Wind's End

An Experiment in Interactive Story Generation

Interactive Media and Game Development

**A Major Qualifying Project Report
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in partial fulfillment of the requirements for the
Degree of Bachelor of Science**

by
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Abstract

Wind's End is an experiment in interactive story generation in which stories are created from sequences of independent yet often cohesive non-player character goals. A Drama Manager controls the evaluation of these goals within a given frame of increasing dramatic intensity. The player may interact with non-player characters through combat or an objective-based conversation system, and affect the story as desired. The goals for this MQP were to implement interactive story generation and to create an engaging, re-playable game.

Contents

1 Introduction

Interactive story generation, the concept of creating stories dynamically based on human interaction, has eluded game developers, who have instead implemented linear or branching storylines. This project was intended as an experiment in interactive story generation, where an environment was created in which non-player characters have goals which affect the state of the world upon completion, thus facilitating complementary goals and creating logical story progressions. Additionally, the player is capable of interacting with non-player characters through combat and conversation in the interest of altering the story, but is not forced into making unwanted choices.

The aim of this project was to create a game which immerses the player in the story by allowing the player to choose their actions within a context and provides engaging stories which differ from session to session thus inspiring replay. The team attempted to design and implement a solution to the challenge of interactive story generation by both improving upon the methods of the project's predecessors and analyzing the ideas provided by researchers in the field of artificial intelligence.

This report will first discuss the design of *Wind's End*'s gameplay, art, story, code, and the team's organizational technique, and then its implementation and how it differed from the game's initial design.

1.1 Related Works Commentary

During the first few weeks of the project, the team researched interactive storytelling to gain a better perspective on its meaning and where it has been implemented thus far. The following summaries explain and interpret the media researched, and relate them to the team's initial ideas with regard to this MQP.

1.1.1 "Partner Technologies" Summary

Within *Partner Technologies*, the way in which jazz musicians work off of one another while improvising is used as a metaphor to explain that partner technologies evolve with their users, acting as servants to their masters who alter the technology through their own actions. Several paradigms are described, each with its own method of contributing to the overall concept of partner technologies, such as allowing the user to act as he pleases within defined constraints.

Because the development of partner technologies is often embraced by those in the field of AI, two applications of the concept, which happen to be of great interest for this MQP, are often ignored by researchers: keeping the user's interest and introducing new, interesting material, which can help to achieve the former.

The rest of the reading elaborates on several examples of partner technologies, such as a drawing partner or a typing partner, which work together with the user to achieve a goal. To effectively implement these examples the authors suggest that the user and computer should be on equal levels, challenging, aiding, and working off of each other, thus allowing for a more rewarding experience and result.

1.1.2 "Narrativity in User Action" Summary

This paper observes the subtle differences between what narrative is seen as and what narrative actually is. First it is important to indicate that narrative is usually viewed as an action, thus in order to describe what narrative is and what it does, narrativity must be defined. Nath's definition of narrativity can be simply shortened to say that narrativity is more about context in which the given narrative is received and to whom and less about what the narrative actually contains. Nath continues to write about the different parts of narrativity which should receive the most attention such as temporal, emotion and subjectivity.

Although the Interactive Story Generation MQP could benefit from all of these subtopics of narrativity, the most helpful topic would be the temporal part of narrativity. This would help the story stay on a very focused timeline, without knowing what is to come but instead focusing on the player's goals. This would also fit in nicely with the project because it could help develop the scene selection generation.

1.1.3 Conversation Systems Found In Games

One of the main features in Wind's End is the different conversation system. Although many games are in existence, most do not use an emotional topic system. Some games which do use a system similar to Win's End are Fable 2 and the Sims.

Wind's End's conversation system starts when the player gets within range of an artificial intelligence form and selects the unit to use their talk ability with. Once the player initializes the conversation, the camera will zoom in on the two characters and prompt the player to select a topic that they would like to discuss. They are then prompted to select an emotion of how they feel towards the previously selected topic. The AI of whom the player is conversing with will then respond in a series of gestures and then a dialogue response. Once the player acknowledges the response, the conversation will end. The player can then choose to speak with this particular AI again or to move on.

> Wind's End - the player chooses an emotion and topic once per conversation.

Unlike Wind's End, the Sims does not let the player pick their emotions per conversation. However, there are emotions shown in each conversation. This happens because the player chooses their character's personality at the beginning of the game. If the player chooses a Sim with the athletic trait, that Sim would enjoy talking about sports to other Sims in the game. On the other hand, if the player chooses the serious trait for his character, the character would become angry after listening to a series of jokes told to him.

> The Sims - the player chooses their emotions on topic before the game starts.

Different from the previous mentioned games, Fable 2 does not allow the players to strike up conversation with AI. Instead, the player can approach an AI and do an action which will result in the AI either liking them more or less. Each AI also has certain actions which they like more,

so the player can gain their likeness quicker by performing those actions. The player is informed of the AI's traits if they select the AI and look at more info.

> Fable 2 - the player chooses actions and then the AI responds to those actions in a certain pre-defined way.

In summary, Wind's End is similar to both of these games in the fact that emotions will play a part in how the AI reacts to the character. However, this game also differs because the character can change their emotions per topic every conversation, instead of choosing it at the start of the game and the player will not be informed on how the AI will respond to that certain topic.

1.1.4 *Chris Crawford On Interactive Storytelling* Summary
The following sections of *Chris Crawford On Interactive Storytelling* were especially relevant to this project.

Chapter 7: "Simple Strategies That Don't Work": In this chapter, Crawford explains a few schemes of interactive storytelling that are to be avoided. Crawford discusses how branching stories require a massive amount of content creation for very little payoff. He proceeds to explain that foldback schemes, in which the story always folds back to specific points, resulting in player action having little to no ultimate consequence. Constipated stories are those in which pieces of story are offered as rewards, which Crawford equates to watching a movie that requires you to jump through hoops to get to the next scene. "Kill 'Em If They Stray" is a model in which the player has quite a bit of choice, but is killed (or otherwise loses) if he or she does not make the choice the designer had in mind. Finally, "storified games" are those that have stories in their game manuals, to set context to the game, but that have no in-game story.

Chapter 8: "Environmental Strategies": In this chapter, Crawford explains the idea of emergent storytelling, in which a complex enough world is created, hoping that a story will naturally appear. He calls this pure fantasy, as there is no magic level of complexity that will cause stories to appear with regularity. He also mentions the Sims, in which people perceive stories. The game lacks true interactive storytelling. The stories are purely fiction in the mind of players that are observing a playground of reacting agents. In Wind's End, we will attempt to use emergence as a base-line, to allow the world to react realistically, but ultimately constrain this emergent behavior with a drama manager (see below).

Chapter 11: "Personality Models": In this chapter, Crawford discusses the numerical representation of personality for agents in a story world. These personality values can be referenced when determining actions for a given agent. He explains that the personality model must include all information that is relevant to the story world, but nothing beyond that. He suggests that no value should overlap another in any considerable way, and that they should remain fundamental, rather than specific. We have decided to use some of his example personalities variables, but not all of them, in order to keep our world simple.

Chapter 12: "Drama Manager": In this chapter, Crawford discusses the drama manager, which is an overarching storyteller in the world. He explains that a drama manager must have three main components: the ability to observe the state of the world, preferably based on some simple set of "overview variables," the ability to interpret this information and choose the best course of action, and the ability to act on the world in some way, such as modifying the environment, modifying actor goals, or modifying actor personalities. We plan to use a drama manager to make sure that exactly one faction or character is participating in a goal that is of the appropriate level of drama, and to make sure that action concerning that goal takes place near the player or that the player is directed towards it.

1.1.5 *Literary Machines* Summary

In *Literary Machines*, Nelson argues that sequential text is not the best way to convey information, since people do not think sequentially, and the sequence chosen for text may not be appropriate for all readers. Thus it would be preferable if different readers could choose their own path through any given piece of text, through 'hypertext,' by which he simply means text that is non-sequential.

Nelson also discusses the problem of school, where a teacher presents information sequentially in a specific style, which may not be the sequence and style through which a student will learn best. If the student could access the parts of a subject that interested him or her, written by a variety of teachers, and could learn sub-components of a subject that are most relevant to those parts, the student would learn much better.

