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70-

“ ”

[1-4].

(

[5].

[1-

). 50- 9]

20
Shell

General Electric,

50-60-

... ?”

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“ ”

()

(

SMART – specific, measurable, actionable, realistic, time-bound) [4, 7].

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(

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“ ”

[11].

MATLAB, Neural Network Toolbox [12].

(. 1),

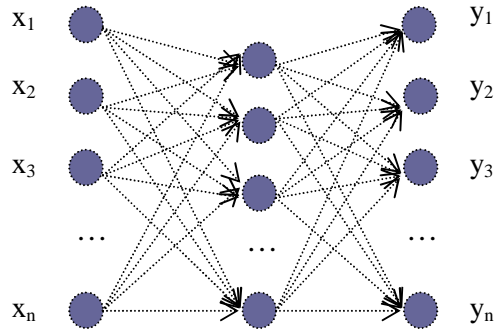
[10],

$$y = f(w_1x_1 + w_2x_2 + \dots + w_nx_n + b_0) = f\left(\sum_{i=1}^n w_ix_i + b_0\right),$$

n - ; $x_1, x_2, \dots,$
 x_n - ; w_i -

; b_0 -

() ; f -
[11], (,),
; y -



. I.

$x_1, x_2, x_3, \dots, x_n$

$y_1, y_2, y_3, \dots, y_n$

x_i

y_i

x_i

$y_1 - x_i$ [13].

$y_2 - x_i$

$y_3 - x_i$

x_i

$x_{ij}; i = \overline{1, m}; j = \overline{1, n}, i -$

$; j -$

$x_{ij} - x_{i+1, j}$

$x_{ij} - x_{i+1, j}$

1)

2)

w_{kl}

b_r

[13].

1861 .

(-1; 1) (0; 1),

$\pm\Delta x_i$ 2010

(. 2).

$\pm\Delta x'_i$ [13].

2002-

1

2002-2010

	2002	2003	2004	2005	2006	2007	2008	2009	2010
	85726	86236	88041	87173	96026	142957	155684	151361	166872
	78703	78507	79555	80764	84524	110013	117668	117360	121713
	17855	20861	23327	21431	27046	34617	44369	42990	61057
	7023	7714	8474	6387	11437	18998	25157	22071	33514
	0	0	0	6	88	13943	12904	11875	11598
	36870,7	46292	53716	73974	88058	107796	124107	91058	154248
	58050	72975	79559	104986	131118	160125	187284	130374	220449
	48271	60814	66445	88540	110033	133531	156070	108803	183808
	11400	14522	12729	14566	21975	25735	31963	17745	29560
	2478,1	2202	1336	1488	4375	4644	6613	63	4325

2006 .) -39% 2004 . (190% (10-50%),
 2010 . (65 2009 .,
 30%

2

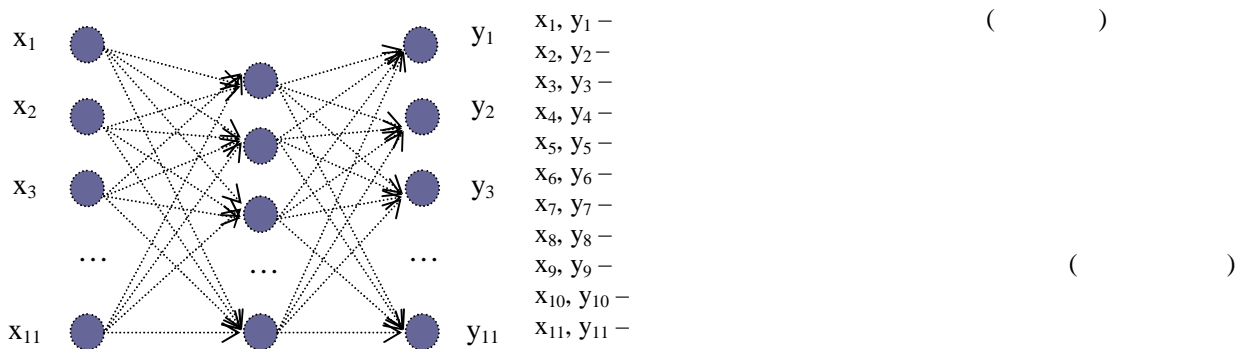
	2002	2003	2004	2005	2006	2007	2008	2009	2010
1	2	3	4	5	6	7	8	9	10
() (.)	2,542	2,704	2,753	3,355	2,365	1,822	1,764	1,948	1,822
(.)	0,144	0,333	0,293	0,157	0,039	0,068	0,088	0,018	0,237
(R)	0,051	0,036	0,020	0,017	0,040	0,035	0,042	0,001	0,024

