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An experiment on the effectiveness of creativity enhancing decision-making support systems

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Abstract

Recent research suggests that creativity can enhance the performance of people for a variety of tasks, including decision-making. Creativity enhancements can be delivered through a decision-making support system. In theory, such delivery should improve the decision performance of the system's user. This paper tests the theory empirically and discusses the implications for decision-making.

Keywords: Decision-making support; Creativity; Creativity enhancement and delivery; Decision support

1. Introduction

Creativity can be defined as the ability to discern new relationships, examine subjects from new perspectives and to form new concepts from existing notions [4,7]. Creativity can be a personality trait or an achievement [8]. As a personality trait, creativity is a dispositional variable characteristic leading to the production of an act, items and instances of novelty. As an achievement, creativity results in a product from the process. The product may be a scientific discovery, an innovative new product or service, art and literature, all of which satisfy some human need.

Formal research has found variables that affect creativity as an achievement include: cognitive variables (intelligence, knowledge skills and others), environmental variables (cultural and socioeconomic factors) and personality variables in addition to creativity as a trait (motivation, confidence and others) [8] (p. 209). Furthermore, researchers have established that creativity can be learned and improved and is not as strongly dependant on individual traits as originally thought [17,25]. Creativity may not so much be the result of genius as being in an idea-nurturing work environment [12,26,30]. This literature suggests that tools that enhance creativity can be made available to decision-makers. Moreover, such availability may enhance the decision-making process.

According to a popular model, decision-making involves a series of phases and steps [5,30]. Creativity

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is useful during most of these phases and steps. For example, creativity can assist in problem design by helping the decision-maker to identify relevant alternatives during the design phase of the process [13,20,24]. In addition, the selection of an appropriate evaluation model is a creative process, involving the matching of problem characteristics with existing models or the construction of a model that describes the problem accurately. Hence, creativity can facilitate the choice phase of decision-making [16,23].

There has been evidence that creativity enhances the performance of persons in a variety of tasks, including decision-making [14,16,19,29]. However, decision-makers may be unaware, and/or lack proficiency in the use, of creativity enhancing tools. It may be useful, then, to deliver the creativity enhancing support through an information system. In theory, such delivery should improve the effectiveness of decision-making support.

This paper tests the theory. First, the paper presents a creativity-enhanced decision-making support system. Next, there is an empirical analysis of the system concept. Then, the paper discusses the study's implications for decision-making support.

2. Creativity enhancing decision-making support system

A number of information systems exist to generate knowledge for decision-making support. These systems collectively can be called decision-making support systems [9]. Usually, the support is offered in a fragmented and incomplete manner with little, if any, delivery of creativity enhancing tools. Yet, the integration of enhancements, including creativity support, within DSS, theoretically, can enhance the quality and efficiency of the decision-making support, create synergistic effects, and augment decision-making performance and value [3,15,21,22,28].

Based on previous research [9,11], the resulting creativity enhancing decision-making support system (CDMSS) will have the conceptual architecture shown in Fig. 1.

Fig. 1 shows that the CDMSS captures and stores as inputs problem specific knowledge (ideas and concepts) and creativity enhancing tools. Ideas and concepts may come from conventional wisdom, documents detailing standard operating procedures, case studies or other sources, while creativity enhancing tools include morphological analysis, metaphors, convergent and divergent thinking mechanisms, brainstorming, calculus and other methodologies.

The decision-maker utilizes computer technology to: (a) organize (chiefly categorize and classify) the problem knowledge, (b) structure ideas and concepts into problem elements and relationships, and (c) simulate conceptual problem solutions. Results are reported as problem elements (status reports), the problem's conceptual structure (criteria, alternatives, events and relationships) and/or forecasted outcomes from the conceptual analyses.

Feedback from the user-controlled processing guides the decision-maker through the design stages of the decision-making process and identifies the parties affected by the conceptual analyses [18]. This identification helps the decision-maker to develop an implementation plan and put the plan into action. Created problem elements and structures are stored as additional inputs for future or additional processing [27].

