Game Conceptualization and Development Processes in the Global Game Jam

ABSTRACT

`update to results`

My proposed research will investigate the knowledge and creative processes involved in conceiving of a game and grounding an initial set of ideas in game mechanics. Particular details of this knowledge and process will be investigated using semi-structured interviews with completed games. Broader characterizations will be explored using a questionnaire distributed to the Global Game Jam participants. Combining in-depth interview information and large-scale survey information will provide insights into the creative practices involved in the game design process of value to researchers in many areas relating to the practices of game design, creativity in game jams, and the goals and tools of game jam participants.

`decide category, terms, etc.`

Categories and Subject Descriptors

H.4 [**Information Systems Applications**]: Miscellaneous; D.2.8 [**Software Engineering**]: Metrics—*complexity measures, performance measures*

General Terms

Theory

Keywords

ACM proceedings, LaTeX, text tagging

1. INTRODUCTION

The Global Game Jam (GGJ) provides a unique opportunity to study the process of conceiving and building a game de novo within tight time constraints. Strict time limits enable the study of the game design and development process at a level of detail normally not possible, with massive participation (roughy 16,700 participants) allowing for large-scale patterns and analysis. However, these opportunities come with methodology challenges for studying the design process. What are effective methods for understanding practices that can balance the scale of the GGJ with rigorous, detailed analysis? How can the unique structure of the jam be accounted for to help generalize results from GGJ participants to broader game design practices and methods?

In this paper we study the compressed development process of conceptualizing a game and realizing the game in a working product at the 2013 GGJ. Studying this process is challenging—building a rigorous theory of the time-limited development process requires understanding how designers choose ideas and develop their game ideas, and how this relates to the dynamics of group collaboration and code-level implementation. We take a multi-step approach: using survey instruments to first characterize the space of game design process and then follow with more detailed studies of aspects of these processes. This paper describes the results of a free-response survey we administered to GGJ participants about their design inspirations and goals, process of implementing those ideas in a game over the course of the GGJ, how they refined their game, and pitfalls they encountered along the way. We find common trends in inspirations for game ideas, design goals for games, and process for implementing a design into a working game. We conclude with a discussion of ways to deepen this analysis through triangulation with other research methods and some of the implication of our results.

2. RELATED WORK / STUDY TOPICS

We examine the process of conceptualizing and realizing a game, specifically: inspirations and goals for a design, and the process of developing ideas and turning them into concrete running code (prototyping, implementing, and refining).

The GGJ emphasizes values of experimentation and innovation and we sought to characterizing the design goals and insirational sources GGJ participants set for their games. Anecdotally, the game design literature had debated the merit of different design goals (e.g. consider prominent game design texts [7][14] [15] [16]). Design goals range from making a game fun for players [10] to creating immersion and a sense of flow [6] to conveying a meaningful message [2]. Bogost [3] catalogs a plethora of uses for games—from inducing relaxation to drilling skills—using existing game examples. Despite this rich discussion, little empirical work has examined the space of design goals. We examine the range of design goals GGJ participants set for their designs.

Game inspirations are the sources of ideas designers draw from when conceptualizing their game. Existing models of game conceptualization suggest there are many entry points for starting a design, but tend to be based on theoretical analyses rather than existing practices [9]. Example sources for game ideas include everyday activities a game is inspired by [17], metaphors a game is meant to convey [13], or models of systems [4]. We empirically examine the kinds of inspiration GGJ participants draw on and discuss their relation to the use of themes in the GGJ.

Developing an idea into game mechanics involves grounding the abstract game concept into a set mechanics through: (1) prototyping designs, (2) implementing running code, and (3) refining the game. Throughout this process there is potentially a feed loop between the game artifact and conceptualization. Initial inspirational ideas must be grounded in particular game systems and designers vary in how they approach the problem [8] [11] [12]. Some approaches emphasize iterative playtesting [7] [16] while others test a breadth of small ideas before settling on an idea [8]. Prototyping may leverage paper models [11], abstract models [12] [5], or simple code [8]. We examine the use of prototyping in the GGJ and approaches designers take to realizing their ideas in running game code.

