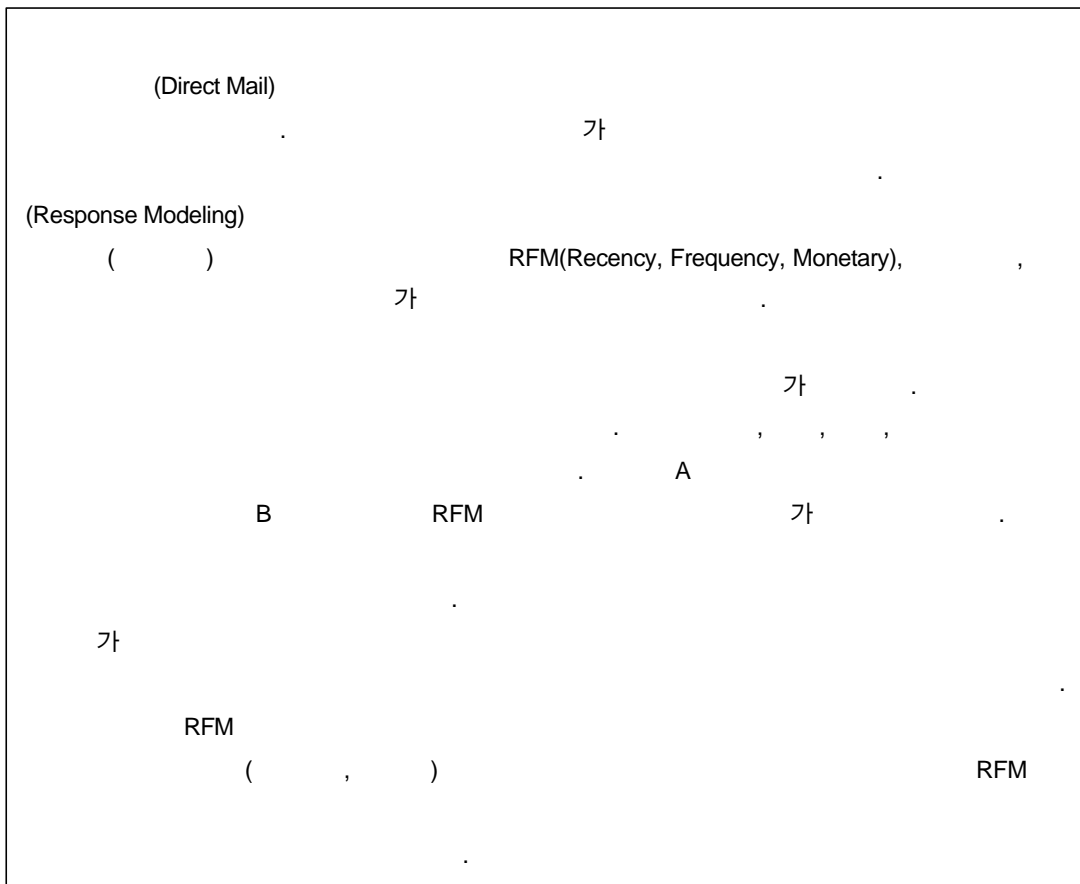


()
()
()

Customer List Segmentation Using the Combined Response Modeling

Eui-ho Seo
Kap-chel Noh
Eung-beom Lee



1.

1.1

1

1. (Arakawa Damaki,1995)

1960			
1970			
1980			
1990		가가	

, 4P

가

(Zahavi and Levin,1995).

가

(Blattberg)

(Blattberg,1987).

The purpose of such models is to predict the probability that an individual will buy from a new offering, given specific historical data about that individual.

The modeling problem is to design techniques that can improve upon current methods.

Are there methods which can be designed for the specific problems direct marketers face that predict better than regression or AID?

1.2.

(Wiersema,1987; Ramaswamy, Desarbo, Robinson and Reibstein,1993). 가

가 .
4가 .

- 1. 가?
- 2. 가?
- 3. 가 가?
- 4. 가 가?

4가

RFM
(,)

2.

2.1

1 . (Zahavi and Levin,1995).

가

1 가 .

