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# Thoughts on map resources.

Tags: TTT, WorldGen, Design

Today I want to put down some initial design ideas for map resources. These will be thoughts, or rules rather than the traditional list. I just want to get them down so I can ruminate on them in the future. They are by no means carved in stone, and may never even make to the first iteration:

1. **Map elevation**: I would like to design the map generator to create lands that have many different elevations, each containing their own ecosystem, or at least ecosystem modifiers. For arguments sake, let’s say there are ten levels, one to ten. Sea level would be level two, with level one reserved for swamps, and other below sea level geographic features. Coast will be two and three. Regular habitable land would be between one and six. Above six would be mountainous terrain which provides travel blockages and natural borders. See [hypsography](https://en.wikipedia.org/wiki/Elevation#Hypsography) for more details.
2. **Bodies of water**: The map-specific bodies of water will be oceans, lakes, and large rivers. Each of these three will be their own unique ecosystems. I’m hoping to be able to design a generator which would be able to link rivers and lakes together so again, they form natural borders.
3. **Moisture content**: Each “hex” will have a moisture content value. The value will naturally decline as the elevation increases. Other factors may be proximity to bodies of water, or dry areas, like deserts.
4. **Geography**: The land within each hex will have between one and three geographies associated with it. Each type of topography will have different ratios of resources available to it, then random amounts of those resources. A ten-thousand food view of natural environment can be found [here](https://en.wikipedia.org/wiki/Natural_environment). A partial list of ecosystems which fall into the different geographical types can be found [here](http://www.ecosystem.org/types-of-ecosystems).
5. **Natural resources, food**: With the land within each hex having different geographies, there will be a value for natural resources, like wild plants and animals, associated with each geography or ecosystem. These resources will be random, and decline once there is any significant population presence habituating or exploiting the area.
6. **Natural resources, materials**: Based on the geography or ecosystem, there will be a finite amount of material resources available for harvest. These resources would be primarily lumber, and anything else which might be available as a surface feature. I would like to set it up on a gradual scale where low amounts of exploitation will have little or no effect on the area, but as utilization increases, the resource return declines, slowly at first, then rapidly, until the inverse happens, and maximum development causes only a small amount of resource to be available.
7. **Natural resources, mining or underground**: Similar to material natural resources, these types of materials will eventually tap out, but the impact on the overall resources of the hex will be far less.
8. **Resource usage**: The population will require a certain amount of resources to function. Like Stellaris, there will be one or more types or “regular” resources, such as food for example. Some can be stockpiled, but it is regularly required and used. Other resources, such as building materials, can be stockpiled, but improvements and structures cannot be created with out their availability. One idea that I have is that as tech improves, the types of resource requirements morph into greater quality/economy/value materials.
9. **Population amounts**: Each hex will have a value for the amount of population it can support. This value will change over time, modified by exploitation, developments, events and the like. If the population exceeds the supportable amount, there will be penalties. These I will work on somewhere down the road, but they will certainly be a reason for overall expansion.
10. **Weather**: I have always wanted to include weather, and in a perfect world I would love to be able to create a “weather map” that would overlay the geographical map. This would be a hidden feature where players would have to experience the effects of good or bad weather and the impact they regularly have on the ecosystem and any habitation.

There you have it – a few ideas that have been rolling around in my head for years, and some new ones that I thought of while creating this documentation. We shall see where this leads!

# Problem solving breaks!

Tags: Thankful, WorldGen, Design

I have been having a problem defining the stats in WorldGen. I created the basic premise, but wrapping it all up, and defining it in a useable manner has been giving me some cause for concern. It’s difficult to work on something when it doesn’t really fit together.

Today I went for a walk and pondered the problem. During the brunt of my programming career, when I had a problem, I would take a break, go have a smoke, and the answer would come. Sometimes before I even lit up. I no longer smoke, but it wasn’t the cigarette solving the problem, it was the break. I go out walking now, and today I found a workable solution for my problem. And I am thankful to have the ability and the method to work through complex problems.

I did write a few weeks ago about my philosophy on person stats. Today I figured out the next step and how I am going to put it all together. Note that the method is new, but some of the labels or descriptors will probably change when I decide on the final nomenclature.

The newish paradigm is that each of the three main areas (mind, body, and soul) have again three stats associated with them. The general idea came from body, where the three stats nicely describe the physicality of an individual. Within each group is a:

* Constant: Something the person is born with created with that is not subject to change, except under extreme circumstances;
* Development: A stat which can be developed and improved over time;
* Current: A stat which is the way it is right now, and will deteriorate over time.

In **mind**, the three stats will be intelligence (constant), education (development), and sanity (current). For the purposes of WorldGen intelligence and education will be the key drivers for discovery, task ability, and cleverness and such. I plan to use sanity somewhat like the role-playing game Call of Cthulhu where it is kind of a wild card, and will generally only go down over time. It may also be used to calculate rationality for some decision-based scenarios.

For **body**, the three stats are size (constant), strength (development), and health (current). They are all pretty self-explanatory, and provided the base model for the other two aspects.

**Soul** is up in the air a bit right now. My current thinking is to use honesty (constant), piety (development), and spirit/spirituality (current). The idea is that the soul realm is really a plus/minus with the higher numbers being the sphere of good, middle numbers neutral, and low numbers bad/evil/immoral, which will be defined precisely later. Perhaps it is an indication of your moral compass. We shall see.

Anyway, I’m pleased with this bit of solving – it adds some strong structure around how the stats can be interpreted, changed, or interfaced with. One of the key mantras behind WorldGen is that the players will not actually see the numbers under normal circumstances, and really, they will be used as factors for calculations and AI variability.

# AI personality traits.

Tags: TTT, WorldGen, Design

Today I came across [this](http://gdcvault.com/play/1024223/Creating-Complex-AI-) conference talk “Creating Complex AI Behavior in 'Stellaris' through Data Driven Design” by Mehrnaz Amanat Bari. As a game that has done a lot of things right, I am pleased that the actual system they use to drive the AI in the game is what I have envisioned for WorldGen. Basically, they are holding all the data in a database and using modifiers and random chance to drive the AI decision making. This can create a much less predictable game experience, and eliminate a lot of the work that would have to be done to figure out all the nooks and crannies with the implementation of a huge decision tree structure.