In theory, such support should improve decision-making performance and add value to the user's decision-making. The improvement can occur through an enhanced process (for example, better problem design) or better outcomes (for example, improved user learning or organizational performance).

3. Empirical analysis

The theory suggests the following research question and hypotheses:

A traditional DSS is used as the baseline to provide a fair test for the CDMSS.

Box 1

> Research question: can the creativity-enhanced decision-making support system (CDMSS) improve decision-making?
>
> Null hypothesis: The CDMSS will result in no improvement in decision-making when compared to a traditional decision support system (DSS).
>
> Alternative hypothesis: The CDMSS will result in an improvement in decision-making when compared to a traditional decision support system (DSS).

To answer the research question, an experiment, involving a complex semi-structured decision situation, was used to collect data and test the hypotheses. The experimental study followed a research plan developed and successfully utilized previously [11].

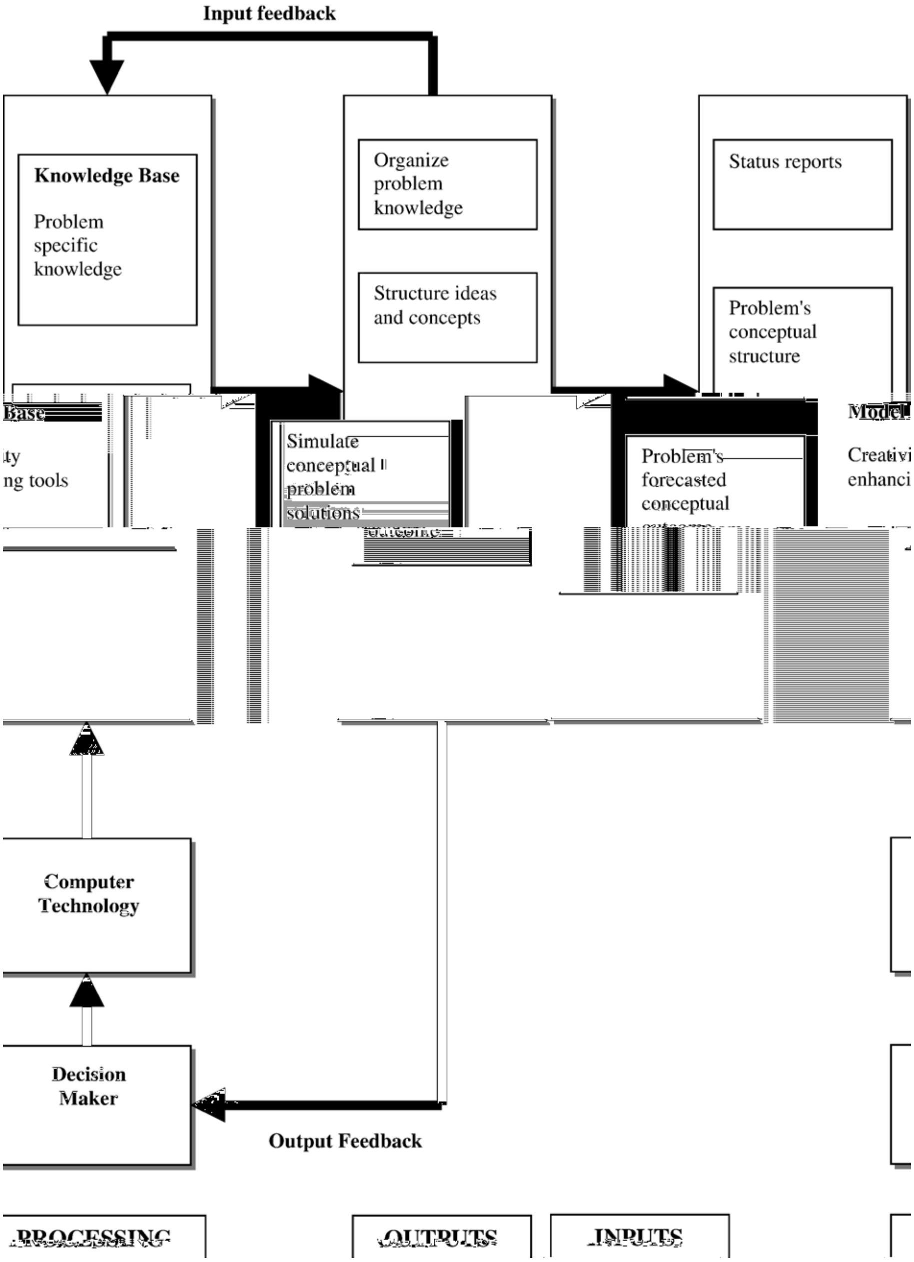

Fig. 1. Creativity enhancing decision making support system (CDMSS).

