EMERGENT STORYTELLING: HOW METHODS OF PLAYER-DRIVEN NARRATIVE DESIGN AND EMERGENT GAMEPLAY CAN BE UTILIZED TO ELICIT BETTER PLAYER STORIES THROUGH PLAY

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DECLARATION

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ABSTRACT

This project aims to investigate the various methods and techniques industry practitioners are currently using to help them reach their goals of emergent narratives and seeks to lay out a small toolset developers can use in their work to fine tune their player-driven narrative design approaches. The literature review works to deconstruct the definitions of emergent, player driven and procedural narrative design before examining approaches and techniques for player driven narrative design to more effectively elicit the players imagination and creativity to generate stronger player stories during play that will stick with them and create lasting memories of their experience. An analysis of various games systems that successfully achieve emergent narratives was also completed, with examples on how they applied player driven storytelling techniques to arrive at their result, and some discussion regarding other games that utilise similar techniques in different ways to achieve similar results.

Prototypes were initially created to experiment with these various techniques, which directly informed the creation of a practice-based project developed in collaboration with three other students, with my focus being within the field of game and narrative design. My primary objective being to create and develop a player centric narrative delivery system that elegantly ties into the gameplay systems, providing an evolving narrative contextually aware to the events of gameplay that works to elicit the player story. A post-mortem analysis was then conducted to reflect on the effectiveness of each of the methods and techniques used in the prototype in achieving it's intended goals.

With my research I hope to contribute to the discussion surrounding emergent storytelling through broadening the potential approaches to contemporary player driven narrative design methods and help drive the industry further towards the true player driven stories dream practitioners currently share. I hope that the knowledge explored by this work will be of interest to gameplay, narrative, and system designers hoping to achieve emergent storytelling.

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INTRODUCTION

The power of videogame storytelling has advanced considerably in recent years, evolving in each approach the developer deems fit for their game, be it linear, branching, environmental, bespoke systems or even mixed media, the game industries adoption and use of various storytelling tools has granted the developer a wide range of possible approaches to which they can design their narrative and deliver content payloads to their players. However, what is arguably more important, is the final resulting experience itself, the game must be greater than the sum of its parts. One such resulting experience is emergent narrative.

There has been an insufficient focus from the wider industry, on the benefits of achieving this result, let alone best practices to follow when crafting player-driven narrative experiences, resulting in innovations in this area being relegated to the fringes of the industry. Due to their best-efforts developers have arrived in a position where they now have many ways in which this experience can be achieved but lack a formal collation of tools, techniques and definitions that can act as a survey of the current emergent landscape, instead information is scattered and often terms are conflated, further obscuring the methods of communication developers use with each other (Gordon, 2021). Taking all of this into consideration, the primary research question of this investigation is as follows:

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Emergent Storytelling: How methods of player-driven
narrative design and emergent gameplay can be utilized to
elicit better player stories through play.

</div>

This project will work to discuss and explore some of the most effective methods being utilised in achieving emergent narratives in games and highlight the benefits of using them even for the smallest of development teams, to improve the stories their players imaginate while playing to better empower the players story and culminate in a much more narratively enriching experience.

AIM OF RESEARCH

The primary aim of this project is to investigate the various methods that can be used to enhance player driven and emergent storytelling by surveying the current practitioner and academic landscape, and to design, develop and evaluate their use through deconstructing similar games systems to influence the creation of an original game concept.

QUESTIONS TO EXPLORE

While still being a small specialism in narrative design, there are still many ways one can succeed in the goal of emergent narratives. With there being so many approaches to cover, to better isolate and focus the scope of this investigation I will be leading it to primarily answer a few key questions:

How can games elicit player driven stories using emergent narrative & gameplay design techniques? – Researching current practitioner and academic landscape

How is narrative structured to create emergent gameplay in procedural narrative, embedded and non-linear games? – Taking the survey of the landscape and understanding how they also utilize narrative

How can character (and the players character) be utilized as a conduit for player-driven narratives in the creation of gameplay systems? – A look at my creative/practical output in response to questions

OBJECTIVE STATEMENTS

I aim to answer these questions through accomplishing the following objective statements:

- Firstly, I would like to research how player driven and emergent storytelling is currently achieved in theory and practice through a literature review to survey the current research and practitioner landscape within this field. This should also help to define emergent storytelling.

- Secondly, I will deconstruct similar game mechanics, systems, and practitioner methods of emergent narrative through case studies.

- Then, using my newfound knowledge, I want to prototype mechanics and iteratively combine ideas and system designs into a larger cohesive design prototype in engine.

- Finally, I want to evaluate the final prototype with a small post-mortem analysis.

This project investigation is conducted in conjunction with the development of an original game concept "Mankind's March", an on-going development purpose built from scratch during the project to provide a collaborative vehicle for research and investigation to everyone's personal focus. It serves as the basis for this projects research, prototyping and development of player-driven narrative systems, procedural story content and play centric gameplay systems, all of which are discussed and evaluated within this project, including our reasoning regarding tying them together in such a way to achieve elegance.

The primary artefact of this project consists of a narrative interaction/dialogue system making use of mixed media practices to convey story content; The Data pad feature, a procedural narrative content system; Storylet System, player character statistic and trait system based on the big 5 personality O.C.E.A.N model utilised in behavioural psychology to chart characteristics and traits and help predict people's actions in the future; Narrative Legos system. There is also a contextually aware content selection system directly tied to other gameplay systems, such as the combat system and character stat system, to determine the best narrative content to deliver to the player based on game state variables and previous decisions in the narrative.

These systems were all developed with direct influence from the research and findings from this investigation into player driven narrative and emergent storytelling techniques. The systems were prototyped in Unity using C# and then developed using GD Script in the Godot Engine (Linietsky and Mansure, 2014; Unity Technologies, 2005). For the systems utilising narrative interaction from the player and delivering story content, the project required utilizing an external free plugin for INK, a narrative scripting language for writers, a bespoke integration approach bridging the gap between the game engine and plugin had to be developed to utilise the full extent of INK (Inkle, 2016). The detailed design approach for these systems is explained in the Chosen Methods of Study and Findings chapter. To inject the systems with enough content to produce re-playable and contextually aware narrative chunks for the players to experience a large amount of work needed to be spent on the writing of side quests and overall world building to draw content from and deliver to the player. This is discussed further in the Chosen Methods of Study section.

BACKGROUND LITERATURE/CONTEXTUAL REVIEW

ESTABLISHING TERMS

*"The beginning of wisdom is the definition of terms" –
(Socrates)*

There is a consensus among practitioners of emergent narrative techniques that, while there are transient terms being used to describe elements of this specialism, they are either not descript enough or carry too much overlap of meaning, causing many to conflate terms. According to Tanya X. Short there is currently an emerging vocabulary set, creating the foundation of technical terms for this specialism, but it's primarily just "industry jargon", alienating those not within the know, causing these topics to be very difficult to discuss due to lacking words to properly describe things like procedural storytelling (Gordon, 2021). For this investigation, it seemed beneficial to formally lay out some of these obfuscating terms and through research into practitioner and academic literature, define them more concisely to strengthen our ability to think about design as a whole (Schell, 2008).

These terms are discussed further in the literature review but for a more comprehensive analysis you can find the establishment of terms in Appendix A.

LITERATURE REVIEW

The Player's Story is a result of a collection of gameplay events accomplished through player autonomy that, only when observed and through interpretation, carry narrative weight in which comprise the overall individuals experience (GDC, 2018a; Mcrae, E. no date b). It is when this collection of gameplay events is coherently interpreted and categorized chronologically by the player have, they then experienced an emergent narrative (Walsh, 2011).

Several researchers define the emergent narrative concept as a novel approach to interactive narrative design in that the weight of the storytelling is shared between the author and the players rather than being fully designed out beforehand through branching story structures or linear plot approaches. It prescribes this approach through a character focused lens in which characters are planned out in advance, with some regards to plot, and a specific set of personalities, emotional reactions, actions, and goals. The players actions within the environment are what essentially drive the simulation forward based on the characters nearby and their current goal library which is determined by their personality (GDC, 2018b; Louchart et al., 2008; Stockdale, 2016; Walsh, 2011)

The primary and oldest known approach to achieve emergent narratives is through simulation (Lebowitz and Klug, 2011; Miller et al., 2019). Games like Sims and Civilization that have a wide range of systems all inter-connectedly interacting with each other through various relationships that, while serving the needs of the games themes, don't adhere to the constraints of a primary plot eventually give rise to unique

emergent narratives (Firaxis Games, 2016; Maxis 2014). When these are observed by the player create the make-up of the player-story, and through further interpretation the player comes away with something more special to them than a predefined narrative; their own story (Grinblat, Manning and Kreminski, 2021).

Leaning further on systemic games is an approach used by Tynan Sylvester during the creation of his game "Rimworld" he coins as "Apophenic Design", in which the design of the artifact takes account of the depth of its systems and attunes it's graphical and visual fidelity to match (GDC, 2019c; Sylvester, 2013A; Tynan Sylvester 2013B). Typically, the deeper a games system the lower fidelity the developer should go, though not for scope reasons. Instead, the developer should design the world in such a way where the player interprets events during play that were not intended by design, as the player infers their own contexts and rationales onto the world due to its high level of reaction and low visual fidelity, which again, once observed, parsed and stitched together by the player creates stronger emergent narratives (GDC, 2019c). However, this is not to say that emergent narratives are relegated to highly systemic games, just as emergence can be born from the simplest of rules (Walsh, 2011), so too can the player-story (GDC, 2017).

Interpreted as game event?		
	YES	NO
Intended by designer? YES	Normal game event	Game event missed / dismissed
NO	Apophenic game event	Non-game event

Figure 1: Apophenic Design Table

The idea of emergent narratives fully coalescing into a cohesive whole through observation and interpretation is further reinforced by the concept of reparative play. Wherein the story in narrative sandbox games typically arrives separated and scattered, and only through the player's experience of them overlayed with their extra-ludic resources can it be given meaning through narrative sense-making. "The narrative must be repaired because it arrives in disrepair.", Through extrapolative narrativization, players become co-authors of their experience as their interpretive frameworks for their characters actions are fed directly by the games mechanics which in turn influences players to fulfil actions that support their narratives stitched together by their frameworks and result in the construction of satisfying narrative enrichment through play (Grinblat, Manning and Kreminski, 2021).