On today’s Ten Thing Tuesday I’m going to start my ramblings on the AI personalities that will be used for data driven decision making. Note that the names here are only placeholders and will be finalized later. The point is to get down the descriptions:

1. **Peaceful**: You always must include “peaceful”. The main concept of this personality is that they will push to borders, and not further aggression. Other modifiers will determine what they will do for defense, and so on. Undecided on what the key constant will be.
2. **Long memory**: This personality will remember how the other players have treated it in the past, probably more as a negative accumulated score, and will interact accordingly. Key constant will be a treatment score.
3. **Warrior**: This personality views themselves through their violence. They are quick to offend and the end goal is glory in victory, in whatever form that takes. The key constant is a higher victory score than the opposition.
4. **Accessible**: This personality welcomes, and can make use of trade and integration. It is more interested in the individual prosperity than the nation, or tribe overall. They don’t really stand for anything and are very adaptable. It does not track a treatment score, but uses some sort of prosperity score.
5. **Spiritual**: The idea behind this personality is that they have a “path” that they exist within based on their history, and they are threatened when they are faced with changes to their “traditions”. The key constant will be a tradition score, and any plus or minus movement is considered a danger.
6. **Structure**: With it’s opposite, “instinctive” this pair represents the polarity of the ideals of the amount of control by the leadership. The key constant for structure will be some sort of conformity, laws, or mandate. Structure might have different facets like tradition, social strata, and the like.
7. **Instinctive**: This personality will be relatively easy going and free-for. Although there is the potential for individuality and the ability to go outside the box, it makes any sort of organizational activity very difficult. Key constant will be a score on exactly how individualistic they have become, which will be a strong modifier if they need to all be rowing in the same direction.
8. **Mercantile**: Similar to “accessible”, mercantile is all about materialism and profit for the society as a whole. Not much for regulation and structure, this personality looks to make the best deal, and is generally centrally controlled, think business for profit organization. The key constant will be economic in nature.

I think eight is all I can think of easily at this point. I know there will be others, and I will add to this list in some form at a later date. I also want to get away from “pairs”, that is, two polar-opposite terms that are mutually exclusive. There may be some opposites, and it may be that they will just cancel each other out. The key takeaway from this exercise is that each non-player nation has to react in some fashion within the game, and this series of personalities will determine the weights which will be used when a decision is made.

# Thoughts about skill and tech trees.

Tags: WorldGen, Design

One of the next areas I want to tackle in WorldGen is the use of skills, and at this point, the tech tree which will be based on the development of skills. The 10,000-foot view is that as pops and individuals do things they get credit for them. At some point, they will “learn” something new, or achieve some sort of discovery.

At the beginning of the game the skills will be very rudimentary – hunting, gathering, basic shelter building, rudimentary warfare. As pops achieve these tasks, the become better at them and can move up to the next level. There will be other factors – random events that happen will contain the keys to the next levels of development. In some cases, trade, or salvaging an item will provide clues, or blueprints as well.

Overall, at some point I will develop the entire tree, then start to add thresholds to take development to the next level. All this will be random so development points will accrue in each category, or skill, and once the discover point is reached, the breakthrough is made automatically. Different from other games will be that there is always a chance of discovery along the way.

A secondary factor will be the speed that “points” accrue. Some skills are seasonal, for instance farming, where the different parts are done over a longer term. I’ll have to figure out a way that these even will even out over time so that one longer-term skill doesn’t impede the overall discovery process too badly. One possibility is that once a maximum is reached in one skill that requires two or more pre-requisites, the “overflow” points will benefit the longer-term skill acquisition.

One of the challenges is to make the whole process non-linear, so that no two games will theoretically follow the same path. The idea is that if the world gives you lemons, you make lemonade. Ideally, I would like to have six to eight spheres of skill trees, at least on the bottom row. Off the top of my head the ones I am currently thinking about are:

* Food production;
* Shelter and building;
* Tools and machines;
* Warfare and tactics;
* Organization, government and administration;
* Education and learning;
* Religion and science.

After the initial levels of the above skills or discoveries are met, then the “tech tree” will become far more intertwined as skills in two or more from the basic are required to advance to the next level, and so on.

Overall, I will create a longer running project to start to fill in the “tech tree”, similar to the one I am using for stories (which is currently at 60!). As it turns out, the stories will have a large impact, both positively and negatively on the overall skill process as a by product of general gameplay.

I think the next step will be to take some of the framework I have laid out here and, add some initial lists from internet searches on the topic, then start to create a structure to start inserting values from the previously proposed challenge.

Someone created a visual chart from Stellaris which I will try to locate again to see how they have set it up. I also think this may be beyond a spreadsheet as far a visual representation goes. A much better tool might be a “mind-mapping” application with connector lines that can go across subject groups a bit easier. Another game to look at might be Rimworld, which I might have to break down a buy at some point.

Overall, I think it will be very interesting exercise, and I’m very fascinated to see what the end product looks like!

# Systems are complex!

Tags: WorldGen, Design

Problems and concepts for the design work I am doing are interesting, but complex. I have been working through the name generation pseudo code and process of late. To begin with it seemed like a simple problem. I decided that I could make it a bit more random and versatile by increasing the complexity, basically adding different formats.

The formats are driven by a number of prerequisites. In order to decide on a name, the following steps must take place:

1. Stats must be generated;
2. Generate name nation (nationality) – could be a user setting or decision;
3. Generate social background;

Each of these steps starts to fill in information about the individual. The statistics may give an indication of a trait of some sort that a name might be based on, example, if size is large, the individual might be called by a nickname, or may have a descriptor as part of their name, prefix or suffix.

Today I started working on name nation. I had some Scandinavian names researched originally, but realized that the individual could be of any nationality, and according to my new back story, would probably be selected by the player, or generated for AI competitors. Once I made the name – nationality connection, I realized that there might be a language or communication problem, or feature. I started researching world languages, and that actually went fairly quick.

