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ARTICLE

Optimality of Management Inconsistency

Ido Millet
Penn State Erie – USA

■ ABSTRACT

Management attention is a vital and scarce resource. This paper provides a model to facilitate reasoning about the allocation of management attention to areas of concern. According to this model, the level of benefits generated by management attention depends on the level of open issues that have accumulated in each area of concern. Readers can download a multi-period excel implementation of this model and adjust starting conditions and response curves to simulate and even optimize attention allocation decisions. We find that abrupt changes in the allocation of management attention may actually contribute to organizational success. Implications for research and practice are discussed.

Descriptors: *Management, Attention, Simulation, Optimization*

■ INTRODUCTION

Management attention is a vital and scarce resource. Davenport and Völpel (2001) claim that attention "is already the scarcest resource in many organizations" and according to Davenport and Beck (2001), "understanding and managing attention is now the single most important determinant of business success."

As with any scarce resource, management attention should be properly allocated. Indeed, Beck and Davenport (1999) state that it is "critical for management to learn to allocate attention judiciously." However, we lack conceptual frameworks and methods for improving the allocation of management attention.

This paper proposes a model to facilitate reasoning about the allocation of management attention to areas of concern. It is a simplified multi-period model where management can allocate attention to two areas: cost-cutting and revenue-generating initiatives. We use a spreadsheet model to simulate the dynamics of this system.

At the heart of the model is a response curve that provides the expected benefits from each area given the level of its issue inventory and the level of management attention it receives. Optimizing attention allocation decisions in this model indicates that for a reasonable set of response curves and initial conditions, management should adopt a policy of abrupt changes in focus between the cost-cutting and revenue-generating areas. The paper provides an intuitive explanation for this result and reviews implications for management research and practice.

■ WHY ISSUES?

Before presenting a model of management attention dynamics, it is necessary to explain what "management issues" are and why they play such a key role in the proposed model. Dutton and Ashford (1993) define issues as "any event, development, or trend with implications for organizational performance."

Organizational success depends a great deal on the ability of employees to identify and handle such issues. Previous literature suggests that "the motor of corporate entrepreneurship resides in the autonomous initiatives of individuals" and that this bottom-up stream of initiatives "may be one of the most important resources for maintaining the corporate capability for renewal through internal development" (Burgelman, 1983; Fliaster, 2004).

The importance of allocating attention to issues is also reflected in Robert Reich's vision of "collective entrepreneurship" (1987):

> ...entrepreneurial efforts are focused on many thousands of small ideas rather than on a few big ones. And because valuable information and expertise are dispersed throughout the organization, top management does not solve problems; it creates an environment in which people can identify and solve problems themselves.

As implied by the vision above, the number of issues may far exceed the organizational capacity to handle all of them. Furthermore, top management cannot make decisions about allocating attention to each individual issue. It is therefore reasonable for top management to allocate attention to general areas of concern, each containing many individual issues. The question of how should we allocate scarce management attention to such areas of concern is the subject of this paper. The following section introduces a system model for studying this question.

A Model of Management Attention Dynamics

Figure 1 depicts a simplified system where management attention can be directed at only two areas of concern: cost-cutting or revenue-enhancing issues. Management attention facilitates and triggers processing of issues in these areas through the work efforts of lower-level employees. Issue inventories accumulate as a function of the number and importance of problems and opportunities awaiting organizational attention.

While management attention depletes issue inventories, the environment acts to replenish them. If the replenishment rate for each issue area is fairly constant, we may be tempted to assume that management attention to each area should be held at a commensurate and constant level. This would allow the appropriate proportion of new issues, those that indeed warrant management attention, to be processed.

