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The important and complementary natures of memory and making connections

The Magic Eyes® of innovation: The role of memory

Magic Eyes® images can illustrate how memory can facilitate or impede breakthrough innovation

One of my favorite Alfred Hitchcock movies is "The 39 Steps," a 1935 spy thriller, based on the 1915 John Buchan novel of the same name, that takes the audience on a cross country chase from London to Scotland and back. While only briefly appearing, one of the key characters is Mr. Memory, a London music hall performer portrayed by Wylie Watson and depicted in the photo at the top of this page. As we learn with protagonist Richard Hannay only in the final scene,[i] Mr. Memory is the vehicle used to smuggle vital military secrets out of the country; in spite of their overwhelming intricacy, with skill he memorizes them down to the last detail.

The role of memory in breakthrough innovation

Ok, so I think it's a great movie, but what does this have to do with breakthrough innovation? In this essay, I summarize four ways in which memory plays a critical role in breakthrough innovation. I also show how the Magic Eye® metaphor enables a comprehensive, yet simple way of illustrating each, further demonstrating the power of this single metaphor to describe what occurs in breakthrough innovation.

Let's begin by looking at two ways in which a strong memory can stunt innovation and then turn our attention to two ways in which it can facilitate it.

1. Photographic memory of details without skill at making connections

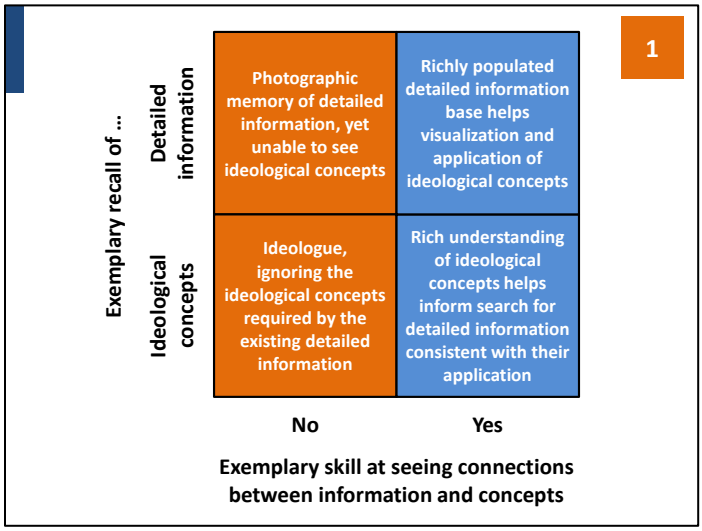
Considering the opening of this essay, what better way to start than with the Mr. Memory-types of the world – those possessing a remarkable photographic memory of detailed information, yet unable to readily see the larger concepts, the broad patterns and trends? This situation is depicted in the upper left quadrant of the 2X2 matrix of Figure 1. Without skill at making connections, encyclopedic or spelling bee recollection of facts in and of itself is neither an aide nor an impediment to personal innovation skill. While upon first impression it might appear that they possess innovation potential, these individuals don't rise above potential on their own. However, working pairwise with a Serial Innovator (SI) close colleague possessing connection-making skill, Mr. Memory-types can contribute by recognizing and filling in blanks for the SI. Some might extrapolate this further to the Mr. Memory-types playing an important role in teams. While this is not the best time to go into detail, I will just say that I harbor concerns about the emphasis placed on teams as the "solution" to innovation – perhaps more in a later essay.

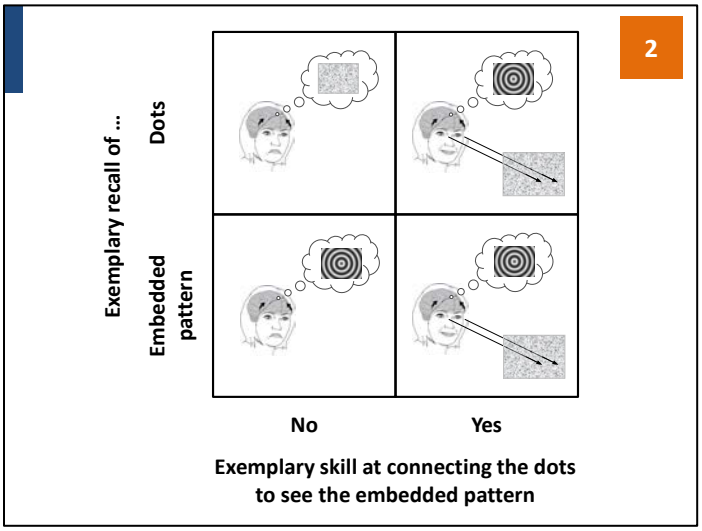
This situation is illustrated within the Magic Eye® metaphor in the upper left quadrant of the matrix of Figure 2. I've chosen to depict this by including the dots in the individual's mind's eye. While I will adjust this a bit when we discuss the situation found in the upper right quadrant, I believe that this depiction is representative of the situation. Even in the absence of external dots this person carries a wealth of dots with them.

The Magic Eye® metaphor enables a comprehensive, yet simple way of illustrating the role of memory, further demonstrating its power to describe what occurs in breakthrough innovation.

