

/ 25022— 2021

(SQuaRE)

(ISO/IEC 25022:2016, IDT)

```
1
     2
                                                               022 «
     3
                            25
                                      2021 .
                                               1282-
                                                                              25022:2016 «
                                                   » (ISO/IEC 25022:2016 «Systems and software
(SQuaRE).
engineering — Systems and software Quality Requirements and Evaluation (SQuaRE) — Measurement of
quality in use». IDT).
         1
               25022
                                                   7 «
                                     1 «
                 ( )
                                                                         ).
     5
     6
                                                                          26
   29
            2015 .
                       162-
    )
                   )
                                                            (www.rst.gov.nj)
```

,

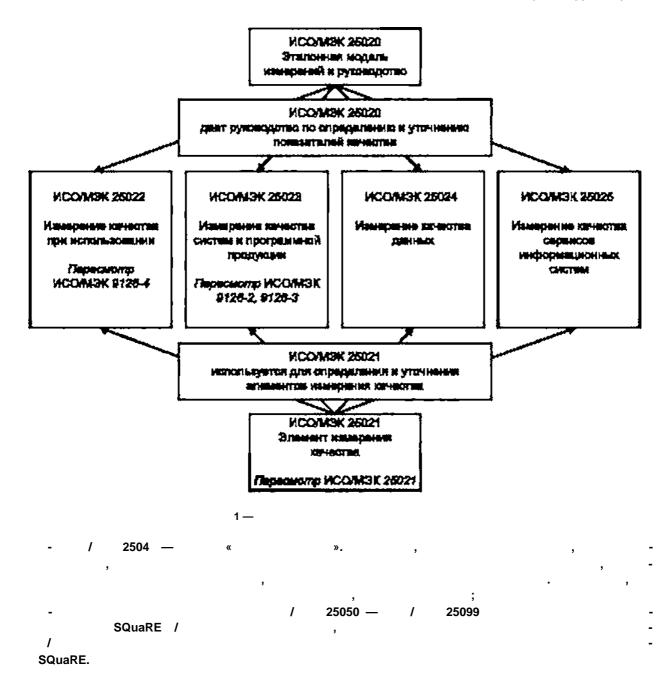
© ISO. 2016 © IEC. 2016 « ». 2021

II

1			1
2			2
3			2
4			2
5			5
6			5
6.1			5
6.2			6
6.3			7
6.4			8
6.5			,8
7	,		8
8			9
8.1			9
8.2			9
8.3		••	11
8.4			12
8.5		***	15
8.6			20
	()	23
	()	24
	()	/ 25022
	•	,	9241-1128
	D()	29
	()	33
	F()	34
	G ()	()
	()	35
	-		36

```
SQuaRE.
                                                                      (
            25010).
/ 25030).
/ 25040 / 25041).
                                                                      (17]).
                                                               2502
     SQuaRE.
     / 25020 —
      2501;
       / 25021 —
       / 25022 —
             / 25010;
            25023 —
                                     25010:
   - / 25024 —
       25012.
      2502 .
       SQuaRE
       / 2500 —
SQuaRE.
                                                   SQuaRE,
             2501 —
        1
             2502 —
             2503 —
                                     15236;
```

IV





— 2022—04—30

(SQuaRE)

Systems and software engineering. Systems and software Quality Requirements and Evaluation (SQuaRE).

Measurement of quality in use

```
2
                                            25010:
                                              8.
                                                                ).
     3
                                                                                           [
     ( )):
ISO/IEC 25010, Systems and software engineering — Systems and software Quality Requirements
and Evaluation (SQuaRE) — System and software quality models (
(SQuaRE).
                                                            )
     4
                                                                 25000.
                                                                                  25010.
                                                                                 SQuaRE
     4.1
                            (context completeness):
               25010:2011.
     [
                                       )
     4.2
                               (context coverage):
```

