BPMN2.0介绍

2011年8月

军旗浪子

QQ: 6764884

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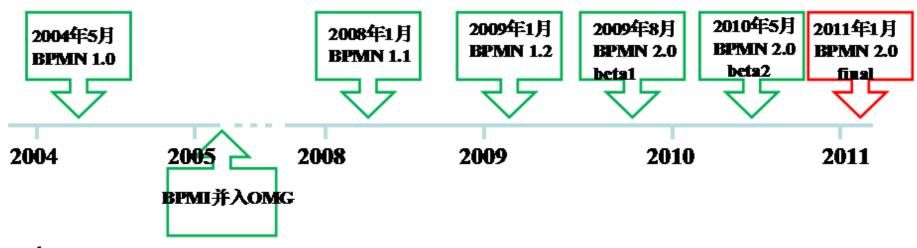
- BPMN2.0概述
- BPMN2.0基础
- BPMN2.0体系

BPMN2.0概述

- · BPMN2.0的概念内涵
 - BPMN, Business Process Model and Notation,业务流程模型与符号。
 - BPMN是一套流程建模的标准,主要目标是提供一套被所有业务用户容易理解的符号,支持从创建流程轮廓的业务分析到这些流程的最终实现,直到最终用户的管理监控。
 - 提供了清晰而精准的执行语义来描述元素的操作。
 - BPMN规范还确保设计为业务流程执行的XML语言(如WS-BPEL),能够用这套以业务为中心的符号所可视化表示。
- · BPMN2.0的提出机构
 - BPMN2.0规范由OMG组织提出并维护。
 - 业界主流厂商参与制定: IBM、Oracle、SAP等。
- BPMN的接受程度
 - 被广泛接受,目前全球有70余个产品实现(OMG登记的)。

发展与历史

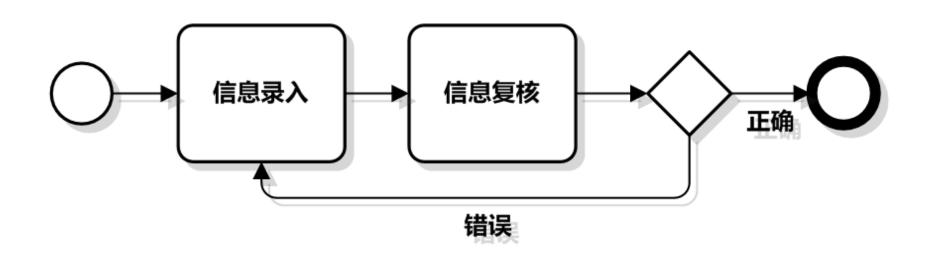
- · BPMN的发展历史:
 - 最早由BPMI提出,BPMI(The Business Process Management Initiative)
 开发了一套标准叫业务流程建模符号(Business Process Modeling Notation, BPMN)。现在由OMG组织负责维护。
 - 2011年一月份发布2.0的最终版。2.0版本后,BPMN全称变成:Business Process Model and Notation。



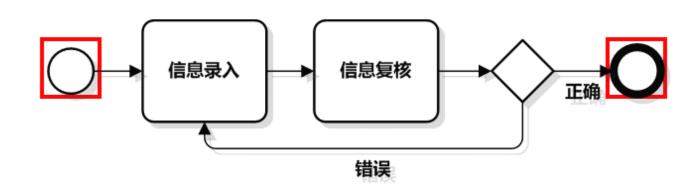
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BPMN基础-简化的信息录入流程



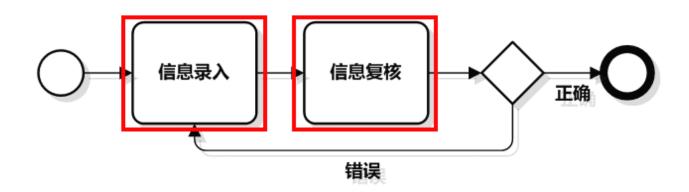
BPMN基础-开始事件和结束事件



开始事件(Start Event)

开始事件标志了一个流程将要开始。

BPMN基础-任务

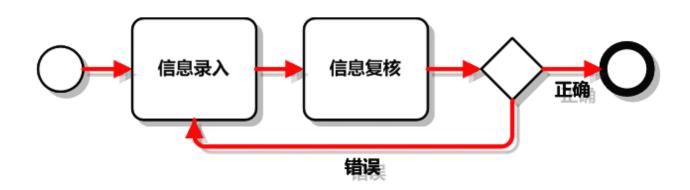


Task

任务(Task)

任务是流程在流转过程中的一个原子活动,它被用于一个流程中的工作不能够被拆开到更细的级别的情景。

BPMN基础-顺序流

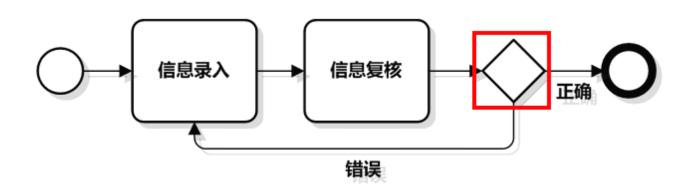


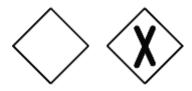


顺序流(Sequence Flow)

