

AHP(Analytic Hierarchy Process)

1



- AHP



2

- Expert Choice

; the Survival of the Fittest

- "It is not the strongest of the species that survives nor the most intelligent, it is **those most adaptive to change.**"
- “ 가 가 , 가 .”

From Origin of Species by Charles Robert Darwin

; the Survival of the Fittest

- 가
 - () : (Mission)
 - 가 : (Vision)
 - Mission Vision : (Strategy)
 - ❖ Quality Management -> Strategy Management

- - Do things right.
 - Do right things.
 - Do right things right!

- Do right things right! -> AHP
 - .
 - : SFO(BSC), 6 , TQM

Pareto's Principle: The 80-20 Rule

- “Vital Few and Trivial Many”
- a few(20%)가 many(80%)
- 가 20%가 80% () .
- 20% 80%
- 20%가 80%
- 20%(10% 10%)가 80%
- 80% 20%
- 20% , 20%가 80%
- : 20% !
- ! () -> AHP

Pareto's Principle: The 80-20 Rule

1. Vision-Driven Decision Making
2. Ruthless Prioritization
3. A Decision-Enabling Culture
 - Speed as a Corporate Virtue ; Empowerment
 - A passion for Information Sharing
 - A Willingness to Take Risks
4. Redefinition of Decision Ownership
5. Humanized Network
6. Connectivity through Process
7. Banking on Memory

[12 Decision Leaders in the world]

- AES Corporation, Robert Bosch(Australia) Pty. Ltd., Citigroup Inc.
- Corning Incorporated, DaimlerChrysler AG, Fuji Photo Film, U.S.A, Inc.
- The Home Depot, Inc., Honeywell International Inc., Intel Corporation
- Johnson & Johnson, Novell Inc., Oracle Corporation

Decision Making in the Digital Age (Dec. 2000) - Challenge and Responses-

AHP ()

- 1. AHP / /
- 2. AHP 3 /3
- 3. AHP /
- 4. AHP /

AHP

- Analytic Hierarchy Process: /
- Analytic: .
- Hierarchy: .
- Process: 가 ,

AHP

- 1970 Pennsylvania Thomas L. Saaty 가
- game utility 가 (3) ,
- " "
- 60 , 20,000 , ,