Taken in the context of game stories, this text would suggest that the player should be able to explore any part of the story that he or she wishes, in any order. This is somewhat relevant to our game, in relation to pre-written information, but a good deal of our game should be generated dynamically, meaning that what the player does will provide him or her not simply with one of a few possible outcomes, but with a natural outcome, modified to make sure it remains dramatic.

2 Gameplay Design

Since *Wind's End*'s conception, the team's overall aim with regard to interactive story generation has remained constant. However, our approach has changed considerably. What was once an attempt at modeling a *Dungeons & Dragons* campaign using an artificial intelligence-based "Dungeon Master" is now an entirely unique experience driven by goals and conversations. For a more in-depth description of *Wind's End*'s design, refer to the Design Document in Appendix 3.

2.1 Storytelling

The original medium for storytelling in *Wind's End* was the scene, an isolated event in which the player would be drawn to the story. Each scene the player entered would be tailored to fit the story as it was at the time, thus attempting to engage the player by having events unfold in front of him or her. This was a nod to *Dungeons & Dragons* where many events take on this structure at the discretion of the Dungeon Master who will often relax the passing of time during this period to allow for more decisive action and to give players more time to plan. Within the scene, text would be given to the player explaining the situation, and upon the scene's completion the result would be narrated as well.

We found that this approach was not only a challenge to model, but also tested the limitations of *Warcraft III*, a real-time strategy game from which our game was created. Little could be done to imitate the stopping of time passage or a leap ahead in time so that the actions of non-player characters could be paused or accelerated.

Currently, *Wind's End* is divided into zones (as shown in Appendix 3) which the player can transition to and from at will by walking to certain locations in each zone. Within each zone time passes realistically, but some zones, such as the mountains, require an extensive trip to reach, thus giving the player the impression that these events are occurring over a longer time-span so it does not feel like the story is unrealistically rushed. During the transition between these outlying zones time does not literally accelerate. Essentially the transition is no different from any other, except that it calls an "accelerate" method in the Drama Manager – which will be explained more thoroughly later – which over the span of *n* days examines the current intensity of the story and its characters and determines which changes to the world state seem reasonable within this time frame.

Additionally, due to the dynamic nature of *Wind's End*'s goal system, true narration of the situation at hand and the results of player action is difficult to create and modify as the game progresses. However, some form of storytelling is a necessary element in a game of this nature, especially now that the game proceeds in real-time so the player should know where to direct his

or her attention. Conversation aside (as it will be explained later), this takes on two primary forms: information and goal-based narration. Information is given to the player upon inquiry and is viewed in a separate menu, and often helps to give the story some context with regard to character intentions and needs, or faction membership. Goal-based narration is provided upon a character's evaluation of a goal when it is most important to the story. A mark is placed on the world map denoting that character's location, and text is displayed on the screen explaining the character's intentions. This helps to draw the player into the action so he or she may intervene.

2.2 Player Interaction

The player can interact with other characters through combat and conversation. The former was left to the combat system of *Warcraft III*, which is easy enough to manipulate by issuing orders to units (characters) that there were no drawbacks in using it in *Wind's End*'s context.

Conversation, however, required a significant amount of careful design so it would properly suit *Wind's End*. On the complex end of the spectrum, it would take a significant amount of work – that of an entire other project – to interpret and produce natural language. On the simple end, a fixed-size conversation tree, which many role-playing games use, often prevents the player from properly expressing his or herself.

Initially, the intent was to allow the player to express an emotion towards a subject, to which the non-player character would respond in kind. At the end of the exchange the result would be narrated. The original example given was expressing frustration over a sword, and subsequently being told of the location of the sword in question. However, as the game's story grew broader it became more and more apparent that this would only lead to confusion, as entirely different interpretations, both by the player and the non-player character. Perhaps the aforementioned sword is simply broken and requires repair, or the player was just attacked by a sword and requires aid.

Figure 1 – The conversation objective choice menu

Figure 2 – The conversation stance choice menu

The final approach to this problem was a conversation system based on objectives and an exchange of stances. The conversation initiator, either the player or a non-player character, decides on an objective (figure 1) he or she would like to accomplish such as asking for information about a particular character or faction, and the opponent chooses whether or not to agree immediately. If not, a mini-game begins where stances such as brag and intimidate chosen by both characters and then pitted against each other as in rock-paper-scissors (figure 2). Points are awarded to the winner and the stance exchange is repeated until a maximum or minimum point value is reached, which decreases in range over time to ensure that the mini-game ends with a clear winner at some point. Upon completion some indication is given that the player succeeded or failed. There are enough objectives from which to choose to suit the game's context and the actions and results are clear enough that confusion is less likely.

2.3 Goals

The goal system originally determined the actions of non-player characters in and outside of scenes. Without scenes, the characters were free to attempt to achieve their goals in real-time. This process has only truly changed under the hood. Currently, goals are managed by "super goals" which do not have evaluator methods and contain normal goals non-player characters can potentially evaluate.

Goals are the primary method for story generation in *Wind's End*. They are based on character intentions towards the current state of the world and result in changes to both. With enough goals they would all work together in ways which differ from game to game and provide the player with fresh new experiences. This design seemed most effective to the team because goals do not directly result from one another, thus breaking the branching or linear storyline format most games provide.

2.4 The Drama Manager

Prevalent from the project's conception, the Drama Manager in *Wind's End* controls the intensity of the story. Initially, the player begins his or her journey in a fairly peaceful environment where the townsfolk do little more than go about their daily lives, aware of the drought which plagues the town but hesitant to act in desperation. This is the first drama level (figure 3). Over time or as a result of player interaction, this level increases and the story builds in intensity, finally reaching its climax at drama level five, where the fate of the village is at stake.

Drama Levels	Features	Example Goals
0 – Opening	Idling, no combat, no inter-NPC conversation; subgoals are of this level	TakeWalk, TendShop, GoHome, GetDrunk
1 – Building	Conversation, no combat, building factions	Praise, Slander, Recruit, FortifyTown
2 – Serious	Mook combat over zones, minor mischief	Vandalize, AttackZone
3 – Heated	Army building, some zone taking	StealRelic, OverrunFarm, BecomeDefector, Breed
4 – Intense	Major faction battles and zone taking	AssassinateLeader, faster breeding and relic stealing
5 – Climactic	Threats to the town, life-changing action, crumbling of factions	BecomeDemon, thieves becoming cursed, extremely fast breeding

Figure 3 – The six drama levels

The Drama Manager was crucial to accomplishing this progression, as goals themselves are not branched in this manner. Instead, each goal has its own drama level which corresponds to the intensity of the goal. The Drama Manager only allows one goal of the current world drama level, and will force a goal of this level if need be. Because of this, there is only one truly important event happening at once and one important character at a time: the character with that goal. However, this technique also prevents one character from remaining important throughout the story, as upon completion of its goal, another character may take the initiative and attempt a goal of the current world drama level. This way more high-level goals are capable of interacting with one another.

Although initially the Drama Manager was intended as an AI-based *Dungeons & Dragons*-inspired Dungeon Master, who would introduce scenes and stories to the player in an attempt to engage him or her while adhering to the current drama level, it now serves as an efficient mechanism for controlling the intensity of the story despite the lack of isolated scenes, so the player can wander about freely, interact, and grow with the story.

2.5 Artistic Design

Because the team only consisted of three programmers and the project's main focus was to implement interactive story generation, little time was spent on art. Art is provided by *Warcraft III* in terms of models, animations, icons, a player interface, and a map creator utilized to create Wind's End Bastion, the town in which the game takes place. The world design (Provided in Appendix 3) reflects a town ravaged by drought, which is reflected in the river, which has run

almost completely dry. Although our overall implementation scheme for interactive story generation may be used in most settings, as *Warcraft III* is a fantasy game and *Dungeons & Dragons*, on which *Wind's End* was originally based (Though this is no longer the case), often caters to medieval fantasy, Wind's End Bastion resembles that of a medieval village, and its inhabitants and their abilities are fantasy-based, often able to use magic in combat.