25022—2021

```
25010:2011.4.1.5]
             (customer):
                  (effectiveness):
4.4
     9241-11:1998]
4.5
                       (efficiency):
     9241-11:1998.
4.6
                           (context of use):
                         , ),
      [1].
( 9241-11:1998.
                           ]
4.7 (flexibility):
         25010:2011,
                       (formative evaluation):
[ / 18152:2010,4.6]
4.9
                      (freedom from risk):
                              SQuaRE.
         25010:2011.
[
      .10
              (goal):
              (measure):
[
         15939:2007,
                                                   2
                                                           ]
4.12
           (measurement):
[4].
            (ADA, . Java . .).
( / 15939:2007. ]
```

```
25022-2021
4.13
                            (measurement function):
          25021:2012)
                    (psychometrics):
4.15
                                     (quality in use):
          25010:2011.
4.16
                            (quality measure):
[ /
4.17
          25021:2012)
                                       (quality measure element (
[ /
4.18
          25021:2012)
                         (quality model):
          25000:2014)
                        (satisfaction):
          25010:2011.
   .20
                                                         (stakeholder satisfaction):
```

1 ,

(summath/e evaluation):

4

4 .21

25010:2011.

```
2
3
    / 20282-2:2013.4.17]
[
  22
               (system):
1
2
          15288:2015,
   .23
             (task):
1
2
    9241-11:1998]
  .24
                                (usability):
                                   9241-210.
          25010:2011]
                              (use error):
     62386 —
[
                                                                »].
   .26
                     (user):
    1
          15939:2007]
5
8
                                     (quality measure element).
6
6.1
                                      25010
                                           );
                             );
```

```
25023
SOuaRE.
     2
             .2
     6
                                                                                                  25063.
```

') / 25023 6

25022-2021

```
25022—2021
         ( .
                       2).
                                                                        ( . .
).
                                                                   20282-2.
               )
                                                                                       20282-2.
                                                                              25023)
                          20282-2
                                                                                             (19].
 SQuaRE.
6.3
                                                       (
                                                                                               )
 )
                                                                         10
                                                                                  );
 )
                                  ):
 )
                                                                          );
d)
                   (
);
 )
```

8.

```
(
                            20282-2
   6.4
      D.
   6.5
          9241-11:
                                                                                               9241-11
                                     25010,
                                                                25022
                                                        9241-11 ( .
                                                                                  );
                25062
               25063
                25064
                                                                  );
              20282-2
   7
                                                                           8.
   a) ID:
   -
- G:
                                                                                ; S:
    )
   d)
. D. 3.3.2 D. 3.3.3):
```

/ 25022—2021

```
/ 25022—2021
```

```
( . D. 3.3.5);
    8.1
                                                     25010:
                                       ( . 6.2).
    8.2
  1
( . D. 3.1.2).
   10
  Ef-1-G
                                                                        = /
X = S (i = 1 ...) W, « ,/ . i—
                                                                                            W, = 1.0.
```

Ef-2-S Ef-2-S
- (=
- , 1. , 0. ,
. (1. 0)
. (1. 0)
., , , , , , , , , , , , , , , , , , ,
- (
- (
(): - : 100 %; 50 %; - 100 %: - 50 %; - 5 %: - : 100 %, 20 %; - 20 %; - 5 % : 100 %, 0 % Ef-3-G
(): - : 100 %; 50 %; - 100 %: - 50 %; - 5 %: - : 100 %, 20 %; - 20 %; - 5 % : 100 %, 0 % Ef-3-G
- : : 100 %;
. , 20%; - : : 100 %: 20 %; - 50 %; - 5 %: - : : 100 %, 20 %; - 20%; - 5 %.
- : : 100 %: - 50 %; 20 %; 5 %: - 20 %; 5 %: - 20 %; 5 %.
50 %; 5 %: 100 %, 20 %; 5 %. 100 %, 0 % Ef-3-G 1 , 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 10
• : : 100 %, : 0 %: - 20 %; 5 %. , 100 %, 0 % Ef-3-G
20 %; 5 %. , 100 %, 0 % Ef-3-G
5 %. , 100 %, 0 % Ef-3-G
Ef-3-G
Ef-3-G
1 , , , , , , .
1 , , , -
, ,
, -
,
3 , , –
4
,
5 , ,
,
Ef-4-G , = / -
=
— Ef-3-G .
Ef-5-G , = / -
A= ,
=

8.3

-

•

1 , -

2

·

2	_						
ID							
Ey-1-G	-	,	=	=			-
	_	(. /	25023)			,	
		,		,		,	•
Ey-2-S		,	=	= /			-
			=				
		-					
1		_			:		, -
		•		,			-
2		,	Ef-1-G,				
_			Li-1-0,				
3					,		-
4				,		•	
Ey-3-S			=	= /			-
			=				
			•				
1							
2				,			
3	,	,		,		,	-
4		,				,	

