International Journal of Scientific & Engineering Research, Volume 7, Issue 4, April-2016
ISSN 2229-5518

Decision Making in Organizations: The Aloz Decision Range Perspective

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Abstract--Decision making in organizations can extremely be challenging if choices are not logically selected and effects weighted in advance. In this paper we introduce 'Aloz Decision Range' as a hub with critical components and their mathematical properties to assist in understanding Decision Making. A lot has not been said about Decision Making whose boundaries are shared yet disputed between psychology, science, mathematics and economics or many more fields. Decision making under unclear circumstances is tricky and challenging that is why scholars advocate for expert judgement, but how often have we witnessed experts fail? This means that a solution in the form of a Decision Outcome may be obtained by a more or less rational process, based on explicit or tacit knowledge. Aloz Decision Range is applied in one of real life scenarios and dove-tailed with planning algorithms to support its validity.

Keywords: Decision Making, Organization, Decision Outcome, Aloz Decision Range.

1 INTRODUCTION

MANKIND lives in a world where alternatives are tainted with portions of uncertainty making outcomes and choices difficult to obtain. The business environment where organizations operate from is not spared from risks and threats whose occurrence usually, is determinable with grim precision and certainty. This obscurity poses a challenge to the thinker, agent or Decision Maker (DM) operating in the information space, on what option to take in order to minimize risks or maximize gains. Therefore, DMs sometimes do meet complex situations with alternatives linked with varying probabilities of success or failure. The choice and outcome that a DM adopts is usually born of the environment of the DM and or his or her behavior. The course of action can be adopted. Once a Decision Outcome (DO) has occurred, it has profound effects in the information space, hence affecting DOs of other DMs in a competitive environment, Neumann and Morgenstern's Game Theory (1944).

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Organizations do therefore make decisions that tend to align with their values and goals. Most business organizations make decisions that are rational and sharped toward minimizing costs and maximizing profits. There are algorithms employed to achieve these goals.

A number of variables come to the 'theatre' in Decision Making and as they do so, they are viewed as occupying a certain mathematical plane whose coordinates can also not be determined with absolute accuracy, at least for now, though I can assume them to be near fitting the geometrical space properties studied by Francois Durand et al [1].The variables are viewed as having a mathematical relationship to each other like troops at a firing range. This range therefore is symbolic, analogous and a possible basis for Decision Making. I shall call it, 'Aloz Decision Range'. Therefore, Decision Making encompasses four elements, Processes, Options, Choices and Actions that are seen as active in the Aloz Decision Range.

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Definition of Terms:

- **Decision Making (DM):** The thought process of selecting a logical choice from the available options having weighed the effects of the choices in advance.
- **Organization**: An institution existing in the information space made up of people, machines, software, policies, regulations, ethics and culture, capable of making sustainable choices that minimize costs and maximize utility.
- **Decision Outcome (DO)** The ultimate product of Decision Making, where action from the organization and information space is begged or demanded.
- **Aloz Decision Range:** A theoretical model set to explain Decision Making Process, Options, Choices and Activities using its tenant properties to assist Decision Makers appreciate their environment, deploy appropriate measures to obtain favourable results with minimum fuss.

2 LITERATURE REVIEW

Buchanan and O'Connell [2] pointed out that the term 'Decision Making' was coined by Chester Barnard in the 1930s. The domain of decision making is a widely researched and contested area, possibly due to its complexity or simplicity. Foundations were laid by theorists like Herbert Simon [3] and James March [4]. Ahmad Al-Tarawneh [5] citing Mark (1997) concluded that for many reasons, the hardest part of managing an organization today is making the appropriate decision. Decision may be programmed or non-programmed (Simon, 1977), generic or unique (Drucker, 1956), routine or non- routine (Mintzberg et al [6] and certain or uncertain (Milliken, 1987). Wellington Samkange [7] citing Drucker in Owens (1995) identifies steps involved in decision making. Nonetheless, these steps are still subjected to rational or irrational influences and are therefore not conclusive. However, a lot has not been said about this area whose boundaries are shared yet disputed between psychology, science, mathematics and economics or more other fields.