Another set of methods to help developers achieve the outcome of emergent narrative is through the procedural narrative design strategy in which the creator of the interactive artefact sections off their narrative payloads into a large collection of narrative chunks or bits (Mcrae, E. no date b). They then scatter them around their worlds or systems of the game to allow the player to find them in any order and piece together the narrative (Mcrae, E. no date a; Short, A.E. 2020). There are a variety of ways to accomplish this but most commonly seen, and effectively executed, are character focused systems in which elements of characterization or statistics are randomized every time the player starts again (Mcrae, E. no date a; GDC, 2019a; Short and Adams, 2019), or systems that surface narrative depending on sources of mechanical pre-conditions (Short, A.E. 2019a; Short, A.E. 2019b). The key to procedural narrative is to ensure they are reusable and contain their own level of variance for each piece, depending on how it is pieced together, to allow for repetition to provide an opportunity for a variety of player expressions (GDC, 2016b).
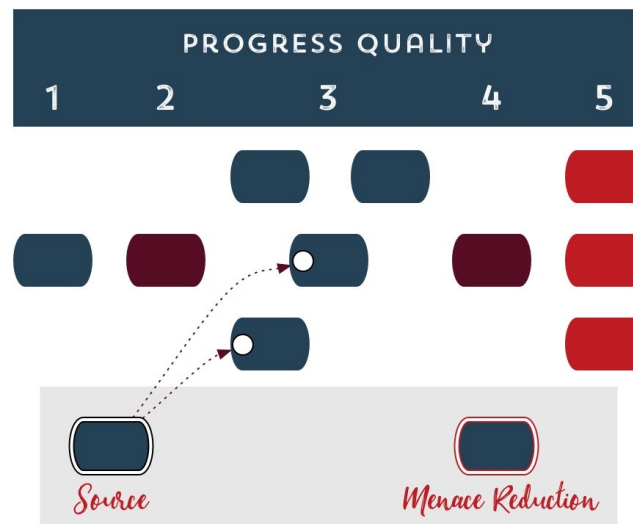
Figure 2: Storylet Approach Overview

Another approach to creating a procedural narrative system, coined by Failbetter Games and developed by Emily Short is the Storylet technique (Failbetter Games, 2010, para 3; Short, A.E. 2019a; Short, A.E. 2019b). This has creators designing the story as discrete chunks of narrative that can be played in any order. There are three general rules that comprise a storylet approach (Cox, 2021), not including the content selection architecture which helps determine how and what to surface to players (Short, A.E. 2019c); qualities or prerequisites: this is essentially data or rules the game tracks that tell the storylets what to do and determine when the content can play. State/content: each piece of narrative or storylet must have some sort of content, this is usually text or pieces of narrative but can be represented in a variety of ways, from sentences to decisions to statistics, and effect on state: this is the general change to the game state through its mechanical values, storylets will typically change these values through its content and in turn determine what other storylets are available and sometimes even effect the content of storylets through techniques such as procedural grammar (GDC, 2019b; Short, A.E. 2019c).
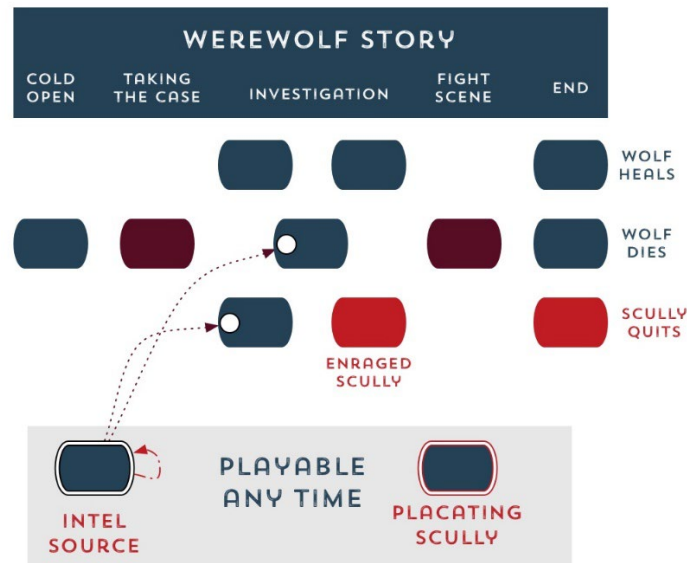
Figure 3: Storylet Example: Warewolf Story

The storylet design landscape has been growing more populated over recent years and we are seeing a variety of ways the storylet approach can be utilized in the narrative design space, proving its effectiveness and malleability (Kreminski and Wardrip-Fruin, 2018).

One thing that is common across all these approaches, which is also a key defining element of emergent narratives, is the players story and their dramatized retelling of it. It is suggested that the mere existence of a player's retellings of their experiences through play is a result of a successful game or system as the players found the experience compelling enough to do so (Eladhari, 2018; Kreminski, Wardrip-Fruin, 2019; Sych, 2020). The fact that players conduct these crafting exercises in retelling their experiences, especially in community spaces, is a sign that the player values not only their own experience but the co-creative and co-authoring potential that these games have and in creating their own player story they recognise the narrative potential the game holds and are drawn to it (Kreminski, Wardrip-Fruin, 2019). This implies that when events perceived by the player are structured in their head in such a way to produce their own narrative artefact, the system has provided a meaningful experience to the player and the evidence can be found and analysed in their player story (Eladhari, 2018; Kreminski, Wardrip-Fruin, 2019; Sych, 2020).

The goal for designers to achieve when working with emergent narrative, according to Kent Hudson, is to design it in such a way so as to provide ample opportunities for these player-driven stories to occur in which he describes as "A story in which the player makes **influential** decisions that **create** a unique **narrative** that is not prescribed by a designer" (GDC, 2018a). This definition maps cleanly with Self Determination Theory, a theory based in traditional psychology that describes a person's intrinsic need for happiness and wellbeing, as opposed to extrinsic alternatives, through the fulfilling of three key psychological needs – competence: the experience of mastery, autonomy: the universal urge to be agents of one's own life, and relatedness: the universal want to interact and connect with others around us (Lepper, Greene and Nisbett, 1973). This

theory has been utilised throughout the industry, contributing to the Player Experiences of Need Satisfaction theory, which through numerous data has demonstrated that these three intrinsic needs are at the heart of the players fun and valuing of games (Rigby and Ryan, 2007). It makes sense then why these player-driven stories are not only highly valuable amongst players but are so hard to achieve.
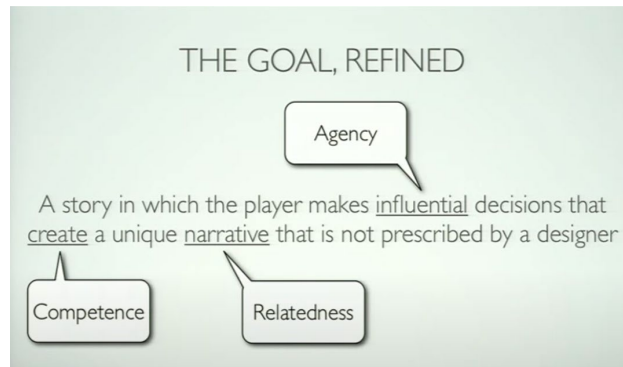

Figure 4: Player-Driven Narratives Goal

According to Hudson, one key reason preventing games from achieving this level of interactive storytelling is a misuse of the mediums potential to utilise agency (autonomy), resulting in what he calls "disparate agency", a situation where the players agency within the world does not align with the characters they inhabit and is instead relegated to the flashiest cutscene moments or equivalent events where control is taken away from the player. Rather games should utilise the strengths of the medium in such a way that allows the player to interact with the story through the games mechanics and systems by implementing the story itself as systems that dynamically change alongside the games systems, this allows for the story events generated through the game and the story events generated by the player to occur at the same level. By systemising the narrative alongside the gameplay mechanics and removing any player excluding mechanics and dynamics game designers can get closer to bridging the gap between gameplay and story and allow the player true "unified agency" within the world through the players actions and the characters/worlds actions (GDC, 2018a).

Furthermore, learning from narrative generation there are four key design problems designers are currently facing when attempting to create interactive emergent narratives. The first being the severe authorial burden placed on content creators of emergent narratives to create enough content for it to become emergent. The main solution to this involved the creation of fully modular content that can be reused and combinable in such a way to remain context-independent so that each unit of content represents individual things, making them highly flexible and allow for recombination. This is incredibly hard to achieve the more authored and plot centric an experience becomes. The second problem is compositional representational strategies, in that this means a strategy for expressing internal systemic processes on the surface to a user for interaction with expressive content. This is the hardest challenges befalling designers as not only does it need to be able to express all of the states of the system despite the systems high range of states, it needs to do this compositionally by deploying content units that collectively express all active simulation primitives and procedures, and until

designers have more mature ways of achieving this, they are forced to rely on authoring content units that are depending on each state of the system, making them less generalizable and thus inflexible.

The third design problem, as mentioned earlier, is story recognition, in that the systems that create player driven narratives from the results of a simulation currently have no way of categorising or telling apart the stories that they are trying to support, this essentially means the system itself has no idea when it has generated a narrative that has been or could be contextualised in the players head, and must have a way to recognise when it can and compile it before it can be understood. The final problem is for story support, which simply involves a system understanding what to do with a resulting storylike event sequence from its simulation. This should involve techniques that help to nudge the system towards desirable event sequences for the player to experience and thus helping to further surface emergent stories once it has been identified by the previous step. A good example to this can be found in Sims 2 or Crusader kings 3, where the player character can be given fears and aspirations in the former and lifestyle focuses for the latter that then help to organise event sequences to be shown to the player that not only fit these categories but can help the player realize the character they are creating a story for (GDC, 2020; Maxis 2004; Paradox Development Studio, 2020; Roguelike Celebration, 2020; Ryan, Mateas and Wardrip-Fruin, 2015).

To move closer to reaching the goal of consistent player driven narratives it is important to understand not only your players needs and imaginations, but that emergent narratives, even to the smallest degree, do not have to be relegated to the fields of narrative generation or simulation game. Player driven narratives can and have been achieved by the smallest of teams working outside the confines of simulation and within the constraints of other approaches such as procedural or systemic narratives. It is important not to discard the ideas of player driven narrative due to low budgets, team sizes or scope and instead developers can lean into the imaginations of their players to help them produce the stories they want. The purpose of this project is to examine these approaches and techniques developers can use at a small scale to help elicit player driven narratives and produce an artefact that is emblematic of the topics and approaches covered in this literature review to develop an applied and practical understanding of emergent narrative.

> "You must know what your audience will and will not like, and you must know it even better than they do. You would think that finding out what people want would be easy, but it isn't, because in many cases, they don't really know. They might think they know, but often there is a big difference between what they think they want and what it is they will actually enjoy." – Jesse Schell, The Art of Game Design: A Book of Lenses

CHOSEN METHODS OF STUDY

As this is a practice focused project, the methods of study will reflect as such. The chosen methods of study throughout this project to further explore these concepts in a practical and applied manner consist of three main methods conducted chronologically, the first feeding into the next:

Case Studies Through the Lens of Emergent Narrative: This consists of a few case studies conducted across a collection of games that have successfully achieved effective player-driven narratives through their systemisation of narrative. The focus of these case studies is on achieving emergent narrative through the practitioner contexts discussed in the literature review, with a tighter focus on games developed by smaller teams with limited resources.

