Rin Tohsaka – a Discord Bot for Community Management

Authors: Edgar Axelsson | Ahmad Fathallah

Supervisor: Mattias Schertell
Examinator: Kåre Synnes

Date: 2018-06-01
"Thank you, your kind words and hope are most inspiring, thank you for your worries for someone you hardly know, it's nice to know that people like you still exist in this world." - Hellie 2018
Abstract

Bachelors level thesis in Media Technology that aims to improve an existing concept of community development. The thesis shows how the definition of Community has advanced and changed its meanings with the help of modern technology. It is not always positive with new definitions. New problems arise within the community regarding management, ethics, and maintenance. This thesis analyses these problems and aim to solve them in a modern standard, with help of rhizomatic and participatory design. With the community shifting towards an online definition, the thesis uses the latest tools available in web technology, to build a product that uses situated knowledge as a mindset and combines participatory design and rhizomatic. This to solve the ongoing problems that online communities face with maintainability and ethics.

Keywords: participatory design, rhizomatic, community development, asynchronous programming, and ethics.
Contents

1. Background ................................................................................................................. 6
   1.1 Research Question ................................................................................................. 7
   1.2 Aim ......................................................................................................................... 8
   1.3 Writing Process ..................................................................................................... 9
   1.4 Chapter conclusion .............................................................................................. 9

2. Previous and Current Research ................................................................................ 10
   2.1 What is a community and what does it mean to be a part of a community? ............ 10
   2.2 Introduction to community to a digital age with the help of Web 2.0 ....................... 11
   2.3 User driven community ethics example .................................................................. 12
   2.4 Moderator driver in community ethics .................................................................... 14
   2.5 Chapter conclusion .............................................................................................. 16

3. Methods ..................................................................................................................... 17
   3.1 Introduction to participatory design to the product ............................................... 17
   3.2 Participatory design as a method ........................................................................... 17
   3.3 Introduction to rhizomatic .................................................................................... 18
   3.4 Rhizomatic as a method ....................................................................................... 18
   3.5 Agile and pair programming ................................................................................. 19
   3.6 Chapter conclusion .............................................................................................. 19

4. Design Process ......................................................................................................... 20
   4.1 Introduction and Implementation ........................................................................ 20
   4.2 Design Execution and Rhizome ........................................................................... 23
   4.3 Participatory Design and Rin Tohsaka .................................................................. 23
   4.4 Full Stack development experiment .................................................................... 27
   4.5 Documentation and Wrap up .............................................................................. 28
   4.6 User driven ethics compared to moderator driven ethics ...................................... 31
   4.7 Chapter conclusion .............................................................................................. 32

5. Conclusions .............................................................................................................. 33
   5.1 Earlier Research .................................................................................................. 33
   5.2 Research .............................................................................................................. 33
   5.3 Creation ............................................................................................................... 35
   5.4 Conclusion .......................................................................................................... 37

6. Discussion .............................................................................................................. 38
   6.1 Research and Methodology ................................................................................ 38
   6.2 Design Process .................................................................................................... 39
   6.3 Future Research .................................................................................................. 40
   6.4 Results and Research ......................................................................................... 41
1. Background

In this chapter we are going to introduce our idea on what we want to research and a research question that will guide us through the entire thesis. This chapter will also introduce an analysis on how we were planning to work.

The technology today is growing and changing the world which is becoming a much smaller place. People can communicate from one end of the world to the other in a matter of seconds. A new way of human interaction is presented. When internet was introduced in the 90s, it changed the way we receive and deliver information. Instead of buying expensive encyclopedias or going to the library and spending hours looking up a certain topic, we can now simply go to the internet and get the information in directly. This era was known as web 1.0.

As the internet expands from becoming a regular tool and becoming a necessity, a new concept is introduced, known as web 2.0. Web 2.0 is a standard that focuses on web application and sharing, such as social media where a user can share his information and communicate with others. In web 2.0 a lot of people began gathering together, to discuss and share information in internet forums, known as communities.

Usually an online community has a single theme or goal. As a community grows it tackles new problems, such as management and to stay relevant as well as maintain a certain ethics. In the real-world, humans follow a lot of different ethic codes, such as the country law, church rules etc. A similar approach is needed in communities online. The internet allows us to be anonymous and sometimes that makes it harder to keep good ethics online, than in the real-world. But how does one decide and maintain community ethics without creating new flaws?

Our thesis is an attempt, to get an understanding on how one can develop a modern community and introduce a management system that helps the community to grow and remain manageable and active. We also want to get a deeper understanding on how community ethics are decided and maintained.
The thesis title *Rin Tohsaka – a Discord Bot for Community Management* is an attempt to improve the handling of existing ethics in the community.

A SWOT analysis on this work and the product lead to the following result:

- **Strength:** The strong point of this research and creation will hopefully allow communities to remain active and be manageable. By introducing our methods of ethics, the number of members will increase, and the community will remain relevant.

- **Weakness:** Trying to turn the negative aspect of community management and activity into something positive. If we have a negative impression on a method, we would like to discard it instead of implementing it. Because we do not want to work with negativity that would give us a bad impression for the community.

- **Opportunities:** To creating a product that will improve the way a community easily manage their ethics

- **Threat:** There is always a risk that ethics in one community can differ from other communities and create a bad will.

1.1 Research Question

How can management of on-line communities be supported by easy-to-use or automated functions while maintaining community ethics and theme?
1.2 Aim

The aim of this research is to find a way, or method, to get our product to allow a community to have a good interaction with high ethics, by applying proper management methods with the help of digital tools.

