

Era of Mages

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Chapter 1. Introduction

Era of Mages is supposed to be a big open-source game. Providing the users with state-of-the-art graphics as well as with the functionality provided by similar games.

The team working on *Era of Mages* consists of members of the open-source community who develop this game in their sparetime. Therefore development duration will certainly exceed the duration of professional comparable projects.

There's also the danger of anyone leaving the project during development. As all developers are voluntarily working on this game they're all free to leave it anytime. Hopefully they won't, but just in case it happens there might be delays until a new developer can be found to replace the one who left the project.

But on the other hand we all hope that the encouragement of the open-source members will help us creating a great game.

Chapter 2. General concepts

Gameplay

The general gameplay of *Era of Mages* is that of a realtime strategy game. You will have buildings producing units. You will move units around. You will attack enemy units and buildings.

But this game is giving a new nuance to the RTS genre. In *Era of Mages* there will be a significant amount of RPG elements. In opposition to most other RTS games this game will also include fantasy elements like spells and special creatures.

So your overall goal for a mission is not to destroy all other enemies, but only to destroy their magician. Every player will have a magician character in the game and loses the game as soon as this magician is killed.

A magician will gain experience during missions and thus get more powerful so that a player will not rely on just creating buildings and units but instead start summoning evil daemons and attacking the enemies with catastrophies like earthquakes or meteor showers.

As this concept requires fast games (so that the player doesn't get bored waiting for new experience points to improve the magician) the concept of gathering resources will not be found in *Era of Mages*. The player only needs to gain mana (magical power resource) which he will automatically gain by owned territory. As the magical power comes from the nature itself all territory under control of the player will result in additional mana resources.

This will force players to expand their territory very fast and will therefore lead to early struggles with enemies. With this behavior *Era of Mages* will not like other RTS games end up with one mission being played for many hours because it's somewhat stuck.

An important part of *Era of Mages* is the fact that most units are restricted to their elements. As every territory controlled by a player will be converted into its element there will be a problem attacking a nearby enemy with normal units only. F.ex. a seamonster will not be able to attack air territory but it will be helpful in defending the sea against attacking air units. This will also result in more magically oriented battles as the player will not have enough normal units to win and therefore will have to use his summoning and destruction spells.

More details on the above points can be found in the respective subparts of this paper.

Features

Here's a short incomplete list of *Era of Mages's* main features:

- Fake-isometric top-down view of the battlefield (like Warcraft)
- Fantasy atmosphere
- Roleplaying aspects
- Realtime strategy aspects
- Multiplayer support
- Open-Source

Motivation

The player's motivation for playing *Era of Mages* will be grounded on these aspects:

The multiplayer support will enable the player to play over the internet or in a local network against his friends. This feature is well-known to raise motivation of players.

The random maps will do their part of giving the player the impression of playing different battles all the time.

The roleplaying aspect of *Era of Mages* is the main motivation factor. It will hopefully make the players want to improve their magician to the maximum. In the beginning it's only to find out how cool those new greater spells are and later on it's to improve the devastating effects of these spells. Therefore the visible representation of spells should obviously be adjusted according to the spell's level.

Last but not least there is the separation of the four elemental magics which gives an extra motivation to restart the game from scratch just to see how it is playing another elementary magician with other units and other spells. Therefore the differences between the four sides must be essential. Compare this to Starcraft's 3 distinct tribes against Warcraft's 2 similar tribes. Warcraft did have a little motivation factor in that you can replay the game on the side of the orks. But finding that there is an equal unit on both sides made this motivation fade very soon.

Chapter 3. Game principles

Expansion

Expansion is an important part of *Era of Mages*. It is working similar to the Zerg slime in Starcraft but does have a main difference. The player can only create buildings on his own territory. To expand his territory he needs to create an outpost. Each of these outposts is equipped with small terrainer units which will run out and convert nearby terrain and integrate it into the player's territory.

