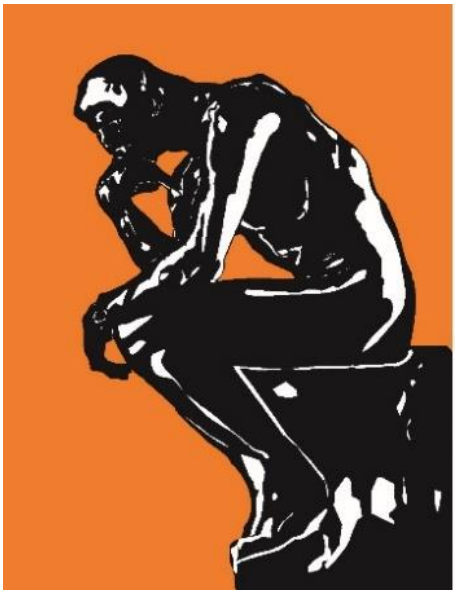
The nature of survival and transformation in knowledge production/technological innovation: Some thoughts from the SM3D theoretical framework

Minh-Hoang Nguyen [1,2,*]

[1] Centre for Interdisciplinary Social Research, Phenikaa University, Yen Nghia Ward, Ha Dong District, Hanoi 100803, Vietnam

[2] A.I. for Social Data Lab (AISDL), Vuong & Associates, Hanoi 100000, Vietnam

* Correspondence: hoang.nguyenminh@phenikaa-uni.edu.vn



December 29, 2023

Preprint v.2 (un-peer-reviewed)

* * *

"Perfection naturally calls for dedication and diligence."

In "The Perfect Plan"; *The Kingfisher Story Collection* (2022a)

The article presents some new developments in the development process that add more in-depth arguments to the SM3D theoretical system of knowledge production/technical-technological innovation processes.

The name SM3D is an abbreviation of "Serendipity-Mindsponge-3D", first used officially through published studies (Nguyen, Jin, et al., 2022; Vuong, Le, et al., 2022), after a long period of development of the composition.

SM3D is not a mechanical connection but reflects an organic connection, which has a familiar starting point: information.

The primary view of the SM3D system comes from the basic hypothesis of the new theory of "serendipity": "serendipity" (or **S**) is the process of recognizing information that appears unexpectedly in space, time, and function. The condition for this information to be stored in mind is the intuition that there is a non-zero probability that such information will have an effect on behavioral adjustment and situational awareness or lead to knowledge production/ innovation/discovery. All these are aimed at one primary goal: survival (Vuong, 2022b).

Given the amount of information that comes from the natural environment (or society through communication or battlefield intelligence commonly found in Tzu (2021)'s *The Art of War*), in the context of an undetermined target system, it is not immediately possible to arrive at actionable outcomes (decision making) or at successful outcomes (a sequence of decision and actions that result in success). The optimal outcome necessitates going through a disciplined process of action (including effective thinking/calculation), which the system refers to as **3D** based on the principle of multi-filtering of useful information, aiming to increase the probability of success by minimizing losses, increasing potential benefits that can be gained, without sacrificing opportunities due to hesitation or delay (Vuong & Napier, 2014). The operational principle of 3D is similar to the "Bayesian update" principle and also reflects the way the human mind makes decisions based on rational reasoning (Eagleman, 2015).

Thus, two important elements of the SM3D system appear, i.e., **S** and **3D**. What about M?

First, to see the logical role of **M**, we should pay attention to 3 important points presented below:

Firstly, **S** has an intimate nature related to the input forms for knowledge production/technical innovation processes, exemplified by the multi-filtering **3D** process. This is because the nature of information consumption is closely related to the biological world, including lower plants or animals. For example, hunger or environmental changes are information perceived through sensory organs or feedback signals from the body.

Second, the nature of the **3D** process cannot operate without information. Thus, if **S** serves as an essential source of information, even determining the variability of the overall next

action system, S may be the most important input of 3D. As such, a good 3D system is inherently designed to await information from S.

At this second point, we can see that since the Warring States period, generals and monarchs have all built intelligence-gathering systems. Many systems may not show daily effectiveness, but in times of conflict, sudden streams of useful information can limit losses or rapidly change the situation.

Furthermore, ultimately, there will be moments approaching the inception of the 3D production/innovation system where all information is serendipitous (this is a strong assumption, but not without plausibility).

