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# Proposal for Ray's Multivector: An objective metric for culling strategic plans

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**Abstract**
Ray's Multivector is a novel conceptual model that provides a method for considering the implications of various strategic decisions over time. It is more useful as an explanatory model for components of other strategic models, helping to determine what is the most effective fit in models such as Anthony's Triangle or SWOT analysis by introducing multiple timeframes into the analysis. The derivation of the model flows from published martial arts philosophy and practice. The article proposes that adoption of Ray's Multivector should be retained as an option during strategic brainstorming in order to maximize the utility of the underlying primary model.

*Keywords:Decision Making, Strategic, Conceptual Modelling, Martial Arts*

## 1 Introduction

One issue that plagues brainstorming strategic planning areas for novice students is the question of 'how much is enough'. The short and easy answer is 'Whatever the instructor or project lead says is the minimum'. However, these methods are subjective even when they aren't falling prey to the fallacy of reliance on authority. A better solution is needed to provide guidelines for students and novice practitioners to refer to when making a decision about which brainstorming ideas are better than others.
The term "better" used in the previous context is a bit misleading, because it presupposed the existence of a rubric or external guide against which to compare. However, the reality is that most people just based on personal preference or their limited opinion on what is best for the company.

In relation to martial arts, this might be akin to the understanding that martial artists will naturally have certain preferences. Some may prefer kicks to punches, some may prefer to parry rather than block, but the astute practitioner would not say that one of those moves is better than the other. The caveat to this is that certain strikes are inherently worse than others in certain situations. In very close contact, an elbow or a knee may be the only physically possible move, whereas against a large opponent stronger and slower attacks might be necessary over an individual predilection for fast, light strikes (Parker, 1992). In the same way, there should be a method to objectively determine which ideas presented during the brainstorming phase of a strategic model are objectively worse than the others. In this manner, rather than raising the possibility of dissent between decision makers based on personal preference, it can be made by referring to specific and delineated metrics.

## 2 Ray's Multivector

In linear algebra, a multivector is a matrix of simultaneous vectors that can be used as an operand for various transformations. In reductionist terms, a multivector is a cone of possible solutions (or outcomes, in this application) that are a continuous volume. However, for applications where the continuity is nonsensical (e.g. image manipulation, Ebling, Scheuermann, 2005) it is conceptually feasible to utilize a discrete representation of the multivector. As a result, Ray's Multivector will be simply represented as a conceptual model, but it should be noted that, like all conceptual models, this is a simplified representation of a complex space.

Parker's statement on considering the most effective response to an attack is that "reaction can beat action if the target to be reached last is the first object to move" (1989). While Parker's phrasing has drawn criticism for being too verbose or mystical in order to promote thinking, Ray has adapted the saying to "Move the target, move the weapon, control the situation" (n.d.). This phrasing is the core of Ray's multivector, with one application being the evaluation of potential solutions presented in any given strategic conceptual model.

There is a long tradition of correlating martial arts philosophy and practice to business principles. Lovret (1987) is still widely considered the strongest treatment of this pattern. He claims that all conflict can be reflexively mapped between different forms of conflict, with a specific ex-

ample for the use of martial arts principles within business. This is mirrored in Ouchi's Theory Z (1981), Pater's Dynamic Business (1999), and Pelham's Eastern and Western Business Tactics (1997). The important part of the derivation is the description of the conceptual path taken in the application of martial art philosophy to business principle.

Ray's Multivector, then, is broken into three components: "Move the target", "Move the weapon", "Control the situation". As can be dissected in Insights 5 (Parker, 1987), most of the techniques follow this pattern (there is anecdotal evidence that deviations from the pattern were intended purely for curricular reasons). Similarly, in business, it's possible to break down the approach into each of these methods. Moving the target is the immediate response, moving the weapon is the next response, and controlling the situation is the medium- to long-term response. Ray's Multivector is generalized, and most useful by breaking it down into immediate, short, and longer-term time frames.

More specifically, the direct corollary to Ray's Multivector is that no solution is complete without application of all three of these areas. In a physical confrontation, failing to move the target might mean the other two areas are successful, but the damage has been done. Failing to move the weapon means that a follow-up will nullify the other two areas (further discussion on the implications of the OODA loop in Larson et al., 2021). Finally, failing to control the situation invites the entire process to repeat, as no resolution has been made.

