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# Agile

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, 2013

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1.1.		.....	4
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		68
	-	73
		74
		75
	<b>OMG BPMN v. 2.0</b>	78

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## 1.1.

### 1.1.1.

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ITIL [2, . 5],

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ITIL [2, . 20]

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[3, . 55] &lt;&lt;

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&gt;&gt;.[3, . 55]

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[4, . 17 -- 18], [5]

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[6, c. 148],

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[6, c. 148].

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[7, . 110]

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[6, . 148]

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## Process Classification Framework ---

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## International Benchmarking Clearinghouse ---

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**eTOM** --- (Enhances Telecom Operational Map), TMForum.

**BEM** ---

### 1.1.2.

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 , [6, .  
 30 -- 31], -  
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 . [6, . 31]  
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 ( ) >>. -  
 , [6, . 31], [6, . 148], -  
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 [8, . 27],  
 . -  
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[8, . 30],

## 1.2.

### 1.2.1.

[9, .6]

PMBOK Guide [10, . 3],

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[11, . 41],

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[12, . 8],

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[11, .45],

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, PMBOK 5 [10],

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[6, . 181]

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### 1.2.2.

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, PMBOK 5 [10, . 309],

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[13, с. 91 -- 93]:

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PMBOK [10]

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[14, . 46]

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[13, . 34]

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[15, . 21 -- 23]

[15], [13].

1.2.3.

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[16, . 41],

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51897-2011 [17]

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&gt;&gt;.

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[13, . 102].

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[13]

:

(equirisk contour method) ---

,

.

(probablistic event analysis, PEA) ---

ABC

342 -- 355]

>> [13, . 340].

[13, .

( ) ---



(critical path method),

*PERT*.

). [13, . 355 -- 357],

[13, . 330 -- 336])

:

[13, . 357 -- 370]  
(milestone plan).

#### 1.2.4.

/ 12207-99 [18]

(life cycle model)

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 ( . 19.102-77 [19]) -  
 ( 34.601-90 [20]). -  
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**Agile** -  
*Agile* ( ) [21] ( )  
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Agile

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2001

17

(K.

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Beck)

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(A. Cockburn).

[\[22\]](#)

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Agile

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: [\[22\]](#)

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Agile,

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agile  
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 Agile.  
 [23, . 3],  
 :  
**(Scrum)** ---  
 , ,  
 . scrum, -  
 [24], -  
 . -  
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 .  
 .  
**(Extreme Programming, XP)** --- -  
 ,  
 , , , . -  
 [25], XP -  
 ,  
 . -  
 . -  
 , .

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 [14, . 110], agile  
 :

**Extreme Programming (XP)** --- -  
 , -  
 , : -  
 , CRC  
 .

**Scrum** --- 30- ,  
 , .

**Crystal methodology** --- ,  
 , - , .

**Dynamic System Development Methodology (DSDM)** --- -  
 , ,  
 .

**Rapid Application Development (RAD)** --- , -  
 ,  
 .

**Adaptive Software Development** --- , -  
 , .

**Lean Development** --- , ,  
 , , .

**Feature-driven development** --- ,  
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1.2.5.

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PMBOK Guide [12, . 33]

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[26, . 57 -- 58]

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- , :  
— (Work Breakdown  
Structure);  
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— ;  
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— ;  
— (executive  
dashboard).
- , —  
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9004 [29], .

[27], [28], -

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[28, . 7]

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[8, . 63 -- 70]

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**FAST ---**

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### 1.3.2.

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[30,

. 73),

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 - ( : [31, . 4.8])  
 PDCA (Plan -- Do -- Check -- Action).

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 [31],  
 -  
 [31, . 205 -- 216],  
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## 1.3.3.

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" "(as is) ,

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, [3, . 52] ,

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>>. [3, . 52]

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: [3, . 181]

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### 1.3.4.

*Kaizen.*

(continous

improvement). [32, . 48 -- 49] ,

(Continuous Process Improvement)

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. - ITIL [2, . 39] ---

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(*Kaizen*).

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>> [33]

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[33],

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(Toyota) [34], Nippon Steel Corp., Honda Motor Corp., Suzuki Motor Corp., Takagi Seiko [35].