3.1. Subjects

The subjects were upper level undergraduate students at a regional public university. These subjects were enrolled in nine different sections of the same course in technology fluency. They were divided into nine 24-person teams. Each team played a management game called AIRLINE where each rival team competed for profits in a simulated market environment.

One team was designated as the control group; four were denoted as DSS groups; and four others were labeled as creatively enhanced decision-making support system (CDMSS) groups. The subjects were randomly assigned to each team within each class. That is, each subject in each of the class sections had an equal chance of being selected for membership in any of the teams. As a result, each of the three groups contained members from each of the nine classes from which the teams were formed. Chi-square tests of cross-tabulated demographics against team and group data verified (at the $\alpha = 0.05$ level) that team membership and group composition were both demographically homogeneous. All nine sections of the class were told that 50% of their course grade was dependent upon their team's ranking at the conclusion of the game.

3.2. Decision task

Each of the nine teams took over the management of a small airline that transported passengers and cargo along less traveled routes. All teams had the same starting position and the same opportunities to purchase market information, expand or contract markets served, purchase or lease additional aircraft, and so on. During the game, each team entered a set of decisions every week for the duration of the game, 15 weeks. The decisions involved marketing, expansion, personnel and finance.

3.3. Decision aids

All teams were provided student manuals that described the simulation. The control group was not given any computer-based system to aid them in the decision-making process. The control group was, however, allowed to complete a decision, receive feedback and repeat this process. Appendix A shows the decision form.

The DSS group was furnished a basic decision support system constructed from Microsoft Excel® and Microsoft Project Manager®. This system allowed the users to perform "what if" and goal seeking sensitivity analyses outside the game prior to submitting decisions.

The CDMSS group was given the same DSS embellished with a creativity enhancement tool, Axon Idea Processor (AIP) [2]. AIP, which is based on the Prolog computer programming language, serves as an electronic sketchpad for visualizing, generating and organizing ideas.

3.4. Sample system sessions

Both the DSS and CDMSS had the same look and feel to users. Upon entering either system, the user is presented with a Project Manager front-end to Microsoft Excel, where users can enter the Airline game's input values. This Project Manager/Excel-based combination constituted the baseline DSS in the study. Fig. 2 gives an example data entry screen from the DSS.

The CDMSS presents the user with the same Project Manager/Excel combination as the baseline DSS. In addition, CDMSS users could obtain creativity assistance by selecting an advice button on the input screen. Such a selection puts the user in the AIP software, where he/she could generate, organize and visualize ideas related to the Airline game variables.

By entering some preliminary ideas about a variable, AIP utilizes its ANALYZER module to analyze sentence structure, word frequency and similar semantic data. The knowledge and wisdom developed during this user-system interchange is then captured and stored by AIP's CHECKLISTS module. AIP's CLUSTERS module next organizes ideas into trees and branches. Fig. 3 presents an example semantic network formed by this processing. The SIMULATOR module then utilizes the formed semantic network to make concepts come alive using simulation techniques. JOHN: This simulation process needs a little explanation preferably with an example that ties all of these modules together for the reader.

3.5. Data capture

AIRLINE output provided game data on net profit after taxes (NET PROFIT) and other operating statement statistics. Each week a questionnaire was administered to each team eliciting Likert-scaled self-assessment of proficiency in decision-making (PROCESS), the number of ideas generated (IDEAS) and the time in minutes needed to reach a decision (TIME). Fig. 4 shows this decision process form.

The CDMSS user can continue with the idea processing as desired before returning to the Project Manager/Excel input form. Both CDMSS and DSS users could experiment with input values before entering their decisions in the AIRLINE game.