Transitioning from martial arts application to business application is trivial: Failing to envision the immediate response cedes costs (actual or opportunity) from a competitor or the environment, failing to move the weapon leaves the issues in Damoclesian hang, and failing to control the situation invites threats to repeat or opportunities to go unfulfilled. There are, however, three considerations to note.: First, there is not always an immediate 'opponent' during strategic decision making but the industry, the environment, competitors, any other source of opportunities or threats could be amalgamated into a conceptual opponent. Secondly, while timeframes are being discretized into immediate, short, and longer-term timer frames, the practically reality is that time is a continuous curve so these are obviously conventions for the sake of simplicity. Thirdly, the intent is not to create three separate plans for any given brainstorming solution so much as to consider how each solution will play out in these three situations.

This last consideration may require further detail. The multivector is not a method for creating new solutions to a strategic decision so much as for analyzing potential solutions and selecting between them. As a result, it makes them more complex.

## 3 Application to Anthony's Triangle

Anthony's triangle is the strategic model that presumes that roles within an organization can be broken down into three categories: operational, managerial, and strategic (Gorry, 1971). The presumption is that these roles act in a present continuous context. This is a feasible solution for a conceptual model that intends to roughly outline or compare roles at a company, but it fails to consider that roles may change over time, that actions may change in modality, or that there is a fundamental discrepancy between how a present continuous task presents in the real world when differentiating between short-term operational tasks and long-term strategic tasks (Larson, 2022).

With Anthony's Triangle, organizational tasks would be separated into the three categories. For example, at an IT Call center, there might be customer-facing technical support, supervisors, and executives. This would involve a straightforward example of the operational, managerial, and strategic decision makers, respectively. But suppose the task is to consider where to put the level 2 and level 3 support personnel. Level 2 technical support typically function as an escalatory call center support technician. The customer-facing technical support initially answers the phones and can solve nearly all problems with a few simple steps (turn a device on and off again, restart the browser, check for updates, follow trouble shooting steps in a binder, etc.) and are frequently called Level 1 techs. However, some support issues may require skills, experience, or permissions that are not available to the Level 1 techs who are typically viewed as entry-level employees. The Level 2 techs frequently need to consider a matter over the course of an hour or more, correct problems from a wide range of platforms, or otherwise engage in more medium-term planning. 'Aha!' says the novitiate strategic decision-maker, 'this sounds like a managerial-level decision maker, because their decision making has more than just immediate implications and requires more follow-through'. By the same extension, it would be feasible to consider the Level-3 tech support personnel to require even longer-term decision making for these problems, sometimes taking weeks or months to follow up on particular support issues.

Of course, the flaw to this analysis should be apparent, since the Level 2 technician was described as being classified by a novitiate, there must be a better approach. For the Level 3, they neglected to consider the description of the role, explore the context of the company, or otherwise put the situation in a broader context. Applying Ray's Multivector to the situation would help (for the sake of brevity, some of the duties will be expanded here to avoid too much repetition):

*Hypothetical Tech Support Roles, times are broad normative estimates*:

1) Level 1 Tech Support
   a. Immediate Timeframe – Establish cordial tone during introduction (0-5 seconds)
   b. Short Timeframe – Neutralize potential hostility by establishing rapport (6-30 seconds)
   c. Longer Timeframe – Solve problem and document (1-5 minutes) and escalate to Level 2 if needed
2) Level 2 Tech Support
   a. Immediate Timeframe – Establish expertise during introduction (0-5 seconds)
   b. Short Timeframe – Confirm the problem and the steps taken so far (1-3 minutes)
   c. Longer Timeframe – Solve problem through repeated calls if necessary, document steps, follow up with customer to ensure solution (1-2 hours) and escalate to Level 3 if needed
3) Level 3 Tech Support
   a. Immediate Timeframe – Research Problem and provide a summary example (1-24 hours)
   b. Short Timeframe – Engage in solving problems outside of customer purview, reporting back on progress (1-24 hours)
   c. Longer Timeframe – Monitor solution, confirm customer satisfaction, and provide any needed systematic changes to avoid future problems to management (1-7 days)
4) Managers

a. Immediate Timeframe – Supervise Support Technicians on a daily basis, diplomatically handle conflict between customers and technicians
b. Short Timeframe – Design working schedules, monitor performance over time on a weekly or monthly basis
c. Longer Timeframe – Engage in personnel decisions, make decisions on systematic changes recommended by technicians, etc. on a monthly or a quarterly basis

5) Executives
a. Immediate Timeframe – Oversee budgets, engage in advertisement, review effectiveness metrics on a quarterly or yearly basis
b. Short Timeframe – Engage contractors, procure necessary equipment, handle escalated conflicts between technicians and managers, supervise managers on a quarterly or yearly basis
c. Longer Timeframe – Investment, long term growth strategies, and engage in strategic decisions eying the long-term effectiveness of the organization over years.

