

, << >>

-

# Agile

4013 -2

230105 65 -

\_\_\_\_\_ . .  
( ) \_\_\_\_\_ . .  
\_\_\_\_\_ . . . , . .

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

\_\_\_\_\_ . . .

, 2013

<b>1.</b>	-	.....	4
1.1.		.....	4
1.1.1.	-	.....	4
1.1.2.		.....	7
1.2.		.....	9
1.2.1.		.....	9
1.2.2.		.....	11
1.2.3.		.....	14
1.2.4.		.....	18
1.2.5.		.....	24
1.3.	-	.....	26
1.3.1.	.	- -	26
		.....	26
1.3.2.		.....	28
1.3.3.	-	.....	33
1.3.4.		.....	34
1.3.5.		.....	38
<b>2.</b>	-	.....	39
2.1.		.....	39
2.2.	-	.....	40
2.2.1.		.....	41
2.2.2.	-	.....	44
2.2.3.		- . . .	49
2.3.		.....	49

2.3.1.	- .	49
2.3.2.	- -	52
2.3.3.		55
2.4. Workflow.		58
2.4.1.		58
2.4.2.	workflow	62
3.		65
3.1.		65
3.1.1.		65
3.1.2.	-	66
3.1.3.		66
3.2.		67
3.3.		67
		68
	-	73
		74
		75
	<b>OMG BPMN v. 2.0</b>	78

-

:

## 1.1.

### 1.1.1.

-

.

-

.

.

-

.

-

,

,

-

.

,

,

.

[1]

-

,

&lt;&lt;

-

.

-

.

,

---

-

&gt;&gt;.

,

ITIL [2, . 5],

,

,

,

.

-

ITIL [2, . 20]

,

-

,

.

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

-

---

,

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

-

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

:

-

,

,

.

,

,

.

-

,

-

,

.

-

,

.

-

,

-

,

.

-

,

-

,

.

-

---

,

-

.

-

-

,

,

,

.

-

,

,

( ),

-

. , ,

[6, c. 148],

.  
- . ,  
 ,

[6, c. 148].

- . -  
 ,  
 .  
 ,  
 .

[7, . 110]

, , -  
 , . ,  
 ,  
 :  
 -  
 --- , , ,  
 . . :

- . .
- 
- 
- 
- 

( ) -  
 .  
 :

- 
- 
- 
- 

-

--

,

-

.

,

[6, . 148]

,

-

:

## Process Classification Framework ---

-

.

## International Benchmarking Clearinghouse ---

.

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

**BEM** ---

### 1.1.2.

.

.

-

.

,

.

-

.

.

---

,

-

.

,

-

,

.

,

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



[8, . 30],

## 1.2.

### 1.2.1.

[9, .6]

PMBOK Guide [10, . 3],

---

( ),

, , ,  
 . -

[11, . 41],

<<

,

,

;

,

, , ,

>>.

[12, . 8],

,

, ,

,

.

, , ,

.

[11, .45],

<<

,

,

,

>>.

, PMBOK 5 [10],

;

;

.

,

,

,

, .

, , -  
.

[6, . 181]

---

, .  
-  
,  
, .

### 1.2.2.

.

. -

, PMBOK 5 [10, . 309],

:

- ;
- ;
- ;
- ;
- ;
- ;

[13, с. 91 -- 93]:

- , ;

- , ;
- , ;
- ;
- ;

,

e

-

• ,

,

PMBOK [10]

:

---

,

;

---

,

,

;

---

,

-

,

;

---

,

;

---

.

[14, . 46]

,

:

•

;

- ;
- ;
- ( ) .

.

[13, . 34]

:

---

-

,

;

, . .

,

.

( )

---

,

-

,

-

;

,

-

.

,

.

,

.

,

,

[15, . 21 -- 23]

[15], [13].

1.2.3.

,

.

.

[16, . 41],

- &lt;&lt;

,

,

&gt;&gt;.

-

.

51897-2011 [17]

&lt;&lt;

&gt;&gt;.

,

,

.

,

,

,

.

. ,

( ),

[13, . 102].

,

,

[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)

<<

, ,  
 , -  
 >>.  
 ( ) ( ).  
 ( , -  
 ), -  
 , , -  
 . -  
 , ,  
 ( . 19.102-77 [19]) -  
 ( 34.601-90 [20]).  
 - , -  
 ,  
 .  
 ,  
 . -  
 , -  
 , .  
**Agile** -  
*Agile* ( ) [21] ( )  
 , -  
 , ;  
 , " " -  
 ;

,

.