Soon I will be committing some cycles to social background – the backstory had made a bit of a paradigm shift so I’m interested to start examining that step in the name generation algorithm. I am positive there will be others after that. Such is the nature of free-form simulation design.

# WorldGen, how it begins.

Tags: My Game, Backstory

When your eyes open, the room is dim. It’s quiet and calm. You move your limbs. They are stiff. Your mind is stiff. It has been a long time since you remember being.

There is a slight hum of machines. Soon you hear the noises of the others – breathing, groaning, the sounds of slight movement.

Your mind thinks back. You were younger then. There was sun, wind, rain – nothing like that here. You remember the people (Scientists? Doctors? Teachers? Family?) putting you into the chamber. Yes, very young.

The hatch is open and you slowly climb out. You are very weak, and dizzy when you stand. The feeling passes.

On the screen is “WorldGen” and press here in a large red button. You press it, and the story begins…

“you are one of the chosen few” the face on the screen says. “What you need to know is that the time has come for you to awake and claim back the world”.

A montage of people, cities, sky runs for a few minutes. You start to have memories of similar things. The images change to explosions, fire, screams.

“The end of the world came. We had little time to prepare, and only had space to save a few. You and your companions have been in stasis for as long as we could possibly allow. The time has come for all of you to awaken and reclaim the world for human kind. Hopefully the world has healed enough for you to survive. There will be others, some may be friendly, some not. Keep this in mind as you go forth.”

The record continues with a few instructions – how to regain strength, a list of available supplies, some tools, materials, and devices. By this time a few others have joined you – you don’t remember any of them, but they seem as confused and excited as you are.

A number comes up at the bottom of the screen and begins to count down. “The seal will unlock in seven days. Organize. Prepare.”

The video repeats, again and again.

Oh, brave new world!

**Descriptions, Concepts and Terminology**

This is the beginning of the story. I want to jot down a few of the constant and constraint ideas I have. These are very preliminary and subject to change upon further considerations:

* Money denominations will be called “credits”;
* There is no concept of ownership, very much a collective;
* The player is the de-facto leader;
* Starting individuals will be about 25, maybe two pops?
* Pops can be created by splitting existing pops, but there will be some kind of overhead cost for the action;
* Food or nourishment will be stored as full ration days or maybe as a consumption amount like energy credits where extras are banked above current use levels (there should be some spoilage, and storage limitations – probably will work in conjunction with each other);
* Building materials will also be banked as well;
* What about water? Is it a factor?

# WorldGen pop activity, starting thoughts.

Tags: TTT, WorldGen

So, in the WorldGen game, what do the pops actually do? The pops are made up of groups of people, the population of the tribes in the game. Each pop is made up of maybe two to 25 people. The pops have different statistics and abilities as determined by an amalgamation of the people’s statistics. Up to this point I have been focusing on people generation, traits and stats, and some of the other issue surrounding the framework of the “units”. I wanted to take a bit of time and start to layout what exactly the people in the game do. What better way than a Ten Thing Tuesday! All these activities will be at the initial, basic level of the game.

1. Hunting: The pops will generate a number that they require for sustenance intake in order to function. This will probably be a number range, or perhaps a threshold and several “bands”, which in turn will have health connotations. Hunting, along with the next couple of entries will be the vehicle to allow pops to gain the resources to eat. Hunting will probably be more short-term sustenance because of the transformation required for longer-term storage. This will be similar to energy generation/use in Stellaris in some ways. A certain percentage of successful hunting will be available as a preserve, and as a protein, may have some additional benefits, but at the same time could be a finite resource, as well as have a particular success rate.
2. Gathering: Like hunting, gathering will have a higher rate of preservation, but will possibly be seasonal based on climate. Again, gathering is a finite resource, and can be variable as well, based on weather, competition, and maybe other factors.
3. Farming: This will produce a steadier output, but will require higher maintenance. Again, farming is seasonal in most cases, and will probably be modeled as a bell curve, with some produce available early, the majority in the harvest season, and some intake late. There will be a much higher preservation percentage available, and possibly a story surrounding spoilage.
4. Ranching: This activity has the potential to be the most stable sustenance production. However, animal keeping will require stockpiling of feed for off-harvest, again like farming, additional work and maintenance, and the potential for crisis from disease or predators.
5. Fishing: For fishing to be a resource, pops must be located near a river, lake or ocean. Like ranching, fishing has the potential to be a long-term steady, sustainable food source. There will be a risk/reward mechanism based on the type of fishing resource being used, with ocean being the most dangerous, but potentially have the best return. There are some costs associated as well, because fishing will require specialized equipment, example boats. There is some potential that fishing may also be season, based on location and climate.
6. Lumbering: The acquisition of building materials will be an on=going activity for pops as growth, progress, and improved lifestyle will all be drivers to produce building material. The by-product of lumbering will be deforestation and the requirement to travel further afield to sustain production.
7. Mining: There are several possible production outcomes for mining. Some are raw materials for metal working, fossil fuel (coal) production for industrial creation and domestic use, precious materials for consumer items (jewelry) and trade goods, and salt as a dietary item and/or a requirement for food preservation.
8. Tool-making: To do much of the pervious, there must be some investment in the industry for tool creation and maintenance. The raw materials for tools will include wood, metal, natural materials for rope/twine/fabric, by-products from food production, and stone.
9. Building: There is a requirement for continual building and maintenance of structures for habitation, security, and the various types of production.
10. Education: For a society to advance there must be a formal or informal requirement for an education system. Education provides a “quick start” for the population to get to the pinnacle of production, a jumping off point for innovation to occur. Education can be in the form of guilds, groups, mentorships, or “bricks and mortar” facilities, or more likely a combination of them all. Through the education vehicle is where innovation is born.

This has been a “quick ten” off the top of my head. By intension I have started with the most basic of civilization working, and will expand the list in the future with secondary activities which surround and support these vocations within a society.

