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Agile

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<<\_>> \_\_\_\_\_ 2013 .

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1.1.		.....	4
1.2.	-	. . . . .	
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1.2.1.	-	. . . . .	4
1.2.2.		- . . . .	7
1.2.3.		- . . . .	8
1.3.		. . . . .	
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1.3.1.		. . . . .	
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1.3.4.		- . . . .	
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1.3.5.		. . . . .	18
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2.	-	42
2.1.		42
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2.2.1.	.	-
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		47
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		52
2.3.	-	53
2.3.1.	-	.
		53
2.3.2.		- -
		56
2.4.		59
2.5.		59
3.	3	60
3.1.		60
3.2.		60
3.3.		60
3.4.		60
		61
	OMG BPMN v. 2.0	66
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		71

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## 1.1.

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1.2. - .

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1.2.1. - .

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. [\[1\]](#) - ,

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 ITIL [2, . 5], ,  
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 . - ITIL [2, . 20]  
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 , [3, .  
 55] << - --- ,  
 >>.[3, .  
 55]  
 - [4, . 17 -- 18], [5]  
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[6, c. 148],

[6, c. 148].

[6,

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Process Classification Framework ---

International Benchmarking Clearinghouse ---

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

BEM ---

1.2.2. -

- . -

- .

2006 . -

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, [4, . 27].

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[7, . 15], -

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, [7, . 15] -

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SADT (Structured Analysis and Design Technique) IDEF(Integration Definition for Functional Modeling.)

- [7, . 17]

c ,

- - .

- UML (Unified Modeling Language).

- [7, . 18]  
 ,  
 - ,  
 . , -  
 - , ARIS(Architecture of Integrated  
 Information Systems).

[7, . 14] , --

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### 1.2.3.

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 . [4, . 27],  
 -  
 , (

2006 .):

DFD (Data Flow Diagram) -  
 ( );

SADT (Structured Analysis and Design Technique) - ;

ERD (Entity-Relationship Diagram) --- " - ";

STD (State Transition Diagram) --- ;

( ) .



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UML (Unified

Modeling Language) , . , . . . .

UML , -

, : [4, . 60]

(use case diagrams) --

;

(class diagrams) --

;

(statechart diagrams) -- -

;

(activity diagrams) --

;

(interaction diagrams) : -

(sequence diagrams) (collaboration diagrams) --

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(component diagrams) --

;

(deployment diagrams) -- -

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UML , -

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2004 . BPMN, BPMN 2.0 Object Management Group (OMG) . [8] 2.0 <<Business Process Model and Notation>> [9] 2011 . , . , , [7, . 71 -- 81] *EPC* (c ) *BPMN* ( - ). BPMN BPMN - - , --- - , - . BPMN ( . . 66). - OMG BPMN. BPMN - : , ( ) --- -- . - , , [9, . 26] - / .

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*BPMN*,

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:[9, . 30]

1. (Flow Objects);
2. (Data);
3. (Connecting Objects);
4. (Swimlane);
5. (Artifacts).

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1.3.1.

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 30 -- 31], -  
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 . [6, . 31]  
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 ( ) >>. -  
 , [6, . 31], [6, . 148], -  
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 [7, . 27],  
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 [7, . 30], -  
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 1.3.2. - .  
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9001[11]), (

9004)

[10], [11],

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[11,

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[7, . 63 -- 70]

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FAST ---

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( )

( ,RBP),

[? ],

(Kaizen),

[12].

( [1.3.4](#) .

16, [1.3.5](#) . 18).

1.3.3.

1.3.4.

>>.[3](#), . 52]

: [3](#), . 181]





1.3.5.

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 .  
*Kaizen*.  
 .  
 ,  
 (continuous  
 improvement). [13, . 48 -- 49] ,  
 (Continuous Process Improvement)  
 ,  
 .  
 - ITIL [2, . 39] ---  
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 , . ,  
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 ,  
 --- (*Kaizen*).  
 ,  
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 << : >> [12]  
 , ,  
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 . [12], --- ,  
 ,

(Toyota) [14], Nippon Steel Corp., Honda Motor Corp., Suzuki Motor Corp., Takagi Seiko [15].