TPM (

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(just in time);

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. [33]

### 1.3.5.

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 . 74).

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2.1.

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[8, . 93 -- 98].

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: [36, . 13]

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( ), ( *ERP*- -  
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## **DocFlow Workflow ---**

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## **2.2. -**

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- . [8, . 14] ,

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( ) - .

**2.2.1.**

2006 . -

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, [4, . 27].

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- .

[8, . 15], -

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- c ;
- - ;
- , - .

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- .

2004 . BPMN,

BPMN 2.0 Object

Management Group (OMG) . [37]

-  
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 ,  
 -  
 ,  
 - [8, . 71 -- 81]  
 -  
*EPC* (c ) *BPMN*  
 ( - ).

, [8, . 15]  
 , . .  
 ,  
 .  
 -  
 .  
 SADT (Structured Analysis and Design  
 Technique) IDEF(Integration Definition for Functional Modeling.)

-  
 [8, . 17] c -  
 , -  
 - .  
 UML (Unified Modeling Language).

-  
 [8, . 18]  
 , - ,  
 .  
 , - ,  
 ARIS(Architecture of Integrated Information Systems).

[38] -

, -

· , ,

, [38, . 15]  $C = (P,T,I,O)$ ,

4- :

1.  $P$ ;

2.  $T$ ;

3.  $I$ ;

4.  $O$ ;

, . . . -

, -

, -

. ( . : [?

]) , ,

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, -

.

[38, . 18]

$G = V,A,$   $v_i \in V$

$a_i \in A.$   $V$  -

$P ( \quad ) \quad T( \quad ).$

.

$\mu$

. -

,

· :  
 $\mu : P \rightarrow N,$   $C, \mu.$  -  
· ,

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· ,

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2.2.2. -  
-  
-

·  
[4, . 27], -  
-

· ( 2006 .):

**DFD (Data Flow Diagram)** --- ,  
( - ).

**SADT (Structured Analysis and Design Technique)** ---  
·

**ERD (Entity-Relationship Diagram)** --- " -  
·

**STD (State Transition Diagram)** --- , -  
·

UML (Unified  
Modeling Language),  
UML  
: [4, . 60]  
(use case diagrams) ---  
;  
(class diagrams) ---  
;  
(statechart diagrams) ---  
;  
(activity diagrams) ---  
;  
(interaction diagrams) ---  
(sequence diagrams)  
; (collaboration diagrams)  
;  
(component diagrams) ---  
;  
(deployment diagrams) ---  
.

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**BPMN****BPMN**

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**BPMN**

( .

. [78](#)).**OMG BPMN.****BPMN**

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[\[39, . 26\]](#)

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*BPMN*,

---

:[\[39\]](#), . 30]

1. (flow objects);
2. (Data);
3. (connecting objects);
4. (swimlane);
5. (artifacts).

. ). *BPMN* ( , /

**YAWL**

*YAWL (Yet Another Workflow Language)*

(Aalst)

(Hofstede) 2003

[\[40\]](#),

**YAWL**

[\[40\]](#), c. 3]

•

- ,
- ,
- .
- .
- YAWL, [40, . 10] -
- ,
- (extended workflow nets, EWF-nets). -
- ,
- .
- ,
- ( . 2.2.1 .
- 42).
- YAWL -
- (workflow patterns).
- ( . ?? . ??). , -
- YAWL -
- . -
- . -
- ,
- ,
- - , -
- Workflow. -
- , -
- - ,
- - .



### 2.2.3.

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**BPEL**

**XPDL**

**WF-XML**

## 2.3.

. WORKFLOW. WORKFLOW  
WORKFLOW.

(Smith, Fingar "Business process management the third wave").

### 2.3.1.

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,

BPM CBOK <<

- &gt;&gt; [41],

ABPMP (Association

of Business Management Professionals).