Technical Support is a good example of the use of Rays Multivector because the nature of the conflict is so pronounced. The conflict is not necessarily antagonistic, but there are typically two different goals at the start of a call: the customer wants the problem fixed right now, and the support organization wants the problem fixed correctly so it doesn't need to be revisited. A good call center technician could be described as progressing routinely: blunting the initial anger or frustration of the caller (move the target), establishing the recognition of a common goal (move the weapon), and then ensuring the compliance of the customer with the steps needed to find a solution (control the situation).

The lead up to this particular misclassification is a bit of a strawman, but it is not an uncommon class of problem: classifying roles based on their hierarchy in the organization rather than their most common tasks. From this layout, it's easy to see that the initial classification of level 1 support as operational acting over the course of minutes, managers as managerial acting over the course of weeks or months, and executives as strategic operating on timescales of quarters and years while projecting into the future is all sensible. However, even though the Level 2 support roles act on a higher level with more permission and experience, their tasks are likely still on the order of minutes and hours placing them firmly in the category of operational decision makers. Level 3 support roles are still acting over the course of hours or days, but depending on the circumstances, they might be occasionally making managerial level decisions (that is, their role is likely an operational role with some managerial-level tasks). Indeed, this change between the initial strawman and a better analysis reflects the situation in the mid to late 1990s (Cunningham et al, 2001) versus more modern solutions (Klindžić et al, 2019, Bruderer & Hill, 2019).

## 4 Application to SWOT Analysis and TOWS Matrix

Another model that is frequently used is the SWOT Analysis. In the SWOT Analysis, in the current environment for an organization, expected Strengths, Weaknesses, Opportunities, and Threats are delineated. But which ones are the most important to consider first? One method of making that decision would be to expand the SWOT analysis to consider the timescale involved. Are each of the factors relevant in an immediate, short-term, and long-term basis? Variations can be considered:

*Variations of Ray's Multivector within the scope of a TOWS Analysis:*

1) All three – These are the true factors for a SWOT analysis. For example, and organization that has a Strength in their funding source based on a tight relationship with, for example, a governmental grant organization that has provided funds currently in the organization's possession (immediate), will likely have favorable opportunities soon (short-term), and has recurring opportunities in the future (longer-term). An organization that, for example, targets dangerous areas of business (such as an international relief organization) is likely operating currently, will continue to operate, and is looking for future operations in areas that are prone to various political or environmental turmoil.
2) Short- and Longer-term – These factors might be construed as the 'true' strategic areas. That is, areas in which an organization is not currently affected by these factors but will shortly develop them. For example, an organization that is anticipating a strong public offering in the near future may not have current funds, but expects funds soon and to use those funds to produce more over time. An organization that sees pending legal changes, such as a weapons manufacturer considering how to handle an upcoming and long-term ban on some of their products would also fit into this area.
3) Immediate and short-term – These factors are, in effect, closed issues from a strategic perspective. While there might be some tangential effect in understanding how organization's response affects longer term issues, from a strategic perspective, they are likely moot or even incorrectly labeled. For example, an organization who considers one of their strengths a large endowment or a large startup grant might have money right now and for the short-term, but it might be better to consider the lack of long-term funding as a weakness. An organization whose primary threat is a legal obstruction that will shortly be resolved through the granting of a patent or approval from a government oversight organization may instead be looking at a weakness in tying their strategic planning to an external body.
4) Immediate and long-term – These areas are likely either suffering from a breakdown in analysis (why is something applicable now and in the future but not for a short period?) or cyclical in nature such as the oil industry's boom and bust cycle. Other examples might be an organization that is expecting that their current well-leveraged position will be compromised by a pending merger but ultimately become stronger as a result. Or an organization that sees a current threat, expects their efforts to have substantive success in resolving it, and will then broaden the range of their target area.
5) One timeframe – Each of these timeframes by itself would indicate a lower priority strategic consideration. Something that is only an immediate threat or an immediate weakness may need to be resolved, but shouldn't need long-term planning. Similarly, an area that is a long-term strength, but doesn't exist

in the immediate or short term should be considered but can't have any direct, current effect on standing.

Again, with the recognition that Ray's Multivector is a simplified model of complex reality, none of this analysis can be taken without context. There are any number of external factors that may override the analysis. But, in general, a factor uncovered in a SWOT analysis that addresses more timeframes is likely of greater strategic decision-making concern than those that address fewer timeframes. In a hypothetical world of infinite patience and infinite time, all factors should be considered. But in reality, planning time and attention is limited, meaning that only the factors applicable to more time frames should be kept, and the rest culled.

