Impact of Group Decision Support System (GDSS) on Organizational Decision Making in Telecommunication Sector in Jordan

Jehan Slman Ereifej

ISBR college, Mysore University, India.

Abstract

Corporate history is full of examples of individual decisions that have been taken by the CEOs or top executives on the basis of their position and power alone. There is the famous story of Lee Iaococa getting fired by Henry Ford II. In his autobiography Lee Iaococa has stated how some of the individual decisions taken by Henry Ford II cost the Ford Company. Such examples are a mystery to understand and in fact motivate researchers to probe into role of systems like GDSS. Decision making with groups is an important process within companies and strongly supported in universities. Policies, budget plans, and other organizational tasks frequently involve group discussions or meetings. Collaboration within groups can be very effective as knowledge is increased, but being geographically dispersed can present a problem. This study investigates the impact of GDSS on organizational decision making in the two top telecommunication companies in Jordan.

Keywords- Decision Support Systems, Ground Decision Support Systems, Private Criteria, Public Criteria, Telecom Companies

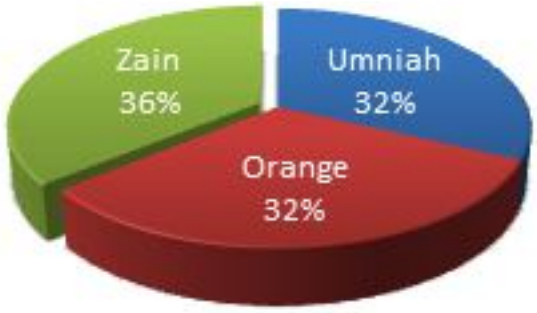
INTRODUCTION

In general, a Group Decision Support System is a computer-based information system that is used to improve an organization's group decision making. The group decision support system is similar to a Decision Support System in that it supports the three basic functions of data, model, and dialogue management. However, unlike an individual decision support system (DSS), a group decision support systems must interact with two or more users through a communications subsystem. In organizations it becomes difficult to make communication with all the employees at the same time and this is where the group decision support system comes into play. Academic work on Group Decision Support Systems was largely led in the 1980s and 1990s by the University of Minnesota (the SAMM System) and the University of Arizona (PLEXSYS), later renamed Group Systems Group Decision Support System main Components.

A Group decision support system (GDSS) is composed of 3 main components, namely hardware, software tools, and people.

Telecom players in Jordan –

2016 - Jordan Telecom Market Share



RESEARCH OBJECTIVES

- To analyze the impact of GDSs on the telecommunication Industry's operations in Jordan
- To understand how the GDSS can increase the efficiency of telecommunication industry through its implementation
- To understand the impact and influence of the GDSS on Organizational support, strategic planning, knowledge management and technology in the telecommunication sectors in Jordan
- To understand the role of private criteria in a collaborative decision making process
- To study the role of facilitator in a collaborative decision making process.

Survey of literature –

a. Noor Maizura Mohamad Noor et.al (2014) in their abstract for the article "Evolutionary Framework of a Decision Support System for Forensic DNA Analysis" have stated that while initial work for development of DSS was done in 1980's, research on this front has not been continuous. But of late, the research has again picked up.

b. Effren G Mallach in his ppt on DS and data warehouse systems (2000) have summarized evolution of DSS as under -

DOI : 10.21904/weken/2017/v2/i2/120588

- DSS evolved in 1970's
- Commercialized during 1980's
- Provides easier end-user access to the data
- In the 1990's data for decision making evolved into the data warehouse

C. Sean B. Eom, (2006) has plotted the evolution of DSS as under – Taxonomy of knowledge –

Technology	Analogy	Management	Metaphor
Data EDP	Elements: H_2O, yeast bacteria, starch molecules	Muddling through	KNOW – NOTHING
Information MIS	Ingredients – Flour sugar, spices, fixed recipe for bread only	Efficiency	KNOW – HOW
Knowledge DSS, ESS, AI	Choose amongst different recipes of bread	Effectiveness	KNOW – WHAT
Wisdom HSM, MSS	Why bread and not croissant	Explicability	KNOW - WHY

d. Daniel E. O'Leary, in his article "Decision Support System "Evolution" has presented the following diagrams on evolution of DSS -

