupa rencana sistem informasi tersebut dari kaca mata akademik dengan memertimbangkan beragam aspek
- **Tahap 2. Pelaksanaan assestment** dan perencanaan pekerjaan tersebut, sesuai dengan kondisi anggaran, serta capaian pada rentang waktu yang diharapkan
- **Tahap 3. Persiapan pelaksanaan lelang**, dengan menyiapkan justifikasi pembiayaan, justifikasi ahli yang terlibat, serta justifikasi keluaran dalam pelaksanaan pekerjaan
- **Tahap 4. Pelaksanaan lelang**, dengan penentuan pemenang melalui evaluasi administrasi, evaluasi teknis, dan paparan
- **Tahap 5. Pelaksanaan pekerjaan** dengan dilakukan pengawasan sesuai dengan dokumen, standard, dan naskah akademik
- **Tahap 6. Pelaksanaan pemeriksaan penyerahan** pekerjaan berdasarkan standard, naskah akademik, serta bakuan evaluasi.



Tahapan Development



Bisnis Proses Layanan SPBE

- Level 0: Penjabaran “Service-service”
- Level 1: Penjabaran proses yang ada untuk memberikan service-service tersebut, informasi yang dijelaskan hanya pada input/output proses tersebut
- Level 2: Penjabaran sub-proses dari proses tersebut beserta informasi/data yang digunakan pada sub-proses tersebut

Tingkatan Bisnis Proses

Bisnis Proses Organisasi
Contoh : Bispro BKN

Level: 0 semua aktifitas Di organsasi

Level 1: Layanan yang ada

Level 2: Proses

Bisnis Proses Layanan
Contoh: Layanan Kepegawaian

Level 0: Layanan yang ada

Level 1: Proses

Level 2: Sub-Proses

Information Modelling

Data Modelling

Bisnis Proses Analis → Implementasi

Bisnis Proses Layanan
Contoh: Layanan Kepegawaian

Level 0: Layanan yang ada

Level 1: Proses

Level 2: Sub-Proses

Information Modeling (process related)

Data Modeling

Information Modeling (system related)

Database Modeling

Bisnis Proses Layanan
Contoh: Aplikasi Kepegawaian

Level 0: Layanan yang Ada (dari kaca mata aplikasi)

Level 1: Sub Aplikasi

Level 2: Proses/Fitur Aplikasi

Persiapan BisPro Manajerial

Bisnis Proses Layanan
Contoh: Layanan Kepegawaian

Level 0: Layanan yang ada

Deskripsi layanan secara manajerial

Level 1: Proses

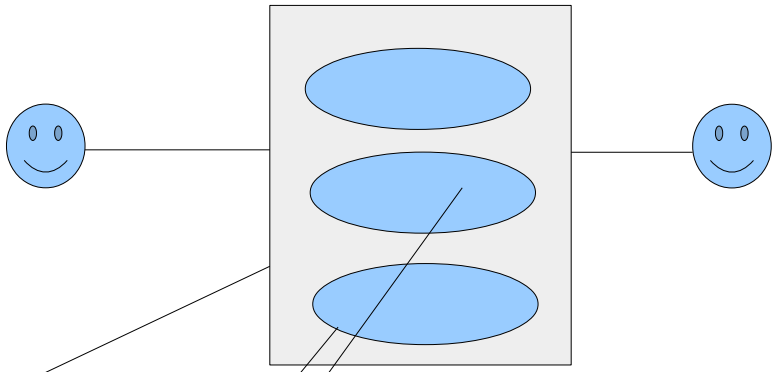
Deskripsi Tiap Proses secara naratif, dan peraturan atau kebijakan yang terkait

Level 2: Sub-Proses

Dokumen/Informasi yang diberikan kepada proses baik elektronis maupun bukna
Dokumen/Informasi yang dihasilkan pada tiap proses

Persiapan BisPro Aplikasi

Bisnis Proses Layanan
Contoh: Aplikasi Kepegawaian



Level 0: Layanan yang ada

Deskripsi Aplikasi (Use Case sebagai patokan)

Level 1: Sub Aplikasi

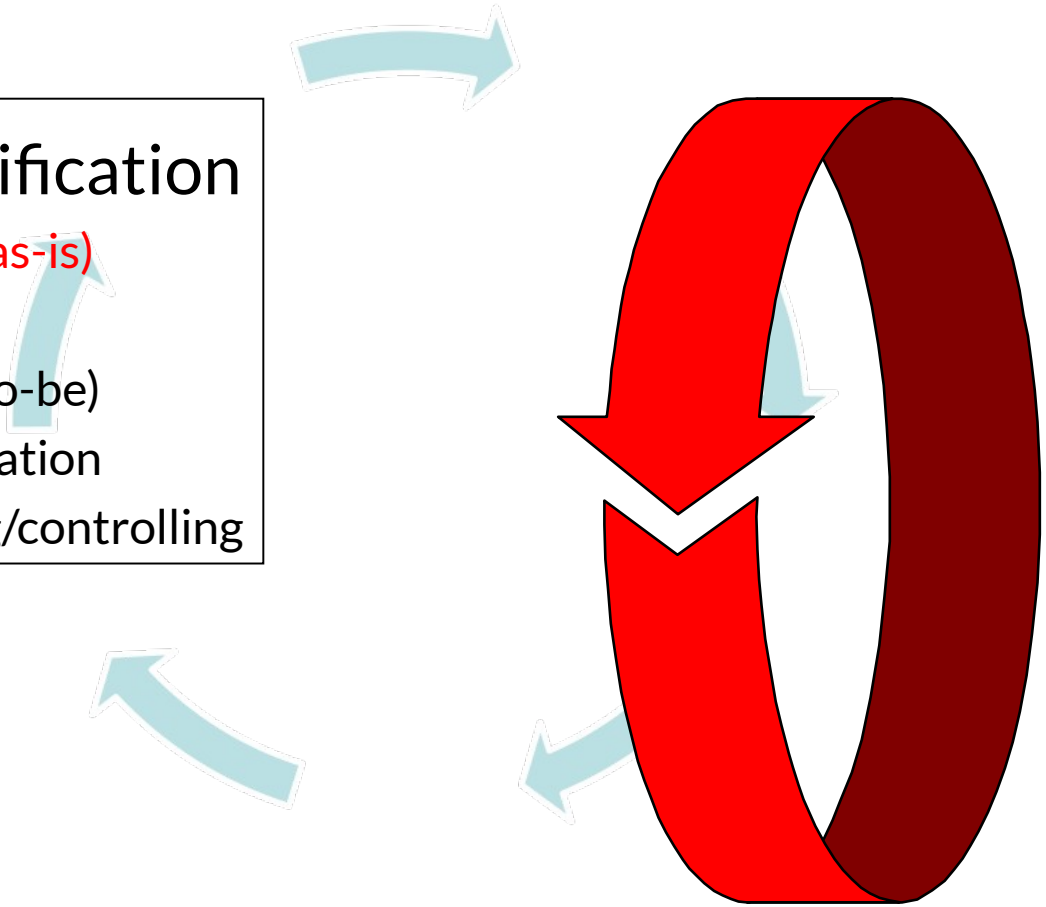
Deskripsi Sub Aplikasi
Data Flow Diagram (DFD)
Use cased ditail (komponen)

Level 2: Proses/Fitur

UI design, Report Design
Flowchart dari tiap sub proses (atau DFD ditail)
ERD
Sub Proses ini “mirip” dengan sequence diagram aplikasi

How to engage in BPM?

1. Process identification
2. Process discovery (as-is)
3. Process analysis
4. Process redesign (to-be)
5. Process implementation
6. Process monitoring/controlling



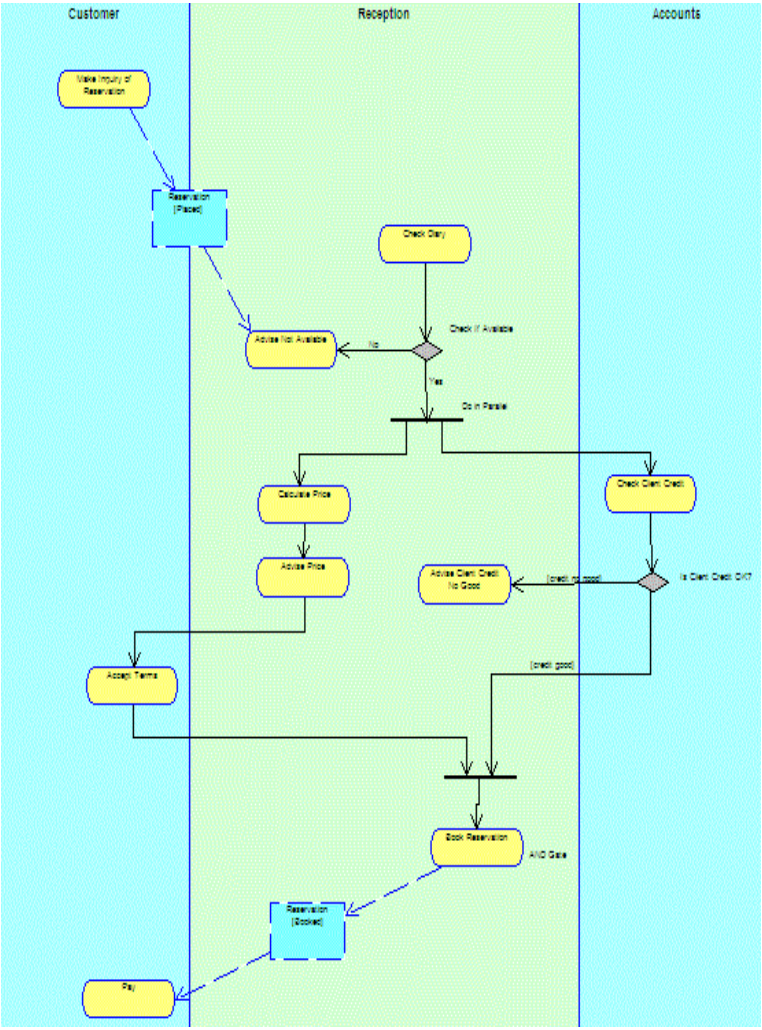
Process Modeling Tools

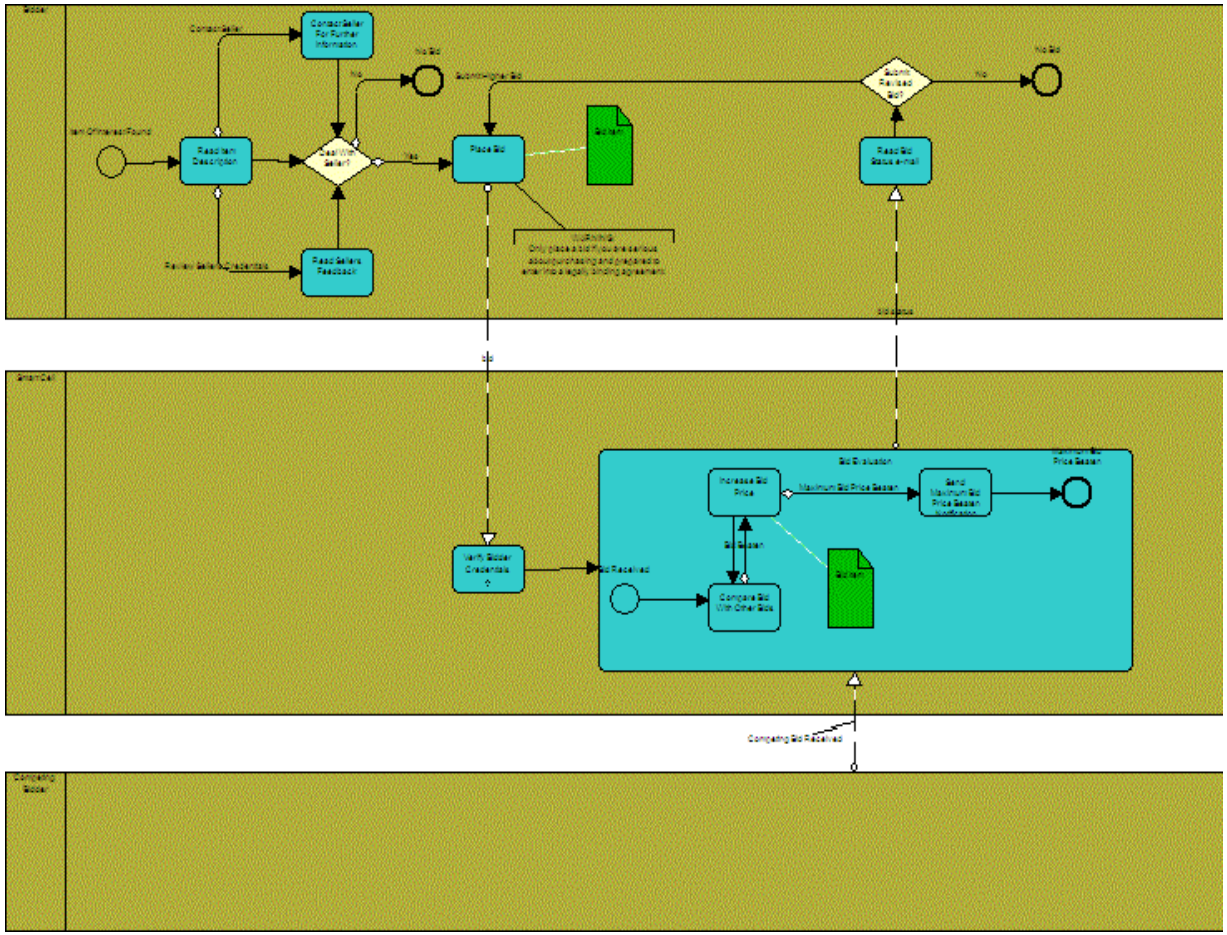
Process Management Systems

Business process modelling with UML

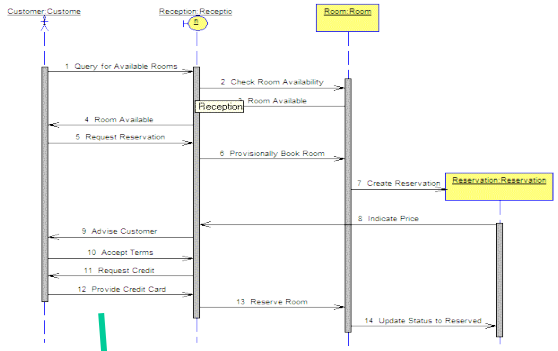
- Is a single modeling language enough?
  - UML describes system behavior (Zachman Rows 4 & 5)
  - Existing UML extensions for business modeling are described in terms of OO concepts, with which most business users are unfamiliar
  - A single modeling language to span all the abstractions required by business users, analysts, systems designers and developers is open to interpretation
- Using UML to describe Scope or Enterprise perspectives:
  - Takes it out of its original domain; and
  - Requires us to map the existing symbol set onto different concepts

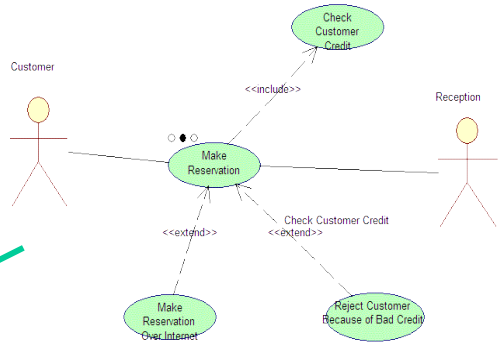
(UML) Activity diagram vs (BPMN) Process diagram

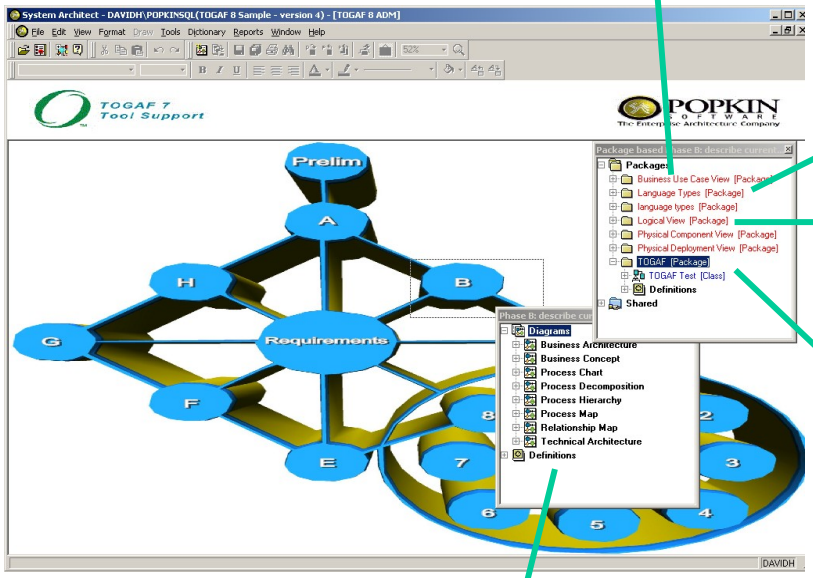


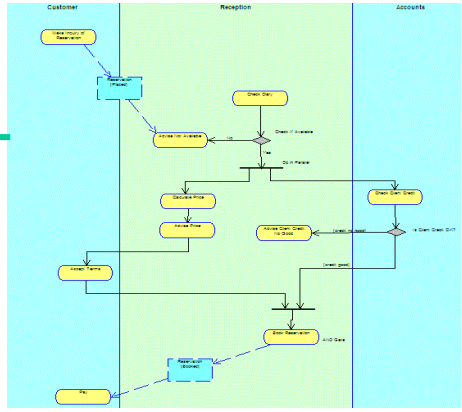


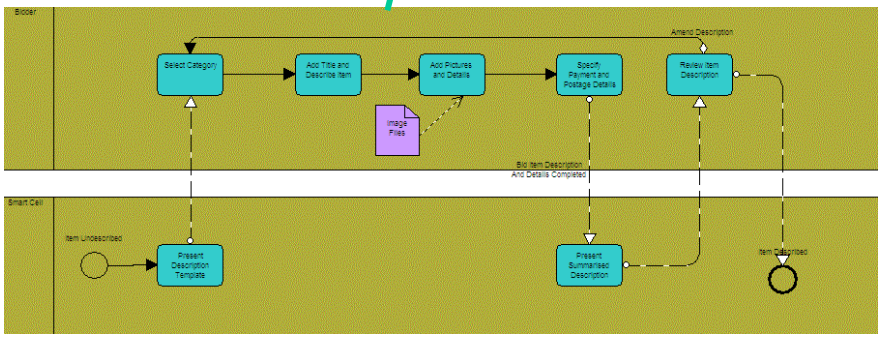
BPMN + UML + TOGAF in SA

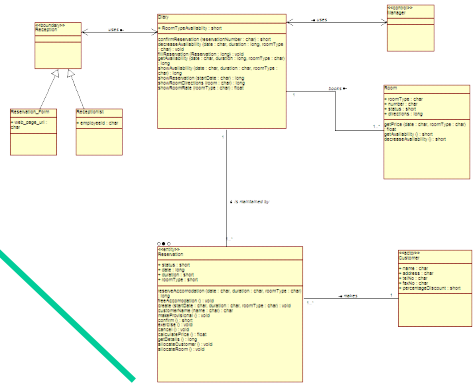




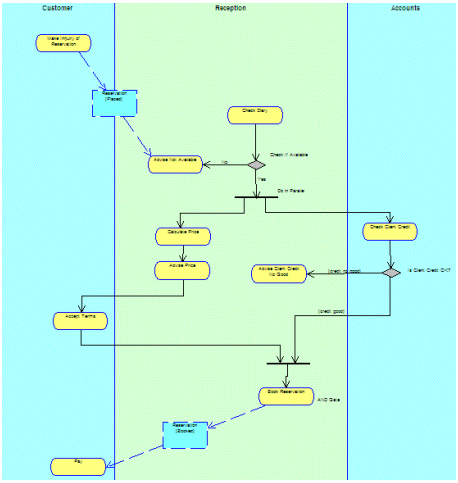






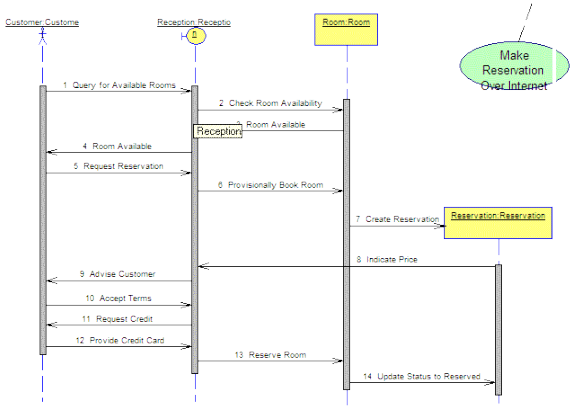


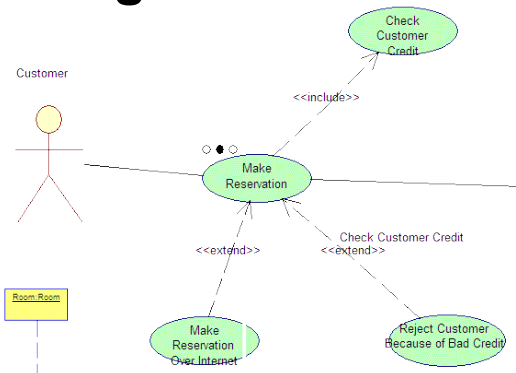
UML – Aggregation of multiple diagrams



James Odell and Oracle

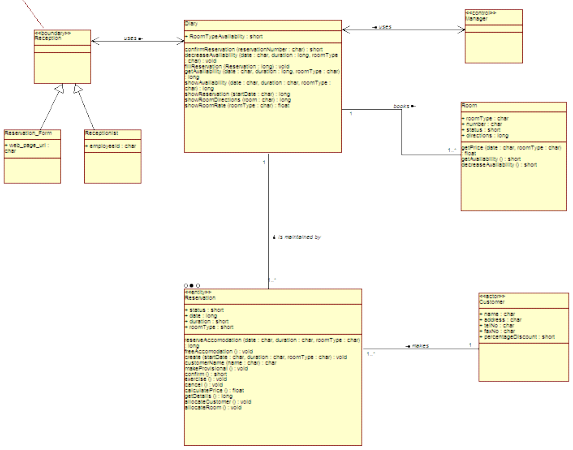
OMT and Grady Booch



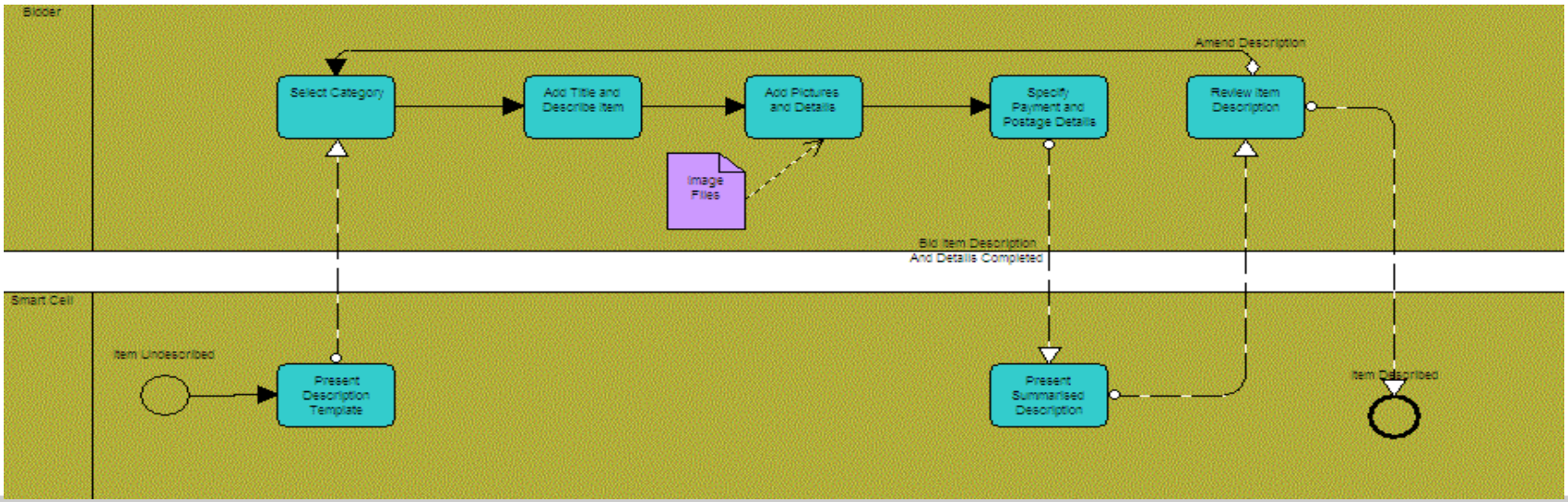


Ivar Jacobson

Grady Booch and OMT

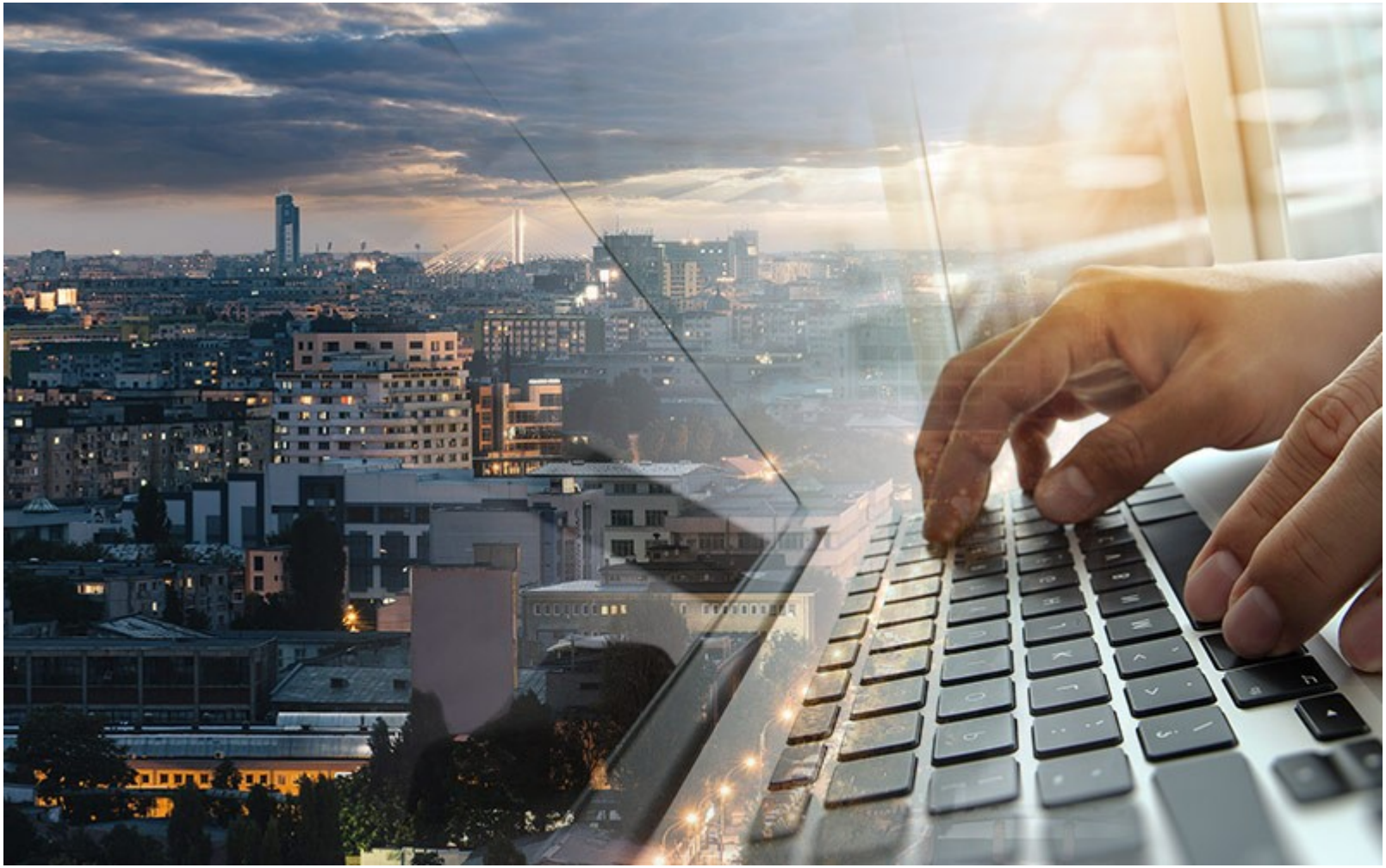


Process-centric – single diagram type from which multiple views can be derived



BPMN and UML co-existence

- BPMN and UML will co-exist
- OMG and potential for BPMN-UML convergence
- Technical users may continue to use UML
- BPMN can be used to drive solutions that will run directly on a BPMS
- BPMN can be used as a business analysis front end for subsequent systems development using UML
  - UML users would then regard business processes merely as another type of component