Practical Development: My practical development consists of prototypes developed using the Unity and Godot game engines with the integration of a plugin for writers called Ink. These prototypes were iterated throughout the course of this project into a final polished gameplay prototype that utilises the techniques and methods discussed in the literature review and case studies to explore player-driven narratives.

Post-Mortem Reflective Practice: A post-mortem will be conducted on the final prototype as well as my process towards achieving it. This will deconstruct its design and discuss the prototypes successes and shortcomings and where it can improve regarding its systemisation of narrative. This will also help determine whether the prototype was successful in achieving its original goals and answering the research questions posed by this project.

CASE STUDIES

WILDERMYTH

Figure 5: Wildermyth Gamplay - Combat

Wildermyth utilises a novel concept the creative director, Nate Austin, has coined the "Library of Plays". This is a unique and relatively straightforward approach to

proceduralising hand-written content and spreading it throughout a game. He describes it, through allegory, as a book of plays that you can choose from in deciding what "play" to conduct that week. There is typically a list of pre-requisites the play must meet, such as time of year, themes, and characters, and when the section in the book that has a collection of the plays you are looking for has been found, then it will cast the characters in those plays depending on their information, and then those characters bring their personality to the play itself (BUas Games, 2021; Worldwalker Games, 2019B).

Wildermyth's content selection architecture works exactly like this, in which based on the chapter of the five-act campaign you are taking part in, whenever a group of heroes interacts with a piece of content that is supposed to start its comic book character focused decision sequences, the selection system will run through a large pool of hand-written events. It will sieve them through its player-character focused pre-condition checks such as if that piece of content should be shown this chapter instead of the next, if it has already been seen or if the event matches the personality traits and characteristics of the interacting character etc.

Figure 6: Wildermyths Event Editor - Setting Preconditions

It will then end up with a small collection of events to choose from, through some additional number weighting and random selection the system will finally decide on the event to surface to the player.

Figure 7: Wildermyth - Event Shown to Player

The players characters themselves then bring their own personality to the story in which will change some of the mannerisms and dialogue in the comic book event sequences based on their traits such as "Hot-headed" or "Romantic". This is a fantastic example of proceduralising several pieces of narrative content such as dialogue and event structuring through the characterisation of the players avatars determining the best content to surface to them (BUas Games, 2021; Worldwalker Games, 2019A).
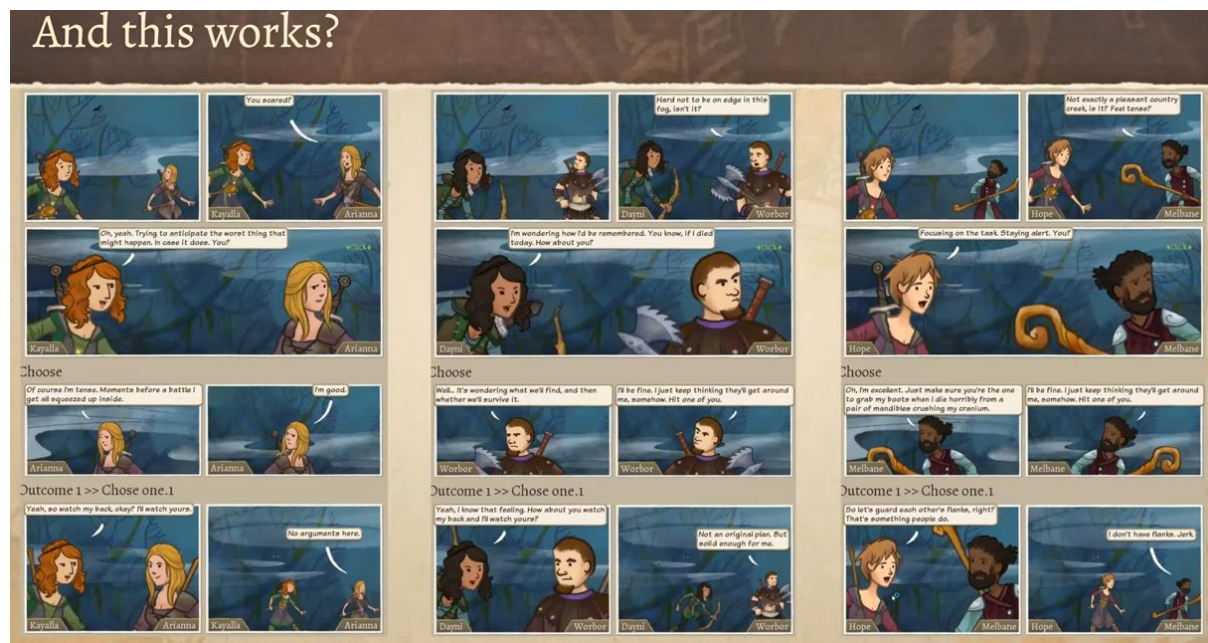

Figure 8: Wildermyth - Content Chaging Based on Interacting Character

It's because of this that Wildermyth is currently the best example of Ken Levine's "Narrative Legos" idea in action. Throughout each players campaigns their characters will increase and decrease their opinions of each other which in turn effects their combat

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performance with each other and, if characters with positive or negative opinions of each other determined by their traits perform a quest together, can inform the story delivery system further by providing content that explores the two characters growing or deteriorating relationship.
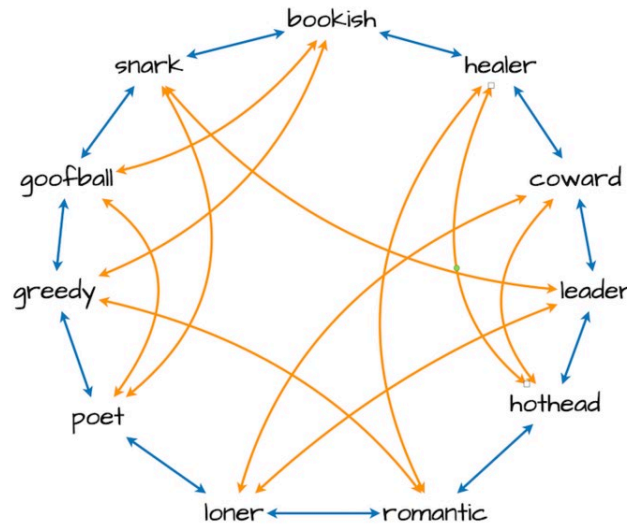
Figure 9: Wildermyth - Relationship Trait Compatability

Whereas Ken Lavine primarily explored this concept with NPCs in an open world developing opinions of the players actions which in turn influenced their decisions, the way Wildermyth has used this to influence the story surfacing techniques to better enable the player driven narrative is a microcosm of the idea and exemplifies the potential of these seemingly emergent scenarios when the player experiences them (GDC, 2016b).
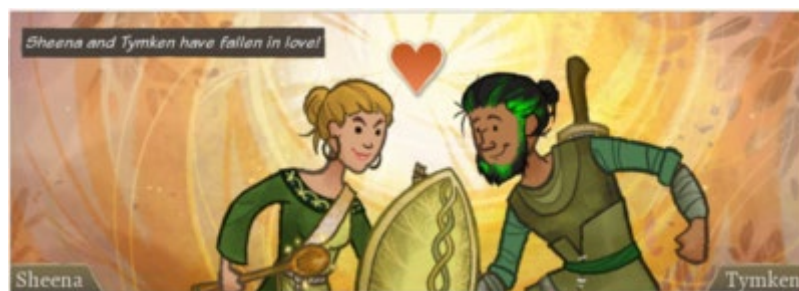
Figure 10: Wildermyth - Relationship Achieved

How Wildermyth systemises its narrative through character is what makes it so successful at producing these stories. Through mixing authored content with procedural and using the authored content to bookend the sections of procedural gameplay while focusing on the core theme and villainous event of that chapter it sets up opportunities through play for player-driven events to occur, which are then contextualised into the plot through the end of each chapter. It also successfully utilises the narrative legos concept while sectioning off its pseudo-authored narrative into chunks, surfacing that

content to the player based on their characters information and context in the story, leading to successful scenarios of player-driven storytelling in play (BUas Games, 2021; Worldwalker Games, 2019A).

SHROUDED ISLE

Shrouded Isle utilises a procedural character creation system in the perfect genre of "Who-Done-It" to create a unique cast of characters with specific characteristics every run of the game for the player to investigate in a "cult" management game. The purpose of Shrouded Isle is to weed out the non-believers and heretics of your cult to ensure, come years end, the great old god presiding over the island is appeased with at least one sacrifice a year. The player must interact with the games character-centric systems to learn the personality traits of their cults followers, as well as their vices and vindications, to best determine who to sacrifice (Kitfox Games, 2017).

What makes Shrouded Isle successful in their approach to emergent storytelling is their focus on character centric system interaction, where the town management matters less than the allocation of its people to specific roles based on their traits and characteristics, and interesting unforeseen events (content) can occur from these characters performing their roles. The determining factor to which content will be surfaced based on a character's allocation to a role is largely dependent on their characteristics, to which the system cleverly hides until the last moment (GDC, 2019a; Molnar and Kostkova, 2015; Roguelike Celebration, 2020).
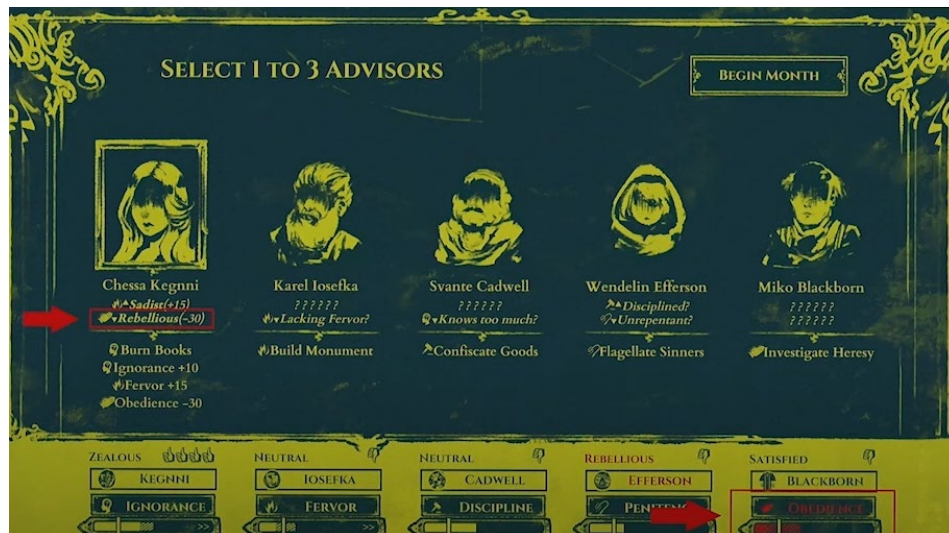
Figure 12: Shrouded Isle - Selecting Advisor Based on Trait

The primary resource the player must juggle and strive towards is information, specifically information about the town's inhabitants regarding their stats and characteristics. This information is hidden from the player throughout their run, and they must perform actions in the town to learn about this information and solidify it.