Each subject provided the numbers and the rating requested in Fig. 4. Responses were assumed to accurately reflect the counts and opinions of the subjects. Since the counts and ratings were done independently from week to week, consistency did not seem to be an issue. Subjects were asked only to provide an overall rating, using the factors that each deemed appropriate.

Table 1 reports collected data from six simulated quarters. Data were usable from four of the original nine groups: g1 (DSS), g2 (no decision aid), g3 (second DSS group) and g4 (CDMSS). All usable data were incorporated in this study.

3.6. Outcome and process measures

Decision value can be measured in terms of the outcome and process of decision-making [10]. Outcome

1. FARE (per seat mile flown) Groups: 28-31, 35-40, 48-51 Enter in cents (no decimal) _____

2. CABIN SERVICE (Enter 0, 1, 2, or 3) _____

Key: 0 = No in-flight service

1 = Free Soft Drinks and Snacks

2 = Free soft drinks, snacks, and a sandwich during mealtimes

3 = Free drinks, hors d'oeuvres, meals

3. PROMOTION BUDGET (Enter in $ with no comma) $

4. ADVERTISING BUDGET (Enter in $ with no comma) $__________

5. NUMBER OF NEW SALESPERSONS HIRED THIS QUARTER (max 4 per quarter)

6. EMPLOYEE COMPENSATION POLICY Entry Key:

Key: 0 = Pay minimum allowable by law or minimum prevailing wage

1 = Managers and pilots receive % above minimum prevailing wage

2 = Pay % above prevailing wage to pilots and professionals only.

3 = Pay % above prevailing wage to all employees, including pilots and professionals

4 = Pay % above prevailing wage to pilots and professionals + stock-bonus

5 = Pay % above prevailing wage to all employees + stock-bonus (includes pilots and professionals)

6 = Pay % above prevailing wage to pilots and professionals + 20% of profits

7 = Pay % above minimum + 20% profits to all employees

7. Enter % wage increase (if applicable) (no decimal) %

QUALITY PROGRAMS AND TRAINING (Enter in S with no mma) $ 8. co

MAINTENANCE LEVEL (Enter Level 1, 2, or 3): 9.

vel 1: Legal minimum maintenance Le

vel 2: Legal maintenance; additional 20% spare parts; wash every 3 onths Le mo

vel 3: Legal maintenance; additional 40% parts; Preventive aintenance program; wash every month Le Ma

. FUEL CONTRACT for next quarter Entry Key: 10

Key: 0 = All fuel purchased on the spot market

1 = 50% purchased on open market and 50% on contract

2 = All fuel purchased on contract

11. CARGO MARKETING BUDGET (Minimum S10, 000) (Enter in $ no comma)

12. CORPORATE SOCIAL PERFORMANCE BUDGET (Enter in $ no comma) $

13. STOCK SOLD: In dollars, not shares (Enter in $ no comma) $__________

14. SHORT-TERM LOAN (use a minus sign to make a loan payment; Enter in $ no comma) $__________

15. LONG-TERM LOAN (use minus sign to make an extra loan payment; Enter S no comma) $__________

16. DIVIDENDS DECLARED (total dollars to be paid; lack of profits will void) $__________

17. NINETY-TWO DAY CERTIFICATE OF DEPOSIT PURCHASED (Enter in S no comma)S_________ VERIFICATION TOTAL FOR ITEMS Ito 17 1

Notes: 1. Verification Total is for computer entry verification only. Include items Ito 17. Subtract negative numbers. (2) All items except #$ to be entered each quarter even if there is no change. (3) Loan payment in addition to automatic payment.

FIRST ACQUISITION TRANSACTION:

18. Number of Aircraft (0-4) _____ (See page 12)

19. Type of Aircraft (A - G) ______

20. Lease (I) or Purchase (2) _____

SECOND ACQUISITION TRANSACTION:

21. Number of Aircraft (0-4)

22. Type of Aircraft (A - G)

23. Lease (1) or Purchase (2)

24. Serial Number of First Aircraft Disposal (Use this space first if disposing.).

25. Serial Number of Second Aircraft Disposal

26. Serial Number of Third Aircraft Disposal

27. Total Cost of Market Research Studies S__________ (SO to 31000. See pg 14)

28. Incident Response _____ (You must know the incident being used)

VERIFICATION TOTAL FOR ITEMS 18 to 28 __________________

NOTE: Verification Total is for computer entry verification only. Add all numbers.