Figure 1
Decision Understanding Stages

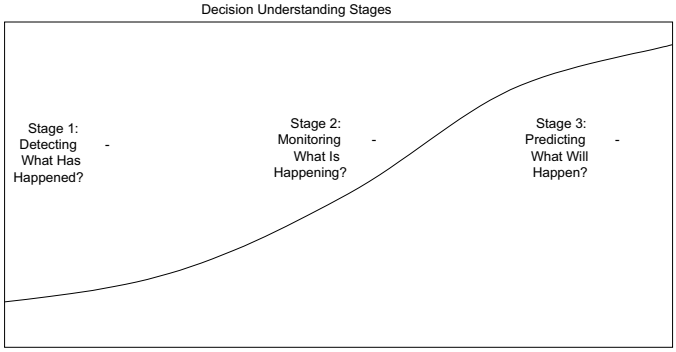
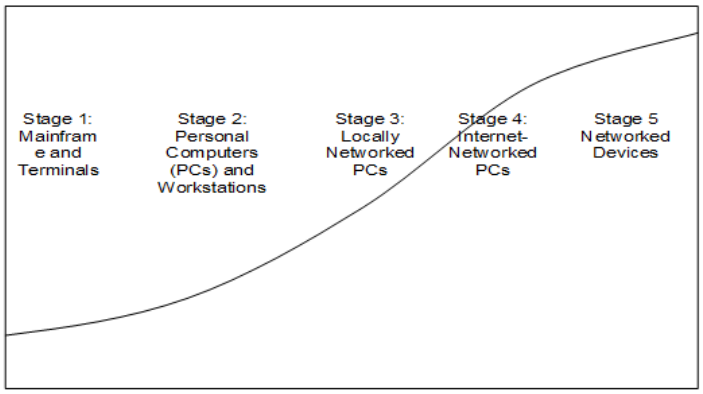


Figure 2
DSS Hardware Evolution



e. Ion ISTUDOR, Luminiţa DUŢĂ Valahia University, Targoviste, Romania 2010, In this, they different phase of GDSS, it is Web-Based Group Decision Support System: an Economic Application. Decision Support Systems (DSS) form a specific class of computerized information systems that support business and managerial decision-making activities. Making the right decision in business primarily depends on the quality of data. It also depends on the ability to analyze the data with a view to identifying trends that can suggest solutions and strategies. A —cooperative decision support system means the data are collected, analyzed and then provided to a human agent who can help the system to revise or refine the data. It means that both a human component and computer component work together to come up with the best solution.

Sample for the study - The research methodology consisted of collection of primary data by way of questionnaire circulated to 400 respondents (200 each from the 2 companies – Zain & Orange) in order to establish the role of GDSS in decision making at these 2 companies.

Summary of data analyses of responses & interpretation

The following table summarizes key parameters and the overall interpretation –

DOI : 10.21904/weken/2017/v2/i2/120588

Sr. No.	Parameter	Valu e(s)	Interpretation
1	P-Value – H01-No impact of GDSS on Overall Development of Telecom sector	0.00	Null hypothesis is rejected. That there is no impact of GDSS on overall development of telecom sector is not true.
2	P-Value – H01-1No impact of GDSS on organization support function	0.00	Null hypothesis is rejected. That there is no impact of GDSS on organization support function is not true.
3	P-Value – H01-2No Impact of GDSS on Strategic Planning	0.33	Null hypothesis is not rejected. That there is no impact of GDSS on strategic planning function cannot be significantly disproved. In other words, it is not proved that GDSS does really impact strategic planning function.
4	P-Value – H01-3 No Impact of GDSS on Knowledge Management Function	0.00	Null hypothesis is rejected. That there is no impact of GDSS on k nowledge management function is not true.
5	P-Value – H01-4No Impact of GDSS on Technology Function	0.00	Null hypothesis is rejected. That there is no impact of GDSS on technology function is not true.
6	P-Value – H02Number of private criteria should not be equal to public criteria	0.19	Null hypothesis is not rejected. The number of private criteria should not be equal to public criteria cannot be significantly disproved. As many as 44% of the respondents disagreed to the proposition that the equality in criteria should

