

SCORING MODEL

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DEFINITION

- What is a Scoring Model?
- A **scoring model** is a formula that assigns points based on known information to predict an unknown future outcome.

A Scoring Model for Job Selection

- A graduating college student with a double major in Finance and Accounting has received the following three job offers:
 - financial analyst for an investment firm in Chicago
 - accountant for a manufacturing firm in Denver
 - auditor for a CPA firm in Houston

CONT...

- The student made the following comments:
 - “The financial analyst position provides the best opportunity for my long-run career advancement.”
 - “I would prefer living in Denver rather than in Chicago or Houston.”
 - “I like the management style and philosophy at the Houston CPA firm the best.”
- Clearly, this is a multi-criteria decision problem.

CONT...

- Considering only the long-run career advancement criterion
 - the financial analyst position in Chicago is the best decision alternative.
- Considering only the location criterion
 - the accountant position in Denver is the best decision alternative.
- Considering only the management style criterion
 - the auditor position in Houston is the best alternative.

CONT...

- **Steps Required to Develop a Scoring Model**
 - **Step 1:** List the decision-making criteria.
 - **Step 2:** Assign a weight to each criterion.
 - **Step 3:** Rate how well each decision alternative satisfies each criterion.
 - **Step 4:** Compute the score for each decision alternative.
 - **Step 5:** Order the decision alternatives from highest score to lowest score. The alternative with the highest score is the recommended alternative.

CONT...

- Mathematical Model

$$S_j = \sum_i w_i r_{ij}$$

where:

r_{ij} = rating for criterion i and decision alternative j

S_j = score for decision alternative j

CONT...

- Step 1: List the criteria (important factors).
 - Career advancement
 - Location
 - Management
 - Salary
 - Prestige
 - Job Security
 - Enjoyable work

CONT...

- Five-Point Scale Chosen for Step 2

<u>Importance</u>		<u>Weight</u>
Very unimportant		1
Somewhat unimportant		2
Average importance	3	
Somewhat important		4
Very important		5

CONT...

- Step 2: Assign a weight to each criterion.

<u>Criterion</u>	<u>Importance</u>	<u>Weight</u>
Career advancement	Very important	5
Location	Average importance	3
Management	Somewhat important	4
Salary	Average importance	3
Prestige	Somewhat unimportant	2
Job security	Somewhat important	4
Enjoyable work	Very important	5

CONT...

- Nine-Point Scale Chosen for Step 3

<u>Level of Satisfaction</u>	<u>Rating</u>
Extremely low	1
Very low	2
Low	3
Slightly low	4
Average	5
Slightly high	6
High	7
Very high	8
Extremely high	9

CONT...

- Step 3: Rate how well each decision alternative satisfies each criterion.

Decision Alternative

	Analyst		Accountant		Auditor		
<u>Criterion</u>				<u>Chicago</u>		<u>Denver</u>	<u>Houston</u>
Career advancement			8		6	4	
Location	3	8	7				
Management		5	6	9			
Salary	6	7	5				
Prestige	7	5	4				
Job security	4	7	6				
Enjoyable work		8	6	5			

CONT...

- Step 4: Compute the score for each decision alternative.

Decision Alternative 1 - Analyst in Chicago

Criterion	Weight (w_i)		Rating (r_{i1})		$w_i r_{i1}$
Career advancement	5	x	8	=	40
Location	3	3	9		
Management	4	5	20		
Salary	3	6	18		
Prestige	2	7	14		
Job security		4	4	16	
Enjoyable work	5	8	<u>40</u>		
Score	157				

CONT...

- Step 4: Compute the score for each decision alternative.

$$S_j = \sum_i w_i r_{ij}$$

$$S_1 = 5(8)+3(3)+4(5)+3(6)+2(7)+4(4)+5(8) = 157$$

$$S_2 = 5(6)+3(8)+4(6)+3(7)+2(5)+4(7)+5(6) = 167$$

$$S_3 = 5(4)+3(7)+4(9)+3(5)+2(4)+4(6)+5(5) = 149$$

CONT...

- Step 4: Compute the score for each decision alternative.

Decision Alternative

	Analyst		Accountant		Auditor	
<u>Criterion</u>	<u>Chicago</u>		<u>Denver</u>			
<u>Houston</u>						
Career advancement			40	30	20	
Location	9	24	21			
Management		20	24	36		
Salary	18	21	15			
Prestige	14	10	8			
Job security	16	28	24			
Enjoyable work	<u>40</u>	<u>30</u>	<u>25</u>			
Score	157		167		149	

CONT...

- Step 5: Order the decision alternatives from highest score to lowest score. The alternative with the highest score is the recommended alternative.
- The accountant position in Denver has the highest score and is the recommended decision alternative.
- Note that the analyst position in Chicago ranks first in 3 of 7 criteria compared to 3 of 7 for the accountant position in Denver.