Game balancing and refining processes involve finding aspects of the game that should be altered, selecting among those aspects, and choosing how to change them. Regardless of level of final "polish", game designs typically go through phases of some refinement of game systems to achieve the goals designers have set out [16] [7]. We examine what aspects of GGJ games were altered and how these changes were made.

3. METHOD

We provided a ten question open-response survey that was administered online as part of the post-GGJ extended survey (Table 1). We gathered responses and coded responses to each of the questions into categories, allowing multiple possible codes for responses.

4. RESULTS

Of approximately 16,700 participants in the GGJ, 420 provided responses to at least one of these questions. Below we discuss broad categories of responses within each of the study topics: inspirations, design goals, prototyping methods, and the flow of realizing game ideas in code.

4.1 Inspirations

Participants drew from a breadth of sources for inspiration, including: other games, abstract concepts, emotions, life experiences, art styles, biological systems, books and poems, music, and films. Many mentioned explicit use of the GGJ theme—the sound of a heart beating in 2013—inspiring the use of rhythm in game mechanics, biological hearts as model systems, and life experiences of love. Interestingly, some intentionally sought to have more distant connections to the theme: "QUOTE"

> quote text

Drawing from life experiences [1], systems to model [4], and other media [3] are all recognized in the game design literature as important sources of inspiration. We found life experiences references in terms of specific memories (e.g.

What was your initial goal for the game you made during the global game jam?
What inspirations or initial ideas did you have for your game? What was the starting inspirational source or goal for the game?
Why did you pick this particular idea for the game?
What problems did you encounter in developing your game?
What changes did you make to your initial idea as you worked on it during the game jam? Please describe the changes as small pieces of changes as possible.
What game mechanics and/or gameplay systems did you use in your game?
How did the mechanics or systems you made relate to the initial design ideas you had?
How did these mechanics change as you worked on the game during the game jam?
Did you prototype your game? If so, what kind of prototyping did you do and what did you learn from doing it?
What tools did you use to make your game? Please include software tools (e.g. programming languages or game engines) and any physical/analog materials (e.g. paper prototyping methods or storyboarding).

Table 1: Survey questions.

watching a blind-friendly TV show) as well as general activities (e.g. holding a conversation). Biological systems—particularly the heart and associated diseases—were a source for some designs, primarily due to the heart beat jam theme. Non-game media provided initial grounding through scenarios (e.g. Edgar Allan Poe's "The Telltale Heart") or more general characters and concepts (e.g. the Borg from "Star Trek").

GGJ participants also tapped their gaming knowledge, in terms of specific target mechanics or reference games. The heart beat theme lead many projects to emphasize rhythm mechanics or incorporate rhythm elements into another genre. In general, mechanics proved to be a frequent starting point, representing the most commonly cite category

> number

after the theme

> number

. Game references included specific digital games (e.g. Super Mario Bros.), playground or field games (e.g. Simon Says or tag), tabletop games (e.g.

> find example

), or broad game genres (e.g. platformer, card game). Game references were connected to game mechanics, art styles, controls, "feel", etc. Overall, game references targeted single-player games and action-oriented genres (side-scrolling runner, platformer, one-button games, etc.).

Together, these results demonstrate the GGJ community matches many professional game design norms, skewed by the theme and limitations of the GGJ. The GGJ theme pushed many participants on more abstract concepts than often seen in industry staple titles focused on fantasy adventures and science fiction. Strict time and resource limits focused development on game genres that are quick and easy to implement and refine. Together, these dual tensions make the GGJ a powerful incubator for small games

that experiment with new themes and mechanics. However, this likely limits the value of the GGJ in training novices to build more complex game genres—real-time or turn-based strategy, role-playing games, simulation games, etc. Future GGJ efforts may target ways to support experimentation in these other avenues through alternative support structures, durations, or means for participating.