Agile

,

2001

17

(K.

,

.

Beck)

.

(A. Cockburn).

[\[22\]](#)

:

1.

.

2.

.

3.

.

4.

.

Agile

-

: [\[22\]](#)

1.

-

,

.

2.

,

,

.

Agile,

-

,

.

3.

-

,

.

4.

.

5. .  
- , .
6. -  
- , .
7. ---  
.
8. .
9. -  
- , .
10. .
11. ,  
.
12. -  
.  
- ,  
- ,  
( ) .  
- ,  
- ,  
agile  
- ,  
.

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

,  
 [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 ---**

,  
 , .

1.2.5.

.

PMBOK Guide [12, . 33]

, , -

, , .

, . -

.

-

. " "

, , .

, -

, , .

-

, ,

.

-

, -

,

, . ,

[26, . 57 -- 58]

:

•

,

:

—

;

—

;



- .
- , :  
— (Work Breakdown  
Structure);  
— ;  
— ;  
— ;  
— ;  
— ;  
— ;  
— (executive  
dashboard).
- , —  
 ,  
 , :
- , —  
 , ,  
 .
- ,  
 — , , .
- , —  
 , :  
— ,



9004 [29], .

[27], [28], -

,

.

,

,

,

,

.

-

,

,

.

9000

-

[28, . 7]

,

,

-

,

,

.

,

.

,

,

[8, . 63 -- 70]

-

:

**FAST ---**

-

,

.

.

---

-

-

.

---

,

### 1.3.2.

. 95]

[30,

. 73),

:

,

;

;

-

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

--  
 [31],  
 - .  
 [31, . 205 -- 216],  
 :  
 •  
 :  
 ---  
 ,  
 ,  
 :

—

—                    -                    ;

—                    ,

—                    -                    ;

—                    ,                    ;

—                    ,                    -

—                    ;

—                    ,                    -

—                    .

—                    ,                    -

—                    ,                    .

—                    ---                    ,

—                    ,

—                    :

—                    ,                    -

—                    ;

—                    ,                    ;

—                    ,

—                    .

—                    ,                    -

—                    -

—                    .

—                    ---                    ,                    -

— : •

---

—

;

---

—

;

---

;

---

—

,

—

;

---

;

---

—

,

;

---

—

---

—

,

;

---

—

,

—

;

---

—

- 
- ,

‘ , ‘ , ‘

• • •

—

, ;

— C

, —

;

•

:

---

,

,

.

---

,

—

,

.

---

,

,

.

•

:

---

,

—

,

---

,

—

,

.

---

,

—

,

—

.



### 1.3.3.

### 1.3.4.

*Kaizen.*

(continous

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

(Continuous Process Improvement)

, .

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

,

,

.

- ,

, -

, . ,

,

,

--- (*Kaizen*).

,

.

<< : >> [33]

, ,

,

. [33], ---

,

,

,

,

,

,

.

,

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

TPM (

) ---

(just in time);

---

,

,

-

;

,

,

-

,

.

-

. [33]

### 1.3.5.

---

-

( , ) ---

-

,

.

-

( .

. 74).

■

∴ − ( ). −

− .

• , −

•

•

•

•

## 2.1.

•

•

•

,

[8, . 93 -- 98].

∴

---

,

−

•

---

−

−

•

---

−

−

•

---

−

,

,

.  
 , -

: [36, . 13]

--- ,  
 ,  
 ,  
 . ,

( ), ( *ERP*- -  
 ), ( ), - -  
 . .

, -  
 -  
 ,  
 .

- --- -  
 - . -  
 - -  
 - .  
 .

## DocFlow Workflow ---

, , ,  
 .

## 2.2. -

- . -



- . [8, . 14] ,

-

,

( ) - .

**2.2.1.**

2006 . -

-

, [4, . 27].

- , -

- .

[8, . 15], -

:

- c ;
- - ;
- , - .

,

.

,

- .

2004 . BPMN,

BPMN 2.0 Object

Management Group (OMG) . [37]

-  
 .  
 ,  
 -  
 ,  
 [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.  $O$ ;

, . . . -

, -

, -

. ( . : [?

) , ,

.

, -

.

[38, . 18]

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

$a_i \in A.$   $V$  -

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

·

$\mu$

. -

,

$\mu : P \rightarrow N,$

$C, \mu.$

### 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) ---  
.

-

**BPMN**

**BPMN**

- -

,

---

-

,

-

,

-

-

.

