

# Brain Apps That Support All Project Work in “Hard Squared Science Fiction”

Tom Riley

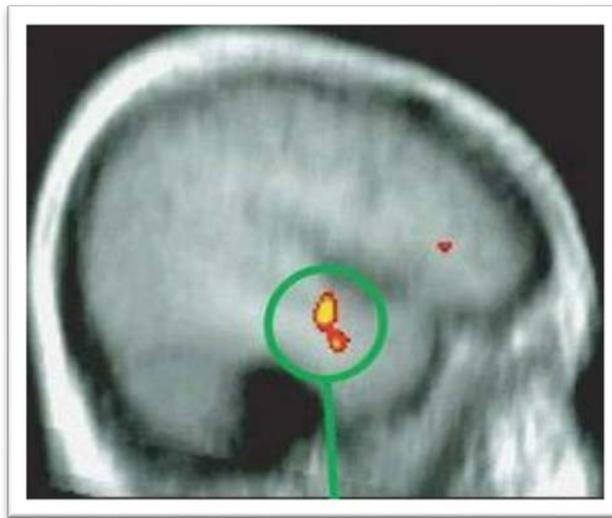
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## 1. Why First <sup>1</sup>

When you want people to work on your project, <sup>2,3</sup> you need to tell them up front why you are doing the project. If you are using unfamiliar tools to invite them to work with you on the project then you need to tell them exactly how these tools work. Here is a discussion, first with an abstract and then with a longer discussion, of some of the 21<sup>st</sup> century tools called Brain Apps that we will be using on our projects, depicting in our stories, and using as the foundation of our game design.

### a. A Short History

When powerful machines that scan the human brain such as the functional Magnetic Resonance Imager (fMRI) first became widely available in the 1990's, we saw enormous progress in our understanding of how the human brain actually works. One area of progress was the identification of specialized bits of our brain tissue that evolved to do very specific functions and do them superbly. It now looks as though there are hundreds of such modules. These are typically the size of a finger nail and look, in the best images, like a wadded up postage stamp.

These brain studies were carried out under the general description “Modular Brain Theory”, but we can now propose a more 21<sup>st</sup> century “Brain Apps” when referring specifically to them. The name Brain Apps stresses the practical similarity between the brain modules and the applications on your iPhone.

## 2. Memes and Brain Apps

A brain module is an actual piece of brain tissue that has evolved to perform a specific, identifiable purpose. Brain modules are subject only to the slow, normal processes of biological evolution. In contrast, a Meme <sup>4,5</sup> is “an idea, behavior, or style that spreads from person to person within a culture.” Memes carry cultural ideas, symbols or practices. Wearing a baseball cap backward is a Meme. Memes can spread like an epidemic and are subject to a separate form of evolution that can be very fast.

These new tools, our Brain Apps, combine brain modules and Memes. This pairing is comparable to the display system on a personal computer. The computer contains dedicated hardware to make displays large, multi-colored, and fast. The operating system also contains software modules that utilize this hardware and produce the data format needed for a standard monitor.

We necessarily are required to take the brain modules more or less as we find them, but we can intentionally design memes to run on them that help us address the major problems of the 21<sup>st</sup> century.

## 3. Characteristics of a Brain App

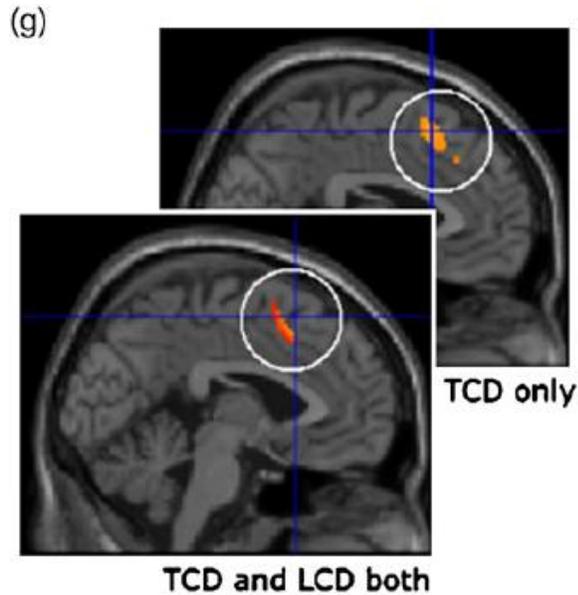
Only a few of the proposed Brain Apps below run on brain modules currently traced to specific pieces of brain tissue (like Eureka <sup>6,7,8,9</sup>). Others are more likely networks of connections (like Frames of Reference <sup>16</sup>) but function in a similar way. I am including in my list a selection of Brain Apps that I feel have practical applications to project work and that meet the following specific criteria:

1. **Universality** – these modules are common to the brains of all modern Homo sapiens.
2. **Identifiable evolutionary value** – these modules support a reasonable theory on what value the particular module had for our ancestors that consequently supported the module’s evolution. For example, Buy-in supports life in a village.
3. **Knowledge insensitivity** – it doesn’t matter if you know what a module is or how it works: the modules keep right on working regardless.
4. **Practical use** – having knowledge of one of these brain modules lets you intentionally put it to use.
5. **Strengthen with use** – Although we cannot modify these modules, like muscle tissue, neural structures will strengthen with use and will atrophy if not used.

Welcome to the 21<sup>st</sup> century.

## 4. Brain Apps for Project Work

A significant number of Brain Apps are available for your 21<sup>st</sup> century project work.



Graphic 02: fMRI of Eureka in action

### Abstracts:

1. **Eureka**<sup>6, 7, 8, 9</sup> – If you solve a puzzle, you get a fast feel-good feeling. This feeling is generated by a specific bit of brain tissue that can now be identified with a functional Magnetic Resonance Imager (fMRI) (see above). Eureka is one of the great drivers for technical innovation and is now understood well enough for practical application.
2. **Buy-In** – Buy-in is a mental process in which a person hears about a project, envisions themselves succeeding with the project, gets into action on the project, and stays in action on the project. It is a defining concept for all project work done by human beings, particularly for major technical projects. The long-form below provides background, detailed steps for generating buy-in, and references.
3. **Flow**<sup>11, 12, 13</sup> – Flow is the state of mind in which a person pays rapt attention to one activity to the exclusion of everything else, even hunger and the need for sleep. Originally studied in writing fiction, where words were described as flowing like a river, Flow has now been studied in a wide range of human endeavors, including all the arts and sciences. It is a big favorite among technical people.
4. **Mindfulness**<sup>14, 15</sup> – Mindfulness is the mental state in which a person concentrates on the activities of the body, for example on their breathing. It has been developed from Buddhist meditation practices and can reduce stress and improve performance. Mindfulness is a counter-balance to Flow; they are mutually supportive.
5. **Social Contact** -- Human beings are social animals<sup>16</sup>. We need to design social contact into our project.

6. **Frames of Reference**<sup>16</sup> – The universe is too complex for its entirety to be examined by a human at any one time. We therefore build several subsets of the universe that are greatly simplified models which we can deal with one at a time.

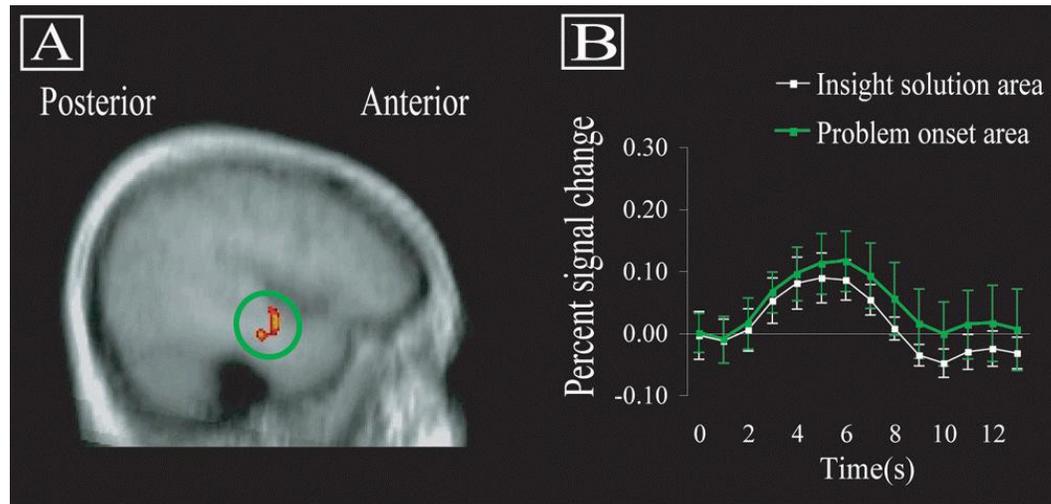
We begin our day-to-day operations under one of these models, or Frames, but can switch to another Frame in a fraction of a second when necessary.