When the internet started (Web 1.0), online communities were not widely spread. It was mostly used by programmers. With the popular rise of social media, the internet is becoming more rhizomatic every day. This lead to change for the meaning of community and its development. With the help of digital tools that are available (Web 2.0), it is easy for everyone to create a community. However, as community grows it becomes a challenge to keep community relevant. Here follows some example of challenges for a community:

- Keeping members active
- Keep the original theme of the community
- Keep the founder’s ethics rules
- Maintain and allow a good communications environment for the members.

With the help of our product, we want to create a management system that will help to tackle these problems. The product shall also make it easier to decide ethics and maintain them. With the help of *rhizomatic* and *participatory design* we want to experiment and introduce these methods to the product. Will our product strengthen or weaken the community?

We would like to collaborate with an existing community to find the answer to our question, in the form of a web programming-based product. The product named Rin Tohsaka, will function as a Discord bot. The bot will help the community to manage ethics and thereby keep the community active. We will use participatory design, which will allow the community members to design Rin Tohsaka.
1.3 Writing Process

This bachelor thesis has been written by two authors’:


Ahmad Fathallah – joined collaboration on chapter 1-4. Writer of chapter 5.1, 5.4, 6.3 and 6.4.

1.4 Chapter conclusion

We want to get an understanding on how one can develop a modern community and introduce a management system that helps the community to grow and remain manageable and active. A SWOT analysis has been performed and resulted in the question: How can management of on-line communities be supported by easy-to-use or automated functions while maintaining community ethics and theme?

The answer is the product named Rin Tohsaka.
2. Previous and Current Research

In this chapter we explain which relevant articles we used to get a deeper understanding of the thesis question. We will also explain which methods we choose to create our product.

2.1 What is a community and what does it mean to be a part of a community?

Stuart A. Queen a publisher of an article known as “What is a Community?” which gives a detailed explanation on what is a community and what is defined as a community. The article was published in 1923 where Stuart A. Queen brings up different definition of communities such as: a small town, city, immigrant colony etc. It was concluded that any type of settlement or a group of people can create a community if there is some sort of agreement and loyalty.

“Must a community be so small that ever member may know and meet face to face every other? Our answer will probably be no, providing there is a definite medium of community used by all.” (Queen, 1923, p.381)

The definition of community is a rhizomatic term that keeps on growing and changing its definition. In the 1980s, the internet allowed the world to experience an online connection and communicate way. So, the meaning of community and its definition has changed when it comes to a digital term.

When we started our major in web development, the first thing we did was to form a group to make it easier to study and help each other understand programming. After a while the group started to help people outside the school, with their projects. Thus, an online community known as Team Husky was created with its own webpage. The goal and mind set were to bring other ideas to life by working together, building projects and sharing coding experience.

Different projects built by people with different background, all over the world, under the same name and motive while not knowing one and other. That fits in the definition of community changes based on Queens article.

“Is the Internet a rhizome? All the straws in the wind say 'yes' it is.”- (Buchanan, 2007, p.9)

With the birth of the internet as a tool to access webpages, its definition changes daily since the internet expands in a rhizomatic way. People revolve themselves more and more around the social medias on internet.
The internet was founded for a purpose of making communication between separate computer systems more convenient. Without the invention of the telecommunication device in 1876, by Alexander Grandam Bell, internet would never have been possible. Down the line the first computer was invented and then the internet came around in the 80s.

However, with the birth of a new concept new problems arise. The internet allows us to remain anonymous and allow the communications between one and other to remain anonymous as well, this can create a problem for management. Usually when a community is founded there is always a leader or a manager, that makes sure that the community stays together. At the same time making sure that the community remains active. Throughout internet existent there has been many successful communities, but a lot of them died due to inactivity or failing to correctly manage it.

2.2 Introduction to community to a digital age with the help of Web 2.0

“With the advent of Web 2.0 technologies the younger generation of internet users is rewriting the rules of social interaction, and the way business is conducted. By utilizing electronic media and Web 2.0 tools such as Wiki’s, blogs, tagging and social book-marking, new and ingenious methods of social interaction across geographic borders and industry silos are being created” (Fu et al., 2007; IBM, 2007) (Sophia van Zyl, 2009, p.3)

Sophia van Zyl mentions in her article Web 2.0. This was a term first used by Tim O’Reilly during a conference in 2004 and meant the introduction of a new generation of web-based technology. Web 2.0 technology created easy ways to collaborate, share and operate web-based communities. As well as hosting services and application such as social media or banking applications. Web 1.0 was all about information gathering, While Web 2.0 gathered the information in a rhizomatic pattern.

“The rapid evolution of Web 2.0 applications offers rich user experiences where the process of knowing is a community-based, collaborative endeavor” (Virkus, 2008, p.5)

With the creation of applications on the concept of web 2.0, online communities are born with the help of web 2.0 tools. This brings a new way of communication. Instead of meeting up physically, users can form digital communities and share information with one and other on the fly. At the same time users can remain anonymous on the internet and share their own opinions without being criticized. With the web allowing communities to be digital, new
problems and challenges arises, such as identifying the person behind the community and what kind of ethics that person follows. Since every individual has their own ethics and the internet allows us to remain anonymous, some users might not follow the same ethics as others, which can create a negative atmosphere for others.

2.3 User driven community ethics example.

The best way to research a user driven community is by finding an example. Stack Overflow (Stack Overflow, 2018) has a management system which is based on reputation points. When a user joins the Stack Overflow (Stack Overflow, 2018) community, the user will start with one reputation point. Users can ask question or contribute to an answer, as they progress they can gain more reputation or loose reputation points depending on the quality of their questions or answers. This allows Stack Overflow (Stack Overflow, 2018) to remain relevant as a Q&A-based community for programmers. The more reputation a user gets the more privileges they are awarded with. Once the individual achieves more than 10 000 points, the individual is granted access to moderator tools and can manage the community. They can then supervise and manage other user’s reputation points. They can also modify, delete and edit other people’s posts.