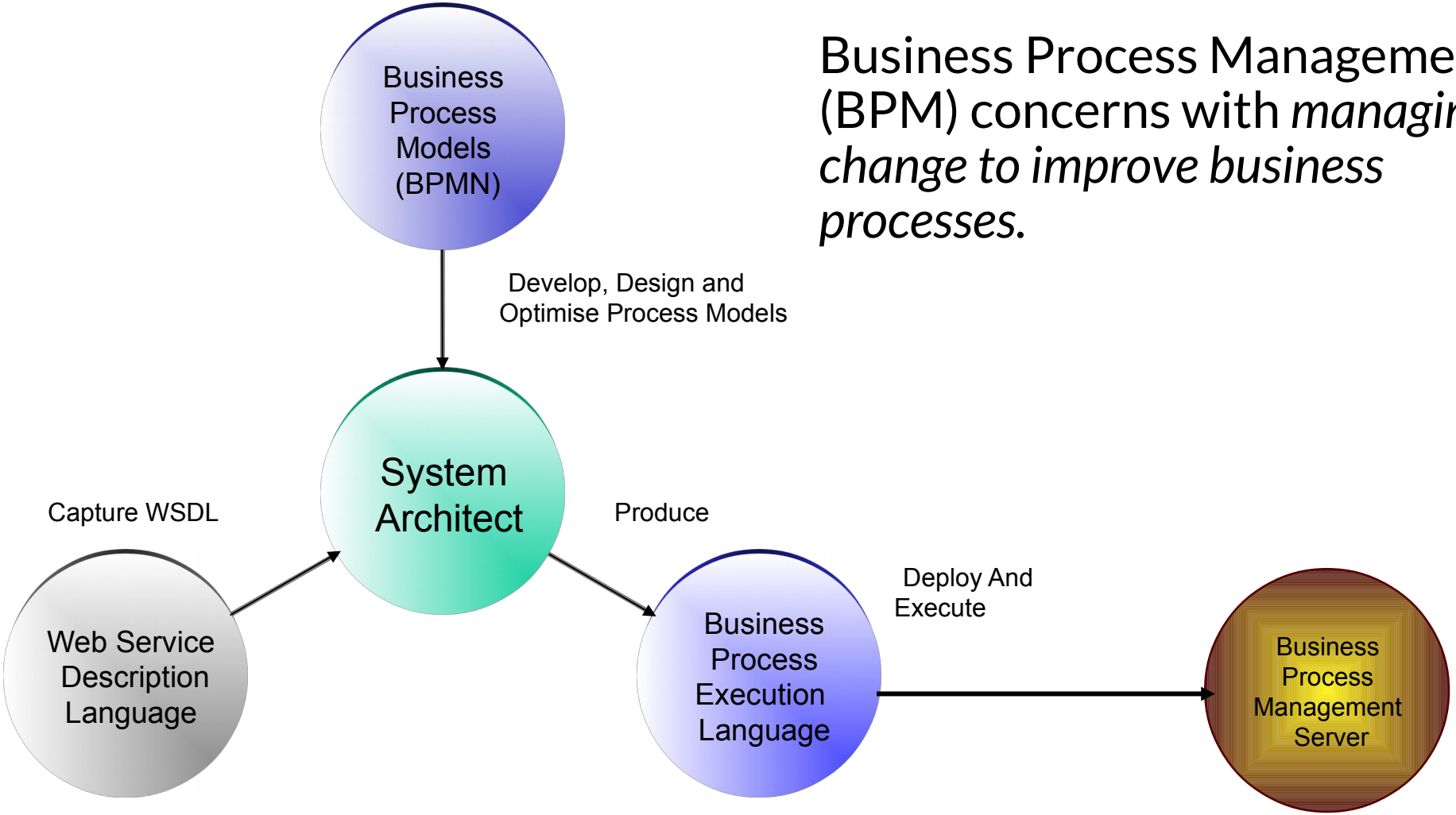


Ekosistem BPMN

BPMN Summary

- BPMN is designed to enable
  - Modelling of simple and complex business processes
  - Offers the capability to model the exchange of messages involved in web services delivery
  - Supports generation of Business Process Execution Languages (BPEL)
- It is expected to become the new standard to model business processes and web services

Business Process Management



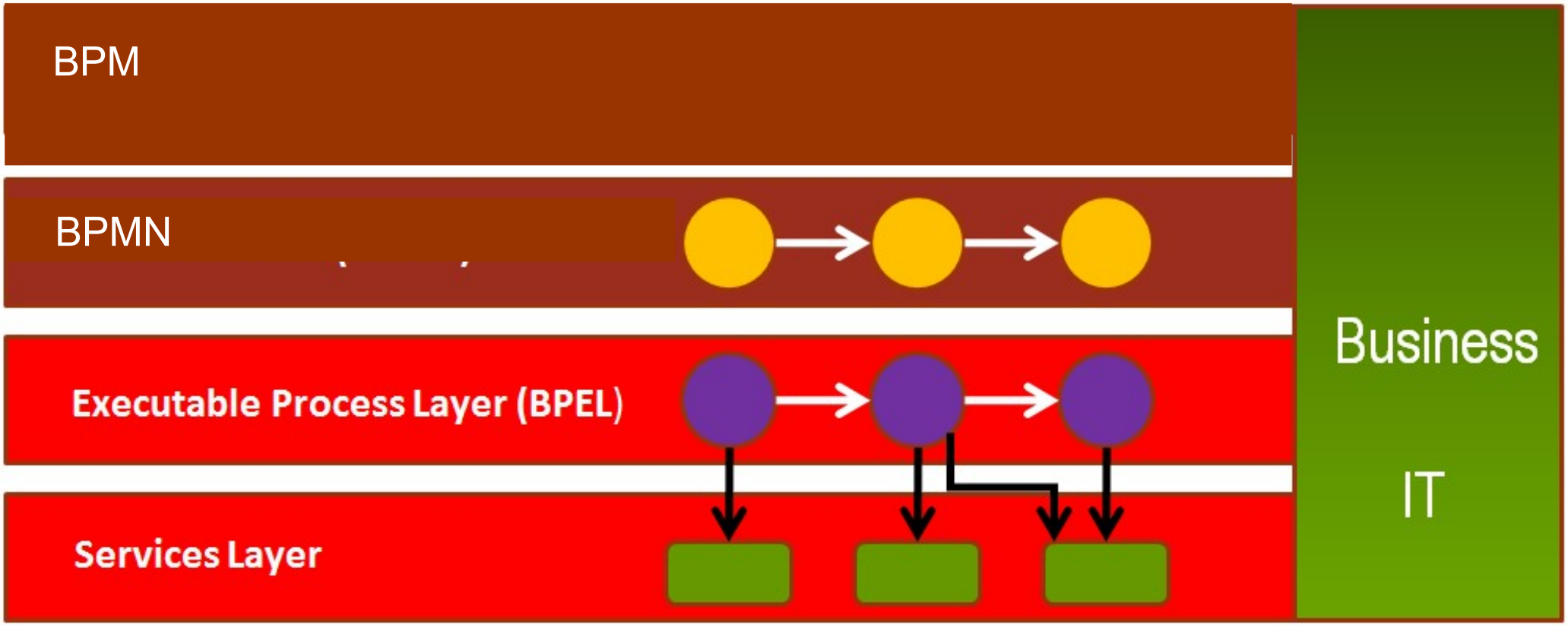
Business Process Management (BPM) concerns with *managing change to improve business processes.*

BPM, BPMN & BPEL defined

BPM **Business Process Management**	A management approach focused on aligning all aspects of an organization based on the wants and needs of clients.
BPMN **Business Process Modeling Notation**	A graphical representation for specifying business processes in a business process model.
BPEL **Business Process Execution Language**	A standard executable language for specifying actions within business processes with web services, created by the Organization for the Advancement of Structural Information Standards.

BPE **Business Process Execution**	Supports web-service languages for process definition and execution. Supports BPEL.
BRP **Business Rules Processing**	Infers outcomes based on data and operation results from previous business process executions (Business Rules Engine).

How does it all fit together?



Key Components in Business Process Execution

- Application Development
  - concerned with modelling business processes
  - description of web services
- Generation of Business Process Execution Language (BPEL)
  - production of executable code
- Business Process Execution
  - running the BPEL code

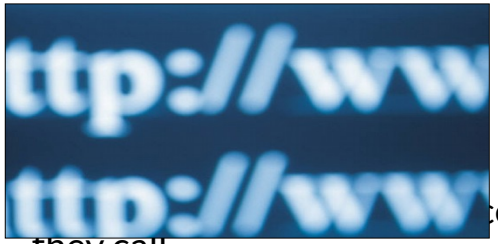
How do we get to a model-driven environment?

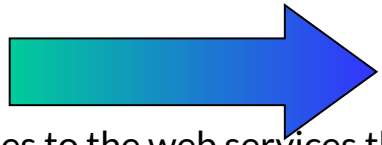
- A BPMN model captures business processes transfers them to a Business Process Automation engine in a BPMN-executable serialization format.

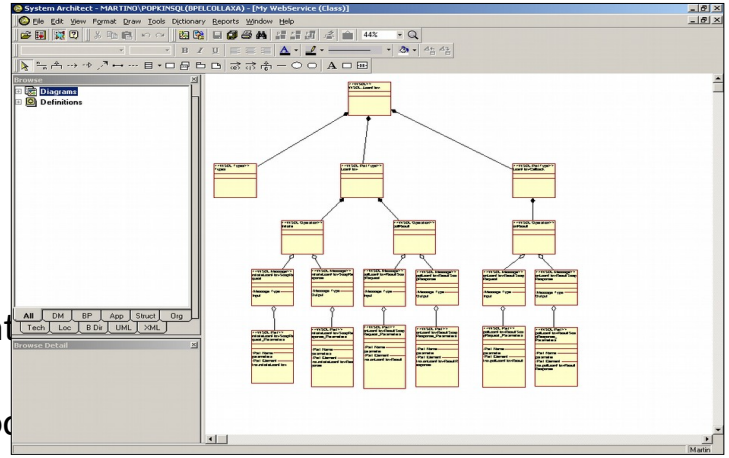
- Depending on the tool, it may also be:
  - Transferred as an XML Process Definition Language (XPDL) format.
  - Translated into the BPEL specification.
  - Captured in one of the business rules languages.

Application Development – description of Web Services

- WSDL describes web services
  WSDL stands for Web Services Description Language.
- What is WSDL?
  - an XML document
  - used to describe Web services
  - used to locate Web services
  - Expose service operations
- Import the WSDL into System Architect as an XML Schema Hierarchy







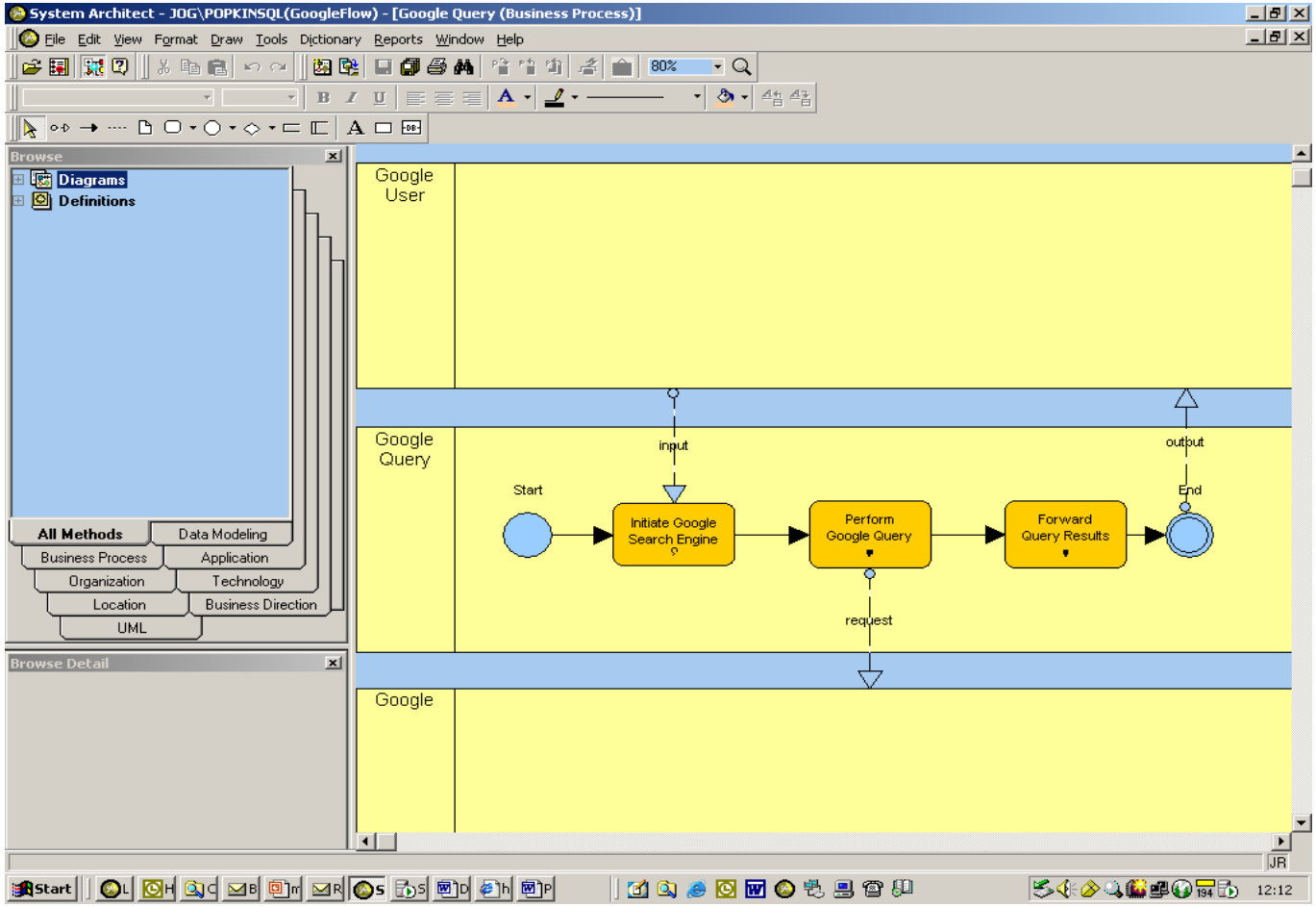
- cesses to the web services that they call
- Use in the business process models to describe the metho execution

Application Development – Business Process Models

The “Functions” described in the XML hierarchy are re-used as UML Class Methods by dragging and dropping into BPMN Processes and Message Flows.

Business Process Modelling

- Design and develop business processes using BPMN and utilising WSDL
- “Functions” described in the XML hierarchy re-used as UML Class Methods by drag and dropping into BPMN Processes and Message Flows.



Generate Business Process Execution Language

- **What is BPEL?**
  - Stands for Business Process Execution Language and is used for describing the execution of business processes
  - provides an XML notation and semantics for specifying business process behaviour based on Web Services as an Is an XML document.
  - A BPEL process is defined in terms of its interactions with partners
  - BPEL orchestrates Web Services by specifying the order in which it is meaningful to call services
  - It assigns responsibilities for each of the services to partners
  - It is used to specify both the public interfaces for the partners and the description of the executable process

Deploying BPEL

- Generate BPEL from the BPMN Models
- BPEL is intended to be platform independent.
- Execution bindings to specific hardware/software platforms and other mechanisms required for a complete runtime environment for process implementation need to be specified prior to running.

BPEL Engines

- Microsoft BizTalk
- Collaxa
- Intalio
- IBM WebSphere
- ……

Execution of BPEL

Load the business processes into the server

Example of business process ready for execution within Collaxa BPM Server

Collaxa BPEL Console v2.0 - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Search Favorites Media

Address http://jog:9700/BPELConsole/index.jsp Go

Collaxa BPEL Console

Module BPEL Manager Logout | Support

BPEL Processes | Instances | Activities

Purge Database

Deployed BPEL Processes	Running BPEL Process Instances		
Name	Instance	BPEL Process	Last Modified
CreditRatingService			
GoogleFlow			
LoanFlow			
StarLoan			
TaskService			
UnitedLoan			
Wait			

Deploy New Process

Logged to domain: **default** Collaxa BPEL Console v2.0 rc1

http://jog:9700/BPELConsole/displayProcess.jsp?processId=GoogleFlow&revisionTag=2.0 Local intranet

Start 12:56

Example execution of BPEL

Example showing diagrammatically the status of one instance of execution of the process

Collaxa BPEL Console v2.0 - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Address http://jog:9700/BPELConsole/displayInstance.jsp?referenceId={A0F940CF-376A-4B96-A131-516CB974892D}&mode=flow

Collaxa BPEL Console

Module BPEL Manager Logout | Support

BPEL Processes | Instances | Activities

Purge Database

Title: Instance #601 of GoogleFlow
Reference Id: bpel://localhost/default/GoogleFlow~2.0/601
BPEL Process: GoogleFlow (v. 2.0)
Last Modified: 2004-01-07 12:58:05.458
State: closed.completed
Priority: 0

Visual representation of the history of this BPEL business flow [As of 1/7/04 12:58 PM] Refresh View

Path:

Flow | Audit | Debug | Activities | WS-T

Logged to domain: **default** Collaxa BPEL Console v2.0 rc1

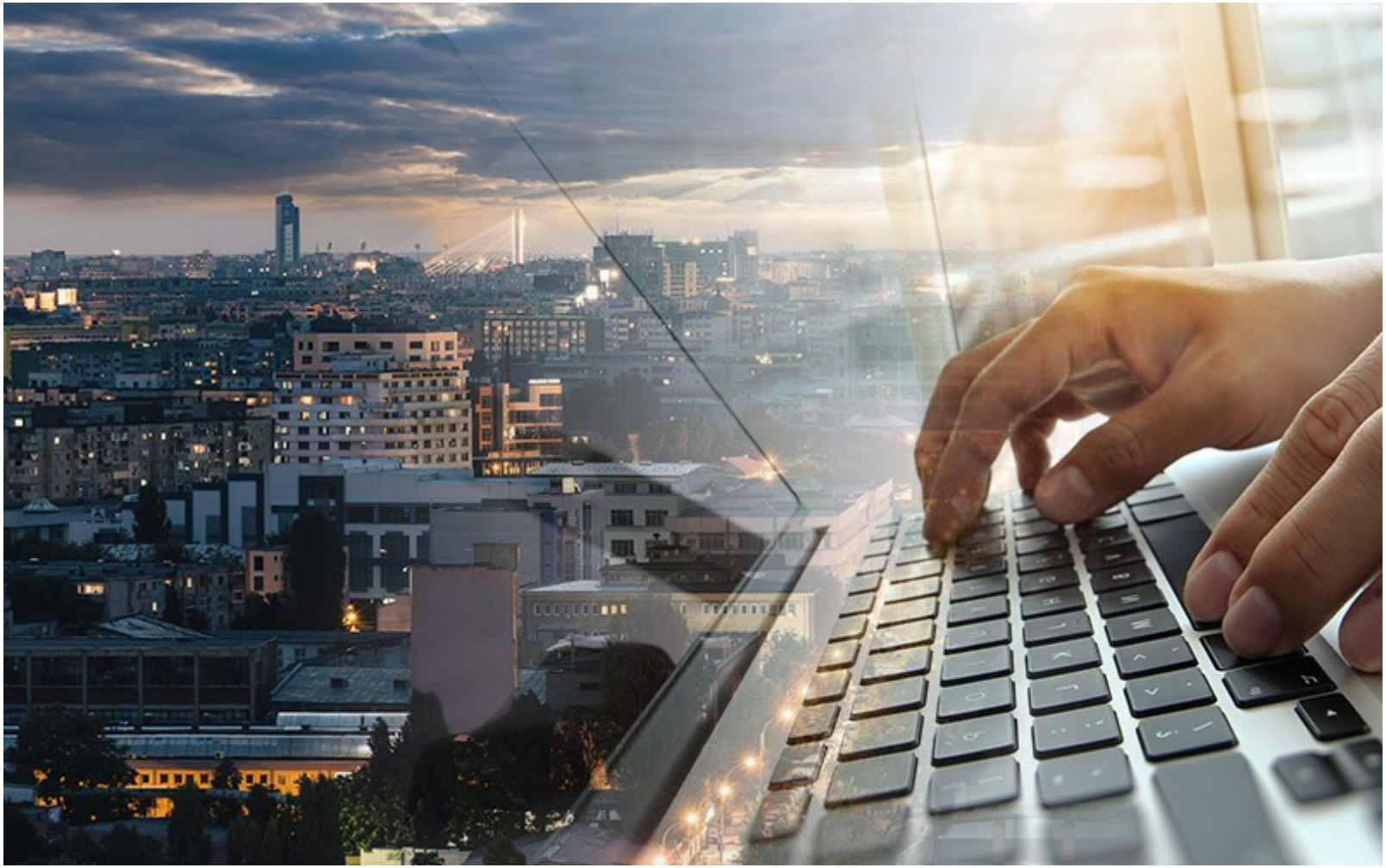
Done. 26 entries rendered. Local intranet

Start 12:58

BPMN and the future

Vendors are expected to provide support for

- Simulation of BPMN processes
- Generation of Business Process Execution Languages
- Integration into workflow management tools



Notasi BPMN

What is BPMN?

- BPMN – acronym for Business Process Modeling Notation
- New standard for modeling business and web service processes
- Provides users with an industry standard set of diagramming syntax and semantics, through a graphical diagram to facilitate the representation of business processes
- Owned by BPMI – www.BPMI.org - the Business Process Management Initiative

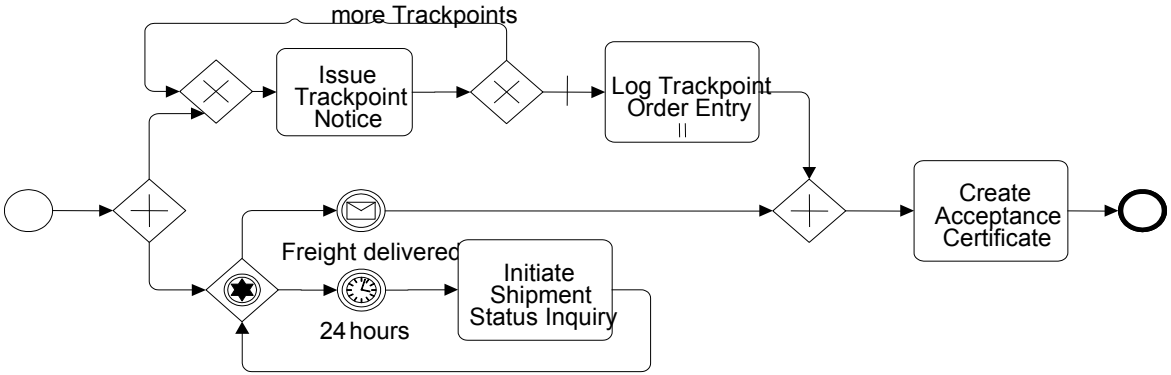
BPMI.org

Business Process Modeling Notation (BPMN)

- OMG Standard, didukung banyak software bantu:
  - Signavio (http://www.signavio.com/)
  - TIBCO Business Studio (free download, quite large)
  - IBM Websphere Business Modeler
  - ARIS
  - Oracle BPA
  - Business Process Visual Architect (Visual Paradigm)
  - Progress Savvion Business Modeller
  - Camunda Modeller

BPMN : Business Process Modelling Notation

- New standard for modeling business and web service processes, Standardized by OMG versi 1.2
- To gain sight and control of the business process.
- To provide a service orchestration layer in SOA implementation.
- Graphical notation for *conceptual* processes. Provides users with an industry standard set of diagramming syntax and semantics, through a graphical diagram to facilitate the representation of business processes
- Covers control, data, authorization, exception
- BPMN helps with Process
  - Design
  - Deployment
  - Execution
  - Maintenance
  - Optimization



Notasi BPMN

Provide a notation

- that is readily understandable by a business audience
- capable of providing technical detail for the purposes of implementation
- that supports generation of XML based execution languages such as Business Process Execution Language (BPEL)

Why is BPMN needed?