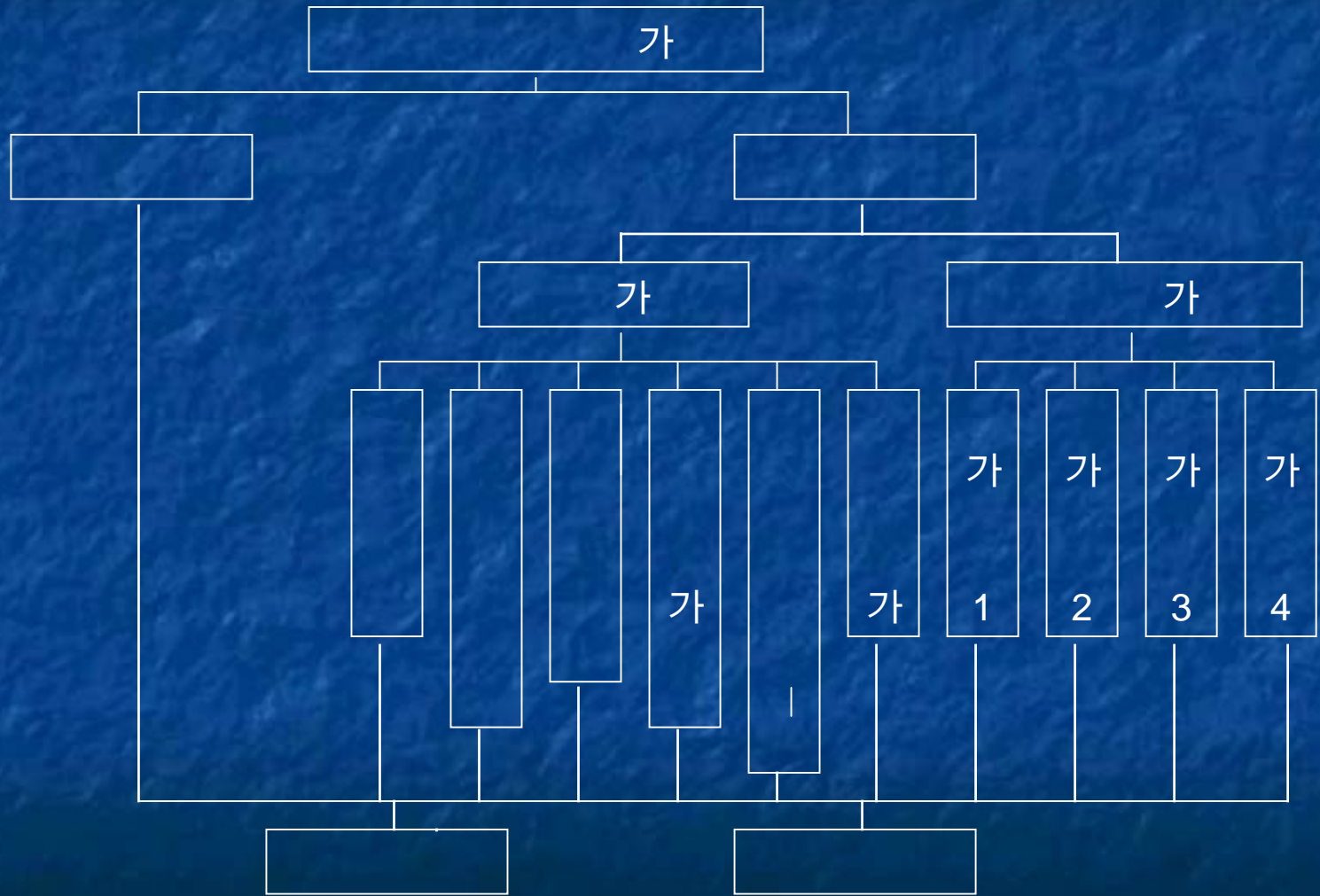
AHP 3 /3

- 3
 - (Hierarchies)
 - (Priorities)
 - (Consistency)
- AHP 3
 - (가)
- 3