Figure 13: Shrouded Isle - Hiding Traits

To get the result of a person's characteristic it takes a long period of in game time, which incentivises making early and risky decisions relating to trusting characters with vital roles in the town, only for them to turn around and fail in their duty and make things worse, betraying the players trust in such a way that it becomes a memorable event; a retelling. These surprising encounters are what the developers call "emergent tragedies", and they believe this is what makes up the soul of their game (GDC, 2019a).

Figure 14: Shrouded Isle - Committing to Action based on Traits

Through centralising the players interaction with the games systems around the towns inhabitants and characters, to whom are procedurally generated with new characteristics and traits with each run, Kitfox Games was able to generate player-driven stories focused on expectations and betrayal. Furthermore, focusing the thematic elements of the game's narrative strictly around a specific genre such as an investigative dystopian who-done-it like Wildermyth with their high-fantasy focus, Shrouded Isle became an effective instrument in the player-driven story and emergent narrative experiment (GDC, 2019a; Roguelike Celebration, 2020).

SUNLESS SEAS

Figure 15: Sunless Sea - Gameplay

Alongside Wildermyth, Sunless Sea is one of the best examples of the storylet design approach while still retaining a lot of pre-authored control (Failbetter Games, 2015). Most of the narrative, including primary plot, is pre-authored, and cut up into chunks and distributed throughout the entire game for the player to find and stitch together themselves. How the player goes about stitching them together is informed by their

decisions made in the moments that pre-authored, handwritten chunks of story are surfaced to the player and the game state variables and mechanics that directly inform the story delivery system (GDC, 2016c).

Several gameplay mechanics are interwoven directly into the story, such as terror, in which the more horrifying sights the characters witness, and the darkest the depths they explore, the higher the terror instilled in those characters. This mechanic acts as a lever for the story delivery system to utilise in what content can be chosen to surface to the player. The higher a character's terror, the more horrifying and difficult the stories are that will have a chance of being shown.

Figure 16: Sunless Sea - Terror Stories

This not only allows the writers to then categorise each swathe of content to write under specific thematic banners, such as terror, but it allows the gameplay designers to easily be able to control and balance the difficulty of the game through its narrative based on where and when they determine the players terror could be the highest based on location design (GDC, 2016c; Kennedy, 2015). This also allows for stronger visibility of consequence, allowing the players decisions to feel more impactful in the world at large (GDC, 2016c).

Figure 17: Sunless Sea - Visibility of Consequence

This clearly communicates to the writers the individual buckets of content that need to be written for based on thematic ties, while also allowing opportunities for the gameplay to directly influence the narrative composition and pacing of the players-story, effectively bridging the narrative with gameplay through systemising it (Kennedy, 2015).

As discussed earlier, a key characteristic of emergent narratives is agency. Allowing the player to autonomously set their own goal within the games sandbox of game mechanics and then interact with them to achieve that goal is crucial to allow better emergent narratives to foster. Sunless Sea attempts this through a mixture approach of its procedural narrative structure and it's handwritten nature. The player can select a background to their captain, giving bonuses to skills that directly affect the story events that are thrown into the narrative pool later. The player can also characterise their captain even further by selecting from a list of ambitions as to what they want to achieve by exploring the city of Fallen London, which in turn determines the main story goals of the game and the victory condition while also affecting the players decisions in the storylets with that character.
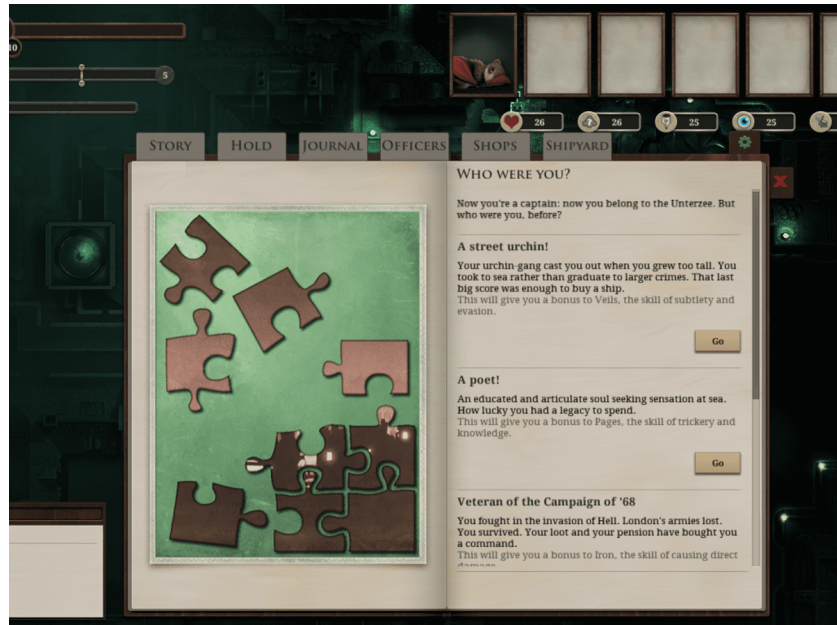
Figure 18: Sunless Sea - Choosing Main Story

By first posing an important, psychological question to the player about how that character functions, it instils the beginnings of a potential personality that could form in the players head, which is then built upon through authored content, spread out throughout the players play session, acting as key points of character development for the main hero, and everything in between working to develop the player-driven story.

PRACTICAL DEVELOPMENT

The prototype was developed using the Godot engine with plugins for Ink in a collaborative environment with each of the three other developers working on their own individual features of the overall interactive prototype. This project will focus on the features developed and directly relating to the research surrounding player driven stories and procedural storytelling.

DATAPAD/DIALOGUE SYSTEM

To start, there needed to be a type of narrative interaction system that would allow the player direct control over decisions made in narrative sequences. Utilising the tools available and scope the prototype makes use of a mixed multimedia dialogue system, utilising pieces of text through dialogue snippets and imagery regarding the characters talking, to deliver the short content payloads that would be spread throughout the prototype.
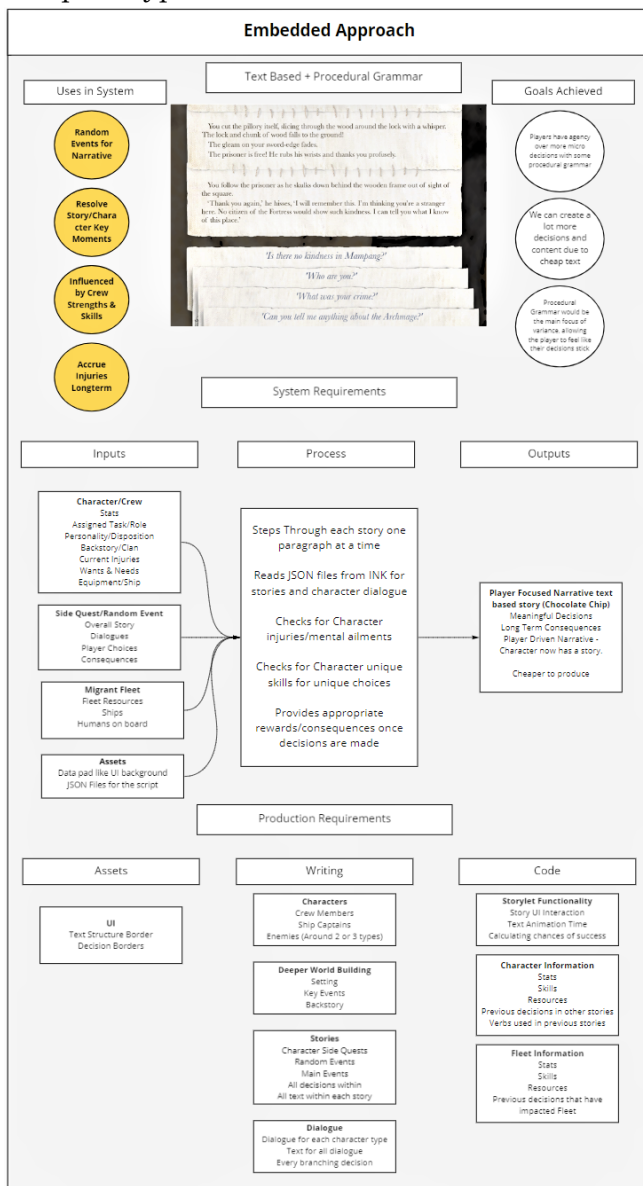
Figure 20: Embedded Appraoch Analysis
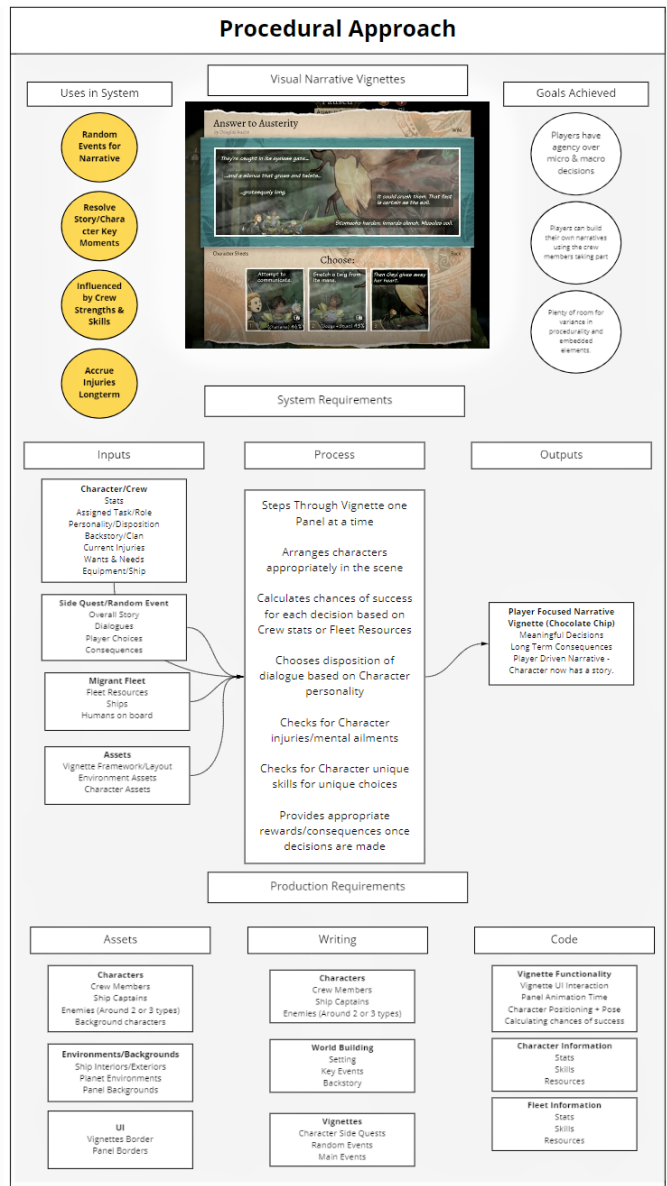
Figure 19: Procedural Approach Analysis