- Provide a standard where there hasn't been a standard
- BPMN helps with Process
  - Design
  - Deployment
  - Execution
  - Maintenance
  - Optimization
- Aid interoperability between Business Process Management tools
  - Support generation of process execution languages
- BPMN is a core enabler for Business Process Management (BPM) which is concerned with *managing change to improve business processes.*

Business Process Model Notation (BPMN)

- Business Process Model and Notation (BPMN) adalah representasi grafis untuk menentukan proses bisnis dalam model proses bisnis.

- Tujuan dari BPMN adalah untuk mendukung manajemen proses bisnis, baik untuk pengguna teknis dan pengguna bisnis, dengan menyediakan notasi yang intuitif untuk pengguna bisnis, namun dapat mewakili semantik proses yang kompleks.

Business Process Model Notation (BPMN)

- Tujuan utama dari BPMN adalah untuk memberikan notasi standar yang mudah dipahami oleh semua pemangku kepentingan bisnis. Ini termasuk analis bisnis yang membuat dan menyempurnakan proses, para pengembang teknis bertanggung jawab untuk menerapkannya dan manajer bisnis yang memantau dan mengelola. Akibatnya BPMN berfungsi sebagai bahasa umum, menjembatani kesenjangan komunikasi yang sering terjadi antara desain proses bisnis dan Implementasi.

- Sejak 2014, BPMN telah dilengkapi dengan standar baru untuk membangun model keputusan, Model Keputusan dan Standar Notasi.

Elemen Model BPMN

Elemen	Definisi	Jenis
Flow Object	Elemen utama yang menggambarkan karakteristik dari sebuah proses bisnis.	• Event • Activities • Gateways
Connecting Object	Elemen yang menghubungkan Flow object.	• Sequence Flow • Message Flow • Association
Swimlane	Pengelompokan dari beberapa model elemen.	• Pools • Lanes
Artifacts	Elemen yang digunakan untuk memberikan informasi tambahan dari sebuah proses.	• Annotation • Group • Data Object • Data Store

Dasar BPMN

- Suatu model proses BPMN merupakan graf yang terdiri dari 4 jenis elemen:

Flow Object

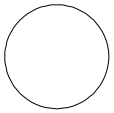
- **Event**

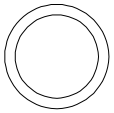
Event adalah sesuatu yang terjadi selama rangkaian dari sebuah business proses. Event mempengaruhi alur dari proses dan biasanya memiliki sebuah tindakan atau sebuah hasil. Simbolnya adalah bentuk lingkaran dan berdasarkan alur pengaruhnya, terdapat 3 jenis event yaitu:

1. Start event: simbol yang mengindikasikan sebuah proses yang akan dimulai
2. Intermediate event: terletak antara Start Event dan End Event. Simbol ini akan mempengaruhi alur proses, tetapi tidak akan memulai atau secara langsung menghentikan proses
3. End event: di indikasikan sebagai simbol untuk mengakhiri sebuah proses

Modelling with BPMN – Control Flow

Events


start event


intermediate event

end event

decorations:

message

error

time

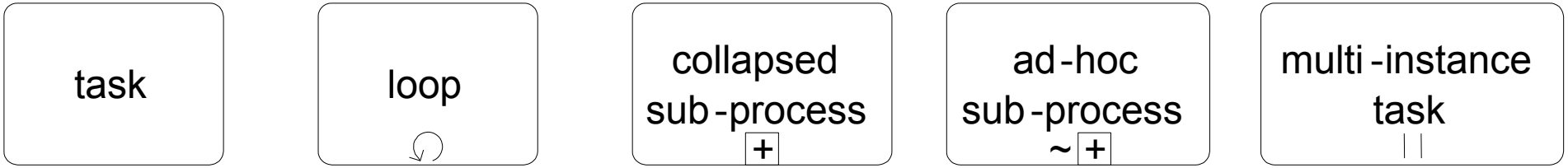
Flow Object

- Activities

Activities digunakan untuk mewakili berbagai makna dalam kehidupan sehari-hari. Aktivitas dianggap mencakup berbagai kegiatan yang dapat diselesaikan dalam waktu 5 menit, satu minggu atau lebih.

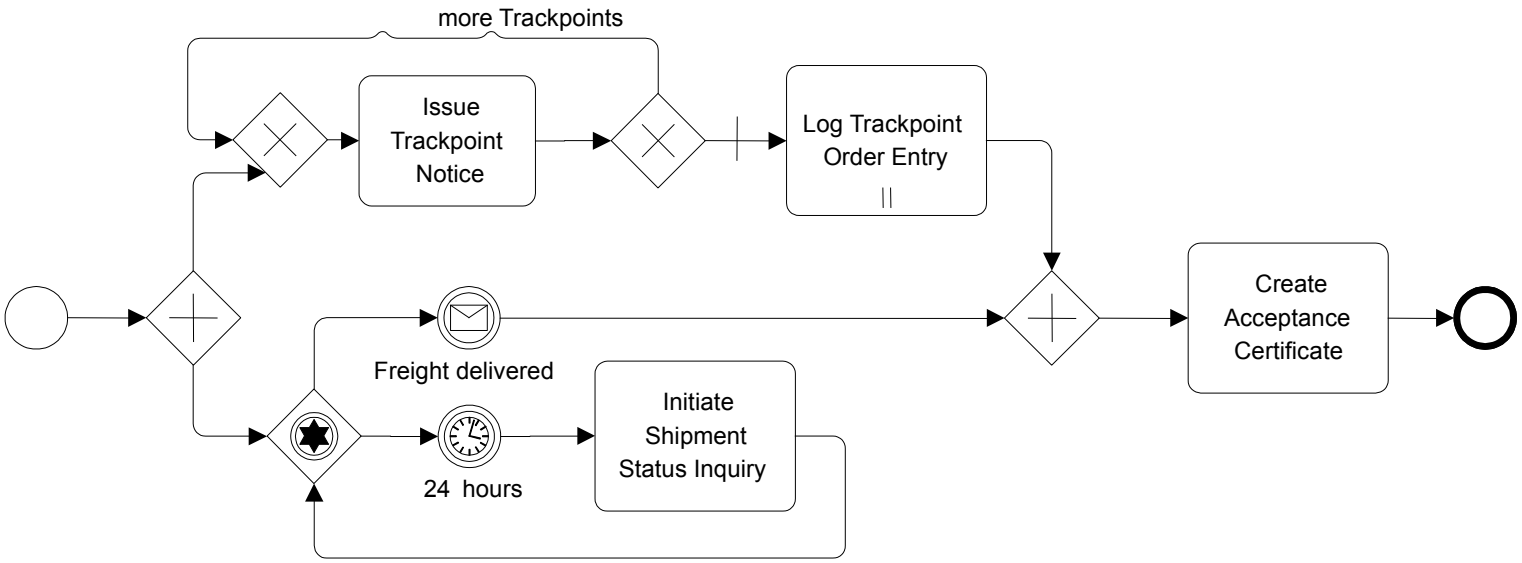
Modelling with BPMN – Control Flow

Activities



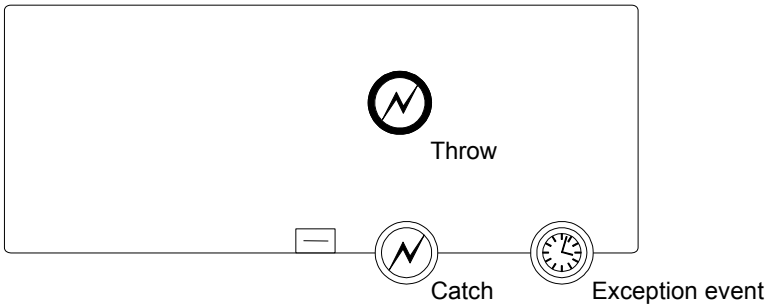
Modelling with BPMN – Control Flow

Example



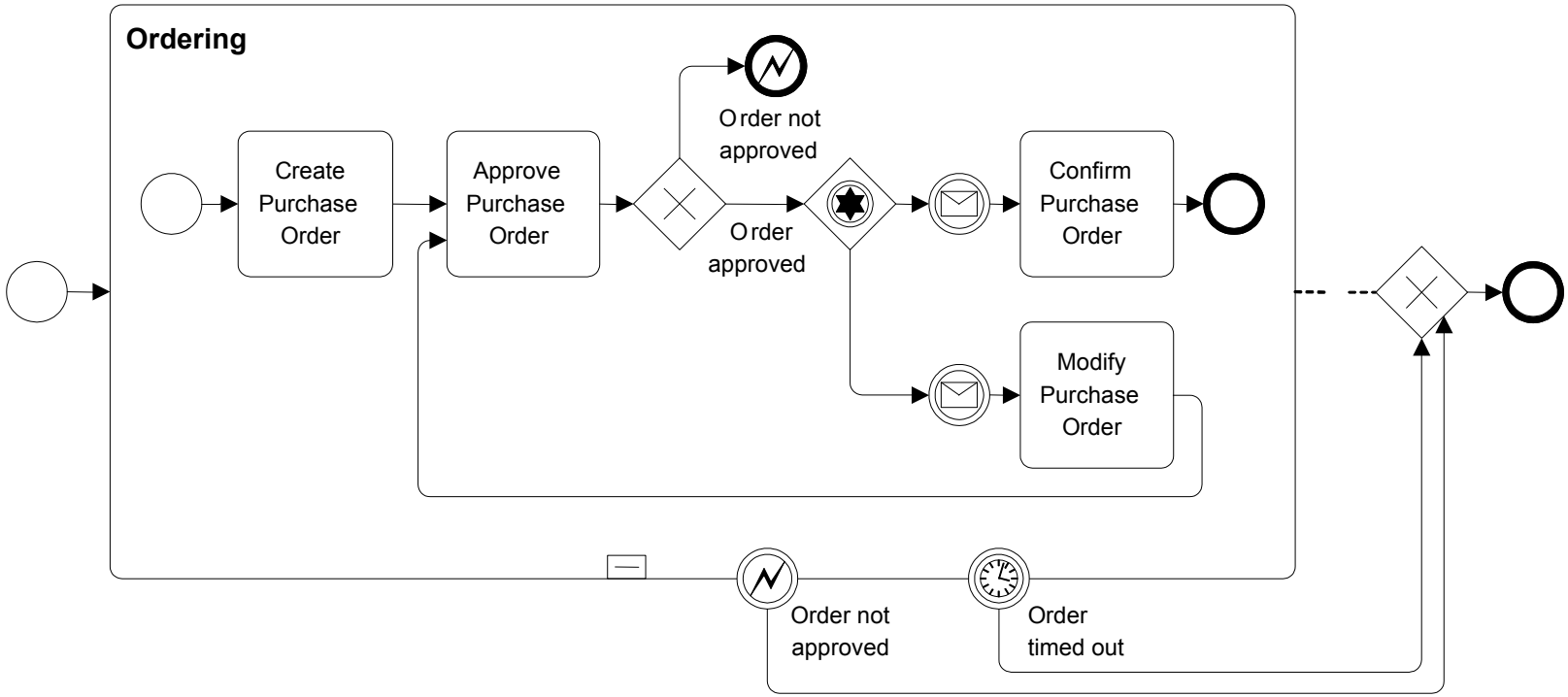
Modelling with BPMN – Exception

- Exception events
- 'Throw' events
- 'Catch' events



Modelling with BPMN – Exception

Example

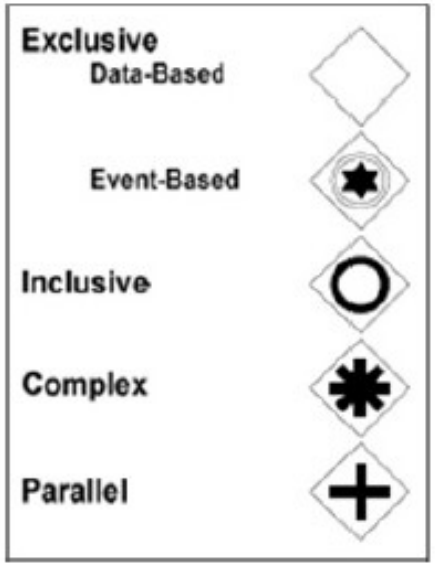


Flow Object

- Gateways

Gateway adalah pemodelan elemen yang digunakan untuk mengontrol bagaimana Sequence Arus berinteraksi saat mereka berkumpul (Converge) dan menyimpang (diverge) dalam Proses

- Semua jenis Gateways bentuknya adalah belah ketupat

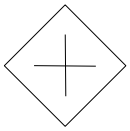


Flow Object

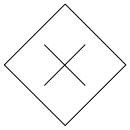
- Gateways
- **Gateways Eksklusif (*Decision*)** adalah lokasi dalam suatu proses bisnis di mana Arus Sequence bisa mengambil dua atau lebih jalur alternatif. Hal ini pada dasarnya adalah "pertigaan jalan" untuk proses. Hanya salah satu jalan keluar mungkin dapat diambil ketika Proses dilakukan.
- **Inclusive Gateways** adalah decision di mana ada lebih dari satu kemungkinan hasil.
- **Complex Gateways** adalah decision di mana ada definisi advance perilaku dapat didefinisikan.

Modelling with BPMN – Control Flow

Gateways



AND



XOR

Event-based

Connecting Object

- **Connecting Object**

Connecting Object adalah elemen yang menghubungkan Flow object. Connecting Object juga memiliki 3 jenis elemen yaitu :

1. **Alur Sequence (Sequence flow)** digunakan untuk menunjukkan urutan yang kegiatan akan yang dilakukan dalam sebuah proses.
2. **Alur Pesan (Messege Flow)** digunakan untuk menunjukkan aliran pesan antara dua entitas yang siap untuk mengirim dan menerima.
3. **Asosiasi (Association)** digunakan untuk asosiasi data, informasi dan artefak dengan aliran benda

Swimlanes

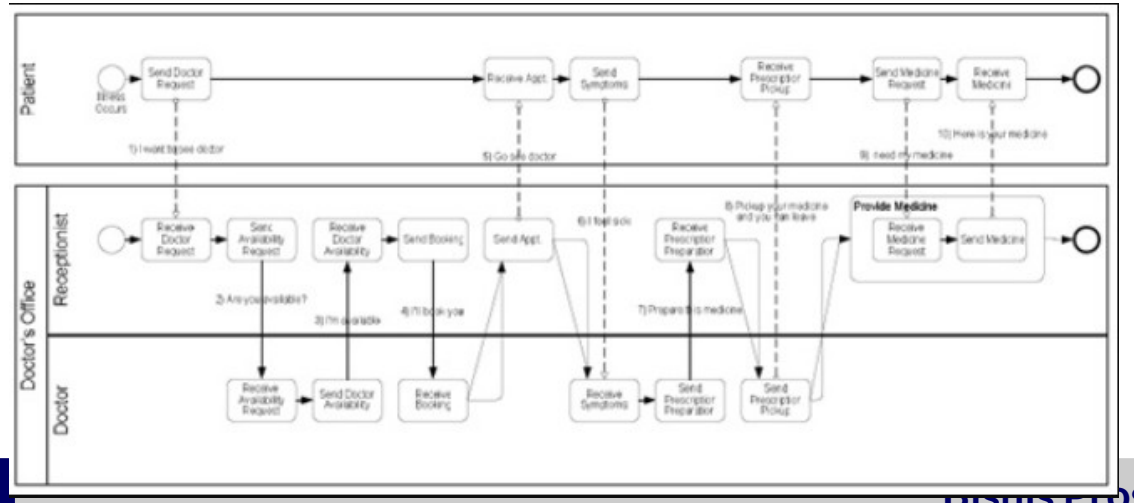
- **Swimlanes**

Swimlanes adalah pengelompokan dari beberapa model elemen.

Swimlines digunakan untuk memisahkan dan mengatur kegiatan oleh peserta sehingga kita secara intuitif dapat memahami siapa yang bertanggung jawab untuk setiap event.

Swimlines ada 2 jenis yaitu :

- **Pools:** Semua Bisnis Flow Diagram mengandung setidaknya satu Pool
- **Lanes:** Pool yang dibagi lagi menjadi sub Swimlanes



Artifacts

- **Artifacts**

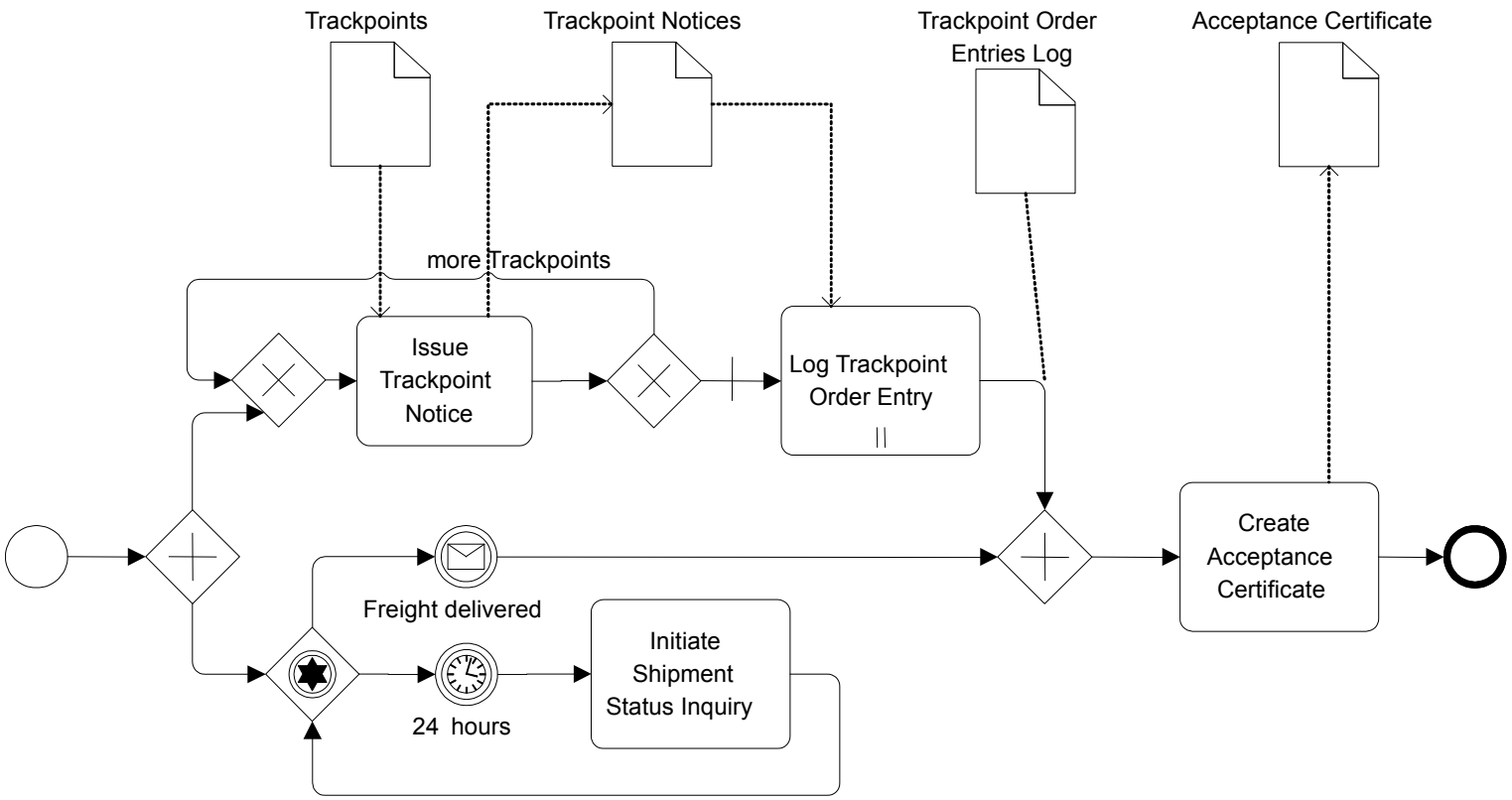
Artfacts adalah elemen yang digunakan untuk memberikan informasi tambahan dari sebuah proses. Bentuk dan penggunaan artifacts itu bermacam-macam dan bisa lebih luas tergantung dari standar pengertian BPMN yang digunakan.

Saat ini terdapat 3 setingan pengaturan artifacts, yaitu :

- Data Object
- Group
- Annotations

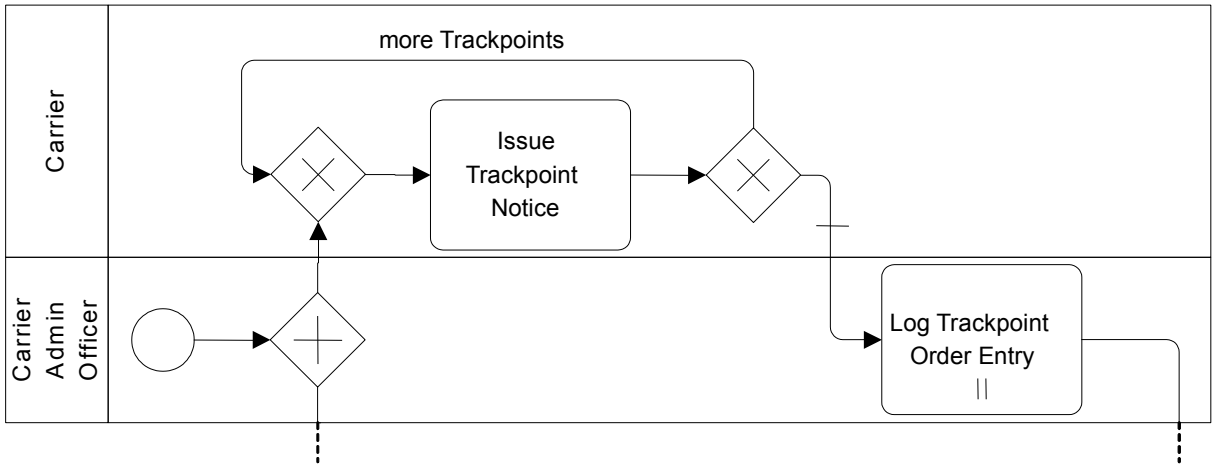
Modelling with BPMN – Data

Example



Modelling with BPMN – Resource

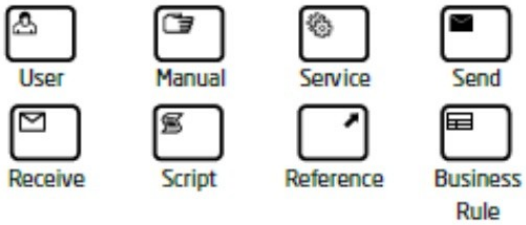
Example



Activities *(Rounded Rectangles)*

Represent the work performed within an organization. It can be simple or composed:

Task
A task is a simple activity used when the work performed within the process cannot be broken down to a finer level of detail.
BPMN defines different task types:



Sub-process
Is a composed activity whose internal details are defined as a flow of other activities.

Embeded Sub-process
Depends on the parent process. It cannot contain pool or lanes.

Reusable Sub-process
Is a process defined as an independent process diagram that does not depend on the parent process.

Transactional Sub-process
Its behavior is controlled through a transaction protocol.

Ad-Hoc Sub-process
Contains a group of activities whose sequence and number of activities is defined by their performers.

Event Sub-process
Is launched by an event

Gateways *(Diamonds)*

Gateways are elements used to control divergence and convergence of the flow. (Split and merge)

Data-Based Exclusive Gateway
The exclusive decision has two or more outgoing sequence flows, but only one of them can be taken based on data expression conditions. As convergence is used to merge alternative paths.

Event-Based Gateway
This gateway represents a point in the process where only one of many paths of the process can be selected based on an event, not on data expression condition. Remaining paths will be disabled.

Exclusive Event-Based Gateway
Allows instantiating a process. If ONE of the subsequent events occurs, a new process instance will be created.

Parallel Event-Based Gateway
Allows instantiating a process. If ALL of the subsequent events occur, a new process instance will be created.

Parallel Gateway
Is used to create parallel flows. As convergence is used to synchronize multiple parallel paths into one. The flow continuous when all the incoming sequence flows have reached the gateway.

Inclusive Gateway
Is used when in a point of the flow one or more routes can be activated from many available, and the decision is based on process data. As convergence indicates that the active routes are synchronized into just one.

Complex Gateway
Is used to control complex decisions. As convergence, there will be an expression that will determine which of the incoming sequence flow will be required for the process to continue.

Swinlanes

Pool
A pool is a container of a single process. The name of the pool can be considered as the name of the process. There is always at least a pool even if it is not diagrammed.

Lane
A lane is a subdivision of a pool and represents a role or an organizational area.

Artifacts

Artifacts are used to provide additional information about the process.

Annotation
Are text boxes used to provide additional information about the process.

Group
Group a set of activities for the purpose of documentation or analysis.

Data Object
Provides information about how documents, data and other objects are used and updated during the process.

Data Store
Provides a mechanism for activities to retrieve or update stored information that will exist beyond the scope of the process.