Think of yourself as an individual work who has children. You would have a Frame for being a good worker and another Frame for being a parent. A common occurrence is to be working using your Good Worker Frame and then get a phone call about your child. This then requires that you switch to the Parent Frame quickly. This you can do, but there is a fraction of a second of confusion as your brain shifts Frames. This particular shift is common – and from all evidence memorable. When you are alerted to the problem, the fraction of a second of confusion during the shift is so upsetting that you naturally remember it.

The recent 16 day partial shutdown of the federal government would not have occurred without the invention, elaboration, and intentional use of the Tea Party Frame.

7. **“No listening for”** – The human brain has distinct short-term and long-term memories. For information to be recoverable after a new distraction, the new information must have already been transferred from short-term to long-term memory. Long-term memory is heavily dependent on the association of new information with existing information. If the new information is so out-of-box that there is no obvious information already in long-term memory to associate with it, then the new information will not transfer well to long-term memory. This is a major problem in presenting innovative ideas and so has been given this rather odd name.
  8. **To Be Determined (TBD)** – This list is by no means complete.
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## Long Form Discussions:



### 1. Eureka <sup>6, 7, 8, 9</sup> –

If you solve a puzzle, you get an immediate, valedictory feeling. This feeling is generated by a specific bit of brain tissue that can now be identified with a functional Magnetic Resonance Imager (fMRI). Eureka is one of the great drivers of technical innovation. When applied, the Eureka process can be seen as having three distinct parts, each entailing a quite different state of mind:

1. **Considering the Problem** — In this mental state the person is researching the problem and trying out many ideas. Action has little focus but can be quite intense.
2. **Eureka insight** – After the accumulation of information a sudden insight can occur, but is by no means guaranteed. This phase may require taking a break, such as a walk, or even sleeping on it overnight. The Eureka insight is often compelling, joyful, and rewarding.
3. **Focused Action** – The person gets into action on the idea with focus and determination. Eureka insights typically support both Flow and Buy-in.

To intentionally use Eureka in your project you need to facilitate each of these phases.

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### 2. Buy-In –

Human beings regularly take on and complete big projects that require the dedicated efforts of large numbers of people often over years. Having this capability, which is not displayed in the wild by any other primate, has provided a major evolutionary advantage to modern homo sapiens. Only a small number of other species (ants, bees, etc.) show this trait but those that do are surprisingly successful.

People have a long history of doing big projects, but how exactly can we intentionally make this happen?

## Who we are:

Human beings are project people. We can start work on a project in one meeting and keep working on it for a decade. Technical people have an intuitive, gut understanding of this process and call it buy-in. Once understood, it becomes clear that buy-in is an enabling principle of all project work, from the building of the pyramids, through the Gothic cathedrals, to Apollo to the moon.

## The Buy-in Process:

Under buy-in:

- We hear about a new project.
- We envision ourselves succeeding with the project.
- We get into action on the project.
- We stay in action on the project.

President John F. Kennedy's "We choose to go to the Moon" speech is one of the strongest examples of buy-in from the 20th century. We listened, we envisioned success as a nation, we got into action, we went to the Moon.

Most technical people can think of examples during their lives in which they bought into a project and worked on it for a very long time. Buy-in is particularly effective in moving us from a state of inaction, like cynicism, to a state of great energy and effective action.

Self-induced buy-in is also very common, particularly among technical people. We think up a new idea and then we proceed through the key steps below by ourselves.

If you are a doer of projects, such as building an electronic games, the following explanation of buy-in generation should be easy for you to relate to from your personal experience. While reading it, think back to the start of your best project. How did you get roped into it? What vision of success kept you going through hard periods? How did being in action on the project make you feel?

