

## Factors Affecting the Users' Satisfaction on the Electronic Medical Record System

JiYoung Kim, Youngmoon Chae<sup>1</sup>

Department of Medical Record, Pundang Jesaeng General Hospital, Daejin Medical Center  
Department of Health Management Information System, Yonsei University<sup>1</sup>

### Abstract

For last five years, several newly opened hospitals have introduced the order communicating system (OCS) along with an electronic medical record (EMR) system for inpatient and outpatient. Since EMR often changed the operating procedures and therefore caused user resistance to change, there is a need for strategy for increase a user acceptance toward the system. The purpose of this study was to identify the factors influencing user satisfaction to EMR for the hospital which has been operating EMR for four years since its opening in 1998. The results were as follows: First, satisfaction level was high for the screen layout, but low for the document image retrieval. Second, overall satisfaction score was highly correlated with twelve variables. Third, the factors significantly affecting the overall satisfaction level were 20 years age group, certified doctors, and the usage period between 1 and 2 years. Based on the about results, the followings were recommended to the hospitals which plan to introduce EMR in the future: First, data entry should be simplified and user friendly. Second, users should be well trained on security of the system in order to protect the confidentiality and integrity of the system prior to the installation of EMR system. Third, size of the files should be minimized using diagnostic codes and reducing size of image files in order to increase the response time. Finally, EMR should be well designed in such a way to improve a quality of contents of the chart. (*Journal of Korean Society of Medical Informatics 8-4,39~53, 2002*)

**Keyword** : Electronic Medical Record, User Satisfaction

I.

4)

1.

Burkle<sup>5)</sup>

90

1994 S

(Order

Communicating System)

(hard ware)가

(software)

1995

(peopleware)

6)

가

1998

J

J

(Hospital Information System)

가

(Chart Editor)

(Automatic Indexing Scanning)

가

가

40

45%가

1)

2.

가

2)

1998

3)

J

4

6가

가

가

2.

가.

2002 4 15 4 30

5 Likert

(1 : . 5 : )

II.

Dean(1999)

QUIS(The Questionnaire for User Interaction Satisfaction)

3

7)

1.

J

J

6

5

77

45

58.5%,  
75.8%

86.0%,

90%

SPSS

5가

(5 )

(2 )

alpha) 0.75

Alpha

가 가

0.8

5가

(5 )

(6 )

(6 )

(Cronbach's

SPSS 80

가

Cronbach Alpha

Cronbach

가

Cronbach Alpha

0.6

8)

Table1.

	(Cronbach Alpha)
	0.7245
	0.8000
	0.8591
	0.8219

Cronbach Alpha 0.7245 0.8591

가

(Chart Editor)  
(Slip Manager)가

가

1)

40 : 20 , 30  
( , 50 ) :

3)

Dean 가

가

가

1 , 2 , 3 , 3

2)

Dean (1998) 가

4)

가

1)

가

(ANOVA)

2)

가

가

가

(Correlation analysis)

5)

3)

Dean (1998)

(Multiple Regression Analysis)

III.

가

1.

2

20

가

30

34.4%

30

40

53.3%

87.7%

가 40

49.2%

50.8%

32.8%

30.3%

36.9%

47.5%가 3

(bedside data entry)

2.

Table 2. ( : ,%)

	20-29	42	34.4
	30-39	65	53.3
	40-49	13	10.7
	50	2	1.6
		60	49.2
		62	50.8
		40	32.8
		37	30.3
		45	36.9
	1	31	25.4
	1 2	23	18.9
	2 3	10	8.2
	3	58	47.5

Table 3. ( : ,%)