Stack overflows (Stack Overflow, 2018) strict code of ethics is well-known in the programming community, for its management system, which is automatic and nearly flawless. However, they have been criticized for being hostile towards beginners and newcomers, who have a hard time to understanding and adapting to this ethics.

“*The openness of CQA systems is closely connected with the diversity of users’ expertise and activity levels as well as the created content’s quality. This diversity is fruitful for efficient knowledge sharing among people with different expertise levels.*” - (Srba and Bielikova, 2016, p.82)

There is no direct approval to access these tools, instead they are automatically granted once the user reaches a certain amount of reputation points. Once an individual has reached such a level, Stack Overflow (Stack Overflow, 2018) counts on them and makes them accountable to lead others. An individual can thereby use their own ethics and conduct to create their own rules as they see fit at the Stack Overflow (Stack Overflow, 2018) community.
As Stack Overflow (Stack Overflow, 2018) has grown in popularity and in members numbers, the community has been facing problems and was divided into three types of categories of users based by IEET Computer Society:

“First, help vampires ask many questions without trying to find the required knowledge (for example, from search engines or archives of answered questions). So, the posted questions are often tedious or duplicated. Help vampires are interested only in getting answers to their questions; they don’t return the help they’ve received back to the community.” - (Srba and Bielikova, 2016, p.83)

As shown here, this type of user just collects answers to the problem he faces. For example, if an individual gets an issue with their programming task they join Stack Overflow (Stack Overflow, 2018) to just get the answer as fast as possible, either by asking or trying to find a quick answer.

“Second, noobs are low-expertise users who create mainly trivial, poor-quality questions. They overload the system with a significant cant amount of low-quality content and make finding unique and interesting questions difficult.” - (Srba and Bielikova, 2016, p.83)

From experience in using Stack Overflow (Stack Overflow, 2018) this individual is usually a beginner who posts an irrelevant question or an off-topic content resulting it harder to find an interesting question.

“Finally, reputation collectors answer as many questions as possible (commonly, regardless of their insufficient knowledge of a question’s topic), primarily to gain a reputation. - (Srba and Bielikova, 2016, p.83)

These types of users try to answer all the questions to boost their reputation and gain access to higher privileges which can result in a flaw, since Stack Overflow (Stack Overflow, 2018) offers such privileges automatically. As shown, even a massive community like Stack Overflow (Stack Overflow, 2018) can have problems with management, where individuals can gain access to privileges and set their own ethics. In a community where Users can set their own ethics, without guidelines, can lead to disaster.
IEEE Computer Society has provided a solution on how to manage such a problem by “adjust the reputation system to reflect the value of contribution” - (Srba and Bielikova, 2016, p87.). This is a good suggestion since this will motivate the user to ask a more beneficial question as well as answer beneficially. The other approach is *answer oriented* where you must have some sorts of experience before asking or answering the questions. The other solution suggested, was to remove access and delete questions posted by abusive users. With these methods in place it won’t directly solve the problem, it will however allow the users to follow some sort of guideline ethic which can be maintainable.

### 2.4 Moderator driver in community ethics.

What kind of effect and result would it have if an individual was to manage a community and decide the ethics over an online environment. What kind of problems and challenges would they meet?

While communities can be driven with a user base ethics where a certain individual can rise themselves and take part in deciding and maintain ethics the next example will focus on moderator-based examples where the individual has been chosen by others.

> “Online education is closely associated with change. The rapid pace of change regarding technology alone requires those involved in online education to act quickly when making decisions and to implement change on a regular basis.” - (Garza Mitchell, 2009, p.63).

Ethics in an Online environment published by Regina L. Garza Mitchell discusses how community colleges makes changes that have a huge impact depending on the market and student demand and always tries to stay up with the latest technology available. An interesting approach of ethics since the changes involve around the student and market demand. Where the community school staff needs to adjust themselves based on demand.

> “As with any aspect of leadership, bringing about change requires a strong ethical underpinning to make decisions that are in the best interest of the college and its culture." — (Hellmich, 2007) - (Garza Mitchell, 2009, p.63)

The articles go further in discussing how quick changes should be applied and proper decision making should be introduced. However, before such change and decision is brought up, it’s the idea that drives the Center of Leadership. Since the demand and interest from the
market and the students is always changing. It requires someone with strong leadership skills who understands these changes and make the proper ethic decision that would satisfy the needs of the students and the market.

“For ethical decisions to be made regarding online education, colleges must cultivate a culture of trust, clearly define the correct and incorrect usages of electronic material and develop a clear understanding of privacy in the college’s online environment.” - (Garza Mitchell, 2009, p.63)

The other important aspect when it comes to decision making is to establish trust between the students and the one who sets and maintains the ethics of the community college. Trust is one of the key factors when it comes to community ethics especially if it’s a moderator based. Moderator based referring to a community or establishment where the individual has been chosen by the community of people to decide over community and establish the ethics that suits the community best.

“As new practices are incorporated, they may not automatically fit into an existing norm, so colleges will have to develop trust that these practices are necessary.” - (Garza Mitchell, 2009, p.64)

If there is a lack of trust between those who establish the ethics and those who follow them it will usually result in a problematic situation. Since the one who was chosen to decide and maintain ethics, those who choose the person look up to this person. That individual needs to set examples so that they can decide the ethics that are in the interests of those who chose him. With that in mind it would create a perfect trust atmosphere and the community can function as one and would not need to split up. The problematic scenario that could happen because of distrust is like one mentioned in the user driven example. Instead this time the community would usually split into small factors with their own trust and ethics, at this stage community ethics become un-manageable.