**BPMN**

( .

. 78).

OMG BPMN.

**BPMN**

-

:

(

)

---

--

.

-

,

,

[39, . 26]

.

-

/

.

---

,

-

.

,

.

---

,

.

-

,

---

.

*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.

-

**BPEL**

**XPDL**

**WF-XML**

## 2.3.

. WORKFLOW. WORKFLOW  
WORKFLOW.

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

### 2.3.1.

- .

-

,

BPM CBOK <<

- &gt;&gt; [41],

ABPMP (Association

of Business Management Professionals).

ABPMP [41, . 24]

, -

, , , , ,

- ( )

,

-

.

-

,

ABPMP

CBOK [41, . 28],

-

:

--- ,

.

---

-

,

-

.

---

( )

-

,

.

-

,

.

---

,

.

---

-

,

.

---

-

289

-

,

c- [42], 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) ---

.

,

,

,

,

-

,

-

.

2.3.2. -

-

,

-

-

IT

.

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

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

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

,  
 - . -  
 -  
 : [45, . 100 -- 101]

--- ,  
 - ;  
 ---  
 - ;  
 --- , -  
 , ;  
 ---  
 - ;

--- ,  
 - ;  
 --- -  
 ;  
 ---  
 ;  
 --- - -  
 ;  
 --- -  
 ,  
 --- ,  
 ;  
 --- ,  
 ;  
 - (SOA)  
 :[\[41\]](#)  
 • , ;  
 • ;  
 • ;  
 • ;  
 • - ;

### 2.3.3.

, ,  
 YAWL, , "

---

( workflow [40] 20-

,

"

,

,

[40, . 10 -- 39] :

(Sequence) --- ,

.

(Parallel split) ---

,

(Synchronization) ---

.

(Exclusive choice) --- ,

.

(Simple merge) ---

.

(Multi-choice) --- ,

, ,  
.

(Synchronizing merge) ---

( -

),

.

(Multi-merge) ---

,

.

(Disctiminator) ---

,

-

.

(Arbitrary cycles) ---

,

.

(Implicit termination) ---

,

,

-

.

(Multiple instances without

synchronization) ---

-

.

,

(Multiple

instances with a priori design time knowledge) ---

-

,

.



	,	(Multiple instances)	
with a priori runtime knowledge) ---		-	
	,	,	,
	.		
	,	(Multiple instances without	
a priori runtime knowledge) ---		-	
	,	,	,
	.		
(Deferred choice) ---		,	-
		,	
	.		
	.		
		(Interleaved parallel routing) ---	
	,	,	-
		,	
	.		
(Milestone) ---		-	
	,		
	.		
(Cancel activity) ---		,	-
		.	
(Cancel case) ---			
	,	.	
	,		
	,		

,

•

,

•

•

—

•

,

,

9

—

,

,

•

—

9

,

2

9

, -  
 , , -  
 .  
 , -  
 , -  
 . -  
 ,  
 [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,

.

4. *(routing)* -

,

.

.

.

,

.

**Workflow-** -

Workflow, [48,

. 127], ,

Workflow

- ,

.

,

.

Workflow, [48], -

:

---

,

,

---

,

---

,

,

---

,

.

---

,

,

-

. .

## Workflow

-

[48, . 131 -- 133]

:

(build time),

,

,

-

-

.

,

-

.

(run time),

-

,

,

.

-

,

-

,

.

### 2.4.2.

### workflow

*Workflow.*

-

workflow

.

-

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

:

.

.

,

.

-

.

.

3.1.

,

.

.

3.1.1.

,

-

.

,

,

.

-

[53, . 44]

:

1.

( )

;

2.

( )

;

3.

,

;

4.

,

,

,

;



5. ;
6. .

3.1.2.

，  
-  
.  
，  
[53, . 51 -- 53],  
，  
.  
-  
，  
( )  
.  
-  
，  
.  
.  
....  
，  
-  
( . 1.2.2 . 11), ( .  
Workflow- 2.4.1 . 61) -  
( .  
2.3.1 . 50),  
( .  
2.3.3 . 55) .

3.1.3.

，  
.

, .  
-  
,  
. . [54] . [55],  
:  
• , ;  
• ;  
• ;  
• ;  
• -  
• ;  
• .  
-  
-  
, ,  
,  
.

3.2.

3.3.