Decision Making under unclear circumstances is tricky and challenging that is why scholars advocate for expert judgement but how often have we witnessed experts fail? Meaning that a solution DO may be obtained by a process which can be more or less rational or irrational based on explicit knowledge or tacit knowledge. The Cynefin framework by Snowden and Boone [8] indeed addresses critical issues in decision making by helping DMs sort issues into five contexts. It is not clear from the explanations how a DM may organize this information during the sense-making process especially if he or she is not creative. This area still remains grey and unpolished. Whilst there are conflicting views on which model to use in organisations, Carpenter et al [11] suggest instances when to use rational, bounded rationality, creative and intuitive decision making models. I still see the Aloz Decision Range's components at play in most of the models and I argue that its mathematical and graphical properties nested in components can assist DMs and scholars understand the mystery of Decision Making in Organisations.

3 THE ALOZ DECISION RANGE UNPACKED

In this section we paint a graphical picture of the Aloz Decision Range and its applicability to decision making in organisations. It is critical to point out that this picture is not conclusive but captures the main components and processes that are seen to interact within a decision making environment.

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The Aloz Decision Range

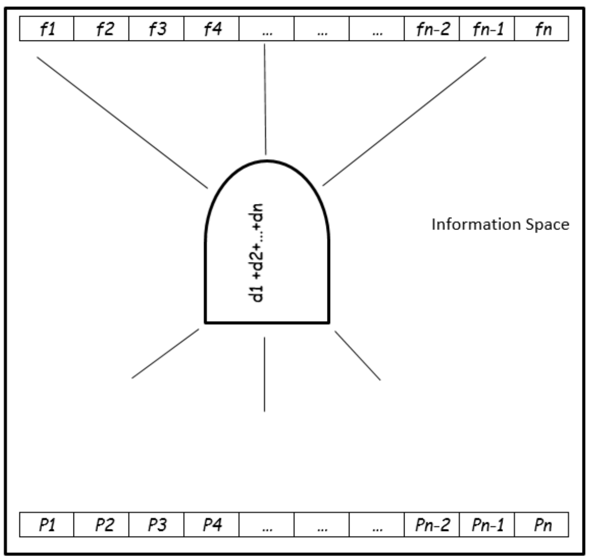

Fig.1. Main Components of Aloz Decision Range and their relative positions in an invisible geometrical plane. Source Alocate Zvikaramba (2015)

Assumptions

- At most, Decision Makers (DMs) in Organizations went to school, read management journals and articles and are therefore rational people.
- DMs want to maximize their goals; therefore they align their decisions with their Areas of Interests (AI) that exist in the information space.
- Effects of not aligning with AI result in unfavorable outcomes.

3.1 Components of a Decision Range in Detail

3.2 Decision Outcome (DO)

A decision outcome is a product of many small decision outcomes (d1+d2+…+dn) that a DM deliberately or subconsciously adopts in order to come up with a major DO.

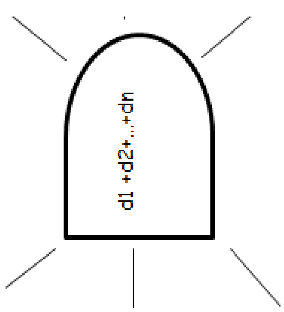

Fig.2.DO, a critical component of Aloz Decision Range where action from the organization and information space is begged or demanded.

These small Dos are sometimes called mundane decisions because less time is spend on them. A major DO is the most important element of an 'Aloz Decision Range'.

Simon H A [3] argues that these Decision Outcomes fall under choice activity in decision making.

At the tail of a DO, there are benefits of the DO. Benefits may be positive or negative. Positive benefits are desirable effects of a DO. When they are negative benefits, we say the 'DO has ricocheted'. Causes of DO ricochet: poor timing, misalignment with disciplinary fields and poor method of DO conveyance in the information space and so on.

At the head of a DO is the main message or purpose of a DO and perceived path to the disciplinary field (f1, f2…fn). When a DO takes the shortest path as desired by the DM, it causes a desirable impact to the targeted field (f1, f2…fn). When it takes an oblique path, it indirectly impacts on the fields (f1, f2…fn).Nevertheless, when it impacts on the targeted field, the knock on effect may still be laterally transferred to nearby fields in a fashion called 'DO lateral influence'. Note that the effect of a DO may not necessary be a desirable impact according to other DMs or players as in the Game Theory. Players are intelligent opponents who make decisions out of their own self-interest. D0s usually occur in the 'C' part of the 'POCA' of the decision making model of the, 'happy manager.com'[9]. However, a DO is fluid and sometimes overlaps to the 'A' part.