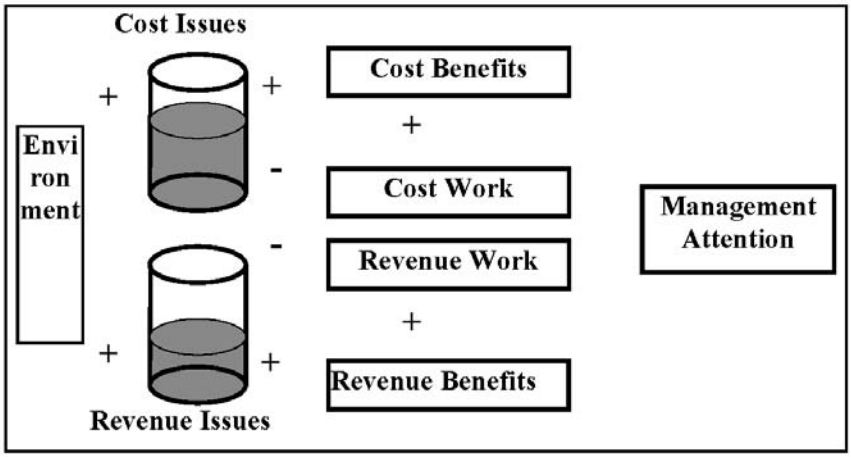

Figure 1: Attention Benefits From but Depletes Issue Inventories

Positive Effects of Issue Inventory

A spreadsheet model (see Appendix A) simulating the behavior of this system allows us to investigate the effects of different attention allocation strategies. A Microsoft Excel implementation of this model is available for download from: www.millet-software.com/Attention.xls. We can adjust starting conditions and assumptions in order to simulate and even optimize attention allocation decisions over multiple periods and under various scenarios.

At the heart of this model is a response curve (adjustable by selecting a point on the curve and dragging it up or down) relating benefits accrued from 1 day of management attention to the level of issue inventory in that area. The key assumption here is that as the level of issue inventory increases, benefits from management attention increase as well. The rationale for this assumption is based on two main effects: the *selection effect* and the *interaction effect*.

The *selection effect* refers to higher issue inventory levels providing opportunities for selecting issues with better benefit/cost ratios. This effect dominates when issue inventory is relatively low. As the number of issues in inventory increases, we expect the marginal improvement in selectivity due to an additional issue to diminish.

The *interaction effect* refers to higher issue inventory levels improving the probability that handling one issue would be successful and would benefit other issues as well due to overlaps, infrastructure, fixed costs, learning curves, organizational awareness, motivation, and critical mass considerations. For example, a cost cutting initiative in an organization awash with inefficiencies and waste may be easier to implement and may provide opportunities for leveraging information, systems, and momentum across other cost-cutting initiatives.

The selection effect dominates when issue inventory is low — the interaction effect dominates when issue inventory is high. Taken together, the combined effects would tend to support the assumption that management attention is leveraged when directed at areas with higher issue inventories.

It is reasonable to assume then that as issue inventory increases, each unit of management attention to that area tends to generate higher benefits. We may use an S-curve or, as shown in Figure 2, a diminishing returns curve to model how higher issue inventory levels increase benefits from management attention. Regardless of the exact shape of the curve, as long as higher issue inventory leads to increased leverage from management attention, our simulation model demonstrates that it may be optimal to allocate attention inconsistently.

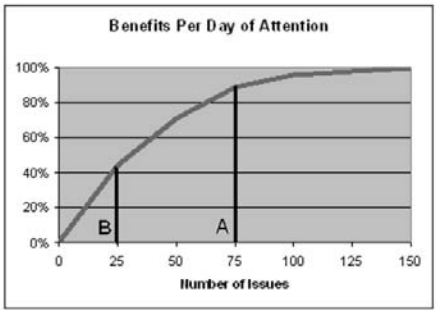

Figure 2: Management Attention is Leveraged by Higher Issue Inventories

Negative Effects of Issue Inventory

While a higher issue inventory has a positive effect on benefits from management attention, hoarding issues can have a negative effect on total generated benefits. First, any issue in inventory is an issue from which benefits have not yet been realized. The spreadsheet model recognizes this effect by limiting management attention to a fixed capacity and by assigning zero benefits to issues left in inventory at the end of the last period.