					X <sup>2</sup>
20 - 29	32(76.2)	9(21.4)	1(2.4)	42(100.0)	45.88*
30 - 39	29(44.6)	32(49.2)	4(6.2)	65(100.0)	
40 - 49	5(38.5)	4(30.8)	4(30.8)	13(100.0)	
50	1(50.0)	0( 0.0)	1(50.0)	2(100.0)	
	17(42.5)	19(47.5)	4(10.0)	40(100.0)	26.11*
	13(35.1)	18(48.6)	6(16.2)	37(100.0)	
	37(82.2)	8(17.8)	0( 0.0)	45(100.0)	
1	16(51.6)	12(38.7)	3(9.7)	31(100.0)	4.35
2	14(60.8)	9(39.2)	0( 0.0)	23(100.0)	
3	6(60.0)	3(30.0)	1(10.0)	10(100.0)	
3	31(53.4)	21(36.2)	6(10.3)	58(100.0)	

: \*p < 0.01

가 (P<0.01).

3

20 30 76.2%, 30 1 51.6%, 38.7%, 9.7%

40 44.6%

20 40 83.6%가 39.1%, 2 3 60.8%

60.0%, 30.0%, 10.0% 3

(P<0.01). 53.4%, 36.2%, 10.3%

42.5%, 47.5%, 100%, 3.

35.1%, 48.6%, 16.2%

82.2%, 17.8%

가 가

가 가

Table 4. ( : ,%)

	64(52.5)	37(30.3)	21(17.2)	122(100.0)
	51(41.8)	34(27.9)	37(30.3)	122(100.0)
	61(50.0)	36(29.5)	25(20.5)	122(100.0)
	51(41.8)	36(29.5)	45(36.9)	122(100.0)
	42(34.5)	57(46.7)	23(18.9)	122(100.0)
	34(27.9)	54(44.3)	34(27.9)	122(100.0)
	22(18.0)	45(36.9)	55(45.1)	122(100.0)
	21(17.2)	57(46.7)	44(36.0)	122(100.0)
( )	18(14.8)	36(29.5)	68(55.7)	122(100.0)
( )	20(16.4)	37(30.3)	65(53.3)	122(100.0)
	33(27.0)	40(32.8)	49(40.2)	122(100.0)
	51(41.8)	44(36.1)	27(22.1)	122(100.0)

41.8%

4

1) 4.

52.5% (Slip Manager) 가.

(Chart Editor)

5

41.8%, 가

50.0% (P<0.01).

2) 41.8% 가 가

34.5% 가 가

27.9% 가 가

3) 18.0%,

17.2% 6

14.8% 가 가

16.4% (P<0.01). 가 20 가

40 가 20

4) 가 가 40

가 가

27.0%

Table5.

		F
	3.12	11.04**
	3.32	
	2.72	
	2.78	7.79**
	3.01	
	2.41	
	3.32	4.79**
	3.63	
	3.19	
	3.00	6.71**
	3.22	
	2.66	
	3.36	12.69**
	3.41	
	2.55	

: \*p < 0.05, \*\*p < 0.01

Table 6.

		F
20 - 29	2.75	19.83**
30 - 39	3.14	
40 - 49	3.38	
50	3.09	
20 - 29	2.50	13.29**
30 - 39	2.80	
40 - 49	3.00	
50	2.60	
20 - 29	3.25	5.15**
30 - 39	3.43	
40 - 49	3.43	
50	3.33	
20 - 29	2.64	11.57**
30 - 39	3.05	
40 - 49	3.35	
50	3.00	
20 - 29	2.58	25.51**
30 - 39	3.26	
40 - 49	3.73	
50	3.25	

: \*p < 0.05, \*\*p < 0.01



Table 7.

			F
	1	3.01	1.54
	2	2.79	
	3	3.10	
	3	3.13	
	1	2.76	0.87
	2	2.52	
	3	2.92	
	3	2.73	
	1	3.38	0.37
	2	3.24	
	3	3.35	
	3	3.41	
	1	2.90	0.86
	2	2.75	
	3	3.00	
	3	3.03	
	1	2.98	3.21*
	2	2.60	
	3	3.15	
	3	3.31	

: \*p < 0.05

가 1 가 2 (P<0.05). 가 5. 가 가.