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The narrative interaction system the prototype makes use of is a form of an instant messaging system presented through a science fiction datapad. The design considered various mixed media message types that could be utilised to deliver types of narrative payloads, from choice messages to player and NPC messages to "Big Choice" messages which would showcase through imagery a story changing decision.
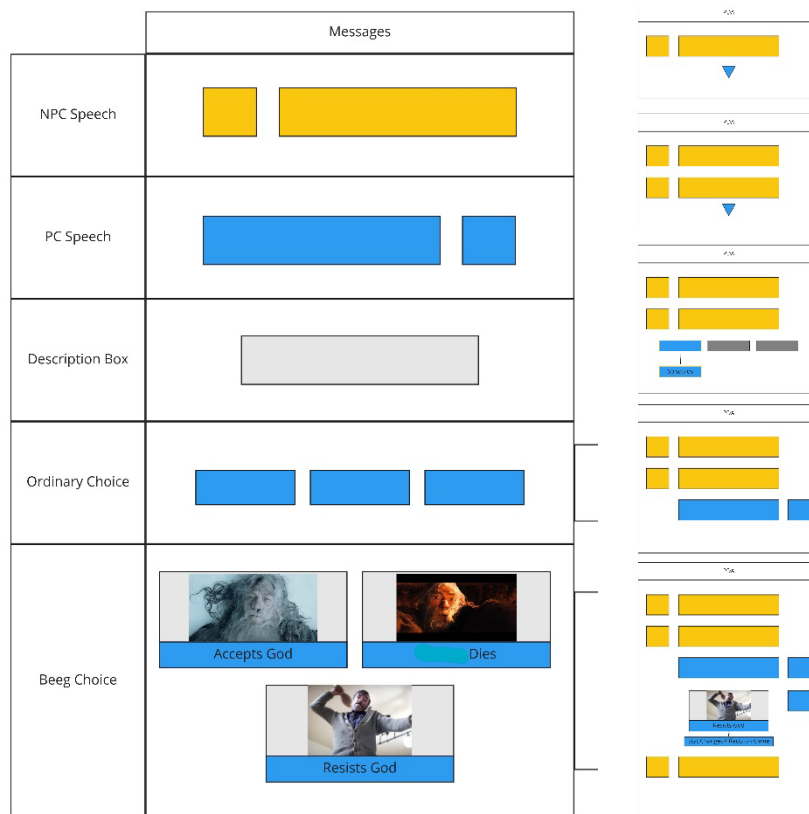
Figure 21: Datapad Design Flow

The design also considered mechanical information being directly utilised and affected by each storylet and how to best showcase this to the player such as character health, action points and oxygen and later it would include gameplay stats like strength, agility and intellect that directly affect the balancing of combat.
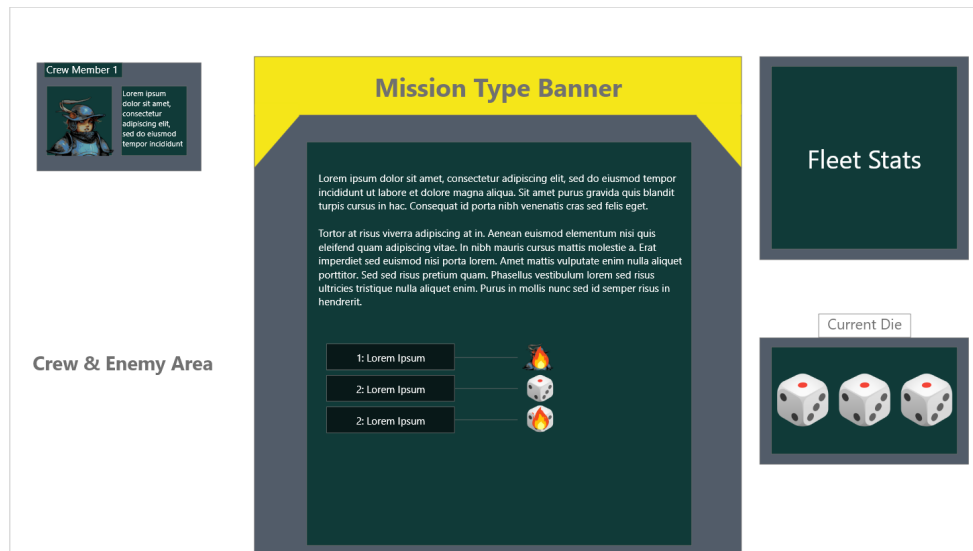
Figure 22: Datapad Design

Ink specialises in text-based content, with extra functionality extended for utilising images and the types of messages required to appear in the dialogue system through using tags. Once this system was implemented in engine it enabled the writer to state which character was saying which line and what profile picture/expression they were using when doing so through tags. This allowed for better workload distribution as writing procedural stories became easier, and through utilising a repository to store all mechanical story related information in a globals file, it better enabled the writer to easily effect game state variables through writing in Ink. Whenever a story is drawn it would then have an observer attached to it to signal whenever a variable changed and needed updated in the game state.
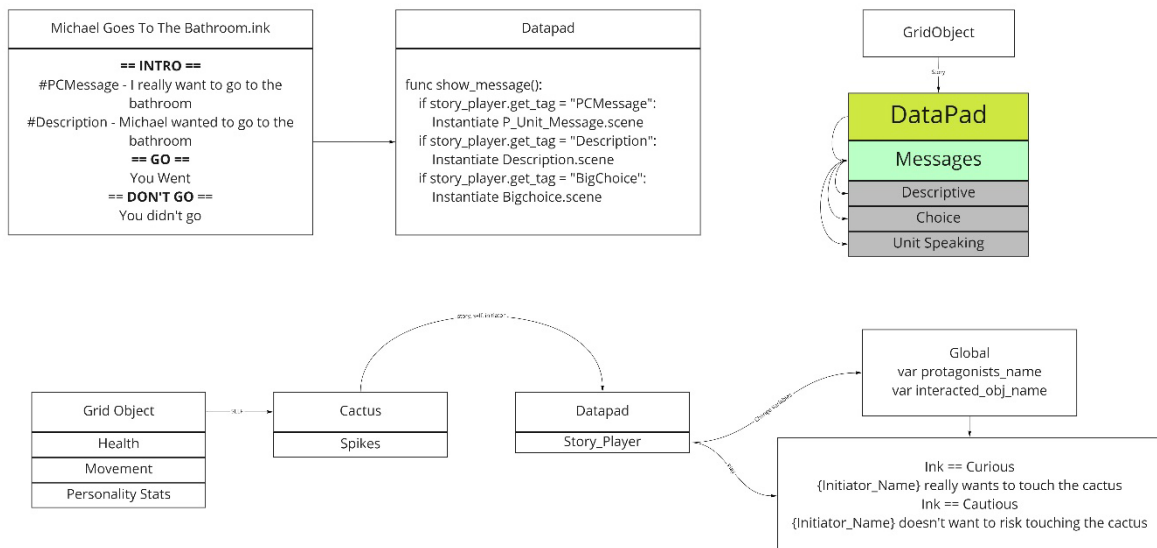
Figure 23: Datapad Implementation Design

Figure 24: Datapad Final Implementation

O.C.E.A.N STAT SYSTEM

To fully achieve the intended narrative design approach of creating a storylet system the prototype needed gameplay levers, mechanics that would help bridge the gap between the gameplay and narrative and act as balancing mechanisms throughout the combat and narrative. To achieve this research was performed, considering the sci-fi horror narrative themes the game was aimed towards, into various approaches procedural narrative designers use to achieve this. Chief among them being Narrative Legos.
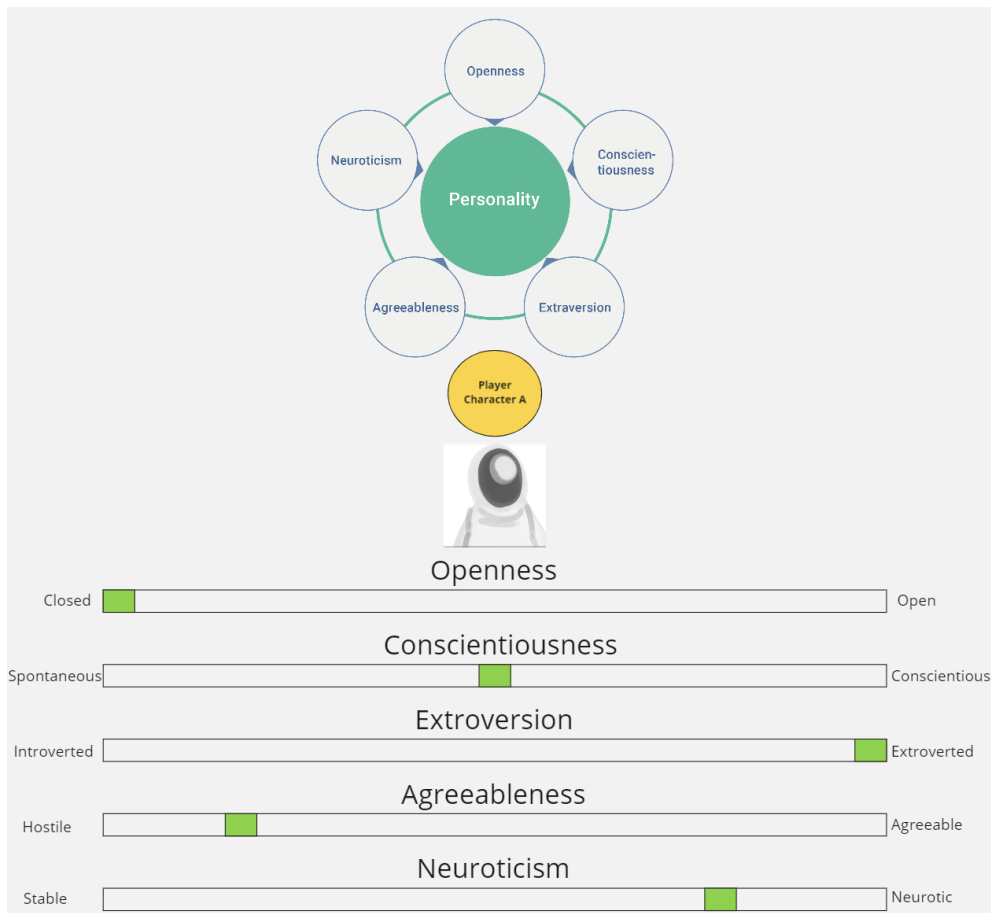
Figure 25: O.C.E.A.N System Design Illustration