## Key Steps:

The skill of effectively generating buy-in is now made much easier by the availability of a step-by-step process, a formal, teachable version of buy-in. Here are the specific steps in the process for inviting people to buy into your idea, as the steps might occur at a project kickoff meeting:

1. **Paying attention** -- When people arrive at a presentation, they are often distracted by things that happened to them just getting there: the traffic is horrible; the weather is worse, here is my excuse for being late. None of this is really important but we do need to get it out of the way. The best way to do this is through language. Get people to talk among themselves before the presentation starts. Work the crowd a little. Do not bother to take notes on what is said; just get them to say anything about whatever is in the way. It doesn't have to make much sense. Like excuses, once spoken the distractive stuff will fade into the background.

2. **My why** – Tell the audience why you are involved in this work. Keep it short. If they identify with your personal why they are much more likely to listen.
3. **This is important to you** -- Get the audience to start thinking about how your idea could make them successful in their lives. This starts the Vision of Success process. Be sure they see the presentation as unusual enough to be interesting, but not so unusual as to be dangerous. In this process, connect personally with the audience. Often a comment on your personal commitment will help. Make sure they know that you are inviting them to contribute to the project and become part of it. State that you are inviting them to join in such a way that they will not hear the presentation as a hard sell.
4. **Present the idea** -- Here you can use any form of media that the audience will find interesting. These days everything is flashy pictures, which is okay, but they won't do your job for you. The presentation must be inspiring and show your personal commitment. Here is where the skill of being a presenter and, to some extent the skill of generating inspiration, come to the fore. They are crafts to be learned and practiced.

Examples of how the idea has affected your personal life are usually accepted as important human-to-human communications, but they must be sincere. Over-rehearsed testimonials will put an audience off. Canned jokes and cynical quips can definitely break the development of the idea. If you sound like a TV pitchman or a preacher, then you will be heard as such. The presentation must have content. It must have information of real value to the audience. Whiz-bang and flash are not enough. Lack of real content was one of the major problems in the dot-com bubble boom and bust. In that boom, technical people demonstrated simultaneously that you can build Visions of Success on pure whiz-bang and that a boom built on this foundation of sand will not last.

The presentation must have integrity. Human beings have a specific brain module for spotting phonies. This module is hardwired to an anxiety center. Done poorly, a formal buy-in presentation comes across as a hidden hard sell, and will thus greatly upset people. Most of our integrity problems in come from saying one thing and doing another. It is very important to be up front about what you are doing and to hide nothing. Early on, you need to find a good way to say that you are intentionally trying to get people into action on the proposed, exceptional idea.

5. **Invitation to Buy-in** -- Don't use fancy graphics here. You can leave something on the screen, but it must not be too engrossing, and it certainly must not be flashing or moving. The next step must be done in language only. It can be written in text, but it is most often spoken. You must assist the people of the audience in envisioning themselves succeeding with your idea. You should then see at least a few eyes light up. Make it perfectly clear that it is completely all right if they choose not to buy into your idea, but invite them to do so just the same. They must have free choice or they will later angrily reject the idea.
6. **Opportunity for language** -- Give everyone in the audience a chance to be moved to language. This usually means at least some time for questions and answers. But if the audience is large, you may need to get them talking among themselves for five minutes or send them to dinner in groups. With young people, the response could be as simple as the word "cool."

7. **Short-term actions** -- Make sure that there is some opportunity for short-term action, something they can do this week without committing to changing their lives. Reference lists to take home and Web sites to surf are great here. It is not necessary that they be able to contact you personally, but a contact possibility with an appropriate organization or discussion group will be most helpful. If they have bought in, they need to have a clear next step to take.
8. **Long-term action** -- Make doubly sure there is an opportunity for long-term action available. They need to know how they can make a real contribution to the project. These are the actions that get the job done.
9. **Vision of Success in memory** – As the project progresses, you should suggest that they recall their vision of success from time to time. This can take the form of describing your personal practices in this area.

### **Expectation of success:**

Do not expect this process to be 100% successful. A 5% improvement in buy-in over having no presentation plan and just prattling on is great. The results compound like interest. The key to our success is to get each interested listener to develop a positive personal vision of success that will keep them in action.

### **Brain App:**

The key insight is that buy-in is a phenomenon of the human brain that defines a path from the language centers which hold a word description of an image of success, to the visual centers where it is envisioned, and on to emotional center which accept commitment to the image. This path is not currently as well documented as some brain modules (such as Eureka) but it is known to be closely tied to Visual/Conceptual Thinking as is Flow.