顺序流是两个流程元素的连接器。一个元素在流程执行期间被访问后,流程会沿着该元素输出的顺序流继续执行。

BPMN基础-单一网关

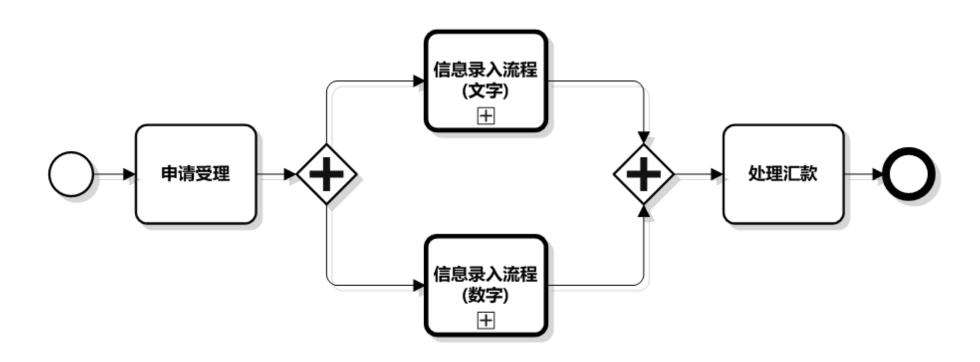




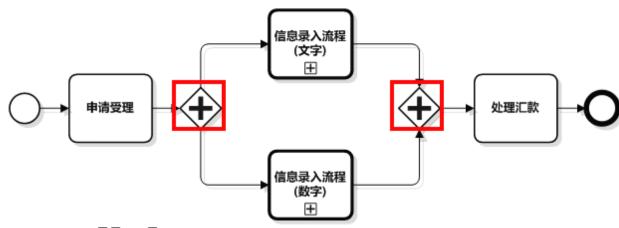
单一网关(Exclusive Gateway)

用来对流程中的决策进行建模。流程执行到这种网关时,按照输出流定义的顺序对它们进行计算。条件为真的顺序流(或默认的)被选取继续执行流程。

BPMN基础-简化的汇款流程



BPMN基础-并行网关





并行网关(Parallel Gateway)

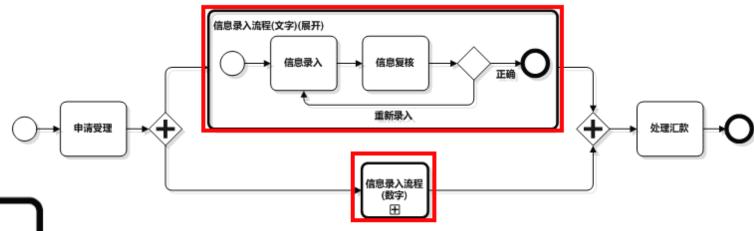
用来对流程中的并发进行建模,它能拆分出多个执行路径,或多个输入执行路径进行合并。

其功能要根据输入和输出的顺序流:

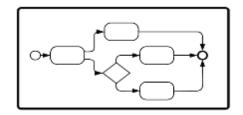
分支(Fork):并行执行所有的输出顺序流,为每一个顺序流创建一个并行执行路径。

● 聚合(Join): 所有到达并行网关的并发性的执行路径都等待于此,直到每个输入流都执行完毕。然后,流程经由它继续向下执行。

BPMN基础-子流程





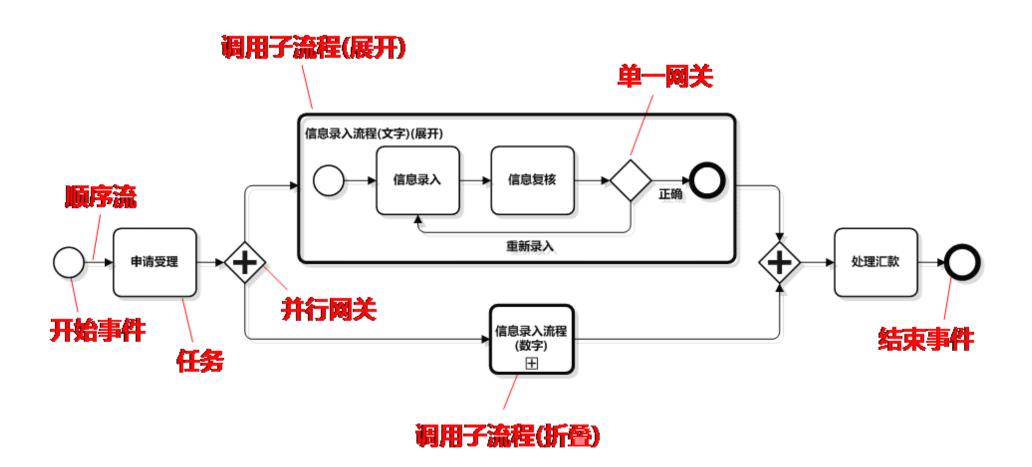


调用子流程(展开)

A Call Activity object calling a Process (Expanded)

调用活动是流程中的一个点,一个全局流程或一个全局任 务将被使用。

BPMN基础-小结



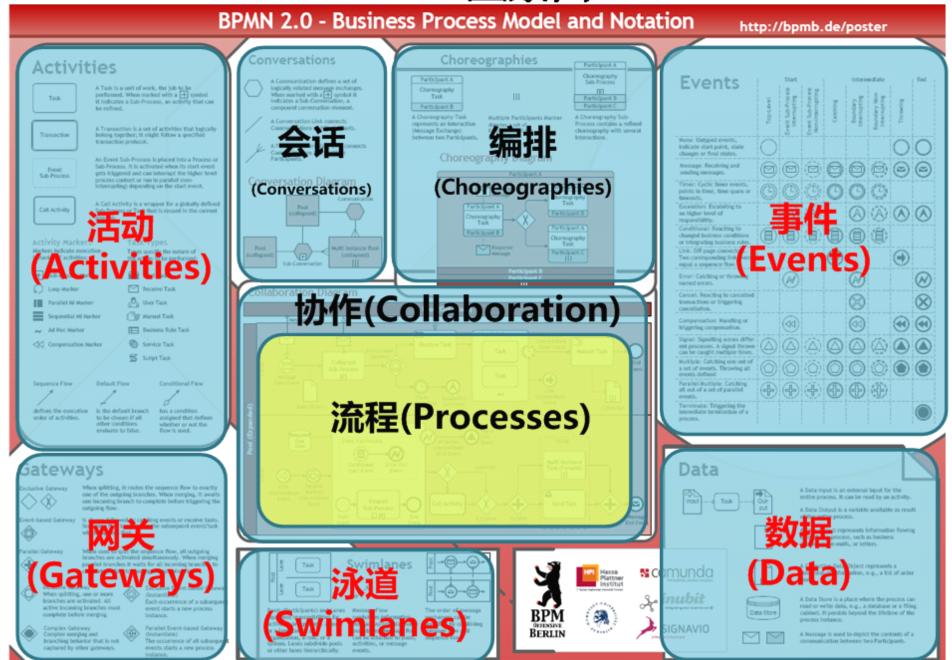
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 - BPMN2.0元素分类