To apply a similar framework to narrative Legos to the prototype there needed to be a few mechanics within the narrative system that could tie several things together through gameplay in a way which caused unexpected events to occur, such as relationship meters on NPC's increasing and decreasing based on their opinions of the players actions. Utilising research into behavioural psychology schemas, such as the Big 5 O.C.E.A.N model for personality modelling, a system was designed to centralise the narrative mechanics around the players characters that would in turn feed into the gameplay systems and the narrative delivery system.
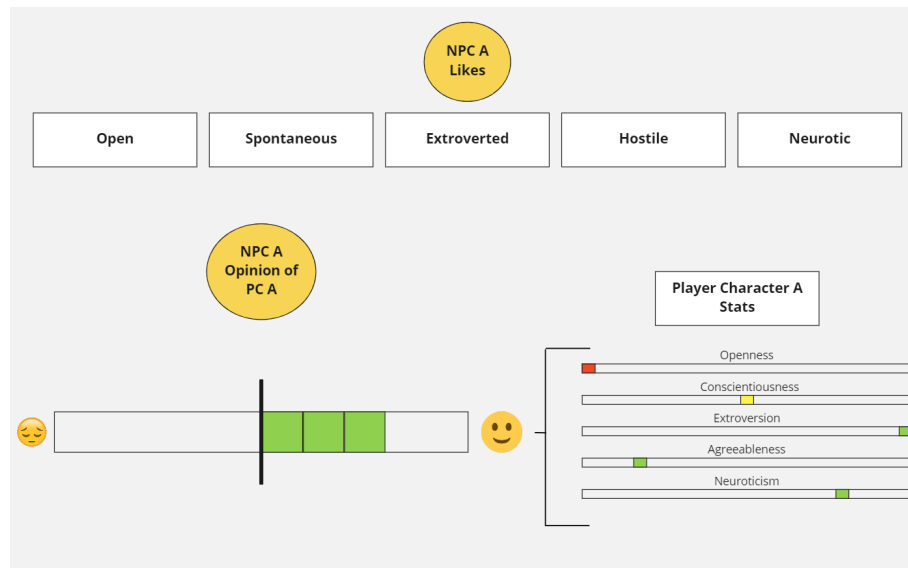
Figure 26: O.C.E.A.N Design - Narrative Legos

Through applying each element of the O.C.E.A.N model (openness, conscientiousness, extroversion, agreeableness, and neuroticism) to each player character as a stat and limiting the information the player can access regarding the system through obscuring exactly where each stat currently lies, the goal was to lean on the players imagination and help give them a tool to start developing their own characters personality in their heads. Through reducing fidelity and focusing on apophenic design the hope was that players would create stories in their heads about their characters through play, and eventually see something in the game that wasn't intended or designed to be there from the outset. Through testing it was found that while this was a good start it needed something more defining for each character based on where each stat lay.

TRAIT DESIGN

The O.C.E.A.N stat system evolved to distribute personality traits to players for each stat, allowing a player to build up to five different traits, each affecting gameplay and the narrative delivery system, feeding into the types of stories that could be showcased to that character depending on their developing personality. Each O.C.E.A.N stat would be sectioned into three unique traits, one for the lower end of each spectrum like closed-minded, one neutral and one on the higher end of the spectrum like open-minded for the openness stat. Through this lens the narrative system became a psychological exam, with each storylet providing a high-level scenario of events within the games fiction, with choices that dramatically change the event and outcomes, which in turn help to develop each character's personalities through their decisions and storylet outcomes.

Big 5 Trait	Example Behavior for LOW Scorers	Example Behavior for HIGH Scorers
Openness	Prefers not to be exposed to alternative moral systems; narrow interests; inartistic; not analytical; down-to-earth	Enjoys seeing people with new types of haircuts and body piercing; curious; imaginative; untraditional
Conscientiousness	Prefers spur-of-the-moment action to planning; unreliable; hedonistic; careless; lax	Never late for a date; organized; hardworking; neat; persevering; punctual; self-disciplined
Extraversion	Preferring a quiet evening reading to a loud party; sober; aloof; unenthusiastic	Being the life of the party; active; optimistic; fun-loving; affectionate
Agreeableness	Quickly and confidently asserts own rights; irritable; manipulative; uncooperative; rude	Agrees with others about political opinions; good-natured; forgiving; gullible; helpful; forgiving
Neuroticism	Not getting irritated by small annoyances; calm, unemotional; hardy; secure; self-satisfied	Constantly worrying about little things; insecure; hypochondriacal; feeling inadequate

Figure 27: Example behaviours for those scoring low and high for the big 5 traits

O.C.E.A.N Stat	Traits	Context (Description)	Segment	Player Archetypes	Gameplay System Effects	Narrative System Effects Trait Found	Trait Gained
Openness	Open-Minded	A preference for variety and a penchant for the experiential, an active imagination allures this one, prone to fantasies.	High - (15)	Fast - High Risk High Reward	-Single Target Blink ability that can teleport to any enemy/spawner on the map -Long Range Dash Towards any object in the field -Enemy Aggro Increased	Storylet Draw Chance Increased	Storylet Draw Chance Decreased
	Cautious	A balance between the conventional and new age is the way forward, eyeing everything under the thin venear of suspicion and scrutiny.	Neutral - (0)	Medium - Balanced Gameplay	-Base Level Ability + Minor Stat Improvement -Max Movement AP Decreased -Max Ability Action Points Increased	Storylet Draw Chance Increased	Storylet Draw Chance Decreased
	Grounded	Closed of mind, an interest in life's cultures alludes this one, heart-bound and unnatentive to ones feelings.	Low - (-15)	Slow - Low Risk Low Reward	-Construction Ability focus with interactable -Utility AOE that slows movement speed but increases HP -Max HP Increased	Storylet Draw Chance Increased	Storylet Draw Chance Decreased
Conci#entiousness	Compulsive	Every action sieved with deliberation. An accurate fellow.	High - (15)	Slow - Low Risk Low Reward	-Construction Ability Focus -Utility Ability Focus -Basic Attack Damage Increased	Storylet Draw Chance Increased	Storylet Draw Chance Decreased
	Easy-going	Lax of thought but uncompulsive. A mind unladen with duty yet still dependable.	Neutral - (0)	Medium - Balanced Gameplay	-Base Level Ability + Minor Stat Improvement -Max Ability AP Decreased -Basic Attack Damage Increased	Storylet Draw Chance Increased	Storylet Draw Chance Decreased
	Careless	Thoughtless malcontention broils at the seams.	Low - (-15)	Fast - High Risk High Reward	-Crowd Control Ability that now effects Friendly units -Long Range dash that destroys tiles behind it -Max Health Increased	Storylet Draw Chance Increased	Storylet Draw Chance Decreased
Extraversion	People Pleaser	Leaning on the gragariously inclined, other souls are where your happiness lies.	High - (15)	Slow - Low Risk Low Reward	- Crowd Control ability that uses Silence - Defensive Buffs for allies - Enemy Aggro Increased	Storylet Draw Chance Increased	Storylet Draw Chance Decreased
	Reserved	Treading neutral ground in society, you hold your cards close to your chest.	Neutral - (0)	Medium - Balanced Gameplay	Base Level Ability + Minor Stat Improvement	Storylet Draw Chance Increased	Storylet Draw Chance Decreased
	Solitary || Aloof	Aloof, society taught you nothing you couldnt learn yourself.	Low - (-15)	Fast - High Risk High Reward	-Construction ability that builds teleporter for team to use -Line ability of traps -Max Movement Speed Ap Increased	Storylet Draw Chance Increased	Storylet Draw Chance Decreased
Agreeableness	Agreeable	A trusting and tender-minded individual, ripe for maniupulation.	High - (15)	Slow - Low Risk Low Reward	-AOE Utility Abilitiy with large range but low effect (buffs units defence or health around him) - Large AOE ability that builds out map but stuns enemies in it's effect -Increase Max HP	Storylet Draw Chance Increased	Storylet Draw Chance Decreased
	Detached	A straightforward thinker, striking a fine line between blind agreement and hostility, but still relativley compliant.	Neutral - (0)	Medium - Balanced Gameplay	Base Ability Base Attack Damage++	Storylet Draw Chance Increased	Storylet Draw Chance Decreased
	Uncooperative	A rather spikey pre-disposition towards others.	Low - (-15)	Fast - High Risk High Reward	-Line tile destroying ability -Line spawner destroyer. For each spawner destroyed increase Team damage -Max Movement AP increased	Storylet Draw Chance Increased	Storylet Draw Chance Decreased
Neuroticism	Unstable	Emotions are an untamed beast subsceptible to mood swings and sudden changes of behaviour.	High - (15)	Fast - High Risk High Reward	-AOE tile destroying ability -Single Target Multi-Blink that leaves speed buffs behind -Enemy Aggro Decreased	Storylet Draw Chance Increased	Storylet Draw Chance Decreased
	Balanced of Mind	Relativley unemotional towards lifes quandries, a balanced psyche, despite the odds.	Neutral - (0)	Medium - Balanced Gameplay	-Base Ability for each character -Max Health increased -Enemy Aggro Increased	Storylet Draw Chance Increased	Storylet Draw Chance Decreased
	Self-Aware || Secure || Unemotional	Mentally fastened, unladen with lifes burdens, and naive all the same.	Low - (-15)	Slow - Low Risk Low Reward	-Construction ability focus that builds ally defence -Crowd Control abilitiy that focuses on blinding enemies -Damage vs Dimensional Beings Increased	Storylet Draw Chance Increased	Storylet Draw Chance Decreased

