112學年度第1學期資訊管理研究所博士班資格考

科目:資訊科技與決策理論

Time：2023/10/27 09:00-12:00

備註：請用原子筆，勿用鉛筆作答。

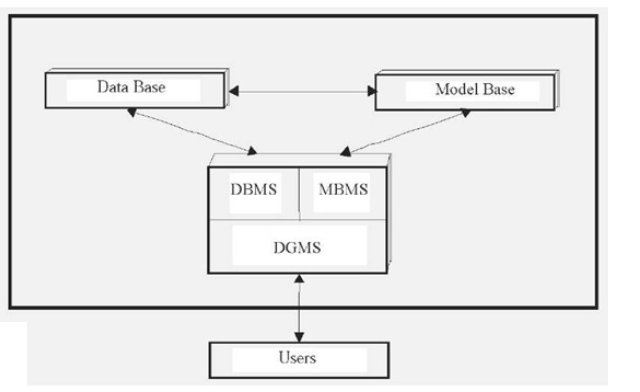
Format： □ OPEN BOOK ■ CLOSED BOOK

1. **(20%)** What are the functions of Language System (LS), Presentation System (PS), Problem Processing System (PPS), and Knowledge Systems (KS) respectively in the generic framework of decision support systems (Holsapple and Whinston, 1996)?
2. **(13%)** Please discuss some "Interpretable data science for decision making" papers published on Decision Support Systems (Elsevier) Journal.
3. **(16%)** In a 1978 study, Keen and Scott Morton (1978) defined a development framework of decision support systems (DSS), as shown in Figure 1. Assuming you are using an enterprise resource planning software to optimize production schedule, please:

(1) Explain the attributes or functions of each component in the framework,

(2) Justify each linkage in the diagram, and

(3) Explain the differences between DSS and traditional management information systems (MIS).



Reference:

Keen, P.G.W. and Scott Morton, M.S. (1978). *Decision Support Systems: An Organizational Perspective*, Reading, MA: Addison-Wesley.

1. **(7%)** Please explain the following DSS characteristics and capabilities.

(1) Business analytics,

(2) Web analytics, and

(3) Predictive analytics.

Reference:

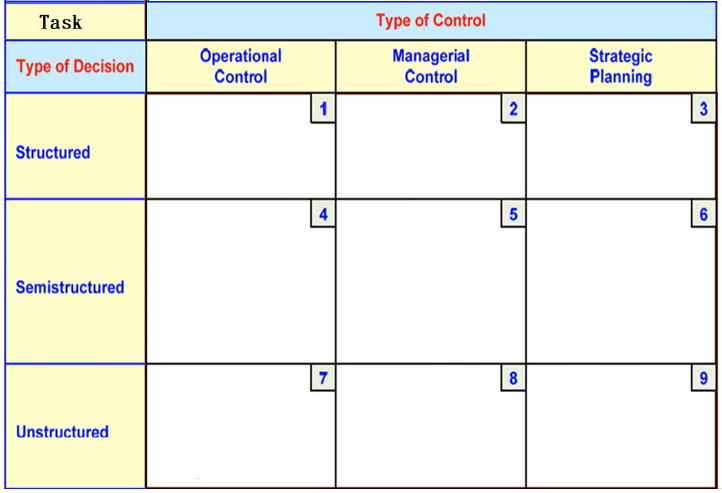
Turban, E., Aronson, J.E., Liang, T.P. (2005). *Decision Support Systems and Intelligent Systems*. Englewood Cliffs, NJ: Prentice-Hall.

1. **(10%)** In The following table identifies the decision support framework. A DSS can support different levels of control and different types of decisions. The levels of control are Strategic planning, Managerial control, and Operational control. The types of decisions are Structured, Semistructured, and Unstructured.

(1) Please briefly explain each level of control and type of decision.

(2) Furthermore, please identify one task example in the 9 entries of the following table based on the list of tasks below.