This is important as the player will gain mana for his territory. So he'll need more territory to be more powerful. Of course he also needs more territory to find enough place for new buildings. And finally the pure elemental units can only act on their territory. So it's obvious that it makes sense to increase that territory.

Now let's take a closer look at the actual process of expanding territory. As mentioned above the player builds an outpost. This is done with a construction spell and therefore the spell level can be increasing. The effect of an increased spell level is seen at the number of terrainers an outpost is equipped with.

Once the outpost is created the terrainers will automatically start their work by finding nearby territory which is not yet part of the player's territory and integrate it into the existing territory.

The search for this territory will follow these rules:

1. Territory of the same element (fire, water, etc) as the player's territory and which is not owned by another player
2. Territory of another element which is not owned by another player
3. Territory of another element which is owned by an enemy player
4. Territory of the same element as the player's territory which is owned by an enemy player

The reason for 3 being taken before 4 is simply that the terrainers do have an interest in their kind of element and rather attack an enemy territory of a different element.

The time needed for converting territory is minimal in case 1, medium in case 2 and in case it is enemy territory it takes the maximum time needed. The actual transforming work between elements is no longer of importance when converting an enemy territory because the enemy's magical connection to this territory takes much longer to destroy.

This principle of territory expansion will by itself take care of enough action at the borders as the terrainers will automatically start attacking enemies once there is no more 'open' territory available. Also note that both sides will use terrainers and so the actual border will change all the time requiring the player to either add more outposts or to take actions against the enemy. (Again faster gameplay is encouraged)

Experience

The roleplaying character of *Era of Mages* is a main aspect of the game. It will be similar to Diablo in its effects. But it's not intended to be a full blown RPG engine. *Era of Mages* is a fun game which doesn't require the player to think about every

single consequence of distributing an experience point to this or that attribute. So the experience is restricted to spells only.

A player will get a new experience point for each opponent he kills. It does not matter what level the killed opponent has. There's only one exception: If the killing player has 25+ experience points more than the killed player then the killing player will not be given an additional experience point as he merely smashed a fly. (However it is possible to get an experience point for beating an enemy who has 50 or even more experience points more than oneself)

You will certainly notice that this behavior will give players the opportunity of creating two characters and letting them win against each other for a few times to improve both characters. This is not a problem though. After all a character's strength will be publicly available and usually beginners (or non-cheaters with newer characters) will not play such advanced enemies. Not worth mentioning that an advanced character won't have much fun bashing some unexperienced minor enemy either.

So after a battle some players will have additional experience points to distribute among their character's spells (there can be multiple points as one player might have killed two or more enemies in the recent game). This distribution is working similar to Diablo. The player will see a list of possible spells and whether or not he can already 'learn' that spell (of course the bigger spells are only available from a certain experience level upwards). Now there are two possibilities for each experience point to choose from: The player can learn a new spell giving him new buildings, new units, new attack possibilities etc. Or he can spend the point on improving a spell he already learned. This works similar to Diablo as well as it basically just strengthens the effect of that spell.

There is nothing more about experience to be said here. It's supposed to be simple and it's intended to raise the players' motivation throughout the game by providing him with new features as well as giving him the feeling of success.

Spells

Spells are a major feature in *Era of Mages*. The player will always strive to get more, better and more powerful spells. In the beginning of the game a new magician character will only have the most basic spells available. These are for one the outpost creation spell which is needed for expanding territory (see Game principles - Expansion) and one simple attack spell depending on the chosen element.

Air magicians will start off with a small attacking air wave, Earth magicians will get a simple stone flying towards their enemies. Fire magicians will start off with a rather usual fire bolt. And Water magicians will get a water bolt.

These elemental spells are very similar in their nature. This is intended as to get the player easily started with the game. Everyone knows and understands what that fire bolt is good for. Once the players got used to the game itself the mightier spells will no longer always have an equivalent spell in another elemental magic.

