

Meaning Density and Other Attributes of Deep Engagement

Mathew Laibowitz
MIT Media Lab
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1 Introduction

As human beings we strive to be engaged. We seem to have an inherent ability to recognize those experiences which engaged us deeply and are, in fact, sometimes defined by that which we find deeply engaging. However fundamental this concept is to our nature, it is seemingly quite difficult to assess or quantify engagement in such a way that allows us to design it into our products. It is further complicated by being an internal and personal creation of our interactions integrating with our tastes and history, and is therefore difficult to observe.

This paper will examine research and philosophies in related disciplines in order to identify potential attributes present in deeply engaging experiences. Where possible, it will indicate if the attribute is observable on its own, and by what method. After discussing a few such attributes, an interactive event will be examined for presence of these attributes, and an overall assessment of the relevance of these attributes to the level of engagement of the event. The method used to measure these attributes and thereby engagement in this case study, can then be examined for its effectiveness. Lastly, we will look at what is entailed in designing for deep engagement and therefore better be able to create appealing and lasting experiences.

2 Attributes of Engagement

2.1 Duration

We often describe experiences based on their apparent duration, such as the feeling of an event flying by or taking seemingly for ever. The relationship of this apparent duration to the actual, measurable duration may be an indicator of the level of engagement achieved by the experience.

We are in agreement that when people evaluate experiences retrospectively, they do not play back the equivalent of a movie but instead tend to recall specific salient features of the experience--- for example, the peak (or trough), ending value, and slope. We also agree---although none of us has discussed it previously in print-- that for many experiences, the most important feature may be the aspects of the experience that gave it meaning; (Ariely, Kahneman, Lowenstein, 2000)

We can thus infer that the apparent duration is related to the value (quality and quantity) of specific aspects that gave the experience meaning with respect to the overall measurable duration of the engagement. From this inference, we can coin the term “meaning density” which can denote the ratio of meaningful content to the overall amount of time spent and site this as a potential attribute related to deep engagement.

It is also important to examine the longevity of the effects of a participant’s involvement in an experience. In other words, how long the experience stays with the participants after its completion, how long it influences perception, and how many related experiences are sought after as a result of the level of engagement from this interaction. Longevity can be witnessed in a desire by a participant to analyze the experience, communicate and promote the experience, and draw inspiration from the event. The formation of a community around an experience usually denotes a desire to prolong the experience itself. This longevity metric can be an indication of the level of meaning density of the originating event and therefore a potential method for measuring engagement in retrospect.

This lasting effect can be observed in the form of what is learn from an event. In fact, educators attempt to teach in such a way that their teachings can be taken away from the lesson and applied by the student in their own way. Attempts to teach in this fashion can be likened to attempts to be engaging in the lesson. (Papert, 1981) This engagement creates ideas that last, generate analysis and communication, and build into inspiration for new and engaging experiences.

2.2 Emotional Response

When we first think of what engages us, we often think of emotions. History is loaded with examples of emotions taking over and becoming all-encompassing and we have all experienced being blinded by our own emotions at some time. This immersive quality of emotions serves as a reminder of how powerful they are, and how when evoked they can bring about a strong state of deep engagement.

Marvin Minsky in his forthcoming book “The Emotion Machine” theorizes that emotions are what remain when you disconnect the parts of your brain that perform reasoned analysis. (Minsky, 2004) This would seem to indicate that we have less processes in-between us and the experience when we are in a state of emotional response; as a result, we become closer to the experience and more immersed. Furthermore, by removing the layer of abstraction that is reason, we become even more susceptible to

emotional response, and it becomes a positive feedback situation. An example of an emotional feedback situation is that of depression. As a person starts to feel more and more negativity, they begin to fall into a cycle of depression in which they start to view more and more formerly positive things with a negative spin, pushing them deeper into depression. Depression is often described as deep disengagement; however, this definition is solely a social view. Depression can also be seen as a deep engagement with the negative aspects of experience, and it is most certain that the original cause of the cycle of depression is never let go of. Depression is all consuming, and is an example that deep engagement is not limited to happy emotions.

The concept of fun also fits the above theory of emotion. What makes fun unique is that it can coexist with reason. We can see a fun experience as a safe experience, one that will not cause us emotional distress. We could be drawn to and engaged with fun as a basic survival instinct. This brings to light the point of deep engagement as opposed to shallow engagement. Engagement from fun because it is safe, is instinctually and therefore not necessarily deep. For fun to be deeply engaging, it has to engage beyond a physical level in order to start the above mentioned feedback cycle of emotional engagement.

