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Emotional Requirements

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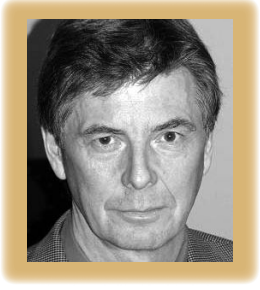

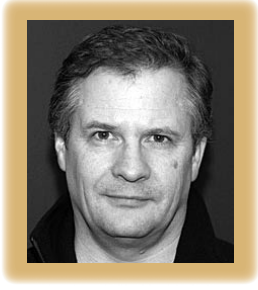

Imagine that you're a software developer working on a video game. One morning, your boss comes in and says, "Make sure the new game is fun or we're all out of a job! Our last game just got savaged by the reviewers!" Now, what can you as a developer do to help make this happen?

Before you panic, begin by remembering that video game software exists to entertain, to actively engage the player's cognitive and emotive processes while delivering a satisfying playing experience. This experience is what customers are purchasing. They care about the game's functional aspects, such as the engine and control interfaces, only so much as they affect the player experience. The functional aspects are simply the expected minimum requirements that must be met before delivering the game.

The game designer crafts the playing experience—how the player should feel at certain points in the game. In "Requirements Engineering and the Creative Process in the Video Game Industry," a paper for the 2005 Requirements Engineering Conference, we showed that it's not easy to effectively communicate the game design vision to the production team. New techniques were needed to ensure that the production team captured, understood, and implemented the intended player experience.

Like a movie director instructing the technical crew on implementing nuanced set design, lighting, sound, and acting, a game development team must work together to implement the game designer's vision. In "Emotional Requirements in Video Games," a paper for the 2006 Requirements Engineering Conference, we introduced emotional requirements to assist game developers with this task. Just as with functional requirements, emotional requirements have attributes that you must describe and model, and those attributes sometimes require careful balancing.

Requirements challenges

Emotional requirements must contain at least two elements: the game designer's intent (that is, the target emotional state) and the means by which the game designer expects (requires) the production team to induce that emotional state in the player. We can consider an emotional state such as happiness as universal, but the way you induce happiness isn't. Emotional requirements need context: classic pratfalls from vaudevillian theater can induce gales of laughter in a viewer who also feels horror at seeing a loved one fall. Unanticipated interactions between what the player sees, hears, and feels before or during the game can also affect the player's emotional response to stimulus, which is further conditioned by the individual's personality, culture, and life experiences.

Emotional requirements blur the lines between requirement and specification. They require significant contextual information, possibly more than any other form of requirement. It's not as simple as stating "The player should be scared." In this domain, vaguely understood emotions interact with well-understood engineering constructs, generating requirements-engineering challenges.

Induced emotional requirements

It's easy to generate emotional requirements that seem reasonable to the game designer but have no value to the player. For example, you might decide to dynamically adjust the game's difficulty. In a real-world example, the designers modified a video

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Figure 1. Far Vista Studios (www.farvistastudios.com) Run the Gauntlet in-game promotional scenes: The player's environment might promote feelings of (a) fear, (b) relief, or (c) elation. (used with permission)

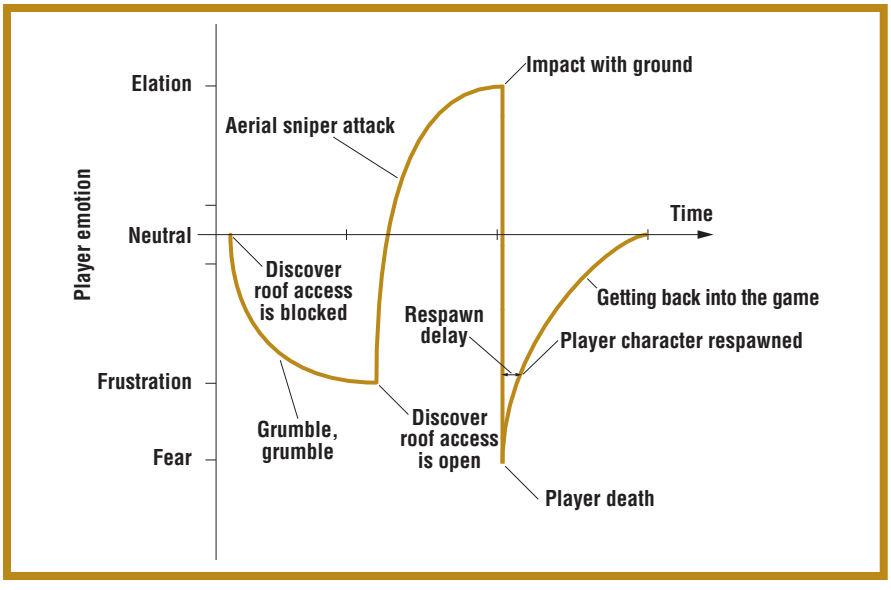

Figure 2. An emotional timeline for Far Vista Studios' Run the Gauntlet. (used with permission)

