

# 가 Framework

## A Framework of the Comparable Performance Measurement in the Construction Industry

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Yu, Il-Han · Kim, Kyung-Rai · Jung, Youngsoo · Chin, Sangyoon · Kim, Yea-Sang

(PMS) 가, , . 1990

PMS

가

가

PMS

framework

(BSC)

: (BSC), , (KPI)

### 1.

#### 1.1

가,

(Michail Kagioglou et al., 2001),

(Peter F. Drucker) ‘

(Dayana B.Costa et al., 2004).

1),

가

IT

가

(PMS:PerformanceMeasurementSystem)

가

(UK. DETR, 2000).

(resources) 가

PMS

(project management)

(incentive)

가

(H. A.

Bassioni et al., 2004).

3

( ),

\*

\*\*

\*\*\*

\*\*\*\*

\*\*\*\*\*

(R01-2003-000-10079

가

(level)

PMS

-0)

framework

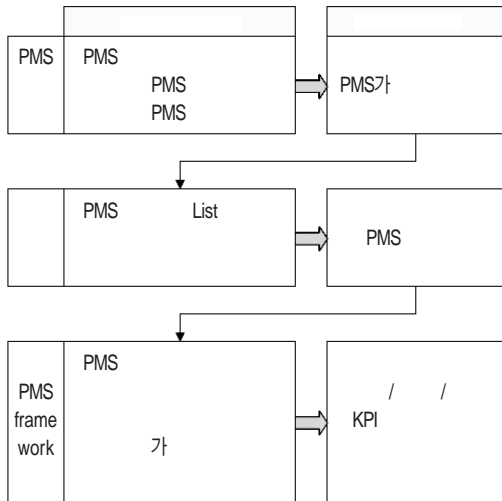
1) , “BSC ”, Sigma Insight, 2001, p17.

1.2

3 가 PMS framework  
 가  
 가(self evaluation)  
 PMS  
 (KPI: Key Performance  
 Indicator) . PMS 가 가

1990  
 (ROI), (ROE)  
 Eccles(1991)  
 가 가

Kaplan&Norton(1992)  
 (BSC: Balanced Scorecard)  
 BSC  
 가



1.

Meyer(1994)  
 (result measures)  
 (process  
 measures)  
 . 1990  
 가  
 Drucker(1995) 가  
 가  
 Kaplan&Norton(1996) BSC  
 BSC 가 (가)

2. PMS

Simons&Davila(1998)  
 ( )

2.1 PMS

(ROM: Return on Management)

1990

Harvard Business Review(HBR)

2) , 가  
 ( , )

2.2 PMS

1( ), 2( )

business level

가

, 가

가 PMS가

가 . 1

CII

Performance Metrics,

DTI( ) CPIKPI<sup>3)</sup>

, 2

project level

1. ( )

(Alarcon et al., 1996, ASCE)	CII (CII BM&M,2001)	DTI (DTI&CBPP,2002)
1)Cost - Total Project Cost 2)Schedule - Project Duration 3)Value - Satisfaction of Owner's need (Business benefit) 4)Effectiveness - How well the P/J was implemented	1)Cost - Cost Growth - Budget Factor - Cost Factor 2)Schedule - Schedule Growth - Duration - Schedule Factor - Duration Factor 3)Safety - R.I.R - L.W.C.I.R - '0Recordables - '0Lost Workdays 4)Change - Change Cost & Schedule Factor 5)Rework - Rework Cost & Schedule Factor	1)Customer Satisfaction - Product Quality - DeliveryReliability - Sales Advice - AfterSales Service - ValueforMoney 2)People - Safety at Work - SicknessAbsence - Training - Qualification 3)Environment - Use of Recycle Material - Reuse of Waste

2.3

PMS

PMS

( , , )

CII

가

(gaps)가

(Michail Kagioglou et al., 2001; Bassioni et al., 2004; Dayana B.Costa et al., 2004; etc)

2. ( )

( 3 , 2001, KICEM)	(2004)	(2004)
1) - (ROE) - 가 - 가가 (EVA) 2) 3) 4) - 1 - 가 - -	1) - 가 - 가 2) 3) - 가 4) - 가 1)	2) - - 3) - - 4) - 가 - - 1)

framework

가

가

( , )

가

Data

가

가

PMS

PMS가

KPI

2

BSC

frame- work

3) Construction Products Industry Key Performance Indicators

3. PMS

3.2 BSC PMS  
PMS framework

3.1 PMS

가 .