[12],

TQC ( ) ---

( ) ---

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TPM ( ) ---  
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(just in time);  
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 . [12]  
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1.3.6.

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[? , c/ 93 -- 98].

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: [16, . 13]

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( *ERP*- ), -

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DocFlow Workflow ---

ERP- SAP -- 49,9%, 1 -- 29,2%,  
Oracle 8%. [17]

1.4.

1.4.1.

[18, . 6]

PMBOK Guide [19, . 3],

[20, . 41],

[21, . 8],



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 >>.[20, . 45]

, PMBOK 5 [19],

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[6, . 181]

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[22, . 34]

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[23, . 21 -- 23]

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 [23], [22].

#### 1.4.2.

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 [24, . 44] :

1. ( ) ;
2. ( ) ;
3. , ;
4. , , , ;

5. ;

6. .

51 --53] ( [24, .

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1.4.3.

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51897-2011 [? ]

<< -  
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PMBOK 5 [19, .

309],

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: [22, с. 91 -- 93]

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[22, . 102].

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[22]

:

(equirisk contour method) ---

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(probablistic event analysis, PEA) ---

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ABC

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&gt;&gt; [22, . 340].

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[22, .

342 -- 355]

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(critical path method),

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*PERT*.

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[22,

. 355 -- 357],

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( .  
[\[22, . 330 - 336\]](#))  
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[\[22, . 357 -- 370\]](#)  
 (milestone plan).

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1.4.4.  
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*Agile* . *Agile*.  
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/ 12207-99 [26]  
(life cycle model) << , ,  
, ,  
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[27, .46]:

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  - ;
  - ;
  - ( ) .
- ( ) ( ).

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 , , -  
 ( . 19.102-77 [28]) -  
 ( 34.601-90 [29]). -  
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 Agile -  
*Agile* ( ) [30] ( ) -  
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 Agile ,  
 2001 17  
 , (K.  
 Beck) . (A. Cockburn). [31]

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1. .
2. .
3. .
4. .

Agile

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: [31]

1. -  
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2. ,  
 , Agile,  
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agile

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Agile.

: [32, . 3]

(Scrum) ---

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scrum ---

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.[\[33\]](#)

(Extreme Programming, XP) ---

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.[\[34\]](#)

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[\[27\]](#), . 110],

agile

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Extreme Programming (XP) ---

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CRC

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Scrum ---

30-

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Crystal methodology ---

, - , .

Dynamic System Development Methodology (DSDM) ---

, , .

Rapid Application Development (RAD) ---

, - , .

Adaptive Software Development ---

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Lean Development ---

, , , .

Feature-driven development ---

, .

1.4.5.

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PMBOK Guide [21, .33]

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[35, .57 -- 58]

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• ,

— (Work Breakdown

Structure);

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— ;

— (executive

dashboard).

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 , (e-mail, . .)  
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[35, . 57 -- 58]).

1.5.

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## 2.1.

## 3.

## 2.2. Workflow.

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

## 2.2.1.

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*WfMC*.

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ITIL [2, . 84],

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&gt;&gt;.

[36].

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WfMC

(workflow management system)

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(workflow engine).

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[37, . 9].

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ITIL [2, . 65]

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WfMC

e WfMC Reference Model [37].

(workflow)

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. [37, . 8]

-

(Process Definition),

, WfMc - --- -  
 , - ,  
 ,  
 .[37, . 10] [38, . 126] workflow (  
 ) , -  
 - . Workflow  
 ,  
 - .

[36, . 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, [38, .

