Simulated Visuals: Some Rhetorical and Ethical Implications

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Introduction

In July 2004, over a year before Hurricane Katrina ravaged the Gulf Coast, FEMA hired private contractors to conduct preparation exercises in New Orleans to ready FEMA for the event of a large-scale hurricane. Strategic workshops and drills were based on a computer simulation of a slow-moving, Category 3 storm named Hurrican Pam and the catastrophic conditions that would result.

Although the Pam simulation predicted damage of Katrina-like proportions, the national, state and local response to Katrina left much to be desired. How is it that no one was ready? Surely political priorities, professional egos and other confounders played a role. This poster explores how the visuals from the simulation present rhetorical and ethical issues that exacerbated the preparedness gap.

The table, map and conceptual model (at right) are from workshop binders prepared by Innovative Emergency Management Inc. (IEM), the contractors who hosted the exercises. They illustrate plans and highest water levels during the simulated storm.

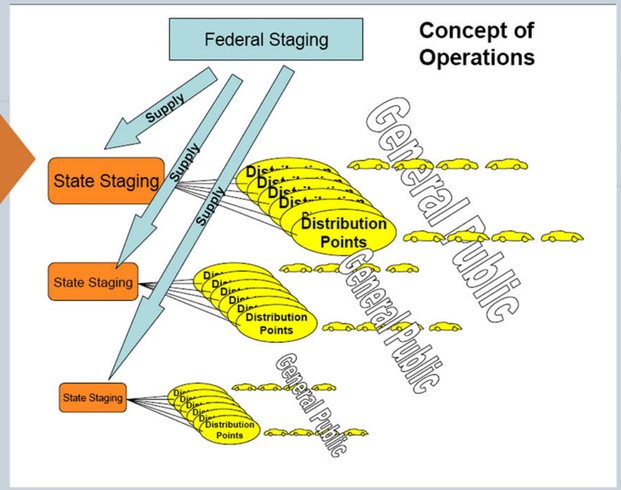
Simulation Shortcuts: The persuasive nature of simulations can mask the subjectivity inherent to creating them. Simulationists must make additions and eliminations and set seemingly arbitrary parameters in order to generate usable data (Winsberg 2001). While the Pam exercises envisioned the possibility that 300,000 people would not evacuate, phone and sewer services would be disabled, and 1,000 shelters would be required, they did not anticipate--or its visuals depict--a specific enough plan for the many factors that beleaguered rescue attempts.

Action plans gave general directives about managing the aftermath ; however, **the visuals left unaddressed many detailed specifics for diminishing the magnitude of the catastrophe** (US House of Representatives 2006). For example, this conceptual model does not factor in traffic, obstruction, or barricades in the rescue routes.

Virtual Meaning: Is the meaning of simulated visuals iconographic (i.e., by resemblance) or indexical (i.e., by relationship)? Even when simulated visuals do not exact the real thing, they can still bear significant meaning. In this case, **the similarity between the simulation data and what actually happened creates ethical tension.**

Some argue that ethics hinge on our understanding of possible worlds (Smith 2001; Borge 2000). Should we deem FEMA's inaction unethical because Hurricane Pam was evidence enough for someone to believe that such destruction could take place? Or was FEMA ethically blameless because, while officials believed it could happen, the visual record of the simulation did not bring to their eyes a vivid enough possible world?

"Hurricane Pam" Data	Actual Results from Hurricane Katrina
20 inches of rain	18 inches of rain
City of New Orleans under 10-20 feet of water	Up to 20 feet of flooding in some areas of New Orleans
Overtopping of levees	Levees breached
Over 55,000 in public shelters prior to landfall	Approximately 60,000 people in public shelters prior to landfall
Louisiana Offshore Oil Port (LOOP) shut down pre-landfall and back on in 2-3 days after storm – LOOP handles 12% of US crude oil imports	The LOOP was inoperable from August 29 to September 2 (5 days)
9 refineries shut down during storm	7 refineries in LA shut down during the storm
57 chemical plants shut down during storm. Many flooded and with no power	More than 50 chemical plants shut down during the storm
Over 1.1 million Louisiana residents displaced (500,000 households affected & 230,000 children)	1 million Gulf Coast residents displaced for the long-term; majority are LA residents



Visual Energeia: Rendering simulated visuals in a user-friendly way poses a challenge to computational science (McCrae et al. 1990). Simulations are opaque, insofar as they require a certain level of expertise to decipher. Simulated visuals, on the other hand, possess what Aristotle calls energeia, since they materialize before our eyes obtuse propositions and hypotheses. Energeia is "the sort of thing which is perfected or completed in the very instances of its being enacted" (Newman 2002, p. 13). These visuals, then, were meant to instantiate a major hurricane and its damage.

Inhumane Visuals: Sam Dragga has argued that technical visuals breach ethical standards when they fail to account for the human factor behind technical information. "We must recognize the equal obligation of the visual component to support and to promote a humanized and humanizing understanding of technical subjects. In brief, ethical visuals must be as humanistic as ethical worlds" (Dragga and Voss 2001, p. 266). For example, this map gives us computer-precise estimates of water levels at their highest point during a Category-3 storm. The map does not, however, include population estimates at key areas of worst damage, such as Lakeview, Gentilly, and East New Orleans. Doing so would superimpose onto the map implications for human life and culture onto the landscape of the natural disaster.

Mixed Visual Messages: Visual rhetoric has a unique capacity to persuade. Simulated animations are a hybrid between photography and illustrations--they have something of the realistic value--or what Benjamin (1969) calls "aura" or authenticity of photographs, without exact verisimilitude. However, this map fails to capture the fine-grained surface details of the object--i.e., damaged buildings, and landmarks, cars and other recognizable objects under water.

The map makes an impression because it superimposes simulated water levels (indicated by the green-colored areas) onto an actual map of Louisiana. The map does less of an effective job managing basics of visual design. For example, it does not maximize color meaning (Hunt 2004) insofar as it uses green rather than blue to indicate flooding or red to denote hazardous damage.

Discussion

The Hurricane Pam visuals did not help communicate the event's scope to the fullest extent. Simulated visuals are hypothetical or subjunctive (i.e., indicative of what could be or might be). Similarly, ethics engage modal possibilities (i.e., what one should do). If we cannot say that subjunctive evidence is enough with which to make modal decisions, we can expect that evidence to broaden assumptions and expectations about modal eventualities. Visuals are inherently memorable and effective for conveying meaning. Therefore, we must hold simulated visuals to high rhetorical and ethical standards, since they possess the virtue (the worth and workings)--if not the truth--of what they represent.