Connecting Objects

Sequence flow
Represents the control of the flow and the sequence of the activities, gateways and events

Conditional sequence flow
Default sequence flow

Message flow
- A Message flow is used to show the flow of messages between two entities or processes.
- Represents signals or messages, not flow controls
- Not all message flows are fulfilled for each instance of the process nor is there a specific order for the messages

Association
An association is used to associate additional information about the process and compensation tasks.

Start events

These events start process flows. Do not have incoming sequence flows.

Intermediate Events

Intermediate Events indicate that something occurs or may occur somewhere between the start and end. These events can be used within sequence flows or attached to the boundaries of an activity so it is executed once the event is activated.

End Events

These events end process flows thus, they do not have outgoing sequence flows.

Start events	Intermediate Events	Catch	Interrupting	Non - Interrupting	Throw	End Events
	Link Intermediate Event This event allows connecting two sections of the process. It only can be used within the process flow.					
	Error Intermediate Event Is used to catch and handle errors. It only can be used attached to the boundaries of an activity.					**Error End Event** Allows sending an error exception when the flow arrives at the end.
	Cancel Intermediate Event Is used within the transactional processes modeling. It only can be used attached to the boundaries of transactional sub processes to indicate an exception flow that will be activated once the sub process is cancelled.					**Cancel End Event** Allows sending a cancel exception when the flow arrives at the end. It is only used in transactional sub processes.
	Compensation Intermediate Event Allows handling compensations. It can be used within the sequence flow to indicate that a compensation is needed or attached to the boundaries of an activity for the activity to be compensated once the event is activated.					**Compensation End Event** Indicates that the flow has finished and it is necessary a compensation.
Signal Start Event A process starts when a signal coming from another process is captured.	**Signal Intermediate Event** Is used to send or receive signals. It can be used within a sequence flow or attached to the boundaries of an activity to indicate an exception flow.					**Signal End Event** Indicates that a signal is sent when the flow arrives at the end.
Multiple Start Event Indicates that there are many ways to start the process. Only one of them will be required.	**Multiple Intermediate Event** This event can be activated by many causes. Only one of them is required. It can only be used within the sequence flow.					**Multiple End Event** Indicates that many results can be given when the flow arrives at the end.
Multiple Parallel Start Event Indicates that there are multiple triggers required to start the process.	**Parallel Multiple Intermediate Event** This event is activated by multiple causes. It is necessary that all of them to be fulfilled for activating it. It can be used within the sequence flow or attached to the boundaries of an activity.					
						Terminate End Event The process and all its activities finish, no matters if there is one or more pending flows.

Events *(Circles)*

Events represent something that happens or may happen during the course of a process and that affect its flow. There are three event types:

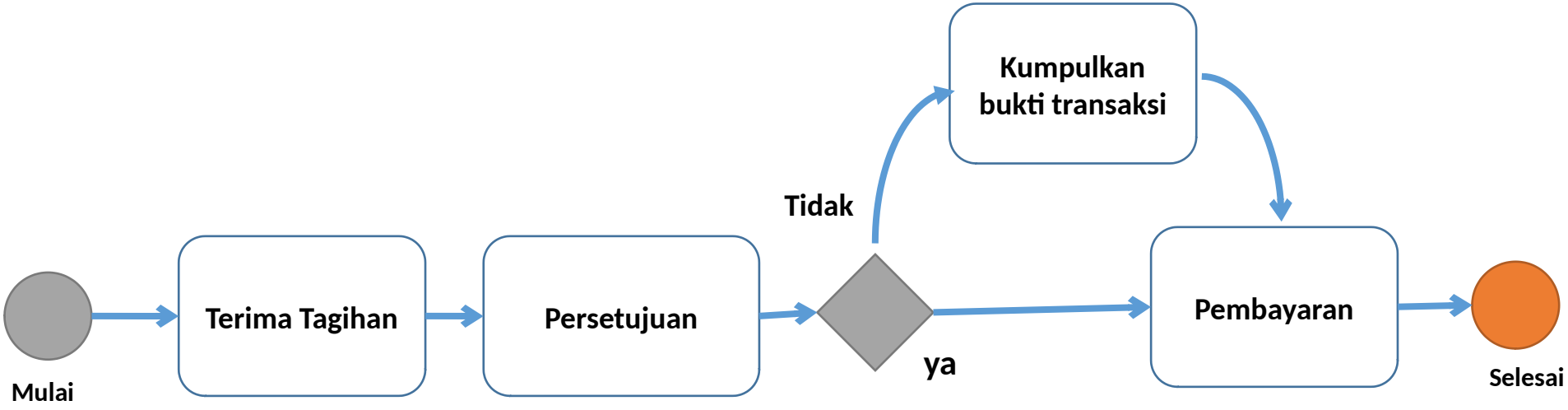
Start events These events start process flows. Do not have incoming sequence flows.	Intermediate Events Intermediate Events indicate that something occurs or may occur somewhere between the start and end. These events can be used within sequence flows or attached to the boundaries of an activity so it is executed once the event is activated.	Catch	Interrupting	Non - Interrupting	Throw	End Events These events end process flows thus, they do not have outgoing sequence flows.
None Start Event Does not specify any particular behavior to start a process.	**None Intermediate Event** Indicates that something occurs or may occur within the process. It only can be used within the sequence flow.					**None End Event** Indicates that the flow ends and there is no a defined result.
Message Start Event A process starts when a message is received.	**Message Intermediate Event** Indicates that a message can be sent or received. It can be used within a sequence flow or attached to the boundaries of an activity to indicate an exception flow.					**Message End Event** Indicates that a message is sent when the flow arrives at the end.
Timer Start Event A process starts at certain time or on a specified date.	**Timer Intermediate Event** Indicates a waiting time within the process. It can be used within a sequence flow or attached to the boundaries of an activity to indicate an exception flow.					
	Escalation Intermediate Event Indicates that the process must be escalated to a higher level of responsibility. The shape can be used within the sequence flow to throw the event or attached to the boundaries of an activity to catch it.					**Escalation End Event** Indicates that an escalation is necessary when the flow arrives at the end.
Conditional Start Event A process starts when a business condition becomes true.	**Conditional Intermediate Event** Is used when the flow needs to wait for a business condition to be fulfilled. It can be used within a sequence flow or attached to the boundaries of an activity to indicate an exception flow.					
	Link Intermediate Event This event allows connecting two sections of the process. It only can be used within the process flow.					

NOTASI

Notasi Inti

- Merupakan notasi yang dapat menggmbarkan suatu proses secara sederhana yang terdiri dari : ***EVENT*** ***(Penanda suatu Kejadian)***, ***AKTIVITAS*** ***(penanda suatu Kegiatan yang dilakukan dalam suatu proses)***, ***GATEWAY*** ***(penanda pengambilan keputusan atau kontrol alur kegiatan)***, ***PENGHUBUNG,*** ***(penanda yang menunjukkan hubungan antar elemen proses)*** dan ***POOL*** ***(suatu bidang gambar berupa kotak persegi panjang yang menjadi area penulisan diagram tatalaksana)***

Contoh :



Gambar Diagram
Proses Sederhana Menggunakan Notasi Inti

Event

Berdasarkan kapan terjadinya :
Mulai *(start)*, **Antara** *(Intermediate)*, **Selesai** *(End)*

	Start (Mulai)	Intermediate (antara)	End (Selesai)
NOTASI EVENT (Kejadian)			
	Tipe-Tipe Event (Kejadian)		
Message (pesan)			
	Dimulai setelah ada surat (misal: Surat perintah,	Terjadi berdasarkan surat	Dinyatakan selesai berdasarkan surat

Event *(lanjutan…)*

***Timer* (waktu)**	Dimulai pada pukul	Berlangsung selama	
***Cancel* (Batal)**		Terjadi pembatalan	Selesai karena dibatalkan
***Compensation* (imbalan)**			

Event *(lanjutan…)*

***Rule* (aturan)**	Dimulai sesuai aturan yang berlaku	Terjadi berdasarkan aturan yang berlaku	
***Link* (Terkait dengan)**	Dimulai dan terkait dengan	Terjadi dan terkait dengan	Selesai terkait dengan

Event *(lanjutan…)*

Terminate **(Berhenti)**			Selesai karena dihentikan
Multiple **(Jamak)**	Beberapa kejadian mulai serentak	Terjadi serentak	Beberapa kejadian Selesai Serentak

Aktivitas

Aktivitas dalam suatu proses dapat merupakan suatu kegiatan **Tunggal** *(atomic)* dapat pula merupakan suatu kumpulan kegiatan atau disebut sebagai **Subproses** *(non atomic)*

kegiatan (serangkaian kegiatan)	kegiatan yang berulang-ulang	kegiatan beragam yang berlangsung serentak

Aktivitas *(lanjutan…)*

Sub-Process (Collapsed)	Loop	
kegiatan yang terdiri dari proses-proses atau disebut sub-proses (tampilan ringkas yang ditunjukkan dengan simbol +)	Sekumpulan kegiatan yang berulang-ulang (tampilan ringkas yang ditunjukkan dengan simbol +)	Sekumpulan kegiatan yang berulang-ulang (tampilan ringkas yang ditunjukkan dengan simbol +)

Aktivitas *(lanjutan…)*

Compensation	Compensation	
kegiatan yang memberikan	(tampilan ringkas yang ditunjukkan dengan simbol *)	Ad hoc

Aktivitas *(lanjutan…)*

Activity Markers

Markers indicate execution behavior of activities:

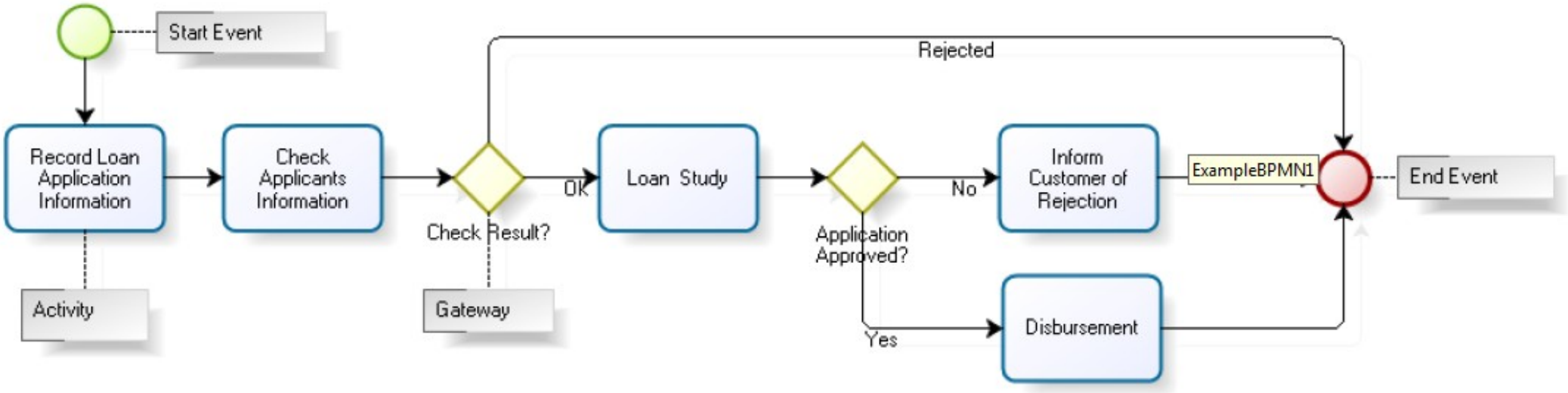
- Sub-Process Marker
- Loop Marker
- Parallel MI Marker
- Sequential MI Marker
- Ad Hoc Marker
- Compensation Marker

Task Types

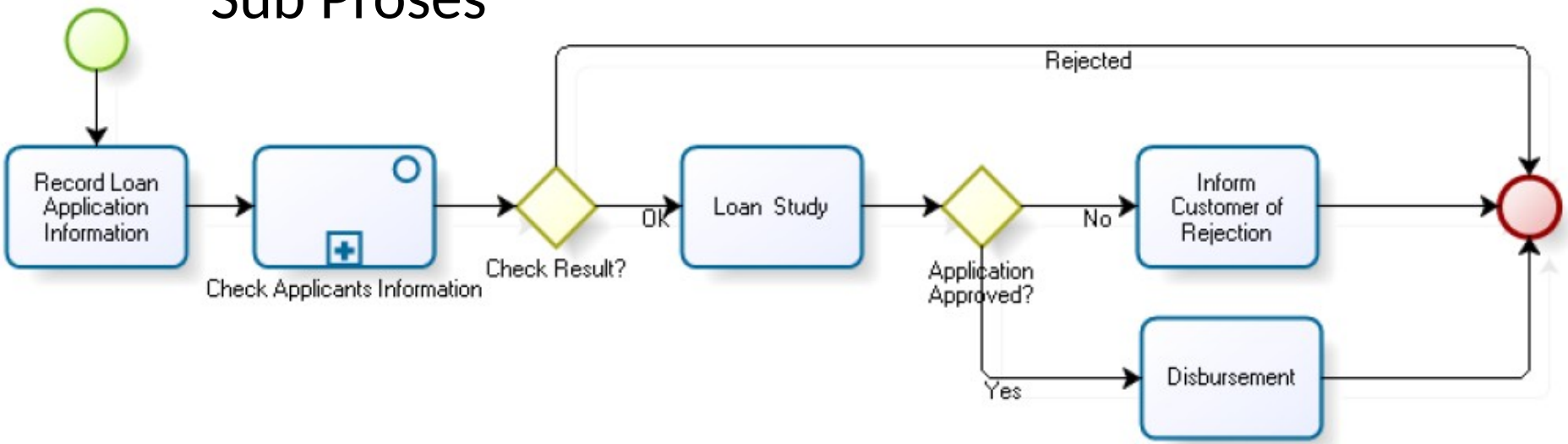
Types specify the nature of the action to be performed:

- Send Task
- Receive Task
- User Task
- Manual Task
- Business Rule Task
- Service Task
- Script Task