# Thoughts on development documentation.

Tags: My Game, Design

I’m struggling a bit with the organization of my documentation for WorldGen. I’ve started using GitHub, and it is working out quite well as it holds any file type, not just code. My struggles are coming up with a consistent format that I can use across the different game mechanisms.

I have created some mantras – see the post from Friday, February 17th. To recap:

1. Work on the foundations first;
2. Take on smaller tasks;
3. Complete a task before moving to the next one;
4. Keep the GitHub project current.

A quick update is in order. Goal one is going well, in conjunction with goal three. I am working in “person” generation right now, moving forward with finishing some older design ideas. I’m not quite all there with goal three however, as I am still pushing out other ideas. It’s difficult because different types of work require alternate ways of thinking. Some of the pure creativity tasks can be started, but for them to have long-term value, they need some time to stew. I am really putting down ideas, and placeholders, rather that jumping all over the place. I think it is a good compromise. Goal four is a given, but I have been making changes to master rather than creating branches. I think this is all right at the moment because I’m not writing live code.

Goal two is sort of working, but that is where the documentation problem comes up. As I break down tasks they continue to spawn other tasks. Something that seems straight forward at first glance, becomes complex when it is put under consideration. Every time a “split” is made, how fine is it cut down, and how do you keep constant across several different sub-systems?

Today I want to start working on some documentation mantras:

* Start every file with pseudo-code;
* In some cases, the steps and task lists can turn into pseudo-code;
* Comment code as much as possible;
* Be liberal with files and folders because they can always be combined and moved;
* Put down ideas and notes in the files where the work is;
* Or, avoid external documentation files;
* Separate the sub-systems, then the elements of those systems.

I’ll start with these (and put them in my logging spreadsheet), and see what I can add in the future. In the next while I’m hoping to complete a significant chunk of the first sub-system, so we’ll see how these mantras stand up! I expect to be revisiting this topic as challenges present themselves, and ideas are developed.

# A summary of pop stats and other things.

Tags: My Game

I did a bit on “Ten Thing Tuesday” about pop stats and where I wanted to go. Out of that article came a few thoughts, and a continuation of the project by way of a daily challenge. Right now, I have been going on longer walks, with much nicer weather and have had a chance to think a bit more about the project.

One of the first things is that I came up with a few initial mantras for the project. These are a list of rules I want to keep in mind when working on the WorldGen project to keep some initiative on development:

* Work on the foundations first;
* Take on smaller tasks;
* Complete a task before moving to the next one;
* Keep the GitHub project current.

Over time I want to keep adding to this list, or at the minimum, keep what I have written in mind.

I also have decided on a change of direction for pop stats. I have decided at this point to use three general stat categories: Mind, Body and Soul. Each of these three categories will have three sub-categories. The sum of the subs will be the classification score. For the purposes of this initial writing the grouping will be. The main category I will call a “trait”, the sub-categories will be called stats:

Trait Mind: Mental capacity of each of the members of the pop. Again, at this point the higher the number the better, but having a lower number doesn’t mean a handicap, just a lack of the ability. The key stats will be labeled at this point:

* Intelligence: Represents the ability to learn. At the high end this stat will allow the individual to suck up information like a sponge. At the low end the individual will be less versatile for changing vocation, and will be a negative modifier to education.
* Contemplative: I’m not sure I will use this term, but the idea is more motivational in nature. Given that an individual is contemplative, they will strive towards an educational goal.
* Education: This will be a growing stat that will reflect age, contemplativeness, and intelligence. Unless there is an accident or illness, this number will grow as the individual ages.

Trait Body: This set of stats represents the physical traits of the individual. Some tasks and vocations will be primarily physical in nature and will rely heavily on this trait.

* Size: This stat will be the physical size of the individual. I think I wrote about this before, that it will be bell-curved. This stat is affected by the other stats of strength and hearty to some degree.
* Strength: Again, another straight forward stat, and again, bell-curved.
* Hearty: This stat will represent the health of the individual. As age increases, and perhaps injury, sub-par diet, or illness happens, this will modify strength primarily, and maybe size to a lesser degree.

Trait Soul: This trait will be a bit more difficult to pin down. To a certain extent, it represents the personality of the individual, but this gets into some sketchy ground when I try to balance it against the mind trait, as it can be argued that they are similar in some ways, two sides of a coin perhaps.

* Honesty: The honesty stat is a reflection on how forthcoming the individual is. This could be used by business, labour, or social aspects. I’m not sure at this point what the overall ramifications of honesty will be at this point, but I think it is an important stat that can have some interesting uses.
* Cooperative: This stat is sort of an all-encompassing vision of how the individual fits into society as a whole. I see “more cooperative” as being social, and for the good of the population, while less cooperative will be introverted. Other choices for the same idea might be “patriotic” or maybe “sociable”.
* Venturesome: This stat will represent the amount of risk an individual is willing to take. It might also be a factor for a “moral check”, and might also be described as “boldness” or “adventurous”. I’m not completely sold on the term, or the ideal at this point, but for the purposes of an initial model it will do.

Beyond the three above traits, leaders will have some additional traits, not the least of which is “leadership”. I am thinking that there will be a list of possible traits a leader could have, and a limited number of slots they can be acquired into. I think they could also be replaced over time, or by external events or stories. These will be determined at some point in the future, and I’m thinking three-quarters positive, and a quarter negative at this point.