Although the frame of our user interface is not modified from that of *Warcraft III*, the options available to the player are pertinent to the context of *Wind's End*. Icons were chosen from those available with the world editor to represent abilities, objectives, stances, and other options. Although some icons may not map to their purpose perfectly, usage descriptions are provided when the player hovers his or her mouse over an icon.

2.6 Story Design

As the story of *Wind's End* is dynamic the team could not formally create a story from beginning to end in the design phase, though once the game was implemented with enough content we played through and described our actions and the resulting events as a story. The story as a whole authored itself. Goals are desired changes in the world state and the information held by characters (figure 4) only help to give context to stories, though neither are stories themselves.

Figure 4 – The information window

Most individual goals were tailored for certain levels of intensity within the overall story frame, though some were designed simply as interesting story possibilities, such as the cult leader's goal to become a demon goddess. At the lowest levels of drama non-player characters are only able to evaluate harmless goals such as walking around and talking to other characters. At the story frame's climax life-threatening events often occur. This scaling was designed to keep the player engaged and interested without overwhelming him or her at the very beginning, allowing the player to explore, experiment, and learn.

The tension present in the story is between several factions caught in a struggle for power. Aside from the common townsfolk, all factions hold goals present within their leaders and members,

and all factions have "mooks", incidental non-player characters which have no goals of their own but are often the tools of faction leaders who populate controlled zones with them and send them off to battle other characters.

Faction conflict was chosen as a base for the stories in *Wind's End* because despite the game world's small size, which did not seem adequate to facilitate all-out war, it still provides reasonable scenarios in which lives are threatened and danger beyond the mundane is present. Additionally, the player can more easily align himself or herself with an entire faction than with single characters that cannot as easily defend themselves.

2.7 Character Creation

At the beginning of each game, the player is presented with a number of questions to answer which build the player's character. Originally a range of classes could be selected directly along with gender but now the class is chosen informally as the result of how the player answers questions concerning the player character's background. Answers which would imply aggression or skill in battle provide the player character with bonuses to offensive spells and abrasive conversation stances, while ones which would imply intellect or peacefulness provide bonuses to defensive spells and conversation stances such as reason or beg. The choice to implement this character creation system was made in the interest of simplicity, as skills may be altered upon leveling up and initial bonuses are not crucial to success. Also, the questions have an immersive quality which can quickly give the player ideas for how he or she would like to play and interact.

3 Technical Design

As a modification, or "mod", of *WarCraft III: The Frozen Throne*, the technical design challenges in *Wind's End* consisted of learning to extend and modify *WarCraft III*, and build our own code on top of what already existed in order to create the gameplay we desired.

3.1 Engine Choice

This project was developed using the *WarCraft III* World Editor, the JASS scripting language, with the NewGen pack add-on, a set of user-created expansions to the editor, which includes vJASS, an extension of the JASS language. The choice to use these tools was based on the following:

- The project's goal was to create an interactive story – not a game from scratch. Using an engine which already supported movement, pathing, combat, learning and using abilities, RPG elements such as character stats and experience, etc., allowed us to focus more of our attention on the story structure.

- The development team consisted of three designers/programmers, and no artists. Although not perfect, the art already in *WarCraft III*, as well as some from websites dedicated to *WarCraft III* modding, allowed us to create a good looking game without an artist.

- Similarly, the *WarCraft III* World Editor includes a powerful terrain creation tool which allowed us to create interesting areas without significant artistic ability and minimal experience in the editor.

- *WarCraft III* was specifically chosen over other game engines because one third of the development team was already familiar with it, and it is easy to learn. Additionally, it provided many elements crucial to *Wind's End* such as art and physics which would have taken too much time to implement using a tool kit or other non-GUI-based engine. With the World Editor the team was capable of focusing on the more challenging task of implementing interactive story generation.

- Playing *Wind's End* requires *WarCraft III: The Frozen Throne*, which is both beneficial and detrimental to the project. It means that we do not need to give players an executable program, but rather a map file to be loaded by *WarCraft III*, meaning people that do not know us will have less to fear from running the game. On the other hand, this means players must have a copy of *WarCraft III: The Frozen Throne* installed to play. We ultimately decided that the experience in *WarCraft III* that we had, combined with the benefit of distributing maps over executables, outweighed the problem of requiring players to own *WarCraft III* already.

3.2 Technical Tools

We used the *WarCraft III* World Editor with the NewGen pack to create the map, units, abilities, and other standard *WarCraft III* elements, as well as some basic code in the Trigger Editor. In order to allow better version control, we used external files to store the majority of our code, which we edited using JassCraft, a program created to edit JASS scripts, and Notepad++, a simple text editor with syntax highlighting. The code from these external files was imported automatically each time the map was saved.

To coordinate and version control our code, we used Subversion (or SVN), which is available to all WPI students at http://sourceforge.wpi.edu. This allowed us to avoid writing conflicting code, to remain up to date on all teammates' progress, and to revert to older version if necessary. We used TortoiseSVN to connect to the SVN server from Windows.

Finally, we used Dropbox in order to coordinate documents besides code, such as our design document, schedules, bug lists, and work logs. Dropbox allows users to share file folders. The files are automatically synchronized as long as the user is connected to the internet, and are version controlled to avoid conflict. Dropbox also keeps backups of all of the files, including older versions, so that we could always return to earlier versions and never lose our important files.

4 Implementation

The implementation phase of *Wind's End* followed the design to some extent, and consisted of developing the code, objects, and map for the game.

4.1 Implementation Workflow and Management

Wind's End was developed iteratively, with a playable game at the end of each week, beginning with the last week of A-Term. Any content which was not yet complete at the end of a week was not included in the provided build for that week, though it would be kept up to date using project management tools.

During the week, we had a varied number of team meetings depending on how much coordination was required for that week. During these meetings, we allocated and reported on work, discussed changes, and coordinated our efforts on development.

We also had a weekly meeting with our advisors, Charles Rich and Dean O'Donnell, where we presented our latest build, along with a report of the week's progress. During these meetings, our advisors gave us feedback on our progress, as well as advice for future development.

4.2 Changes to Design

During implementation, we followed the design as much as possible, but some of our design was changed as we progressed, largely due to the experimental nature of the game, as well as time constraints and previously-undiscovered limitations. As a result, the design document changed to match our changes as well.

The largest changes we made to the design were the actions and goals of non-player characters. Before we began the actual programming, we were unsure what could actually be accomplished using the system we had designed, and thus had only a rough outline of the goals non-player characters would have. Throughout the first stages of implementation, we learned quickly what was, and was not, possible, as well as what would take too much time. Our final design had a much simpler list of goals which were more versatile. This resulted in a more emergent and less scripted behavior than we had originally imagined.

4.3 Artistic Implementation

There was little artistic implementation to be done in *Wind's End* because we had no artists on the team and most art was already provided by the world editor we used. The artistic development consisted largely of choosing models and portraits for the various units and abilities from those already in *WarCraft III*. Models for characters and abilities such as magic were already rigged for animation as well.

The other major artistic content implemented was the terrain design, which was a simple matter of laying out the zones and placing objects such as trees and buildings using the *WarCraft III* World Editor.

4.4 Technical Implementation

The technical implementation of *Wind's End* consisted mostly of writing code in JASS, the scripting language used in *Warcraft III*. With vJASS, a modification of JASS, we were able to take an object-oriented approach in implementing our game. Libraries were created for goals, conversation objectives, and other objects for which there would be many variations, and a class-based structure was used for all but triggers, which interact with the game world, and a few instances in which objects were not necessary, such as our initialization function.

WarCraft III's base code was inaccessible to us, but the World Editor allowed us to make a great deal of changes as necessary, especially through its Object Editor, which allowed the creation and modification of units, items, abilities, etc. The rest of our modifications came in the form of new code, separate from the game's base code, though often calling pre-existing functions provided by the editor.