“However, creating awareness involves more than simply building a Web site or creating a policy. These guidelines must be incorporated into existing institutional practice and be
Another important aspect about ethics is to keep them updated when community grows and need to change directions. It is important that the changes are incorporated in such ways that meet the current practices and that current members are properly informed. The best results are achieved if current members have a chance to comment the new ethics rules before they are implemented. Not everyone likes quick and drastic changes. Disturbing the environment that an individual is accustomed to, can have the effect that he/she lose trust in the new ethics changes and simply leave the community. However, drastic change on the ethics can have a good effect if the old one was out of date and lead to bad behavior in the community.

2.5 Chapter conclusion

Community, and its definitions, have migrated towards an online definition. This chapter also brings up examples of community ethics from: user driven ethics where automation is introduced to manage communities and moderator driven community ethics: where ethics is introduced by a public figure where the figure is chosen.
3. Methods

In this chapter we are going to bring up methods that will be used for our research and final product. As well as give a deeper overview of how those methods function in our research and product. We are also going to introduce the methodology used for final product.

3.1 Introduction to participatory design to the product

“Along various lines, design has always dealt with user participation as one of the possible ways to reach a design” - (Hess and Pipek, 2012, p.62).

When it comes to community and our research question participatory design was the first methodology that was thought of. Since the definition of community is “A group of people living in the same place or having a characteristic in common.” - (Oxford Dictionaries | English, 2018). The whole point of this research and project revolves around working together and communicating together, to maintain and manage certain ethics based on community’s decision making. For this to become successful, participatory design is a central key, everyone’s participants are important when it comes to community development and maintainability. Because without those basic guidelines the whole concept of community would fall apart fast. Without participation of community members, the community becomes inactive and dies out.

3.2 Participatory design as a method

“Involving users from online communities in a software design process requires room for discussions. Virtual platforms (e.g., forums) where all interested users can share and discuss their ideas and opinions provide an alternative to physical meeting.” - (Hess and Pipek, 2012, p.68)

Implementations of participatory design in our product comes in the form of working together with the community members in the Mages Association (the client). This is done so that the product and the thematical question can be answered in the form of a slogan “For community by community members”. Instead of gathering information and later developing the product. The entire community staff discussed what is required for implementation and we went through the entire development cycle together. So that everyone is always aware of what is going on and no one is left out.
The community will be actively participating in the implementation of the product, to get an understanding on how the product will function. This gives developers an easier approach to make changes on the fly. The entire participation of the products design will be done on a virtual platform known as Discord with the help of text or oral communication.

3.3 Introduction to rhizomatic

“Whereas mechanical machines are inserted into hierarchically organized social systems, obeying and enhancing this type of structure, the Internet is ruled by no one and is open to expansion or addition at anyone's whim if its communication protocols are followed.” - (Buchanan, 2007, p.9)

Just like Buchanan mentioned, machines follow a hierarchy organized structure, but the internet itself is an open expansion if the right protocols are followed. This mindset was decided together with the client since the whole product operates rhizomatically with a specific protocol. When following a rhizomatic pattern, the specific rhizome grows and spreads into other small roots, like on a tree. When the new tree is formed, the roots provide the base of the protocol, like Buchanan specifies:

“Consequently, no point in the rhizome can be altered without altering the whole.” - (Buchanan, 2007, p.10)

3.4 Rhizomatic as a method

“The rhizome connects any point to any other point (connections do not have to be between same and same, or like and like.)” - (Buchanan, 2007, p.9)

Implementation of rhizome as a design method was decided instead of the more traditional hierarchy-based decision making and design, like the waterfall methodology. Please see chapter four for more information how the fly idea pitching and suggestion, was achieved with the help of voting decision making.

It was decided by us, to try something new known as asynchronous programming. This would allow a new design pattern to be created in a rhizomatic structure. Asynchronous programming is also known as parallel programming. Instead of executing a specific method block by block, the program allows execution of all blocks at the same time. Asynchronous
programming is not directly rhizomatic execution wise, however the design model of it allows it to be rhizomatic. Since the code design is broken down into a small module and is always growing in a rhizomatic pattern. The size of the modules and the number of them create the whole program. This is asynchronous programming just like Buchanan mentioned:

“The rhizome cannot be reduced to either the One or the multiple because it is composed of dimensions (directions in motion) not units. Consequently, no point in the rhizome can be altered without altering the whole.” - (Buchanan, 2007, p.10)

3.5 Agile and pair programming

The development team for this product and design, consists of two developers and the client, who is a big community. The client has an active role, in design and decision making. Pair programming is a form of agile methodology, where one individual writes the code and the other analyzes it for quality.

Agile is applied where participatory design and rhizomatic design methods meet in form of iterations. Agile application is done for the client when it comes to design and decisions making.

3.6 Chapter conclusion

We choose to use participatory design as a method of ethics and to use it for ethical decision making when designing features for the product. Rhizomatic implementation was introduced where ethics would be combined with the product to create a new branch. Agile and pair programming methods were used to allow community members to join in on the design process and the developers used pair programming for quality control.
4. Design Process

Here we follow through the design and implementation of the product in this chapter we will show different functions and descriptions of the product as well as introduce ethic methods that was used for the product.

4.1 Introduction and Implementation

We started to collaborate with an existing community called The Mages Association. The community foundation was already up and running as a community, with their own server. Our focus was to solve the problem. During the early stages of development, we used participatory design with the community staff and community members, to establish what kind of platform that was needed. Since the client already used Discord, we decided together to keep on using Discord in the execution phase. We also decided to use Discord as a decision tool for which requirements should be the base of the product.