BPMN2.0全景图[引用4]



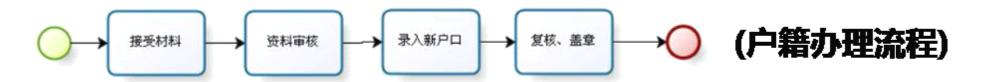
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BPMN2.0流程模型[引用1]

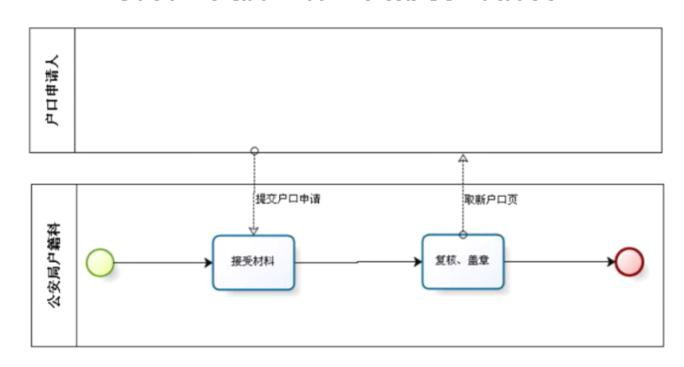
- 流程图(Processes)
 - 私有流程
 - 公有流程
- 协作图(Collaborations)
- 编排图(Choreographies)
- 会话图(Conversations)

BPMN2.0流程模型之:流程图(Processes)



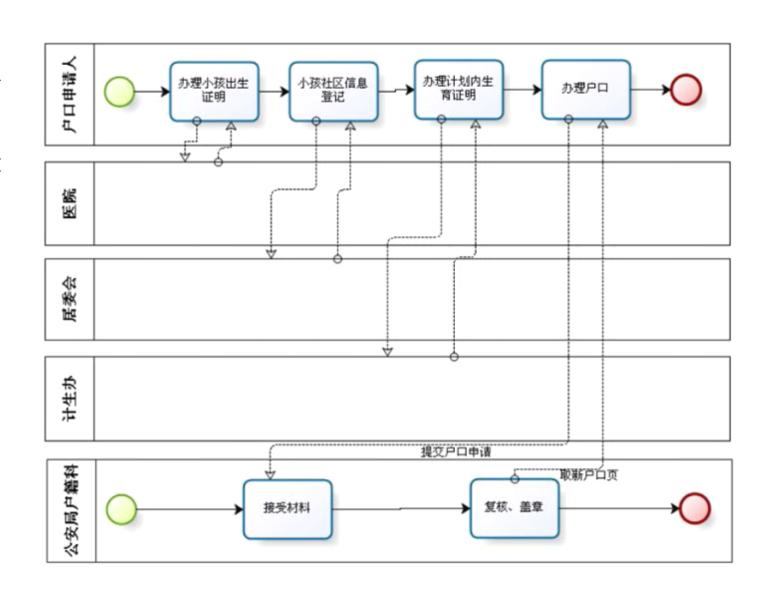
私有流程:指某一组织的内部工作流程,我们通常称之为称为工作流,在Web Service领域,我们也称之为服务的编制。

公有流程: 表现 一个私有流程与 其他流程或参与 者之间的交互。

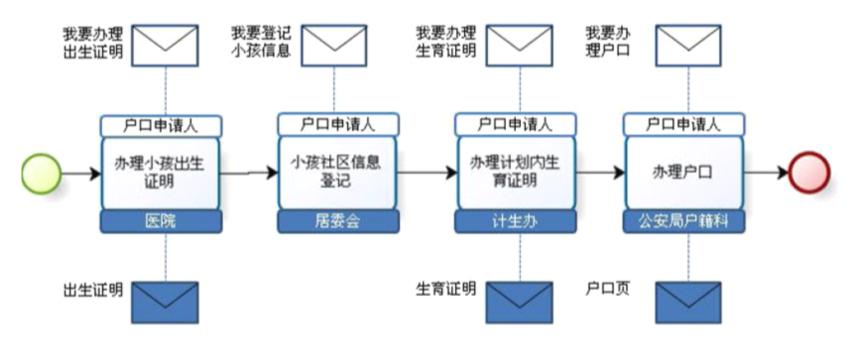


BPMN2.0流程模型之: 协作图(Collaborations)

协作图: 描 绘两个或多 个业务实体 间的交互。

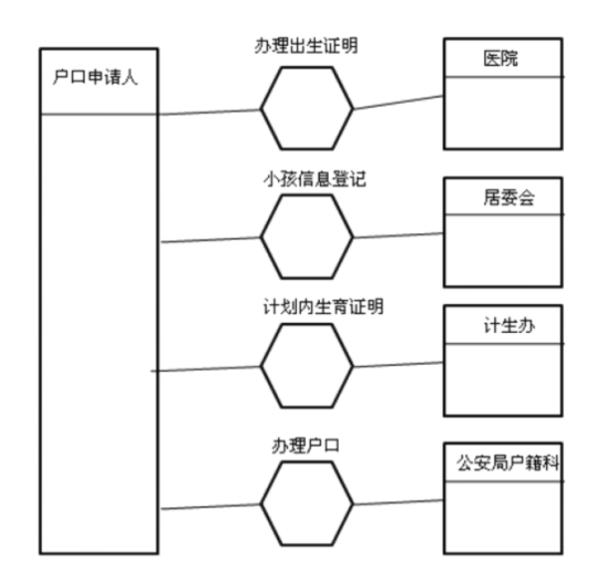


BPMN2.0流程模型之:编排图(Choreographies)