There is an increasing research effort to figure out methods to measure emotional response. One such project is the Galvactivator, (Picard, 2001) which attempts to measure emotional arousal through skin conductivity. Besides being able to use this information as quality control on designs intended to evoke an emotional response, these systems can provide real-time feedback information to help an experience adapt to better enable the emotional feedback cycle that leads to deep engagement.

2.3 Personal and Exclusive

Another fundamental property of human nature is the desire to justify ourselves and our own individuality. (Freud, 1921) We seek interactions that are personal or that we possess some special ability to comprehend ultimately leading to a feeling of uniqueness. A personal connection with an experience creates a more open channel for the evocation of emotion as discussed in the previous section.

Furthermore, this relationship creates a feeling of exclusivity, as if you are the only person who could have experienced this in this way. This generates engagement through a subconscious feeling of superiority and a justification of one's abilities.

Researchers have attempted to use this idea to design more engaging experiences by making them more personal and having them interact with the participant based on as much exclusive data that they have available. (Maes, 1994). These systems have been called smart agents and have been popularized by companies such as Netflix and Amazon. The idea behind these agents is to create entities that can be considered a companion that works with you and knows as much about you as it possible can. The theory is that this interaction will be more humanlike and thereby more productive (engaging).

Opponents to agents claim the opposite, that agents actually create a less engaging interaction. The claim is that by making interactive systems more human, we make ourselves more like machines. (Lanier, 1995) Even if the agent is completely correct and

the interaction is more productive as a result, one might argue that since the system can identify and predict the human's behavior, the human is left feeling predictable and the exclusivity of the interaction, regardless of how unique the interaction is, is reduced due to the apparent ease in which the system understood their personality.

An interesting case example is the example of advertising and marketing. The goal of advertising is to invoke a personal reaction in the widest possible range of viewers. By definition, if something strikes a chord with the masses it is not personal and exclusive. But the goal of marketing is not to be deeply engaging, just engaging enough to seed the thought. It also identifies the art of advertising which requires careful weighing of the tradeoff between personality and mass appeal.

2.4 Phenomenology

Phenomenology is the philosophy of bringing experience to the forefront, in the broadest sense placing value only on that which can be personally observed with the senses and analyzed for one's self without any layers of abstraction. In other words, it is about "being there". (Heidegger, 1962) The level of how involved (being there) a person is with the experience can be quite important to how engaged they are. This relationship is almost inherent in the definitions of engagement and phenomenology.

A concept that stems from phenomenology is the concept of hidden processes and proxies. It may affect the level of engagement if the processes that drive an experience are hidden from the interaction with the participants. The agents described in the previous section are based around such hidden processes. Similarly, video games exist as a layer of abstraction between our actions and some related responses. While it may be possible to argue that agents are not deeply engaging, it is much harder, if even possible, to argue that there does not exist a deeply engaging video game.

While it is shown that the presence of this hidden layer of processes does not denote the absence of deep engagement, in fact in the case of video games it might be what makes them engaging, it may be the presence of layers in our day to day life that makes the positive case of completely sensorial experiences so deeply engaging. We possess the ability to witness and sense and experience the activities of the world around us, as well as the intellect to understand and appreciate these systems. However, we prostheticise these abilities with technology and other proxies, which in general add to our comfort and potential, but also can add dormancy to our innate desire to interact directly with the world. It is the freedom from this dormancy that makes tangible interactions so deeply engaging. The case study analyzed below in Section 3 is an event that takes types of interactions normally abstracted by games and implants them into the real world for direct interaction.

There is a theory of robotics called the Uncanny Valley Theory. It states that as we increase a robot's anthropomorphism from not very human to indistinguishable from a human emotional response to that robot from a human will increase except for a spot where the robot is almost human where negative emotional response can be observed. (Mori 1978) This can be related to the above argument by considering the level of anthropomorphism as the depth to which the machine-like processes performed by the robot are hidden by the human mannerism. If the robot is very machine like, humans will

interact with it as if it were an object, directly. It is the zone where it appears human, obscuring the direct interaction with the machine processes, that gets rejected. At some point, it no longer seems to have hidden processes and can be interacted with directly, albeit at a different level and in a way that you would interact with another human. This is an important point when designing for an engagement; the proxy-level of the interaction is critical.

2.5 General Purpose versus Specialized Interface

Researchers are continually debating whether it makes more sense to design an interface as a general purpose interface that can be easily adapted to perform many functions by the end user or middle-road designer, or to design expert interfaces that perform specific tasks to the utmost of ability. (Ishii, Ullner 1997) While there are economic issues with this debate since you may not have the resources to equip yourself with an expert interface for every task, requiring you to use a general purpose tool for many tasks, the interesting question with regards to deep engagement is where the creative emphasis winds up.