127], , ,

. Workflow

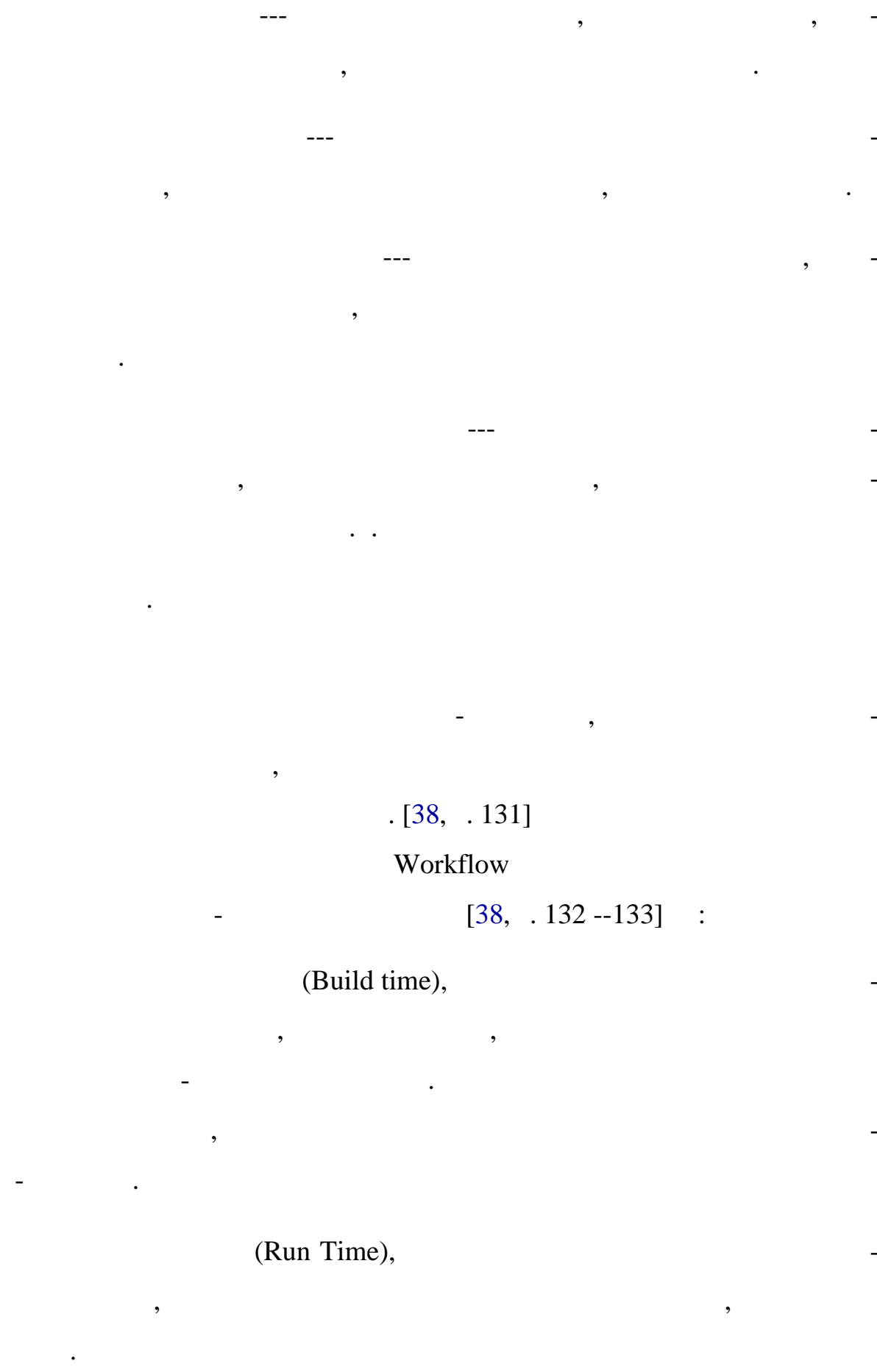
- ,

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, -

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Workflow : [38]



[38, . 131]

Workflow

[38, . 132 --133] :

(Build time),

(Run Time),

## 2.2.2.

workflow.