As in all Brain Apps, it makes little difference whether a person understands the process or not: the process works just the same. Feel free to tell people exactly what you are doing.

### **Application:**

Versions of buy-in have a long history of use in self-help <sup>6</sup>, business, gaming, and military recruitment. The same concept has a number of names in different industries such as buy-in, enrollment, and recruitment. Much of our understanding of buy-in is currently treated as “confidential” by various organizations and is often difficult to reference without attending paid courses.

### **Value in Game Design:**

The success or failure of nearly everything we do in all project work is tied to how well we can generate buy-in for our ideas. This is particularly important for high-level ideas like electronic games. If our game’s top-level design visions for our game are visions of success for your development team then your people will get into action, and more importantly, stay in action.

It is doubly important that we generate buy-in among our players. Players who have bought into a game are loyal players.

The buy-in process can provide the resources needed for us to move forward with a game project and then build the player loyalty needed to make it a big success.

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### 3. Flow <sup>11, 12, 13</sup> –

Human beings do things for many reasons. If you want to get people to work on your project or to play your game you must understand those reasons. To be in the Flow state of mind is one of the most rewarding of life experiences. Flow gets people into action; Flow keeps people in action.

#### **Definition:**

Flow is the state of mind in which a human being pays such rapt attention to one effort that the person is oblivious to everything else. You forget the passage of time; you ignore hunger and thirst; you put off sleep; you are one with the effort.

Flow is a particularly enjoyable mental state. People love to be in flow. Flow is such a fulfilling state of mind that time spent in Flow is a major reward for all technical work and game playing. Flow often out competes immediate financial reward in motivating people.

The Flow state of mind can be recognized with instruments and was one of the first states that was studied in detail by modern neuroscience. The interaction of the various modules within the human brain has a recognizable pattern in Flow and these patterns include a pleasure center.

Flow was named in early studies of creative writing where the participants described it a flow of words like a river. This study has now been extended to most areas of human endeavor.

Flow is most often achieved in one-person activities such as computer programming, but can be done as a team effort. In sports, team Flow is often called being “in the zone”.

#### **Importance in Gamification:**

This mental state has been used heavily in software development from the very beginning of the field and has now been extended to all design tasks. In fact, there is no branch of human endeavor in which somebody does not Flow.

Work done under Flow can be excellent, which is not true of some other mental states. People do very good work under Flow and do a lot of it. Most technical people Flow and love it. Specifically in Gamification, flow is critical to:

- Great software development
- Detailing a design

- Developing loyal players

#### 4. Mindfulness<sup>14, 15</sup> –

Mindfulness is the state of mind in which a person concentrates on the state of their body, such as for example, on their breathing. It has been developed from Buddhist meditation practice and can reduce stress and improve performance. Mindfulness is a counterbalance to Flow; they are mutually supportive.

(A more detailed explanation is needed.)

#### 5. Social contact --

Human beings are social animals<sup>16</sup>. We need to design social contact into our project.

Even taken together, Flow and Mindfulness do not support a complete and well-balanced human personality. Additional interpersonal human contact is needed that cannot be provided by electronic media alone. It will therefore be necessary to organize local project meetings that let participants support each other's actions at a reasonable cost.

If our project aids us in spending long periods of time in Flow, we need to balance this with time in Mindfulness and in parts of the project where you meet real people. These three elements form a triad in which balance is needed.

#### Balancing Physicality in a Game:

In a major game meme, we will need to include the concept of wellness by providing balancing activities so that they support the wellbeing of the player. Physical activity will certainly be needed in the mix. If many of our Mind Opps are used to excess, such as too many hours in Flow (think TV, "Big Bang Theory"), then adverse medical and social effects can occur. Fortunately, all the Mind Apps present so far can be balanced into a mentally and physically healthy mix. We will need to design Memes that generate such a balance.

(A more detailed explanation is needed.)

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#### 6. Frames of Reference<sup>17</sup> –

Frames of Reference is another one of these structures in the human brain that we all have (like Flow, Eureka, and Buy-in) that are formally called Modular Brain Theory, but that we are now calling Brain Apps. The explanation is simple and most people can identify this affect in their own lives.