If we consider the experiences that are the most deeply engaging to be the ones that we have substantial creative input, we have to identify how open the interaction is for this input from the end-user. The designer of the experience has to be careful not to overly script it, leading to a closed system that does not involve the audience in a creative way. This identifies another potential attribute for deeply engaging experience which we can call openness, and it is the metric of how much creative control the end user has over the interactive experience.

2.6 Comfort/Mastery versus Novelty

Mihalyi Csikszentmihalyi theorizes that we only achieve a state of flow, akin to a state of deep engagement, when our skill level and the challenge level of the experience are in unison. In other words, if it is too difficult we get frustrated and if it is too easy we get bored. (Csikszentmihalyi 1975)

This attribute, relative difficulty, can be observed from the artifacts of the experience, such as performance data. Since skill levels vary from person to person it is difficult to design an experience with the correct level of relative challenge without having it adapt once it determines the skill of the player. This may indicate why video games are so engaging; they have software that adapts to the players ability or, at the very least, lets the player select a level of difficulty.

While it may be quite engaging to have mastered something and be repeatedly exercising this mastery, it is probably not that deep. This type of interaction can be described in the shallowest of terms, such as relaxing and comfortable, and does not have longevity of thought or invoke an emotional feedback sequence.

2.7 Motivation and Reward

A person might arrive at a state of engagement in order to reach a particular goal. An example of this is the drive to conquer a mountain pushing you through miserable conditions. Another example is the drive to be fit keeping you engaged with your exercise routine.

It can be argued, however, that this is not deep engagement unless the motivation for a reward acts simply as a catalyst for some other reasons to be deeply engaged. The reward is a result of the experience, not a component; therefore involvement with it does not indicate involvement or engagement with the actual experience.

Motivation can also be seen as a basic desire to do well or to even to simply be engaged. These types of motivation are usually evident with a build up prior to the event that can ultimately add to the enjoyment of the event, or at least starting a pure, enjoyable section of the experience ahead of schedule. This motivation can also help open you up to better receive the experience and better start the aforementioned emotional response feedback cycle. In this case the cycle is started from the participant's side instead of triggered by the experience.

3 Case Study

3.1 Midnight Madness

The case selected for analysis is a multiplayer "hunt" style game played in New York City each summer. The general idea of the game is that teams follow trails of clues embedded into the urban environment in order to reach a secret finish line first. The game usually attracts around 200 players comprising 20 teams and generally takes around 12 hours to complete. Players often return from year-to-year bringing with them more interested players and the general excitement surrounding the game grows each year.

This game, named Midnight Madness after a 1980 film by the same name was selected as a case study for several reasons. The first reason is that it appears that it is an engaging event because of the continual and returning interested and excitement surrounding the game each year, so we can begin to examine it based on our above outlined attributes to try and discern why and how it is so engaging. It also is an event that takes some elements from video games and similar abstracted activities and combines them with real-world tangible situations into something new. Thus we can examine it with respect to the phenomenological ideas presented above. The game contains many sub-elements, some of which were probably more engaging than others. A detailed log of the time spent on each of the sub-elements is available for duration based analysis and comparisons. A similar log of the entire game can be used additionally to judge a team's overall skill level. The final reason that this game makes a good case study is that access to the community of players is still available for questioning.

Above in section 2 we have highlighted the following attributes as potentially indicative of a deeply engaging experience: meaning density (overall duration versus duration/strength of meaningful content), longevity (how long the effects of the experience remain with the participants), causing an emotional response, personal and

exclusive, phenomenological, creative input from participants, relative challenge level, and the level and type of motivation of the participants. In order to try and extract information about the presence of these attributes, the following questions were posed to the participants:

#Is the amount of time spent playing the game appropriate?

#If so, is the length and effort required of the game part of what makes it compelling?

#Which puzzle took the longest? Why? Which puzzle did you find the most challenging? Why?

#Which puzzle did you find the least challenging? Why?

#Were you often frustrated?

#Did the fact that many other teams were likely frustrated as well make it more enjoyable to be frustrated?

#Did the fact that when you were stuck on a game element you were in the city at unique locations with a group of friends make it more enjoyable to be frustrated?

#How did the frustrating moments of Midnight Madness compare with other moments of frustration in your day-to-day life?

#Do you want to play again next year?

#Did you find yourself thinking about Midnight Madness for quite some time after the game was over? How long?