Figure 28: Trait Design

There is some contention over the use of reductive personality hierarchies to determine the behavioural characteristics of an individual, specifically in using the big five to determine whole personalities or future behaviours. Instead, it is suggested to use a combinatorial approach, in utilising character traits derived from whatever metric is

being used to gauge personality by asking context specific questions relating to said metric. It should then be taken further through assessing aggregated behaviours averaged over time relating to a trait before it is granted to an individual to better determine characteristics (Diener et al., 2019). Through this the "soft traits" concept was developed, in which players would at first be shown the trait they are about to unlock after a few decisions made with an O.C.E.A.N stat to give them a chance to move away or closer to that trait, allowing for a process of aggregating their behaviour over time before granting a hard trait. This soft trait would then inform the content delivery system in that it would help prioritise stories relating directly to that O.C.E.A.N stat to provide the player more opportunities to make decisions regarding that trait.
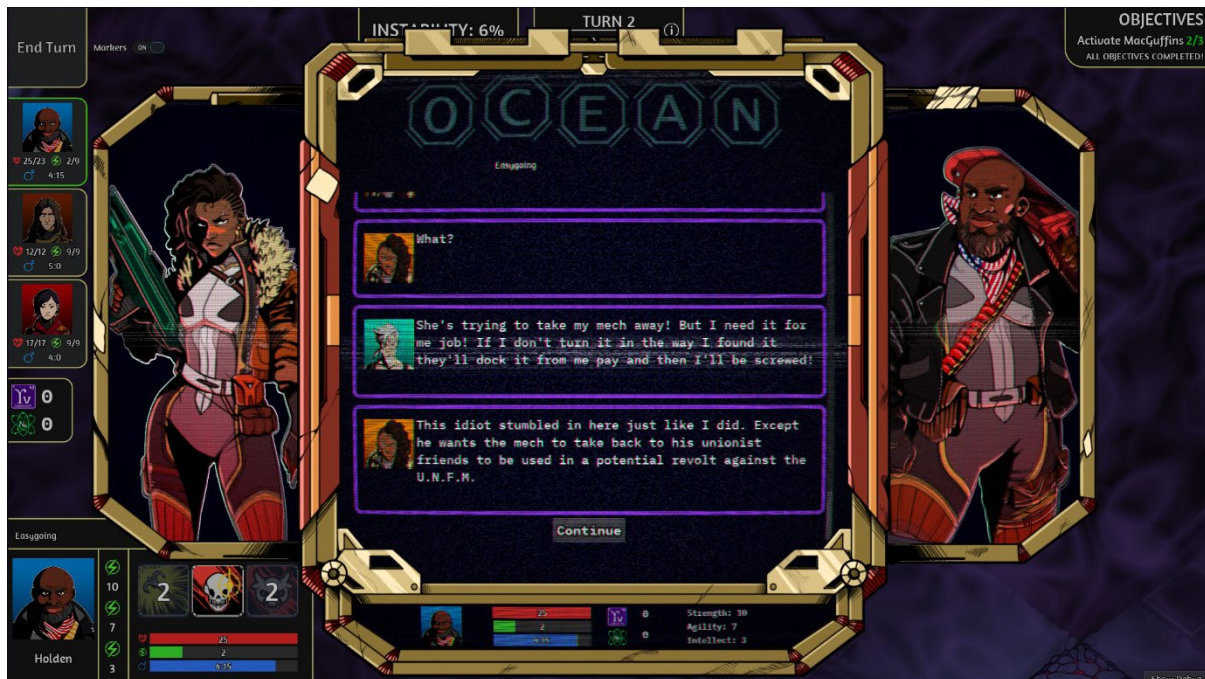
Figure 29: Trait in Use

The trait system was also designed with orthogonality in mind. Each trait was designed to have observable effects on the mechanics of the game through linking with game state variables to allow character personalities to have effects on the game state and help drive the player story. To avoid the ten thousand bowls of oatmeal problem, in that procedurally generating thousands of variants of a mechanic or stat in tiny incremental ways means nothing compared to observable differences in mechanical traits, the traits were designed to affect character abilities and even change them over time (GDC, 2018b). Each trait was also designed to effect game state variables such as health, damage reduction, crowd control etc.

Narrative orthogonality was also preserved in that traits that do not necessarily correlate to each other should still be able to be paired together as that's what ends up creating unique and conflicting personalities which can produce unique effects in the narrative. Decoupling traits to make them more orthogonal can lead to interesting personality(s) with intricate complexity like the people you meet in real life (GDC, 2019a; Roguelike Celebration, 2020).
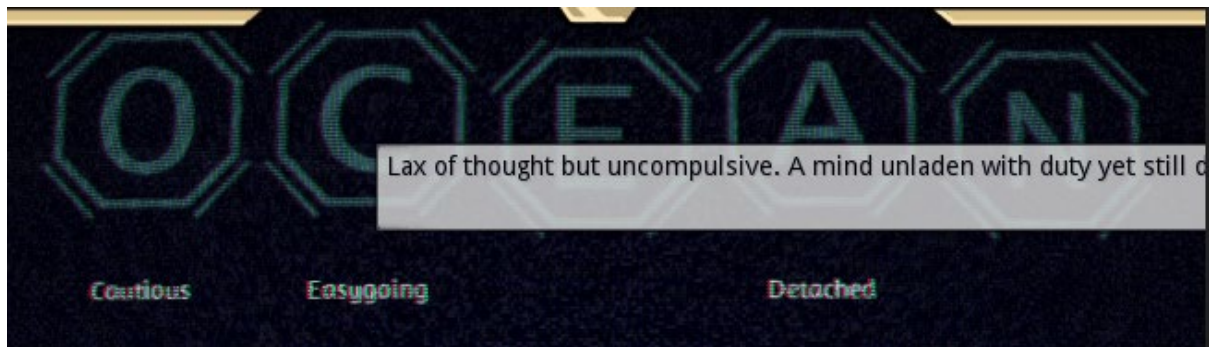
Figure 30: Orthogonal Traits

NARRATIVE DELIVERY SYSTEM

The narrative delivery system was designed to read in various game state variables, as well as story variables, to best determine the most appropriate content to surface to the player as they played. This was initially designed to be handled by "The Director", which would take in each Ink story written as a separate gameobject called a "Story" object, and through the Director the narrative designer would simply adjust the precondition variables of each story in editor to seamlessly allow the narrative designer to balance and tweak story draw chance variables without having to touch code. This approach also would allow the designer to add weighting to specific stories depending on the precondition reached, for example if a characters oxygen was low then stories that have a chance to positively affect oxygen would be granted a higher weighting to be drawn at the next chance a story is shown, or if a character has specific traits, such as a soft trait for open-minded, then stories containing open-minded decisions should also increase their weighting.

Figure 31: The Director

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Through this, the story selection system should produce a small bucket of content it can choose from to play, and from that bucket it would select randomly between them, with more weighting being added to the stories with a higher weighting assigned to them by the designer based on how close they are to their precondition check.

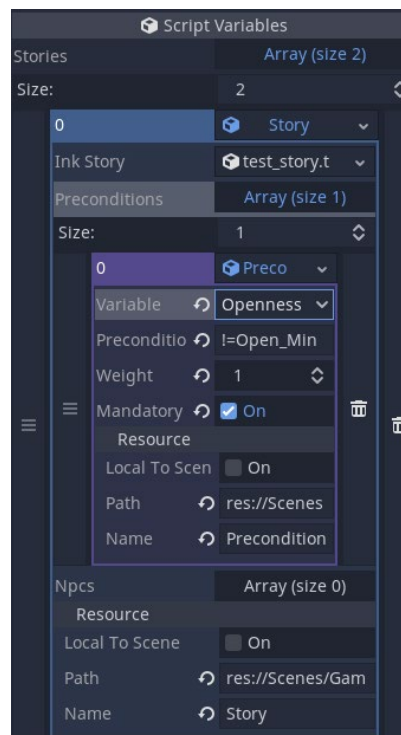| Type	Pre-Condition	Variable/Calculation	Priority	Weighting
Traits	Soft Traits	Ocean Stat Amount && Current Soft Traits	High	2
	Hard Traits	Ocean Stat Amount && Current Hard Traits	Medium	1
	Strongest Trait	Trait Counter > Other Traits	Highest - Takes Priority Over Other Traits	3
Game State Variables	Unit Health	Unit Health <= 0 || Death Counter	Low	1
	Units Available	Death Counter	Low	1
	Objectives Currently Active	Objective Counter <= 3	Medium	1
Intensity/Section of Demo	Low Intensity	Tiles < 25	High	2
	Mediumn Intensity	Tiles > 25 && < 50	High	2
	High Intensity	Tiles > 50	High	2
Storylet Decisions	Non-Continuation	Null	Medium	0
	Continuation	Connected Stories String Variable/Dictionary	Highest	3

Figure 32: Narrative Delivery System Design

The final systems implementation didn't reach this level of depth however and was scaled down to accommodate a burgeoning scope and limited timescale due to the story content required to make most condition checks relevant. Instead, the implementation achieved a simpler approach to checking the players currently achieved trait as it's main precondition, and all other preconditions of game state and story variables such as health, oxygen, action points and character stats all being handled in each story, showing unique chunks of content to the player for each story depending on the current condition of the player character interacting with that specific story.

```
Don't matter. Look can you fix wagner? Keeps runnin' in circles, A'fink he's on the fritz again, could you 'elp?

    +[Provide Some Resources $agreeableness]
    We are not in the position to adopt him, but we can spare some resources.#message:Player_Character
    ->provide_resources

    +{character_intellect >= 7}[Suggest Potential Fix $conscientiousness]
    I've seen one of these before #message:Player_Character
    ->suggest_fix

    +[Adopt Wagner Temporarily $openness]
    I could... take it off your hands for a bit? Maybe he just needs a walk.#message:Player_Character
    ->take_doggo
```

Figure 33: Ink Structuring Conditional Choices

```
===provide_resources===
~agreeableness = agreeableness + 3
Oh thats just wonderful. 'Ear that wag? They's gonna give me anything I need to fix you right up #message:NPC #dialogue_image:Engineer

Aren'cha
|
...#message:Player_Character

Neutronium should help towards some of the be'avioural problems but it will take some time, although some unobtainium should fix 'im
    right up. At the very least some oxygen will help buy some time to find a solution.#message:NPC #dialogue_image:Engineer

    +{unobtanium > 0}[Give Unobtainium $agreeableness]
    Here's some unobtainium, I hope it will make him better.#message:Player_Character
    ->give_unobtainium

    +{neutronium > 0}[Give Neutronium $conscientiousness]
    Here's some neutronium, hope it helps. #message:Player_Character
    ->give_neutronium

    +{character_oxygen > 0}[Give Oxygen $conscientiousness]
    I can't spare the other resources, but I can share some of my oxygen, hopefully that buys you some time.#message:Player_Character
    ->give_oxygen

    +[Give Nothing $neuroticism]
    I can't spare anything right now.#message:Player_Character
    ->gave_nothing
```

Figure 34: Ink Further Branching Choices

This approach allowed the stories to be sectioned into several branching paths, each
diverging depending on the players decisions and succeeded based on stat checks for the
gameplay stats like health and strength. Each success and failure providing unique
content and outcomes with rewards or penalties depending on their choices. No matter
the punishment the player would always be working towards incrementing or
decrementing their O.C.E.A.N stats, in turn providing them more traits to help
determine what stories to play. This meant the drawing of the story was much less
contextually aware, but still allowed players opportunities to build characters depending
on the traits they have, pointing them in the direction of other traits.