Another negative effect caused by high issue inventory levels is due to the fact that some issues generate lower benefits if their processing is delayed. This effect is captured in the spreadsheet model by applying a value "shrinkage" factor to issues left in inventory at the end of each period.

Issue Selection

Clearly, attention should be directed at harvesting issues from the top rather than from the bottom of the response curve. For example, assuming we are allocating attention for processing 50 issues out of 75, the benefits should be taken as the area under the response curve between line A and line B in Figure 2. This is indeed the method used in the spreadsheet modeling this system.

Since we assume attention is directed at the best issues, the remaining issues must be deflated according to the ratio of remaining benefits (area under the curve up to line B in Figure 2) to total benefits (area under the curve up to line A). The spreadsheet model applies this procedure at the end of each period.

After deflating the remaining inventory of issues, the model adds new issues as specified by the replenishment rate parameter.

■ SIMULATION RESULTS

As mentioned earlier, since our model assumes a constant issue replenishment rate for each area, we may be tempted to assume that the allocation of management attention should be held at a constant level as well. This section of the paper compares three attention allocation policies and shows that management consistency is not a good policy in this system.

Consistent Policy Results

Appendix A simulates the effect of a policy whereby management attention is allocated equally and consistently between cost issues and revenue issues. This consistent policy generates a total benefits score of 312. If you download the spreadsheet file, the first spreadsheet tab provides this scenario.

The model parameters were set to allow replenishment of 60 new issues per period for each area and a shrinkage rate of 7% for all issues left in inventory at the end of each period. The consistent policy consumes the top (most valuable) issues in each area. Since in each period the remaining inventory is adjusted downwards to reflect the lower quality of remaining issues, this policy tends to deplete issue inventory levels. This explains why we start with a total inventory of 150 issues and we end the simulation with a total of only 134.

As discussed earlier, while fast consumption of issues has some positive effects, the downside of this consistent policy is that inventory levels in each area are kept low. This means that management is not taking advantage of the high-leverage regions of the response curve (Figure 2).

Inconsistent Policy Results

Appendix B shows the results of optimizing, using the spreadsheet solver, attention allocation decisions over the five periods. If you download the spreadsheet file, the second spreadsheet tab provides this scenario. To activate the spreadsheet solver model, and see how the objective and constraints were set, click the menu options of Tools, Solver.

The optimization model is set to maximize total benefits by adjusting the number of days allocated to cost Issues in each period. The number of days allocated to revenue issues is simply the difference between the total attention capacity (number of attention days per period) and the number of days allocated to cost issues. The constraints imposed on the optimization are: a) the number of days allocated cannot be more than the attention capacity parameter, and b) to avoid wasting attention, the number of days allocated to an area cannot be more than the total number of days required to handle all issues in that area.

This optimal policy generates a total benefits score of 327 (5% improvement over the consistent policy). Note that the optimized policy targets the Cost area for total depletion in the first 3 periods. This allows a gradual increase in the inventory of

the Revenue area until, in the fourth period, attention is shifted to harvest the accumulated inventory of Revenue issues using the high-leverage region of the response curve.

A closer examination of the dynamics of this system reveals that, counter to intuition, what seems like a reasonable constraint is not reasonable at all. The optimization model used in this phase assumed that management is not allowed to waste resources by allocating attention beyond the inventory level in each area. For example, in the first period inventory level is 75 and hence we can allocate, at most, 75 days of attention to the Cost area. This forced us to allocate the remaining 25 days of attention to the Revenue area. This slowed down the rate at which we were able to build up the issue inventory level in the Revenue area. In the following periods, the depleted inventory in the Cost area forced us to shift even more attention to the Revenue area, slowing even further our efforts to build up the issue inventory there.

Inconsistent Policy Results when Waste is Allowed

Appendix C shows the results of optimizing attention allocation decisions when wasting of management attention is allowed. If you download the spreadsheet file, the third spreadsheet tab provides this scenario.