5 Evaluation

At the start of the project, the team laid out several goals of what we thought would make the project be a success. These goals, however, are all very subjective and thus took a lot of user testing to determine if each of the goals were met. We decided that the project would be a success if it was:

- Engaging – We wanted the players to enjoy the unfolding storylines with the option to immerse themselves in those stories.
- Replayable – By having a new story generated each time, we wanted the users to want to replay the game in order to see all of the different possible stories.
- A dynamically-generated story – The main feature of the game needed to work in order this project to be considered a success.

5.1 Methodology

Since the team wanted everyone to enjoy the game, we needed to find a varied audience on which to test the game. We accomplished this by sending out e-mails to various friends and groups and setting up a website which could help us keep track of the user feedback as well as allowing us to release different versions of the game.

5.1.1 Promotion

In order to get our game known and find interested user testers, we did two things. The first thing that we did was to set up a website that would allow users to search our game and find out the key information about the project as well as test and give feedback to us in a controlled format.

We also sent out e-mails to certain gaming groups, friends, and families asking for their help in user testing our game. In this e-mail, we explained the importance of user testing and how to setup the new game and give feedback.

5.1.2 Testing

Each tester who volunteered to play test this project was given precise instructions of how to do so. We first, explained that how to put the map file into the appropriate folder and how to access it using *WarCraft III*. We also gave each user a written tutorial (Appendix 4) to familiarize them with the game, and shortly after implemented an in-game tutorial in which the player is given

information about certain abilities and features through pop-up windows when those abilities and features come into play.

User testers were asked to give general feedback on the game, which could include any bugs they encountered, user interface issues, and comments about how they felt about the game. These comments were given to the team by e-mail from the website. Each comment received was then complied into a larger document which split the comments up into the three different sections so that the team could address issues during meetings and during the debugging process.

5.2 Results

During the testing process – the last four weeks of the project – results were gathered from roughly fifteen testers of varying ages and gaming abilities. Overall, the results collected were mostly positive. Results varied depending on the experience of each tester. The more experienced user testers gave us invaluable feedback about bugs they encountered while the more inexperienced testers seemed to get confused when encountering a bug. However, the inexperienced testers were the ones who gave us the most feedback about the usefulness of the tutorial and how hard/easy it was to learn the game.

5.2.2 Problems Encountered

The main problems that were brought to the team's attention during testing were the lack of direction that the player was given. Although this project was intended to let the play create their own unique story, we feel that we might have done this a little bit too well since the players seemed to not know what to do next.

The user testers also generally agreed that they did not know the best way to achieve their own goals in the game. To address both problems, the team and advisors discussed features which would solve these issues and implemented them with enough time to send out a final play test request.

6 Conclusion

The *Wind's End* team completed the three phases of design, development, and evaluation largely successfully.

In the initial design phase, we had to make some assumptions about what would be feasible to implement in the context of our game engine, as the project was partially an experiment, which turned out to be untrue, but this was not a significant detriment, and we managed to revise our design as we discovered more. Throughout the design, we developed the basic story and possible story elements that could emerge, as well as the drama manager and goal system.

In the development phase, we completed most of our important features, but were left with some lacking features, such as goal content. However, during the evaluation phase, we managed to complete the remainder of our content, and fix the majority of our bugs.

During the evaluation phase, we collected feedback from play-testers, expanded the game greatly in terms of content, and fixed any remaining bugs. We brought the game to an enjoyable state and accomplished our goal of creating an interactive, dynamic, and replayable story.

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Appendix 1: Original Project Pitch
Background/Motivation:
The Interactive Story Generation project this year was very intriguing, and the idea of a game that generates a story is excellent, but the project ran into difficulties, and this project was conceived as an idea that would negate many of those difficulties by creating a very simple world, which limits the number of characters and interactions to a manageable level, using narration in place of dialogue, so there doesn't need to be text interpretation or writing extreme amounts of dialogue, and limiting the story to the hero's journey format, to keep the number of possible stories within reason.

Planned Resources:
The WarCraft 3 World Editor: The editor is really a modding tool, not just a level editor. The editor is simple and easy to use, but powerful, and having a basic system in which character movement, combat, etc. are already done allows for complete focus on the story generation, which is the point. The editor also supports importing new art assets, but has plenty of assets already.

NewGen: NewGen is a package of tools developed by the modding community that allow for an even more powerful environment that supports creating classes, structures, polymorphism, etc. on top of the normal WarCraft 3 scripting language.
Planned Results/Goal:

What we'd like to do is model the way in which a game master runs a tabletop RPG in a single player video game environment, where the story changes and adapts based on player action, but usually still proceeds forward, reaching key scenes eventually, as long as the players don't take extreme action, but the precise details of those scenes will change. The game would keep track of the next scene that needs to happen to progress the hero's journey to the next stage ("meeting the mentor," "entering the cave," etc.). It would introduce scenes that best lead to that next important scene (in some incarnation). At the end of a scene, it would reevaluate and do it again, eventually leading, by some path, to some scene that satisfies the next stage's parameters.

A game without dialogue, when combined with the interactive component of the story, would create a unique story experience for the player, and present an interesting example of how games could implement an interactive story, which, though simple, could potentially be expanded to a larger scale.

Appendix 2: Original Vision Document

The Beginning
Who are you? Why are you here? Tell us about your heroic feats so that we can choose a proper class for you.

- Choose your gender.

- Wind's End Bastion is brimming with trouble. Travel about from scene to scene and see what's up.

- Talk to people! Find out what's going on and what you can do to help.

As you talk to people, you'll realize there are a variety of problems that need fixing. A deadly cult, a band of thieves, and a tribe of goblins all plague Wind's End Bastion.

You must then decide which problems to deal with first, and how. Will you go kill thieves? Talk down the goblins? Convince the cultists to sacrifice the rest of your enemies instead of the town? Your choices determine what your story will be.

- Take on new and exciting adventures. The town has a lot of problems that need fixing. Will you be the true hero?

- Gather information, allies, equipment, and skills to help in your quests.
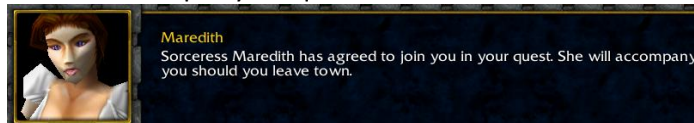
- Use these rewards to your advantage during quests and battles!


Conversation
Conversations in the game will be portrayed as a mini-game. These could be as simple as just choosing a topic. However, if the NPC disagrees with a topic, you can fight to make them agree with you. Simply choose one of the five stances (Mock, Intimidate, Beg, Brag, or Reason) and hope that you can beat

what they choose. If you win, they agree with you! Although, if you lose...there may be consequences.

- Pick a stance and pray. It's that easy!

- Narrated results help you understand how your conversation went.
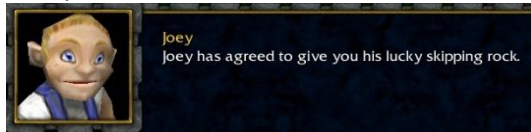
- The possible topics you can select from will be limited based on your character's knowledge of the story.

Story

- The game will be broken up into scenes, where each scene includes a few smaller events and/or challenges.

- The scene will change when you move to a new area, or if you remain in an area for a while.
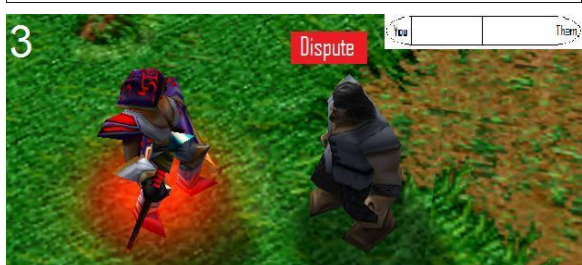
The world will change as you play. Your influence will alter the world, and NPCs will interact with each other when you're not around.

Things may change even more as you travel. For example, it may take several hours (Narrated as "several hours later") to travel from town to the forest. During those several hours, a lot may have happened without you.

The events of the game will progress whether you participate or not, but you will always be at the center of the action. Whichever current event is the most dramatic and interesting will be modified to make sure you are there to see it, participate in it, and change it as you please.

- As the game progresses, the action will increase. Scenes will become more dramatic, more important, and more action-packed as events escalate.