Thirdly, which also poses a challenge: a) How can the 3D system recognize S as useful; b) If recognized, but with uncertain probability (P<1), how to 'trigger' the 3D process to engage with and utilize S information.

The mindsponge theory (MT) helps lay the foundation for this hypothetical argument: The most effective if not almost sole, way for S to reach 3D is through the mindsponge (expansion) process, namely M.

This means that M acts as both the conduit and carrier of the amount of information S to 3D. For 3D, the role of M is very important because it helps assess whether experimenting with S could harm the system and affect the ultimate survival or not.

Figure 1 illustrates the trajectory of M's movement (represented by the commonly seen red and gold pie chart) over time from T to T+1. During this movement, the space around M will change. Note that the space here refers to the information transmission space (including phones, the Internet, etc.) but is not limited to geographic space (Nguyen, 2022).

When M moves along Trajectory 1, the composition of Space B will not change much compared to Space A. However, if M moves along Trajectory 2, the composition of Space C will be very different from Space A (indicated by the color of information particles in space). From the optimization perspective of the simple 3D process, choosing Trajectory 1 will be more advantageous than choosing Trajectory 2 for three reasons:

- Firstly, the information in Space C is new, so it may generate conflicts with the 'old' value system (the set of information currently existing in M).
- Secondly, the benefits and costs of the new information have not been thoroughly evaluated.
- Thirdly, the new information has not yet gained sufficient credibility, so there is a risk of inaccurate assessment.

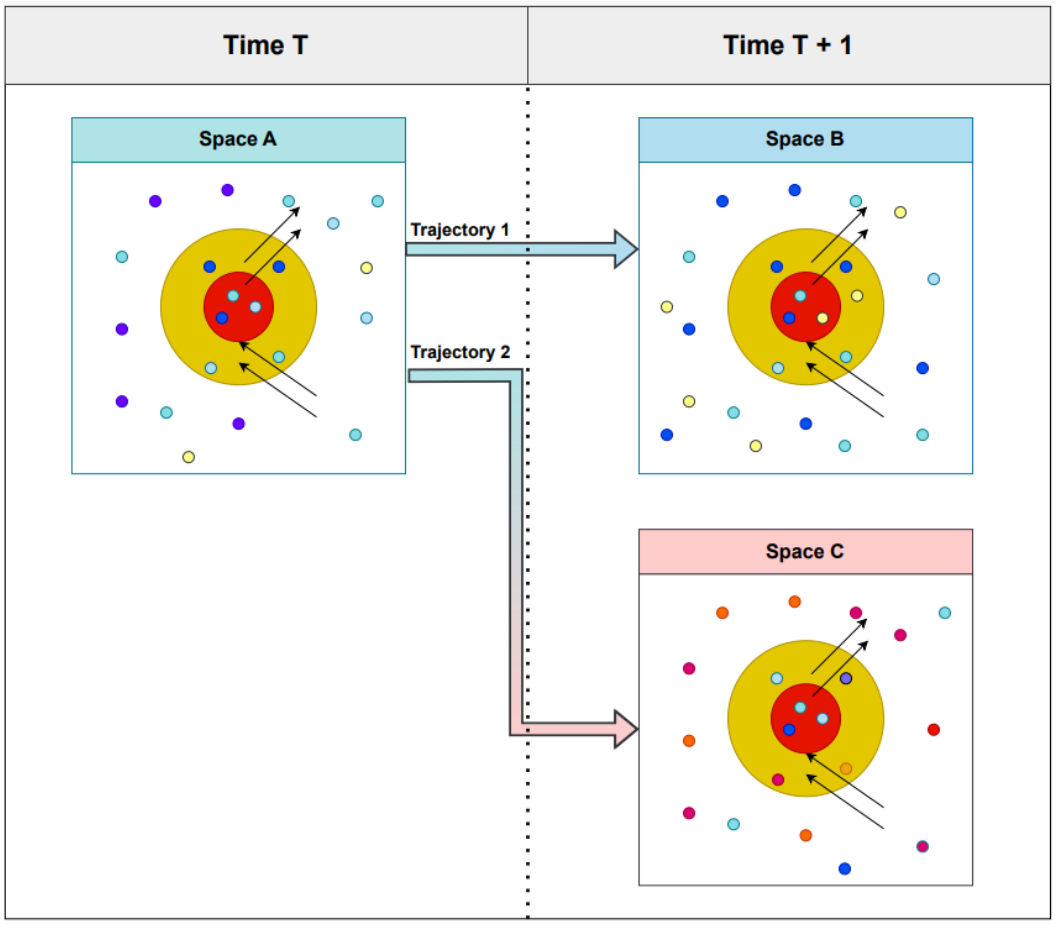


Figure 1: The moving trajectory of **M** determines the composition of the information space and the process of recognizing unexpected information **S**.