Discord is a multi-chat platform, which allows an individual to create an account and then communicate via text or oral with other members. The member is capable of inviting others in the group and create communities. Discord also allows management and manipulation of application programming interface. With the help of discords tools and community tools the decision was made to create a Discord bot as a management platform to ease the management of the community as it progressively grows.
Figure 1: Number of members in the client’s community, before implementation (Discord, 2018)

Figure one displays the number of members when the management platform was just in the design stage with the total of 205. Once the decisions regarding the products requirements was decided by the community and its members for implementation, the design stage began. The products requirements were chosen with the help of voting as shown on figure 2.

Figure 2: voting for features to implement (Discord, 2018)

Figure 3: Platform plan for product (Team Husky, 2018)
Figure three shows the community suggestions of communication level and the design, between the product, also known as a bot, and the Discord server where the community is hosted.

The products programming starts with Node.js, which is a back-end programming language. Node.js is used for our management platform, where all the commands and logic that will be implemented by the product/bot. The connection will then be sent to Discord API since Discord provides the communication level between its API and Node.js. To get the connection with Discord and Node.js, a token is required to access the Discords Developer Tools. This process is simple and requires a registration of a developer account and the token will be issued.

For the product to be accessible, it needs to be always online, otherwise other users won’t be able to use it. To solve this problem, we decided to host the application on a cloud server that would handle all the processing power.

Once the requirements are fulfilled, the bot should be able to run alongside Discord and function as a platform. To use the bot, a user must have a list of commands that the bot waits and listens too. The commands are the features that were implemented by the community with the help of participatory design.

The idea was also that the code would follow a specific design pattern of **asynchronous programming**, which would make the code more reliable and manageable. Asynchronous programming follows the design pattern parallel programming, where the code is executed separately from the main application. This allows the developer to break down the code into smaller blocks instead of having massive blocks that are not maintainable. The reason for choosing asynchronous programming was because the program would get more things done at the same time, since more than one individual would interact with the bot, the application should handle the overload requests made by the user. At the same time the idea is to make the bot an open source application, so that other developers can jump in and get an easy understanding on how the application functions. This is a big bonus, other developers using the application can assist in debugging the open source application. Because the features run solo from the main application, the debugging can be done feature wise, instead of wasting a lot of time debugging the entire application.
4.2 Design Execution and Rhizome

The design implementation began by breaking down the requirements into small manageable modules, which is required for asynchronous programming. For the best logical approach, we decided to call those modules *commands/features*. To create such design, it was required to break down the application design with a multi structure. Where the features run on their own, to make debugging simpler. To solve this problem a handler was created which manages those features.

A handler works like an engine, it makes sure that all the components are loaded in properly. This is where rhizomatic comes in, the handler is where the rhizome starts and allows it to grow. The handler itself never shrinks in size, it expands based on the developers features. With the handler platform, it allows the developer to add more features and it will expand in size and new rhizomes will be created. Once the core feature handler was implemented, new ideas can be created with the client’s community.

4.3 Participatory Design and Rin Tohsaka

Calling the project, a bot or management platform is a bit formal. Discord allows bots to be named with communities voting. It was decided to call the bot Rin Tohsaka. The client’s community that voted on all the requirements for Rin Tohsaka is an anime themed community. The character Rin Tohsaka is based on an anime series named Fate Stay Night. In the series Rin Tohsaka personality is shown as bossy, competitive, resourceful and serious; a fitting name for a management system and themes considered during development. The goal was to make the bot more personal and realistic. This to give that sense of participation. Participatory design began with asking the community what features are best and most useful, by voting like mentioned above. Once the ideas and features were listed down a requirements list was created.

**List of requirements:**

Two weeks in the process, we had received around 50 requirements. The seven most important is presented below:

- The bot should have a simple prefix and simple to use commands.
- The bot should be able to have easy access to commands.
- A detailed documentation of each command and its features.
- Basic and standard commands that are provided by the Discord API.

- The management commands should have a log system that allows tracking, which would make it easier to determine what action needs to be taken depending on the infraction.

- The bot should be always online and easy to access.

- Potential expansion so that other people can use it and not be restricted by one community.

Based on those requirements list the implementation process began by adding the features and the program began growing in a rhizomatic form.
Figure 4: List of commands and handler (Heroku, 2018)

Figure four shows how the handler handles each feature/command. The handler follows the rhizome design as mentioned before. More commands can be added if desired. The image taken was the early version of the program. As shown, the handler loads in all the commands, it also displays the amount of commands. Then the handler sorts them accordingly in specified categories. The handler also logs all the commands, which is used for monitoring and debugging purposes. This feature of the product can only be accessed by those who are developers, for data security purposes.

Once the handler execution is finished, it will constantly run and listen for user inputs. The inputs are in form of commands. Once the user types in a command, the handler will look for the command and execute it, hence the participatory design.

To be able to run constantly, it was decided to host Rin Tohsaka on a cloud server that runs 24/7.

This allows Rin Tohsaka to control the Discord API and perform the tasks desired by the community staff member. The community staff member is chosen by the community and the staff members are the only one who can enforce the code of ethics. It is also the staff members who decide these rules. The product is made in such a way, that if it is implemented in another community, other code of ethics can be introduced. The management tasks performed by Rin Tohsaka for enforcing the code of ethics can be as followed:
• Kick user
• Ban user
• Delete certain messages
• Delete messages upon banned

(More commands can be found if the user pushes the link, as shown on figure seven.)

In the early stages of the application, most of the requirements were fulfilled as was requested. However, there was a challenging problem with the features which ran static. This means that only one version of product Rin Tohsaka can be hosted. If someone desires to host more than one instance, it would require them to partake in a long set up process. So, to simplify the startup process, a new feature was added.