编排图:表现多个参与者之间的交互,由编排活动直接表现多个参与者之间的消息交互,为协作模型提供了一种基于流程图的视图。

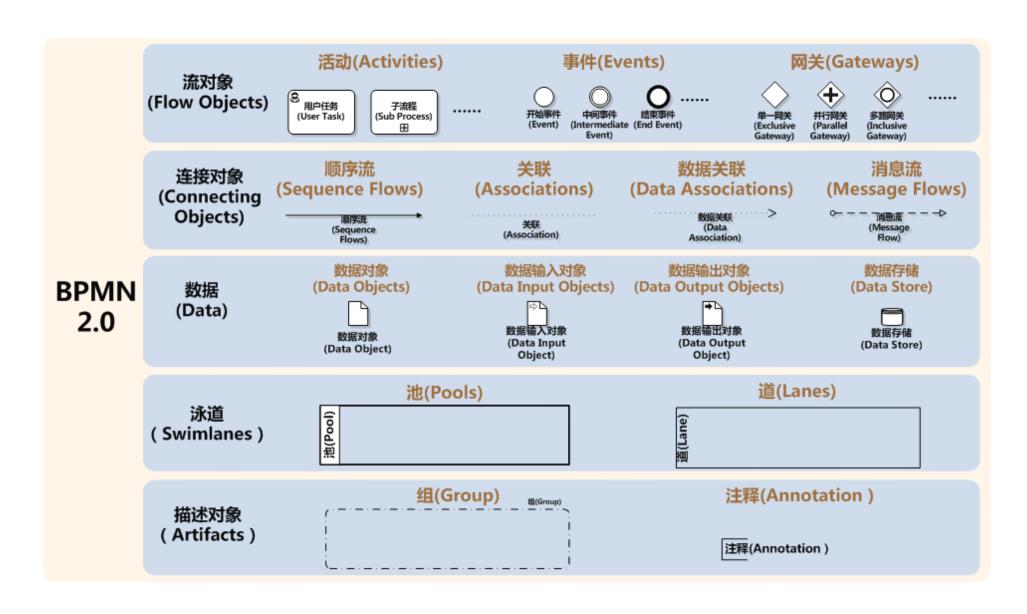
BPMN2.0流程模型之:会话图(Conversations)



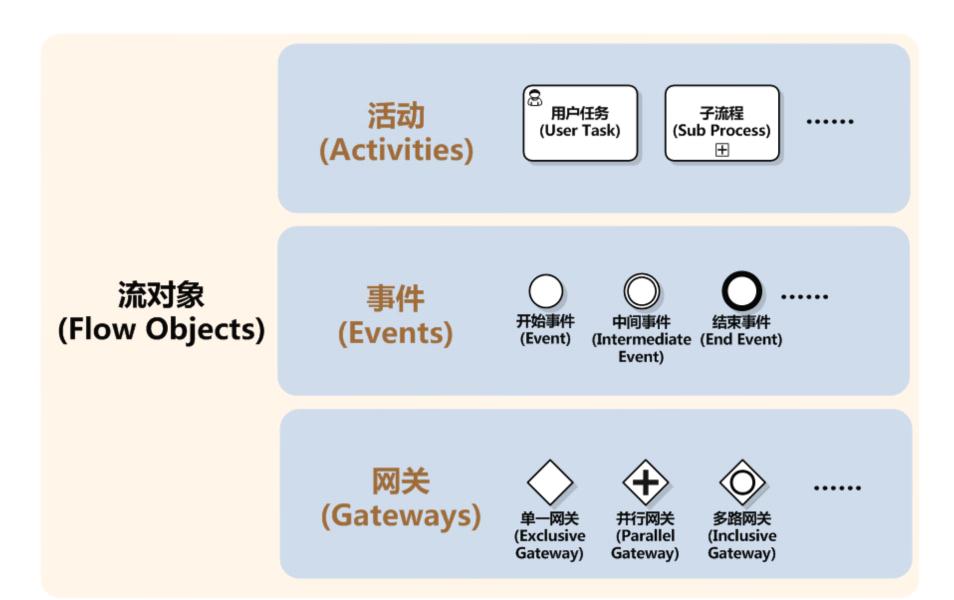
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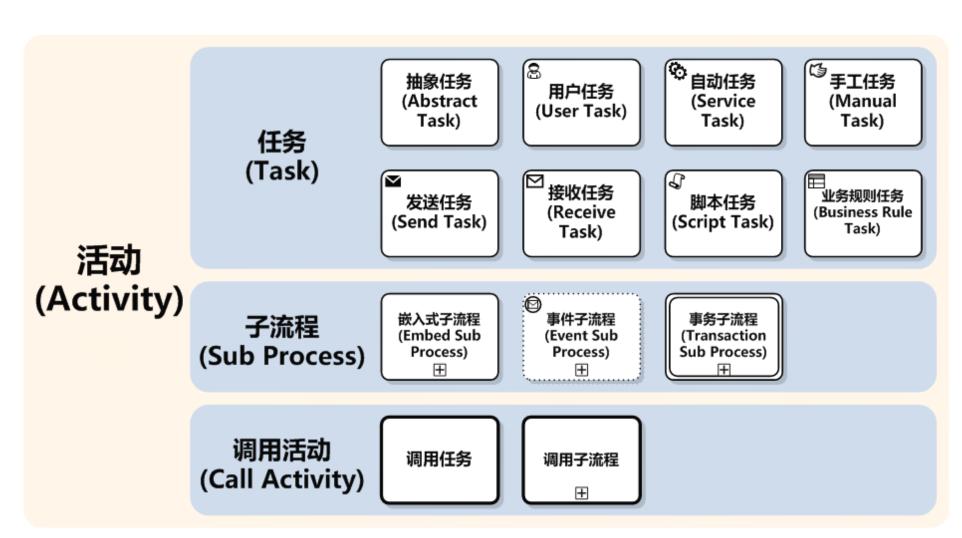
BPMN2.0体系-元素的五大分类[引用2]