ABPMP [41, . 24]

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ABPMP

CBOK [41, . 28],

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289

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c- [42], 20

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:

(design model, DesM) ---

;

(discover model from event

data, DiscM) ---

;

```

        (select model for collection, SelM) ---
        ;

    (merge models, MerM) ---
    ;

    (compose models, CompM) ---
    ;

    (design configurable model, DesCM) ---
    ,
    ;

    (merge models into configurable model, MerCM)
---
    ;

    (configure configurable model, ConCM) ---
    ;

    (refine model, RefM) ---
    ;

    (enact model, EnM) ---
    ;

    (log event data, LogED) ---
    -
    ;

    (monitor, Mon) ---
    .

    (adapt while running, AdaWR) ---
    ,
    ;

```

(analyze performance based on model,  
 PerfM) --- -

.

(verify model, VerM) --- -

;

(check conformance using event data, ConfED)

---

;

(analyze performance using event data, PerfED)

(repair model, RepM) --- -

;

(extend model, ExtM) --- -

,

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(improve model, ImpM) ---

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2.3.2. -

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IT

Gartner[43], *c* - ( . Business Process Management Suite),

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 . BPM- -  
 - ( ),  
 << , ,  
 . BPMS

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 .>>[44]  
 , -  
 - , << >>  
 (Handbook on Business Information Systems) [45] -

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 : [45, . 100 -- 101]

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 - (SOA)  
 :[\[41\]](#)  
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### 2.3.3.

, ,  
 YAWL, , "

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( workflow [40] 20-

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"

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,

[40, . 10 -- 39] :

(Sequence) --- ,

.

(Parallel split) ---

,

(Synchronization) ---

.

(Exclusive choice) --- ,

.

(Simple merge) ---

.

(Multi-choice) --- ,

,  
.

(Synchronizing merge) ---

( -

),

.

(Multi-merge) ---

,

.

(Disctiminator) ---

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.

(Arbitrary cycles) ---

,

.

(Implicit termination) ---

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.

(Multiple instances without

synchronization) ---

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(Multiple

instances with a priori design time knowledge) ---

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	,	(Multiple instances)	
with a priori runtime knowledge) ---		-	
	,	,	,
	.		
	,	(Multiple instances without	
a priori runtime knowledge) ---		-	
	,	,	,
	.		
(Deferred choice) ---		,	-
		,	
	.		
	.		
		(Interleaved parallel routing) ---	
	,	,	-
		,	
	.		
(Milestone) ---		-	
	,		
	.		
(Cancel activity) ---		,	-
		.	
(Cancel case) ---			
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 [47, . 9]. , -  
 , ITIL [2, . 65]  
 .  
 WfMC e WfMC Reference Model [47].  
 (workflow) -  
 , , -  
 , .[47, . 8].  
 -  
 (Process Definition), .  
 , WfMC - ---  
 , - ,  
 , -  
 [47, . 10]. [48, . 126] workflow  
 ( ) , ,  
 - . Workflow -  
 ,  
 - .  
 [46, . 31 -- 35].

1. workflow-  
(*cases*) ,  
:  
:  
( ) ---  
:  
:  
,  
,  
:  
2. (*task*) ,  
,  
:  
- ( ).  
, ( )  
:  
(work item) ( )  
,  
(activity)  
,  
3. (*process*) ,  
:  
,  
workflow,

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4. *(routing)* -

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**Workflow-** -

Workflow, [48,

. 127], ,

Workflow

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Workflow, [48], -

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## Workflow

- [48, . 131 -- 133]

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(build time),

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(run time),

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### 2.4.2.

### workflow

*Workflow.*

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workflow

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-

Cunningham LLP, Toronto,

CA Magazine [49].

,

[50],

Cunningham LLP

,

(B2B)

,

,

,

workflow,

"Bank Technology News" [51], workflow-

Zagiel S.A.,

Infonomics [52].

495

AIIM

2008 -- 2009 . ,

26%

34%

24%

BPM.

64%

(26 %).

(36 % )

workflow

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3.1.

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3.1.1.

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[53, . 44] :

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2. ( )

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6. .

3.1.2.

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[53, . 51 -- 53],  
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( . 1.2.2 . 11), ( .  
Workflow- 2.4.1 . 61) -  
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### 3.2.