29. CHANGES IN MARKETS SERVED: Enter only the markets in which you have a change If changing any items in a currently held market, enter all items even though you may be changing only one item this period. Enter zeros beside a market you wish to abandon. A Fare Sale must be entered each quarter for each market if you wish to continue it.

Fig. 2. AIRLINE decision form.

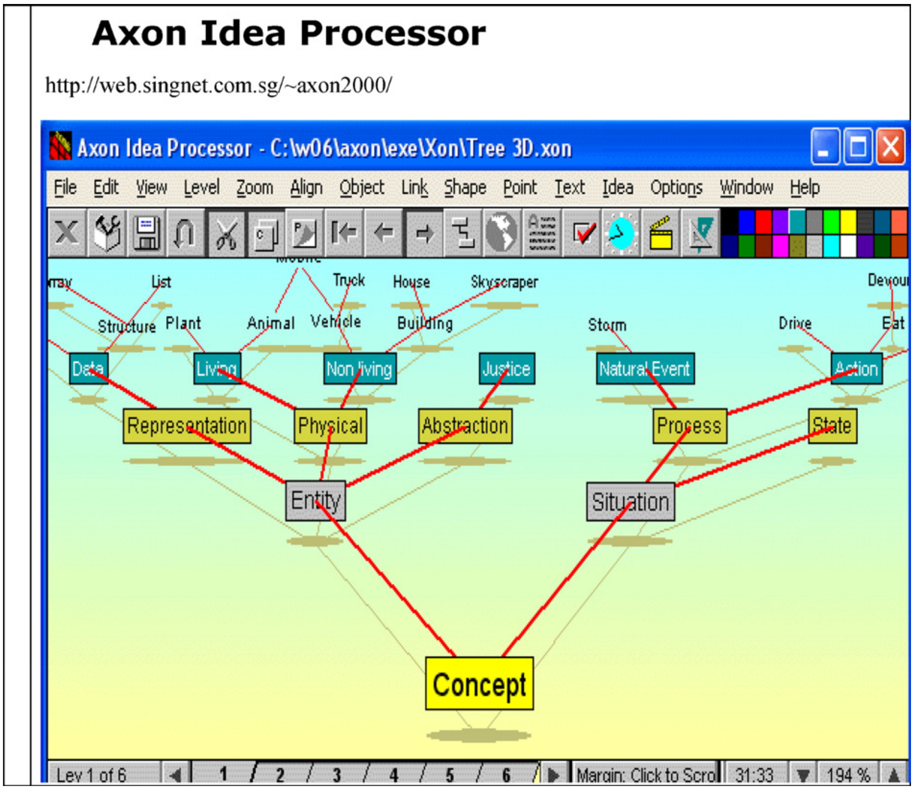

Fig. 3. AIP example screen.

occurs through the process of decision-making, and this process can be characterized as intelligence, followed by design and choice, and concluded with implementation.

In this experiment, outcome is measured by the AIRLINE's net profit after taxes (NET PROFIT). This measure is metric.

The AIP creativity enhancement tool provided the users with visual representation of data and information, and it encouraged working at a higher level of abstraction —dealing with ideas and concepts rather than words. This perspective enabled the users to more efficiently and effectively use the decision-making process. AIP's ANALYZER and CHECKLISTS modules enabled users to discern the nature of the problem and the opportunities presented (*intelligence)* and generate problem elements and structures (*design*). The CLUSTERS and SIMULATOR modules helped users to qualitatively evaluate alternatives, select a management strategy (*choice*) and gain confidence in the strategy. This strategy was executed through the user's entry of the input values on the decision form (*implementation*).