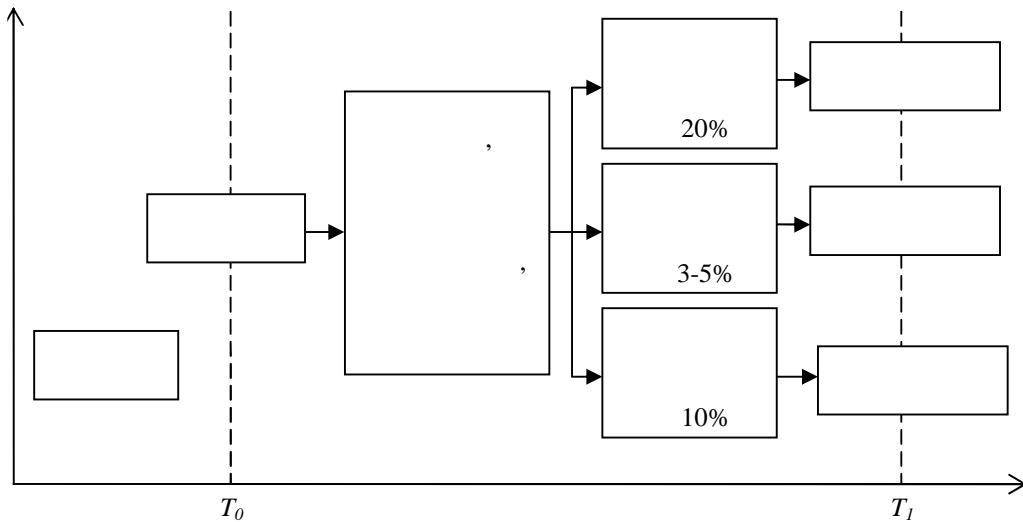
. 2

1	2	3	4	5	6	7	8	9	10
()	0,918	0,910	0,904	0,926	0,880	0,770	0,756	0,775	0,729
()	0,000	0,000	0,000	0,000	0,001	0,127	0,110	0,101	0,095
(. .)	0,058	0,067	0,080	0,086	0,010	0,033	0,056	0,054	0,083
(R)	0,067	0,048	0,025	0,020	0,050	0,043	0,053	0,001	0,028
()	0,981	1,003	0,990	0,980	0,974	0,524	0,977	1,000	0,992
() (.)	0,068	0,085	0,092	0,121	0,147	0,121	0,106	0,073	0,123
(. .)	0,464	0,228	0,061	0,269	0,249	0,222	0,186	-0,180	0,668
(. .)	0,759	0,244	-0,147	0,101	0,509	0,172	0,259	-0,346	0,644

“ ” x_1, \dots, x_{11} (2002-2010), (7)
) (11),

. 2. : (11 y_{11} .
), $y_1, \dots,$





. 3.

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11. ... /

... , ... //
... " "
... - : , 2010. - .
130-135.

12. ...
MATLAB 6 / ... , ...
- : - , 2002. - 496 .
13. ... :
... - 2- ; ... / ... -
: ... " ", 2006. - 1104 .

05.09.2011 .