1 가

가 , 10% 10

50% 2 0% 8

가 100% 1

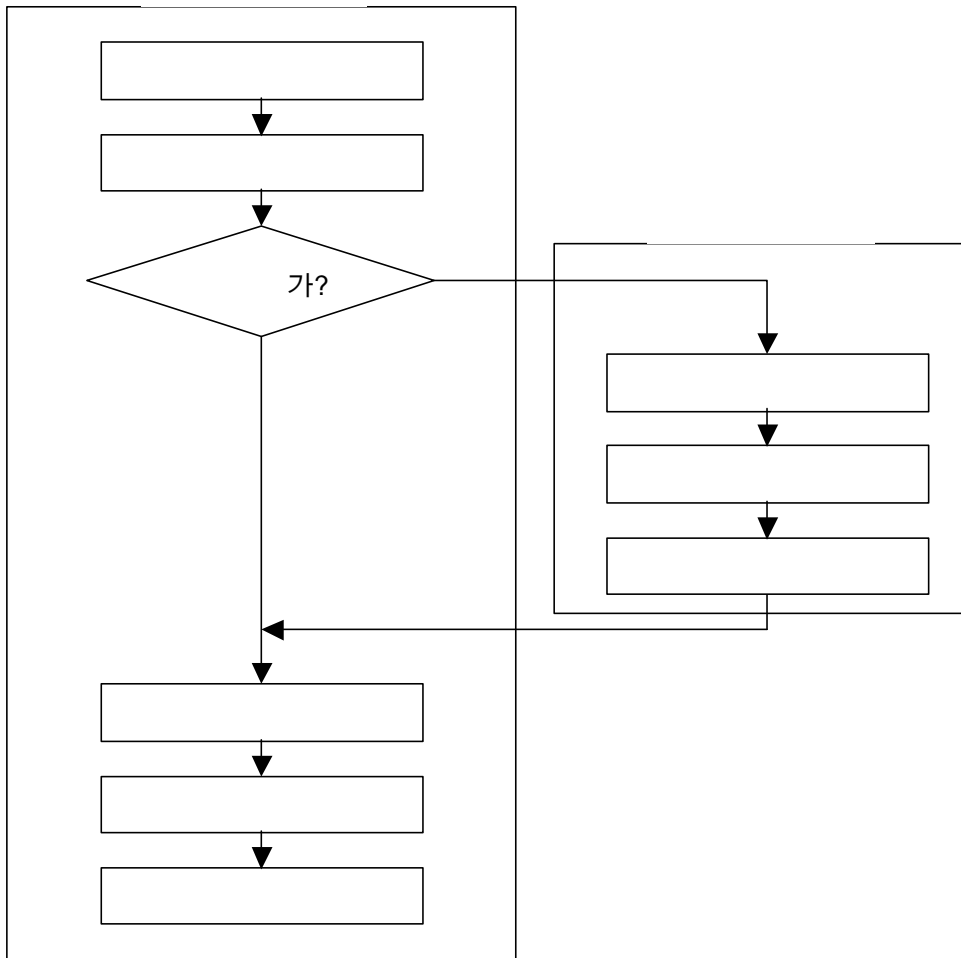
0% 9 가 (Kim, J.,1997).

. RFM,

가

1

(Zahavi and Levin,1997)



2.2

1999. 3

22

가 ,
 가
 RFM (Hughes,1998; Wang and Baker,1996),
 (Widrow, Rumelhart and Lehr,1994) AID, CHAID (Blattberg and
 Vitale,1986; Magidson,1998), CART, (Ben and Lerman,1985;
 Berger and Magliozzi,1992; Shepard,1995) RFM
 가
 (Hughes,1998; Zahavi and Levin,1997).

가
 가
 가
 가
 (Jain and Neg,1997; Zahavi and Levin,1997).
 . J. Zahavi 가
 가
 가
 15가 (Zahavi and Levin,1997). Zahavi 가

1. Min (Output of M1, Output of M2)
2. Min (Output of M1, 2*Output of M2)
3. Min (Output of M1, 3*Output of M2)
4. Min [SQRT (Output of M1), SQRT (Output of M2)]
5. Min [SQRT (Output of M1), 2*SQRT (Output of M2)]
6. Min [SQRT (Output of M1), 3*SQRT (Output of M2)]
7. Output of M1 + Output of M2
8. 2*Output of M1 + Output of M2
9. 3*Output of M1+ Output of M2
10. 4*Output of M1 + Output of M2
11. SQRT (Output of M1) + SQRT (Output of M2)
12. 2*SQRT (Output of M1) + SQRT (Output of M2)
13. 3*SQRT (Output of M1) + SQRT (Output of M2)

14. $4 * SQRT(\text{Output of M1}) + SQRT(\text{Output of M2})$

15. Upper 50% Output of M1 and Upper 50% Output of M2

Zahavi 가 가 가
 RFM RFM RFM RFM

3.

3.1.