 - Goal, Alternatives, Criteria(Sub-criteria)

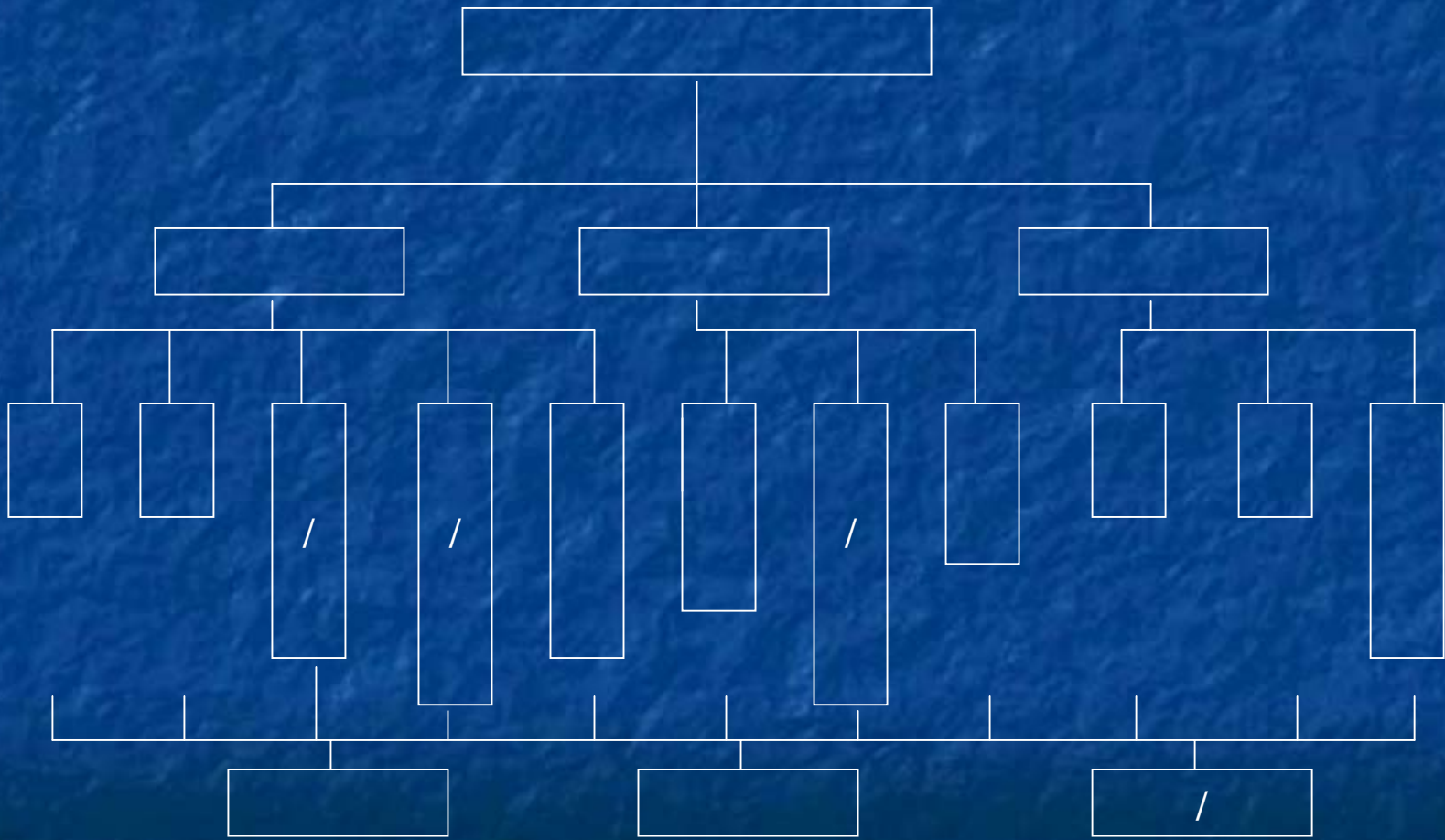
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: 가

