Review Example

Title:
> The Peter Principle Revisited: A computational study

Submitted to:
> Physica A: Statistical Mechanics and its Applications

Summary:

This paper addresses the important topic of improving the efficiency of large organizations. In particular, they consider the effect that promotion policies may have in a hierarchical organization, such as a large company. The underlying assumption is that a the promotion policy may have a dramatic impact in the efficiency of the organization. Therefore, the interest of finding optimal policies is clear.

The context of the paper is the previous work of Peter, where it is claimed that:

- The competence transmission mechanism (CTM) of individuals along the different organization levels is not correlated. We will refer to this as Peter Hypothesis (PH)

- Given PH, The usual promoting policy of promoting the most competent workers (called best policy or BP) is indeed a very inefficient policy.

Since checking whether PH holds or does not hold in real organizations and assessing the impact of promotion policies is difficult, the authors propose an abstract model where different scenarios can be simulated. Their experiments show a number of interesting observations such as:

- If PH is true, the best policy is inefficient

- If PH is not true (namely, competence level along levels is mostly preserved), the best policy is efficient

- If PH is true, promoting the least competent worker (worst policy) is efficient.

The authors conclude that their experiment confirms Peter's intuition. Besides, they claim that organization managers should analyze the CTM operative at their organization and revise their promotion policies accordingly. If they do not know the CTM operative at their organization, they should promote randomly.

Originality: (why the paper contains new stuff)

According to the authors, the validity of PH and the analysis of promotion policies has been approached by mathematicians and psychologists. To the best of my knowledge the computational approach of the paper is original. The authors mention some previous theoretical work [Kane 70]. May be the paper should discuss in what sense their computational analysis improves over or complements this theoretical analysis.

Significance: (who cares about that stuff assuming that it is published in that venue)

I think this paper is mostly relevant to Economists, Managers, Social Scientists and Psychologists. My impression is that it is not very interesting for Physicists, since it does not contain any complex analysis technique. I am not familiar with the journal, but the paper lacks Statistical Mechanics which seems to be the journal's scope.

Relevance: (why the topic addressed and the methodology used is pertinent)

I agree with the authors that the question addressed is relevant. Discovering better promotion policies is an important topic worth to study.

As mentioned before, a computational study seems very reasonable seems a reasonable approach given the difficulty of performing analysis and experiments on real organizations.

Validity: (how sound is the work, how reasonable is to believe the conclusions given the paper)

This is in my opinion the weak point of the paper.

The authors present an abstract model for a hierarchical organization. The model is very simple, which is good. But in my opinion the simplification makes it too unrealistic. The paper fails in justifying the assumptions made in the model. Some conerns about the model are,

- Assuming that the competence of an individual can be summarized in one number seems too simplistic

- The two CTMs considered (PH where there is no correlation and the common sense hypothesis where there is almost full correlation) are too strong. I believe that reality is something is between. As an example, note that PH in combination with the best strategy is equivalent to firing the best workers (since in the model it is equivalent to promote than to recruit new workers to fill-up gaps). I would recommend a parameterized

CTM where the competence level of a worker at new level is $\alpha c + (1-\alpha)\epsilon$) where c is the competence level of the previous level, ϵ is a uniform random variables representing new competence and α is a parameter with which we can define how much competence is passed over new levels and how much competence is new.

- The model completely disregards psychological aspects of individuals. For instance, I think it is reasonable to believe that individuals are more competent if they receive an incentive, and the possibility of a promotion seems a very good one.

Unless the authors give evidence of their model being a reasonable abstraction of real systems, I think that any conclusion extracted from their simulations is, at least, questionable. Consequently, I believe that the authors should soften some of their conclusions. I do not think it is true that their results "confirm" that if managers do not know the CTM of their organization the "best strategy is to promote at random". Similarly, I do not think that they "found" that under the PH using the best strategy ."all members will end their career at the level where their competence is minimal... Therefore, Peter's intuition is definitely correct"

The second set of experiments is done "in order to obtain exactly the same efficiency for CS or PH". I do not really see the motivation behind this goal. Probably, what is more important is to find out the real CTM and then select the best policy, rather than finding a universal policy.

I appreciate the authors making their code available, which favors transparency and allows easy replication. About the experiments, I would suggest reducing the number of iterations (which company has 1000 years of duration?)

Not being an expert in the topic, I found the bibliography accurate.

The presentation of the research is in general good. The paper is easy to follow and pleasant to read. Nevertheless I have some minor comments and suggestion that may be used to improve the draft:

- Section 2 (first paragraph) mixes the description of the model with experiment details. In Section 2 (third paragraph) it happens again. The CTMs are part of the model while the promotion strategies are part of the experiments.

- Sometimes the organization of the paper can be improved. For instance, I found unnatural that the definition of the global efficiency is explained after experiment details (last paragraph of Section 2)

- I think the formula for the efficiency of the organization is wrong.

What I believe you want to say is,

$$E = \frac{\sum_i C_i r_i}{10 \sum_i n_i r_i}$$

where C_i is the sum of competence of all the individual at level i and n_i is the number of individuals at level i

- I feel uncomfortable with some of your $Max(E)$ and $E(\%)$ notation. Parenthesis should be used to contain parameters in a function. I would suggest a plain E to denote efficiency, instead.

- Figure 1 is not very informative, and I think could be completely removed without harming the paper.

Two final minor typos:

- "...takes into account"should be "determines"

- "...is normalized to its..."should be "with respect to"

Recommendation:
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Level of Confidence:
I am not an expert in the topic and I am not familiar with the journal where the paper is submitted. Nevertheless, I think I completely understood the paper and its context. Therefore I would say that my level of confidence about my recommendation is medium.