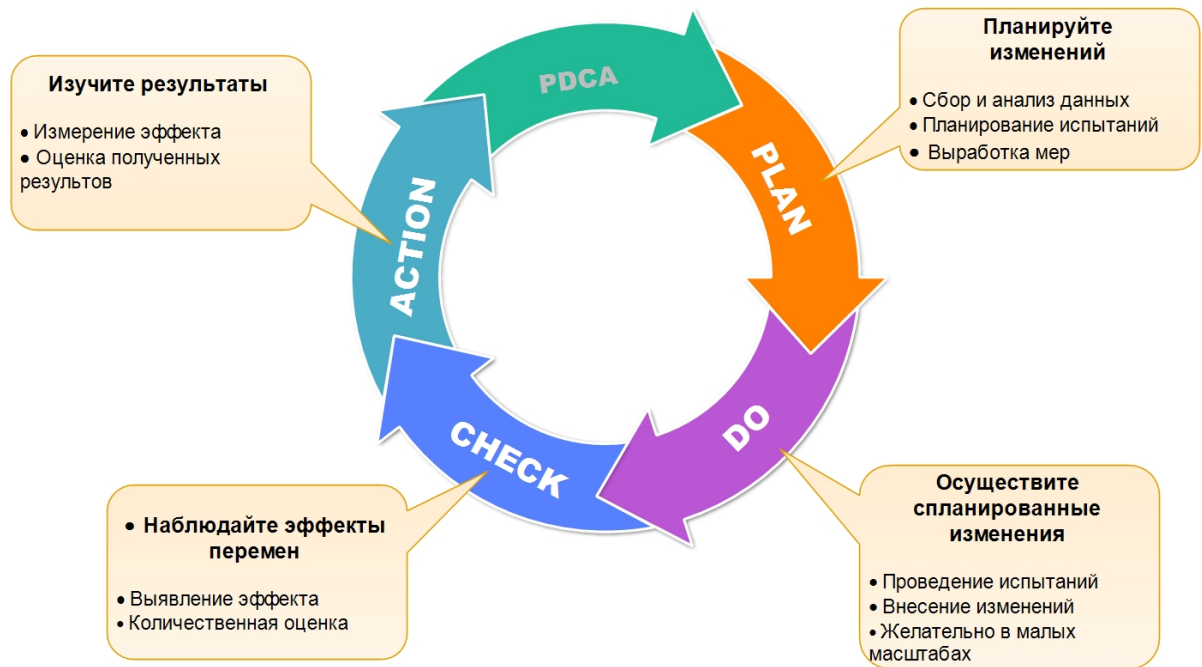
1. Davenport T. H. Process Innovation: Reengineering Work through Information Technology. Boston, MA, USA: Harvard Business School Press, 1993.
2. itSMF. ITIL. itSMF Russia, 2011. .  
 . itSMF Russia.
3. . . :  
 . : , , 2006. . 287. . . .
4. . . , , -  
 - . : , 2006. . 240.
5. . . . - -  
 . : : , 1997. . 224. . . .
6. . :  
 : , 2006. . 528.
7. . . : " 2005. . 608.
8. . . . : . :  
 - , 2013. . 118.
9. Wysocki R. K. Effective Project Management. Traditional, Agile, Extreme. 6th edition edition. Indianapolis: John Wiley & Sons, Inc., 2012. P. 710.
10. Institute P. M. A Guide to the Project Management Body of Knowledge (PMBOK Guide) - Fifth Edition. Project Management Institute, 2004. P. 388.
11. . . . - : , 1996. . 610.

12. Institute P. M. A Guide to the Project Management Body of Knowledge (PMBOK Guide) - Third Edition. Project Management Institute, 2004. P. 388.
13. << - >>, 2004. . I. . 400.
14. Charvat J. Project management methodologies: selecting, implementing, and supporting methodologies and processes for projects. Hoboken, New Jersey: John Wiley & Sons, Inc., 2003. P. 264.
15. . . . - : , 2006. . 400.
16. . - : , 1996. . 183.
17. 73:2009 . . . . . 2011.
18. 12207-99 . . . . 1999.
19. 19.102-77 . . . . 1977.
20. 34.601-90 . . . . 1990.
21. Ambler S. Disciplined Agile Software Development: Definition. 2007. URL: <http://agilemodeling.com/essays/agileSoftwareDevelopment.htm>.
22. Beck K., Beedle M., van Bennekum A. et al. Manifesto for Agile Software Development. 2001. URL: <http://www.agilemanifesto.org/iso/ru>.
23. Cobb C. G. Making Sense of Agile Project Management: Balancing Control and Agility. Hoboken, New Jersey: John Wiley and Sons, Inc., 2011. P. 264.
24. Rouse M. What is scrum? 2007. URL: <http://searchsoftwarequality.techtarget.com/definition/Scrum>.