PMS

PMS

1000

50%, FT( ) 500 55% 가  
( , 2003) BSC가 PMS  
framework . BSC

가 .  
- 가 가?  
- 가?  
- 2.3 가 가?  
가 3 6가  
PMS  
가

BSC

4. (BSC) 4가

framework

(3) BSC가 가

PMS

가 BSC 2.3 PMS 가  
3.2

				가
	?	가?	가?	가 가?
		가		가
( )1)	1) 2) 3) 4) 5) 가	1) 2) 3) 4) 5)	1) / 2) 3) 4) / 5)	1) 2) 3)IT 4)IT 5)

3. PMS

	/		.
(1)		- ( ) - ( )	/ , 가 가
(2)	Simons&Davila, 1998	- ( ) - ( )	가 가
(3)	Kaplan & Norton,1992	- - - /	가 가
(4)	Alarcon & Ashley,1996	-Cost -Schedule -Value -Effectiveness	, .
(5)	U.K. DTI ( )	-Customer Satisfaction -People -Environment	가 가
(6)	U.S. CI <sup>TM</sup> BM&M	-Cost -Schedule -Safety -Changes -Rework	CI 가

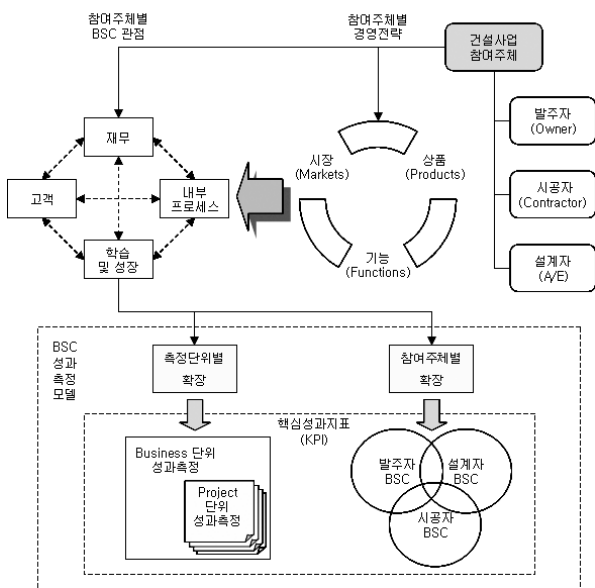
4 4가 5가  
( 4 , 2003) BSC  
20가 KPI  
PMS framework  
BSC  
(1) BSC 가  
15~20 가  
(Kaplan&Norton, 1993)  
(2) BSC 가 KPI  
( 2 , 2002)  
(3) BSC 4가  
가  
(Olson&Slater, 2002)

(4) BSC 4가  
 (5) BSC  
 (6) BSC  
 86.5%가 BSC  
 BSC PMS framework

3.3 PMS

BSC PMS framework 2

BSC KPI  
 (business level, project level)  
 가  
 가 BSC PMS



2. BSC PMS

4. PMS Framework

4.1 Framework

( , , )  
 BSC  
 PMS framework PMS  
 KPI 5 9  
 9  
 2 PMS  
 KPI KPI  
 가

project level  
 business level KPI  
 가

5. PMS Framework

1	BSC Pool	4가 ( / / )	BSC
2	/	BSC 4가	/ , ' , '
3		BSC 3 12	13 ( 4 , 9 )1
4	/		BSC PMS /
5	List ( 1 )	12 45~50 List	13 ( 4 , 9 ) 2
6	가/	List 7 가	Metrics 가 5 가
7	List ( 2 )	8~10 24~26 List	13 ( 4 , 9 ) 3
8	/	가	' 11 ' 가 ,
9	( ) KPI	8~10 26~27 KPI	

4.2 PMS

5 1 Pool

BSC 4가

가 KPI

PMS framework

15 ~20  
(Kaplan

KPI

& Norton, 1993; etc), BSC 4가

( , 1993)

가

3 , 2001 ; etc)

5

8 KPI

(2 )

(12 )

10

4).

, BSC

(Paul

R. Niven, 2002 ;

, 2001; etc)

8.

BSC 4가

6, 7

6.

5	[3 ]	[5 ] List (1 )	[7 ] List (2 )	[9 ] KPI
- *	- *	- *	- *	- *
- *	- *	- *	- *	- *
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
- *	- *	- *	- *	- *
- *	- *	- *	- *	- *
- *	- *	- *	- *	- *
- *	- *	- *	- *	- *

	(Markets)	(Products)	(Functions)
:	:	:	:
		( / )	
		가 /	

7. BSC 4가

				/
				/
				Database

4.3 PMS

4.4

가 PMS framework

KPI

, BSC 4가

8

Pool (Niven, 2002; Kaplan&Norton, 2001; etc) , 9

1

4) KPI

8

9. List(1 )

	/	/	/
	CII BM&M DTI DETR	CII BM&M DTI DETR H P K	CII BM&M DTI DETR A/E
	- - - -12 ( )		- ( , ) - /CM -

4.5 가

8 5

, , 45 ~50 ,  
가 KPI  
(U.S.DOE, 1995; APQC, 2000;  
Mercer, 2003; Niven, 2002; , 2000;  
1997; etc)

가  
가 PMS framework KPI 가  
10 7 . 7  
가 가 가 1  
5 가 .  
가 / ,  
5 7 2  
10. KPI 가

가	/	
(Validity)	(1997)	가?
(Representative)	Mercer(2003)	가 가?
(Balanced)	Mercer(2003)	가?
가 (Measurable)	Niven (2002)	가?
가 (Accessibility)	Niven (2002)	가?
(Understandable)	Niven (2002)	가 가?
가 (Comparability)	(1997)	가 가?