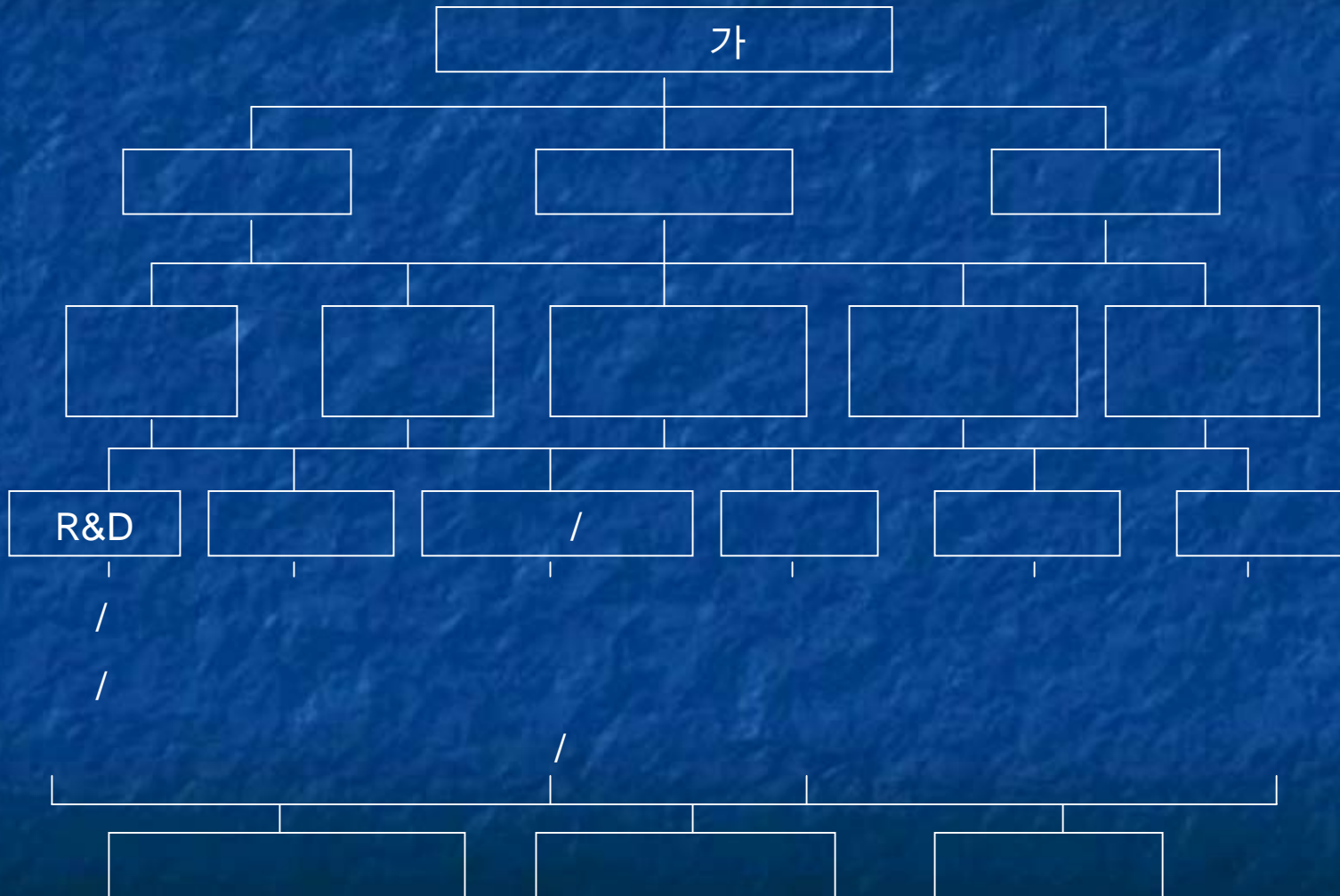


: ()



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가



()

1:1

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가

■

1. 가

가

2.

가

3.

가

■ 1-9

1: , 3:

, 5: , 7:

, 9:

2, 4, 6, 8:

* 가

9

가 가

.

()

1.

(*가 ,)

	1	*1/2	*3
	2	1	*4
	1/3	1/4	1

2.

	10/3	7/4	8
--	------	-----	---

3.

,
,
* “ ” ,

	3/10	2/7	3/8	0.9607	0.3202
	6/10	4/7	4/8	1.6714	0.5571
	1/10	1/7	1/8	0.3679	0.1226

■ 가 가 *

					가			
H-car	0.1160	0.3790	0.3010	*		H-car	0.3060	
S-car	0.2470	0.2900	0.2390			0.3196	S-car	0.2720
K-car	0.0600	0.0740	0.2120			0.5584	K-car	0.0940
D-car	0.5770	0.2570	0.2480			0.1220	D-car	0.3280
						=		

■ D-car가 ()

- 가 가
- (, 가)
- 가
-) $A=5B, B=2C$, then $A=10C$
- ->
- 0.1

()

1. ()

	(0.3202)	(0.5571)	(0.1226)
	1	1/2	3
	2	1	4
	1/3	1/4	1

2. 가

	0.3202	0.2786	0.3678	0.9666
	0.6404	0.5571	0.4904	1.6879
	0.1067	0.1393	0.1226	0.3686

/ ()

3.

$$\begin{array}{rclcl} 0.9666 & & 0.3202 & & 3.0186 \\ & * & & = & \\ 1.6879 & & 0.5571 & & 3.0298 \\ 0.3686 & & 0.1226 & & 3.0066 \end{array}$$

4.

λ_{\max}

$$(3.0186 + 3.0298 + 3.0066) / 3 = 3.0183$$

5.

$$CI = (\lambda_{\max} - n) / (n - 1)$$

$$CI = (3.0183 - 3) / 2 = 0.0183 / 2 = 0.0092$$

6.

$$(CR) = CI / RI = 0.0092 / 0.52 = 0.018$$

AHP

- KDI 가
- 가 , 가 , 가
- , ,
- 가
- 가
- 가
- 가 가

AHP

- 목표 (Goal) / 기준 (Criteria) (가) (W-I) (가)
- 목표 (Goal) / 기준 (Criteria) (가) (W-I) (가)
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- 목표 (Goal) / 기준 (Criteria) (가) (W-I) (가)
- 목표 (Goal) / 기준 (Criteria) (가) (W-I) (가)