#Are you already trying to get a team together for next year?

#Do you still tell people who did not play about your experiences during Midnight Madness?

#Do you find yourself relating seemingly unrelated experiences in your day-to-day life to that of experiences during Midnight Madness?

#Did you learn anything new from your experiences playing Midnight Madness? What?

#Do you often come up with ideas for clues of your own?

#Does Midnight Madness generate a desire to create interesting experiences for other people?

#Briefly mention any emotional responses you had with respect to the game as a whole, the other teams, your own team, the city itself, and/or the duration of the experience.

#How scripted do you find Midnight Madness? In other words, do you feel that you are following a very set path, or do you feel that there are enough open-ended elements such as the team dynamics, various ways to wins, or random events caused by the city itself to make it a very personal experience?

#Do you find Midnight Madness to be predictable? If not, is this unpredictability one of the major reasons that you play the game?

#If you have played multiple Midnight Madnesses do you find that it is getting more or less predictable as you play it more?

#Do you believe that people who have not played Midnight Madness would not understand what it is like regardless of a detailed explanation?

#Do you think just anyone would enjoy playing Midnight Madness or do you feel that it is not for everyone? If so, what do you think it takes to enjoy it?

#How do you compare playing Midnight Madness with playing video games?

#How do you compare playing Midnight Madness with wandering around the city all night?

#Does playing Midnight Madness have an effect on your relationship with the city?

#How do you rate your puzzle solving ability on a scale of 1 to 10, 10 being an expert?
#How do you rate your stamina for staying out all night playing the game, 1 being not able to do it at all, 10 being you keep going for days?
#How do you rate your overall skill level at playing Midnight Madness?
#How do you rate your team's overall skill level?
#How challenging did you find Midnight Madness? 1 being really easy, and 10 being impossible.
#How important is it for the game to be challenging for it to be exciting?
#Did you find the game too challenging with respect to your skill level, or too easy?
#Did the challenge level and the frustration involved with the game add to your overall enjoyment after you work past it?
#How motivated was your team? Did you meet up often prior to the game to plan?
#How important was victory to you?
#Are you going to win next year?

3.2 Analysis of Responses

3.2.1 Meaning Density Analysis

The first two questions attempt to assess an overall feeling concerned with the duration of the game. Almost across the board, people agreed that not only was the length appropriate but also that the game is a game of endurance and this makes it more compelling. One person claimed that it was a bit too long. This person was on a team that finished towards the end, meaning it took them as much as 4 more hours than other teams. Furthermore, this indicates that they didn't solve many clues without the time expiring and having the answer given to them. From other questions, it appears that solving a clue on one's own form the best moments of the game. Therefore by not solving the clues quickly, not only does the number of meaningful moments decrease, the overall duration increases. This makes the meaning density drop towards zero, whereas teams that solved even a modest number of clues answered the questions in a much more positive light.

The next batch of questions examines frustration. Almost everyone responded to this section in the same way. They identified one particular puzzle as the most frustrating. It was later discovered that this puzzle had gone missing from where it was located. Furthermore, the puzzle itself was not very well designed and had problems. As a result no team was able to solve it and they were stuck for several hours. They indicated this as the most frustrating point of the game, as well as the most challenging. Since the absence of solving a clue means quite some time with out a meaningful moment, frustration can be seen as the emotional result from a decrease in meaning density. This is further combined by the teams that finished last and claimed that the game was too long, also answered yes to the question of if they were often frustrated.

The remaining few questions of this section seek to look at the specific type of frustration felt with respect to the game and the environment. Some people indicated that the presence of other team's frustrations helped with their own, and everyone indicated that the environment of the city and the presence of their friends helped attenuate their

frustration. This would show that these other elements added meaningful content to the frustrating period. This helps raise the meaning density a bit.

3.2.2 Longevity Analysis

Questions 9 to 16 attempt to examine the lasting impression that the game had on its participants. This impression can be characterized by a desire to talk about the experience, start getting ready for next year, and apply insight garnered from the game elsewhere. In general, all the responses indicate some lasting effect but it varied in method and strength. While the presence of this longevity indicates that it is related to the engagement of the experience, it is difficult to quantify and measure. For example, one response claims to have thought about constantly for weeks, while another person who had not thought about the game for months spontaneously was reminded of it and walked home from work. It is difficult to compare different types of lasting impressions in a uniform way. But it is apparent that a lasting impression or inspiration of some sort was present in all participants who found the event engaging.