4.6

10 가 2  
가,

가

2004 3 ~4

6 11 가 ,  
2 2 , 3  
/ 3 , 2 /  
2 , 2 가 4  
10 27 KPI가  
9 26 KPI가 ,  
8 27 KPI가 .  
11~ 14 BSC 4가

4.7 KPI

(1)  
(financial)  
가 가  
, IMF  
(가 )  
(ROE)  
(ROIC), 가가  
(EVA) 가  
11 KPI

11. KPI

	(Contractor)	(Owner)	(A/E)
	-	-	-
	-	-	-
	(ROE)	(ROE)	(ROE)
	(ROIC)	(ROIC)	
	가가 (EVA)	가가 (EVA)	
	가 (3 )	가 (3 )	가 (3 )
	가 (3 )	가 (3 )	가 (3 )
	(3 )	(3 )	(3 )
	(3 )	(3 )	(3 )
	(3 )		(3 )
	(%) :		
	(%) :		
	(%) : ( ÷ ) × 100		
	가가 ( ) :		
	가 (%) : 3	가	
	가 (%) : 3	가	
	가 (%) : 3	( ) 가	
	(%) : 3		
	(%) : 3	가	
	(%) : 3		

(2) (customer) 가가 가 , , 가 , 가 KPI 13

(Paul R. Niven, 2002).

가 가 가 , 가 가 가 KPI 12 12. KPI

	(Contractor)	(Owner)	(A/E)
	-	-	-
	-	-	-
	-	null	null
	null	-	null
	(score) : , [ ] (score) : ( ) [ ] (score) : , [ ] (%) : (score) : (%) : ( ÷ 가 (3 ) ) (%) : 가 (3 )		

(3) (internal business process) 가 가 가 , , 가 가 ,

5) ( ), , , , (

가 가 , , 가 , 가 KPI 13

(4) (learning and growth)

가 , , 가 , , 가 가 ( , 2001) 가 (business function) KPI 14

	(Contractor)	(Owner)	(A/E)
	-	-	-
	-	-	-
	-	null	-
	-	-	-
	-	-	-
	null	-	null
	null	- 가	null
	-	-	-
	-	-	-
	(%) : (score) : , , (score) : ( , ) (%) : ( ÷ ) (%) : (score) : feedback (%) : (score) : feedback (%) : ( ) (score) : 가 (%) : ( , 1 , 3 ) (%) : ( )		



14.		KPI	
	(Contractor)	(Owner)	(A/E)
	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-
	(%) : ( , , , ) ÷ )x100		
	(%) : ( ÷ )x100		
	(%) : ( ÷ )x100		
	(score) :		
	( ) : 1		
	(score) : , , ,		
	(%) :		
	(score) : , , ,		
	(score) : , , ,		
	(score) : , , ,		
	가 (businessfunction)		

가 가

(4) PMS 가

(5) 가

가

5. 가

framework 가

PMS 가

4.8 가

PMS framework BSC 가

(balanced) PMS 가

framework PMS framework 가

(1) KPI (1) 2.3 가

가 (measurable) 가

(comparability) 가 ( , )

(2) PMS 가

15~20 KPI BSC PMS framework 가

(3) 3.2 BSC PMS 가 BSC 가 PMS framework 가

(3) 가 PMS framework 가

( , , )  
 BSC  
 , KPI  
 (4) BSC 47  
 , KPI  
 PMS  
 framework  
 ,  
 PMS  
 framework  
 framework  
 (incentive)

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### Abstract

The performance measurement system of a company is an important tool to evaluate business result, to manage human resource and to achieve strategic management goals. Until 1990's, the performance in most of companies had been measured by financial perspectives. Recently non-financial perspectives with various and balanced view points are used. In the construction industry, the same situation is happened. However, effective tools are not developed yet. Therefore, this research proposes a framework of the comparable performance measurement in the construction industry. This framework is based on concept of the balanced scorecard(BSC) and prepared respectively for owner, contractor and architect/engineer. Using this framework, it is possible to compare performance of a company with each other and to benchmark the best performance.

**Keywords** : Balanced Scorecard(BSC), Performance Measurement, Key Performance Indicator(KPI)

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