# Ten stats for pops.

Tags: TTT, My Game

I want to start doing a bit more development documentation while I continue to evaluate programming technologies. To that end, today’s Ten Thing Tuesday will be some thoughts surrounding the different stats or traits being generated for individuals who will makeup the pops, and how the stats will be used. Here goes:

1. Health: Health is a measure of how well an individual is at any given moment. There will be several factors which will modify health including age, injury, illness, vocation, and diet. I would like to use a real-time scale something like Stellaris, but failing that I will be using something turn-based. For each turn, or time segment if using continual flow, health will be evaluated. At this point I want to use a 100 scale, and there will be a series of random rolls for events which will modify the health of the individual. For example, there will be a chance that the individual is injured, with a modifier based on vocation, and a random penalty tallied. This will require a fair amount of detail and tinkering.
2. Size: There will be a number of size categories, maybe around seven, which will provide modifiers when the individual takes part in activities. A couple of examples might be a larger individual might require more sustenance, or be more intimidating in battle. A smaller individual might be better for a mining vocation, or cost less to equip. A medium sized person will be standard and probably cheaper in the log run to maintain. Distribution will be setup as a bell curve with only a small percentage being out of the norm.
3. Adaptation: The adaptation trait will be for learning and discovery. The more adaptable the individual (and the sum for the pop), the higher the chance of learning better ways of doing stuff, or crafting new things. Adaption will be a modifier during each “turn” and will directly add to the over-all chance for discovery, which in turn will be a random discovery roll which will have increased chance as time goes on.
4. Strength: This stat will be used to modify the effectiveness for certain vocations, and certain roles in combat. For example, strength will be a benefit for logging, thus would add a modifier to it’s productivity.
5. Dexterity: Like strength, dexterity has to do with the manipulation of stuff, whether as a vocation or warfare. An individual with high dexterity would be a more effective archer in battle.
6. Conventional: This trait is a measure of how much an individual will follow authority. It will be used as a modifier when making social order checks – Is the individual willing to follow decrees and directives or will they rebel. Again, this will be a bell curve, and will be amalgamated within a pop to determine overall willingness or resistance to change.
7. Leadership: This is a modifier for compliance. In the case when a leader issues directives, this is compared against, or in relation to compliance to determine some sort of productivity modifier, plus or minus. This could have to do with productivity, warfare, or any other endeavor that may be mandated through the chain of command.
8. Cooperative: This trait is a social modifier for an individual to determine how social they are. The higher the value, the more community oriented they will be, and will be a modifier to increase or decrease productivity at the expense of innovation.
9. Education: Education is a value that is modified partially by the individual, as an single person can educate themselves to a certain extent. It becomes important aa part of a pop for being productive in complex vocations, or advancing technology. In some ways it is similar to health as it develops over time, and to some extent, is based on external sources for modification.
10. Honesty: This trait will come into play anytime trust is an issue. Combined within a pop, honesty will come into play for productivity, as it has the potential to undermine for personal gain. It can also be used for negotiation, leadership situations, and perhaps a “crime” score. In many ways, it is putting the individual ahead society as a group.

These are some of the strongest candidates I am considering at this point. I have a document that lists traits, and it might be a good exercise to group them under the banner of these ten to see if there are patterns, or additional traits I should be focusing on. The other consideration is to simplify the individual traits down to just a few that concentrate on a limited idea of physical, mental, and spiritual attributes.

My next step will be to group the traits under the simple heading, then see if there are good reasons to make it complex. It may be that “pops” start out simple, and leaders gain additional traits once they become “ascended” from the great unwashed. All in all, good food for thought.

# Some thoughts on pops and scale mechanics.

Tags: Game, Design

I have been thinking about scale for quite a while. I don’t want to have just nameless populations that end up being a statistic, and at the other end, I don’t want to have the micro management of every single individual. What I like is the idea of “pops”. These are groups of individuals that represent maybe 3 to 25 individuals. In general, they will be a “type” as to what their main vocation, or vocations are, hand will have a summed number for maintenance costs.

When generated they will total all their individual stats. If they can reach certain thresholds they will become specialized. The basic specializations will be things like farming, lumbering, labouring, militia, and the like. The next series will be “improved” specializations. These will be branches of the basic specializations, with additional productivity modifiers and output types. Next stage will be advanced, again more branches, better products. The pinnacle will be “specialized”, where the unit will be particularly good at one thing, and maybe passible at a couple of others.

Pops can be created on command, with cost. This will cause a reduction in the other pops, but the sum will still be equal to the pre-formation. Results will very based on the skills of the leader who creates and manages the pop. Over time pops will potentially improve.

A couple of other events types will change pops. Over time event will cause pops to age and die, but new pops will be created. Specific events like war, famine, natural disasters will reduce the ability of pops as members are removed, but other random events will improve pops. Also, prosperity will be a big factor in pop improvement, both in size and ability possibilities. Leaders will come from pops at some point, whether they are recruited or naturally appear in a pool.

I think this will be where I will start programming as it holds the most potential and interest. The amount of information, and way I will store pops is yet to be determined. I am still considering generating everyone as an individual with statistics and potential. I want to avoid genetics for the most part as I don’t want it to become a focus point of the game.

When generated, a person will have a set of still-to-be determined base statistics, and then chances for specialized abilities or potentials. I would like to see the pop system as a discovery mechanism. At some point, a person, as a member of a pop may get the chance to innovate, depending on the work they are doing. I will have to figure out a way to track this because it will be a game balance focus point.

I will have to dig up the document that has the base information work I have done. I don’t want to speculate on it again here. Figuring out how the stats will play into the specifications will be a ongoing process.

Action Items:

* Fine the spreadsheet on the dev computer that contains some of my previous work;
* Pseudo-code the generation steps;
* Determine the different pop specialization groupings – in essence this will be the “tech tree” feature;
* Create a living document and methodology to track the thresholds for the specifications;
* Come up with a formula for support costs, and how it inter-relates with the general production of pops. There has to be some pops exploiting resources in order for others to grow and specialize.

So, this will be my development tasks for the next little while. The design and documentation will buy me some time before I have to make decisions on technology.

# The game story challenge – what do I want to achieve?

Tags: Game

At the middle of January, I set myself a challenge to create tag lines and notes for game stories. Game stories are the random events, or “stories” that happen during the course of a game. The stories can be short, like "something happens, result”, or can be made into a complex story line that requires time and decisions.

The space game Stellaris uses “stories” – generally when an anomaly is researched, a story is triggered. The stories tend to be game-time oriented, the same story, or groups of stories only available during certain time in the game. It would be a waste of time to have a beginner story triggering at end-game. Other stories are events which again happen at certain junctures of the game. The one that comes to mind is the “pirates” storyline that tends to happen early on, and forces the player to build a bit of a navy to deal with it.