3.2.3 Emotional Response

It turned out that the question asking participants to identify any emotional responses that they had proved to be an invalid method of gathering information on this attribute. The answers tended to be quick generalizations such as excitement, frustration, exhaustion, and joy without any specific information as to the cause, strength of the emotion, or any indications of any emotional feedback cycle. The strongest emotional responses such as frustration could best be examined through the more specific questions analyzed above. It would seem that a post-experience interview is not necessarily the best way to understand emotional response and more investigation into methods for observation of emotional response is necessary.

3.2.4 Personal and Exclusive Analysis

When asked if the game was something that anyone could enjoy, most people responded that it requires a certain attributes to make it an appealing experience. They then listed the attributes that they were referring to. Although they all agreed that not everyone would enjoy the game, their list of attributes of those that would enjoy it varied from response to response. If we just look at the responses from people who claim to have greatly enjoyed the game, we can assume that they are in some ways describing themselves with this list of attributes. Since these attributes are varied from person to person we can deduce that the experience interacted with a different set of personality traits in each participant leading to a personal experience.

3.2.5 Phenomenological Analysis

This particular game was designed to include some of the abstract elements of games and puzzles and use them in a situation requiring experiential interactions with the environment and other people. The phenomenological side of this goal was not lost on

the players. When asked to compare the game to a video game, the gist of many of the responses was that this game is like entering a video game. In fact, that seems to be the number one cited reason for playing, being placed in the real-world but with some amplification of the experience by a thin layer of abstraction, as indicated by favorable comparisons with simply walking around the city all night. The point on the scale of sensory to mental was evident to the designers of the game and to the players, and was agreed upon by all to be the main draw to participate in this experience.

3.2.6 Participant's Creative Input Analysis

There were no questions that really address this attribute directly; however, related questions seek to examine how unpredictable the game was. Unpredictability requires creative thought to react accordingly and solve problems without a practiced method. If an experience is too scripted, it will limit the participants creative input and ultimately be less deeply engaging. All of the participant's in *Midnight Madness* responded in this way and identified the game as unpredictable and that this is one of its best attributes.

3.2.7 Relative Challenge Level

Due to the case study being a competition, the relative challenge level is easy to observe. The better the team performed, the closer the challenge level was to their skill level. Considering no team found it too easy, we don't have data from an overload on the skill side of the balance. An overload on the challenge side can be easily observed from the responses. First of all, out of all the responses, one 1 was from a member who finished below the first ten teams to cross the finish line. This illustrates that the teams whose skill level was far below the challenge level were not even engaged enough with the experience to participate in the survey. The one response received from the member of a team from this side of the challenge-skill curve commented on how challenging it was but enjoyed it all the same since it was his first time playing. The novelty of the experience won out over the relative challenge level. He is sure to do much better next year.

3.2.8 Motivation

Most of the responses indicate that winning was not that important, a nice thing to happen, but not the reason to play the game. The fact that they desired to play the game for its own sake, in fact there is no prize ever offered for this game, is a strong indication of a deeply engaging experience. The relationship with the experience is clean and the interaction is seen exactly for what it is: a desirable situation on to itself.

4 Conclusion

In our case study there is evidence that all these proposed attributes are present and relevant to the appeal of the experience. However, the method is questionable since the questions were built from these attributes as a starting point. Nevertheless, the responses completely confirm that the participants of the event are deeply engaged with this event in a way partly describable by breaking the interaction down into these attributes. While the complete list of attributes needed to completely describe all possible deeply engaging interactions with an experience may be quite lengthy if not endless, it may be possible to identify a few attributes that seem to have the strongest relationship to deep engagement common to the most participants.

We can use this study to hopefully add some systems in future events similar to this case in order to assess the level engagement of the participants during the experience. Such systems can include monitoring the interaction from the perspective of the individual tasks. We can then observe the differences in behavior from task to task. When compared to the timing data of the tasks we may be able to discern the density of salient events and why they happened with each particular task. The number of times a participant returns to the task and how much time is spent on individual tasks when they are occurring simultaneously can all be recorded. This is a particularly interesting piece of data, since simultaneous tasks as part of the same overall event have enough common ground, such as the motivation to finish one task, that the differences can be highlighted.

It is the ultimate goal of understanding the concept of deep engagement to be able to design new experiences that will engage their audience deeply. However, by intentionally trying to design in attributes such as those discussed in this paper, we run the risk of over-scripting the experience and thereby preventing a deeply engaging experience. From this analysis, it seems the best way to design for engagement is some sort of middle ground, in other words, use some of these types of attributes as guidelines for your design, identify which design decisions highlight which attributes, but ultimately allow them to organically form an open and unique formula for engagement specific to the experience.

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