*

Why How 가



, 가

AHP

- 가 (A), (1/A)

$$A = \begin{matrix} & \begin{matrix} 1 & 2 & 3 & 4 \end{matrix} \\ \begin{matrix} 1 \\ 2 \\ 3 \\ 4 \end{matrix} & \begin{bmatrix} 1 & A & A/A & A \\ 1/A & 1 & A & 1/A \\ A/A & 1/A & 1 & A \\ 1/A & A & 1/A & 1 \end{bmatrix} \end{matrix}$$

- A=2, U=(0.322, 0.221, 0.247, 0.210)

- 2002 D, D 1, 2

AHP

AHP

!

- 7가

- AHP

0.177	0.019	0.042	0.116	0.190	0.129	0.327

: 0.022

-

0.180	0.010	0.040	0.120	0.180	0.140	0.330

- AHP

가

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AHP

가	, 가 , ,
	가, , , ,
	, M&A, R&D, Risk Management Marketing, , Life-cycle / , Public Relations, (QC, TQC) (, , , ,)
가	, 가
	, ,

AHP

Cost Optimization	Monash University
Diagnostic Management	Rochester School of Medicine
Human Resources Management	Army, Waltham Police Department
Medical Practice Guidelines	George Washington University, Rechester General Hospital
Organizational Development	Support Centers of America, University of Western Sydney, ...
Policy Development	Environment and Policy Institute
Quality Assurance/Improvement	Stainless and Magnetic Steel Divisions, Latrobe Steel Company,
Resource Allocation	Ford Motor Company, Army, Conoco, FAA, Korea Telecom Authority,..
Risk Assessment	FAA, University of Hawaii
Source Selection	Navy, NASA, Royal Institute of Technology, Fulcrum Ingenieria Ltd.,
Strategic Planning	USDA, Naval Postgraduate School, Madigan Army Medical Center, ...
Surveying	University of Kentucky
Other Applications	Argentine Congress, Naval War College, British Colombia Ferry Corporation, Apex Environmental, DOE,
	Benefit/Cost Analysis, Marketing Strategies, POM, M&A, Credit Analysis, Performance Evaluation, Selecting Alternatives,