### 3.3.

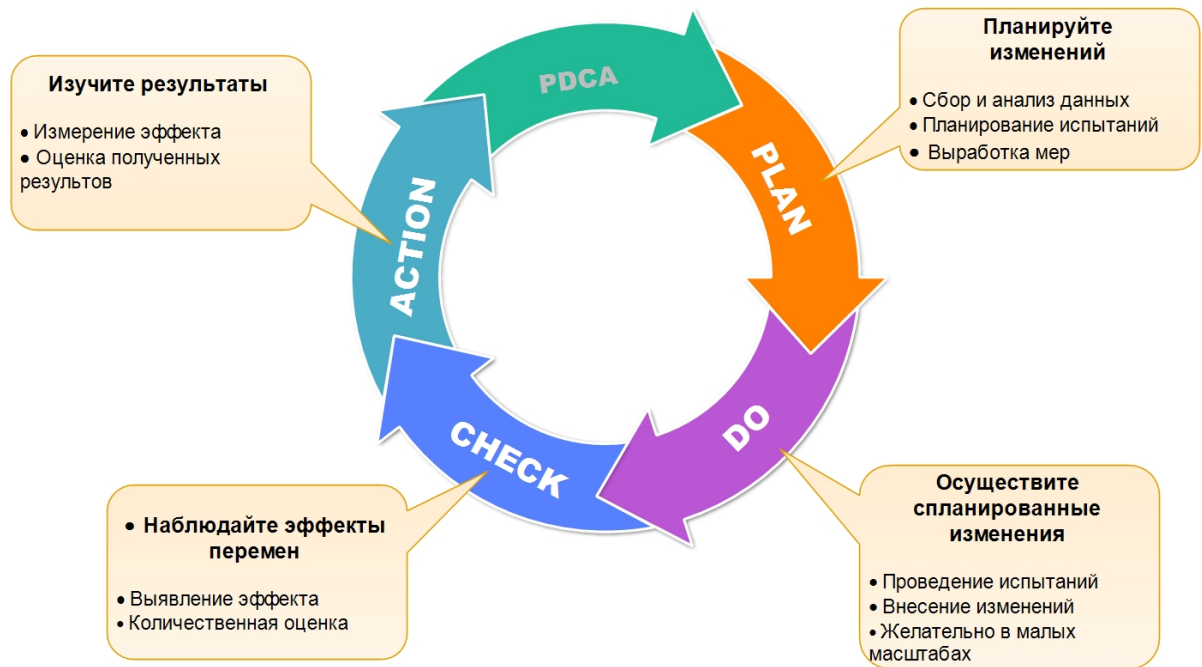
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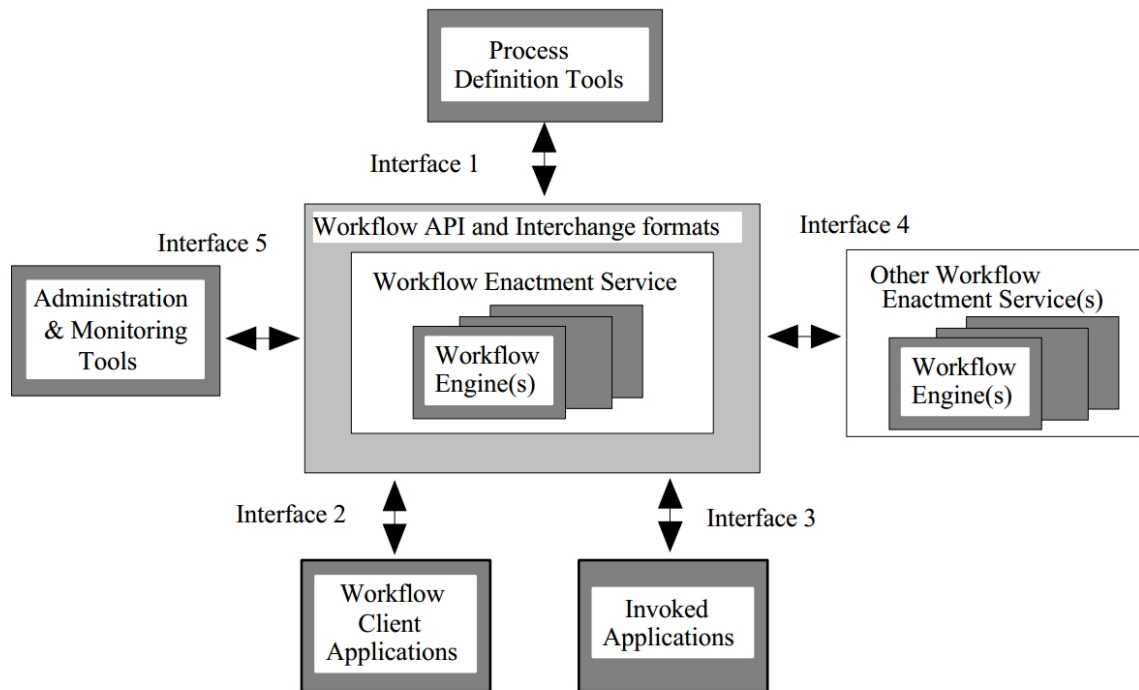
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[30, . 97]