- You will always be in the middle of the story. If something interesting is about to happen, it will be modified to make sure you're part of it.

- If nothing dramatic is happening, drama will be created for you.

Conversation Mockup

1

You | | | Them

Pick a topic:

        *Ask for Information
→ *Request Assistance
        *Slander
        *Praise
        *Demand Surrender

2

You | | | Them

Pick a subject:

        *Supplies
→ *Companionship

3

Dispute

You | | | Them

Pick a stance:

    *Mock   → *Brag
    *Intimidate   *Reason
    *Beg

4

Brag   Mock

You | | | Them

Pick a stance:

    *Mock   *Brag
→ *Intimidate   *Reason
    *Beg

5

Intimidate   Reason

You | | | Them

Pick a stance:

    *Mock   *Brag
    *Intimidate   *Reason
→ *Beg

6

Beg   Reason

You | | | Them

Pick a stance:

→ *Mock   *Brag
    *Intimidate   *Reason
    *Beg

7 Mock | Reason | You [========] Them

Pick a stance:

*Mock
*Intimidate ⟶ *Brag
*Beg   *Reason

8 Reason | Brag | You [========] Them

Pick a stance:

*Mock   ⟶ *Brag
*Intimidate   *Reason
*Beg

9 Brag | Intimidate | You [========] Them

You make a convincing argument so the shopkeeper decides that he will become one of your companions.

5 Minutes, Endless Possibilities

Setup:
The player has discovered that a band of thieves is stealing supplies from Wind's End Bastion. The militia has had no luck hunting down the bandits, so the player is going to go deal with them in their mountain hideout.

The player ends her conversation with Knight Commander Neil Reise, who suggests she prepare a little more before leaving.

Situation 1:
The player ignores the commander's advise and leaves town immediately. She selects "Mountains." She is told that the trek will take 4 hours. She accepts.

"4 hours later," the narration reads.

Outcome 1:
The player enters the mountains.

Suddenly, a group of bandits appears from behind. The bandits demand to know who the player is.

She explores, eventually finding a small stream. She checks it out, but finds nothing.

The player tries to explain that she isn't their enemy, but the thieves see through her lie and attack.

The bandits are not terribly powerful, and the player wins the fight, but is injured.

Fearful that more bandits may arrive, the player flees the mountains. She chooses to head back to Wind's End Bastion, and accepts after being told that another 4 hours will be spent.

Later 1:
The player returns to town to find an empty supply cart has arrived. She is told that the bandits raided the cart, and the village is almost out of food.

Situation 2:
The player decides to take the commander's advice and find some help. It looks like a hunter, Jonathan Mostan who hangs out by the inn, may be a good fighter, so the player approaches him.

He turns out to be an adventurous type, who has had enough of the thieves. He agrees to help the player hunt down the leader of the thieves, George Emmor.

The player then stops at the magic shop, run by a woman named Meredith Neintir. The players explains that she is going to fight the thieves, and Meredith gives her an amulet of protection.

Jonathan then tells the player that he wants to go now. So as not to lose favor with the capable warrior, the player heads to the town exit. She selects "Mountains." She is told that the trek will take 4 hours. She accepts.

"4 hours later," the narration reads.

Outcome 2:
The player enters the mountains.

Jonathan notices tracks, and leads the player to a secret entrance near a small stream.

The player enters and finds a group of sleeping bandits.

Jonathan attacks, and the player follows suit. The bandits are easily defeated.

The player and Jonathan progress further into the cave to locate and kill George Emmor, thus completing the quest!

Later 2:
After slaying George Emmor, the player returns to town victorious. But soon townspeople continue to complain about goblins that have apparently taken over the farms.

Situation 3:
The player decides to take the commander's advice and find some help. She finds that most of the town is too busy to bother and save itself. Mostly they complain about how goblins have taken over their farms and how thieves have been stealing supplies.

However, speaking with Meredith Neintir, the owner of the magic shop, the player is given an amulet of protection.

Meredith also gossips about Jonathan Mostan. She says he's a very aggressive warrior who would love to kill all of the thieves if the player wanted the help. The player decides that discretion may be needed when dealing with thieves, and so decides not to ask Jonathan for assistance.

The player decides that she is ready to go. She selects "Mountains." She is told that the trek will take 4 hours. She accepts.

"4 hours later," the narration reads.

Outcome 3:
The player enters the mountains.

She explores, eventually finding a small stream. She checks it out, but find nothing.

Suddenly, a group of bandits appears from behind. The bandits demand to know who the player is.

The player attempts to surrender, and asks them why they have begun raiding supplies. The thieves call over their leader, George Emmor, who explains that they won't let the town have new supplies until the Knight Commander admits to hoarding his own stash of supplies.

The player explains that the town is low on food because goblins have taken over the farms, not because the commander is hording. George demands to be shown the goblins. The player and George head out towards the farms.

Later 3:
After showing the goblins to George Emmor, the player returns with him to the town. The militia, lead by Knight Commander Neil Reise, arrive to apprehend the criminal.

Appendix 3: Design Document
Player Creation
The Player's Character: When the game begins, the player is presented with a few dialogue boxes. These boxes describe the current world in which the player will start off. The game will then ask the player to choose a gender for his or her character, which will be reflected in the player character's model.

You have control from the very first second by choosing your past experiences and gender.

Adventurer Combat Skills: Every adventurer has 4 combat skills that he knows or can learn throughout the game. These combat skills are: evasion, thunder clap, chain lighting, and rejuvenation. The two skills thunder clap, which gives the adventurer the ability to stun close units, and evasion, which allows the adventurer to avoid taking damage for a certain amount of time, thus granting the adventurer time to escape, heal, or kill the remaining enemies. Chain lighting, on the other hand, will deal damage to one target and depending on the level of this skill will jump to other units close by. Rejuvenation is the skill that allows the adventurer to heal. The adventurer can cast this upon himself or units in his party.

You gain 3 points at every level, allowing you full control to advance your unique character.

Past Experiences: Since the player will be controlling an adventurer, it is important to discover what this adventurer has done in the past. In order to do this, the player will be presented with a series of questions pertaining to his motivations and accomplishments. This will let the player know his adventurer status before entering the game and it will also serve as starting point for each of the skills the adventurer can have.

Situation 1: Who were you before you became an adventurer?
Choices:
- I was a peasant. *(Beg)*
- I was an aristocrat. *(Mock)*
- I was a scholar. *(Reason)*

Situation 2: What caused you to become an adventurer?
Choices:
- I wanted to find fame and fortune. *(Brag)*
- I wanted to help people. *(Rejuvenation)*
- I wanted to learn new things. *(Chain Lighting)*

Situation 3: What was your greatest achievement?
Choices:
- I escaped an infested orc cave. *(Evasion)*
- I stared down an ogre. *(Intimidate)*

- I slew a battalion of invading soldiers. *(Thunder Clap)*

Become a conversational whiz, a combat guru, or a Jack of all trades. Just beware to not put all your eggs in one basket.

Player Skills

Types of Skills: A player at all times will have a total of 9 skills. These 9 are split up into 2 different categories of: conversational and combat. Of the 9 skills, 5 of them will be conversational skills that include the different stances the player can take during a conversation, such as mock. The combat skills make up the last 4 skills the player can have. These skills were described above in *Adventurer Combat Skills*.

Leveling Skills: At the beginning of the game, the player starts with each of these 9 skills at their default level of zero with 1 point allotted into the 3 skills that he choose when creating his adventurer. By defeating enemies or winning conversations, the player gains a pre-determined amount of experience. This experience will add up until the player is able gain a level. At each level, the player will gain an additional 3 points which he can place into any of the skills. Once a skill is improved, the player can use it more efficiently. For conversational skills, this would mean that the player will gain an extra advantage during a conversation by either losing by less or winning by more. Combat skills, if improved, will simply make that skill more effective and the observational skill will give the player more information about what he happens to be observing.

Skill Limitations: When adding new points into any of the skills, the player will only be able to learn a skill once every other level. This allows players to become more well-rounded versus only learning one skill every level. The skills will not be allowed to be higher than level 5.