Interpretation –

1. On an overall basis, as per the opinion of the respondents, GDSS has an impact on Development of Telecom Sector in Jordan.
2. This agreement is also seen in respect of the various functions of the Development, barring Strategic Planning, where we fail to reject the null hypothesis that there is no impact of GDSS on strategic planning. In the light of this failure to reject the null hypothesis, impliedly it means that respondents have denied significant impact of GDSS on strategic planning.
3. The null hypotheses that private and public criteria should not be equal in numbers could not be rejected, which means that the respondents do not really vouch for equality in the 2 types of criteria. In other words, respondents do not favor this idea of private criteria being equal to that of common criteria.
4. That a GDSS can function without a human facilitator has been rejected. In other words, respondents believe that a GDSS has to have a human facilitator.
5. Respondents believe that there are benefits of allowing use of private criteria along with public criteria.

Identification of key problem areas or main issues -

Sr. No.	Problem / Key A rea(s) identified	Rationale for selection as problem/discussion point
1	GDSS does not have a significant impact on Strategic Planning function	In response to the question whether GDSS has a significant impact on strategic planning, as many as 47% of the respondents replied in disagreement.
2	Non-agreement over number of Private criteria to be equal to that of common criteria	In response to the question whether number of private criteria should be equal to that of the common criteria, as many as, 44% of the respondents replied in disagreement.
3	GDSS can play a better role (than the current role)	Taking the 5 dimensions together, 68% of the respondents agreed that GDSS can play a better role.
4	Non-quantification of impact of GDSS	Taking the 5 dimensions together, 64% of the respondents disagreed that impact of GDSS can be quantified
5	Non-availability of external information	Taking the 5 dimensions together, 75% of the respondents disagreed that adequate external information is available for the GDSS.
6	Non-availability of modeling	Taking the 5 dimensions together, 73% of the respondents disagreed that adequate modeling techniques are available for the GDSS.

Suggested GDSS model through a case study approach –

ABC company is envisaging installation of a ERP system. Decision involves substantial investment. 3 vendors – SAP, MAPICS & ORACLE

DOI : 10.21904/weken/2017/v2/i2/120588

have pitched their proposals with all technical and commercial details. Company has to choose one vendor. For taking this decision, a group comprising of the following was formed by the management and have been asked to submit a studied recommendation to the top management –

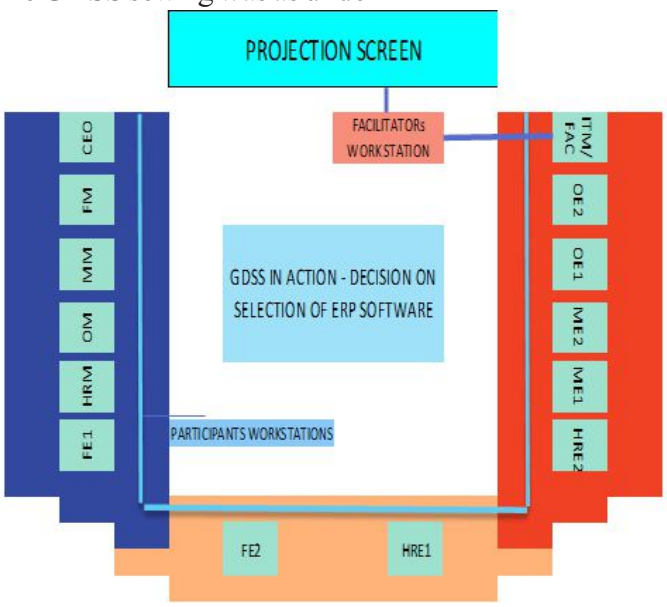
1. CEO
2. IT Manager
3. Finance Manager
4. Marketing Manager
5. HR Manager
6. Operations Manager
7. Finance Executives (2)
8. Marketing Executives (2)
9. HR Executives (2)
10. Operations Executives (2)

Total group size was of 14 members. IT Manager was nominated as the group facilitator.