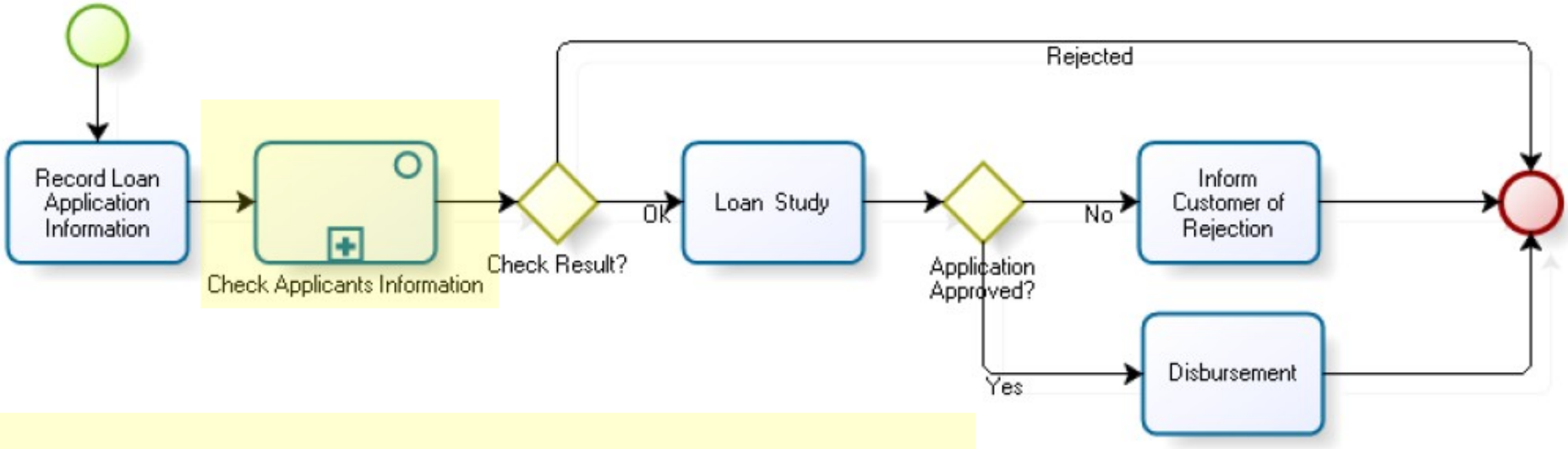
Aktivitas *(lanjutan…)*

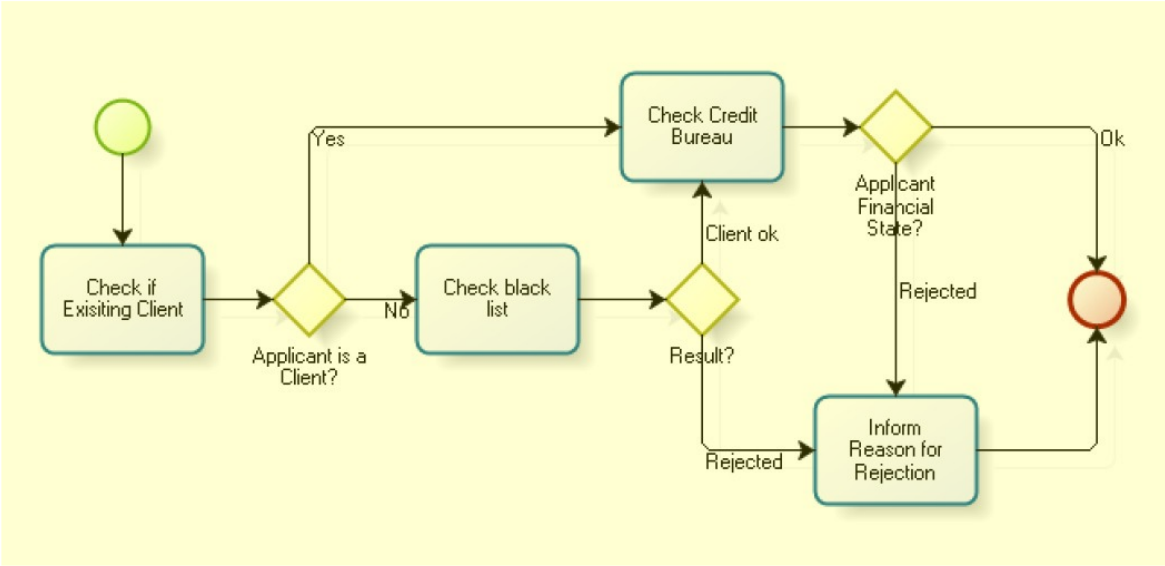


Sub Proses



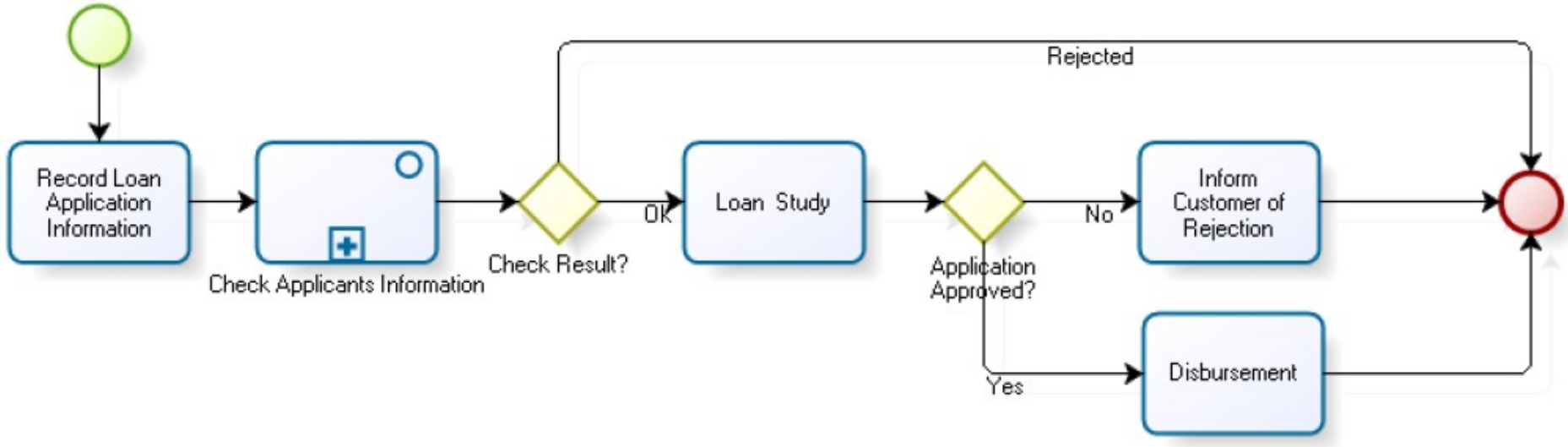
Aktivitas *(lanjutan…)*

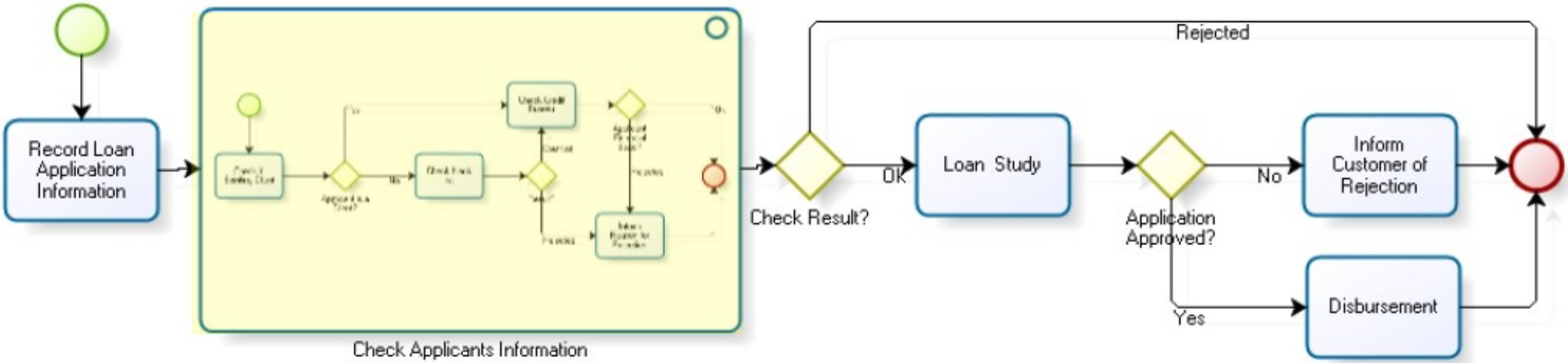


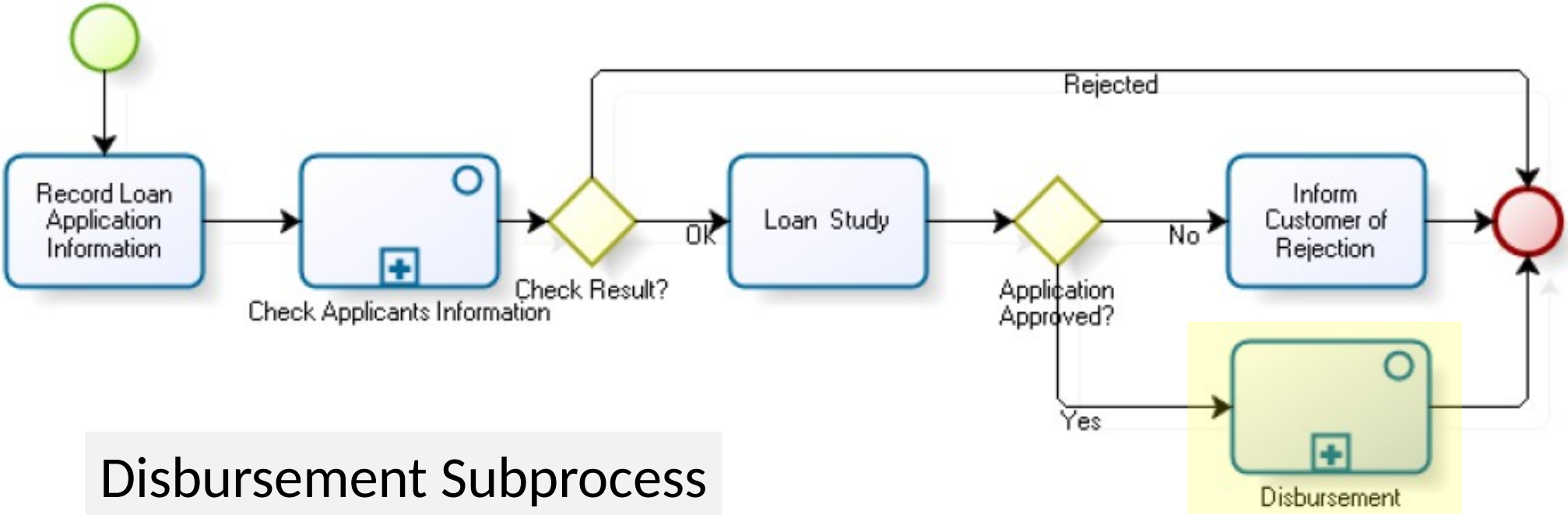


Check Applicants Subprocess

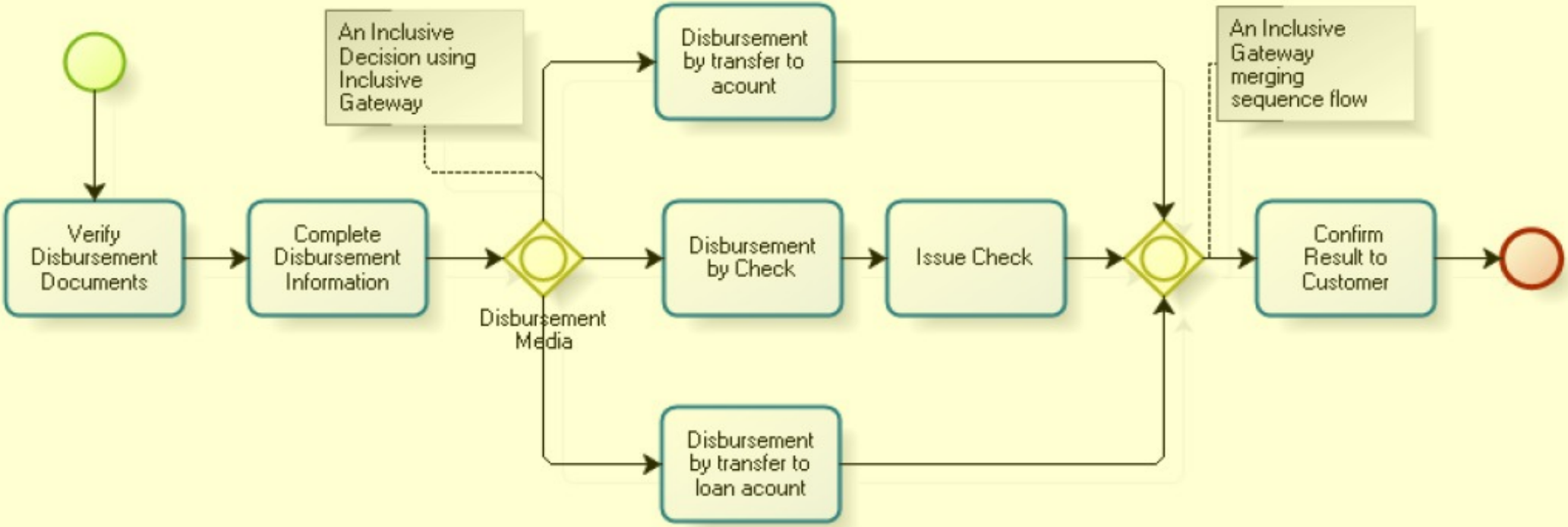
Aktivitas *(lanjutan…)*

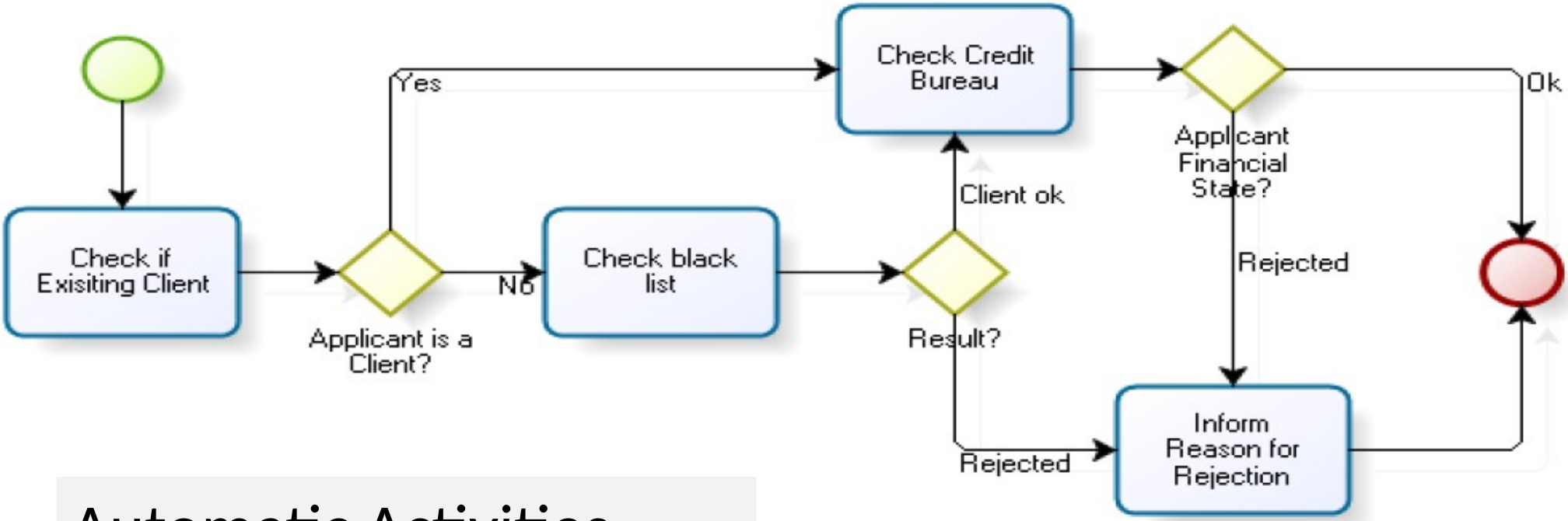




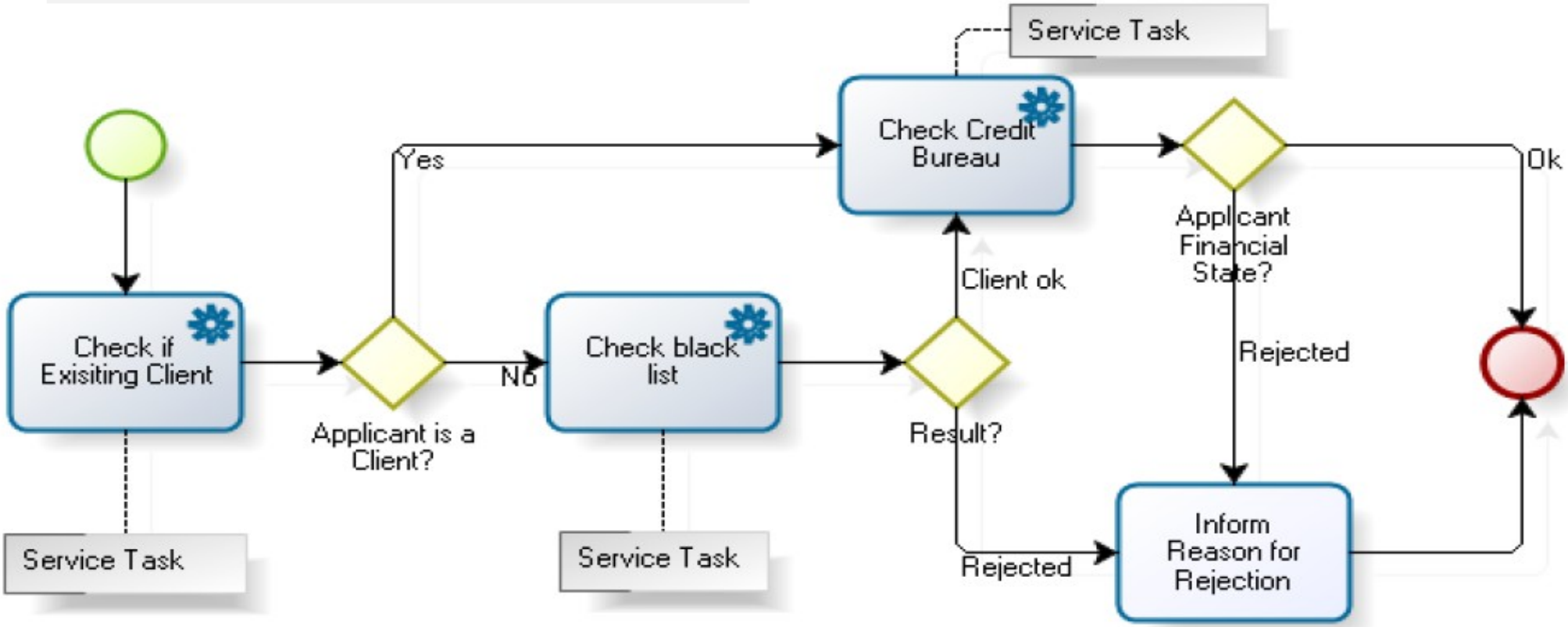


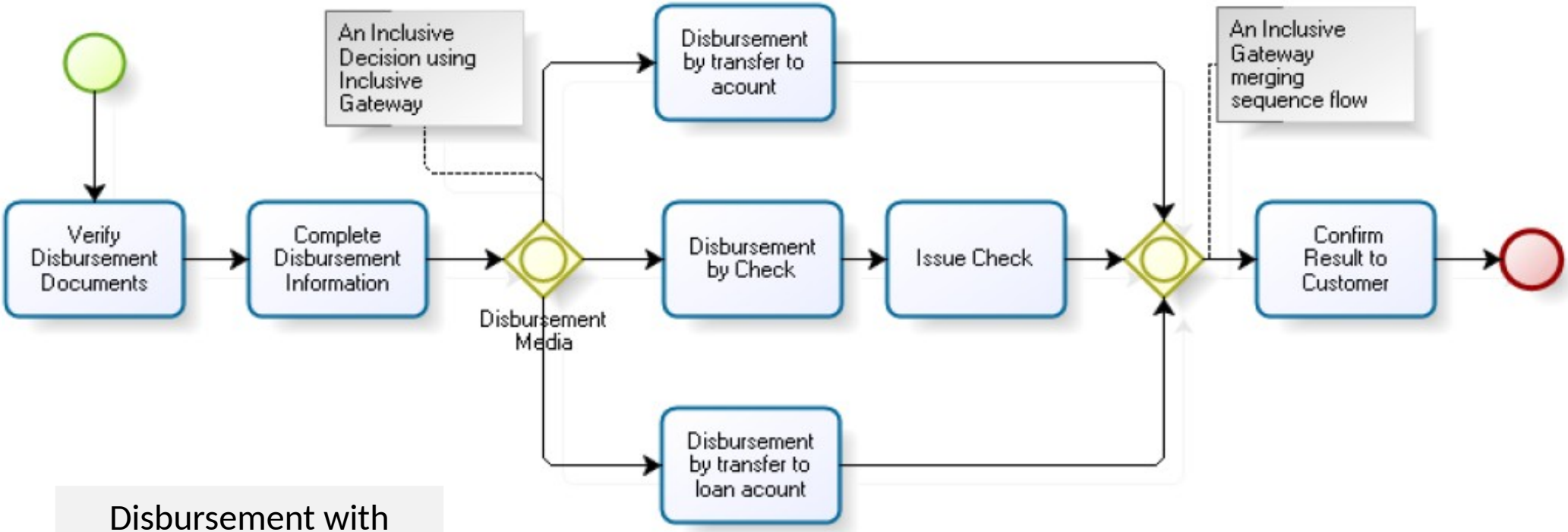
Disbursement Subprocess



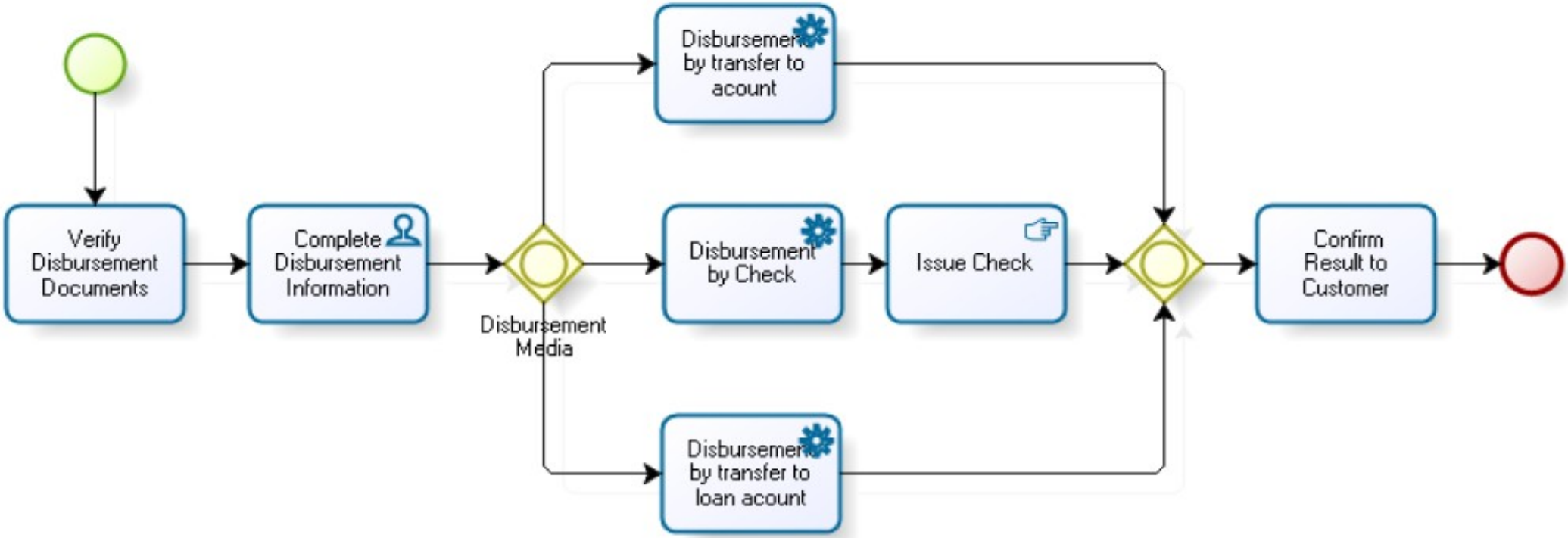


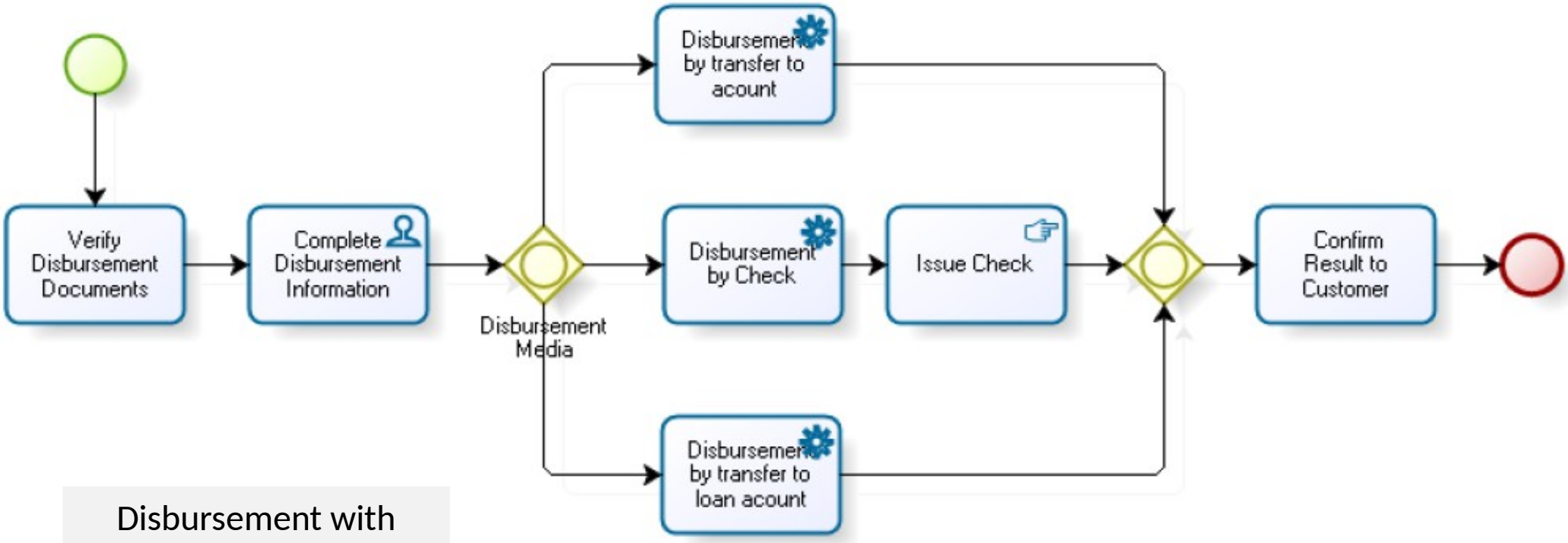
Automatic Activities



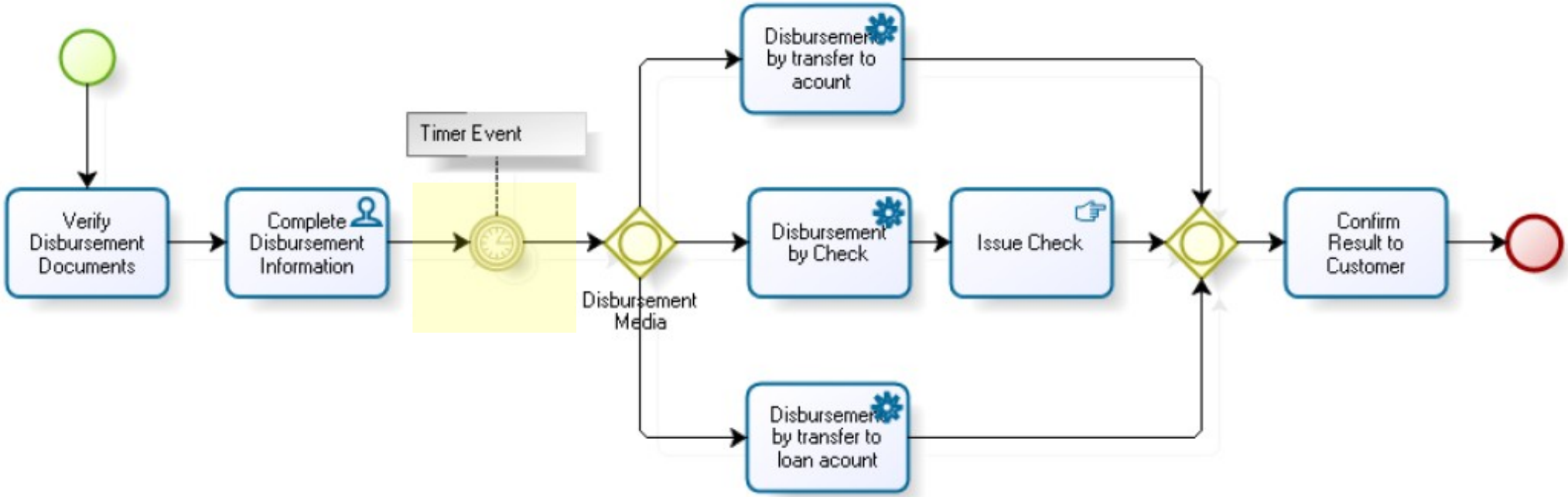


Disbursement with Some Type of Tasks





Disbursement with Timer



Notasi Penghubung

1. **Sequence Flow**
   Menunjukkan kegiatan yang dituju semata-mata merupakan kelanjutan kegiatan sebelumnya.

2. **Message Flow**
   Menunjukkan adanya aliran pesan dimana proses yang dituju bukan kelanjutan proses sebelumnya.

3. **Associate Flow**
   Menunjukan bentuk hubungan antara dua proses atau kegiatan.

Notasi Penghubung *(lanjutan…)*

Notasi Gateway

1. **Exclusive Decision**
   Pengambilan keputusan karena tergantung dari kondisi atau masukan sebelumnya.
2. **Event**
   Pengambilan keputusan bergantung dari adanya event (misalnya harus ada surat keputusan).
3. **Paralel**
   Pengambilan keputusan hanya dilakukan bila seluruh kegiatan sebelumnya sudah diterima lengkap.

Notasi Gateway *(lanjutan…)*

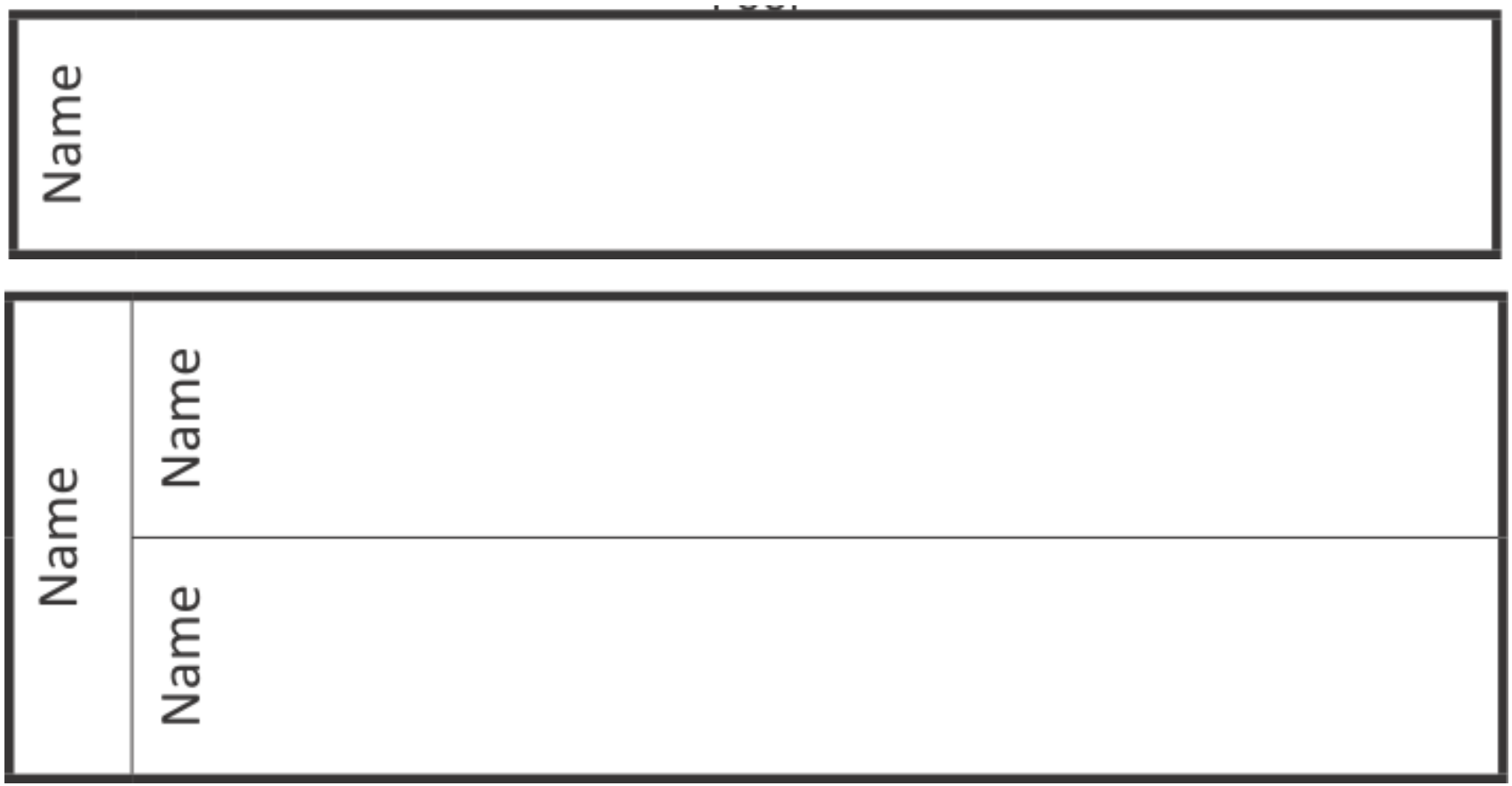
(Merge/(xor))	*(Merge/(xor))*	*(Event based)*
Keputusan diambil berdasarkan data	Keputusan diambil oleh	Keputusan diambil berdasarkan kejadian
Keputusan yang bersifat inklusif *(Merge/(or))*	Keputusan yang bersifat kompleks *(Merge)*	Penanda bahwa aktivitas harus berlangsung sacara paralel *(Joint/(And))*

Notasi Pool

Bagian inti merupakan kerangka yang menunjukkan suatu proses atau kegiatan dikerjakan oleh siapa. Satu pool untuk merepresen- tasikan satu unit kerja, fungsi atau jabatan tertentu.

1. **Swimlane**
   suatu proses dikerjakan oleh suatu unit kerja, fungsi atau jabatan tertentu.
2. **Lane**
   (gabungan beberapa pool) menunjukkan adanya beberapa proses pada suatu unit kerja yang masing-masing dikerjakan oleh satu jabatan unit kerja tersebut.