Process, then, can be measured by the Likert-scaled self-assessment of decision-making proficiency (PROCESS). This measure is nonmetric. Additional process measures are the number of ideas generated (IDEAS) and the time in minutes needed to reach a decision (TIME). These additional measures are metric.

MNSC 150 Due with each Decision Form

Evaluation of the Decision-Making Process

Team # ___

Date __________

Number of Ideas

Time to complete the Decision Form (minutes) _____

Overall Evaluation of the decision-making process _____

[illegible]

Fig. 4. Decision process form.

3.7. Data analysis

For outcome, an analysis of variance (ANOVA) was used to test the differences in net profit after taxes between the control, DSS and CDMSS groups. The SPSS statistical package was used to perform the

Table 1
Data for key airline variables*

Group/quarter	Net profit after tax	Process rating	Ideas	Time (min)
g1q1	50,340	3	8	180
g2q1	12,550	4	5	210
g3q1	54,000	4	7	175
g4q1	62,050	5	10	200
g1q2	50,500	3	9	175
g2q2	10,500	2	5	190
g3q2	54,500	2	8	165
g4q2	63,500	5	15	180
g1q3	49,500	4	6	170
g2q3	10,550	3	4	220
g3q3	54,000	3	7	169
g4q3	63,000	5	11	120
g1q4	49,500	3	7	150
g2q4	12,500	2	3	180
g3q4	56,500	2	6	180
g4q4	62,500	3	9	120
g1q5	50,000	3	6	145
g2q5	10,500	2	4	175
g3q5	55,500	3	5	120
g4q5	63,050	4	8	90
g1q6	48,000	3	7	150
g2q6	11,500	2	4	180
g3q6	56,500	4	6	150
g4q6	62,500	5	9	90

analysis and the results are reported in Table 2. This table is an excerpt from the actual SPSS statistical output.

The results from Table 2 indicate that: (a) there is a significant difference in net profit between the no decision aid, DSS and creativity-enhanced DSS groups; and (b) the creativity-enhanced DSS group had significantly higher profits than any of the other groups. These tests, then, support the conclusion that the CDMSS will result in an improvement in net profit when compared to a traditional decision support system (DSS).

Several process tests were conducted. For the metric measures (IDEAS and TIME), ANOVA was used to test for differences in these variables between the control, DSS and CDMSS groups. The SPSS statistical package was used to perform the analyses and the results are reported in Table 3. This table is an excerpt from the actual SPSS statistical output.

The results from Table 3 indicate that: (a) there is a significant difference in the number of ideas generated between the no decision aid, DSS and creativity-enhanced DSS groups; and (b) the creativity-enhanced DSS group had significantly more ideas than any of the other groups. These tests, then, support the conclusion that the CDMSS will result in an improvement in the number of ideas generated when compared to a traditional decision support system (DSS).

Table 3's results are somewhat mixed for the TIME variable. These results indicate that: (a) there is a significant difference in time needed to make a decision between the no decision aid, DSS and creativity-enhanced DSS groups; and (b) the creativity-enhanced DSS group had different times needed to make decisions than the no decision aid, but not either of the other DSS, groups. These tests, then, support the conclusion that the CDMSS will result at the same time needed for decision-making when compared to a traditional decision support system (DSS).

For the nonmetric measure (PROCESS), a Kruskal–Wallis statistic was used to test the differences in self-assessed process proficiency between the control, DSS and CDMSS groups. The SPSS statistical package was used to perform the analysis and the results are reported in Table 4.

The results from Table 4 indicate that there is no significant difference in process ratings between the no decision aid, DSS and creativity-enhanced DSS groups. This test, then, does not support the conclusion that the

Table 2
ANOVA for AIRLINE net profit after taxes

Net profit					
	Sum of squares	*df*	Mean square	*F*	Sig.
Between groups	9,435,467,116.667	3	3,145,155,705.556	3674.319	0.000
Within groups	17,119,666.667	20	855,983.333		
Total	9,452,586,783.334	23			
Turkey HSD	(i) group	(j) group	Mean dif. (i)–(j)	Std. error	Sig.
	Creativity enhanced	DSS	13,126.667*	534.161	0.000
		No decision aid	51,416.667*	534.161	0.000
		DSS	7600.000*	534.161	0.000

The * indicates that the mean difference is significant at the 0.05 level. Scheffe and Bonferroni test were also used, and the results were the same as the Turkey test.