10					
Ey-4-S	_	,	=	= ,	-
		-	_	= , - -	
			,	– ,	
			_	,	
			•		
	-	,		,	
Ey-5-S		, -	= /		-
			=	, -	
		•	=	, -	-
1		,		(,
,).			,
2				,	1
Ey-6-S		-	=1- =		-
		-	=		-
1					-
. 2					(-
		,).		,
3 4					
5				,	
					,
7		,			

```
8.4

8.4.1

...

;

) (SUs-1-G);

(8.4.2. 8.4.3. 8.4.4,

8.4.5);
```

, .

2 —

-(,),

,

,

2__

<0				
SU8-1-G			= 1 ,	
			, –	
	_			-
[18]		[20].		

8 .4.2

,

4 —

10					
SUs-2-G	• •	- -	= £ , Aj = ,	-	
	_	,	,	,	

/ 25022—2021

4

ID						
SUs-3-G	-	-		= /		-
	-	-	=		, -	-
		-			,	
			=		-	
				,		
	_	,		,	,	-
	,					,
SUs-4-G	-	-		= /		-
			=			-
		, -	=			
				•		
1						-
2	•					
	,		,	,		-
011- 5-0	T					
SUs-5-G	-	-	=	= '		
			=		, -	
SUs-6-G				= '		
50S-6-G	-	-	=	= '		
			=		_	
			_		-	
	,					,
					-	

8 .4.3

.

5 —

ID						
STr-1-G		, -	=			
	[16].					

```
/ 25022—2021
                                                    (
                                                                            )
    8
          .4.4
                                                   25010: «
    2
                               (
                                                    )
   ID
SPI-1-G
                                                                           [14] [23].
    8
           .4.5
                                                             / 25010: «
                                       ».
   ID
SCo-1-G
     2
            [15]
    8.5
    8.5.1
                                                             25010: «
                           (11)
```

d) 8

8 —

		-	
	-	-	
	,		
, -			
, -			
-	-		-

8.5.

2).

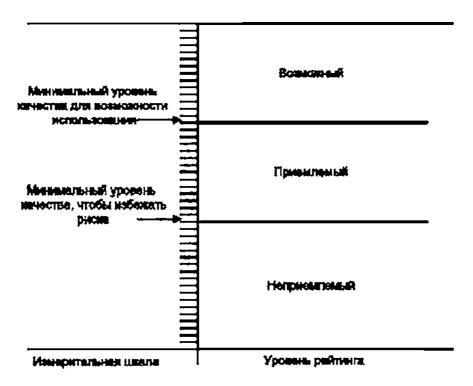


Рисунок 2 — Риски и возможности, связанные с уровнем качества

9 —

	I			1
ID				
REc-1 -G			=(- >-	-
	(1)		A = -	
			=	
	<u> </u>		l	_
		,		
	I	•		
REc-2-G	-	,	=	-
			= ROI	
			ROI.	
	<u>–</u> I			<u> </u>
REc-3-G			= /	-
			_	
			(= .	
			,=)	
	-			
REc-4-G	-		= / 1	
REC-4-G		·	A =	-
		-	(*= .	
		-	At=)	
		*!		
	<u> </u>			
	,	, , -		
			•	
REc-5-S		,	= / A= -	-
			A-	
			-	
	_	1.		
REc-6-S		_	= /	-
NEC-0-3	- ,	•	= 7	-
	-	- ().	-	
			=	
			- ()	
-	_		-	-
REc-7-S	-	-	=	-
	<u> </u>		L	_
		,		-

ID						
REc-8-G	-		-	X = /VB	-	,
	-	•	-	-		-
			-	= -		-
1						-
2				,		
		,				,

8.5.3 (,

IEC 62366 , 65 27 1 2 -

10 —

ID				
RHe-1-G	-		= /	
	-	, -	= .	-
			_	
		-		
	_		,	-
	,			-
RHe-3-G			= /	
	-	,	,	-
			=	, -
	=		, =	
	_	•	,	

8 .5.4

.