So, what leads to the shift from Trajectory 1 to Trajectory 2?

There might be two main reasons. The first is the sudden change in the surrounding environment, causing significant changes in the information transmission space or prompting individuals to seek new information spaces to meet survival needs. The second is **M**'s proactiveness in exploring and discovering new information spaces to address the current problem (and even deeper survival needs), which sometimes may be seen as irrational and non-optimal choices compared to the 'old' thinking standard (Nguyen et al., 2023; Vuong et al., 2023).

In reality, both of these reasons occur simultaneously and interact with each other because **M**'s information processing system cannot be completely isolated from the surrounding environment. However, the degree of impact of these reasons will vary depending on the situation, timing, and condition of the information processing system **M** (e.g., psychology, knowledge, etc.). The dominance of the first reason reflects passive information absorption

and processing by **M**, while the latter reason indicates active processing and absorption of information by **M**.

Whether stemming from environmental changes or active changes made by **M**, both will lead to the need for behavioral adjustments and situational awareness, thereby altering the information space, affecting the process of recognizing unexpected information **S**, and potentially generating knowledge/innovations to address the current problem. This can be better understood through Albert Einstein's quote:

> "We cannot solve our problems with the same thinking we used when we created them."

Let's take an example: Mã đề (in Vietnamese), called 车前草 (chē qián cǎo) in Chinese and *Plantago asiatica* as the scientific name. (This is also the preferred example in the new theory of serendipity book (Vuong, 2022b).)

The information suggests that consuming the *Plantago asiatica* could potentially save the horse herd, preventing them from falling ill, while soldiers not eating this plant fell ill, raising a glimmer of hope: This tree might save lives.

However, eating an unfamiliar plant that horses eat is not a trustworthy "value," especially since it is a strange species in an unfamiliar land amidst deadly diseases (a change in the information space).

At this point, **S** has emerged, and **3D** is also ready to act (Does anyone doubt the discipline of the military?). But the general himself must also undergo the process of evaluating the information value before making the decision: Should we try eating it? How much to dose? Who tries it first?

This is a process where a bit of value is formed through the cooperation with **3D** and with very little additional information from **S**. Why do we boil *Plantago asiatica* in water nowadays? It is because the **3D** process had let the general know that boiling water with various herbs will prevent diseases and stomachaches (perhaps bacteria were not known then, but the harm of unboiled water was known). So, would the commander have soldiers eat *Plantago asiatica* leaves like horses, or would he request boiling it like Chinese herbal medicine? The latter option is more plausible: boiling it like cooking rice or making soup. *Plantago asiatica,* at this point, needs to be tested for reliability to be treated as a medicine. Precautions are also taken alongside its medicinal properties; there could be toxicity.

The process of weighing pros and cons, familiarity (war horses being quite familiar to soldiers, commanders, even considered comrades), appealing appearance and color, pleasant aroma of the water (assuming it is boiled but not yet consumed), and the lack of other options (if not tried, there might not be any other solutions available, or if there are, they might be extremely costly), all push the probability to try towards 1.

M takes on such a demeanor with this specific example. Of course, deciding to use it for an entire at-risk army is a difficult task. The 3D process will not be as brief as the discussion above. Nevertheless, fundamentally, the logic behind the decision-making path is quite clear.

I push forward this crucial hypothesis because it is evident that the upgrade from the "mindsponge process" in 2012 (Vuong & Napier, 2015) to the "mindsponge theory" in 2022 (Vuong, 2023), spanning over ten years and featuring two very important factors: the new theory of serendipity (2022b) and the SM3D system as an interconnected body (2022). Also, it is precise because of this significant leap that subsequent research breakthroughs in my work have been able to achieve a foundational condition to draw profound, valuable conclusions, even though the starting point of observation was not entirely favorable (similar to S, and going through considerable time with 3D). (You can directly refer to the points discussed through references (Nguyen & Jones, 2022a, 2022b).)