BPMN元素五大分类之一:流对象



流对象之:活动



活动标记

标记 (Markers)	十 子流程	子流程是含有其它活动、网关、事件等的活动			
	循环	能够按照顺序执行多次顺序。			
	#行多实例	允许对于给定集合中的每一项都并行地执行某 个步骤、或者甚至执行完整的子流程。			
	串行多实例	允许对于给定集合中的每一项都顺序地执行某 个步骤、或者甚至执行完整的子流程。			
	~ 即席	表示一组活动,不要求顺序关系,而由这些活 动的参与者决定它们的顺序和次数。			
	√ 补偿	用来标识被修饰的对象是用来做补偿处理的。			

流对象:活动示例

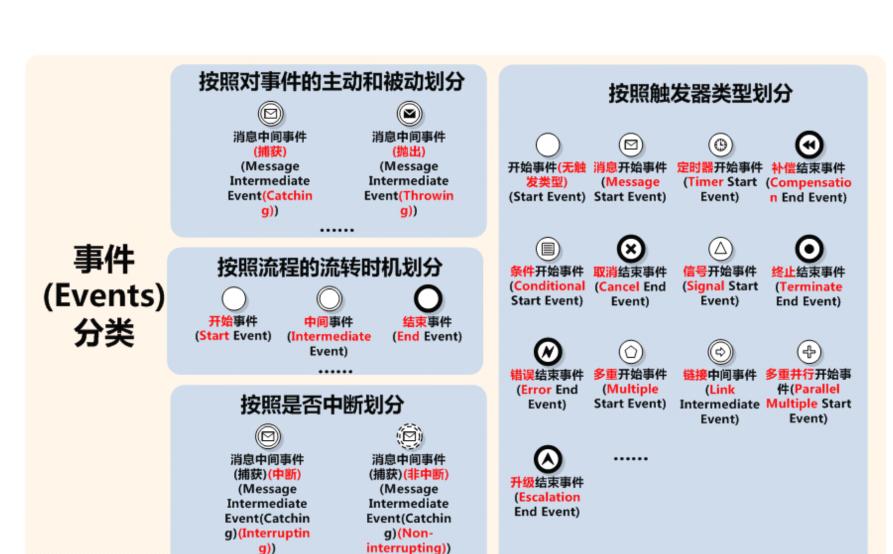
8 8 多实例并行的 多实例串行的 循环的 用户任务 用户任务 用户任务 Ш Ω Ø 多实例并行 补偿的 即席子流程 即席子流程 自动任务

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流对象之:事件——事件的分类



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流对象:事件

1	捕获型							抛出型	
	开始			中间				结束	
类型	顶层	事件 子流程 (中断)	事件 子流程 (非中断)	捕获	边界 (中断)	边界 (非中断)	抛出		
无 (None)	0						0	0	
消息 (Message)	©	0	(2)	0	0	(2)	(2)	9	
定时器 (Timer)	0	(9)	(0)	0	0	(<u>©</u>)			
错误 (Error)		*			®			0	
升级 (Escalation)		(A)	(A)		<u> </u>	(A)	(A)	0	
取消 (Cancel)					8			8	
补偿 (Compensation)		49			@		•	0	
条件 (Conditional)		•	(1)			(4))
链接 (Link)				0			•		
信号 (Signal)	Δ	Δ	(<u>A</u>)			(A)		Θ	
终止 (Terminate)								0	
多重 (Multiple)	0	0	0	0	0	(9)	•	0	
多重井行 (Parallel Multiple)	(+)	(4)	(4)	((1)	(4))

事件示例[引用3]

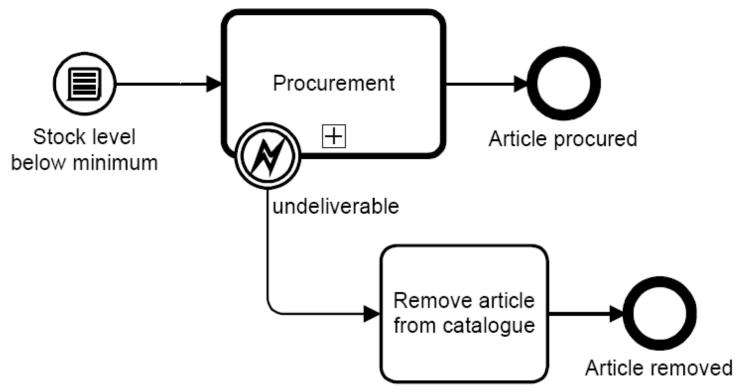
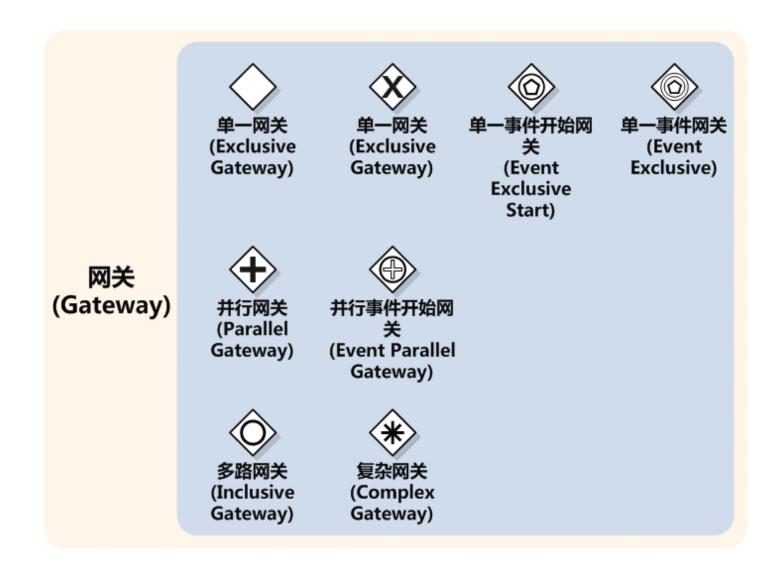


