



POSTMORTEM: FACTOR.IO

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1 **Game Design**

Our goal was to create a mod for the already existing game Factorio. Klondike, our mod, would increase the difficulty of the game, add in new mineable and craftable resources and allow the player to create more interactive buildings.

To increase the difficulty of the game we added in a new mechanic called hunger, so that the player now has to regularly keep their character fed. Since the existing game only had one edible item, fish, we implemented a whole bunch of new foods and recipes so that the player can now also craft and grow their own new foods. Another reason why we wanted hunger, is that we thought the game could use a more survival aspect.

By putting in new resources, such as gold, we allow the player to create various amounts of different buildings and research completely new fields of science, which then grants them the possibility to create even more newly added in items. Because the goal of the main game is to create a spaceship and send it off, we adapted the entire technical tree of the existing game, forcing the player to use the new resources the mod provides in order to create the spaceship. This way we, once again, increase the difficulty of the game and make the gameplay longer now that there is more to discover.

2 **Tasks of the Team Members**

After crunching on our mod for a while, we were able to divide our tasks into two main areas. The first area being the new mineable resources and craftable items. The second area being the hunger and its algorithm.

- **Monir Lennart** had the task to implement the new resources, items, adapt the existing research tree within the game and graphic design.
- **Rasmusen Sven**'s task was to add in the hunger, regulate the initial balancing and walk speed regulation.

All in all, we helped each other out whenever the partner got stuck. We had meetings so that we could play the game in multiplayer to find bugs and balance the hunger area to everyone's liking.

3 Used Tools

3.1 *Development*

For the coding aspect of our mod we used the source code editor Sublime Text, because it was easy to use, free and worked well with our programming language LUA.

3.2 *Art and Design*

When creating our mod we used the graphics editor GIMP, simply because there is no need for advanced knowledge to use it and because it is free.

3.3 *Testing*

To test our mod, all we had to do is add in our mod files into the game files and start up the game Factorio.

3.4 *Communication*

The team was mainly using WhatsApp to keep each other updated and ask questions, but on bigger topics and tougher problems we used Skype to discuss solutions and new ideas.

3.5 *Algorithms*

When it came down to figuring out what kind of algorithm we should use for hunger and walk speed we worked with a tool called GeoGebra. This tool would help us visually see how our algorithm would behave when changing up the variables and balancing the game.

3.6 *Version Control*

Generally to keep everyone's files up to date we used GitHub for simultaneous and independent programming. After figuring out that it was best to divide our mod into two areas, we branched off and could merge our code without any problem.

4 What Worked Well

4.1 *Mod Content Agreement*

Each time when we had a personal meeting or skype meeting, we would communicate very clearly and had the same mindset toward what should be in the mod and what not. Everyone was contributing a lot when it comes to ideas and we also agreed on coding norms so that everyone's code could be easily read by another.

4.2 *Teamwork*

As a team we worked perfectly. We had similar ideas, similar approaches to problems and helped each other out with positive attitudes. There was constant communication, regular meetings where we would discuss the next steps and we would also test the game in multiplayer mode and debug our code together in real-time. In general, there was respect from each member toward the other.

4.3 *Presentations And Documents*

Working on our presentations and documents was very fluent. We instantly agreed on who takes up what part and we always reviewed everything together, sharing opinions and obtaining the best possible result.

4.4 *Individual Tasks*

As said before, the moment we divided our mod into two main parts we were able to work on our own speeds, yet always with the help of the other partner, if needed, and did not disturb the other person's code.

5 What Worked Not so Well

5.1 *Many Ideas But No Time*

From the very first moment we sat down together and discussed what we wanted put into our mod, nobody could hold themselves back and all ideas were grand. But we had to cut off at least half of the ideas and focus on the most interesting ones. Yet after coding for a few weeks, we still didn't have enough time for the remaining ideas, because we lost time on the two biggest parts of the mod, being hunger and the new interactive buildings.

5.2 *Bad Overview*

After a weeks of programming on hunger balancing and new items we started to lose track of other, less important but still interesting, ideas and then consequently didn't get the time to research on how to implement them. These two ideas were the jetpack and the stealthsushi. Adding in the ability to fly with a jetpack and gaining stealth from an item were to completely new mechanics. We also stated in the game design document that we would add in a defensive robot, sadly we overworked too much on other tasks and lost this one out of sight.

5.3 *Resignation Of A Team Member*

In the beginning, the Factor.io team was made of 3 team members. Sadly, after about halfway through one of our members had to resign due to not having enough time being very busy with other projects, therefore leading to not being able to participate in the project anymore. This was a setback for us, since a third of our team was gone and we still had much to do for our mod Klondike.

6 Summary

All in all, our mod is fully functional with what is has in it. Even though it does not have everything in it as stated in the game design document, it can still be considered a good and one of the biggest mods for Factorio. Players will have a whole set of new tasks to do within the game, keeping their hunger up, finding new resources, building new buildings, farming their own crops and researching new technologies. All of that prolongs the gameplay and makes Factorio a lot more divers.

Adding on, this being the very first time we could put something out there in the world that other people can use and give feedback on is an amazing feeling. Learning how to modify a game and getting into a different programming language can be stressful and tedious. But putting vague ideas into an actual game and being able to play it afterwards is very motivating and exciting. And from now on we can use this knowledge to modify games in our free-time.

The Factor.io team highly recommends other students that are interested in learning about what happens behind the scenes of video games to attend the course Game Design and Development. You also learn that making video games is not just all “fun and games”, it is actually a business and during the course you'll learn how to act more professional. We also recommend other the students to keep a very clear overview of all remaining tasks and to keep their game simple yet addictive.