It is interesting to note that this counter-intuitive change to the optimization model resulted in significantly improved results. This policy generated a total benefits score of 365. This is 17% improvement over the consistent policy and 12% improvement over the optimized policy where wasted attention was not allowed.

Under this scenario, by allocating 100 days of attention to an area that has only 75 issues, we end up wasting 25 days of management attention in the first period. However, this allowed the other area to significantly increase its inventory level (from 75 to 130 issues). From that point on, the optimal policy is to completely switch attention between areas in each period. This allows the system to harvest the high-yield end of the response curve in one area while allowing the other area to recover its inventory before repeating the cycle.

In the last period, the optimized model elects to use a less extreme approach whereby some attention is allocated to both areas. The intuitive explanation is that inventory buildup is beneficial only for a future period. Hence, in the last period the optimizer simply maximizes the benefits from the existing inventory.

We conclude that it is optimal to use a pulsating or rotational management strategy whereby attention is focused on a limited number of areas before abruptly switching to other areas where issue inventories were allowed to accumulate.

It should be noted that we obtained our results without modeling or appealing to other effects that would further support abrupt changes in management attention. Davenport and Beck (2001), observe that attention economics involve “Increasing returns” in the sense that it is easier to attract more attention to areas that already receive significant attention. In addition, employees may respond strongly to significant changes in management attention while consistent levels of attention may have a desensitizing effect. Such effects may provide even further support for the optimality of inconsistent allocation of management attention.

■ ROTATIONAL GRAZING AS A METAPHOR

Throughout this paper we viewed management issues as an accumulating resource that can be harvested through management attention. This perspective invites a comparison with grazing practices: just replace issues with grass, and managers with cows.

It is reassuring to find that the conclusions we reached about the value of pulsating or rotational management match the well-established practice of Rotational Grazing in the management of livestock:

Management-intensive grazing (MIG) is defined as grazing and then resting several pastures in sequence. The rest periods

allow plants to recover before they are grazed again. Doubling the forage utilization on a given acreage is often possible when changing from a continuous to a controlled grazing system (Beetz, 2002).

IMPLICATIONS

This paper demonstrates that abrupt changes in the allocation of management attention may actually contribute to organizational success. Perhaps this explains why managers tend to adopt and discard management fads at the flip of a hat. More importantly, the proposed model and the results derived from it have clear implications for practice and research in the area of allocating management attention.

The dotted lines in Figure 1 imply that management attention might be adjusted according to the level of benefits generated from each area. A key insight is that such an adjustment mechanism can be dysfunctional since it might lead management to allocate more attention to precisely the wrong area. As an area gets harvested with excellent results, management may be tempted to allocate more attention to it even though its issue inventory has just been depleted.

The key implication is that we should not allocate management attention according to the success of past efforts in each area but according to the level of issue inventory in each area of concern. This can be done using informal methods and estimates, but we may benefit from formal systems to monitor issue inventories. Peter Drucker claimed that the ability to measure something is a prerequisite for managing it. Similarly, formal systems for measuring the number and importance of issues in different areas of concern seem to be a prerequisite for properly allocating top management attention to these areas.

One of several questions left for future research is how to best cluster management issues into areas of concern. In our simplified model we assumed management has two areas of concern: cost issues and revenue issues. It is obvious however that there are many potential ways of classifying the same issues. It may be productive to pursue this question from the point of view of selecting areas that would maximize interaction or synergy effects. If, for example, much of the interaction effects are generated due to shared technology and infrastructure aspects, it may be reasonable to map issues according to the technology rather than functional or organizational areas.

Future research should also address the question of sensitizing versus desensitizing effects of abrupt changes in management attention. While abrupt changes may provide a sensitizing effect, if such changes are done too frequently, the effect might diminish to the point where employees begin to ignore such signals from top management. In other words, a minimum level of consistency may be required to establish credibility and to allow for organizational momentum effects.