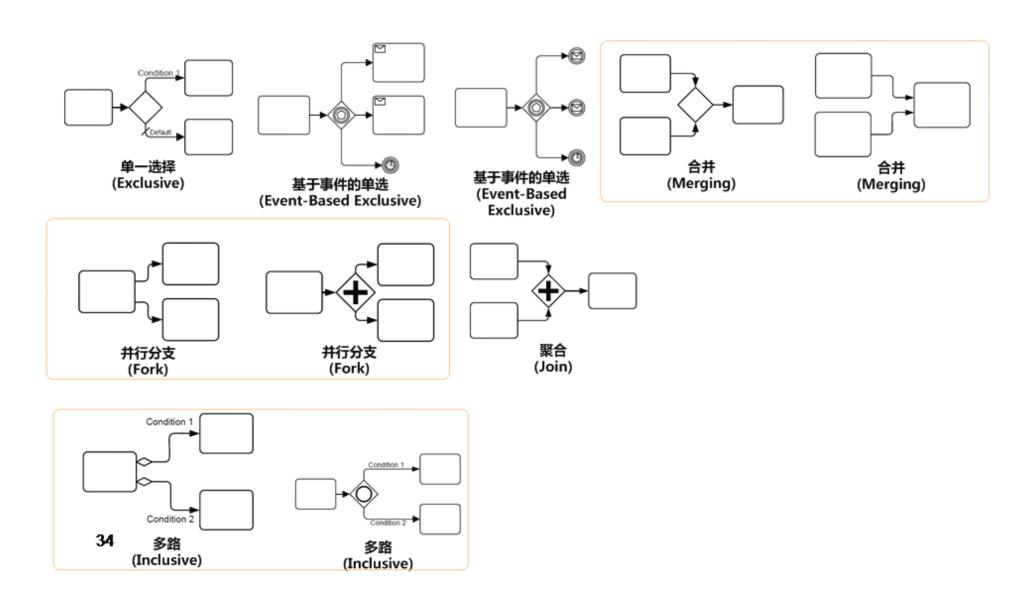
Figure 5.4: Stock maintenance process

贮备维护流程

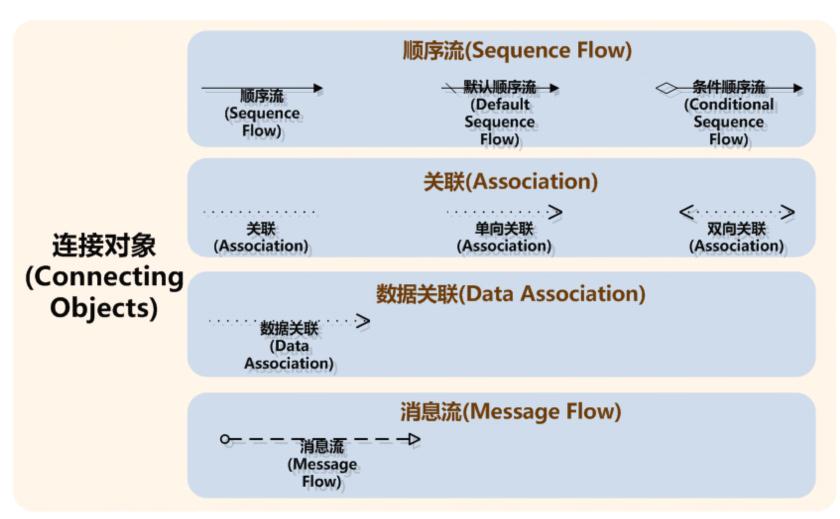
流对象: 网关



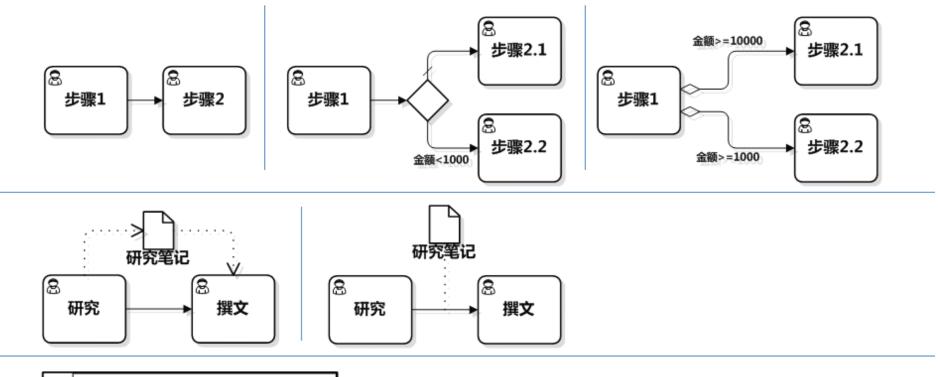
网关示例

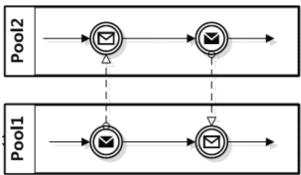


BPMN元素五大分类之二:连接对象

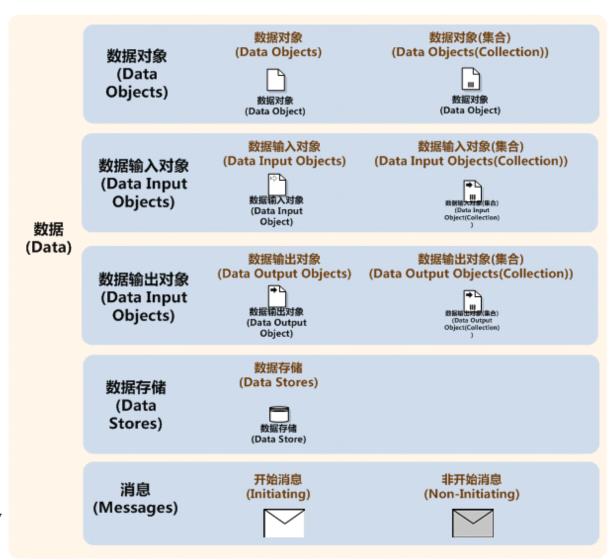


连接对象示例

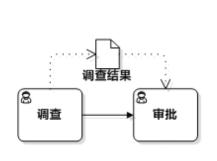


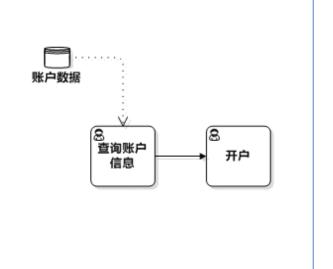


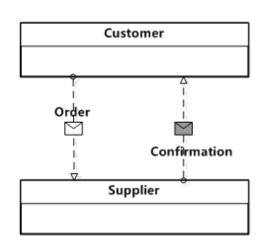