4.2 Design Goals

a few large categories of goals seem to drive participants:
- system/expression = conveying themes, trying out mechanics, recreating classic games
- personal = learning things, networking, portfolio, idea testing, win competition
- player = player enjoys, learns, thinks critically, becomes aware, changes world

player-centered design de-emphasized, likely due to jam constraints. suggests GGJ currently emphasizes a process for game development rather than game design.

4.3 Prototyping

list out aspects mentioned in prototyping
Main approaches:

1. Paper prototype. Draw out or use parts if available.

2. Engine prototype. Code basic version with assets stripped out. Often evolved into the final product. Two versions: (1) parallel development with integration into core; (2) iterative expansion of core.

3. Iterative prototype. Intentionally layering in content.

4.4 Realization

list main kinds of changes

Three approaches to managing ideas/features: (1) start from many ideas and iteratively downscope based on dependencies/feasibility (2) start from vague/generic ideas and build out both mechanics and ideas during implementation (3) start from small baseline and build up

primarily forced to cut out mechanics or features. visualization and controls are occasionally mentioned (along with balance), but less central aspects. GGJ focuses on integrating many parts over learning how each task works. heavy programming challenges suggest biggest issue and focus on learning is around how to get code up more than exercising other skills.

idea changes most frequently driven by development needs rather than playtest results. testing primarily seems to have been based on personal reactions to product rather than player feedback. GGJ seems to encourage "personal" games that meet one's own standards more than play-centric designs.

> cite other study of professional designer types?

1. results aligning w/theories

2. results diverging

3. details of areas

5. METHODOLOGICAL LIMITATIONS AND IMPLICATIONS

The voluntary survey methodology we has important limitations in coverage of GGJ participants and the depth of response data gathered. Only 420 of 16,700 participants responded to these questions. Respondents were likely skewed toward successful projects and those more invested in the GGJ. Thus, we cannot easily examine similarities or differences in design processes between those who successfully complete the GGJ and those who do not. Future research will require better methods to automate survey administration and collection or ensure randomized sampling from participants.

Survey responses are limited to the most salient aspects of an experience, limiting the level of detailed processual information gathered. We cannot make strong conclusions about the cognitive or social processes involved in game development from this form of data. Retrospective protocol analysis—where participants are recorded and asked to then view this recording and narrate their thinking—is one means to gather such detailed data, although constrained to a smaller scale than we employed. As retrospective protocols are typically used for short sessions (up to hours) they may require modifications to find and examine only key points in the process, or to use a "fast-forward" viewing approach.

Semi-structured interviews provide another alternative to gathering detailed data. Interviews are limited by being primarily subjective data, but require far less time and detailed data than protocol analysis while still gaining useful qualitative insights. Using prompt materials gathered over the course of the GGJ—such as in-process game builds from source control, photos or video of onsite activity, and observer notes on the development process—may amerliorate some of the biases around memory salience.

Our survey did not identifying information on participants. Understanding how team members differ in their thinking and process was not possible as a result, preventing a more in-depth study of how collaboration impacts the conceptualization and development process at the GGJ. Employing a retrospective protocol or semi-structured interview with individuals and subsequently groups is one means to collect such information.

6. CONCLUSIONS

More research into differences in outcomes based on processes for approaching: pruning vs expanding. In-depth protocol analysis to get detailed evolution. Comparison of design methods by levels of experience.

Alternate formats of jam for skill sets: playtest-focused, full game development, etc.

need better ways to understand how constraints impact results, particularly when aspects like time limits vary. need better ways to automatically record many aspects: participant outcomes and experiences, products, practices employed over development process.

clearly provides useful guidance on priorities and perspectives. open question responses helped address a breadth of issues without guiding participants to only answer key points.

7. ACKNOWLEDGMENTS

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