In Civilization and Alpha Century running over map explorer points triggers an event based on maybe ten random outcomes. Additionally, I think there are other scripted events that happen at stages in development. Dominions also has random events that are trigger every game turn month – a few of them are cause/effect that hint at a negative outcome unless some action is taken.

My idea is to create a pool of random series of events. I would like these events to be scalable so they wouldn’t happen at just one point during the game, and still be meaningful at end-game. I would like a majority of them to be multi-step, over time tales, with choices which can lead to multiple outcomes. Building this “tree” will probably be another project at some point, and in the rough notes I am making, I am alluding to some of the possible outcomes. There are several general categories I want to create them under:

* **Economic**: This category is primarily currency-based outcomes. A simple example would be “Cause – effect”, while a more complex story might be “statement, decision, outcome”. One of the challenges is to make the economic events worth reading, rather than just having them click-throughs. I think this will mean taking one story and making subtle modifications to it, or having the result being more random.
* **Society**: These events may be the result of certain statuses in the game. For example, if people are starving, there would be a group of stories that stem from that consequence. I think this category will be less spontaneous that the other, but the challenge is to create many random outcomes for event status types, so it is not “the people are hungry again and revolt causing something”. The trick will be to envision the situation and consider creative stories that fall out of the situation. I may just give Rimworld a try as it seems to be story-driven, or at least having a complete story as an outcome.
* **Personal**: Personal events will have to do with changes within the “management people” of the game. I envision that the player will control the activities of individual who are only a couple of management levels below. The premise for the events are that people change over time, some may be ailments, which happens in Dominions, others are trait additions in Stellaris. I would like to see them more as “modifications”. Over time a person may change their complete view of the world, and their place in it. This may be based on a randomly generated attribute, kind of like a “gene for personal change”, or a “trait for searching for purpose”.
* **Environmental**: The triggers for this story will be random weather-based events, but the stories will take into consideration current terrain and physical attributes when creating the story. There will probably be a “severity” roll to determine the next or terminal event of the story. An example would be “rain storm, de-forested hex, roll for severity of mudslide”, with outcomes being anything from “dodged a bullet” to “complete devastation”.
* **Warfare**: During battles, I would like the possibility of random events to happen. I see the battles as being small-scale and tactical in nature, and would like to devote a series of stories that modify the outcomes of such. The types of stories might be knowledge gain, heroic or cowardly action, freak accident, and the like.
* **Research**: I would like the possibility of random things happening during research and tech aspects of the game. Things such as an unintended result, research stolen or lost, or incompetence caused loss, might be some of the story lines. The people traits may have some effect on the triggering of these types of stories.
* **Miscellaneous**: Pretty much stuff that doesn’t fit into any of the above categories.

So, after writing this out I will add a column to my challenge for story type in the next little while. This has been an excellent exercise in thing through at least part of a game system.

# How to layout the directory structure for WorldGen.

Tags: Game, Organization, Design

This is part one of a couple of articles planning how I am going to lay out the files for the WorldGen project. I wanted to do this in a journal entry to use it as a tool to think about the overall structure of the program in GitHub, now that I have started to move some of my existing files in. I will examine it in parts based on the different structures I am including. Some of these are incomplete thoughts at this time, but I am using this for an overall idea as the general element that I need to create and focus on.

**Map**: Folder that will contain constraints for the map and map generation. Sub-folders include the map graphics and map terrain type information. I envision the map as hex grid style with, in the beginning, the hexes being of one general type of terrain in terms of graphics, but the data underneath will be complex and variable. I’m hoping at some point to be able to generate the map graphics based on the terrain composition.

**People**: This folder will contain static name and trait information for the inhabitants of the game. The data in here will be used by the initial generation process, and throughout the game to create people based on the specific rules and traits the player designs. Some of the key features are tribe names, tribe traits (political and personable), specific people traits available, possible personal afflictions, and vocations.

**Generation**: This folder will contain the initial generation routines and ongoing generation code. The idea is that after initial generation, this will be a regular series of routine that will manage the generation aspects of the world. Some of these include name and title generation, specific terrain generation types, and NPC (non-player character) generation.

**AI (Artificial Intelligence)**: This folder will contain data on the different AI algorithms, and the frequency of use. One of the ideas is that nothing is forever, and over time tribes will change based on events, situations, and leadership.

**Mod**: This folder will be the place where any external mods are kept and administrated. The idea is that an individual can customize aspects of the game, and these modifications will be organized and stored here. I have a few ideas on how this will work, but much more thought must go into it.

**Resources**: This folder contains data and code concerning the resources in the game. This will be a big part of the game, as how the tribes interact with resources will, in a large part, represent the dynamics of how the game plays.

**Data**: The specific data files for the game will reside here. This will be more of a “data dump” because I plan to use an actual database to manage the information at this point.

**Saves**: This folder will contain the custom tribes created by players, and pointers for game-in-progress saves.

**World**: This folder contains the data structures that are used during game play. I’m not completely sure how the data and save information will be made to interact with these structures at this point.

Overall, as I organize the files I have created thus far, I will be creating this structure in GitHub. The goal is to create something ridged enough to be able to form some structure for development goals, but flexible enough to be able to incorporate new ideas. I hope that each of these sections will be the subject for in-depth analysis at some point over the next while.

# Game stories, what are they for?

Tags: Game, Content

Today I want to write about game content a bit. I started a project late the end of last week to write a story everyday. What I mean by story is the basic premise behind a random event that would happen in the game. This is a bit of a work in progress because I haven’t written many, and I am creating only a brief notation to use as a starting point. The idea of story differs a bit from regular game play which is more of a cause-and-effect mechanism with random result created for success or failure.

The reasons for creating these stories are to develop the breadth of what the game will become. As I play a bit of Stellaris I am finding that the same “stories” keep coming up. The problem is that they were “really good” the first couple of times when the outcome was in doubt, but they change from stories (which draw you into the game) to events that just happen. No, I don’t see the same ones every time, but at this point I am not seeing enough “new” stories, or being surprised by the current ones.