25. Jeffries R. What is Extreme Programming? 2001. URL: <http://xprogramming.com/book/whatisxp>.
26. Hill G. M. The Complete Project Management Office Handbook. Boca Raton, Florida: Auerbach Publications, 2008. P. 685.
27. 9000-2001 . . . . .  
. 2001.
28. 9001-2008 . . . . . 2001.
29. 9004-2010 . . . . .  
. 2010.
30. e . . . . . , 2007. . 370.
31. J.M. Juran A. G. Juran's Quality Handbook. 5th edition edition. McGraw-Hill, 1999.
32. / . . . . . , . . . . .  
. , 2007. . 384.
33. . : .  
. : , 2004. . 274. .  
.
34. Kaizen --- Toyota Production System Guide. URL: [www.blog.toyota.co.uk/kaizen-toyota-production-system](http://www.blog.toyota.co.uk/kaizen-toyota-production-system) ( : 20.11.2013).
35. A. Brunet S. N. Kaizen in Japan: an emperical study // International Journal of Operations and Production Management. 2003. Vol. 23. P. 1426--1446.
36. . . . . - : . :  
- , 2005. . 319.

37. Group O. M. Business Process Modeling Notation (BPMN) Specification. 2006.
38. . : ,  
1984. . 264. .
39. Group O. M. Business Process Model and Notation (BPMN) Version 2.0. 2011.  
. <http://www.elma-bpm.ru>.
40. W. van der Aalst A. t. H. YAWL: Yet Another Workflow Language (Revised Version). Queensland University of Technology, Brisbane, 2003.
41. of Business Process Management Professionals A. ABPMP BPM CBOK. Guide to the Business Process Management Common Body of Knowledge. Association of Business Process Management Professionals, 2009. P. 236.
42. van der Aalst W. A Decade of Business Process Management // Business Process Management / Ed. by E. K. A. Barros, A. Gal. Berlin: Springer-Verlag, 2012. P. 350.
43. Gartner IT Glossary. Business Process Management Suites (BPMSs). URL: <http://www.gartner.com/it-glossary/bpms-business-process-management-suite> ( : 29.11.13).
44. BPM. BPMS ( - , ).  
URL: <http://abpmp.org.ru/resource/bpm-glossary> ( : 29.11.13).
45. M. El-Mekawy N. A., K. Shahzad. Modeling and Managing Business Processes // Handbook on Business Information Systems / Ed. by M. S. A. Gunasekaran. Singapore: World Scientific Publishing Co., 2010. P. 943.
46. Wil van der Aalst K. M. v. H. Workflow Management. Massachusetts, London: The MIT Press Cambridge, 2002. P. 363.

47. Coalition W. M. Workflow Management Coalition. Terminology & Glossary. Issue 3.0 edition. Hampshire, United Kingdom: Workflow Management Coalition, 1999. P. 65.
48. . . . . , . . . . .  
: . . . . : , 2007. . 336.
49. Bragonier D. WORKFLOW IN A NEW AGE // CA Magazine. 2013. Vol. 146, no. 7. P. 30 -- 34.
50. Cunningham LLP's Products and Services Page. URL: <http://www.linkedin.com/company/cunningham-llp/products> ( : 01.12.2013).
51. Adams J. A SMOOTHER FLOW OF WORK // Bank Technology News. 2012. Vol. 25, no. 8. P. 22 -- 25.
52. Miles D. BUSINESS PROCESS MANAGEMENT --- WHAT IS THE PAYBACK AND WHAT IS THE ROI? // Infonomics. 2010. Vol. 24, no. 1. P. 24 -- 25.
53. John M. Nicholas H. S. Project Management for Business, EGINEERING, and Technology. 3rd edition edition. New Delhi: Elsevier, 2008. P. 707.
54. . , .  
: , 1983. . 344.
55. . . . . :  
, 1959. . 430.