Handler management allows individuals to manipulate the variables as they wish, making the set-up process simple without needing deep knowledge of the application. For implementation of handler management system, it requires a database so that when a new instance of the program is created, the database would remember all the variables. This made the program dynamic and removed the restriction on the requirements list, as specified on Figure number five and seven.

**Simplicity**

To make the application more personal and easy to use, abbreviations were added, so it is not required to type up the whole commands, as shown in figure five. The same command can be executed with a shorter phrase.
4.4 Full Stack development experiment

Once most of the features were implemented, it was decided to expand the application into a published product. The development cycle was focused on participatory design and rhizome. To achieve this, full stack development was needed. Full stack development consists of back-end and front-end development, where there is a server-side application and a user interface. In this case the application so far has been focused heavily on back-end development, but the application had the potential status of becoming a product. Two instances of the project were created, the back-end developer version which contains all the necessary files to run its own instance. This version is aimed for those who know how to manually set it up. However, a product version was also created, where creating an instance of the project is as simple as clicking on one button and the whole set up process is finished as shown here:
As shown on figure six, the user simply needs to click on the + to add Rin Thosaka to their Discord server, run the basic variable set up and that’s it. The central server will handle the rest requires. No programming knowledge or experience with advanced set up is needed.

4.5 Documentation and Wrap up

Since the project is divided into two versions, one version has pros over the other. It’s difficult to design a product that can support all the features in a single version. Some restrictions are needed to make it a functional product. The developer version of the product comes with documentation for those who are interested and want to get the most out of the Rin Tohsaka.
The documentation offers a set up guide and features available for Rin Tohsaka. There is also a link to a GitHub page where the code is available for those who want to improve and develop Rin Tohsaka further. The technical version offers full control and the individual can modify and host the product as desired, which is an advantage. However, the rhizome will then be destroyed if the theme is altered. Our intention and design go by the slogan *for community by community*, with a mindset of participatory design. However, we are always open for new ideas and want to see our product improve with other opinions.
Figure eight shows the code of conduct that has been written by the developers of Rin Tohsaka. Public version of the product is controlled by the developers. Code of conduct comes from Discord general terms of agreement and the code of conduct written by the community that the product is developed for. The developers and the community managers have the right to revoke access to Rin Tohsaka. The developer version of the product follows Discord API agreement and the code of ethics cannot be enforced. Instead it’s up to the individual who decides to host Rin Tohsaka to set up their own code of ethics. If that specific individual abuses the Discord API agreement, they would be instantly terminated source: (Discord, 2018).

The character Rin Tohsaka is owned by a company named Type Moon and they hold full ownership. However, the name and the character we use falls under fair use of copyrighted material. The reason we choose to use that name falls in the theme of the community that we developed the product for, all the original creators are credited properly. If one day we decide to sell our product, a rebranding would be required to register the product as a trademark.
4.6 User driven ethics compared to moderator driven ethics.

Chapter two relevant research covered two articles based on user driven ethics and moderator driven ethics.

When it comes to user driven ethics, the community named Stack Overflow (Stack Overflow, 2018) was introduced and how their ethics works with automation. Where an individual can set their own ethics based on their reputation status and privileges, which is based on their status of reputation. In our research about Stack Overflow (Stack Overflow, 2018) we found an example, that shows that moderator driven ethics has its downsides.

![Stack Overflow question and reputation](Stack Overflow, 2013)

**Figure 9 Stack Overflow question and reputation (Stack Overflow, 2013)**

Looking back at moderator driven college community in chapter two, we found that an individual is granted power through a process. The individual who sets and maintains
community ethics, is a public figure that goes through a process and a set of ethics decided by others, for him to follow and maintain.

CODE OF ETHICS

Ethical Standards for the College Workplace

Tacoma Community College enjoys a reputation for having high ethical standards. As a member of the college staff, you can take pride in our reputation for doing things right and doing the right things. This is important because we, as public servants, are accountable to the people who rightfully have high expectations for our behavior and service standards.

To help state employees understand their rights and responsibilities, the Executive Ethics Board was created by the Washington Legislature to develop the Washington Ethics Law. This law enables each of us to take positive actions and demonstrate ethical behavior at all times. Although an organization may ascribe to ethical behavior, it ultimately begins with individuals. This brochure describes the basic principles for ethical behavior and asks you to accept personal responsibility for your decisions. If there is any question of whether your decision will be ethical, please seek advice from the Director of Accounting Services, who is the college’s Ethics Officer.

The ethics law is subject to interpretation by the Executive Ethics Board. As they issue rulings, this college’s Code of Ethics will be revised as necessary. Thank you for your support of and belief in Tacoma Community College.

Pamela Transue signature

Figure 10 Community college code of ethics (Hess and Pipek, 2012)

The public figure, who gets selected by the people, needs to agree to Code of ethics as shown above, before they can maintain the infrastructure (Tacomacc.edu, 2018).

Comparing the differences between user driven and moderator driven, in theory and/or practice, shows that both methods have their own pros and cons. When comparing the two methods and our product. It shows that we have applied both methods, as showed in figure two and figure one. Sometimes automation is practical and is useful, for time- and resource saving. However, automation in our example shows that automation is not always needed and is also sometimes heavily disliked. When it comes to enforcing community ethics, interaction is the key. It’s important for both community leaders and their members to understand the ethics, to be able to have a successful community.

4.7 Chapter conclusion

The chapter showcased the design process for Rin Tohsaka with a description of each feature that was introduced as well as a comparison of user-driven ethics to moderator driven ethics.
5. Conclusions

In this chapter we will refine our earlier chapters and summarize everything whole.