Most SWOT Analysis is explained in conjunction with a TOWS matrix, where each Strength is matched with each Opportunity and Threat, and each Weakness is matched with each Opportunity and Threat. The classical form is a 2x2 matrix where multiple brainstormed solutions for addressing each of the pairings can be aired. Trivially, this results in an exponential growth in possible strategies that are, again, limited by time and attention. Each of the brainstormed solutions could be analyzed by Ray's Multivector to consider whether or not they adequately address the needs of the organization at all timescales.

Using the SWOT and TOWS tools provides two categorically different methods of culling potentially brainstormed solutions. In the case of SWOT, Ray's Multivector is more proactive in determining a best fit for further consideration. In the case of TOWS, Ray's Multivector is more reactive, determining whether the proposed solution will be effective.

## 5 Application to the CIA Model

Another common model for use within strategic planning is the CIA model. Briefly, the CIA model is not intended to provide concrete application of the intricate details of a security framework. However, it does provide a high level overview of the balancing act required to maintain a functioning security framework. While it can be applied in intricate detail, it's more effective at describing whether the model is sufficiently addressing each area.

In this respect, a decision maker could leverage Ray's Multivector to determine whether or not there is a change in time with regard to the application of an organization's security efforts.

*Change in time for CIA Framework*

1) Confidentiality
   - *a.* Decreasing - In the immediate timeframe, if there is an expectation of sufficient confidentiality, but in the short- or longer-term timeframes the confidentiality is expected to shrink. This would be the case where, as a company grows, permissions, keys, or access codes expand but the controls for them are not maintained at the same level. This might be the case for a forum that suddenly grows in popularity or in a retail company that expands the number of physical keys it distributes from a few trusted individuals to a wider network.
   - *b.* Increasing – In the immediate timeframe, there is no expectation of sufficient confidentiality, but in the short- or longer-term timeframes the confidentiality is expected to grow. This would be the case where a new security professional is intending to refactor the current security arrangements or there is a new vendor on the horizon who will change the current setup. The most likely response to this situation is to maintain a heightened state of alert in the shorter-term timeframes in order to insure that there is sufficient warning in the case of a breach.
   - *c.* Maintaining sufficient – In all three timeframes, there is an expectation of sufficient confidentiality. In this situation, it would be important to review assumptions and make sure that they are valid and applicable to unforeseen situations.
   - *d.* Maintaining insufficient – In all three timeframes, there is an expectation of insufficient confidentiality. In this situation, the most likely outcome is to transition to an Increasing scenario, where flaws in the current security framework are increased.
2) Integrity
   - *a.* Decreasing – In the immediate timeframe, there is sufficient integrity, but in the longer-term timeframes there is an expectation of decreasing data integrity. This would be, for example, at the outset of a military conflict in the region that forecasts disruptions in basic utilities or physical breaches. In this case, there would likely need to be a determination made to bolster security measures or leave the theatre.
   - *b.* Increasing – In the immediate timeframe, there is insufficient integrity, but in the longer-term timeframes there is an expectation of increasing data integrity. For a similar situation, if the organization is operating in a disruptive environment that is likely to be resolved in the short- or longer-term timeframe. In this case, it might be most feasible to refrain from data storage in the location or bolster immediate data redundancy.
   - *c.* Maintaining sufficient – In all three timeframes, there is an expectation of sufficient data integrity. In this situation, there is an expectation of normalcy and the status quo, regarding the current security framework versus the environment. This seems like an unlikely objective conclusion, as the security landscape is in constant flux, however it may be impossible to plan for unexpected and unknowable changes. The most effective strategy would be to ensure that there is sufficient depth to the organizations disaster plan.
   - *d.* Maintaining insufficient – In all three timeframes, there is an expectation of insufficient data integrity. The most likely scenario where this would occur in an unexpected manner is either in the aftermath of an unheretofore known security flaw or in the publication of an unresolved security flaw in deprecated assets. This would likely require fundamental refactoring of the security framework.
3) Accessibility
   - *a.* Decreasing – In the immediate timeframe, there is sufficient accessibility, but in the longer-term timeframes there is an expectation of insufficient accessibility. This scenario is likely the status quo, as hardware and software interactions change swiftly. However, it can be ameliorated by insuring that adequate attention is devoted to maintaining use case planning to insure that

the problem does not exacerbate faster than the framework plans for.