. 1. "

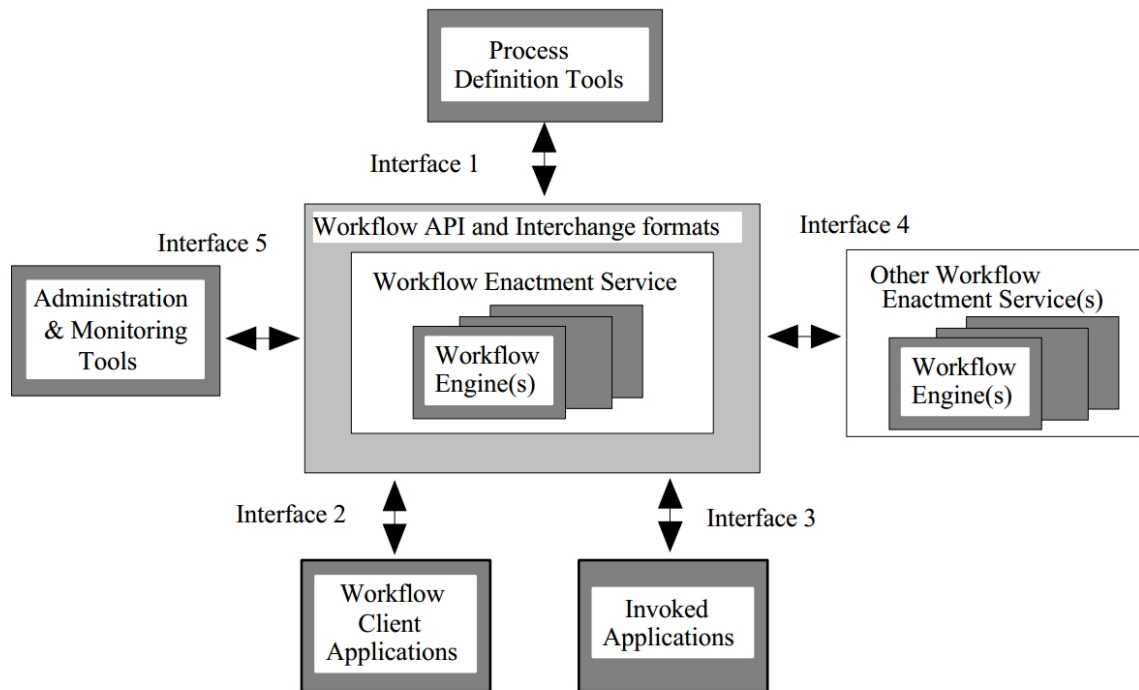
-

[30, . 97]



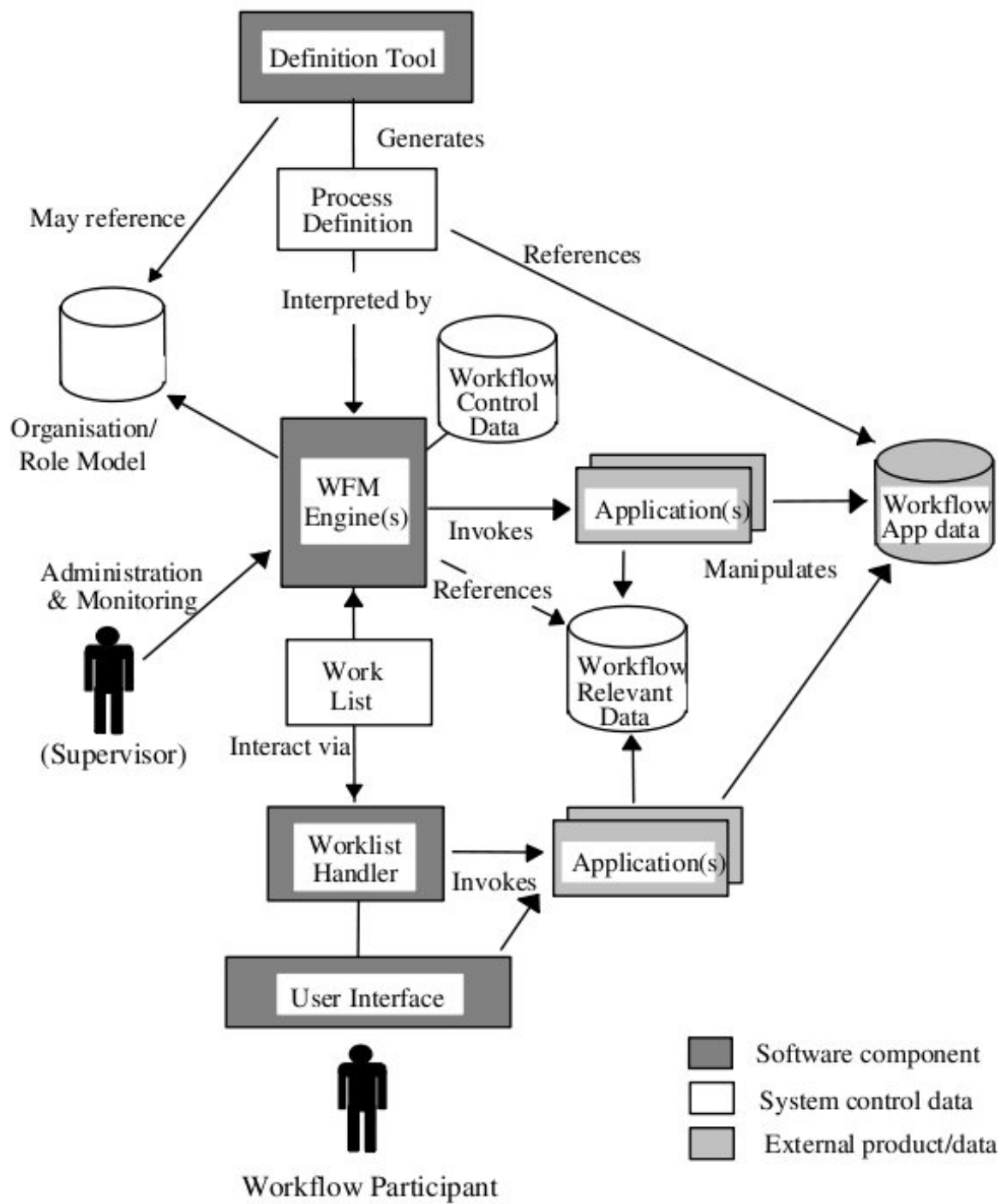
.1. - -  
[32, . 228]