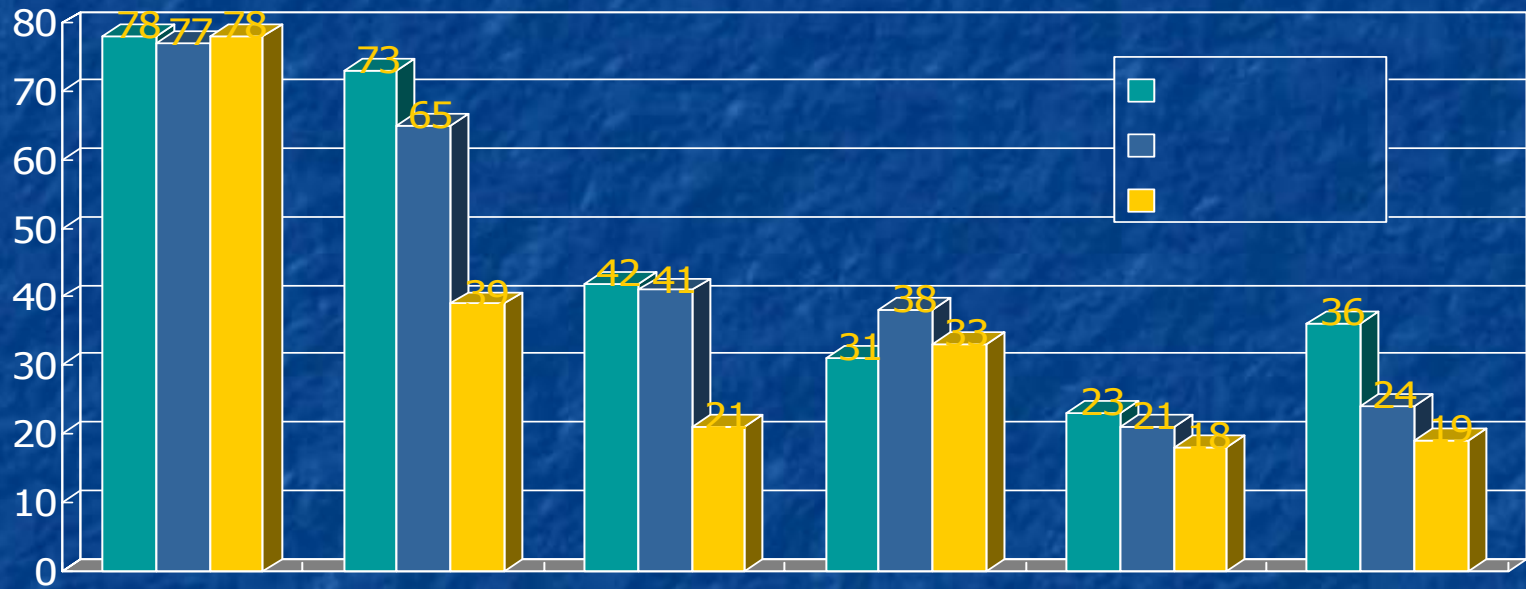
AHP

/	<p>The US Postal Service, etc , South Africa, 가 , etc. : The world Bank, ...</p>
	<p>NASA, Anderson Consulting, Deloitte & Touche, The Wharton School, Harvard University (KDI), , KAIST, , , , , , , , , , , , , , ...</p>
	<p>GM, IBM, AT&T, Citibank, Xerox, Boeing, Exxon, 3M, Amoco, GE Conoco Oil, Rockwell International, Allstate Insurance, Alcoa,... , , , , , , PowerVenture...</p>

1. /
- 2.

	Group Maintenance		Problem Abstraction		Structure		Analysis	
	Leadership Effectiveness	Learning	Scope	Development of Alternatives	Breadth	Depth	Faithfulness of Judgments	Breadth and Depth of Analysis
Structuring								
Analogy, Association	Low	Medium	Medium	Low	NA	NA	NA	NA
Boundary Examination	Medium	Medium	High	Low	NA	NA	NA	NA
Brainstorming/Brainwriting	Low	Low	Low	Medium	NA	NA	NA	NA
Morphological Connection	Low	Medium	High	Very High	NA	NA	NA	NA
Why-What's Stopping	Medium	Medium	High	Very High	High	High	NA	NA
Ordering and Ranking								
Voting	Low	Low	NA	NA	Low	Low	Low	Low
Nominal Group Technique	Medium	Medium	Medium	High	Low	Low	Low	Low
Delphi	Medium	Medium	Medium	High	Low	Low	Low	Low
Disjointed Incrementalism	Medium	High	Medium	Medium	High	Low	Medium	Medium
Matrix Evaluation	Medium	Medium	Medium	Low	High	Low	Medium	Medium
Goal Programming	Low	Low	Medium	Low	High	Low	Very High	Medium
Conjoint Analysis	Low	Low	Medium	Low	Low	Low	Very High	Medium
Outranking	Medium	High	Medium	High	High	Low	Medium	High
Structuring and Measuring								
Bayesian Analysis	Medium	High	Medium	Low	Low	Low	Very High	Medium
MAUT/MAVT	Medium	High	Medium	High	High	Low	High	High
AHP	High	Very High	Medium	Very High	High	High	Very High	Very High

■ 가 : NPV, ROI, EVA, Payback Period



Source: Cooper, R.G., Edgett, S.J., and Kleinschmidt, E.J., "Best practices for managing R&D portfolios", Research-Technology Management, 41, 4, July-Aug. 1998, 20-33.

(KM) AHP & EC

- KMCI(Knowledge Management Consortium International)
- KM 가 KMCI K-STREAM
- , ROI
- , ,
- “ EC , KM
- “ , KMCI , Joseph M. Firestone-

(QFD) AHP & EC

- QFDI(Quality Function Deployment Institute)
- QFD: 가

- QFD EC

“ EC

“ , QFD
.”

–QFD , Glenn Mazur-

(HRM) AHP & EC

▪ EC Catella Consortium Securicor

“ EC

가

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-Catella, Marna Cilliers-hartlief-

- Moral or Prudential Algebra