BPMN元素五大分类之三:数据对象



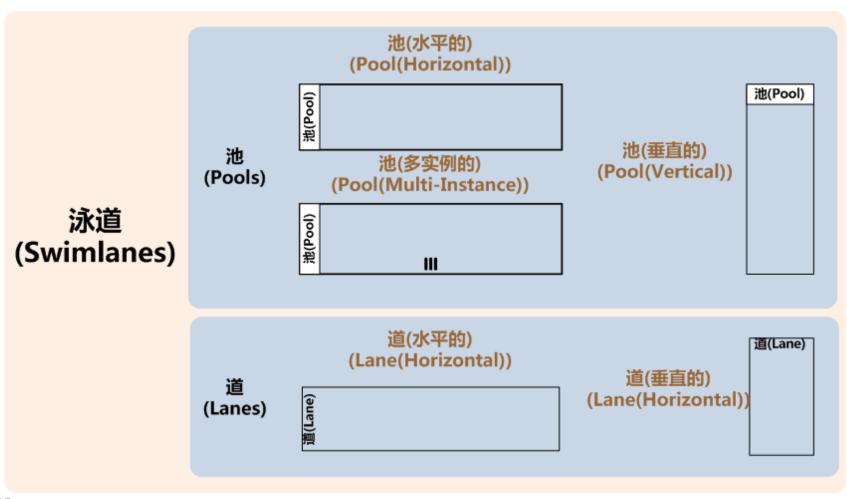
数据对象示例







BPMN元素五大分类之四:泳道



泳道示例[引自2]

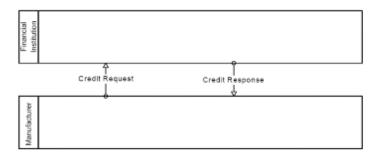


Figure 9.3 - Message Flows connecting to the boundaries of two Pools

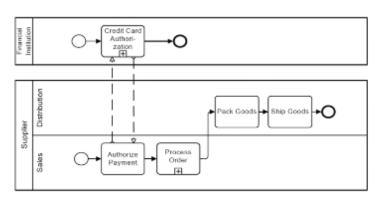


Figure 9.4 - Message Flows connecting to Flow Objects within two Pools

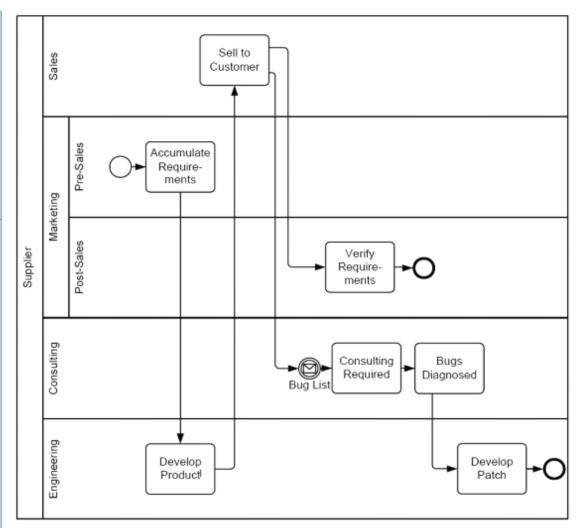
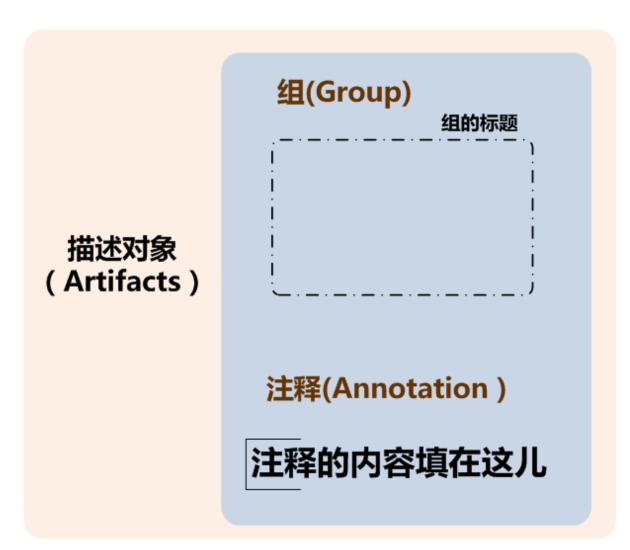