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YAWL,

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,"

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(

workflow [39]

20-

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"

"

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,

[39, . 10]

:

(Sequence) ---

,

(Parallel split) ---

,

(Synchronization) ---

(Exclusive choice) ---

,

(Simple merge) ---

(Multi-choice) ---

(Synchronizing merge) ---

(Multi-merge) ---

(Discriminator) ---

(Arbitrary cycles) ---

(Implicit termination) ---

(Multiple instances without synchroni

---



	,	(Multiple instance
with a priori design time knowledge) ---		
	,	-
	.	
	,	(Multiple instances
with a priori runtime knowledge) ---		-
	,	,
	.	
	,	(Multiple instances without
a priory runtime knowledge) ---		-
	,	,
	.	
(Deffered choice) ---	,	-
	,	
	.	
	.	
		(Interleaved parallel routing) ---
	,	-
	,	
	.	
(Milestone) ---		-
	,	
	.	
(Cancel activity) ---	,	
	.	

(Cancel case) ---

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workflow.

BPMN

(workflow)

Workflow Management Coalition

(WfM Coalition).

WfMc

-

,

workflow.

BPMN

( . 1.2.3 . 10).

YAWL

*YAWL (Yet Another Workflow Language)*

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(Aalst)

(Hofstede) 2003

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[39],

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YAWL

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[39, c. 3]

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&lt;&lt;

>> [2.2.2](#) . [52](#).

YAWL

(workflow patterns).

( .

[2.2.2 47](#)).

WSPD

OMG JoinFlow

EFC

WF-XML

SWAP

BPEL

XPDL

( ) . -

- . -

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- .

[36]

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2.2.3. Workflow .

workflow --

Cunningham LLP,

Toronto, CA Magazine [40]. ,

[41], Cunningham LLP

(B2B)

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workflow,

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Workflow -

, "Bank Technology News"[42], workflow

, Zagiel S.A.,

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Infonomics [43]. 495

AIIM, 2008 -- 2009 . , -  
 26%  
 , 34% -  
 , 24%  
 BPM. 64% -  
 - ,  
 . , - -  
 (26 %), 36 % -  
 BPM  
 .

## 2.3. -

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

2.3.1. - .  
 - ,  
 BPM CBOK <<  
 - >> [44], ABPMP (Association  
 of Business Management Professionals).  
 ABPMP [44, . 24]

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- , ABPMP

CBOK [44, . 28],

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289 -

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c- [45], 20 -

- :

(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) ---

,

;

(improve model, ImpM) ---

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2.3.2.

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IT  
 Gartner[46], c ( . Business Process Management Suite),  
 ---  
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 . BPM-  
 - ( ),  
 << , , ,  
 . BPMS  
 -  
 - ,  
 .>>[47]  
 ,  
 - , << >>  
 (Handbook on Business Information Systems) [48]  
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 - .  
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 : [48, . 100 -- 101]  
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(SOA)

:[44]

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2.4.

• , BPMS 2 .

WORKFLOW. -

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

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2.5.

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3.1.

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3.2.

3.3.

3.4.

3.

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4. , , - , 2006. . 240.
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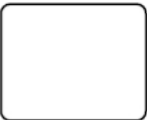


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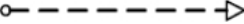
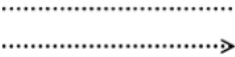
## OMG BPMN v. 2.0

.1.


OMG BPMN version 2.0 [9]



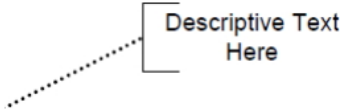
(Event)	<p>--- , -</p> <p>- -</p> <p>.</p> <p>- -</p> <p>( ) ( -</p> <p>). -</p> <p>,</p> <p>-</p> <p>.</p> <p>-</p> <p>- , -</p> <p>: (Start), -</p> <p>(Intermediate)</p> <p>(End).</p>	
(Activity)	<p>--- , -</p> <p>,</p> <p>- .</p> <p>,</p> <p>( ). -</p> <p>,</p> <p>:</p> <p>(SubProcess) (Task). -</p>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