game's control systems to adapt to the user's skill level, effectively enabling two players of significantly different skill levels to achieve the same score. This sparked accusations of cheating and unfair play from the player community. The game designer and developers had set an emotional requirement of "Make the player feel successful, independent of their skill level," but the player audience had a conflicting emotional requirement: "Validate my self-worth on the basis of my performance in this video game—relative to others." Game developers should validate such complex emotional requirements through user testing to ensure that the player shares (or derives value from) the game designer's goals.

Representation

How do you represent the emotional state envisioned by the game designer? In the "Basic Emotions" chapter of the *Handbook of Cognition and Emotion* (John Wiley, 1999), Paul Ekman provides a list of culture-independent (universal) emotions (amusement, anger, contempt, contentment, disgust, embarrassment, excitement, fear, guilt, pride in achievement, relief, sadness/distress, satisfaction, sensory pleasure, and shame) that you can use as a basic emotional vocabulary for representing these states.

To illustrate, figure 1 shows three scenes from Far Vista Studios' Run the Gauntlet game. In figure 1a, the central player is totally exposed to attack from all sides; the game designer wants the player to be nervous or fearful at this location. In figure 1b, the central player has found a structure to hide behind; the game designer wants the player to feel relief from gaining some degree of safety from attack. While purely textual descriptions suffice, they're difficult to maintain and don't align with the game's graphical paradigm. Previously, we successfully overlaid cartoon faces and emoticons on the game graphics (see figures 1a and 1b) as a simple, graphical representation of the desired emotion and recommend this practice for economy and ease of use.

Cultural conditioning

Emotional requirements can require localization efforts. International audiences (and members of international teams) might interpret the same symbols and events differently. Test your scenarios on your target markets to ensure that they don't elicit inadvertent interpretations. Perhaps the most cited example is the color red, which in North America means danger, whereas in China, red means good fortune.

Contextual information requirements

You should also consider how abstract contextual elements produce or affect player emotions.

Positional

An effective emotional requirement identifies where, in the virtual world, the player should feel a given emotion. In figure 1c, we see a player leaping off a roof to perform an aerial attack on the street-level players below. Discovering this tactical advantage, which exists only at this location within the game, is intended to induce feelings of success (pride in achievement). Because it's expensive to create a virtual world, use emotional requirements to ensure that every element contributes to how the player is supposed to feel in that setting.

Temporal

Context can vary with time. In figure 1c, jumping off the roof elates the player. This feeling of success increases as the

player approaches street level because the distance between the player and the enemy decreases and the probability of hitting the enemy consequently improves. However, this elation ends on landing because the game designer has set a trap—the fall impact actually causes the character to die and regenerate elsewhere. This emotional roller coaster is a staple of the action and suspense genres and delivers great satisfaction to the target audience.

Supporting the development of the game's story arc over time, the game designer could also block access to the roof for certain periods, deliberately inducing frustration in the players as they attempt to use the roof as a sniping position and find that they can't. The designer could then use the roof access as a trap to force a transition from frustration to fear. Figure 2 shows this emotional timeline, which depicts players' emotions as they experience the game's story arc.

Effective use of emotional requirements requires understanding how your audience reacts to emotional intensity. Players, just like movie-goers, generally react better to a change in intensity than to long-term exposure to high-intensity emotions. For example, you can only expose players to high-intensity emotions for a relatively brief period before they begin to become immune to the stimulus.

Relational

Gamers play because they want to have particular emotional experiences. If a game delivers those experiences, they play it again and again until they no longer achieve their emotional fix. Game designers must remember that this emotional experience is the player's definition of a successful game, and it might not match the emotions they've specified in their game design document.

As gameplay progresses, players accumulate experiences that can lead to positive and negative prejudices. Development teams should attempt to consider these accumulated experiences. Which would you rather hear: "I am so angry; I just can't get past that enemy!" or "This game is worth every minute that you invest in it!" You can use extensive play testing to identify these emotional biases, but consider whether player perceptions are being skewed by prior experiences with the game.

Emotional-requirements techniques can help improve player experience and reduce development uncertainties. Focusing on entertainment software is a logical starting point, but we plan to extend our application of emotional requirements to other areas. Emotional requirements add the human element to engineering practice. This combination helps and encourages us to better understand those around us and might even help those around us better understand our practice.

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