The usage of spells is pretty simple. A player first selects the desired spell (see General concepts - Gameplay) and then the target. The target can be territory where a building shall be created or where a creature shall be summoned. It can also be territory for a destruction spell which does area wide damage (thinking of meteor showers and earthquakes). And of course it can be a direct enemy target.

Each spell will cost the player mana. Mana is the only RTS like resource in *Era of Mages* and is gained from controlled territory. The more territory controlled the more mana a player gets. Usual spells cost a certain amount of mana once invoked and that's it. Summoning spells are a little bit different. As the summoned creatures must

be controlled by the magician it costs constant mana so that the player will finally get less mana from his territory as some of it is used up for the creature. If a player summons too many creatures and his mana reserves are empty the summoned creatures will no longer be controlled by the magician. But they will also not vanish. They will be angry about their mental capturing and attack whatever target they can find (even each other). So it can pay out to summon lots of creatures and send them into the enemy's fortress even if you don't have enough mana to keep control of them.

Units

Units in *Era of Mages* need to be separated into four totally different kinds of units:

1. The magician
2. The terrainers
3. Normal units
4. Summoned units

The magician is of course the most special one and for further parts of this document it will not be treated as a 'unit'. Details about the magician can be found in other game principle topics and in its detailed unit description.

The terrainers are different from all other units as they are not attackable and do not attack others. They are basically invincible but won't fight for the player (pretty mean huh? :). As mentioned earlier the only way to kill them is to destroy their outpost. More detailed information can also be found in the terrainer description.

Now normal units are the kind of units a player is used to from other RTS games. You create a building and produce an unit in it. This takes some time and costs some resources (mana in our case) then you got a new unit. There will be a need for food supply to keep the units alive (well-known from similar games). The main difference in *Era of Mages* is that most of the normal units can only exist in their own element. An exception to that rule are the air units of course which can all fly into enemy territory. This gives air players an advantage as they can start attacking their enemies very early. Their disadvantage though is that air summoned creatures are weaker than those of other elements. (Of course the exact values need to be determined during development)

The summoned units are the most interesting part of *Era of Mages*. The artists will have to concentrate on them to make their appearance something really special. It costs the player a lot of mana to summon it and it costs him lots of mana for keeping control of it. So think of these creatures as the high-end of unit building. They're the fastest and strongest available units. And yes.. they can be dangerous for the summoner as well. Of course there will be smaller creatures available for unexperienced magicians who are not that strong and easier to control. But in the long run these creatures are responsible for the game's success. They need to look dangerous. They need to look powerful. And they will have to be both in the game engine of course. Some nice sound effects for the creatures as well as for their summoning wouldn't hurt either.

Buildings

There are several types of buildings available in *Era of Mages*:

- the magician's castle
- the outposts
- supply buildings
- unit production buildings
- simple defense structures
- magic defense structures
- neutral structures

The magician's castle is the source of his power and once it is destroyed that player loses the game. More details can be found in the detailed description of this building.

The outposts are something special as already mentioned above. There's nothing more to say about them here.

The supply buildings will be needed to supply the normal units. They are comparable to the houses in Warcraft and once there are too few of them available no new units can be produced. (The magician's castle will act as a supply building as well)

The unit production buildings will be the usual RTS buildings enabling the player to build more units for his army. The main aspect of this game though is that most units produced in these buildings will only be useable in their own elemental territory and therefore will mostly be useful as defense units.

The simple defense structures are weak defense buildings. Think of them as simple stationed cannons shooting incoming enemies with low frequency and causing small amounts of damage. Therefore they are cheap and built fast.

The magic defense structures are more interesting. But also more failure-prone. The main difference to the simple defenses is that they make use of the magicians mana resource. So they can shoot the enemies with higher frequency and cause much more damage. But therefore they need to use up the player's mana. It depends on the player how many of these structures he will build. It is a good thing in terms of defense, but a risky thing in terms of mana resources. Just imagine you summoned a creature and at the same time an enemy attacks you. The defenses use up all your mana but beat the enemy. Just that there's no more mana left to control the summoned deamon. Oh-oh!