The first group meeting was held with the following agenda –

1. To formulate decision objectives
2. To review presentations of all the 3 vendors
3. To agree upon common criteria's for decision making
4. To deliberate and decide upon the usage of private criteria in the decision making process

The GDSS setting was as under –



Following were the outcomes –

1. Decision objectives –

a. To select ERP system that would provide the following benefits (adopted from "benefits of ERP software by RAMCO software") –

I) Scalability
ii) Improved reporting
iii) Data quality
iv) Lower cost of operations
v) Better CRM
vi) Business analytics
vii) Improved data access
viii) Better supply chain
ix) Regulatory compliance
x) Reduced complexity

b. To evolve a mechanism that will compare the cost of the system vis-à-vis the likely benefits

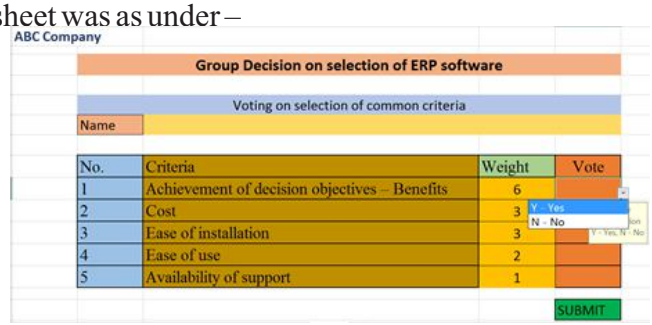
2. All the 3 vendors were asked to present their proposals in line with the benefits that were targeted along with cost and other details. All the 3 vendors gave their presentation. Soft copies of all the 3 presentations were made available to all the 14 group members.

3. To agree upon common criteria for evaluation of all the 3 options – In this regard the IT Manager proposed the following list of criteria for consideration of the members –

No.	Criteria	SAP	MAPICS	ORACLE
1	Achievement of decision objectives – Benefits			
2	Cost			
3	Ease of installation			
4	Ease of use			
5	Availability of support			

The IT Manager further stated that on each of the criteria, the 3 companies are to be given ranking on a scale of 1-10 and the decision about the final selection would be based on the maximum total score.

He then proceeded to seek agreement on these criteria. All the 14 participants were asked to enter "Y" or "N" in the voting sheet provided on their respective computers and press the "Submit" option to vote on the inclusion of the criteria suggested. The voting sheet was as under –



DOI : 10.21904/weken/2017/v2/i2/120588

Before the voting took place, Finance Manager, Operations Manager, one Finance Executive, one Marketing Executive and one HR Executive expressed their disagreement over the weights assigned to each of the decision criteria.

4. To deliberate and decide upon the usage of private criteria in the decision making process – At this point the IT Manager said that there is a provision for inclusion of private criteria and since there is some disagreement over the weights assigned to the criteria we can change the voting sheet leaving the weight column blank to be entered by the individual participants before their choice of "Yes" or "No" for each of the criteria. He also clarified that the range of value for weights would be between 1 to 5. All the participants agreed to this proposal.

The IT Manager then circulated the following revised voting sheet –

ABC Company

Group Decision on selection of ERP software

Voting on selection of common criteria

Name

No.	Criteria	Weight	Vote
1	Achievement of decision objectives – Benefits		
2	Cost		
3	Ease of installation		
4	Ease of use		
5	Availability of support		

5 4 3 2 1

SUBMIT

All the 14 participants voted in favor of inclusion of the criteria proposed but entered different values of weights for the criteria.