Player Level Cap: The player will cap his level once he reaches level 10. This means that the player will never earn enough points to be able to max out all of his skills.

If you are level 4, your reason skill can only have 2 points into it.

Factions

Townsfolk: The townsfolk faction consists of all of the main NPCs that the player can expect to find inside the town, plus incidental NPC villagers. The town is split up into three areas, which are the upper class, lower class, and town square. By nature, the townsfolk are not hostile to the adventurer and can usually be convinced to join the adventurer on his journey.

Militia: While the militia does not initially reside in the main part of town, it has decided to make camp in the castle district. The militia, like the townsfolk, will not attack the player automatically as well since its job is to try to help rid the town of the evil surrounding it.

Cult: Nobody in town knows exactly who is or who is not a member of the cult, allowing the faction to work under cover within the town boundaries. The cult may or may not attack the player when they first meet, depending on its feelings at the time towards the adventurer.

Goblins: The goblins have long been pushed away to reside in the forest near the town. While they usually do not cause much trouble, the townsfolk are seeing their mischief more and more each day. To put a stop to the goblins, the townsfolk and the militia have become hostile towards them, causing the goblins to be very wary of the adventurer.

Thieves: While the thieves used to reside in the town square and lower district of town, since the militia has arrived, they have escaped to the northern reaches into the mountains. Since it is not their nature to just pick up and leave, townsfolk will still see a few agents wandering about in the lower district.

Thief Defectors: Unknown to the townsfolk, a thief defector, Rissa Emmor, has managed to take command of a small but loyal group of thieves. These thieves believe in their right to work under cover in the lower class section of town and refuse to stop the activities which are making them wanted by the militia.

Food Supply: Since the town is having severe problems with the food supply, each faction does keep a strict eye on the supplies that it still has available. If it is unable to obtain supplies for too long, its storage of food will deplete and will usually cause its members to act unreasonably or even die. On the other hand, if it manages to keep a steady supply of food ready to itself, its leader might even cease certain activities.

Major Autonomous NPCs

Name	Story Role	Combat Role	Description	Ultimate Goal
Neil Riese	Militia Commander	Knight	Stubborn, Chivalrous	To protect the town (All town zones occupied by militia)
Melinda Gold	Baroness		Manipulative, Flirtatious, Mean	To win the heart of the knight commander
George Emmor	Thieves' Guildmaster	Rogue	Stylish, Egotistical	To front a giant crime syndicate
Rissa Emmor	Thief Defector	Rogue	Power hungry, Selfish, Charismatic	To become rich and famous
Anne Sidora	Cult Leader	Necromancer	Deceitful, Friendly	To spiritually cleanse the world
Nak Brightfeather	Goblin Chief	Shaman	Hyper, Mischievous	To support his people and see them prosper
Edward Snair	Shopkeeper	Alchemist	Nice, Clumsy	To solve the world's problems through his potions
Richard Snair	Innkeeper	Bard	Cranky, Wise	To have some peace and quiet
Jonathan Mostan	Hunter	Archer	Mean, Dedicated, Reckless	To be a praised hero who slays dragons and saves damsels
Sister Sierra	Priest	Priest	Preachy, Superstitious	To see the cult's demise
Kendra Epera	Blacksmith	Fighter	Cowardly, Spiritual	To serve in the militia
Joey Tielom	Child		Annoying, Imaginative	To grow up and be like George Emmor
Meredith Neintir	Magic Shopkeeper	Sorcerer	Naggy, Gossipy	To become the new baroness

Incidental NPCs

Militia	Thieves	Cultists	Goblins	Peasants
Captain	Thug	Zombie	Warrior	Farmer
Soldier	Spear thrower	Banshee	Shaman	Townsfolk
Archer	Thief	Warlock	Sappers	Child

Information: NPCs will also have information that can be used to evaluate goals and can be given to the player. Each piece of information will be associated with a subject that corresponds to the list of subjects from which the player can choose when asking for information, and a text

description explaining the piece of information (e.g. a piece of information about goblins with the description "There are goblins stealing food from the farms.").

Story Setting

Wind's End Bastion was first founded when the king of the time awarded the land to a travelling hero for his honorable undertakings. Along with the land, the hero was given the title of Baron and slowly over time, many travelers who came across Wind's End Bastion have decided to call it their home. This story takes place a few decades later, when Wind's End Bastion is under the watch of the heiress of the original hero, Melinda Gold, and a squad of the king's own, commanded by Sir Neil Riese.

Although this quiet town has not seen many fights, an unfortunate turn of events has taken place. Over the past year, Wind's End has been suffering a severe drought, leaving many of the citizens barely enough to feed themselves. Some have seen this as an omen, others as corruption of the nobles. The beautiful woman, Anne Sidora, who lives near the outskirts of town is one of the many who believe that the drought was caused because of the lack of rituals performed to Olkia, the goddess of land. She has convinced many of the townspeople of this fact and persuaded many of them to do these rituals to protect their families from harm.
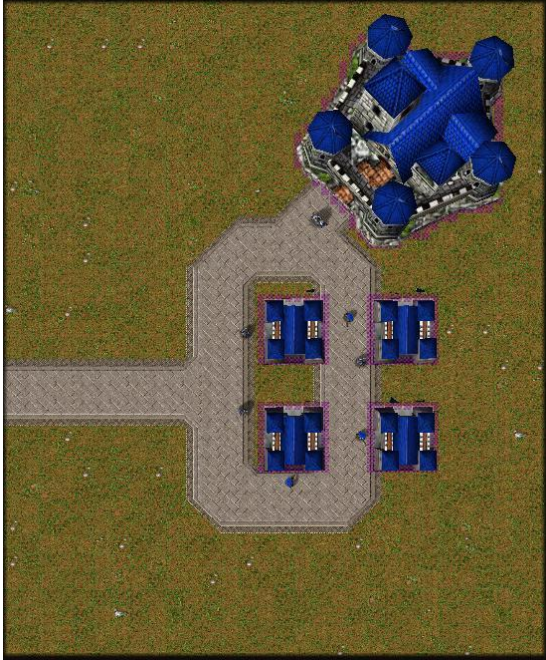
Unlike Mistress Sidora, George Emmor, the leader of the resident thieves, believes that the recent addition of the militia squad is responsible for the lack of food. Although many know of the thieves activities, there had been little violence to acquire the supplies needed for him and his friends. However, the Commander Knight has tried to change the unwritten pact between the thieves and traders, hunting and executing caught thieves.

Another group who resides in the forest near Wind's End is particularly interesting. Led by Nak Brightfeather, the goblin horde who are usually wreaking mischief on unwary travelers have begun to steal what food they can get from the local farms. This is less due to their mischievous natures but more so they will be able to survive in such a barren time.

World Areas

Area	Residents
Town (Militia District)	Neil Riese, Militia
Town (Upper Town)	Melinda Gold, Sister Sierra
Town (The Market)	Edward Snair, Richard Snair, Kendra Epera, Meredith Neintir, Jonathan Mostan
Town (Lower Town)	Joey Tielom, Anne Sidora, Rissa Emmor, Peasants
Farms	Farmers
Forest	Nak Brightfeather, Goblins
Mountains	George Emmor, Thieves

Militia District: The militia district contains Wind's End Bastion's primary fortifications. A large castle is the main focus of the area, and smaller military barracks are set up nearby.

Upper Town: This is where the rich townsfolk live. The baroness's manor resides here, as does the church.

The Market: The market contains the shops and stands that keep the town running. The majority of the main NPCs spend most of their time in the market.

Lower Town: The poor district. Most of the common people live here, and it houses a disproportionate number of hidden thieves.

The Farms: The farms are the main source of food for Wind's End Bastion, and are a short distance west of town.

The Forest: North-west of town, the forest is home to the goblins.

The Mountains: North of town, the mountains are the base of operations for the thieves.

Conversation System

Player Initialization: When the player wishes to begin a conversation with an NPC of his choice, he can select that NPC and use the talk ability. At the start of the conversation, the player gets to choose an action *(see Actions section)*. Once the player has chosen an action, the NPC can either choose to "Agree" with the player on the action and subject or to "Dispute," which allows the player and the NPC to argue over the topic.