FINDINGS & POSTMORTEM

For complex simulation games, or similar games with a heavy mechanical and systemic scope, techniques that help reduce fidelity around otherwise expensive to simulate aspects of the game in such a way that allows the player to co-author their experience during play can be an effective approach to emergent narratives. By allowing the player to observe something in the systems interaction that wasn't intended by design but is still extrapolated by the player and parsed through their narrative sense making, can allow the designer to bridge the gap between the black box systems and the players themselves while focusing their scope on agency through gameplay to fulfil the narrative delivery. This can allow the designer to lean into their players imagination to help them tell their stories through the interaction of systems containing purposefully low fidelity by design concepts, such as the characters in Rimworld or the Sims language otherwise known as Simlish (GDC, 2020; Sylvester, T. 2013A; Sylvester, T. 2013B).

When the technique of Apophenic design is paired with an intent for Autonomy through play mixed with an approach to storytelling that allows the player to piece together their story through their gameplay experiences such as reparative play, or narratively enriching moments through procedural approaches to storytelling like Narrative Legos or Storylets, these techniques can coalesce into an artefact that can effectively produce player-driven stories (Tynan Sylvester 2013B). Enriching these stories further requires unifying them with a specific and focused narrative theme that can drive the game forward while helping to reduce scope to ensure enough content can be produced for more pre-authored systems, such as storylet selection systems like the Library of Plays approach in Wildermyth. Or for more simulation focused systems allowing the player to specify early on the types of character they are intending to build, such as the Ambitions in Sunless Sea (Failbetter Games, 2015) or Lifestyle Focus trait system in Crusader Kings 3 and Sims 4, can have the same effect while helping to reduce scope through focusing on the intended themes (Maxis, 2014; Paradox Development Studio, 2020).

Through systemising a games narrative with an approach that integrates it seamlessly into the gameplay systems, such as the Storylet approach, a games narrative can be structured in such a way that accommodates contextual awareness to the gameplay systems current state during play. Providing a more relevant narrative experience to the player depending on n their gameplay and narrative choices. Through sectioning and spreading out narrative content and engineering a system that listens to the pre-conditions of that content influenced by game state information, the story can be surfaced in such a way that feels like the players own narrative based on their decisions that playthrough, allowing the player to come away from their experience with more meaningful retellings of events that felt unique to them.

Finding ways to centralise the main story and primary storytelling mechanics around the players characters better enables them to tell their story within the fiction provided. From reviewing the current practitioner landscape this can be seen as one of the most effective approaches that can help successfully achieve better player-driven stories, from Sims utilising extrapolative narrativization through the narrative sense-making of the mechanics at play that help the player, through reparative play, piece together their

own narrative for their characters and pursue it for more narrative enrichment. To Shrouded Isle and Sunless Sea centralising the core of the narrative and gameplay mechanics around the player character and other NPCs utilising traits, abilities, and stats and then controlling the information horizon of such mechanics. Further using them as levers in the narrative delivery system to provide more contextually aware procedural story content that help to further develop the player-story through surfacing content creating an observable change in the game state upon completion. To Wildermyth's approach, utilising Narrative Lego's to centralise the focus of story content around characters in the players party and then use the outcome of that content to better inform their "Library of Plays" story delivery system to deliver unique and variable events that change key aspects such as expressions and diction based on the characters taking part.

Feedback gathered through the character focused O.C.E.A.N, traits and Datapad systems for the creative output of this project suggests that under specific gameplay circumstances, player driven narratives where able to unfold when the procedural storylets seemed more contextually aware of the current state oof the game. This was aided by further iterations of the story delivery system. Players typically would come away with their own interpretation of some events through retellings when they were confronted with stressful scenarios and difficult decisions while being pressed for time. During these moments of emotional intensity, whenever a story was interacted with the player would pay greater attention to the detail of the story and notice connections to their gameplay experience unplanned for in design, allowing them to immerse themselves into the experience further and create stronger retellings. When asked to speak aloud during play they would typically observe connections to the gameplay from the narrative depending on the gameplay context the narrative was shown, and when certain information was left obscure the player would usually work to fill in the blanks through their imagination to help bridge the gap.

These moments, while rare, were typically quite poignant for the player and would often leave them wanting to try again and see other permutations of similar situations. Further feedback suggests the O.C.E.A.N and trait system requires a little more information to help bridge the gap however, as players rarely understood which way a stat was being affected. The moments of observed emergent narrative also only occurred on new players who had not played the prototype before due to the low amount of content produced. Feedback suggests that making the content more replayable through procedural text or greater contextual awareness through more relevant pre-conditions would have reduced the overuse of the same stories becoming noticeable.

As found through research and solidified through practice, one of the primary design problems for achieving emergent narrative through player-driven stories and procedural content design is the sheer scope of content required to make it function differently enough each time to produce different results for the player. Focusing more time and effort on designing ways to make content procedural replayable, while interchanging specific aspects of that content to make it different enough every time is key to reducing the content burden while still providing a compelling experience for the player.

CONCLUSION

In conclusion, through the research surveyed, case studies completed, prototypes produced, and findings gathered there is a clear want and need for stronger player driven narratives in games, by both practitioners and players, to produce compelling emergent narrative scenarios stronger than traditional plots pre-authored from start to finish.

To achieve this, game designers need to work closely with their narratives to systemise them in the same way they would systemize gameplay mechanics. Designing with the intent to achieve greater autonomy in the game's narrative through its gameplay mechanics. There are various tools and techniques out there that can achieve this, from storylet approaches to Narrative Legos to Apophenic and Reparative Design. When used in conjunction with each other greater results can be yielded.

However, more work must be done towards finding techniques to reduce the scope of content required to achieve player-driven narratives and emergent storytelling. There are successes in this already, such as Wildermyth's Library of Plays and Event design approach. With more experimentation being done in this field more techniques and tools will become available for practitioners to use in their approaches to emergent narrative, and with a reduced burden of scope, these techniques will become more accessible to developers.

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Emergent Storytelling/Narratives: Emergent narrative is the result of the players interpretation of a collection of events. It is the macro-goal achieved when a unique narrative has emerged from the game's systems/environments interacting in such a way that, when observed by the player, turns into that individual player experience. It is unique to that player and is something that, when parsed through the individual players current emotional circumstances and extrapolation and interpretation of events, turns into the players' unique story, and thus has become an emergent narrative. This is incredibly powerful as when individual player stories are collated by communities and shared they evolve from a singular story and become a discourse to which further agreed upon interpretations through the community can emerge regarding the games themes and events and can lead to entire community driven works of fiction. Look no further than *Blaseball* and *Dwarf Fortress* to see this in effect (Gordon, 2021; Molnar and Kostkova, 2015).

Procedural Storytelling/Narratives: Procedural Narrative is one of the micro-design processes developers can choose to utilise that, when paired with contextual gameplay systems and mechanics, can help achieve emergent narratives. When a narrative becomes procedural it simply means it has been cut up and separated into chunks and rearranged and spread out in any way the designers see fit (Petit, 2013). With this approach story elements, ranging from dialogue lines to snippets of text, to wholesale characters, become one of the many of the games assets that gets churned through its systems. Verbiage surrounding this topic is getting more and more defined and practitioners and academics are even arriving at potential specific terms that can be utilised when referring to these elements, one such term is Emily Shorts "Storylet", coined by Failbetter Games. This is detailed in the Literature Review below.

Narrative Generation/Story Generators: Narrative Generation is an approach to story and content creation that utilizes procedural generation techniques within the story itself, not just in the areas surrounding the story. It is not necessarily a practice that involves creating the actual content by hand or through authorship, but instead creating it algorithmically. The technique for procedural generation is used popularly throughout the industry within many specialisms of development such as level generation in Minecraft. The use of Procedural generation techniques within the actual creation of stories however, especially in more plot driven games, is still relatively unexplored, resulting in small splinter groups of academic practitioners experimenting with narrative generation techniques alongside narratology research to produce completed stories with salient plots (Mason, Stagg and Wardrip-Fruin, 2019), and while they have been successful in their exploration to some extent, it has yet to produce interesting and meaningful stories for a user to interact with through a game. (Miller et al., 2019; Mason, Stagg and Wardrip-Fruin, 2019; Stockdale, 2016)

Player Driven Stories/Retellings: Retellings are the players unique narrative artefacts comprised of their most significant moments experienced through play that are then told to other people. They typically arise when a set of seemingly random or unconnected events occur that when interpreted by the player, can be organised

mentally into a coherent structure usually supported by their knowledge brought to the game and the games thematic ties, and then becomes a story perceptually unique to that player which comprises their experience. These can range from the smallest of conversations shared amongst players about their experiences in online forums to a player having experienced events that when structured by the player become so compelling that when shared with communities warrants analysis and commentary on the players story itself (Eladhari, 2018; Kreminski, Wardrip-Fruin, 2019; Sych, 2020). A system designed to elicit unique retellings is a system that puts the player in the driver seat of their own story and thus becomes player driven (Petit, 2013).

Story Selection Architecture/Story Sifters: Story sifting is typically used best in conjunction with narrative generation, in which the simulation of a story world produces a large catalogue of events that need to be tied together in some way and shown to the player. Story sifting is a highly sophisticated approach to identify and separate content that holds narrative significance and then surfacing that story content to the player, as Max Kreminski describes it best as *"a system that assists players in the process of narrativizing their play experiences by helping them locate sites of potential narrative interest in a larger simulated storyworld"* (Kreminski, Dickinson and Wardrip-Fruin, 2019). This area of interest is one of the key design challenges facing emergent narrative and has yet to see a lot of work done to resolve it. A story sifter primarily serves to answer the problem of "Story Recognition", where a system has no way of identifying coherent stories from the large pools of data they produce through simulation and is one of the primary techniques utilised in narrative generation currently. Aside from story sifting there is "Story Selection Architectures" that are used to surface specific story content to the player to a much less granular level in procedural narratives, and simply refers to the rules and pre-conditions a system uses to best decide what modular story content would be best to be shown to the player at this current time while still retaining the context of the game state. Both terms can technically be used interchangeably as a story sifter is a sub-type of a story selection architecture but through my findings have found it to primarily reference a key issue plaguing emergent narratives through simulation games, whereas story selection architectures are used in reference to storytelling systems designed to surface modularised pieces of authored content to players. (Kreminski, Dickinson and Wardrip-Fruin, 2019; Mason, Stagg and Wardrip-Fruin, 2019; Ryan, Mateas and Wardrip-Fruin, 2015)

<blockquote>[It is] described as a "bottom-up" approach to narrative design — their job is to "find and bubble up" the interesting stories that fall out of the player's interactions. – Max Kreminski</blockquote>