RFM, ,

3.1.1. RFM

RFM Recency, Frequency, Monetary

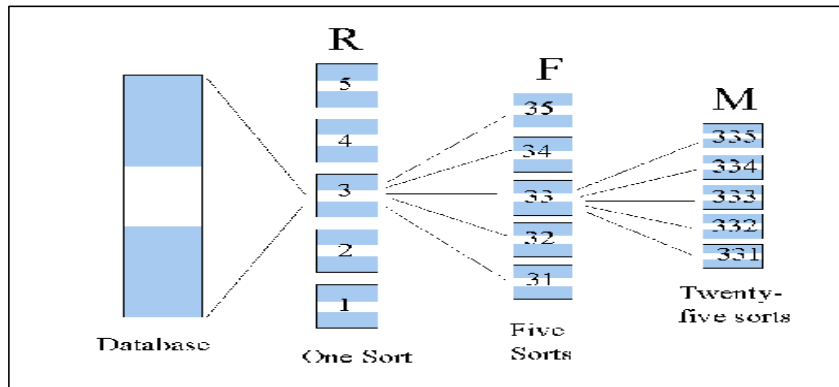
30 R

F M

(Hughes,1996; Jen,1995; Park,C.,1996). RFM 3가

R 가 가 F , M

가 . 2 RFM

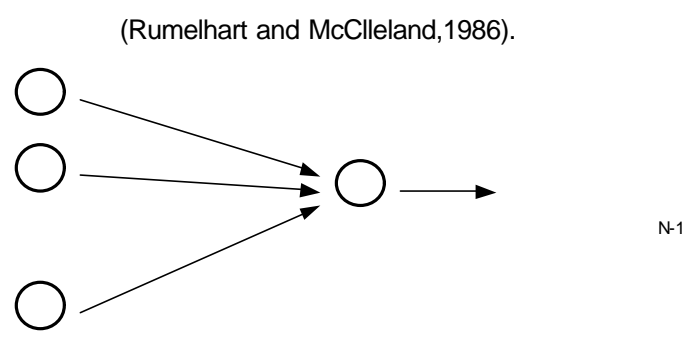


2 RFM

2 5 125 F R 5 5 M 1 2

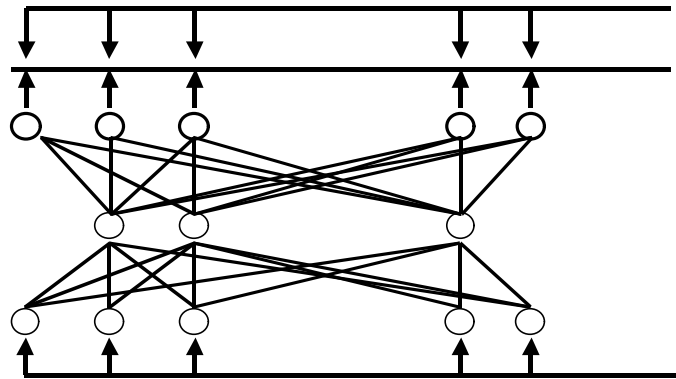
3.1.2.

가 (Connection Weight) 가 (Activation Function) 가 (Learning Process) (Rumelhart, Widrow and Lehr, 1994; Lee,J.,1996). Backpropagation



$X_0 \sim X_{N-1}$: The values of input nodes (between 0 to 1)
 $W_0 \sim W_{N-1}$: Connection weights
 y : Output value (between 0 to 1)
 θ : offset

3 가 Multi-Layer Perceptron 4 Multi-Layer Perceptron (Hidden Nodes) 가 Multi-Layer (Lee,J.,1996).



4 Multi-Layer Perceptron

3.1.3.

Inc,1991).

가

(SAS Institute

(Sung,N.,1996).

가

- Probability
- Odds
- Logit
- Odds ratio
- Log Odds

Odds

$$odds = p / (1 - p)$$

$$\ln(yes) = \ln(p / 1 - p) = \ln(p) - \ln(1 - p)$$

(Jeon,C., Jung,M. and Lee,H.,1998; Shepard,1995).

$$\log it = \ln(p / 1 - p) = \mathbf{b}_0 + \mathbf{b}_1 X$$

Exponential Function

$$p = \exp(\log it) / (1 + \exp(\log it)).$$

3.2.

Zahavi

15가
가 1, 4, 7, 11 가 15
가
11 가

- 16. Min (Output of M2, 2*Output of M1)
- 17. Min (Output of M2, 3*Output of M1)
- 18. Min [SQRT (Output of M2), 2*SQRT (Output of M1)]
- 19. Min [SQRT (Output of M2), 3*SQRT (Output of M1)]
- 20. 2*Output of M2 + Output of M1
- 21. 3*Output of M2+ Output of M1
- 22. 4*Output of M2 + Output of M1
- 23. 2*SQRT (Output of M2) + SQRT (Output of M1)
- 24. 3*SQRT (Output of M2) + SQRT (Output of M1)
- 25. 4*SQRT (Output of M2) + SQRT (Output of M1)
- 26. Upper 50% Output of M2 and Upper 50% Output of M1

Minimun 1 ~ 6 가 가
가 가 3가
(RFM+ , + , +RFM)
26가 1 ~ 6
가 RFM (Ordinal
Value) RFM value

3.3.