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



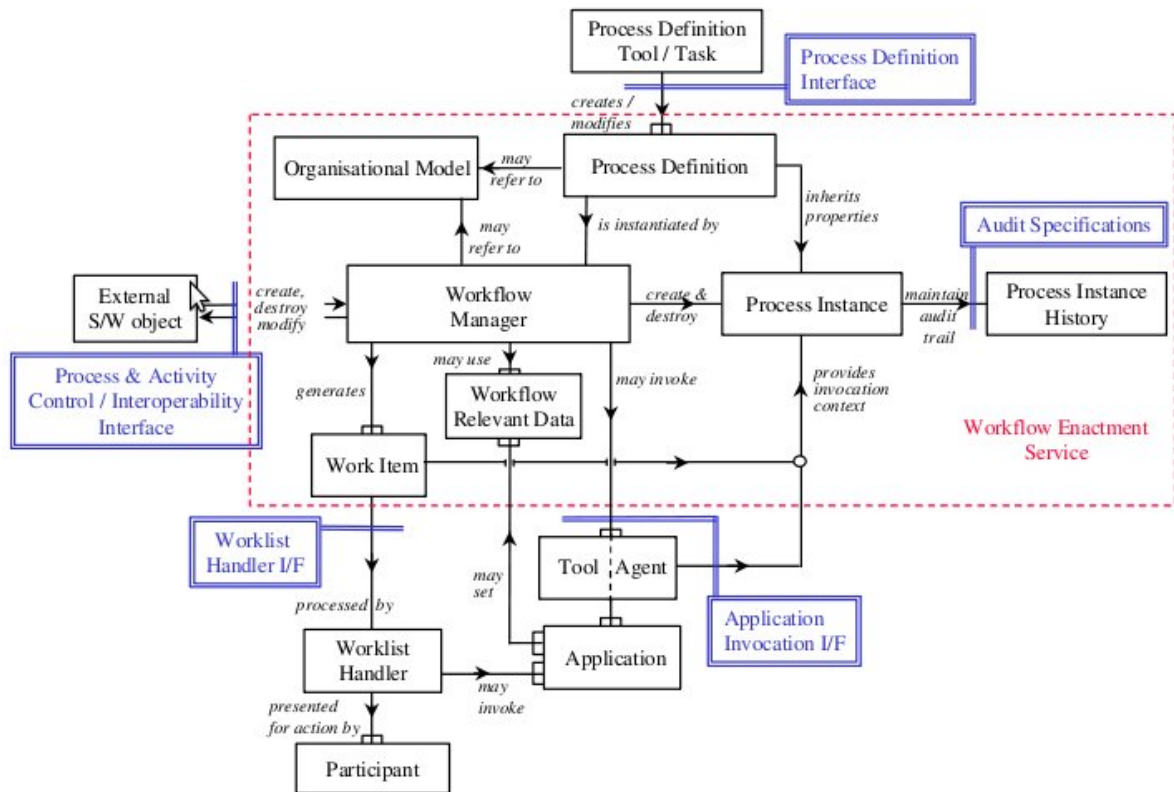
. .1. "