Table 3
ANOVA for AIRLINE ideas and time

		Sum of squares	*df*	Mean square	*F*	Sig.
Minutes to decide	Between groups	10,540.333	3	3513.444	4.396	.016
	Within groups	15,985.000	20	799.250		
	Total	26,525.333	23			
No. of ideas	Between groups	116.458	3	38.819	16.697	.000
	Within groups	46.500	20	2.325		
	Total	162.958	23			

Tukey HSD post hoc test

Variable	(i) group	(j) group	Mean dif. (i)–(j)	Std. error	Sig.
Minutes to decide	Creativity enhanced	DSS	−28.333	16.322	0.332
		No decision aid	−59.167*	16.322	0.008
		DSS	−26.500	16.322	0.389
No. of ideas	Creativity enhanced	DSS	3.167*	0.880	0.009
		No decision aid	6.167*	0.880	0.000
		DSS	3.833*	0.880	0.002

The * indicates that the mean difference is significant at the 0.05 level. Scheffe and Bonferroni tests were also used, and the results were the same as the Tukey test.

CDMSS will result in better process ratings when compared to a traditional decision support system (DSS).

Although not central to the research question, an additional statistical analysis was performed on the relationship between the outcome and process measures. Such testing helps determine the process source of the outcome improvement. This linkage can facilitate future system design and strategic planning.

In this case, the previous statistical analysis revealed significant differences between the groups regarding net profit, the number of ideas generated and the time needed to make a decision. All of these measures are metric. To determine if there is a significant relationship between outcome (NET PROFIT) and process (IDEAS and TIME), a regression analysis was performed. The results, from SPSS, are summarized in Table 5.

The results from Table 5 indicate that: (a) IDEAS and TIME each have significant effects on NET PROFIT, and (b) collectively, the variation in IDEAS and TIME account for about 67% of the variation in NET PROFIT.

Table 4
Kruskal–Wallis analysis for process

Group	*N*	Mean rank	Chi-square	*df*	Significance
DSS	6	13.00			
No decision aid	6	7.67			
DSS	6	12.00			
Creativity enhanced	6	17.33			
Overall	24		6.206	3	0.102

These findings support the conclusion that the process improvements from the CDMSS result in enhanced decision outcome.

The regression analysis also identifies the specific improvements in outcome that can be expected from the enhanced decision-making. Table 5, for example, shows that each additional idea generates approximately $4660 in net profit, while each additional minute of time savings generates an extra $253 in net profit. These values are point estimates, but it is also possible to determine interval estimates of the gains for specified levels of confidence.

In summary, the statistical tests indicate that: (a) CDMSS users generated more ideas in the same amount of time as DSS users; (b) CDMSS users had more net profit than DSS users; and (c) the variation in net profit was largely accounted for by the variation in the number of ideas and the time needed to make decisions. These findings suggest that the null hypothesis should be rejected. Consequently, there is statistical support for the alternative hypothesis that the CDMSS improves decision-making when compared to a traditional DSS.

4. Conclusions and implications

The broad conclusion from the conducted experimental study is that the CDMSS, relative to the DSS and no decision aid groups, helps improve the process of, and outcome from, decision-making. Moreover, the improvement occurs because decision-maker can generate more ideas through the CDMSS than with any of the other tested systems. Ideas facilitate intelligence,

Table 5
Outcome and process regression analysis

Model summary

Model	R	R^2	Adjusted R^2	Std. error of the estimate
1	0.834 [a]	0.696	0.667	11,692.748

ANOVA [b]

Model		Sum of squares	df	Mean square	F	Sig.
1	Regression	6,581,459,526.912	2	3,290,729,763.456	24.069	0.000 [a]
	Residual	2,871,127,256.422	21	136,720,345.544		
	Total	9,452,586,783.334	23			

Coefficients [b]

Model	Variable	Coeff.	Std. error	β	T score	Sig.
1	(Constant)	52,929.388	15,511.750		3.412	0.003
	Minutes to decide	−253.431	74.621	−.425	−3.396	0.003
	No. of ideas	4660.124	952.030	.612	4.895	0.000

[a] Predictors: (constant), no. of ideas, minutes to decide.
[b] Dependent variable: net profit.

design, choice and implementation in decision-making. The results imply that the creativity-enhanced concept is superior to traditional decision support system approaches in guiding the decision-maker toward an effective policy or strategy.