1580 C 3 1 2
27 . 27

● RFM

RFM (R), 3 (F), 3
(M) . R 5 5
F 2 M 2
522 111 20 . RFM
522 가
. RFM
가 . RFM
522, 521, 322 가

. RFM
가 .
0 1 20
522 0.95 ~ 1
521 520 0.90 ~ 0.95 0.85 ~ 0.90
111
가

RFM .

●

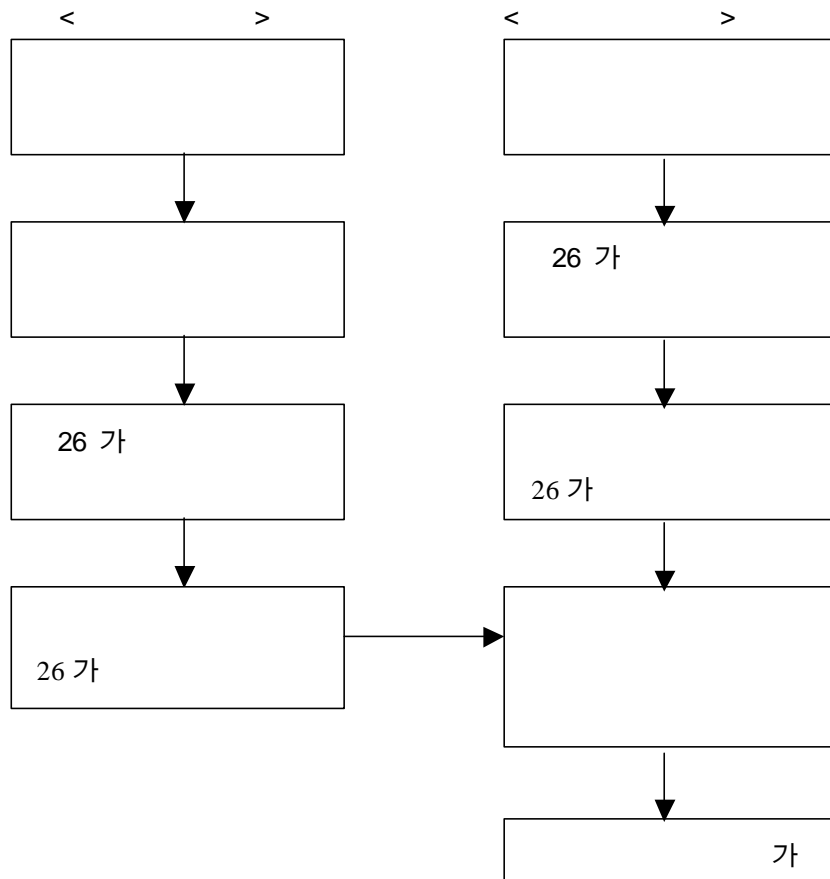
, , , , 가
, 6 가
20% .
가
가 150
가 (6 , 10
1 , 1)
가
20% 가
20% 가

1.

- 1.
- 2. 1
- 3. 26가
- 4. 1 3
- 5. 4 가

2.

- 6.
- 7. 5
- 8. 6 7
- 5



5

4.

4.1.

2 1

2. 1

Methods	Correct	Incorrect	Percent
RFM	78	80	49
NN	87	71	55
Logistic	61	97	39

가

3 2

3. 2

Methods	RFM	NN	Logistic
RFM	1	0.32	0.27
NN	0.32	1	0.62
Logistic	0.27	0.62	1

RFM 가 가
가 4

4.

RFM, NN	26	0
RFM, Logistic	20	6
NN, Logistic	1	25
	47	31

6.

Methods	RFM	NN	Logistic
RFM	1	0.29	0.33
NN	0.29	1	0.66
Logistic	0.33	0.66	1

RFM 가 RFM
 가
 . 7 26가

7.

RFM, NN	19	7
RFM, Logistic	20	6
NN, Logistic	24	2
	63	15

가 RFM
 7
 RFM (50%) 가 RFM
 6가 RFM
 가
 5% 가
 26가 11, 12, 13
 1. 50% RFM
 2. RFM 3
 (69%)
 3. 가

1 2
가

가

RFM
37%

2

5.

가

RFM
RFM

가

RFM

가

가 RFM, ,

4가

, RFM
, RFM

가

.RFM

, 가

, 가

37%

가

가

가

가

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