*b.* Increasing – In the immediate timeframe, there is insufficient accessibility, but in the longer-term timeframes, there is an expectation of sufficient accessibility. In this scenario, the most likely cause is the advent of a new technology providing more seamless interconnections between devices or protocols. However, it is important to insure that adequate planning has been taken to not introduce new security flaws in its adoption.

*c.* Maintaining sufficient – In all three timeframes, there is an expectation of sufficient accessibility. This scenario would most likely occur when there is either a mature environment unlikely to change and unaffected by technological progress. Altenrateively, it could be a small system with a finite footprint whose interactions are strictly defined.

*d.* Maintaining insufficient – In all three timeframes, there is an expectation of insufficient accessibility. Since the lack of a security framework would essentially be a 0/0/100 split between the three factors, this situation would likely be the case when there is an immediate cause. This might be a legal change or the notification by a user of a practical deficit in this area. It would likely necessitate a rebalancing of the three component areas.

This demonstrates that while Ray's Multivector could be used in the previously explored proactive and reactive scenarios, it's also a functional comparative tool for looking at inter-timeframe evaluations. The CIA model could also be used in conjunction with Ray's Multivector in a brainstorming capacity to, for example, evaluate the solutions produced by bidding vendors on a security framework. However, it could also be used in this context as a way to evaluate the current (or historical post-mortem evaluation) structure of the organization.

The use of Ray's Multivector in this situation has two primary drawbacks. The first is that, while it adds depth, it also significantly increases the complexity of the CIA framework. Rather than having a simple 3-point check to determine the functionality of an organization's security, it becomes a 9-point check.

Similarly, this predilects a weakness in the most brute-force application of Ray's Multivector. While it is suitable for use in a comparative capacity, that comparison mitigates the effectiveness of a model that is already comparative in nature. In the CIA Model, there is an expectation of balance, that is that the Confidentiality, Integrity, and Accessibility components are compared to one another and no one factor overwhelms the others. While this can still be done with an sbstraction of the CIA/Ray's Multivector analysis, only comparing the components of the CIA model, it may mean that default application of Ray's Multivector to a conceptual model like the CIA Model would be superfluous, producing more work for little success. It warns that, like all conceptual models, the outcomes need to be balanced by common sense, expertise, and whether other models come to similar conclusions.

The CIA model is included here primarily to demonstrate that, like all conceptual models, there is a certain amount of benefit in being able to apply a simple construct to novel problems with novel intent, the reality is that the benefit gained from this approach is not as substantive as the benefit gained from use in its primary focus: the culling of brainstorming ideas based on their application to different timeframes. However, the benefit does still seem apparent.

## 6 Conclusion

Certain types of analysis and brainstorming activities like SWOT, TOWS, etc. could conceivably occur ceaselessly without end. One potential solution is to adopt an overarching rubric like Ray's Multivector that constrains these potentially endless choices into a more workable and efficient subset.

Ray's Multivector is a powerful tool, but it provides some limitations. The first is that conceptual models are intended to simplify the complexity of the world in a manner that provides for clear and straightforward communication between individual decision makers, but compounding a conceptual model with a second ancillary model muddles the clarity of that communication. It makes up for this by providing more concise and objective methods for determining effectiveness: how much of the multivector is covered by any given portion of a conceptual model

Similarly, Ray's Multivector expects a higher level of proficiency with the subject matter. While some organizational and strategic-level planning can be done by anyone in any field, understanding the finesse and particulars of timing and distance is something that requires experience to develop.

However, it provides a certain amount of increased effectiveness in the communication of the material. Further consideration could be done on a number of levels. For example, is martial arts framing the best method for deriving the principles involved? Is a three timeframe function the most effective or are there benefits to reducing or expanding the number of timeframes? At what point would it be effective to consider a continuous application of Ray's Multivector?

In addition, while Ray's Multivector has been analyzed from the perspective of three common conceptual models:

1) Anthony's Triangle
2) SWOT/TOWS Analysis
3) CIA Model

It is certainly feasible that there exist models both inside and outside the realm of management science that would provide for more interesting applications. It is presumed that future authors would be interested in pursuing this avenue of research and refining the model appropriately. Of particular note are: Longevity designs of diminishing products such as batteries and processors, possibly whether it can be used along with the Von Neumann architecture to improve the design of processors or processes, and whether newer variations on strategic planning models that are more complicated (such as some proprietary models currently in vogue by strategic consultants) provide enough of a benefit to warrant the additional complexity.

The authors invite discussion and feedback on the concept. In particular, they would appreciate practical examples of the use of Ray's Multivector in real-world scenarios outside of their own usage.

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