This conclusion supports the findings from previous studies. The reported AIRLINE study involved a different decision problem and different creativity enhancing tools than the previous studies, and each of the previous studies involved disparate decision situations and disparate creativity enhancing tools. The commonality of findings, then, suggests that the theory has validity across various decision situations.

Unlike the previous studies, the AIRLINE study established an explicit and precise relationship between the process improvement and outcome enhancement. In particular, the AIRLINE's regression equation can be used to establish the dollar value of process improvements, thereby establishing an imputed economic value for CDMSS delivered process support. The regression equation can also be used to evaluate the relative value of competing process improvements. These explicit and precise relationships offer an objective basis for system design and strategic planning.

There are some limits on these conclusions. The number of users in the AIRLINE study is small and the user group itself is limited in scope. Doing further studies with larger sampled, more diverse users can alleviate this limitation. In addition, the AIRLINE study had a limited number of outcome and process measures. Further studies should include additional criteria. Moreover, the multiple criteria could conflict. Hence, it would be desirable to consolidate the multiple criteria into an overall measure of decision value.

Despite these limitations, this study does indicate that the creativity-enhanced decision-making support system concept has considerable promise and deserves further study.

Appendix A. AIRLINE decision form

1. FARE (per seat mile flown) Groups: 28–31, 35–40, 48–51 Enter in cents (no decimal) ______
2. CABIN SERVICE (Enter 0, 1, 2 or 3) ______
Key: 0 = No in-flight service
1 = Free soft drinks and snacks
2 = Free soft drinks, snacks and a sandwich during mealtimes
3 = Free drinks, hors d'oeuvres, meals
3. PROMOTION BUDGET (Enter in $ with no comma) $
4. ADVERTISING BUDGET (Enter in $ with no comma) $____________
5. NUMBER OF NEW SALESPERSONS HIRED THIS QUARTER (max 4 per quarter)
6. EMPLOYEE COMPENSATION POLICY Entry Key:
Key: 0 = Pay minimum allowable by law or minimum prevailing wage
1 = Managers and pilots receive % above minimum prevailing wage

2 = Pay % above prevailing wage to pilots and professionals only

3 = Pay % above prevailing wage to all employees, including pilots and professionals

4 = Pay % above prevailing wage to pilots and professionals + stock-bonus

5 = Pay % above prevailing wage to all employees + stock-bonus (includes pilots and professionals)

6 = Pay % above prevailing wage to pilots and professionals + 20% of profits

7 = Pay % above minimum + 20% profits to all employees

7. Enter % wage increase (if applicable) (no decimal) %

FIRST ACQUISITION TRANSACTION:

18. Number of aircraft (0–4) _____ (See page 12)

19. Type of aircraft (A–G) ______

20. Lease (I) or purchase (2) _____

SECOND ACQUISITION TRANSACTION:

21. Number of aircraft (0–4)

22. Type of aircraft (A–G)

23. Lease (1) or purchase (2)

24. Serial number of first aircraft disposal (Use this space first if disposing).

25. Serial number of second aircraft disposal

26. Serial number of third aircraft disposal

27. Total cost of market research studies $__________ (0 to 31,000, see p. 14)

28. Incident response _____ (You must know the incident being used)

VERIFICATION TOTAL FOR ITEMS 18 to 28

____

NOTE: Verification total is for computer entry verification only. Add all numbers.

29. CHANGES IN MARKETS SERVED: Enter only the markets in which you have a change. If changing any items in a currently held market, enter all items even though you may be changing only one item this period. Enter zeros beside a market you wish to abandon. A Fare Sale must be entered each quarter for each market if you wish to continue it.

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