This brings us to the question of how management can best signal and direct a change in the allocation of organizational attention. Besides the obvious options of shifts in the funding of projects and the staffing of organizational units there are other approaches that should be studies to assess relative efficacy under different contingencies. For example, Beck and Davenport (2001) suggest that corporate leaders seek feedback and “go public” on how they are actually allocating their own time.

Our findings suggest that if management believes that issue inventories have been depleted, it may be optimal to reduce or even waste managerial capacity. In our model, managerial capacity was assumed as constant, yet the proper setting of management and staff capacity is clearly an important research subject.

Research should also investigate how the dynamics of pulsating or rotational management change as we scale down to smaller organizations, to units within organizations, and perhaps even to individuals.

ENDNOTES

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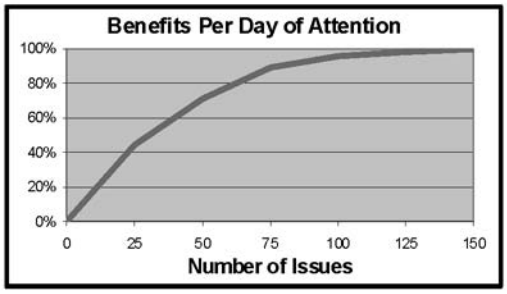
■ BIOGRAPHICAL SKETCH

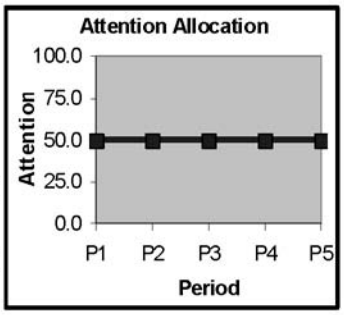
Ido Millet is an Associate Professor of MIS at Penn State Erie. He received his Ph.D. in Decision Sciences from the Wharton School at the University of Pennsylvania. His research interests include the Analytic Hierarchy Process (AHP), reporting systems, and online reverse auctions. He enjoys mixing teaching, research, consulting, and software development with hobbies such as skiing, playing bridge, and flying sailplanes.

Appendix A: Model with Consistent Policy

# of Attention Days per Period	100
# New Cost Issues per Period	60
Cost Inventory Shrinkage Factor	7%
Starting Inventory of Cost Issues	75
# New Revenue Issues per Period	60
Revenue Inventory Shrinkage Factor	7%
Starting Inventory of Revenue Issues	75

Benefits from 1 day of attention depend on number of issues in inventory as follows:	# of Issues	Benefits/ Day
	0	0%
1 day of attention removes 1 issue	25	44%
	50	71%
	75	89%
	100	96%
	125	98%
	150	100%





Period:	P1	P2	P3	P4	P5	
# Days allocated to Cost Issues	50.0	50.0	50.0	50.0	50.0	
# Days allocated to Revenue Issues	50.0	50.0	50.0	50.0	50.0	
Starting Inventory of Cost Issues	75.0	69.6	67.8	67.2	67.0	
Starting Inventory of Revenue Issues	75.0	69.6	67.8	67.2	67.0	
Benefits from attention to Cost	34.5	31.3	30.3	29.9	29.8	
Benefits from attention to Revenue	34.5	31.3	30.3	29.9	29.8	
TOTAL BENEFITS:	68.9	62.6	60.6	59.9	59.6	312

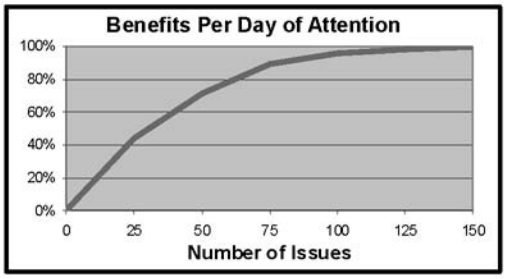
Appendix B: Model with Inconsistent (optimized) Policy -- Attention Waste Not Allowed