5.1 Earlier Research

While researching for relevant topics we came up with the idea to find a balance point about code of ethics, between existing methods. Since online community has shown in previous scientific research, that there is always some sort of drawback with the methods used. The intention was to find a perfect method, that would solve the problem that was stated in this collaboration project.

When it comes to earlier research, the result shows that there is a neutral stand point. Analyzing the references, shows that earlier research has concluded and found a solution, but the communities have not implemented the result that would solve the problem.

When it comes to ethics in user driven ethics, Stack Overflow (Stack Overflow, 2018) shows that the result is progressive and is going towards a good change, however it lacks user friendliness. Bad behavior and self-set ethics with no guidelines and reputation privileges leaves a bad impression, however is useful in big communities where it’s needed.

Moderator driven ethics shows an improvement case since it’s more traditional and developed which works well in smaller communities, but the result shows that its more time consuming. With web 2.0 as mentioned in chapter two, the whole concept of community moving and changing definitions, like technology in a rhizomatic pattern. The more changes done, the more the user needs to adapt. Same concept applies with developers that create the services for the users.

To conclude earlier research, it’s a neutral standpoint it concludes and solves the thematical question. In the form of a guideline that was provided for this research with scientific data necessary to create a good and well structure method to solve the thematical question.

5.2 Research

During the research phase, we used scientific articles from relevant research, as a guide to get a deeper knowledge and to get an understanding of how the research question can be potentially solved. The purpose and the thematical question itself, is a complex philosophical process, which requires a long period of time to conclude.
Earlier research gave us a good head start, the intention was not to invent something new. But to improve an existing concept and creating something new within that concept. How to decide and maintain community ethics in an online community?

Online Community and ethic management requires time and resources to solve the thematic question problem, which is an ongoing process that could take the communities entire life to adapt. There is no direct answer in what way community ethics should be maintained or decided. However, it’s important to understand how it’s done from the beginning. When a community is built it follows through its process, a rhizome is created, and that rhizome expands itself to other rhizomes based on community’s theme. People are different, everyone thinks differently, our knowledge is situated and structured differently.

Result of our research can be concluded in the form of a method and a solution that can be implemented and used by other communities. The key importance here is participation, growth, accepting and uphold. With those central elements the thematical question and the purpose can move further and show a positive result with participatory design and rhizomatic.
5.3 Creation

Creation is the combination of all the previous chapters and shows the result in form of a product. The product takes all the previous research and the research that was conducted and combines them as a method and is delivered in the product. The product consists of the management system, that was specified in the design process and its purpose to help answer how to conclude the thematical question and its problems. The result is shown after a month of use.

Figure 11. Creation usage daily (Cloudflare, 2018)

<table>
<thead>
<tr>
<th>Unique Visitors</th>
<th>Total Unique Visitors</th>
<th>Maximum Unique Visitors</th>
<th>Minimum Unique Visitors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Last month</td>
<td>3,155</td>
<td>331</td>
<td>77</td>
</tr>
</tbody>
</table>

Figure 12. Community website activity (Cloudflare, 2018)
By looking at figure thirteen after deploying the product, it has shown an active request and active time per day roughly being used by 29 different users. The second figure shows the popularity and activity of the community with more than 3,155 active viewers, an implosive increase over 115 views before the product launch.

The most important is figure thirteen showing the number of members currently in the community and how many members grow on average between 15-40 members join the community.
5.4 Conclusion

Based on the data gathered from Cloudflare it shows that the Mage Association (client) has increased in member growth. Thanks to Rin Tohsaka the community is more manageable and is more expandable. With a good number increase the community still maintains its theme and is active daily as mentioned in the purpose chapter.

With the research question: How can management of on-line communities be supported by easy-to-use or automated functions while maintaining community ethics and theme? The question itself can’t be answered directly. However, by following its patterns, it shows that the results can go towards a positive outcome. With participatory design the core answer of decision and uphold of ethics without participation there is no community-. Without those crucial elements a rhizome simply either seizes to exits or is not created to begin with.
6. Discussion

In this chapter we will discuss our findings in the product as well as go through what our expectations were, and potential future works and answer our research question.

6.1 Research and Methodology

We had a different mindset, it took us a long time to perfect the question, methods and relevant research we intended to use. Originally, we intended to create the community and develop it over time. However, through contacts and interest the community reached out with the similar problem that most communities face. It was a perfect opportunity for us because this would give us an advanced knowledge in community making. We could dedicate most of the time on the problem and the thematical question, instead of community creation.

The research gave us a general background knowledge and allowed us to find potential problems. It showed how community definition began as whole. With today’s advanced and technological aspects, the definition of community changes with a more open mind.

As the definition of communities changed and moved towards the net and more people having access to it, new problems arose, and we introduced a potential solution. Introducing \textit{participatory design} and \textit{rhizome} as design methods allows us to keep situated knowledges. Situated knowledges plays an important role in community ethics and uphold. Situated knowledge is the center of community development in the digital world we live in.

Rhizome as a design method played an important role in our development because our intentions was to improve an existing method, instead of creating a new definition for it. We wanted to solve existing problems with new ideas and try to minimalize creating new ones. Participatory design played an important role in our development since we were working with communities and participation was the key to creating a successful research. Pair programming was used a lot for practical work. We wanted to make sure we were creating a quality product. By using pair programming one developer analyzed the quality of the code and the other coded the product and then switched over time. However, participatory design was applied on top of pair programming. So that others who have no programming experience to can be a part of the process.
6.2 Design Process

Design process applied the methodologies and research, to build the product that we envisioned to create. The design plan and process were an important part in this work. Our first idea was to create a working prototype and stop there. Since the prototype came together quite fast and was finalized, we moved towards a full working product.