And of course there are neutral structures ranging from trees over stones to anything else that might be needed.

Chapter 4. Comparison to well-known games

- Diablo

Similarities to Diablo include mainly the roleplaying aspects. The spell system is also separated into distinct types of spells whereunder the actual spells can be found. The spell improving is also comparable to Diablo.

- C&C / AoE

The RTS aspects are taken from these games. Unit production, unit commanding, bases etc

- Starcraft

The distinction between races/elements is taken from Starcraft. It will be hard to achieve the same level of fairness as seen in Starcraft, but we'll try our best to get as close as possible. Also the Zerg slime was the inspiration for the outpost and expansion mechanism of *Era of Mages*.

- Netstorm

Netstorm is achieving a really high motivation factor with its networked-only play and *Era of Mages* will try to get as close to this motivation as possible.

- Warcraft

This game is having the most influence on *Era of Mages*. There are a lot of similarities ranging from the top-down view to the separation of races/elements and the whole RTS part to the magics used in such a game.

So you can say that *Era of Mages* does have a lot of similarities to other games. But nevertheless it is a unique new game of its own. The combination of good features will be one part and the summoning of creatures for a RTS game as normal units which can even go out of control is the other.

Chapter 5. Interface specification

The game screen

The *Era of Mages* game screen will be similar to usual RTS game screens to give players an instant knowledgeable feeling. There will be the main battlefield viewport taking up the biggest part of the screen and an information bar.

The information bar of the game screen will be situated at the right part of the screen and will always be 224 pixels wide. This is true for all resolutions so that the same graphics and routines can be reused.

The content of the information bar concludes a minimap (which takes away a lot of space from the top of the bar), a mana resource indicator bar and a unit supply indicator showing the current amount of mana / unit supplies as a graphic as well as with an additional font representation below them. Furthermore there will be 3 buttons for the 3 different spell categories by which the user can access his magician's spells faster than by clicking the magician first.

In addition to these static elements of the information bar there will be additional functionality once the user has selected an object. The information bar will then display an icon identifying the chosen object and some information about it (depending on the kind of object). For buildings which can produce units there will be additional production buttons. For all chosen objects there will also be a small icon by which the user can cause a dialog to pop up providing him with encyclopedia-like information about the object (similar to civilization)

There is not a lot more to say about the game screen now. The details about graphical requirements can be found here (Graphics) and the controlling details on the next page.

Game controls

The game controls are simple and similar to other RTS games. So you can click on units to select them and then send them somewhere else or make them attack enemy units and buildings. Also drawing selection rectangles will work to select multiple units. The only units that can not be selected are enemy units, terrainers and out-of-control creatures.

Selecting a unit will have influence on the information displayed in the game screen's information bar. Including health status of the unit as well as an identifiable picture of it and some more info depending on the type of the chosen unit. For multiple unit selections small pictures of the selected units will be shown along with their health status.

The health status itself will also always be present in the main battlefield viewport as a small health bar below the unit or building. Optionally for units with their own mana reserve there will be an additional mana bar. Both bars can be configured not to be shown in the main viewport as well.

Like in most RTS games you can group your units by selecting some units and then pressing *ctrl+[0-9]*. This will save these units as being part of the respective group. By hitting the same number key again (without modifiers this time) this group will be selected again.

There's also a new subtraction and add mechanism available in *Era of Mages* which works like this: You got a group #1 and some other units scattered among this group.

You now select all those units and hit *shift +1* to subtract the group #1 units from your selection. Using the *alt* key works as an addition operator in the same way

Another big part of the game controls is the spell handling. This will be similar to Diablo. The player can either right click on his magician to a small popup command-icon menu including the three magic separations and click one of those to chose the spell of his choice. Or he can use on of the 3 icons from the game screen's information bar which will again pop up a list of all available spells in that category.