There is quite a notable difference between the approach to my SM3D and that of the venerable author of MT, in that my approach carries more practical-applicable characteristics, specifically maximizing BMF analytics deployment (Nguyen, La, et al., 2022; Vuong, Nguyen, et al., 2022). Meanwhile, the MT author, being older, seems to have seen it beforehand and set it up for younger generations like myself to continue exploring. It seems the method and philosophy differ precisely at this point.

The difference still lies in the letter M.

References

Eagleman, D. (2015). *The brain: The story of you*. Canongate Books.

Nguyen, M.-H. (2022). Conditions for improving serendipity encounter and attainment probability. In Q.-H. Vuong (Ed.), *A new theory of serendipity: Nature, emergence and mechanism* (pp. 109-130). De Gruyter.

Nguyen, M.-H., Jin, R., Hoang, G., Nguyen, M. H. T., Nguyen, L., Le, T.-T., . . . Vuong, Q.-H. (2022). Examining contributors to Vietnamese high school students' digital creativity under the serendipity-mindsponge-3D knowledge management framework. *Thinking Skills and Creativity*, *49*, 101350. https://doi.org/10.1016/j.tsc.2023.101350

Nguyen, M.-H., & Jones, T. E. (2022a). Building eco-surplus culture among urban residents as a novel strategy to improve finance for conservation in protected areas. *Humanities & Social Sciences Communications*, *9*, 426. https://doi.org/10.1057/s41599-022-01441-9

Nguyen, M.-H., & Jones, T. E. (2022b). Predictors of support for biodiversity loss countermeasures and bushmeat consumption among Vietnamese urban residents. *Conservation Science and Practice*, *4*(12), e12822. https://doi.org/10.1111/csp2.12822

Nguyen, M.-H., La, V.-P., Le, T.-T., & Vuong, Q.-H. (2022). Introduction to Bayesian Mindsponge Framework analytics: an innovative method for social and psychological research. *MethodsX*, *9*, 101808. https://doi.org/10.1016/j.mex.2022.101808

Nguyen, M.-H., Le, T.-T., & Vuong, Q.-H. (2023). Ecomindsponge: A novel perspective on human psychology and behavior in the ecosystem. *Urban Science*, *7*(1), 31. https://doi.org/10.3390/urbansci7010031

Tzu, S. (2021). *The art of war*. Vintage.

Vuong, Q.-H. (2022a). *The kingfisher story collection*. https://www.amazon.com/dp/B0BG2NNHY6

Vuong, Q.-H. (2022b). *A new theory of serendipity: Nature, emergence and mechanism*. De Gruyter. https://www.amazon.com/dp/B0C5C4LPF1

Vuong, Q.-H. (2023). *Mindsponge Theory*. Walter de Gruyter GmbH. https://www.amazon.com/dp/B0C3WHZ2B3/

Vuong, Q.-H., La, V.-P., & Nguyen, M.-H. (2023). Serendipity and inherent non-linear thinking can help address the climate and environmental conundrums. *Qeios*. https://doi.org/10.32388/ULP2R8

Vuong, Q.-H., Le, T.-T., La, V.-P., Nguyen, T. T. H., Ho, M.-T., Khuc, Q., & Nguyen, M.-H. (2022). Covid-19 vaccines production and societal immunization under the serendipity-mindsponge-3D knowledge management theory and conceptual framework. *Humanities and Social Sciences Communications*, *9*, 22. https://doi.org/10.1057/s41599-022-01034-6

Vuong, Q.-H., & Napier, N. K. (2015). Acculturation and global mindsponge: An emerging market perspective. *International Journal of Intercultural Relations*, *49*, 354-367. https://doi.org/10.1016/j.ijintrel.2015.06.003

Vuong, Q.-H., Nguyen, M.-H., & La, V.-P. (2022). *The mindsponge and BMF analytics for innovative thinking in social sciences and humanities*. Walter de Gruyter GmbH. https://www.amazon.com/dp/B0C4ZK3M74/

Vuong, Q. H., & Napier, N. K. (2014). Making creativity: the value of multiple filters in the innovation process. *International Journal of Transitions and Innovation Systems*, *3*(4), 294-327. https://doi.org/10.1504/ijtis.2014.068306