(Workflow Reference Model) [47, . 23]

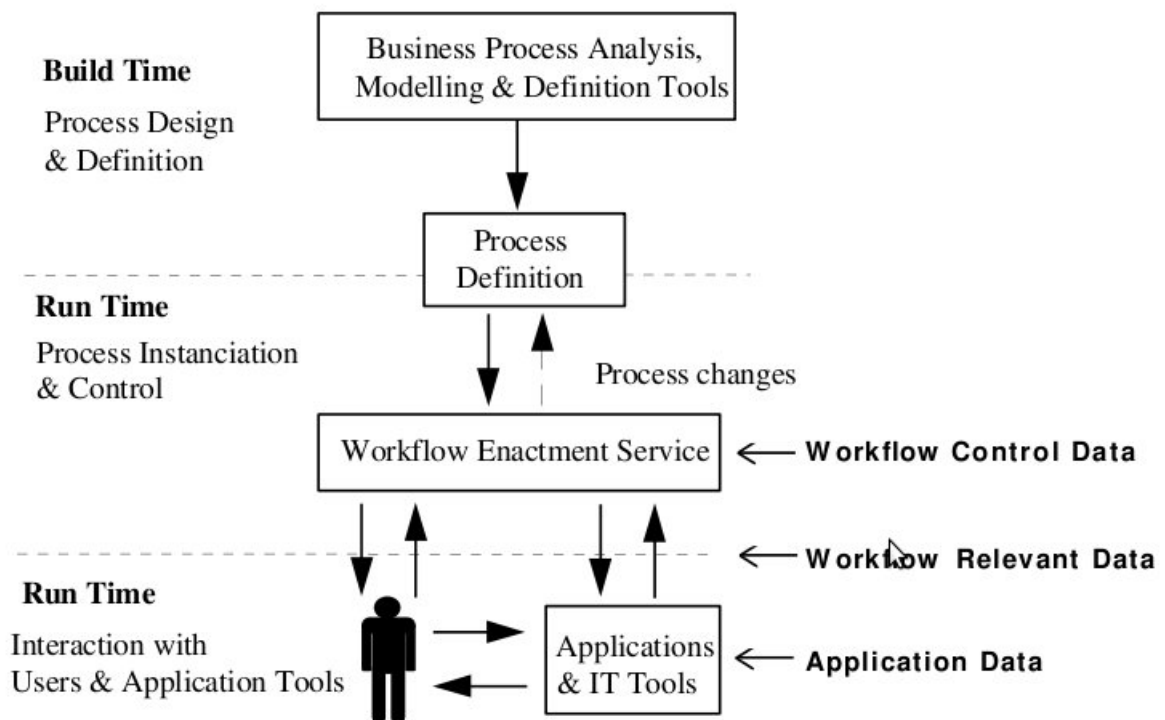


. .2.

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





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





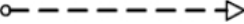
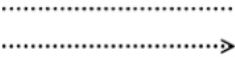
. 4.  
(Types of Data in Workflow Management Systems) [47, . 44]

OMG BPMN v. 2.0


.1. OMG BPMN version 2.0 [39]



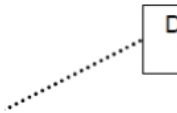
(Event)	<p>---</p> <p>,</p> <p>-</p> <p>.</p> <p>-</p> <p>( )</p> <p>(</p> <p>).</p> <p>,</p> <p>.</p> <p>-</p> <p>,</p> <p>:</p> <p>(Start),</p> <p>(Intermediate)</p> <p>(End).</p>	
(Activity)	<p>---</p> <p>,</p> <p>,</p> <p>-</p> <p>.</p> <p>,</p> <p>( ).</p> <p>,</p> <p>:</p> <p>(SubProcess) (Task).</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>business PartnerRole business PartnerEntry).</p>	
(Group)		
(Text Annotation)	BPMN	 <p>Descriptive Text Here</p>