•

-

,

11 —

ID				
REn-1-G			= / ,	
			=	
			(= . At =)	
1		_	,	,
2	,	·		

8.6

8.6.1

•

1 .

, , *l* -

[2].

8 .6.2

,

1 , / 25010: « ,

,

··· 2

12—

CCm-1-G				= /			-
		-	=		-		-
	•	_			-	1	-
		-	=				
		-			-		

12 2 8 .6.3 9241-110. 13 — CH-1-S (1 1. 2 (), ().

16

i-ro

25023)

CH-2-S

/ 25022—2021

iD				
CFI-3-S		, -	= 1	-
	-	-	-	
		,	, , -	
			,	
	1			
1				-
2		•		0.
		- ,	1.	

() .1 .2 (U). () -(8): : U1: U2:): . 2: . .; : 1: Internet Explorer. 2: Firefox . .: : 1: (); U1 T1 81: U1 T1 2; U1. 2.81 , U1 1; U2T1: U1 + U2 () 2. .4

()

.1 , , 6.3.

.1—

	<u> </u>					
10			«	*	*	-
Ef-1-G	-	= / -				
Ef-2-S	-	{X = 1 - SAj X 2 0} , = - - (= 1)				
Ef-3-G		= ,				
Ef-4-G		= / = =				
Ef-5-G	-	= / = , - = ,				
Ey-1-G	-	=				
Ey-2-S	-	= / = =				
Ey-3-S	-	= / = =				
Ey-4-S	-	= / =				

. 1

	•	1		ı				
		ı			ı		ı	T
ID				-	*	*		-
Ey-5-S		=	= / ,					
		=	,					
Ey-6-S		= =	= 1- /					
SUs-1-G	-	, =	-					
SUs-2-G	-	Aj =	X-S(Aj) , -					
SUs-3-G		=	= <i>I</i> ,					
		=						
SUs-4-G	-		= /					
		=	, -					
SUS-5-G		= =	= /					
SUS-6-G	-	=	= 1					
		=	-					
STr-1-G	-	=	=					
SPH-G		=	=			1		
SCo-1-G		=	=					
		l		l	l		<u> </u>	<u> </u>

/ 25022—2021

. 1

ID			
REc-1-G	-	= (-)/	1
	(ROI)	=	
REc-2-G	-	= = RO)	
REc-3-G	-	= / 1 = - (= . ,=)	
REc-4-G	-	= /, = (= .,=)	
REc-5-S	-	= / = =	
REc-6-S	- ,	= / = , = - ()	
REc-7-S		=	
REc-8-G		= / A = « - = -	
RHe-1-G		= / = , -	
RHe-2-G	-	= 1(^ i = 1	

. 1

ID					-	*	*	•
REn-1-G	-	-	X=A _a /A _t)				
CCm-1-G		=	= /	- - -	1			
CFI-1-S	-	= = ,	= /	-				
REn-1-G	-	=	= / ,)				
CH-2-S		i= 1	X = £Aj/B (25023)					
CB-3-S	-	= = ,	= / ,	-				

```
/ 25022—2021
```

```
( )
                            / 25022
                                           9241*11
                               (
                                                   9241-210)
                                                  / 25010,
           9241-11
                    9241-11
      .1 —
                             / 25022 9241-11
                               - 25010
                                                        ISO 9241 -210
                                                                    9241 -11
                                                 ) 8.3 (
9241-11.
                                  8.2 (
                                                                      8.4.1 (
                                                 9241-11, —
8.4.2 (
( ),
         ) 8.4.3 ( ),
                                                                             8.4.5
                                               8.4.4 ( ),
                                         ,
9241-11.
```

D) D.1 / 25040. / 20282-2 D.2 D.2.1 (D.2.1.1 D.2.1.2 (. [10]). D.2.1.3 D.2.1.4 D.2.1.5 D.2.1.6

```
D.3.3.2
D.3.3.3
                                                                       )
D.3.3.4
D.3.3.5
0.3.4
```