The IT Manager compiled the responses and presented the compilation as under –

ABC Company

Group Decision on selection of ERP software

Voting on selection of common criteria

No.	Criteria	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Avg.
1	Achievement of decision objectives – Benefits	5	5	5	5	4	5	5	4	5	5	5	3	4	4	5
2	Cost	4	4	4	1	1	3	4	5	4	4	4	4	4	4	4
3	Ease of installation	3	1	3	2	2	2	5	2	2	2	2	2	1	1	2
4	Ease of use	2	5	5	5	3	5	4	3	3	1	2	4	1	3	3
5	Availability of support	3	5	5	4	2	5	3	4	3	4	2	4	5	5	4

The 1st meeting thus ended with the following outcomes –

a. Consensus over the use of the 5 criteria for arriving at the decision and

b. Agreement over the weights to be assigned to each of the criteria based on individual opinion of the members.

It was also decided that the next meeting would be held after a week's time. Based on the presentations by the 3 vendors members were asked to study the proposals in details and come prepared to vote for the 3 options on a scale of 1-10 in the next meeting.

The 2nd group meeting was held with a single point agenda of voting on the 5 criteria for the 3 options and taking a decision based on the maximum score.

Members were given the following screen to cast their votes –

ABC Company

Group Decision on selection of ERP software

Voting on choice of ERP software

No.	Criteria	Weight	SAP	MAPICS	ORACLE
1	Achievement of decision objectives – Benefits	5			
2	Cost	4			
3	Ease of installation	2			
4	Ease of use	3			
5	Availability of support	4			

10 9 8 7 6 5 4 3

Select your score for the option

All the 14 members voted and the IT Manager presented the results as under –

Group Decision on selection of ERP software

Voting on ranking for the 3 options

No.	Criteria	SAP														MAPICS														ORACLE													
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	A	1	2	3	4	5	6	7	8	9	10	11	12	13	14	A	1	2	3	4	5	6	7	8	9	10	11	12	13	14	A
1	Benefits	3	1	6	8	5	4	7	10	8	6	5	2	6	9	6	4	1	9	9	2	10	6	5	8	9	4	2	5	4	6	10	2	3	3	4	2	5	2	7	9	7	9	4	6	5
2	Cost	5	2	9	6	4	1	2	7	7	4	7	5	7	5	5	7	9	3	4	6	4	9	5	1	3	1	8	4	3	5	7	7	8	6	9	7	8	7	5	6	10	10	9	9	8
3	Installation	6	5	8	7	8	9	1	10	10	5	9	7	3	10	7	3	2	5	1	4	5	3	2	7	9	6	10	5	6	5	3	7	2	5	3	9	9	4	7	2	2	8	5	4	5
4	Ease of use	1	3	1	7	5	6	2	6	4	10	7	6	3	5	5	10	4	4	7	8	4	2	3	3	8	1	4	10	8	5	6	4	2	8	8	1	2	2	8	4	2	9	10	3	5
5	Support	9	9	5	10	3	1	5	6	2	9	4	1	4	7	5	10	6	3	10	8	3	2	6	2	3	9	6	10	6	6	5	8	9	5	8	1	4	2	8	2	4	7	6	8	6

A - Average of 14 members

Final decision was presented as under –

ABC Company

Group Decision on selection of ERP software

Group decision based on voting on criterias for the 3 options

No.	Criteria	Weight	SAP	MAPICS	ORACLE
1	Achievement of decision objectives – Benefits	5	30	30	25
2	Cost	4	20	20	32
3	Ease of installation	2	14	10	10
4	Ease of use	3	15	15	15
5	Availability of support	4	20	24	24
	Weighted Grand Total		99	99	106
	Ranks based on weighted grand total		2	2	1

Group recommended ORACLE ERP software based on its maximum weighted total score.