.1 ( )

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

.1 ( )

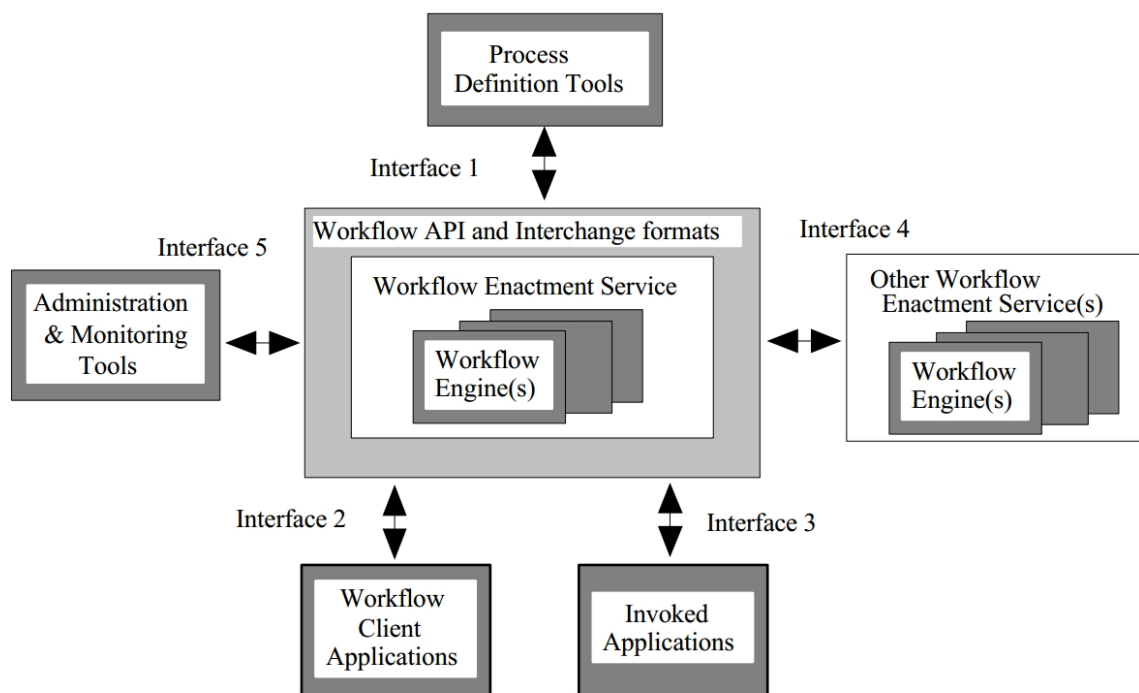
(Pool)	<div style="position: relative; height: 400px;"> <span style="position: absolute; top: 5%; left: 60%;">-</span> <span style="position: absolute; top: 15%; left: 35%;">.</span> <span style="position: absolute; top: 25%; left: 55%;">,</span> <span style="position: absolute; top: 35%; left: 25%;">&lt;&lt;</span> <span style="position: absolute; top: 35%; left: 48%;">&gt;&gt; (B2B).</span> <span style="position: absolute; top: 45%; left: 25%;">.</span> <span style="position: absolute; top: 45%; left: 35%;">,</span> <span style="position: absolute; top: 55%; left: 40%;">,</span> <span style="position: absolute; top: 55%; left: 35%;">&lt;&lt;</span> <span style="position: absolute; top: 55%; left: 55%;">&gt;&gt;.</span> </div>	<div style="position: relative; height: 400px;"> <span style="position: absolute; top: 5%; left: 60%;">-</span> <span style="position: absolute; top: 15%; left: 60%;">-</span> <span style="position: absolute; top: 25%; left: 60%;">-</span> <span style="position: absolute; top: 35%; left: 60%;">-</span> <span style="position: absolute; top: 45%; left: 60%;">-</span> <span style="position: absolute; top: 55%; left: 60%;">-</span> </div> <div style="border: 1px solid black; width: 250px; height: 70px; margin-top: 10px;"> <div style="background-color: #f0f0f0; padding: 2px; font-size: small;">Name</div> </div>
(Lane)	<div style="position: relative; height: 200px;"> <span style="position: absolute; top: 5%; left: 35%;">,</span> <span style="position: absolute; top: 5%; left: 60%;">(</span> <span style="position: absolute; top: 65%; left: 55%;">).</span> </div>	<div style="position: relative; height: 200px;"> <span style="position: absolute; top: 5%; left: 60%;">-</span> </div> <div style="border: 1px solid black; width: 250px; height: 70px; margin-top: 10px;"> <div style="background-color: #f0f0f0; padding: 2px; font-size: x-small;">Name</div> <div style="padding: 2px; font-size: x-small;">Name</div> <div style="background-color: #f0f0f0; padding: 2px; font-size: x-small;">Name</div> </div>
(Data object)	<div style="position: relative; height: 200px;"> <span style="position: absolute; top: 5%; left: 60%;">-</span> <span style="position: absolute; top: 15%; left: 35%;">,</span> <span style="position: absolute; top: 15%; left: 45%;">/</span> <span style="position: absolute; top: 25%; left: 40%;">.</span> </div>	<div style="position: relative; height: 200px;"> <span style="position: absolute; top: 5%; left: 60%;">-</span> <span style="position: absolute; top: 15%; left: 60%;">-</span> <span style="position: absolute; top: 25%; left: 60%;">-</span> </div> <div style="text-align: center; margin-top: 20px;">  </div>