가 3 가 가

가 가

가 가 (P<0.01).

가 가 (P<0.01).

가 가 0.820 가 가 (P<0.01).

가 가 (Correlation analysis) 9 50% 12

가 Pearson

Table 8.

	F
2.50	14.17
2.91	
2.57	
3.00	2.41
3.13	
2.64	
2.95	13.61**
3.02	
2.04	
3.30	7.13*
3.18	
2.42	
2.80	1.89
3.08	
2.73	
3.10	1.55
3.21	
2.86	
3.27	1.52
3.59	
3.26	
3.25	3.63
3.48	
3.02	
3.47	4.12
( )	4.05
	3.51
3.52	1.32
( )	3.75
	3.40
3.67	12.49**
3.64	
2.71	
3.05	8.70**
3.18	
2.40	

: \*p < 0.05, \*\*p < 0.01

0.801

(P<0.01).

10

20

1

가

0.215

Table 9.

0.57**						
0.63**	0.37**					
0.61**	0.36**	0.49**				
0.68**	0.25**	0.34**	0.37**			
0.72**	0.54**	0.38**	0.41**	0.56**		
0.71**	0.44**	0.33**	0.34**	0.48**	0.56**	
0.55**	0.23**	0.39**	0.27**	0.22*	0.39**	
0.56**	0.34**	0.31**	0.30**	0.25**	0.44**	
0.53**	0.36**	0.36**	0.23*	0.18*	0.37**	
0.58**	0.37**	0.32**	0.33**	0.30**	0.44**	
0.80**	0.22*	0.44**	0.44**	0.62**	0.47**	
0.82**	0.39**	0.43**	0.43**	0.60**	0.53**	

: \*p < 0.05, \*\*p < 0.01

0.39**						
0.42**	0.68**					
0.38**	0.38**	0.33**				
0.32**	0.28**	0.36**	0.64**			
0.62**	0.30**	0.27**	0.31**	0.33**		
0.59**	0.41**	0.37**	0.29**	0.40**	0.70**	

: \*p < 0.05, \*\*p < 0.01

Table 10.

		B	B	B	B	B
(20 =0)	30	0.110	0.060	0.026	0.188	0.096
	40	0.188	0.150	0.047	0.282*	0.158
	50	0.015	-0.029	-0.001	0.054	-0.013
( =0)		0.220	0.184	0.081	0.080	0.340
		0.430**	0.362*	0.327	0.318	0.422**
(1 =0)	1	0.072	0.029	0.045	0.088	0.060
	2	0.042	0.058	-0.025	0.019	0.075
	3	0.166	0.043	0.103	0.093	0.264*
		0.215	0.140	0.089	0.170	0.270

: \*p < 0.05, \*\*p < 0.01

40 , 가 3 가 가 가 가 가 가 가 가

IV.

가

가

가

MRI(Medical Record  
EMR

Institute) 1999

가

가

가

가

가

(Chart Editor)

Dean<sup>7)</sup>

(Slip Manager)

가 가

가 가

가

가 가

가

가 가

가

40

20

가 가

20

가

가

가

40

가

EMR

가 Lorenzi<sup>10)</sup>

5

가

Gamm<sup>9)</sup>

가

가

가 가 1 2  
가 가 , 3  
가 가 Gamm<sup>11)</sup>  
EMR  
12

가 가

가

가

BICS  
(Brigham & Women's Integrated Computing System)  
QUIS(Questionnaire for User Interaction  
Satisfaction) 가  
12)  
13)

가

가 가  
가 (Content Validity)  
EMR 가

가

14)

가

75.8%

58.8%

가

가

가

V.

J

(structured data)

가

2002. 4. 15

2002. 4. 30

가 가

(risk)

가

가 가

가

6

20

1

2

가

가

가

가

가

2

가

1

가

3

(alert)

(decision

가 가

가

supporting system)

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