I understand that there is a cost to creating great stories, but I am hoping to mitigate some of the costs by at least spreading the creation aspect up over a longer time frame.

I am also using this opportunity to think a bit about the mechanics and technical issues surrounding the stories. A couple of key ideas are that I want to make them data-base driven. There will be a starter record for each story which contains the text of the story, a count of how many times the story has been used, the level of the story (a concept I have yet to think about at this point), and then a branch to the next node in the story.

The reason I would like to create a story counter is that it is possible that I could add some weight to the story trigger that would select less-used stories as time moves on. I would like to ensure that, if a player plays the game enough, at some point all stories will have been used.

There will be no restrictions on how many “chapters” a story can have. Like “choose your own adventure”, the stories will not have a set length, and depending on the path you decide to take, the story may end right away, or go on for a considerable time.

Something will have to complete in order for the story to move to the next chapter – it could be passing time (which would be nice to make random), it could be something the player has to do, it could be a condition triggered through the game mechanics, or an event when the AI scripts reach a certain point.

At some point, I may have a few of the better “plots” move from becoming stories to sagas. Part of the idea for this is to have them become part of the player motivation for “just one more turn” mindset.

As far as putting some numbers around the amount required, to begin with I am thinking my initial goal will be 100 raw stories. Today I am changing my challenge to reflect this number. Until some development and integration starts to happen I will go with this preliminary target.

# Blockchain, command hierarchy & other game mechanics

Tags: Game, Mechanics

I’ve been thinking of a few game mechanics recently and would like to put them down in writing. I’m hoping that I can fill in a few of the design blanks in this journal that will fill in the overall scope of the project over time.

**Blockchain**: According to Wikipedia, A blockchain (originally block chain) is a distributed database that maintains a continuously-growing list of ordered records called blocks. Each block contains a timestamp and a link to a previous block. By design blockchains are inherently resistant to modification of the data. Once recorded, the data in a block cannot be altered retroactively.

For the purposes of my game, I believe that by using a blockchain methodology I can create a system to record the providence of inhabitants (heredity), resource development, trade, travel and events. The blockchain will, in essence, become the unique identifier. I will create a registry for objects of different types with an incrementing numeric counter. The blockchain will contain the new id, last source id, second-last source id, and so on. I think I will plan to keep the identifiers of the previous three at this point. Based on that chain I can at least link back to the registry to develop a history for the select item. An example would be “ABC-123-88-43-7”, where the type of unit/resource/entity is ABC (I will probably use a three-character data-less identifier), the current identifier is 123, previous is 88, and so on. Notice how the numbers will always decrement. I’ll have to consider using a greater sum of previous ids.

**Command Hierarchy**: For the purposes of player control and artificial intelligence (AI) I would like to create a command hierarchy. The idea is the player can affect the decisions and actions of only a limited number of entities based on hierarchy. The player in the “great leader” and all other generated inhabitants are subservient. As inhabitants are place in different roles and responsibilities, the actions and instructions the give are performed by the AI. I’m uncertain at this point how many levels that might be – it could be that the player appoints “mayors” for settlements, and “generals” for mobile groups, and it is only to these entities that instruction can be issued. The other possibility is that it could be the leader of any type of user, modder, or developer-defined group and there would be either a specific or generally designed instruction interface to issue commands, actions, goals, preferences, and the like.

These are the two game mechanics that are currently on my mind – more to come!

# So, what are WorldGen genre options?

Tags: Game, Genre

I have been considering the setting for the WorldGen game for some time. In the absence of thinking of something truly original that stands out, I want to take some time and document my thoughts on some of the existing genres to see what my vision of the fit would be. The overall theme of the game will be 4X (eXplore, eXpand, eXploit, and eXterminate), so I’ll start with some of those.

The classic 4X is a space genre, and although the science behind it really interests me, I think there are enough good games out there that I couldn’t bring too many fresh ideas to the setting. Master of Orion is the “grandfather” of them all, and some have improved the experience (Stellaris), while some developers are working to re-create it!

Civilization, and the game series of the same name by Sid Meier is also a popular genre. The Civilization game series, again, is the gold standard and has pretty much explored all the ideas in a global and historical context. This specific genre is a little more “macro” than what I am interested in exploring.

Mythology, and colonial development in the context of racial nations (a la Dominions) is again more xenophobic and more racially specific than what I would like to explore.

Another genre of interest to me is a post-apocalyptic world. I know there are some games out there, and a number of games use the story for some aspects. The games that I know of tend to be small armed foraging and micro-development based.

So, whatever the genre, I would like to be somewhere in the middle of population and race size. I would like to not have to use racial boundaries as such, more along tribal lines. I would like it to be beyond a small party, at least once past the early game. At this point I might not have to decide on a back story – it could be shipwrecked tribe, post-apocalyptic re-emergence, or achieving a sentient state. The key decisions I have to make to initiate development are basically scope, and gameplay activities.

This topic is a good start. Thinking through, I can focus activity elsewhere, at least for now.

# Game process thoughts.

Tags: Game, Process Design

I’m pre-empting “Thankful Thursday!” This week for a little more work on game design. Today I want to list some of the mechanic processes that I have been ruminating on. The processes are described in relation to a wilderness 4X game that I have been contemplating.

**Settlements:** I think the long-term plan is to make settlements autonomous because once you have enough of them, or a specific size they start to become administrative millstones. I think at some point there should be a handoff for AI to administrate. The IA will not do a fantastic job, but I think it can be decent enough to create steady, long-term development. There also could be a mechanic that the earlier a settlement is handed-off something good or bad can happens, like an “ethics diversion” benefit or penalty. I believe there has to be a lot more “meat” or substance behind the scenes for settlements (and therefore the AI) for the game to work with. Deep end settlement characteristics will be a topic for further discussion.