Briefly, the universe is too complex for humans to hold the complete actuality in their heads at one time. Thus, we build several subsets of the universe that are greatly simplified models. We do our day-to-day operations under one of these models, or Frames, but can switch to another Frame in a fraction of a second when necessary.

### Example:

For example, think of yourself as a worker and who has children. You would have a Frame for being a good worker and another Frame for being a good parent. A common occurrence is to be working using your Good Worker Frame and get a phone call about your child. This requires that you switch to the Parent Frame quickly. You can do this but there is a moment of confusion as your brain shifts Frames. This particular shift is common and memorable. When you are informed of a problem with your child, the fraction of a second of confusion during the shift is so upsetting that you tend to remember it.

Frames are extremely common in our lives. Religions are Frames. Political ideologies are Frames. Professions are Frames. Parenting is a Frame. Hobbies are Frames. The Scientific Method is a Frame. From a sustainability standpoint, Frames can be very helpful. Much out-of-box thinking is really out-of-frame thinking. A concept taken from the Parent Frame can be critical in the Ecologically Ethical Frame if you make your project be your baby.

### History and the Government Shutdown:

Frames were originally developed by the political left<sup>9</sup> but have been used most successfully by the political right. President Ronald Reagan is known as a great communicator but it is more insightful to understand him as a brilliant Framer. His “Welfare Queen” story was an absolutely brilliant example of a Frame element. He was critical in laying the foundation for the powerful extreme right or Tea Party Frame, which shut down much of the Federal government recently.

The problem is that arguments and logic that work well within a strongly defined Frame, such as the Tea Party, often fail when moved between Frames. The Tea Party Frame’s arguments for risking default of the Federal government make excellent sense within that frame but are baffling outside of it. The problem is not that these people are stupid but rather they are using arguments compelling within their model of the universe but destructive in larger views. This particular frame also has a number of features that make it problematic for the majority of people:

1. **The Past is the Future** – The Tea party Frame is strongly committed to the key to the future being the past.
2. **Cherry Pick Science** – It recognizes only science that supports it and is tirelessly enthusiastic about defunding work that runs against its tenets (like global warming).
3. **No Logic** – It does not value logical argument; slogans are preferred.
4. **Left-handed support from big corporations** – The Tea Part Frame is well funded by special interests and supports many actions favored by those funders (such as no regulation)

This problem is currently locked in by the users of this particular Frame refusing to recognize the value of other Frames, or even that Frames exist as a concept. This makes reaching compromise impossible.

### Diversity of Frames:

The Frame problem occurs regularly in building teams and alliances. If all members of the team use exactly the same Frames they cannot understand the values of people using other frames and they cannot come up with out-of-Frame ideas. If the most powerful members of the team insist that their

primary Frame (be it business, or political, or religious) is the one and true way of thinking, they will not value any out-of-frame people or ideas at all. Frame freezing is thus a newly understood form of frozen thinking.

Working from the idea that everybody has Frames and everybody is capable of switching between them in a fraction of a second, opens up a multitude of new ideas and actions. Once you understand Frames, you can both intentionally switch Frames and recognize the precise moment when the switch occurs. For example, if your project is your new baby, then you can intentionally switch your head to your Parent Frame and see what actions you are compelled to take for your project.

### **Projects:**

Large complex projects can be Frames in themselves. Such projects use a Frame to generate dedicated action and commitment from the workforce.

Large technical products and companies can be Frames too: there is an Apple Frame. If an e-game becomes a Frame it will quickly grow to be notably powerful and valuable.

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### **7. “Not listening for” –**

The human brain has distinct short-term and long-term memories. For information to be recoverable after your next distraction, the new information must have already been transferred from short-term to long-term memory. Long-term memory is heavily dependent on the association of new information with existing information. If the new information is so out-of-box that there is no obvious information already in long-term memory to associate it with, the new information will not transfer well to long-term memory. This is a major problem in presenting innovative ideas and so has been given this odd name.

If our project relies on a lot of information that is unfamiliar to most of our customer base, then we must put out the energy to explain the new information and relate it to information that they already know. The use of short stories to illustrate our new ideas is just such an effort.

(A more detailed explanation is needed.)

### **8. TBD –**

(Add more Brain Apps here)

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