It would be interesting to note the decision had the weights initially proposed by the IT Manager would have been accepted. The calculation is presented as under –

DOI : 10.21904/weken/2017/v2/i2/120588

ABC Company

Group Decision on selection of ERP software

Group decision based on voting on criterias for the 3 options

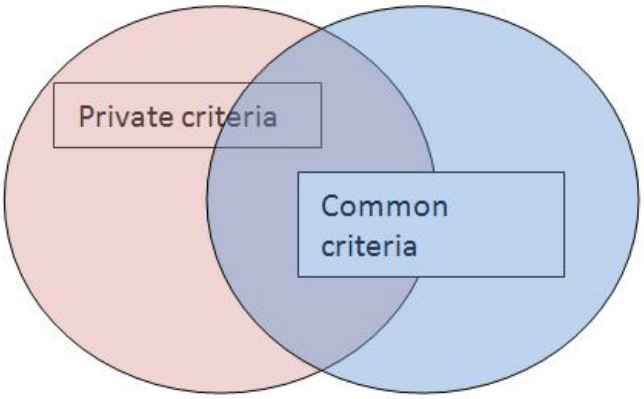
No.	Criteria	Weight	SAP	MAPICS	ORACLE
1	Achievement of decision objectives – Benefits	6	36	36	30
2	Cost	3	15	15	24
3	Ease of installation	3	21	15	15
4	Ease of use	2	10	10	10
5	Availability of support	1	5	6	6
	Weighted Grand Total		87	82	85
	Ranks based on weighted grand total		1	3	2

Based on the above case study we suggest the following –

a. Private criteria have their own value

b. They can be very well combined with common criteria in a collaborative decision making process.

c. Actually the nature of private criteria as revealed from the above case is something like this –



All the 5 criteria were agreed by all the 14 participants but with different levels of importance. The average of the weights paved the way for incorporation of the individual say for each of the common criteria. Yet since averaging was done, say of all the 14 participants got equal consideration. One could apply weights for the weights as well. For instance CEO will have weight of 3, Managers can have weight have of 2 and Executives can have weight of 1 for their weights. In any case, the case demonstrates that private criteria can go hand-in-hand together with common criteria in a collaborative decision making process.

CONCLUSION

On an overall basis, as per the opinion of the respondents, GDSS has an impact on Development of Telecom Sector in Jordan. This agreement is also seen in respect of the various functions of the Development, barring Strategic Planning, where we fail to reject the null hypothesis that there is no impact of GDSS on strategic planning. In the light of this failure to reject the null hypothesis, impliedly it means that respondents have denied significant impact of GDSS on strategic planning. Secondary data analysis related to 11 years financials of both the companies corroborate this conclusion. That the companies have remained flat for more than 10 years fails to speak anything in favor of existence of effective strategic planning. The null hypotheses that private and public criteria should not be equal in numbers could not be rejected, which means that the respondents do not really vouch for equality in the 2 types of criteria. In other words, respondents do not favor this idea of private criteria being equal to that of common criteria. That a GDSS can function without a human facilitator has been rejected. In other words, respondents believe that a GDSS has to have a human facilitator. Respondents believe that there are benefits of allowing use of private criteria along with public criteria.

REFERENCES

[1] Annual Reports – Orange.

[2] Annual Reports – Zain.

[3] Noor MaizuraMohamad Noor, Ahmad FaizGhazali, MdYazidMohdSaman, ZafarinaZainuddin, Mohd Iqbal Hakim Harun, and Muhammad Che Abdullah, 2014, *Lecture Notes on Software Engineering, Vol. 2, No. 2, May 2014,* "Evolutionary Framework of a Decision Support System for Forensic DNA Analysis".

[4] Effren G Mallach, "DS and data warehouse systems", busn.uco.edu/dnoel/DSS/Chap001.ppt.

[5] Daniel E. O'Leary, University of Southern California, Los Angeles, California, *Decision Support System "Evolution".*

ABOUT AUTHOR

Jehan Slman Ereifej is born from Jorden. She has a great potential to explore her interest in research. She is pursuing her research from Mysore University, ISBR college under guidance of Dr. Murthy Narasimha, In Management Information Systems. The field of her research about "Group Decision Support System and How impacted on decision making on Telecommunications Company".

Email id: jeraifej@icloud.com

DOI : 10.21904/weken/2017/v2/i2/120588