Choose your topic wisely – you won't get another chance to talk for a few seconds.

Actions: The actions which can be chosen when starting a conversation are limited. The choices are: ask for information, request assistance, slander, praise, and demand surrender. Once the player chooses an action, he is given a subject at which he wants the action to be directed. A table of subjects that are relevant to each action is below.

Action	Subject
Ask for Information	Town, Militia, Characters, Thieves, Cult, Goblins
Request Assistance	Supplies, Companionship
Slander	Townsfolk, Militia, Characters, Thieves, Cult, Goblins
Praise	Townsfolk, Militia, Characters, Thieves, Cult, Goblins
Demand Surrender	None

Argument: If the NPC decides to "Dispute" the action that was chosen, an argument will begin. During the argument, the player and NPC will each choose a stance to take without the other's knowledge, and then both will be displayed. Depending on the stances chosen, either the player or the NPC will win that round, brining the score closer to either side. If the score reaches its minimum, the opponent wins. If it reaches its maximum, the character initiating conversation wins. If it has not reached either side after a given round, a new round will begin, the score maximum and minimum decrement and increment by five, and the player and NPC will again select stances, which will be compared.

Simply choose a stance.

It's that easy.

Winning or Losing: The different stances are compared to each other in a rock-paper-scissors style, though higher skill in a given stance and situational modifiers may modify the result. As the argument progresses, the amount by which the winning stance wins will increase, eventually reaching a point where the next time the player or NPC wins a round, he wins the entire argument. By winning the argument, the player may achieve his goal or perhaps even change the NPC's belief on the subject. No matter the outcome of the argument, the player will not be able to initiate conversation with that same NPC for a few seconds. This system will ensure that an argument will never go on for too long and it forces the player to try to win every argument.

Drama Manager

Autonomous NPC: The major NPCs do whatever they want based on their own personalities and aspirations, and their assessment of the situation at hand. Minor NPCs also act of their own accord, but can be ordered to help a major NPC.

NPCs will have states and properties. Each important NPC will have saved states which will know the NPC's goals and aspirations, while its personalities and emotions (see NPCs) will be saved as properties.

Each NPC will use a goal-based system to determine its next action, leading to natural emergent development of the game world. NPCs will update their goals at the end of each scene.

> *Exactly one interesting thing is*
>
> *always happening, no more*
>
> *and no less.*

World Drama Level: The world will have a level of drama, rated from 1 (Someone's breathing too hard in Sector 8) to 9 (Demonic apocalypse). This drama level will increase as the game progresses, representing a rise in action.

Dramatic Goals: The goals that a NPC can have will be constricted in order to preserve the dramatic flow, based on the world drama level. NPC goals can be rated from 0 (Loafing about) to 5 (To protect the world from devastation…).

At any given time, *exactly* one NPC – no more and no less – will have a goal with a rating which matches the world drama level. If no NPCs want to man up to that level with their own goals we make them do it anyway. Every other NPC will have a goal with a rating lower than the world drama level, and it will be impossible to have one higher than that level.

> *World drama makes sure*
>
> *that you are never bored.*

Increasing Drama: The drama level will only increase due to two factors, the first factor being time itself. As time passes in the game, the drama level will react accordingly depending on the current drama level and the amount of time. Combat will also influence the rise of drama level since combat itself is very dramatic.

Drama Manager Variables

These are the variables at which the drama manager is looking.

- World Time
- World Drama Level
- NPC Variables
  - Importance
  - Location
  - Death
  - Combat Power
  - Argument Power
  - Goals
  - Faction Leader
  - Conversation Cooldown

Drama Manager Actions

These are the actions the drama manager can take in the world.

- Arbitrate NPC fights and conversations
- Move NPC to different places
- Change NPC goals
- Add new goals to NPCs
- Activate a new scene
- Change world drama level
- Designate new faction leaders

NPC Dramatic Goals

Examples of Level 0 *Doing nothing important*	• Go to a place • Talk with the player • Stand around • Talk amongst other NPCs • Tend shop • Gossip • Attack • Run away
Examples of Level 1 *Set up goals*	• Become cautious *(Richard, Meredith, Kendra)* • Complain to player • Join a new faction • Ask player to check on farms *(Edward, Sister Sierra)* • Flirt with player *(Melinda)* • Join the player *(Jonathan)* • Suggest new items *(Meredith, Kendra, Edward)* • Help player kill incidental NPCs *(Jonathan)*
Examples of Level 2 *Set something into motion*	• Make Commander Knight jealous of player *(Melinda)* • Ask player to prove his heroism *(Melinda)* • Defend property • Refuse to tend to shop • Join the player *(Kendra, Sister Sierra, Edward)*
Examples of Level 3 *Complete a minor goal*	• Pit Commander and player against each other *(Melinda)* • Join the player *(Richard, Meredith, Neil, Rissa, George, Nak, Anne)* • Avenge death *(Richard, Neil, Rissa, George, Anne)*
Examples of Level 4 *Threaten town*	• Replace leader of a faction
Examples of Level 5 *Final confrontation*	• Bring order back to town

Faction Dramatic Goals

Examples of Level 0 *Doing nothing important*	• Go to a place • Communicate with the player • Gossip • Attack • Run away • Stand around • Talk amongst other NPCs
Examples of Level 1 *Set up goals*	• Initiate people into the cult *(Cult)* • Spread Propaganda *(Cult)* • Steal supplies *(Thieves)* • Steal crops *(Goblins)* • Post guards in town *(Militia)*
Examples of Level 2 *Set something into motion*	• Kidnap someone unimportant *(Thieves, Cult)* • Send sentries outside of town *(Militia)* • Kill incidental NPCs • Retrieve an artifact *(Cult, Goblins)* • Vandalism • Raiding food when food supply is low *(Thieves)* • Occupy farms *(Goblins)* • Burn a house in town *(Cult)* • Destroy barracks *(Thieves)* • Attack minor faction members • Interrogate townsfolk *(Militia)*
Examples of Level 3 *Complete a minor goal*	• Resurrect someone to help *(Cult)* • Kill important NPC • Take prisoners *(Militia)* • Send patrols into surrounding areas *(Milita)* • Take hostages *(Thieves)* • Perform ritual *(Cult, Goblins)* • Attempt to mind control an important NPC *(Goblins)*
Examples of Level 4 *Threaten town*	• March on town ground *(Cult)* • Take over the town • Declare martial law *(Militia)* • Loot and pillage town *(Thieves)* • Start having a war in the town (rebellion) *(Thieves)* • Curse food that mind controls a bigger population of NPCs *(Goblins)*
Examples of Level 5 *Final confrontation*	• Summon demon god *(Cult)* • Create a dictatorship in town *(Thieves, Militia)* • Consolidate power • Be in control of all supplies *(Thieves, Goblins)*

NPC Allies

Gathering Allies: The player has the ability (as stated above in Conversation) to convince NPCs to join his group at any time. Once an NPC has decided to help the player by adding his companionship, the NPC will help the player to explore and in fights. The NPC will not take orders from the player but will try to protect him if it becomes necessary. The player should be cautious when choosing allies because not all people are welcome in certain parts of town and their crimes will not be excused simply because they accompany the adventurer.

> *It is your job to keep your allies alive during fights. After all, they decided to help because you asked them to.*

> *Be careful to not upset your allies – they can choose to leave your group.*

Losing Allies: The player can lose NPC allies in three different ways. The first way to lose an ally is to make that NPC die in combat. If the NPC does manage to die under the player's control, he will be deceased for the rest of the game. The second way to lose one of your allies is to do an action of which he generally disapproves. One example of this would be to have the innkeeper as an ally, then killing the shopkeeper (his brother). If this happens, the innkeeper would then leave your party and will no longer be your ally. The third and final way to lose an ally is if your actions no longer fulfill his goals. Since your allies are NPCs, they will still be evaluating their goals while in your party. An example would be if the player convinces a NPC to help them solve a problem, such as killing a mutual enemy, and then he completes that goal, the NPC ally might decide to leave the player's party because he has completed his current goal.