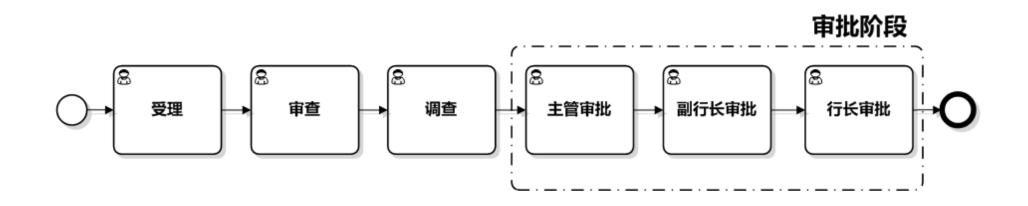
Figure 10.125 - An Example of Nested Lanes

BPMN元素五大分类之五: 描述对象



描述对象示例





BPMN2.0全景图

BPMN 2.0 - Business Process Model and Notation http://bpmb.de/poster Choreographies Conversations Activities Fertidpent A Choreography Participant A **Events** A Communication defines a set of Sub-Process logically related message exchanges. When marked with a symbol it Choreography ш indicates a Sub-Conversation, a compound conversation element it indicates a Sub-Process, an activity that can Participant B be refined. A Choreography Task **Multiple Participants Warker** A Choreography Sub-A Conversation Link connects Process contains a refined A Transaction is a set of activities that logically Communications and Participants. choreography with several Hessage Dichange) Participants of the Transaction belong together; it might follow a specified between two Participants. Interactions. Hone: Untyped events, A Forked Conversation Link connects indicate start point, state Communications and multiple changes or final states. Choreography Diagram An Event Sub-Process is placed into a Process or Participants. 00000000000 Message: Receiving and Sub-Process, It is activated when its start event gets triggered and can interrupt the higher level sending messages. Sub-Process process context or run in parallel (non-Conversation Diagram Timer: Cyclic timer events. interrupting) depending on the start event. 000000 points in time, time spans or Choreography Participant A Exceletion: Exceleting to Call Activity $\triangle \triangle \triangle \triangle$ Sub-Process or Task that is reused in the current an higher level of Choreography Tarek Conditional: Fearting to 8888 changed business conditions Choreography Task Activity Markers Task Types or integrating business rules. Link: Off-page connectors Markers Indicate execution Types specify the nature of (田 behavior of activities: Two corresponding link events equal a sequence flow. + Sub-Process Marker Send Tark Error: Catching or throwing (M) named errors. Cop Harter Faceive Task Collaboration Diagram Cancel: Reacting to cancelled Parallel MI Marker 🐧 User Task transactions or triggering cancellation. Sequential All Market W Harrosi Task Compensation: Handling or (44) triggering compensation. Business Rule Task ex. Ad Not Market Service Task √C Compensation Warker ent processes. A signal thrown Tank can be caught multiple times. S Script Task Multiple: Catching one out of a set of events. Throwing all Tank events defined ◉ Parallel Multiple: Catching Sequence Flow (A) (A) (all out of a set of parallel ш Terminate: Triggering the immediate termination of a defines the execution is the default branch has a condition to be chosen if all assigned that defines process other conditions whether or not the Deb Store (III) **Hulti Imban** Gateways Data Task (Parallel Start Event Down 111 When splitting, it routes the sequence flow to exactly **Exclusive Gateway** A Data input is an external input for the one of the oxigoing branches. When merging, it awaits one incoming branch to complete before triggering the $\bigcirc \otimes$ settire process. It can be read by an activity. Looped Sub-Process A Data Output is a variable available as result ΩŒ Is always followed by catching events or receive tasks. Sequence flow is routed to the subsequent event/task ٥ which happens first. through the process, such as business documents, e-mails, or letters. Parallel Gateway When used to split the sequence flow, all outgoing branches are activated simultaneously. When merging parallel branches it waits for all incoming branches to Swimlanes Tank A Collection Data Object represents a ™ camunda complete before triggering the outgoing flow. collection of information, e.g., a list of order Exclusive Event-based Gateway Tank ·(E) 3. inubit When splitting, one or more branches are activated. All (Instantiate) A Data Store is a place where the process can Each occurrence of a subsequent read or write data, e.g., a database or a filing active incoming branches must complete before merging. event starts a new process. Pools (Participants) and Lanes Data Store cabinet. It pensists beyond the lifetime of the exchanges can be specified by combining represent responsibilities for numbolizes information activities in a process. A pool flow across organizational Parallel Event-based Gateway SIGNAVIO or a lane can be an message flow and BERLIN A Message is used to depict the contents of a Complex merging and (Instantiate) organization, a role, or a The occurrence of all subsequent branching behavior that is not nication between two Participants notem. Lanes subdivide popils activities, or message

captured by other gateways.

events starts a new process.

or other lanes hierarchically.

参考:

- 1.《BPMN的流程模型》, http://ronghao.iteye.com/blog/1148762
- 2. 《Business Process Model and Notation (BPMN)》 Version2.0, http://www.omg.org/spec/BPMN/2.0
- 3. 《BPMN 2.0 by Example, Version 1.0 (non-normative)》, http://www.omg.org/spec/BPMN/2.0/examples/PDF
- 4. 《BPMN 2.0 Business Process Model and Notation》, http://bpmb.de/poster