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3.3 Disciplinary Field

It is where the DO is directed and anticipated to impact. It is the DM's Targeted Area of Interest. It is made up of infinite random variables called fields. Fields on their own are connected and do not have distinct boundaries. They are occupying an unknown size of space in the information space. An example of a field is Politics. It is assumed that it is the biggest field which when impacted has immense effects on other fields like Economics, Technological, Social-Cultural and Environmental. In organisations, organizational politics also plays a crucial role. In the Games Theory, competitors, adversaries and players reside in these fields. Whilst Francois Durand et al, 2014 focused on the case where available options are being 'symmetrical from one another', here the Aloz Decision Range sees the disciplinary field like politics occupying a larger space than other fields. Why? Because naturally politics be it organizational or national, seems to beg and demand more DOs than any other field. Disciplinary field is the 'end' portion of the 'Decision Content' of Professor Jerry L Talley [10] that contains the, 'customer group for whom we create value or risk'.

3.4 Decision Makers' Platform

The Decision Maker's Platform is the perceived 'home area' made up of familiar tools, people, software, methods , experience, information and material resources that the DM has considered when coming out with a DO. Usually, the platform is made up of Materiel, Information, Finance and Time (MIFTs). Therefore a DM may select to stand on a random position when considering a decision alternative that brings a DO. The DM may thus choose (P1, P2…Pn). The Decision Maker's platform has historical data that a DM treasures and uses to form the basis and foundation of his DO. A DM who triumphs is the one who has mastered his tools and database to project a DO that will not ricochet. The Decision Maker's platform is scalable and has the ability to move forward in terms of time scale, thereby shortening the gap between the 'means' and the 'end' or between variables (P1,P2..Pn) and variables (f1, f2...fn). When this occurs a decision level is set.

In organizations these levels vary according to the position and authority of DMs. Level of decisions commonly made in organizations like Strategic, Tactical and Operational and who typically makes them are well tabled by Carpenter et al [11]

3.5 Information Space

It is the environment that carries information and it is almost boundless but has some geometrical properties that we shall not discuss now. All components of Aloz Decision Range reside in this space. The space has informational objects like DOs that are flying from platforms to their destinations, disciplinary fields and ricocheting. DOs flying back to unintended fields and impacting on DMs. Since the information space is semi boundless, this property causes DMs to sometimes act irrationally too. When individuals say they arrive at DOs without conscious reasoning, this is borne out of intuitive behaviors.

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4 DECISION MAKING WHERE THE GOALS ARE TO MAXIMIZE PROFITS AND MINIMIZE COSTS: THE APPLICABILITY OF ALOZ DECISION RANGE

4.1 Scenario: The Problem facing the Decision Maker

A Quartermaster (QM) has requests of 600 units of rations from forward operational troops in a combat zone particularly from Sierra Foxtrot and 400 units from Sango. The QM has 700 units in a warehouse in Nyanga and 800 units in a warehouse in Lima. It costs $5 to ship a ration pack from Nyanga to Sierra Foxtrot but it costs $10 to ship it to Sango, It costs $ 15 to ship a ration pack from Lima to Sierra Foxtrot, but it costs $4 to ship it to from Lima to Sango. How many ration packs or units should the QM ship from each warehouse to Sierra Foxtrot and Sango to fill the requests, at the least cost, despite the possibility of enemy air threat along the routes?

4.2 Analysis of the Problem:

The QM is the Decision Maker and in undertaking the task of moving rations to the combat troops, he should minimize costs at the same time moving greater load. The QM should also minimize the effects of enemy action and weather on these combat supplies. This type of a problem is a bit complex but requires the use of algorithms integrated with Aloz Decision Range theory to solve it.

4.3 The Applicability of Aloz Decision Range

The QM is assumed to be well trained and a rational person who has thorough knowledge of his job. This background knowledge forms the Decision Maker's platform (P1, P2…Pn) and the aggregate MIFTs are at the QM's disposal. Therefore, in coming out with his main DO, there are small DOs that the QM reaches and they all sum up and point to the main DO. For example, the QM uses the information space to obtain shipping charges, information about current enemy action and threat levels along the routes. His choice will also be determined by weather conditions prevailing at the time he will choose to ship the rations.

Disciplinary Field. The QM will focus on his area of interest selected from (f1, f2…fn) that is logistics, observing principles like cooperation, flexibility, efficiency and economy. Secondly, the QM will not divert from this field whilst working out a DO. If the QM loses focus, he may interfere with another commander's area of tactical responsibility and rations may end up not reaching their destinations at the least cost. This is a 'ricochet' effect which may also result in the QM losing his job.