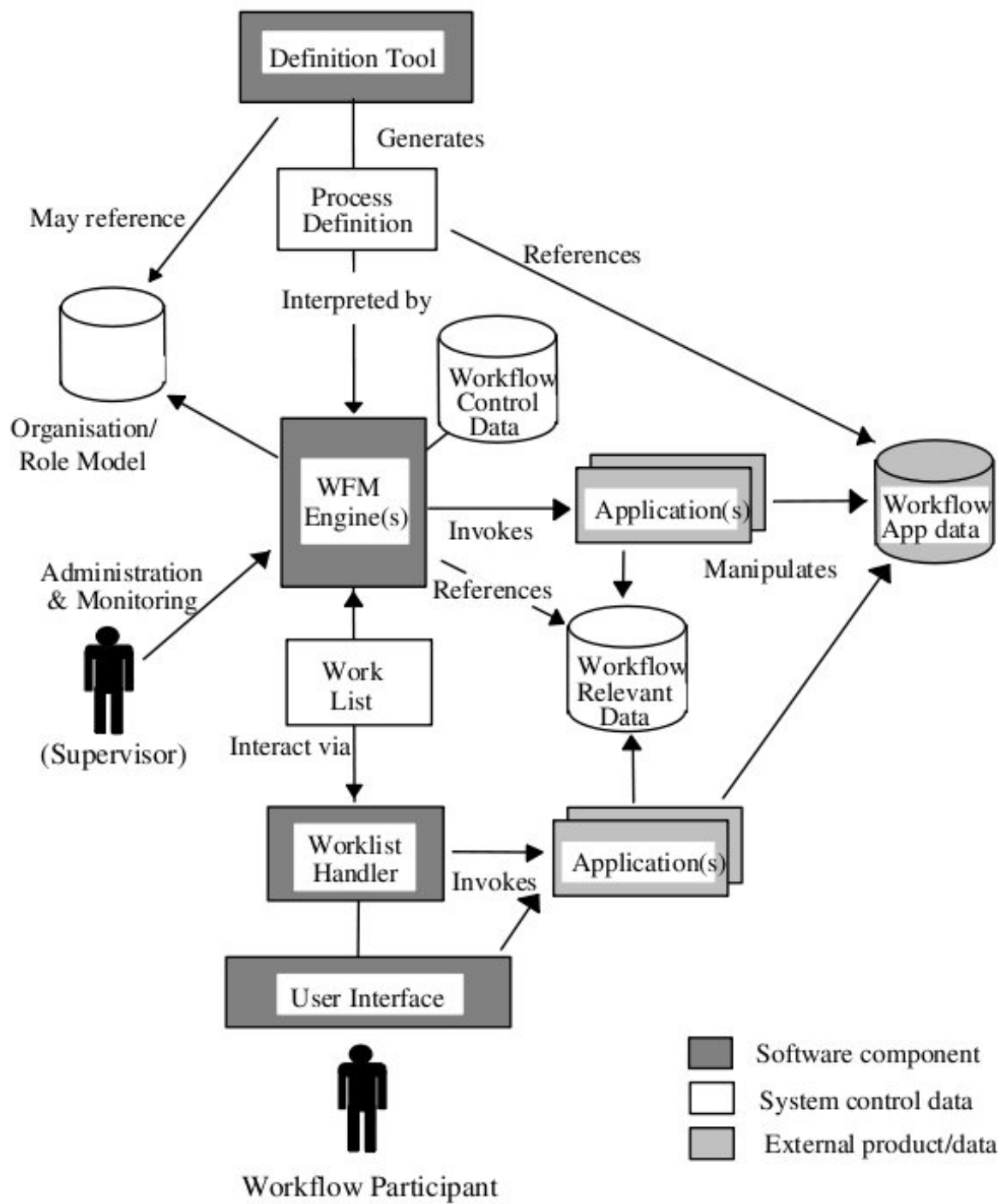
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[32, . 228]