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

.1. - -  
[13, . 228]

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- . . . . . ( ). , . .	- . . . . . ( ). - . .
: .	: .

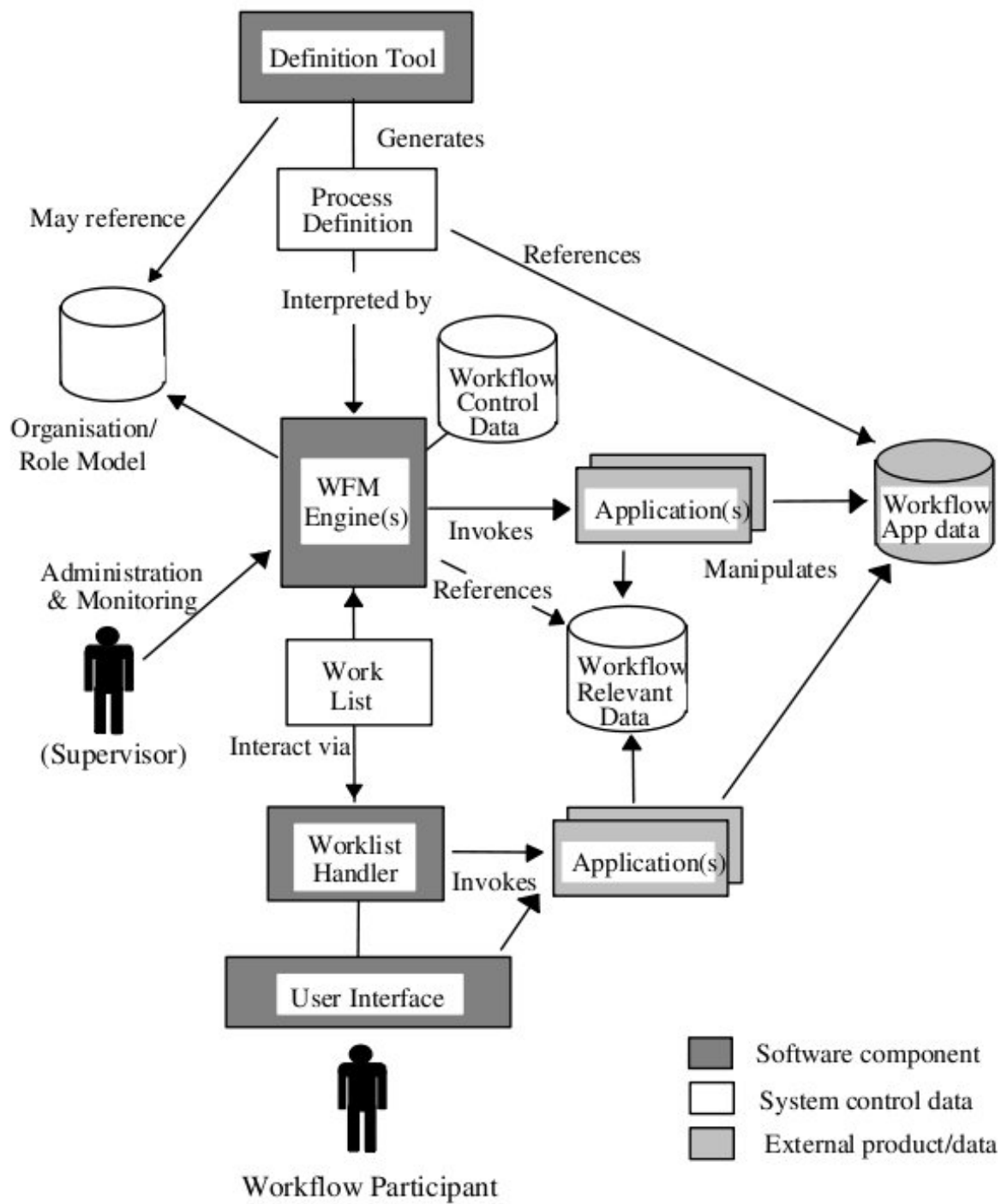
: WfMS, WfMC, Workflow management system, workflow,  
, Workflow. [\[37\]](#)