(90 %	,	,		10).	. 10)	10),	(
70	D.3.5		,	,.	,			,	
	,							,	
		,	,					,	,
			,	,	,				,
	D.4		,		•				
	• ,	:	rei	,			,		
			[5]		,		(
	•	,).	,		:	(
	D.5 D.S.1	, (. [10]).							
			,	,			,		,
	, D.6		,			,			
				,			[10]		

```
( )
            1
                                                              SQuaRE
                                           )
                                                                              ).
                         .1).
                                Систами и программном
                                     обавличения
                                                                             испольрования
                                                                 M/MARKY
                                                   Качество
                                                                               Кичества при
                                                   овреносе
INCOMEDOM
                                                   продукта
                                 Качаство
                                  DELICAN
```

Повантин изиства с снотвино-

Понимарованной

точен эрекия

.1 —

смутриной

717-104 SQUARE (STATE

25022-2021 (F.1). 1» R 9

soeOe

F.1 —

/ 25022—2021

(}

.1

ISO/IEC 25010	IDT	/ 25010—2015 «	
		(SQuaRE).	-
- IDT —			

- (1] ISO 9241-11:1998. Ergonomic requirements for office work with visual display terminals (VDTs)— Part 11: Guidance on usability
- [2] ISO/IEC 12207:2008. Systems and software engineering Software life cycle processes
- [3] ISO/IEC 15288:2015. Systems and software engineering System life cycle processes
- [4] ISO/IEC 15939:2007. Systems and software engineering Measurement process
- [5] ISO/TS 20282-2:2013. Usability of consumer products and products for public use Part 2: Summative test method
- [6] ISO/IEC 25000:2014. Systems and software engineering Systems and software Quality Requirements and Evaluation (SOuaRE) Guide to SQuaRE
- (7] ISO/IEC 25020:2007, Software engineenng Software product Quality Requirements and Evaluation (SQuaRE) Measurement reference model and guide
- [8] ISO/IEC 25021:2012. Systems and software engineering Software product Quality Requirements and Evaluation (SQuaRE) Quality measure elements
- [9] ISO/IEC 25030, Software engineering Software product Quality Requirements and Evaluation (SQuaRE) Quality requirements
- [10] ISO/IEC 25062, Software engineering Software product Quality Requirements and Evaluation (SQuaRE) Common Industry Format (CIF) for usability test reports
- [11] ISO/IEC 25063. Systems and software engineering Systems and software product Quality Requirements and Evaluation (SQuaRE) Common Industry Formal (CIF) for usability: Context of use description
- [12] IEC 31010. Risk management Risk assessment techniques
- [13] IEC 62366:2007. Medical devices Application of usability engineering to medical devices
- [14] Hassenzahl M.. & Monk A. The inference of perceived usability from beauty. Hum. Comput. Interact. 2010. 25 (3) pp. 235—260
- [15] Hernandez L. (2002). Evaluation of different scales for measurement of perceived physical strain during performance of manual tasks. Int. J. Occup. Saf. Ergon. 2002.8 (4) pp. 413—432
- [16] Jian J.-Y., Bisantz A.M.. Drury G. Foundations for an empirically determined scale of trust in automated systems. Int J. Cogn. Ergon. 2000.4 (1) pp. 53—71
- [17] Ministry of Economy. Trade and Industry. Japan (METI) (2011) A Set of Metrics for Information Systems/Software Product Quality in Japan http://www.meti.go.jp/policy/mono_info_service/joho/cloud/2011/11_05.pdf
- [18] Net Promoter Score. 2014) http://en.wikipedia.org/wiki/Net_Promoter Systems and software Quality
- [19] Sauro J.. & Lewis J. Quantifying the User Experience. Morgan Kaufmann. 2010
- [20] Sauro j (2010) Single Ease Question (2010) https://www.measuringu.com/blog/single-question.pbp
- [21] Sauro J. 2011). Measuring Usability With The System Usability Scale (SUS). http://www. measuringusability.com/sus.php
- [22] Sauro J. 2012) 8 Advantages Of Standardized Usability Questionnaires. http://www.measuringusability.corrVblog/standardized-usabitity.pbp
- [23] Watson D.. Clark L.A.. Tellegen A. Development and validation of brief measures of positive and negative affect: the PANAS scales. J. Pers. Soc. Psychol. 1988. 54 (6) pp. 1063—1070

006.354:004.056.5:006.354 35.080

23.10.202!. 16.11.2021. 30'84 5.12. .- . . 4,35

416 - , . 3t. . 2. www.goslinfo.ru info@gostnfo.ru 117416