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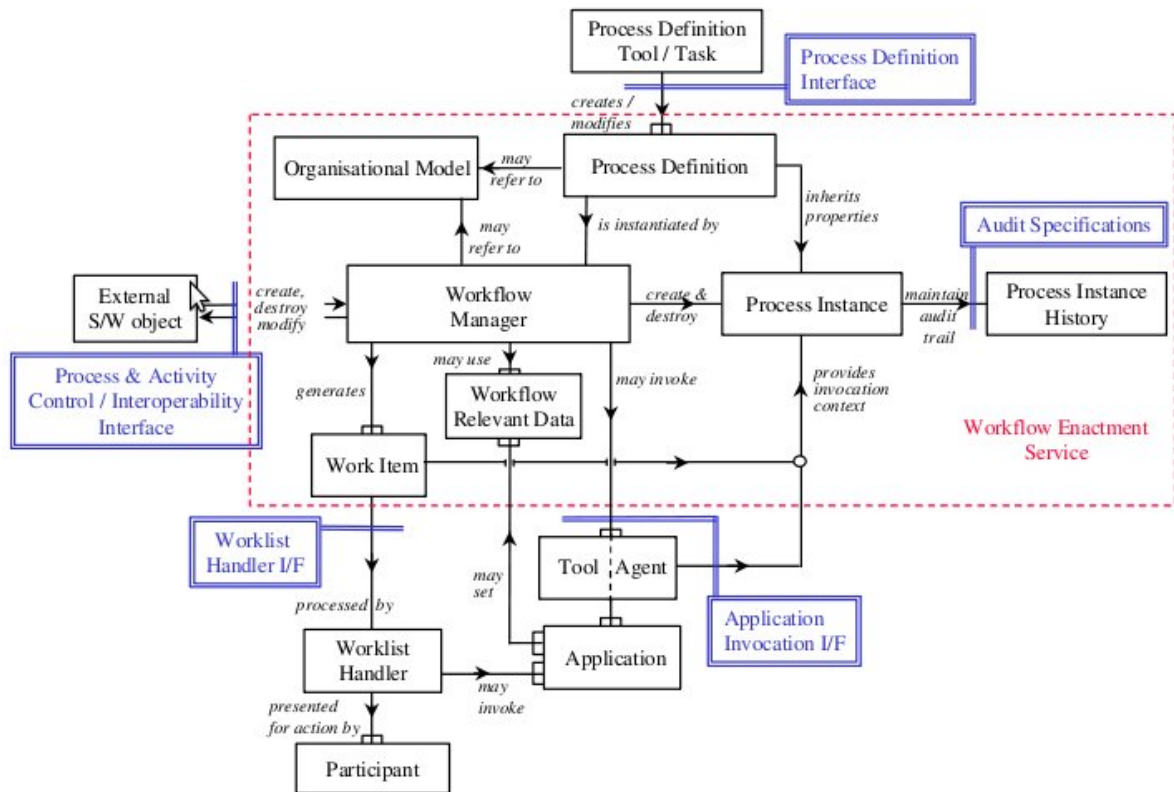
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(Workflow Reference Model) [47, . 23]