. .1. "

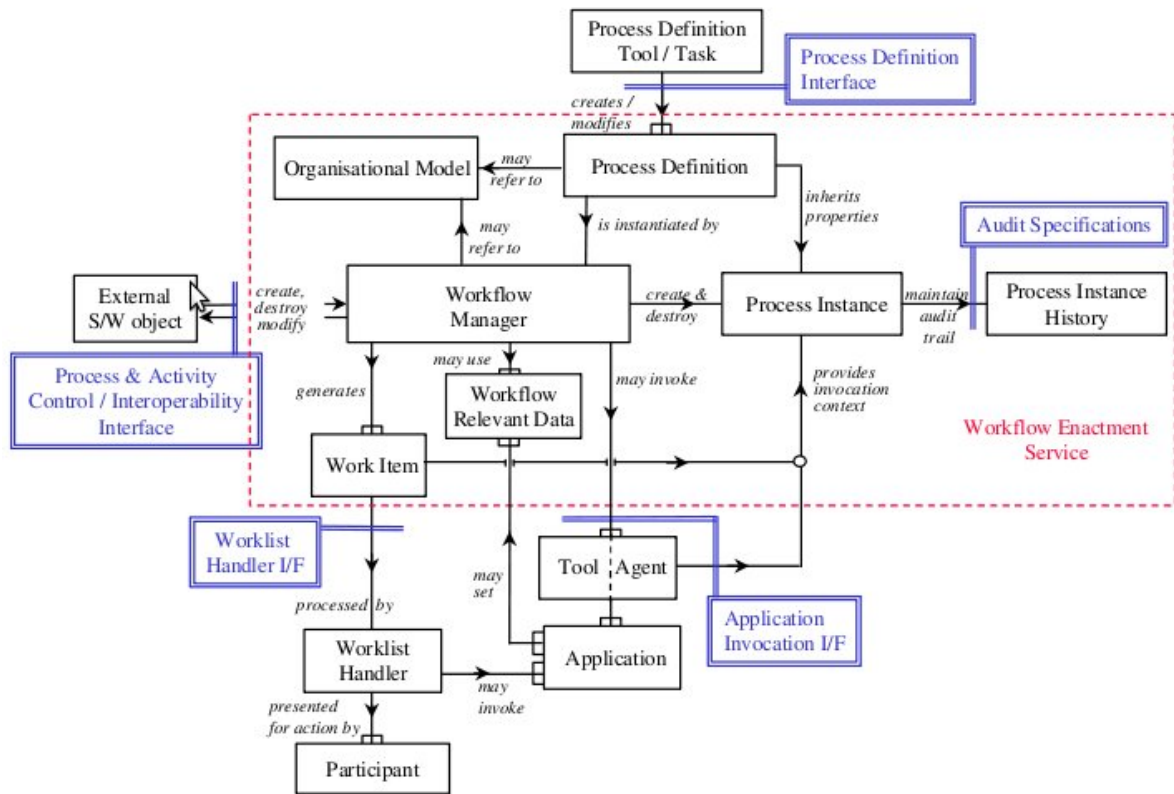
(Workflow Reference Model) [37, . 23]