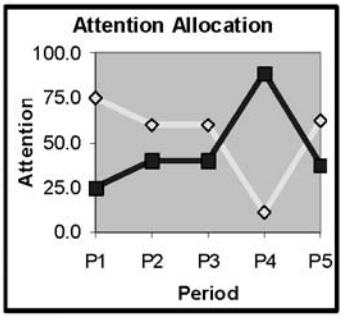
# of Attention Days per Period	100
# New Cost Issues per Period	60
Cost Inventory Shrinkage Factor	7%
Starting Inventory of Cost Issues	75
# New Revenue Issues per Period	60
Revenue Inventory Shrinkage Factor	7%
Starting Inventory of Revenue Issues	75

Benefits from 1 day of attention depend on number of issues in inventory as follows:

1 day of attention removes 1 issue

# of Issues	Benefits/ Day
0	0%
25	44%
50	71%
75	89%
100	96%
125	98%
150	100%





Period:	P1	P2	P3	P4	P5	
# Days allocated to Cost Issues	**75.0**	**60.0**	**60.0**	**11.1**	**62.3**	
# Days allocated to Revenue Issues	**25.0**	**40.0**	**40.0**	**88.9**	**37.7**	
Starting Inventory of Cost Issues	75.0	60.0	60.0	60.0	98.6	
Starting Inventory of Revenue Issues	75.0	94.8	95.9	97.1	62.7	
Benefits from attention to Cost	40.0	27.9	27.9	8.6	49.8	
Benefits from attention to Revenue	20.1	34.5	34.7	58.6	24.6	
TOTAL BENEFITS:	60.0	62.5	62.6	67.2	74.4	**327**

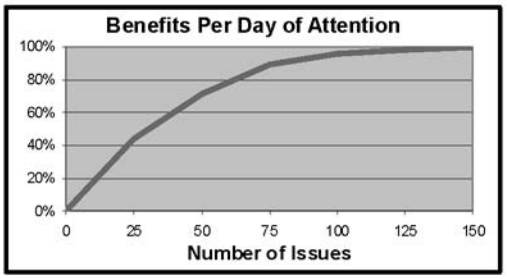
Appendix C: Model with Inconsistent (optimized) Policy -- Attention Waste Allowed

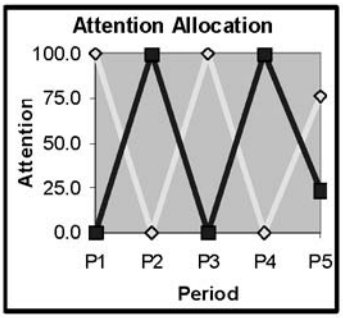
# of Attention Days per Period	100
# New Cost Issues per Period	60
Cost Inventory Shrinkage Factor	7%
Starting Inventory of Cost Issues	75
# New Revenue Issues per Period	60
Revenue Inventory Shrinkage Factor	7%
Starting Inventory of Revenue Issues	75

Benefits from 1 day of attention depend on number of issues in inventory as follows:

1 day of attention removes 1 issue

# of Issues	Benefits/ Day
0	0%
25	44%
50	71%
75	89%
100	96%
125	98%
150	100%





Period:	P1	P2	P3	P4	P5	
# Days allocated to Cost Issues	**100.0**	**0.0**	**100.0**	**0.0**	**76.4**	
# Days allocated to Revenue Issues	**0.0**	**100.0**	**0.0**	**100.0**	**23.6**	
Starting Inventory of Cost Issues	75.0	60.0	115.8	64.8	120.2	
Starting Inventory of Revenue Issues	75.0	129.8	70.8	125.8	67.9	
Benefits from attention to Cost	40.0	0.0	75.0	0.0	66.3	
Benefits from attention to Revenue	0.0	83.8	0.0	82.2	17.7	
TOTAL BENEFITS:	40.0	83.8	75.0	82.2	84.0	**365**