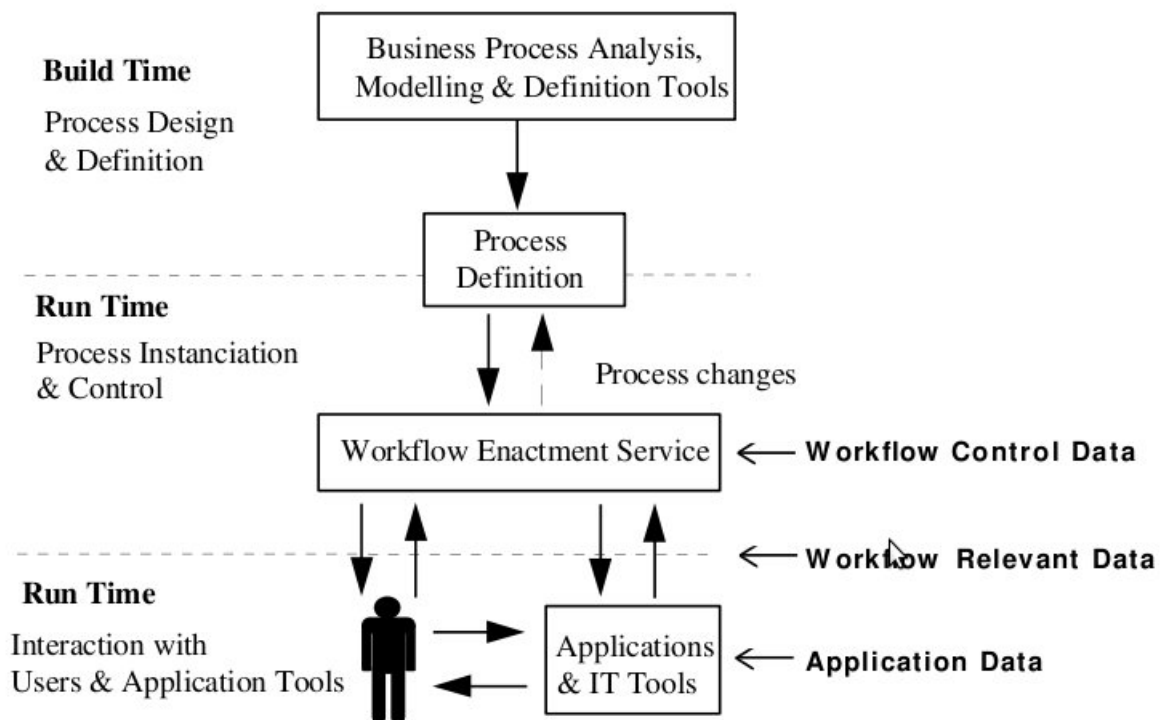
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(Generic Workflow Product Structure) [47, . 39]



### . 3. Workflow

(WFMS Components & Interfaces) [47, . 40]





### . 4.



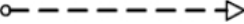
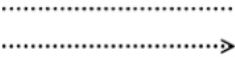
(Types of Data in Workflow Management Systems) [47, . 44]

OMG BPMN v. 2.0

.1. OMG BPMN version 2.0 [39]



(Event)	<p>--- , -</p> <p>- -</p> <p>. -</p> <p>( ) (</p> <p>).</p> <p>,</p> <p>.</p> <p>- ,</p> <p>: (Start),</p> <p>(Intermediate)</p> <p>(End).</p>	
(Activity)	<p>--- , -</p> <p>, -</p> <p>- .</p> <p>,</p> <p>( ).</p> <p>,</p> <p>:</p> <p>(SubProcess) (Task).</p> <p>,</p> <p>.</p> <p>,</p> <p>,</p> <p>.</p>	

.1 ( )

(Gateway)	<p>- , . , - , .</p>	
(Sequence Flow)	<p>- , -</p>	
(Message Flow)	<p>- , BPMN ( - ) .</p>	
(Association)	<p>( , ) , , ( , ) .</p>	

.1 ( )

(Pool)	<div> <div> <div>.</div> <div>,</div> <div>&lt;&lt;</div> <div>&gt;&gt; (B2B).</div> </div> <div> <div>.</div> <div>,</div> <div>&lt;&lt;</div> <div>&gt;&gt;.</div> </div> </div>	<div> <div>Name</div> <div></div> </div>
(Lane)	<div> <div>,</div> <div>(</div> <div>).</div> </div>	<div> <div>Name</div> <div>Name</div> </div>
(Data object)	<div> <div>,</div> <div>/</div> </div>	<div> <div></div> </div>

(Message)	<p>business PartnerRole business PartnerEntry).</p>	
(Group)		
(Text Annotation)	BPMN	