Notasi Pool

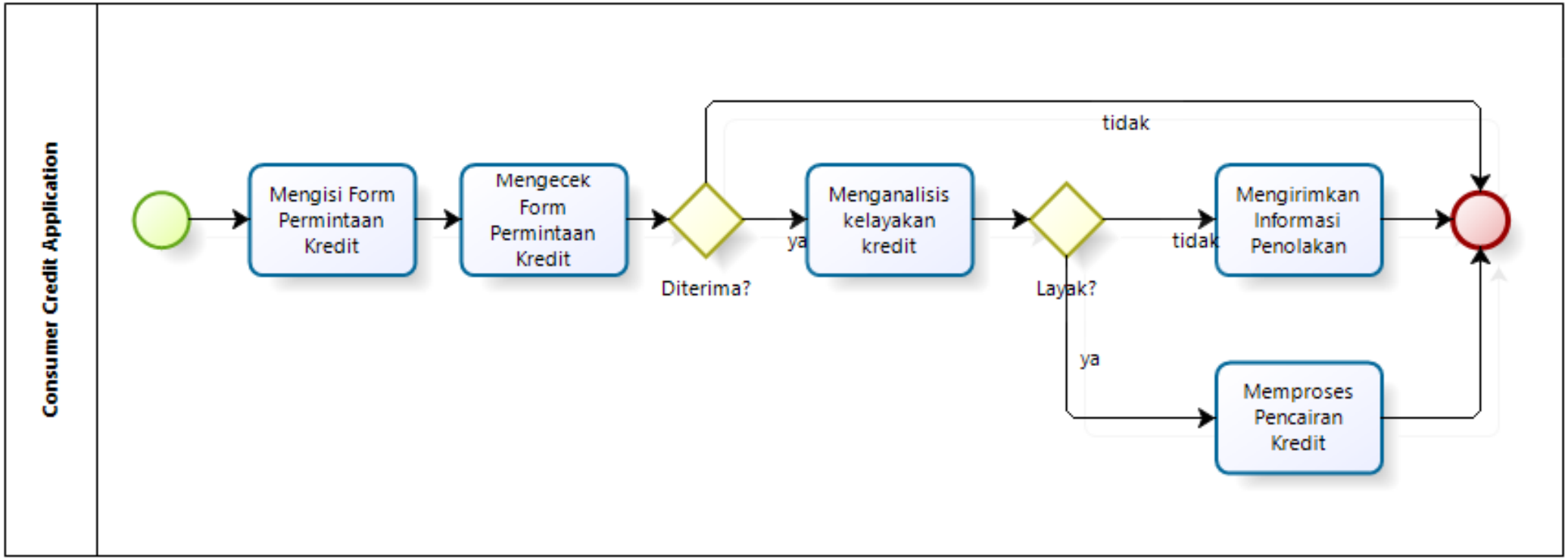


Pengajuan Kredit

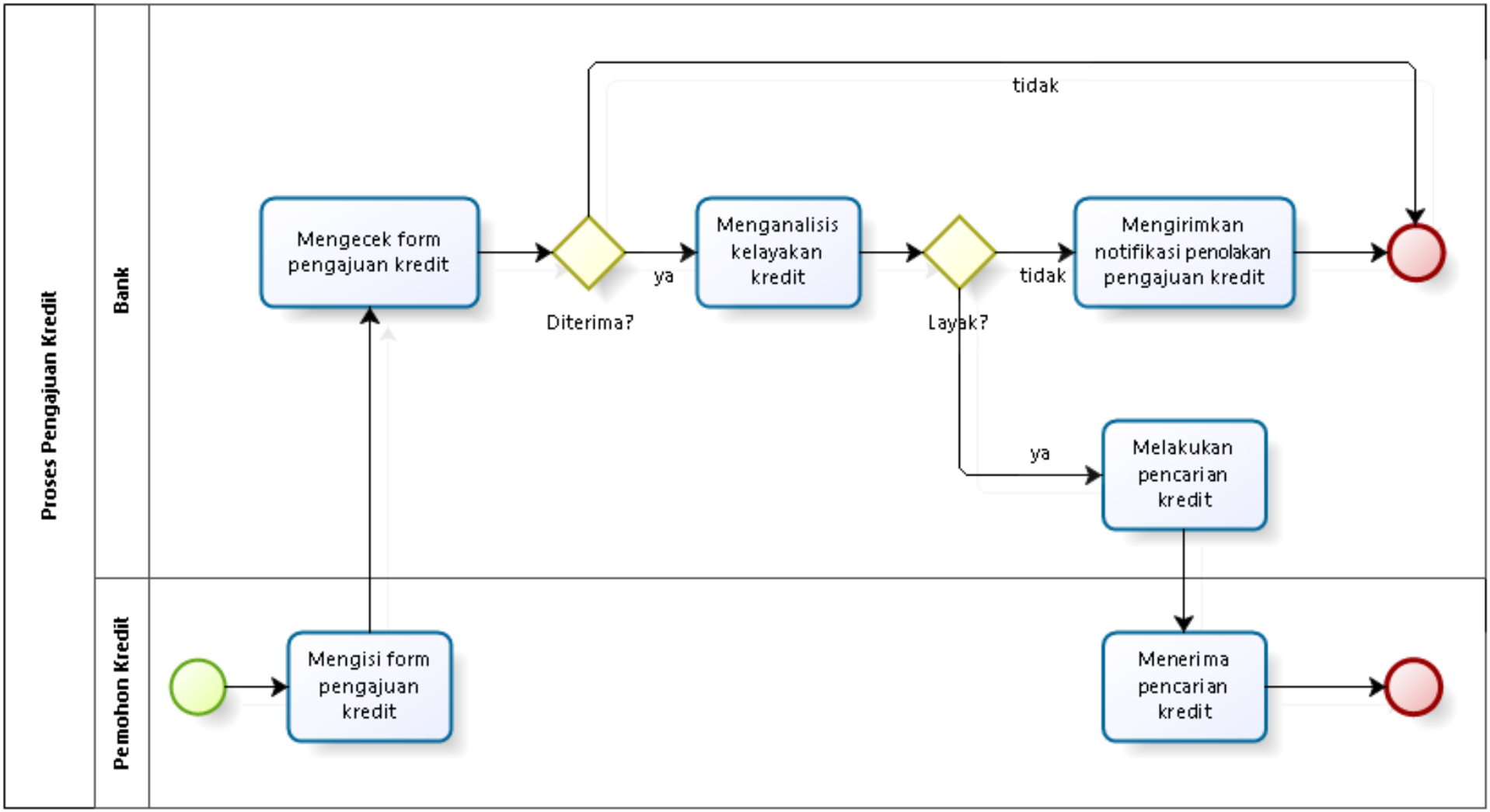
Contoh :

- Proses permohonan kredit dimulai dengan **pencatatan aplikasi** di mana klien menyatakan minat untuk memperoleh kredit
- Tahap ini termasuk **penyampaian aplikasi**, dan **dokumen** yang diperlukan untuk **verifikasi**
- Dilanjutkan dengan **analisis kelayakan** terhadap **aplikasi kredit** dan akhirnya **keputusan** untuk ***menerima*** atau ***menolak*** permohonan kredit.

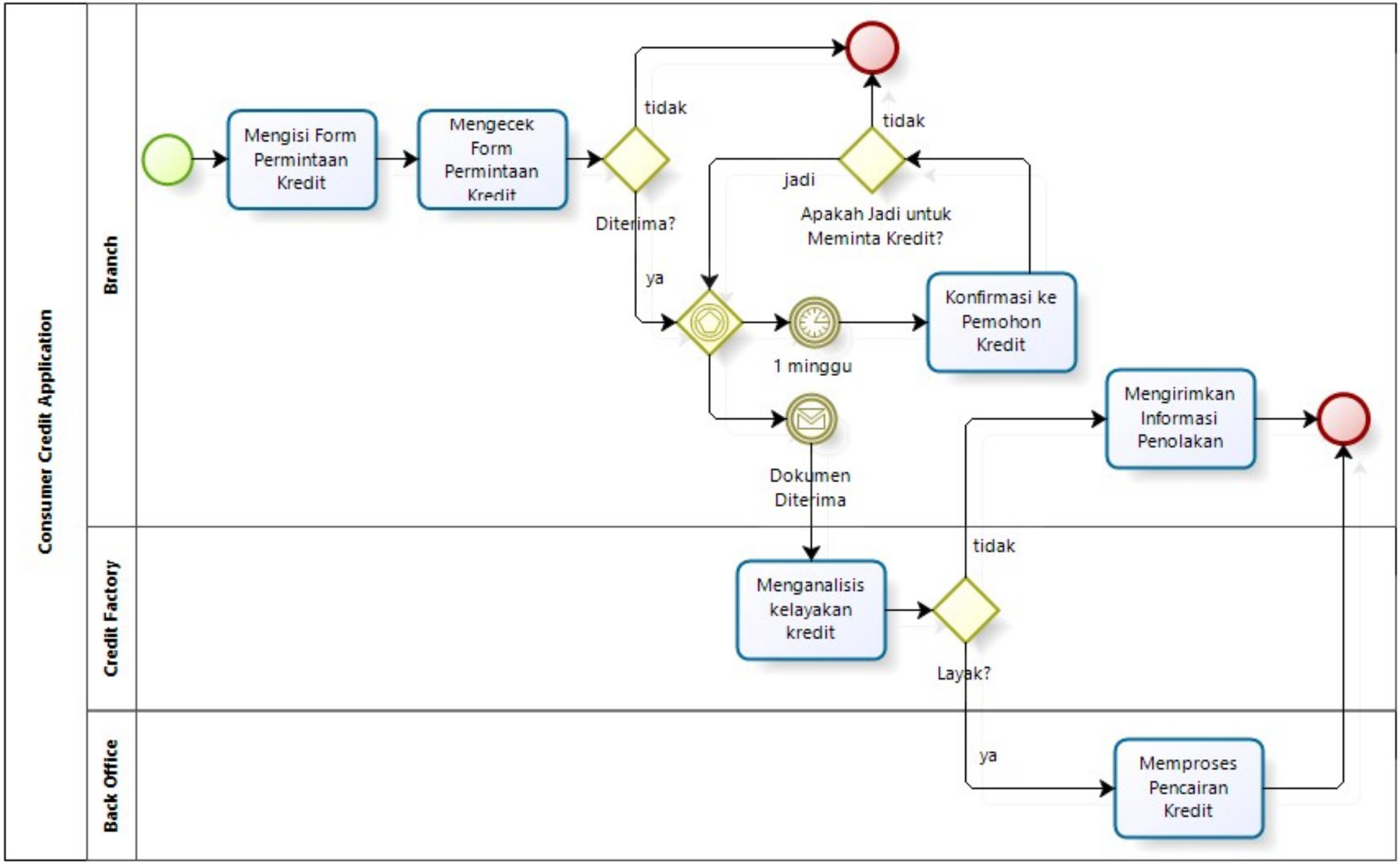
Pengajuan Kredit *(lanjutan…)*

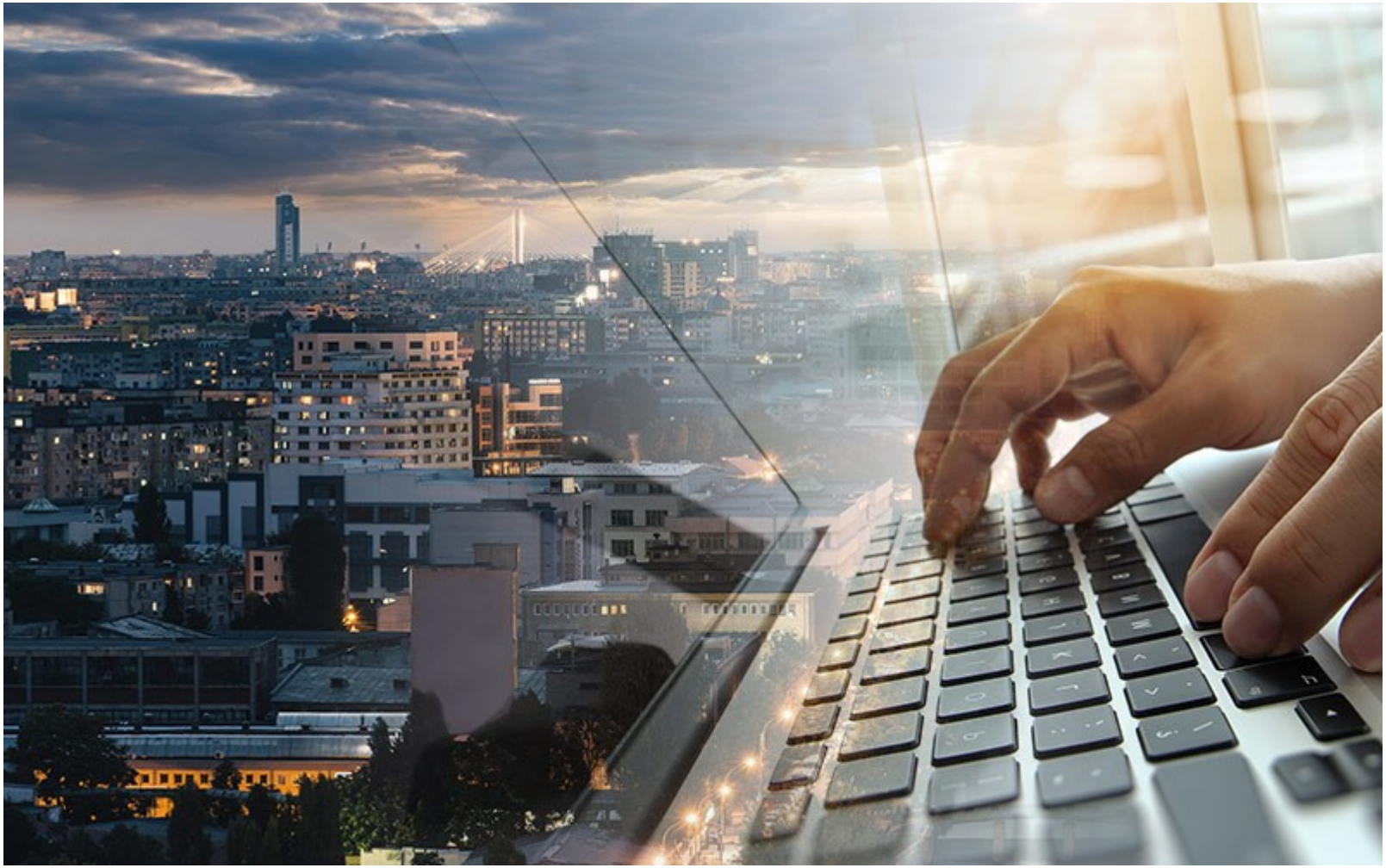


Pengajuan Kredit *(lanjutan…)*



Pengajuan Kredit *(lanjutan…)*

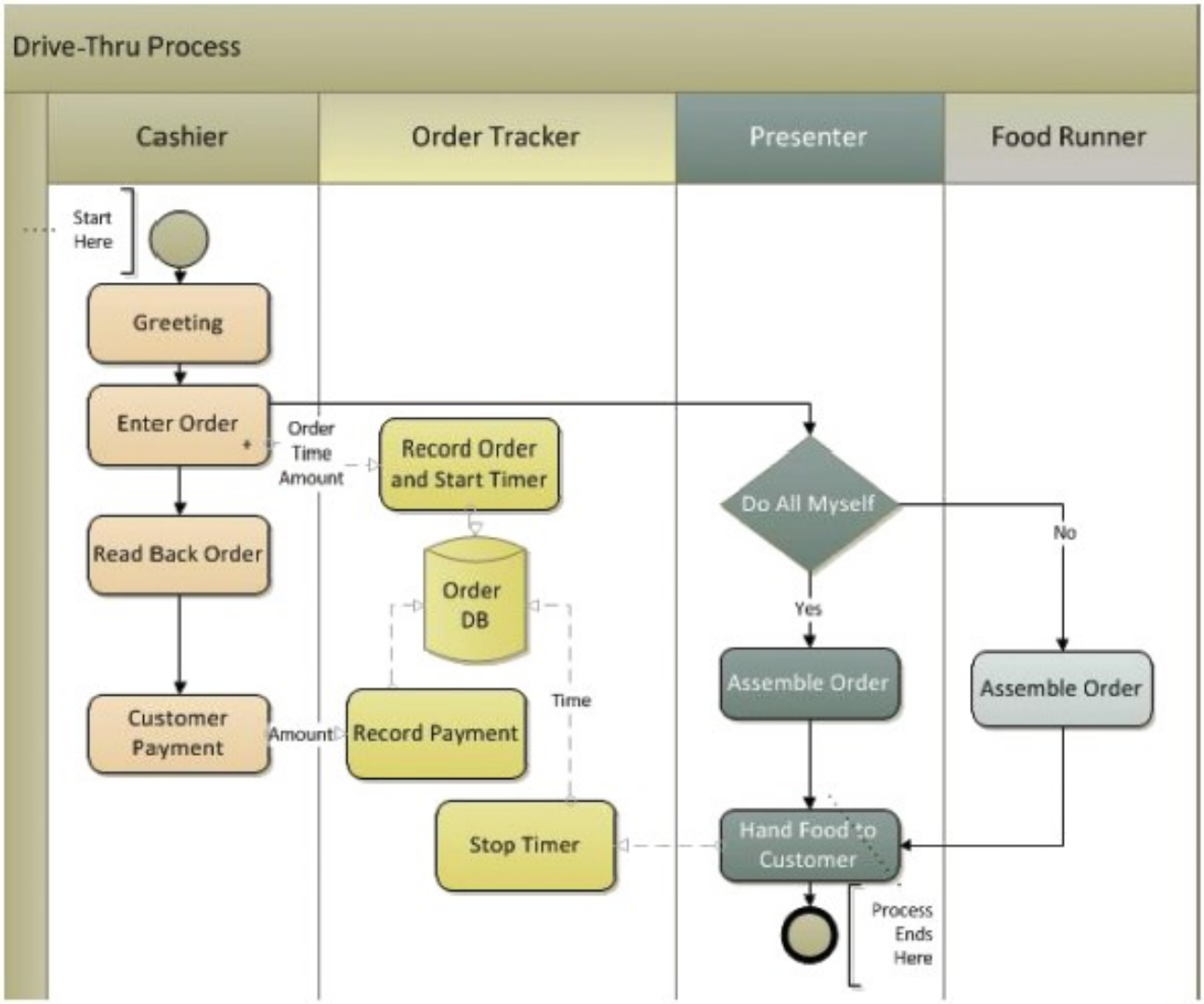




BPMN

BPMN: standard modeling (diagraming) method

FIGURE 2-1
Fast Food Restaurant Drive-Thru BPMN Diagram



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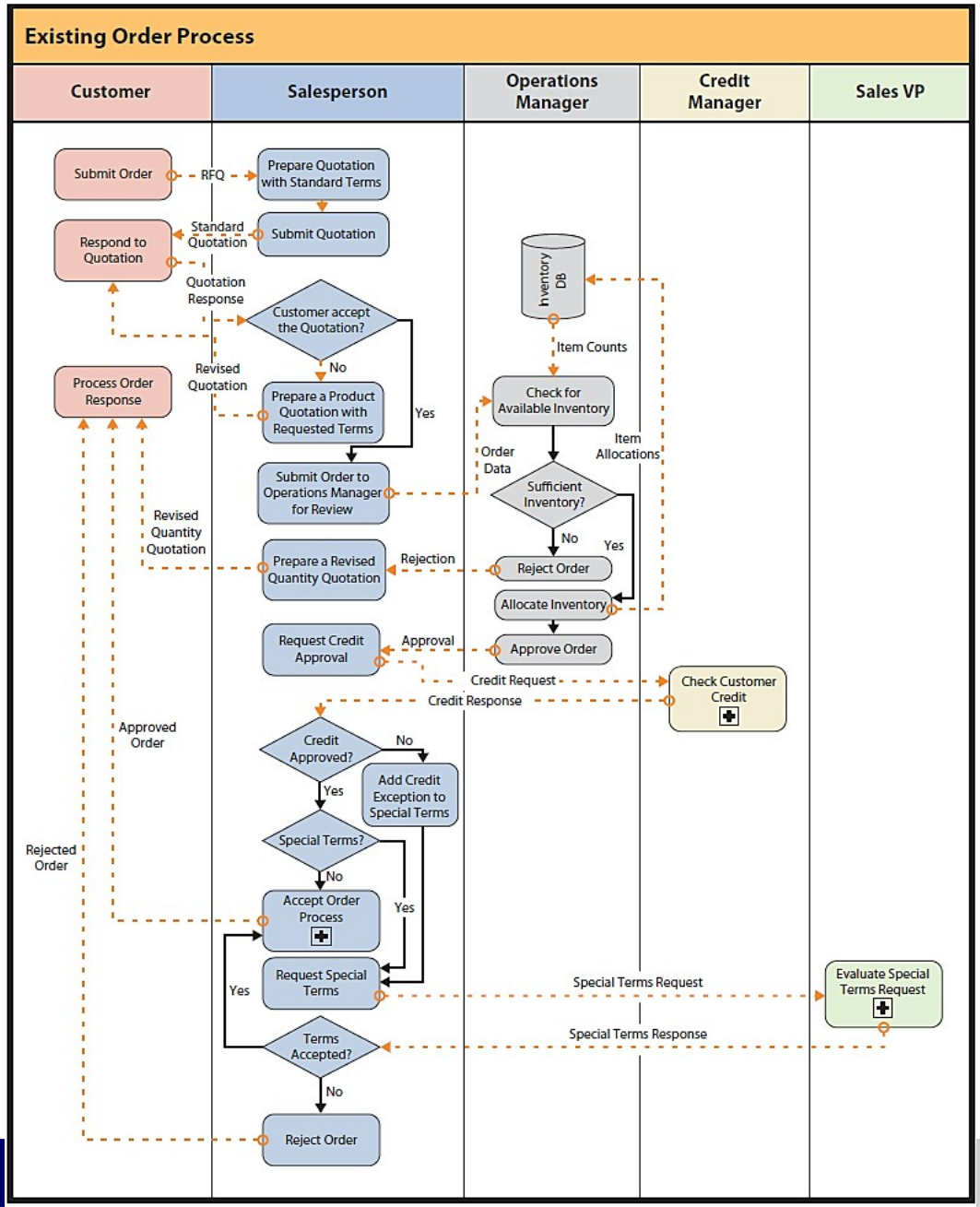
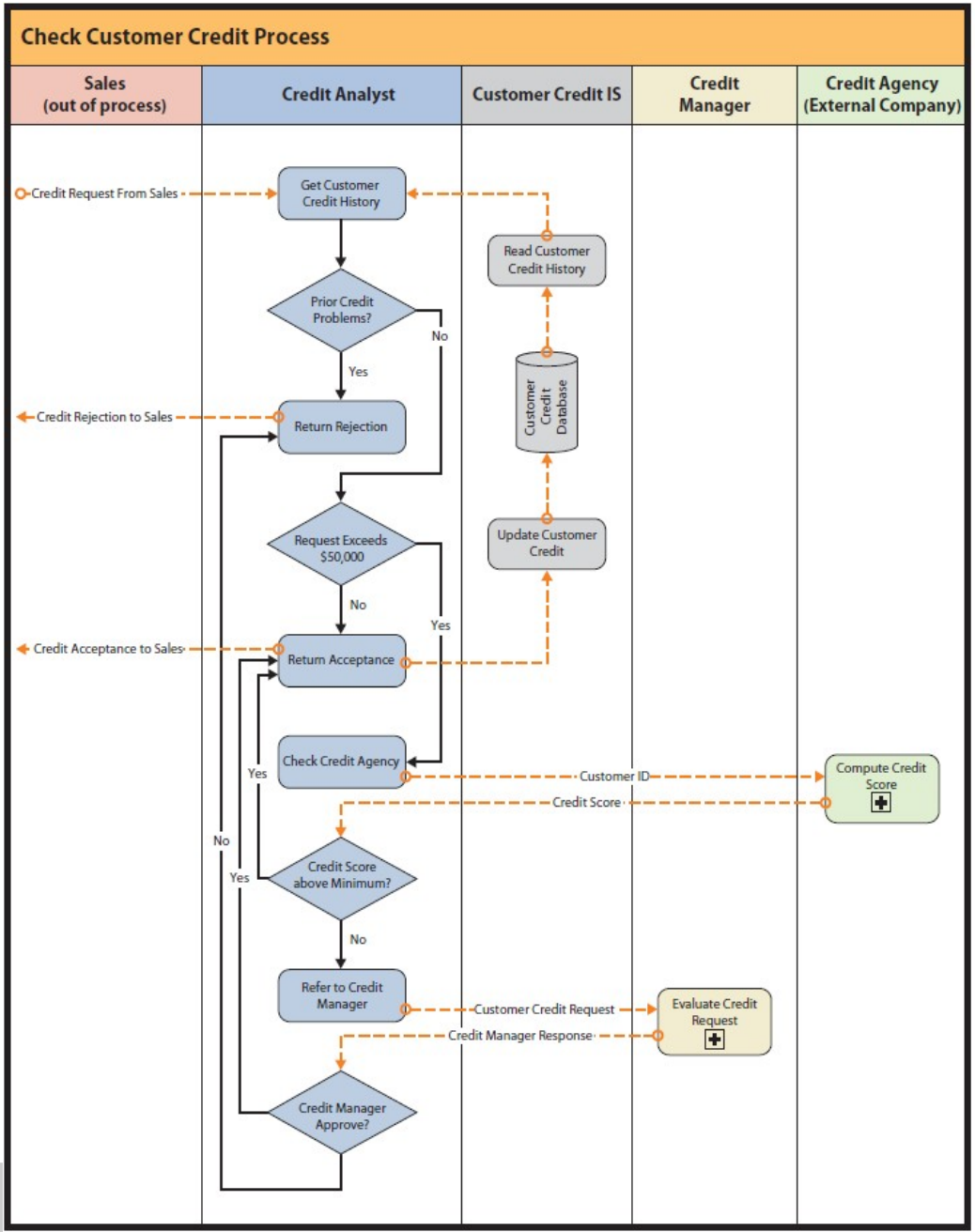
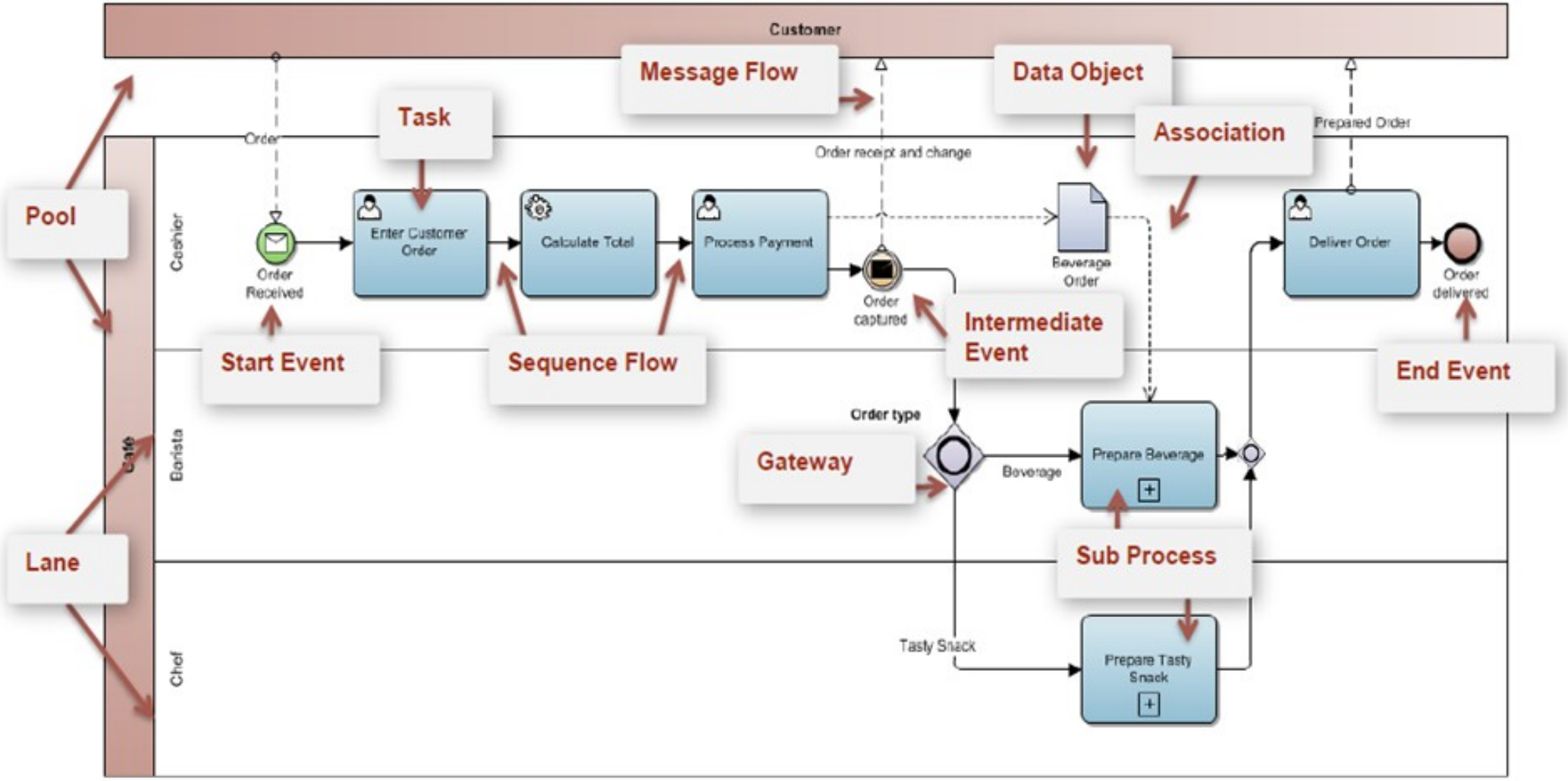
As-Is
Business Order Process: Existing Ordering Process