Once the player has chosen a spell he can cast it by clicking on the target. As this process involves between 3-4 clicks there will have to be a faster way to access the spells. This faster access is taken from Diablo again as it proved to be a great feature to access pre-selected spells with function keys.

Chapter 6. Game details

There are no detailed Informations for the following chapters available as of now. The reason for this is obviously that there need to be lots of discussions about the details of which spells/units/etc will be introduced to the game, which effects are involved and last but not least the fairness factor between all 4 elements needs to be determined. So this part of the document will be frequently updated during the ongoing development of *Era of Mages*.

Spells

General spells

Air spells

Earth spells

Fire spells

Water spells

Units

General units

Air units

Earth units

Fire units

Water units

Buildings

General buildings

Air buildings

Earth buildings

Fire building

Water buildings

Chapter 7. Appearance Guidelines

Graphics

There are two considerations for the general appearance of the gfx. One way of realizing it would be a realistic graphic like used in Command & Conquer. The other way would be a more artistic approach as in Starcraft or even a comic style graphic similar to Warcraft.

The problem with a realistic graphic is the additional amount of efforts from the artists as well as a higher bitdepth. As *Era of Mages* is also going to be a proof-of-concept game for a RTS implemented in pygame we might have to use 8bpp surfaces. It is basically impossible to get realistic graphics with these restrictions so as of now the comic style approach is preferred.

There will be changes to this chapter as soon as discussions on the general graphics get started on the mailinglist. Please note that realistic graphics are not generally declined for *Era of Mages*. The future discussions on this topic will clear things up as to what exactly the needs will be.

Sound

Sounds are nowadays a vital element of games. And with pygame it is easy to include them into *Era of Mages*. But what exactly are the requirements to the sounds included?

As I'm no musician myself.. I'll stick to giving some general ideas here. Future discussions will certainly lead to a more accurate version of this chapter.

The background music should of course create the general atmosphere of the game. We might want to include more than one background music to avoid obvious repetition.

Then of course we'll need sounds. For everything happening inside the screen (and maybe nearby events?) including unit production, spell casting, summoning, unit movement, basically everything.

Gameplay

The gameplay should be as easy and straightforward as possible. It should motivate the player to continue, to get new spells and to summon new creatures. There is also not a lot to write about the gameplay appearance as of now as most parts of that will be evolving out of future discussions.

Chapter 8. Technical details

Utilities used

I cannot (yet) include information about utilities used by artists and musicians.

As *Era of Mages* is (as mentioned earlier) a proof-of-concept that RTS games similar to Warcraft can be realized in pygame the main utility used will of course be pygame. This also means that the code will be written in Python. We will see whether it's necessary to include native C methods. As the goal is to realize the game with only using pygame we will try avoiding this. Therefore it might very well be possible that we will use 8bpp surfaces as this will speed up the game by at least two times. (I know it sounds ugly but consider that Warcraft and Starcraft are 8bpp games as well)

That's all about the utilities for now.

Client/Server architecture

The details for this chapter will have to be developed during future discussions.

Basically every game needs a server to which all clients connect. The server's implementation will differ from most older games as it will enforce dumb clients. This means that all client programs will be informed by the server of what they need to know. The server will not pass them any information not actually visible to the player. This enforces all calculations to be made by the server and therefore grants that no client is cheating in any way. This is also true for possible future AI enemies which will be client programs with automated reactions. This architecture demands that also AI programs only know what a player would know and therefore cannot cheat on the player like seen in many many games.

The synchronization of the participating clients will be done using a ticking method. Each client will frequently send ticks to the server and the server will only start calculation once each client has really sent this tick. If a client takes longer than a certain timeout to send his tick he will be thrown out of the game. With this method all clients will automatically be synched to the speed of the slowest client.