Game Ending

> *Don't rush into battle. There are severe consequences if you aren't quite prepared.*

Ways to End: The game can end in two different ways. First of all, the player does have the option at any point during the game to save the game and then restart from that point. However, if the player manages to die during the game, the game will end immediately. The other way that the game will come to a completion is when the world drama manager decides that the drama level 5 has concluded. This will happen after at least one of the many drama level 5 goals have been completed or thwarted.

Epilogue: If the player dies and ends the game early, the world drama manager will continue observe the world in the state that the player has left it. The player will then see what the drama manager calculated to be the end state of the world.

> *That's right. You have the power to see the future (after you die, of course).*

Appendix 4: Tutorial

This following is the written tutorial given to testers to make them familiar with the user interface of *Wind's End*, as well as some of the characters and zones of the game world. This was primarily created as a placeholder until our in-game tutorial was implemented.

1) Welcome to town! First, shouldn't you learn a bit about Wind's End Bastion? Look north! It's Richard Snair, the town's innkeeper! Try talking to him. Click on the "Talk" button in the bottom right corner of the screen, and then click on Richard.

2) Now you get to select the objective you'd like to accomplish in this conversation. Try selecting "Ask For Information". Mouse over icons to see their descriptions.

3) At this point you can choose what you'd like information about. Select "Faction", followed by "Townsfolk". Feel free to observe your other choices as well. It couldn't hurt to familiarize yourself with the other factions around here!

4) Congratulations! Richard doesn't mind telling you about the town. Click on the "Information" button in the top left corner of the screen to see the information you've obtained.

5) Now you're ready to mingle a bit more. Try complementing someone now. Go talk to Edward Snair, Richard's brother, the shopkeeper, to the east.

6) This time, select "Praise" as your objective, followed by "Character" and then "Jonathan Mostan", another adventurer in town, but once again, it may benefit you to observe some of the other names and faces of our community.

7) As you might have noticed, instead of automatically succeeding at your objective, you are now faced with a new menu, and an initial score has been set above your head.

This is the stance menu. From it you may choose the stance you'd like to take towards your opponent, who will also choose a stance. Weighing the two chosen stances against each other will either tip the scales in your favor, or your opponent's. Pick a stance, any stance!

8) Check it out! The score changed based on the stances chosen. Additionally, with each exchange the score range narrows a bit. Currently, if the score reaches 95, you succeed with your objective. If it reaches -95, you fail to do so.

Continue to select stances and try to get a feel for what your opponent likes to choose, as well as what works well against that particular stance.

9) If you succeed Edward Snair's disposition towards Jonathan Mostan will increase a little bit. Perhaps they'll become better friends in the future due to your actions. If you fail, no worries. Just try again.

10) Let's take a trip to the north side of town. Head straight up the path until you end up in another section of town.

This is how you travel. You'll find that some zones take days to reach. Travel if you must, but take heed: the town does not stand still during this time. It will change in your absence, perhaps drastically.

11) Feel free to try out other objectives, targets, and stances, and see how they affect the world around you.

12) Although you should try to avoid it, sometimes combat is the best option. To attack a target, click on the "Attack" button and then select your target. Be careful though. Attacking commoners may cause other commoners to attack you, and attacking someone a lot of people like will make them like you less. They may even want to kill you. Also, your actions will affect the overall drama level. Basically, don't bite off more than you can chew.

13) Once you have defeated enough foes and/or won enough conversations, you will level up. With this your stats will increase and you can then strengthen your abilities and unlock others. Click on the "Increase Abilities" button and select what skills you'd like to build.

Good work. This ends our tour of Wind's End. Now go out there and show this town what you're made of!

Appendix 5: Project Workflow and Management
With the fast pace and limited amount of time available to complete this project all three team members had to work in parallel on the tasks at hand. In order to do this, we set up weekly and end of term goals to make sure that we were on track.

Appendix 5.1: Man-hours over time
In order to complete this project it was estimated that each team member would needed to spend a total of 20 hours per week doing work related to it. We each were in charge of recording our amount of hours and sending these logs into our professors each week to not only make sure that everyone was doing their fair share but also as an inspiration to keep up the amount of work from week to week. Figure 1 shows the average amount of time spent for the team each week of the process.

Average Hours per Week

Average hours per week
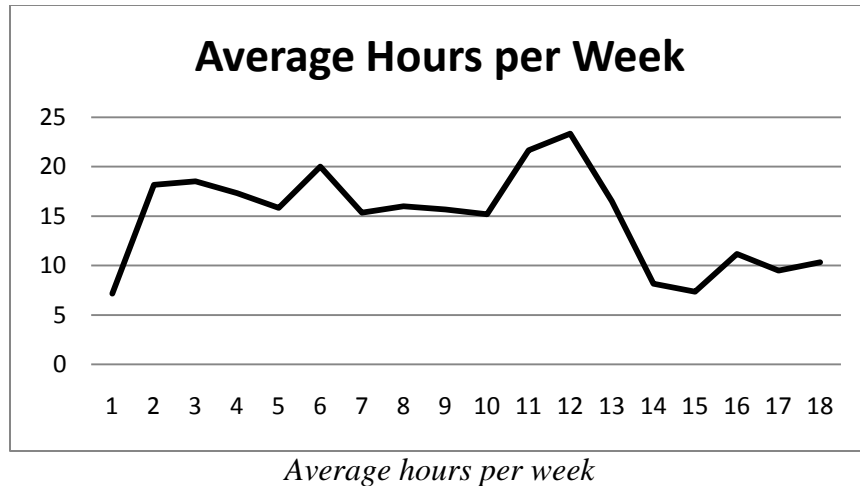
At the end of each six-week period we reached the end of a term along with a major milestone: the completion of our design, the game's core features, and finally, our tested and completed game. Due to other obligations we were often unable to devote as much time to the game in the third term as evidenced by the severe drop in work hours between week 12 and week 14. Also, the first few weeks of our first term were largely devoted to organization and studying previous work in interactive story generation, which did not require as much time as the design and implementation of *Wind's End*.

Appendix 5.2: Task Scheduling and Student Meetings

Scheduling tasks for each member to work on during a week was very helpful to us. Each week we would have a student only meeting to discuss the feedback received from the professors and how to split up the work for that week. On most weeks, we would also meet a second time to make sure that everything was on track or to update the schedule if needed. This kept each member motivated to do their share of work.

Appendix 5.3: Meetings and Communication with Professors

Every week the team would meet as a whole with both professors. Before these meetings, status reports where sent in to the professors to update them with the progress made each week. The status reports consisted of:

- Revised Schedule
- Meeting Agenda
- Work Logs
- Documents/Update Map File

The meetings with the professors allowed us to physically show off the most recent progress made and to discuss and get feedback for what we would be doing the following week.

Appendix 5.4: Project Milestones

For each term during this project, we came up with an end-term goal which was something that we would want to accomplish before the end of the term. For the first term, we decided that it

would be best if we had the design document for our game completed and that we all familiarized ourselves with the engine that we would be using to create the game.

The second was dedicated to the development of the game. To accomplish this we knew that it would be the busiest term because a lot of work had to get done in order to produce a playable game. The third and final term was dedicated to user testing and debugging for the game as well as fleshing out the game according to what we decided needed to still be done.

Appendix 6: Player Pitches

Appendix 6.1: In One Sentence...

Forge your destiny in *Wind's End*, where your story weaves and evolves with every interaction, be it by your hand or tongue, or those of the townsfolk who grow restless and desperate to act, with or without your aid.

Appendix 6.2: In One Paragraph...

What is your destiny? Will you wrestle the town of Wind's End Bastion away from thief invaders, forge peace among former enemies, or perhaps sit back and watch the town crumble from faction warfare? In *Wind's End*, your interactions with the townsfolk weave together stories as you play, which build and culminate in a dramatic conclusion to seal the fate of the town. Act as you please, but be warned: the smallest conversation or fight can one day lead to a tragedy or victory of epic proportions.

Appendix 7: Credits

Models Used:
- Blood Elf Phoenix Archer - General Frank
- Dark Elf Necromancer - darklord_avalon