**Area Development:** This is a sub-mechanic of settlements, setup by growth and development (the two must be able to function separately). Area development is based on a combination of the initial resource generation process and settlement development. The player will, at least in the beginning, create “development units” that, based on there internal characteristics, have abilities to discover, exploit or develop the resources surrounding a settlement designation. The development units will be autonomous unless given specific instructions by the player. Because of the random “internal statistics” ordering units will have varying degrees of success, even for the AI (although I would like to have an AI stat that recognises or learns unit proficiency, good and/or bad).

**Trade and Communication Network:** This will be an automated process that develops over time. The idea will be to create an AI “spider” that controls trade and communication between given settlements, or the empire as a whole. I think the efficiency that this operates at will be a branch of the “tech tree”. Again, part of this could potentially be player over-ridden.

**Tech Tree:** This is another sub-system that will require more detail later. The concept is the have discoveries that would generally be directed by the player, with the ability to add different weights based on the player’s vision on where they want their empire to go. I don’t want to use the term “tech tree”, so I will have to come up with an alternate name. One idea is to have the player select “administrative” individuals for positions, and based on their generated traits, have them determine the course of events, areas of development/research, and the like.

I keep getting interrupted today, so I’m gong to have write more on this topic another day. There are still a few more systems to account for.

# Game technical concerns.

Tags: Game, Technical Design

I want to write about some of my technical concerns for game development. I do have some general ideas about what technical tools I want to use today, but some research is still required.

First off, the game will be primarily backed by a database because I have the most experience with using it as a data repository, and I think it can be designed in such a way that it will be very easy to tinker with settings and add new content. Probably the best database choice is SQL Server as it is the industry standard right now, and I can obtain a free version. I plan on using vanilla code, so I shouldn’t need some of the professional features, at least not to start out. I plan on using database procedures to do a lot of the heavy lifting.

Platform is one of the big decision. I am thinking of using a browser base because I don’t want the hassle of having to create different versions for different operating systems. This can cause some inherent problems because I must determine what level of browser to use and rendering language.

Next up is programming language. All of them are similar, and really the key features, given the above constraints, are that it should be browser and database specific (or friendly). I think I will post a question on Stack Overflow to see who out there has some ideas.

I’m not particularly worried about the programming expertise. I feel that I can learn a new language and format over time, and that I have the fundamental programming ability to do the code. I also feel that I must select something at least a little mainstream so I can take advantage of resources and training available on the internet.

Design documentation will be done using Trello – I think it is the most versatile tool for capturing the overall project, and I will add other tools as I see fit.

One last requirement is the creation and integration of a website. I have to come up with a name (or fall under the banner of Fuzzy Cube or Netprogs), a domain, and all the other related identification nice-to-haves. I really must stop thinking about perfection and select something, at least a working title beyond “WorldGen”.

# My favorite game features.

Tags: Game, Design

Today I want to write about game designs or mechanisms I would really like to create for a game. This will be the 10,000 foot view. The key here is that it is all about me. These are features, or ideas that I have distilled down from games I have played over the years.

My favorite is the “just one more turn/a few more minutes” feature. The strategy games that I like to play most all have this one feature in common. What this means is that what you want to accomplish in the game comes to fruition over time. Plans are made, things are put into production, units start journeys, and all sorts of “action over time” problems/goals/mechanisms are created, administrated, and monitored by the game. The game that I will have created is a series of stories, or events that are pieces of the whole. Each of them has some intrigue, or building block within the context of the overall mechanism of each session or game as a whole.

A second mechanic that I like is the ability to, at least in the beginning, micro-manage the game. The ability to have many, many settings is key for me to add the ongoing interest in the game, and the feeling that the decisions I make have an impact. At some point it is advisable that the computer starts to look after these settings as the turns become too long, and as a player I cease to care about the micro decisions once the game reaches a certain point.

Some of the key automation features include movement/rally points/pathing for non-essential “units” being produce away from the action. It also involves a robust series of setting for the caretaking of production hubs, population centers, and the like, which continue to grow and evolve, but have lost the immediate focus of interest.

Another mechanism is a discovery tree. As the game advance new technologies/units/options become available. A tech-tree is the best description, but for me it has to be random. I think that some paths will only become available, and I must choose the best tech path to follow. The other half of discovery is a fundamental idea that there are physical things to discover, generally within the map. They could be resources, clues, story opportunities, or random events, but they are all discovered through examination or searching the map.

I think that choices are one of the strongest activities of the game. The player is prompted to make small choices, or even choosing to do something at all, on a continuous basis. These choices create the overall path of the story.

The last mechanism I am going to write about today is history. I think it is important to add interest by either customizing or modifying decision-based units over time. Capturing statistics and the “history” of a unit as it grows and accomplishes actions is really important for player buy-in. Although there is overhead attached to it, having the ability to look back at a running history, or statistics of a game piece of interest is very important because it allows the player to look back at the game and invoke (hopefully) good memories.

To sum up, the five features I discussed today are:

1. Longer frame realization of decisions;
2. Ability to customize administration level;
3. Create opportunities for discovery in several ways;
4. Allow for a wealth of small choices;
5. Compile history and story over time.

This is the type of game that I would like to build and play. One of the next design articles will be about what are the options for story worlds.

# Strategy game thoughts.

Tags: Gaming, Strategy

I would really like to develop a strategy computer game. I think more for the mental challenge then the commercial success. In the future I’m going to try to figure out some of the global paradigms and parameters I want to use.

There are a couple of mental hurtles I have to get past. The big one is “This game has already been done” thoughts that I have. I have to concentrate on creating something and not use that excuse to give up. I feel that if I get towards the “end game” of a project like this, it will turn out differently than anything else in existence. The second hurtle is scope. I always keep having ideas, and if the final version is a moving target, it will never get finished. In creating extra options, hence extra work, I am giving myself a reason to quit.

Some of the other issues are technical. Determining the platform, deciding on a environment or language, figuring out a database to use.

The story issues are trying to figure out a time, should it be a “caveman” time frame, all the way to apocalyptical setting. What will be the granularity of the game? At one end is a strategic overview, the other is a “Rimworld” style of sandbox story telling.

The next little while I’m going to write about some of these ideas and solutions and see where I can go from here.