4.4 Applying the Transportation Problem Algorithm

From the analysis, this is an unbalanced transportation problem.

TABLE 1
SOURCE DESTINATION

Destination

Source	Let Sango=A	Let Sierra Foxtrot=B	Let Dummy=C	**Supply**
	A	B	C	**units**
Let Nyanga=1	$10	$5	$0	**700**
Let Lima=2	$4	$15	$0	**800**
Demand units	**400**	**600**	**500**	**1500**

Using the North West Corner Cell (NWCC) Method to find the initial basic feasible solution. NWCC (or upper left-hand corner) is a heuristic that is applied to a special type of Linear Programming problem structure called the Transportation Model, which ensures that there is an initial basic feasible solution (non artificial) [12].

TABLE 2
SIMPLIFIED SOURCE DESTINATION

Destination

Source	A	B	C	**Supply**
1	10	5	0	**700**
2	4	15	0	**800**
Demand	**400**	**600**	**500**	**1500**

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4.4.1 Calculation of Initial Feasible Solution using North West Corner Cell (NWCC) Method

	A	B	C	Supply	
1	[400] 10	[300] 5	0	700	300 0
2	4	[300] 15	[500] 0	800	500 0
Demand	400	600	500	1500	0
	0	300	0	0	
		0			

Initial feasible solution is obtained from summation of (allocated cells, boxed units X corresponding Slashed Cost per Cell).

=∑ ((400x10) + (300x5) + (300x15) + (500x0))

=$10000 **[1]**

4.4.2 Optimization through UV Method

	V1 = 10	***V2 = 5***	***V3 = - 10***
U1= 0	[400] 10 –	[300] 5 +	0
U2= 10	4 +	[300] 15 –	[500] 0

Ui + Vj= Cij
m+n-1= 2+3-1→4

Source = Pij =Ui+Vj-Cij

C13=0-10-0→ -10

C21=10+10-4→16

4.4.3 Optimization through UV Method Iteration

	V1 = 10	***V2 = 5***	***V3 = - 10***
U1= 0	[100] 10	[600] 5 -	0 +
U2= -6	[300] 4	15 +	[500] 0 –

Ui + Vj= Cij
m+n-1= 2+3-1→4

Source = Pij =Ui+Vj-Cij
C13= 0+6-0→ 6
C22=5-6-15→ -16

Optimal Solution While Observing Principle used in Initial Feasible Solution

=∑ ((100x10) + (600x5) + (300x4) + (500x0))

=*$5 200* **[2]**

Continuing with the UV method will not produce favourable results anymore as proved by the algorithm now failing the acceptability test of m + n -1

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4.5 Learning from the Algorithms

When the DM will be applying the NWCC and UV Methods he integrates properties of the Aloz Decision Range. For example, even though the calculations, have given the optimal solution as $ 5200, the DM is bound to slightly alter this figure whether willingly or ignorantly. The reason is that the QM may not have adequate information about possible enemy action and effects of weather, therefore he may intuitively base his small DOs on his previous experience, tastes and feelings. For example, he may feel committing 400 units of rations to a combat unit at Sango whose Commander is a personal rival in personal issues is tantamount to succumbing to the opponent's machination and glory. Therefore, he may alter this figure to, say 390 units in order to settle their vendetta. The DM is still bound by the fear that if it is overdone, the DO will ricochet and he may lose his job.

5 CONCLUSION

Organisations can use the Aloz Decision Range to improve Decision Making Processes, Options, Activities and Choices. Decision Making in organizations can extremely be challenging if choices are not logically selected and effects weighted in advance. The Aloz Decision Range properties can be integrated with Linear Programming Algorithms in solving a cost minimization or profit maximization goal oriented decision making problem. Using the critical components of the Aloz theoretical model DM launches DOs from Decision Maker's Platform that houses MIFTs and direct DOs, usually effortlessly, towards disciplinary fields to cause the shortest best results.

6 ACKNOWLEDGMENT

My profound gratitude goes to Professor Tatiana F. Filippova of Ural Federal University, Mr Tafadzwa Zimucha and Willard Gwarimbo of Harare Institute of Technology and VaChaminuka. Workers at Aifotech Corporation and ecobua.com made my research possible. My wife Victoria and children; Makanaka, Nenyasha and David Zvikaramba deserve special recognition too.

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