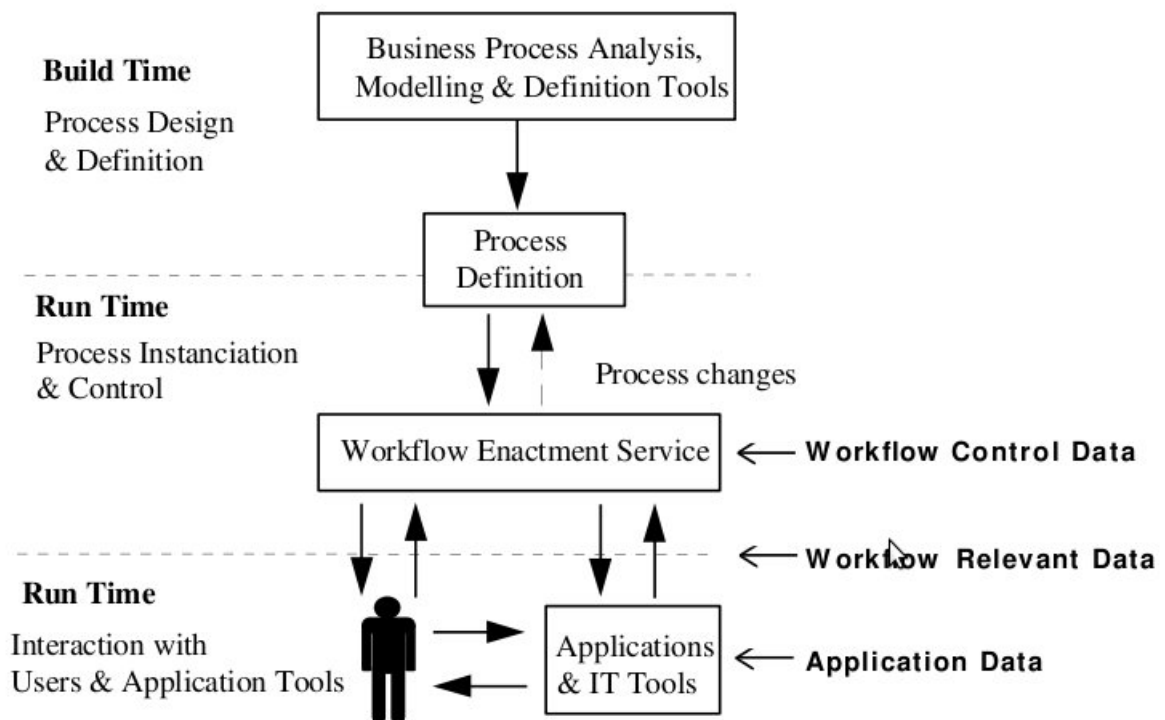


. .2.

(Generic Workflow Product Structure) [37, . 39]



. 3. Workflow  
(WFMS Components & Interfaces) [37, . 40]



. 4.  
(Types of Data in Workflow Management Systems) [37, . 44]