Ought-to-be
Business Order Process: Improved Ordering Process

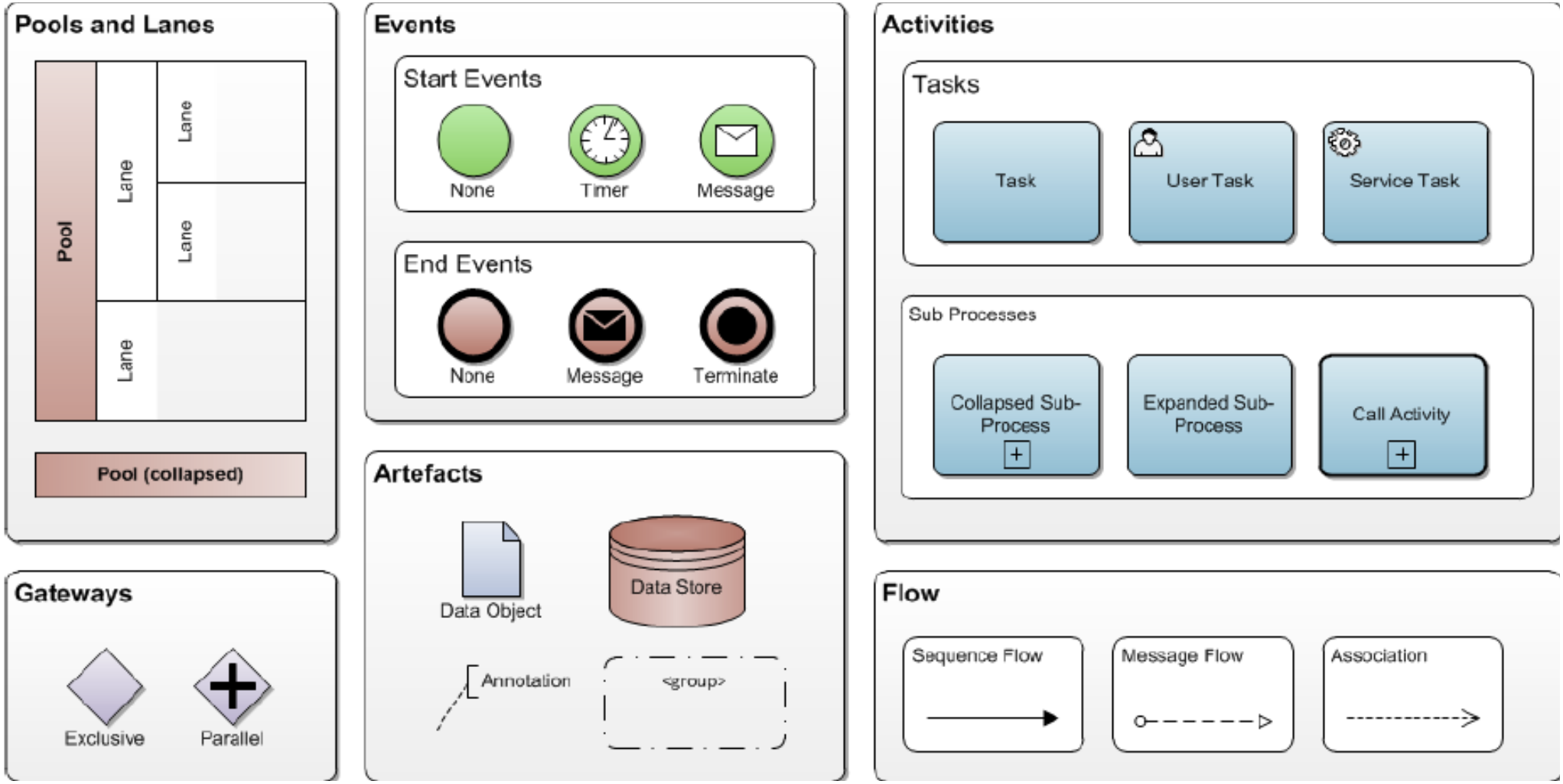


Core BPMN elements



For a very thorough tutorial, see http://camunda.org/bpmn/reference/.

Some common BPMN symbols



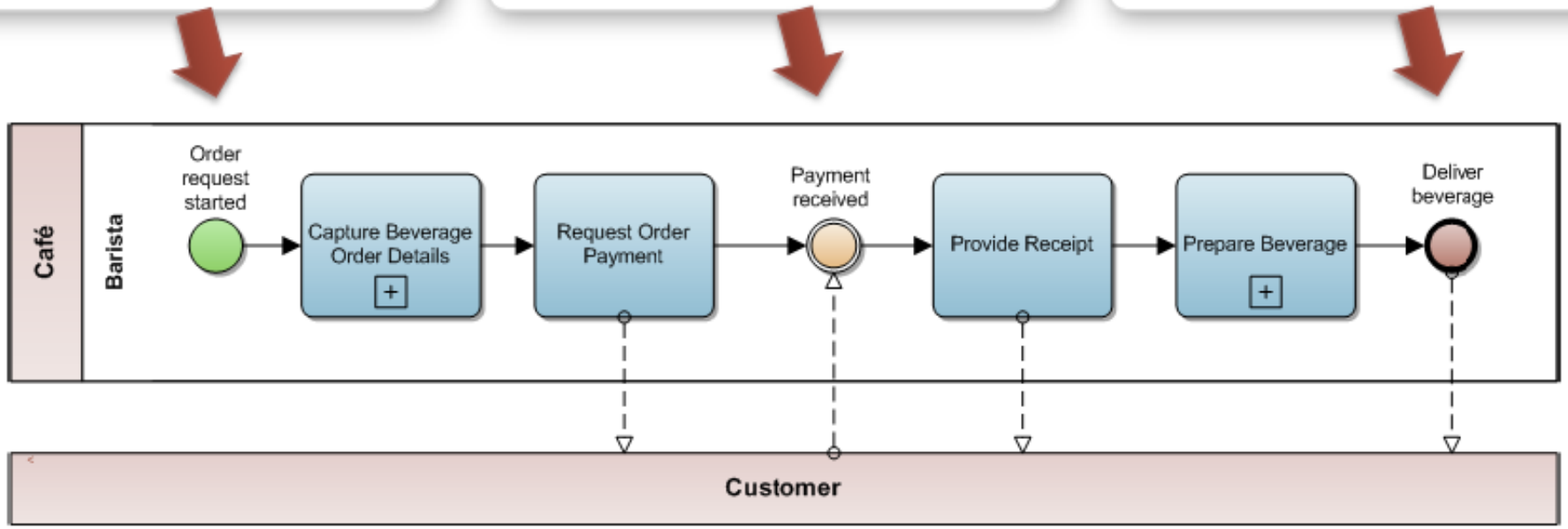
BPMN events

An event is an indicator that something has happened within a process.

Start Event
A process commences because something has happened, such as a message received or a date is reached.

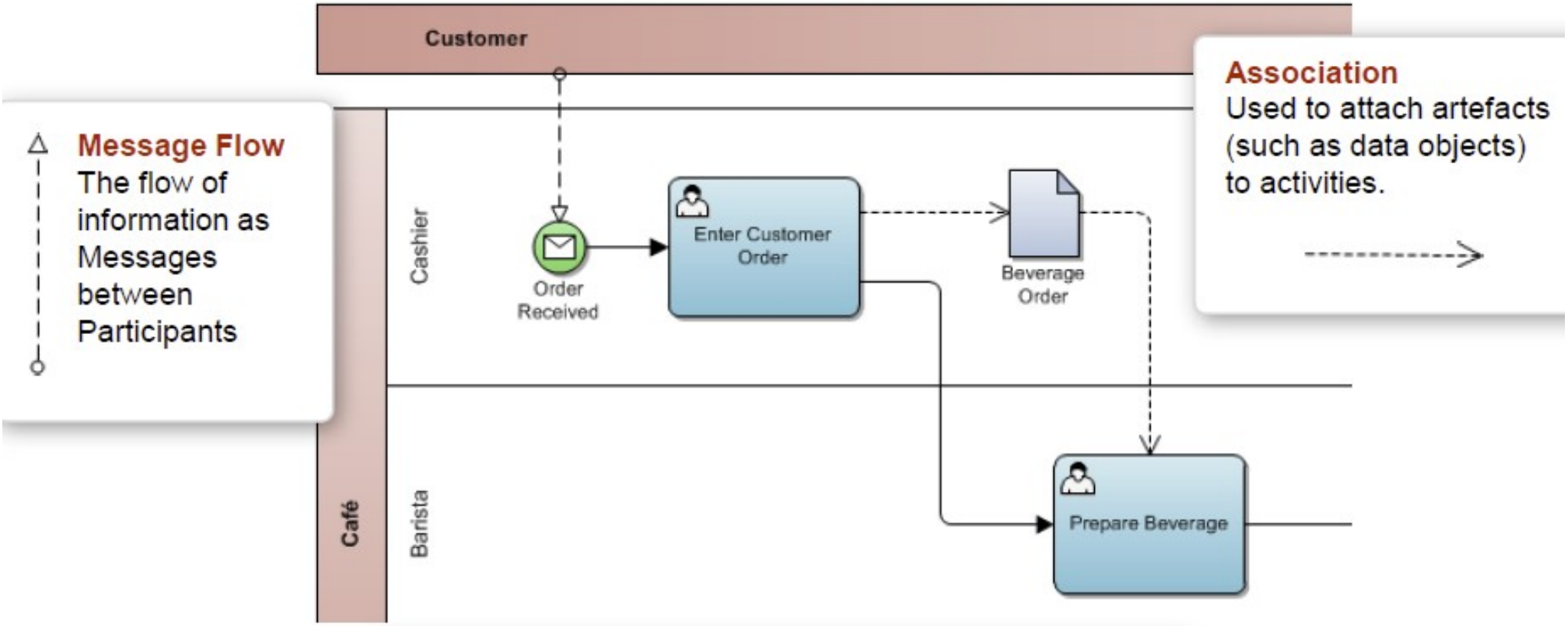
Intermediate Events
Intermediate events happen within the flow of the process (between the start and end events).

End Event
A process finishes when an end is reached. Because a process may have several outcomes, there may be multiple end events.



BPMN flows

Sequence Flow, Message Flow and Associations



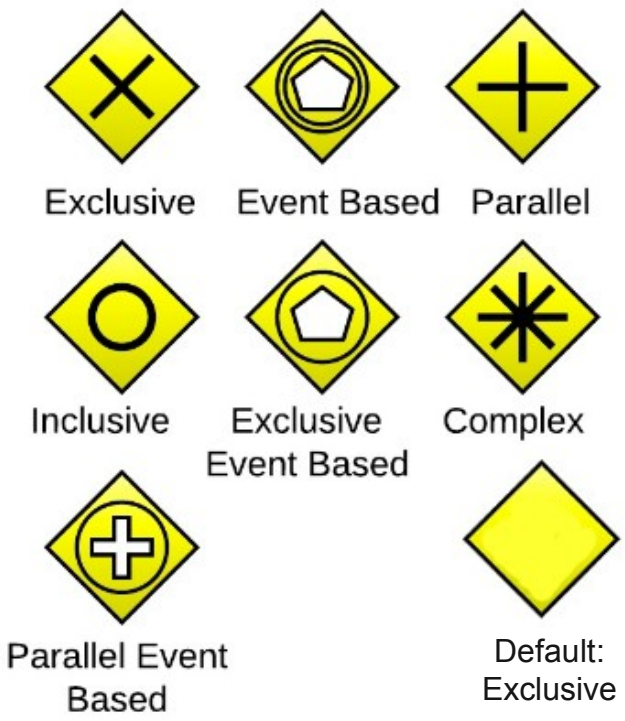
Message Flow
The flow of information as Messages between Participants

Association
Used to attach artefacts (such as data objects) to activities.

Sequence Flow
The sequential flow of the process between events that occur, activities performed by the lanes and decisions that are made (gateways).

BPMN gateways

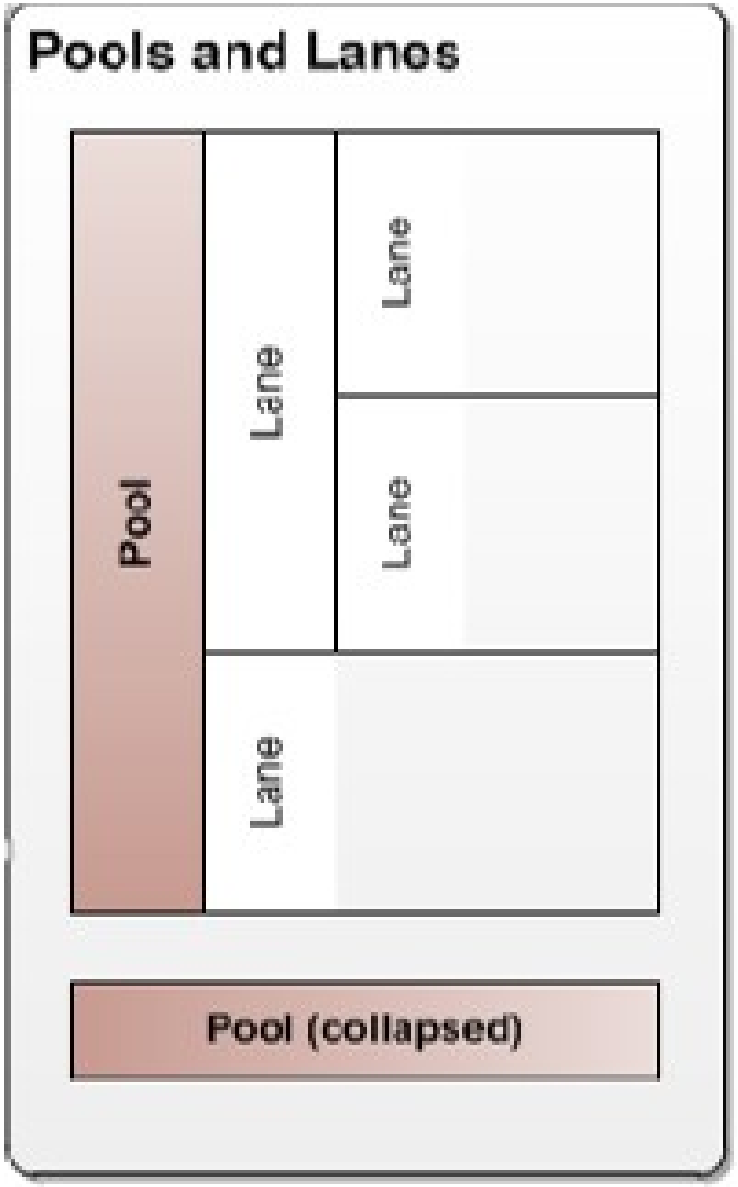
- Gateways are decision points where the sequence of activities splits up o recombines
- Many types exist, but the most comr ones are:
  - ×(Exclusive): only one choice can be selected
    - This is the default, if no shape is shown
  - **O** (Inclusive): one or more or even all choices might be chosen
  - **+** (Parallel): all choices are carried out in parallel (at the same time)



Shapes adapted from Wikipedia

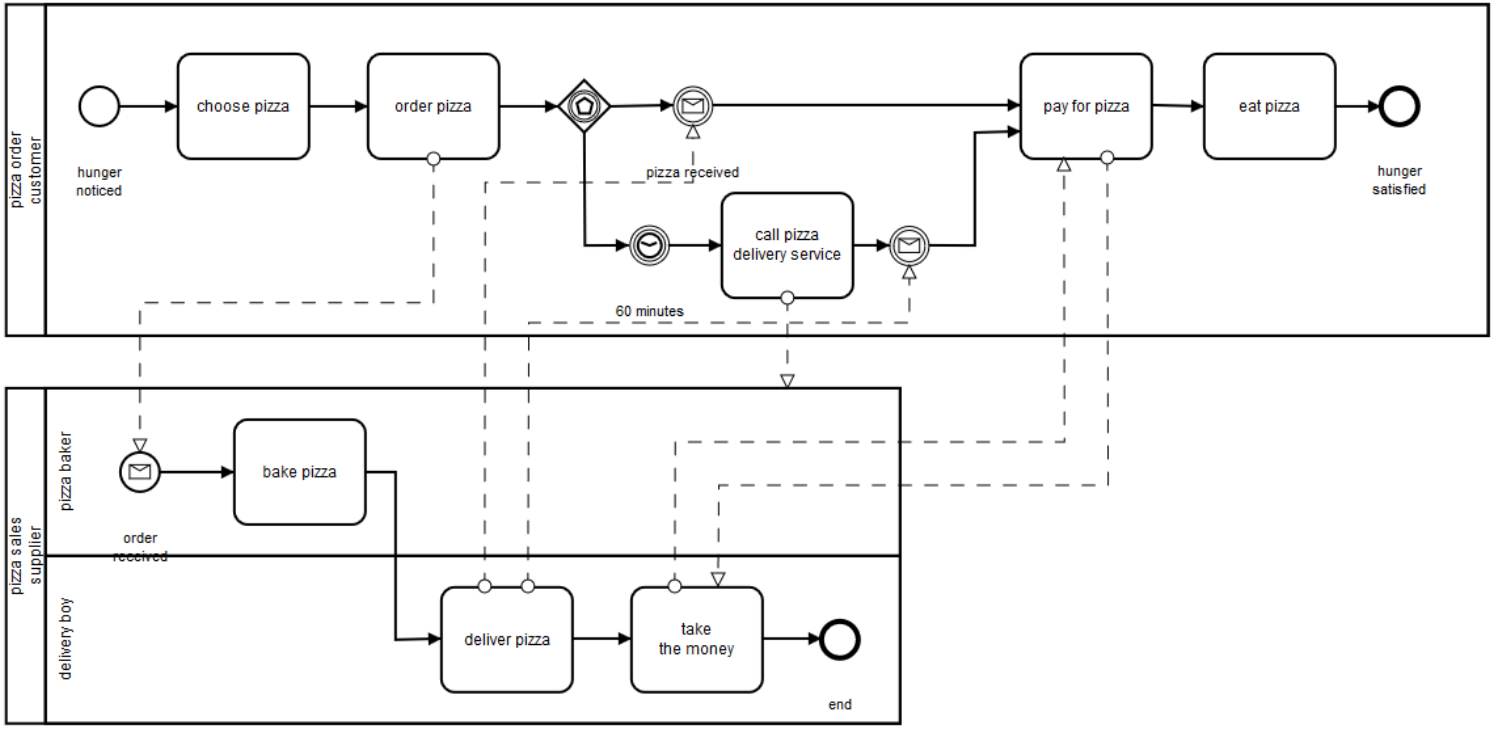
Modeling with multiple pools

- A **pool** represents **an independent organization**
- A **lane** within a pool is an **individual actor or role** (either a person or an information system) within an organization

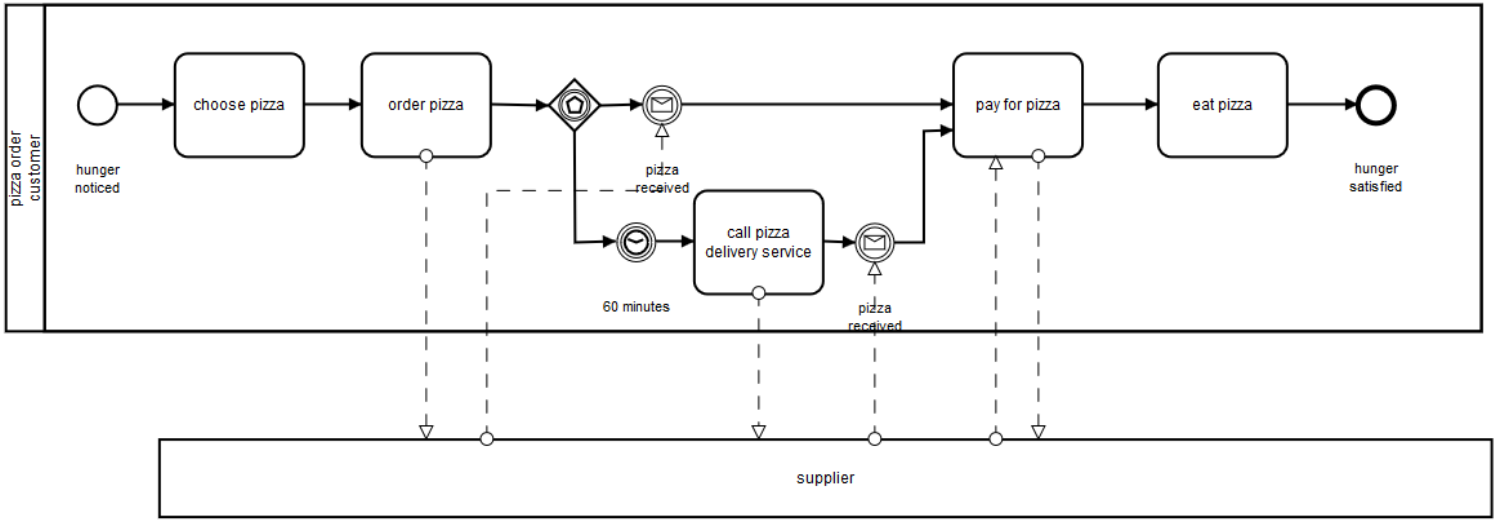


Modeling with multiple pools

- Each pool gets **its own complete process**
- Every white-box (non-collapsed) pool must have **its own start and end events**
- **Sequence flows only occur within pools**, never from one pool to another
- Only message flows can be used from one pool to another



Source: Camunda



Drawing BPMN diagrams

- Microsoft Visio (Windows only)
  - 60-day free trial
  - Available in SCBTM lab (MB 12.314)
  - Video tutorial for COMM 226
- Free online diagramming tools (any operating system)
  - Lucidchart
  - Gliffy

An example of BPMN in Visio

sample_visio_native_bpmn.vdx - Microsoft Visio (Trial)

File | Home | Insert | Design | Data | Process | Review | View | Cross-Functional Flowchart

Shapes
More Shapes
Quick Shapes
BPMN Basic Shapes (Metric)
BPMN Events (Metric)
BPMN Activities (Metric)

BPMN Basic Shapes (Metric)
Task, Gateway, Intermediate Event, End Event

BPMN Events (Metric)
Intermediate Event, Intermediate (Throwing..., End Event

BPMN Activities (Metric)
Task, Collapsed Sub-Process, Expanded Sub-Process, Multi-Insta... Loop Colla...

BPMN Gateways (Metric)
Exclusive Data Gateway, Exclusive Data Gatew...