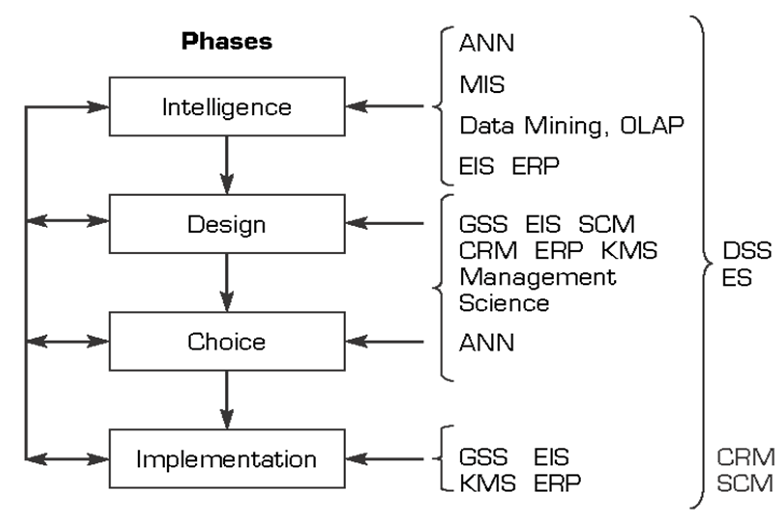
|  |  |
| --- | --- |
| 1. Accounts payable | 20. Make-or-buy |
| 2. Accounts receivable | 21. Mergers and acquisitions |
| 3. Approving loans | 22. Negotiating contracts |
| 4. Booking a business trip | 23. New product planning |
| 5. Budget analysis | 24. New technology development |
| 6. Budget preparation | 25. Operating a help desk |
| 7. Building a new plant | 26. Order entry |
| 8. Buying hardware products | 27. Personnel reports |
| 9. Buying software products | 28. Plant layout |
| 10. Compensation planning | 29. Production scheduling |
| 11. Credit evaluation | 30. Project scheduling |
| 12. Distribution systems | 31. Quality assurance |
| 13. Financial management | 32. R&D planning |
| 14. HR policies | 33. Recruiting an executive |
| 15. Inventory categorization | 34. Reward system design |
| 16. Inventory control | 35. Select warehouse location |
| 17. Inventory planning | 36. Selecting a cover for a magazine |
| 18. Investment portfolio | 37. Short-term forecasting |
| 19. Lobbying | 38. Social responsibility planning |



Reference:

Holsapple, C. W. and Whinston, A. B. (1996). *Decision Support Systems: A Knowledge Based Approach*. Minneapolis, MN: West Publishing, Inc.

1. **(10%)** Please explain the meaning of the following Figure (including the meaning of each acronyms, square and the link relation between the squares and acronyms).



1. **(10%)** Please use the following knowledge base to forward and backward infer West is a criminal.



1. **(8%)** Suppose someone is going to buy a tractor. He has two alternatives: A new tractor (cost 17,000) or an used tractor (cost 14,000). The engine of the old tractor may be defect, which is hard to ascertain. That man estimates a 15 % probability for the defect. If the engine is defect, he has to buy a new tractor and gets 2,000 for the old one. Before buying, that man can take the old tractor to a garage for an evaluation, which costs 1,500. If the engine is OK, the garage can confirm it without exception. If the engine is defect, there is a 20 % chance that the garage does not notice it. Please draw a decision tree to suggest the best alternative for him.
2. **(5%)** Jack and KiKi play a game. Both of them can propose a strategy. Assume Jack can have the four strategy, A, B, C, or D; and KiKi can have E, F, G, or H. The score listed below shows the benefit received in the viewpoint of KiKi. Jack wants the score higher, but KiKi wants lower instead. Assume both of them propose their own strategy simultaneously, and they both use the game theory to get their max profit. How Jack/KiKi should propose their strategy?

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | | Jack | | | |
| A | B | C | D |
| Ki  Ki | G | 46 | 7 | 34 | 40 |
| H | 13 | 21 | 35 | 18 |
| E | 32 | 9 | 27 | 31 |
| F | 16 | 20 | 2 | 29 |