2. Ideologue without skill at making connections

The world is replete with ideologues, those who ignore the salient patterns demanded by the existing detailed information that they encounter on a daily basis. Ideologues learn and embrace ideological concepts, adhering to them faithfully, reflecting little on when and where they apply. In the world of innovation, this is characterized by those who hold to their preferred problem or solution. Taking care to not disparage any of these – as each has its own appropriate range of applicability – ideologues are observed within the adherents of "the innovator's dilemma", "open innovation", and TRIZ to name a few. Again, applied appropriately, where the situation requires them, each can contribute greatly. Unfortunately, it's the ideological application of such ➢





concepts that must be safeguarded against. Individuals not skilled at making connections can behave as if they have a hammer and the whole world of innovation is a nail. This is the situation depicted in the lower left quadrant of the matrix of Figure 1.

This situation is illustrated within the metaphor in the lower left quadrant of the matrix of Figure 2. Here the individual carries with them a detailed recollection of the embedded 3D pattern, yet does not possess the skill associated with seeing just how that pattern arises from the dots. They can describe the embedded 3D pattern with great nuance in the absence of an RDS. In the extreme, they see the pattern wherever they look, regardless of an RDS, let alone a relevant RDS, being anywhere in sight.

Brainstorming is often prescribed to address such rigidity. However, it is critical to note that brainstorming as a solution can be just as much an ideology as anything else! As I hope you see, I'm not advocating anything other than ensuring that, speaking from within the metaphor, the embedded pattern arises from the existing dots – nothing more or less.

3. Photographic memory of details with skill at making connections

Were we to stop here, things would look pretty bleak for the role of memory in breakthrough innovation. Fortunately, when coupled with great skill at making connections, memory proves to be a powerful asset for an SI.

Let's begin by considering the situation depicted in the upper right quadrant of the matrix of Figure 1. Once again, like Mr. Memory, some have remarkable, almost photographic memory of detail. Among SIs we anecdotally observe that such memory often appears along with their great curiosity. Since SIs also exhibit great skill at making connections, we find them readily visualizing patterns from within their inventory of detailed information. Further, when this inventory is supplemented by still more, newly acquired information, these individuals are quick to recognize even more patterns and trends. That they begin with a richly populated information base makes innovation opportunities more readily available to them than if they did not.[ii]

I've chosen to illustrate this with the Magic Eye® metaphor in the upper right quadrant of the matrix of Figure 2 by starting with an RDS in the viewer's mind's eye, suggesting that the viewer already has access to a fully populated set of dots such as that which would be available to one with a photographic memory. Then, by adding a small number of additional dots – appropriately placed and external to the viewer – new patterns can be readily visualized. Where this illustration becomes a bit suspect from my perspective is that the dots that the viewer carries are not directly added to the RDS, as one would expect if the metaphor is held tightly. Although I'm not yet fully satisfied with how I have depicted this aspect of memory within the metaphor as it applies to breakthrough innovation, I am sufficiently content to share it with you. Be assured that I will give it additional thought over time.

4. Ideologically insightful with skill at making connections

Finally, some people have remarkable recollection of holistic concepts – just like those who never forget a face.[iii] When combined with great skill at seeing connections, this is the situation depicted in the lower right quadrant of the matrix of Figure 1. Due to their exemplary ability to make connections, those who also recall patterns are best able to test their assumptions by exploring the specifics of the actual information that they are working with. Shifting their focal attention between pattern and information, unlike their counterparts in the lower left quadrant, they expertly discern whether an ideology appropriately applies to the situation at hand.

This is illustrated within the Magic Eye® metaphor in the lower right quadrant of the matrix of Figure 2. Here the viewer also is able to test any assumptions regarding the embedded 3D image by working with the available dots. They are secure in the knowledge that the embedded image is there because they are witnesses to its emergence from the dots.

Closing thoughts

While these four examples might have appropriately been shared along with the fifteen presented in the previous essay, I thought it best to work through them separately.

They work well as a stand-alone whole, especially since the two 2X2 matrices capture the various memory-related issues as something of a unified set. In the next essay, we consider one final grouping that works well as a stand-alone whole – the role of mediation. More on that on August 1st. ■

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[i] SPOILER ALERT!

[ii] As I discussed this with colleague and friend, Ray Price, he noted the remarkable memory of his colleague and friend, Chuck House, an SI who was responsible for the creation of the logic analyzer at HP, recognized by *Electronic Design Magazine* in 2002 as one of the fifty most important electronic innovations ever developed. Ray agreed that, in addition to curiosity and the ability to make connections, Chuck's remarkable memory was a critical component of his skill as an SI.

[iii] Note that a remarkable memory of detail is almost inevitably accompanied by a remarkable memory for concepts. Thus, scenarios 3 and 4 should be considered as occurring together.

"On the Epistemology of Innovation: How Breakthrough Innovators Connect the Dots" is a series of brief, occasional essays addressed to executives, managers, and technologists responsible for innovation in industry. Its purpose is to challenge readers to reflect broadly and deeply on the practice of innovation – in particular on how innovators come to know what to do today – in order to succeed commercially in the future. Essays are available without charge at the University of Illinois' digital archive at https://www.ideals.illinois.edu/handle/2142/27667. The discussion group at http://epistemology-of-innovation.com is a place to provide feedback and dialog with the author and others regarding these essays, as well as to register to receive notice of new essays as they are issued.