BPMN Connecting Objects (Metric)
Sequence Flow, Message Flow, Association

Pool 1
Lane 1
Lane 2
Group with many objects inside
My process start
Task 1
Exclusive gateway
Option A
Task 2
Task 3 (looping)
This is my annotation
Option B
Task 4 (Multi Instance)
Sub process 1 (collapsed)
This is my process end

Pool 2
Start
Ad-hoc Sub-process
Intermediate event
Transaction
End

My BPMN diagram

Page 1 of 1 | English (U.S.) | 106% | Pokaż pulpit

Building project permit process

Figure 5-21: As-is

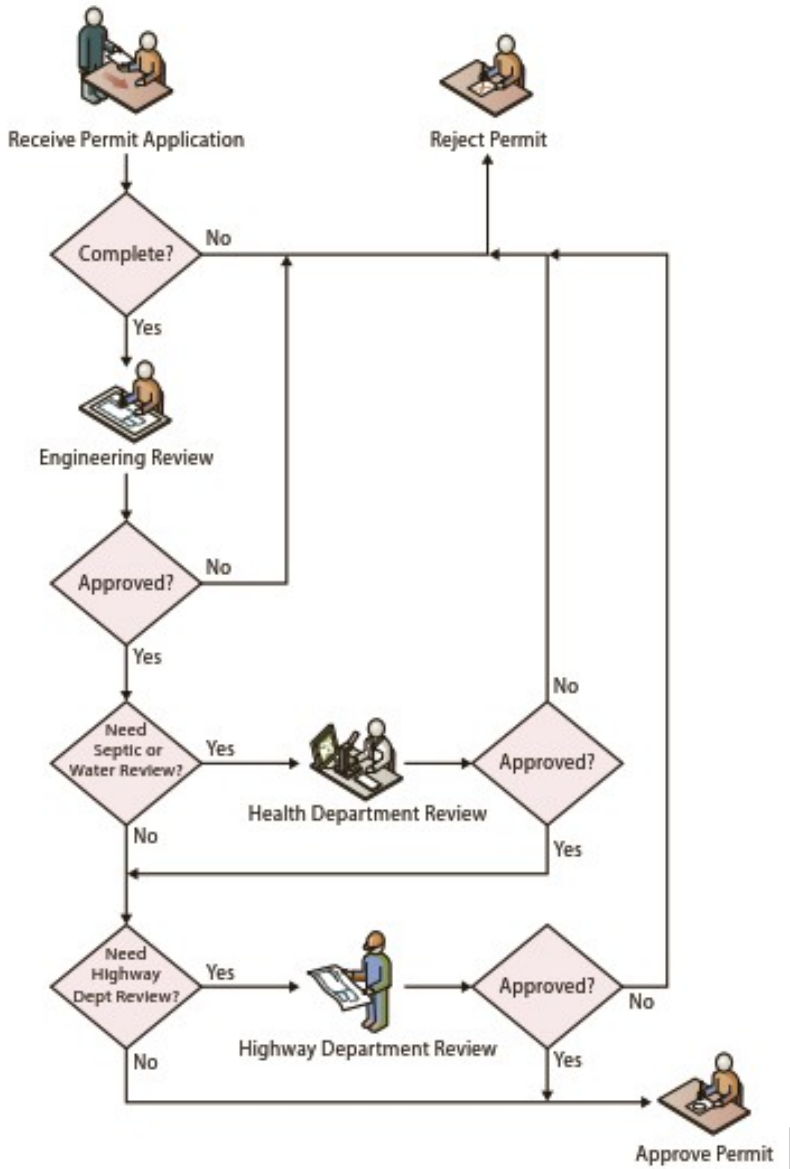
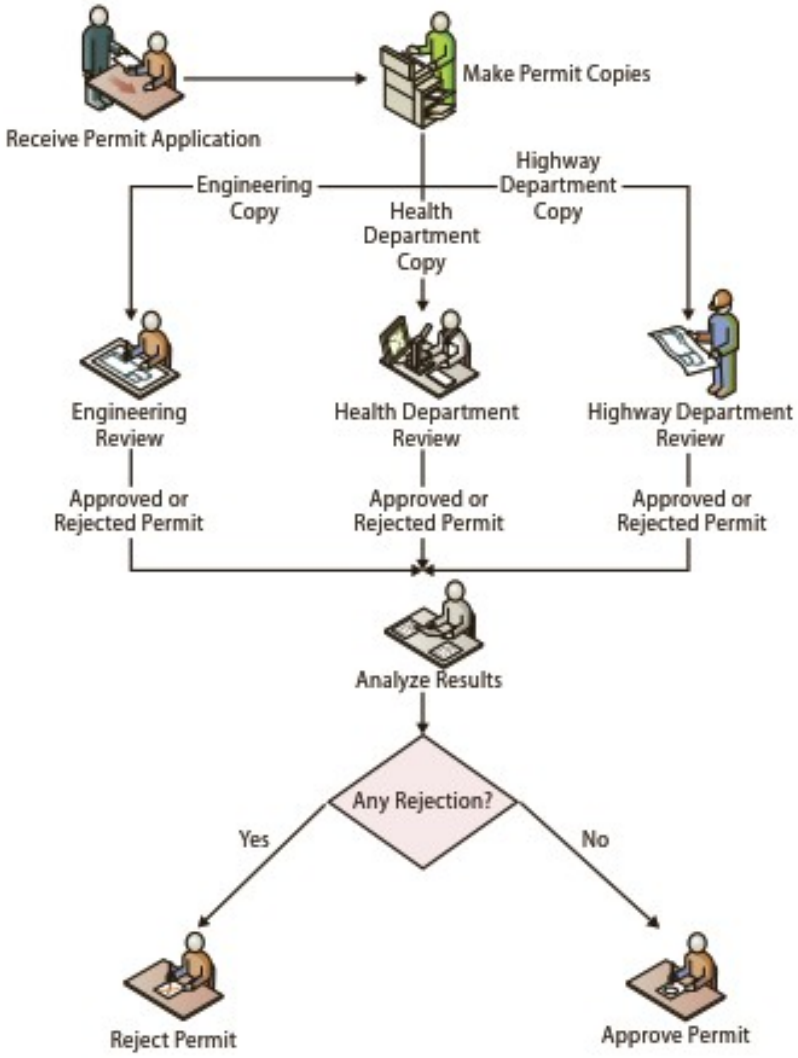
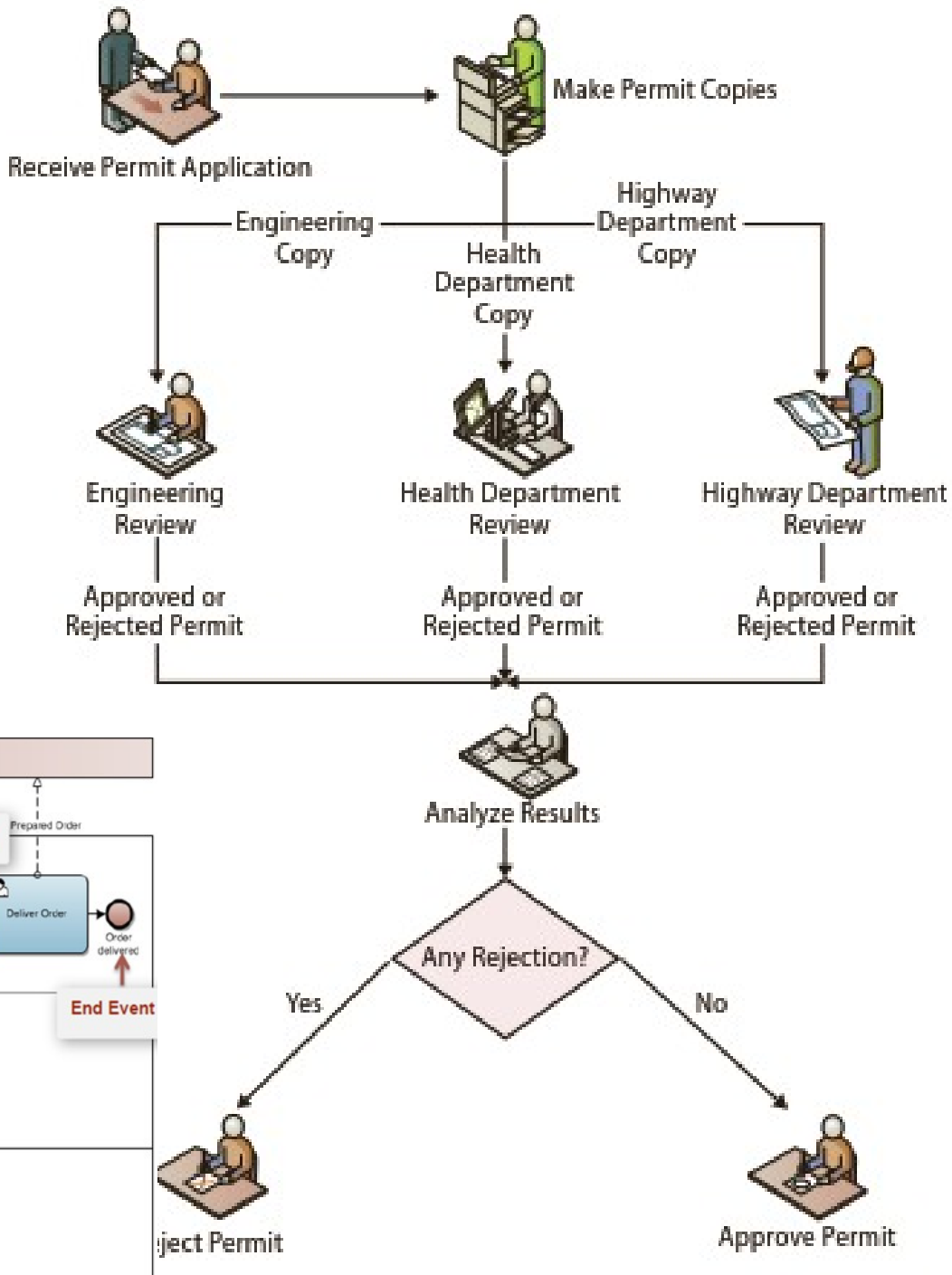


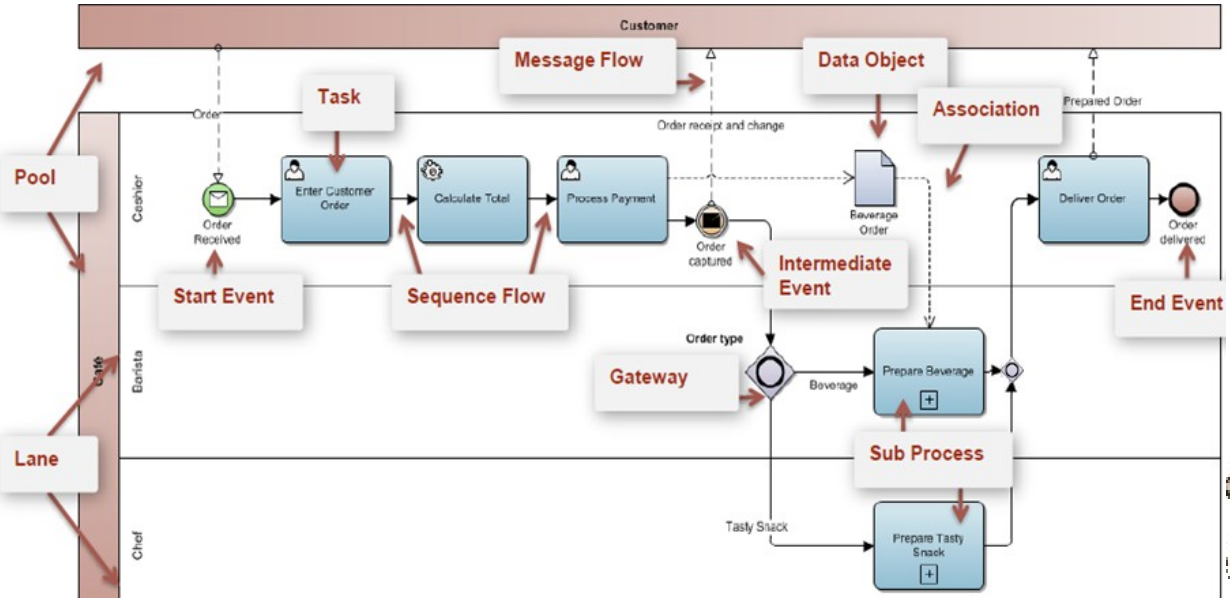
Figure 5-22: Ought-to-be



BPMN exercise

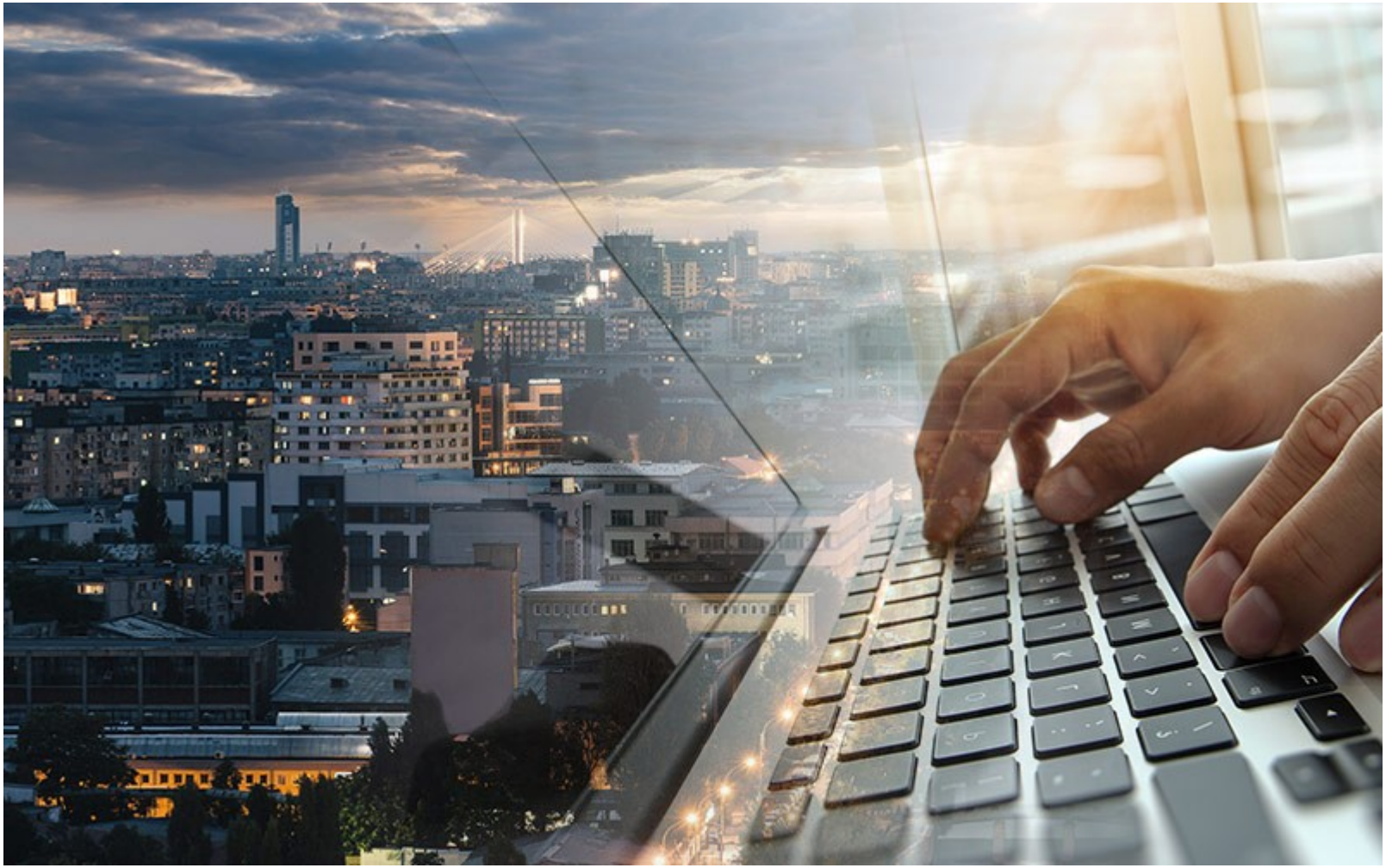
- Based on **Collaboration Exercise 5** in PSI pp. 149-151, in groups of 3-4 students, **draw the BPMN for Figure 5-22 only:** The permit office made three copies of the permit and distributed one to each department. The departments reviewed the permits in parallel; a clerk would analyze the results and, if there were no rejections, approve the permit.
- **Draw it on a blank sheet of paper, write all your names and student IDs, then submit it.** (You can take a photo so that you have a copy.)





Sources

- Most of the slides are adapted from ***COMM 226 Business Technology Management*** by David M. Kroenke, Andrew Gemino, Peter Tingling, and Earl H. McKinney, Jr. 2nd Custom Edition for Concordia University (2014) published by Pearson Canada. ISBN 13: 978-1-269-96956-7
- BPMN gateway shapes are adapted from Wikipedia
- I thank Gregory Kersten and Marc-André Léger for their assistance with various slide content and exercises
- Other sources are noted on the slides themselves



Camunda Modeller

Camunda

- Camunda Modeller
- Camunda BPM Engine
- ….
- Didownload pada
  - Versi community (free)
  - Versi enterprise

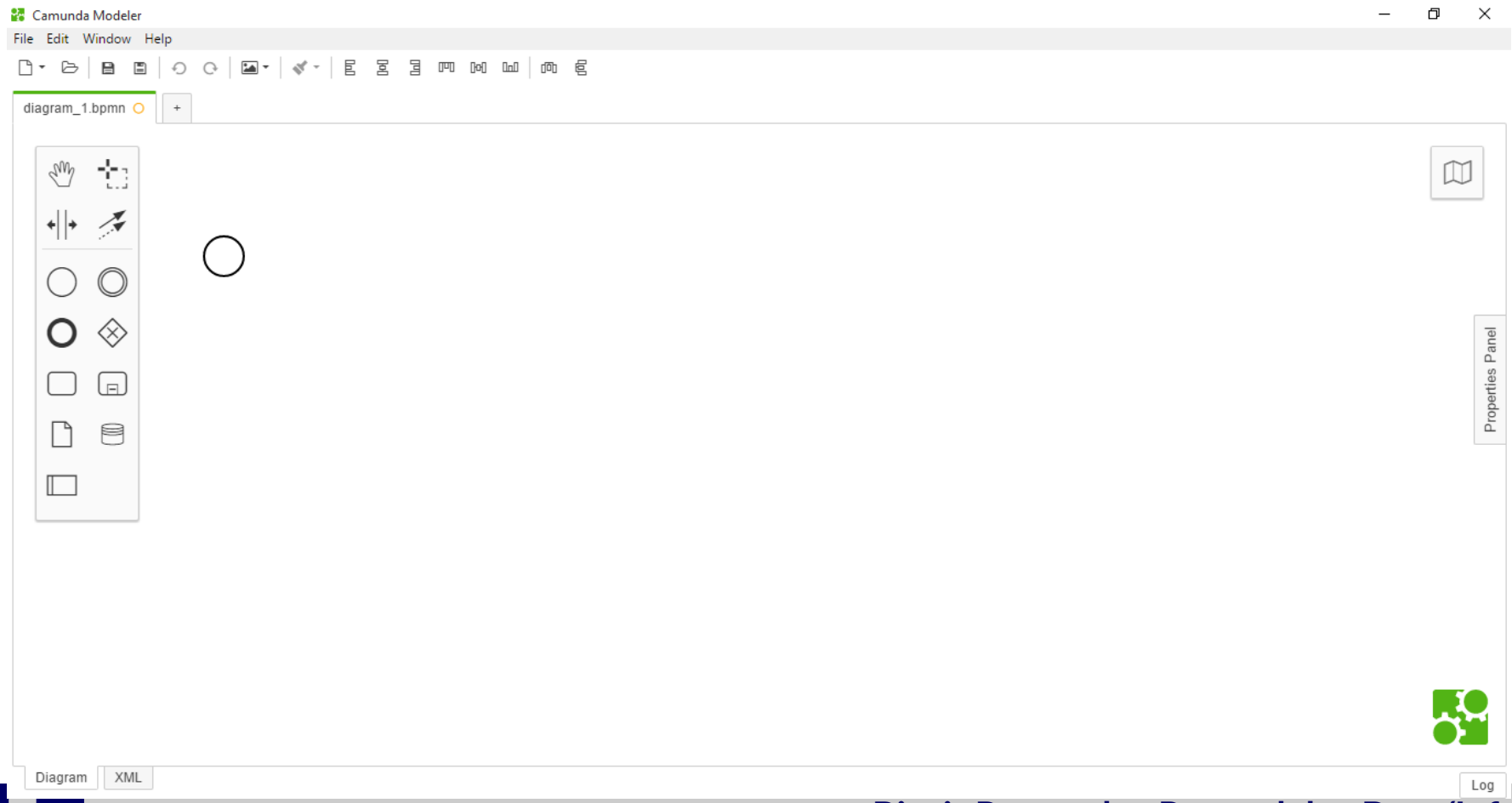
Camunda Modeller

- **Camunda BPM** adalah platform alur kerja sumber terbuka dan otomatisasi pengambilan keputusan.

Camunda BPM dilengkapi dengan alat untuk membuat alur kerja dan model keputusan , mengoperasikan model yang digunakan dalam produksi, dan memungkinkan pengguna untuk menjalankan tugas alur kerja yang ditugaskan untuk mereka.

Penggunaan Camunda

Tampilan awal Camunda



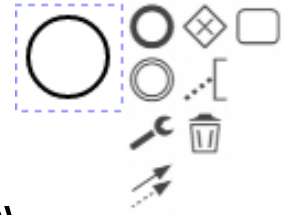
Penggunaan Camunda

Penjelasan tampilan awal Camunda

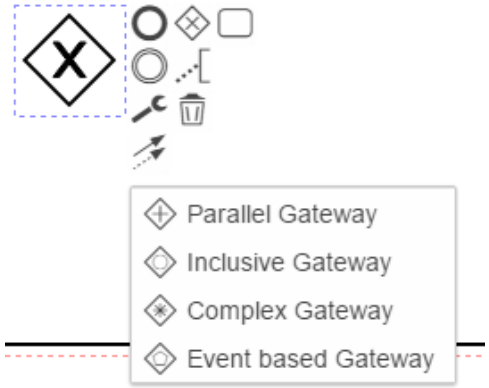
- Start event
- End event
- Exclusive Gateway
- Data
- Data St
- Task
- Pool

Penggunaan Camunda

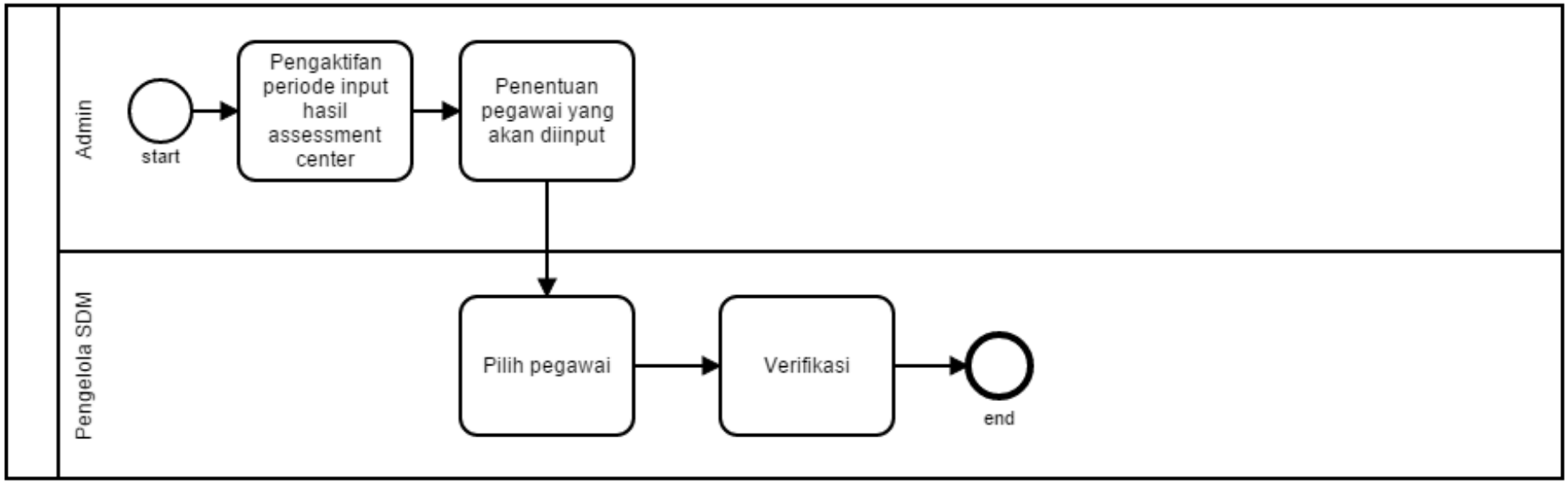
- Mula-mula tempatkan Start Event dalam Pool. Fungsi Pool mewakili Peserta dalam (B2B) Diagram Bisnis Proses interaktif
- Buat Task, lalu hubungkan Start Event dengan task dengan menggunakan Connecting Object. Klik Start Event kemudian pilih tanda panah arahkan pada Task.



- Jika diperlukan Gateway terdapat beberapa pilihan Gate\ merubah Gateway yaitu dengan ikon , maka akan muncul seperti gambar disamping



Contoh BPMN Camunda



- Buat Pool terlebih dahulu lalu buat menjadi dua line. Terdapat dua peserta pada Pool diatas yaitu Admin dan Pengelola SDM.
- Buat Task masing-masing kemudian hubungkan dengan Connecting Object.

Sejarah dan Aktifitas

- 1962, komputer pertama diinstal di Indonesia (PT Stanvac)
- 1965, kelompok pengguna IBM
- 20 Mei 1965, Badan Kerjasama Otomasi Negara (BAKOTAN)
- 18 April 1974 - Himpunan Pengguna Komputer Indonesia (HPKI)
- 20 Juli 1974 – Ikatan Pengguna Komputer Indonesia (IPKIN)
- 1975 IPKIN berbadan hukum
- 1990, Ikatan Profesi Komputer dan Informatika Indonesia

KODE ETIK

Prinsip Standar Teknis
Prinsip Kompetensi
Prinsip Tanggung Jawab Profesi
Prinsip Kepentingan Publik
Prinsip Integritas
Prinsip Objektivitas
Prinsip Kerahasiaan
Prinsip Perilaku Profesional

- 1979 : Konferensi Komputer Nasiponal (KKN) Pertama di Indonesia,
- 1980: Konferensi SEARCC 3 di Indonesia
- Kode Etik Profesi bidang TIK
- Doktoral dan Master Kollokuium, Klinik Jurnal Ilmiah (Dirjen Dikti – HIVOS), Internasional Conference dan Journal Ilmiah
- Pemetaan dan survey SDM TIK (Kominfo, Aptikom)
- Pengembangan Standard Profesi dari era SRIG-PS 1995 dengan SEARCC, Pengembangan Standard Kompetensi Kerja Nasional Inodnesia (SKKNI, Pemaketan Kerangka Kualifikasi Nasional Indonesia (KKNI) dan Peta Okupasi (dari tahun 2005) – Kominfo, Kemnaker,

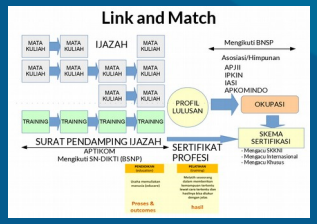
IPKIN

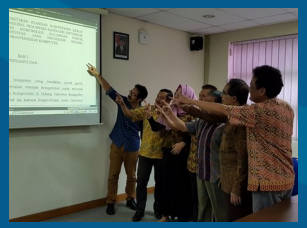
Ikatan Profesi Komputer dan Informatika Indonesia
http://www.ipkin.or.id

Perjalanan Keprofesian TIK

The first computer in Indonesia

SEARCC chief delegates at the head table





Terima kasih