During our three years of experience in Media Technology, we always had the mindset of creating prototypes and test new technologies. Having good experience with prototypes, we wanted to challenge ourselves further and get a deeper understanding on how the software development cycle works. By testing and following the software development cycle, we could create a working platform. The platform was created with an intent to go further and improve upon it, that’s where we introduced asynchronous programming.

Asynchronous programming allowed us to make the software more dynamic and manageable and open source. We intended to distribute the platform in an open source, allowing others to be a part of the participatory design process for those who wanted to.

As the product was completed it allowed us to compare the similarities between other methods, that were mentioned in earlier research. With user driven and moderator driven examples compared to our own.

The design process was a stressful but successful creation allowing us to understand how we could solve the potential problem. The design process also allowed us to improve as developers and understand how the methods function on a professional level, with the help of previous experience.
6.3 Future Research

With the research, thematical question, problem and the creation concluding with a successful result. During the process it also showed some interruptions between the research and creation. Time being one of them, due to us taking a long time to finalize the plans and move further to creation. Once we got to the creation we faced some practical problems, such as estimating the time of completion of a feature.

The methods that we decided to use showed a strong view on our thematical question. However, the method we decided to work under sometimes showed negative reaction by others. Such as moving the product to a more “autonomous design” where most of the work would be done by the product. We managed to solve that approach by combing both methods that we researched in earlier researches and perfect them by finding compromises and removing some outdated practices.

**Participatory design and rhizomatic** as design methods and concepts being a strong point. They are philosophically difficult to grasp and follow through, this required a lot of time to master. Since our research focuses deeply on those methods, it was time consuming to develop an application with big community and making sure that everyone is satisfied to fulfil our requirements list.

Working with a new concept such as **asynchronous programming** it took a long time to get used to and designing a platform that was minimalistic on resources to have a sustainable working environment.

The biggest challenge we faced was staying close to the strict requirements set by the community to get a satisfying result. But in the end, we can conclude that we created a product that’s satisfies our expectations.

For future research we would like to go deeper into the project with more confidence to maximize the time. It is also understandable that the research level of the project is on an undergraduate level, but we would like to focus deeper so that we can enhance our experiences and move up the academical ladder.

During this research we learned a lot of new concepts and got to put our three years of academicals to good use and conclude our first stage of academical studies. Combining three years of experience into one final course gives us a good oversight of what we have done in the past. This gave us a good learning reflection on what we are capable of and what to improve on in our future academical career.
6.4 Results and Research

Results of our research and creation showed a good result and we are happy with what we originally planned on creating, as specified by our SWOT analysis and requirements list. By applying our previous knowledge and experience into the creation and research the result showed a complete working product.

We could create a functional result and a good research, that can be used further by others as a guideline.

The result speaks for itself, the creation was a successful project, with the help of our research and previous experience. Its shown that the product that was intended for the solution of our thematical question is working and the community is growing and is active. The methods that were applied for the result were generated by tools that monitor the activity. The result also concluded the answer to our research question in form of a guideline of how the question could be answered.

Since there are no straight answers we found that participatory design was an important value for community ethics and its uphold, especially when it comes to decision making.

The research methods that we used like user driven ethics, moderator driven ethics, and participatory design being the main one, showed that methods like user based and moderation based can be good but lack a deeper explanation on how the method works.

With us implementing situated knowledge as a concept it allowed us to investigate the problem more quicker and find a more suitable solution to the problem and build a working product that is active and is usable.
Figure 14 thought process. (Team Husky, 2018)

Figure fourteen shows the different associations done in this bachelor’s thesis and our thought process we had when combining all the elements. Features and ethics being in the middle serving as a connection to the public version of the product and to the client. Rin Thosaka as a character representing the product and the features and methods behind the Discord bot/product that was created in the bachelor’s thesis. Team Husky and the thesis being the guideline to solving the question.
Figure fifteen shows a small idea and thought what we wanted to create out of this bachelor thesis.

- One person can destroy a community by not following the code of conduct.

- The staff of the community stop this!

- The product helps the staff to make it easier to manage the behavior and remove [misbehavior!]
6.5 Research Question: Answer

This chapter discusses what we have achieved in this thesis, in conclusion we are confident that the research question can be answered based on our research question:

“How can management of on-line communities be supported by easy-to-use or automated functions while maintaining community ethics and theme?”

This can be done by introducing a product with automated functionality, which will help with creating communities and establishing rules and ethics. Participatory design must be the lead development method through the whole product development phase, from start to finish; this ensures easy management of a community and the community staying true to its theme.
List of References

Scientific articles


Websites

List of Terms Used

Abbreviation – used as a term for command execution instead of typing out the full command to execute a method use its short abbreviation.

Agile methodology – a methodology mostly used by software developers as a working method for developing projects.

Anime – a style of media and animation for entertainment purpose originated from Japan.

Asynchronous programming – method runs separate from the main application.

API – application programming interface used by developers when creating a program as a reference list.

Back-end development – a part of web application development where the developed is done towards the server side. Not shown to the user the logical operation done by the computer.

Developer version – a version of the product intended for development purpose and for those who are failure of how its intended to run.

Discord – a free voice over IP application developed by Discord Inc.

Documentation – a list specifying how the product functions and what features it has.

for community members by community members – a term used by the report to describe a motto behind this project.

Front-end development – a part of web application development done towards user experience what the user sees when the webpage is rendered.

Full stack development – a type of development which features front and back end as well as knowledge with all type of development methods.

Handler – in programming term used to handle a set of methods or execute a certain method when an event occurs.

Heroku – a cloud platform for deploying web-based application with a support for multiple programming languages.

Hierarchy based – used in this thesis as a term to describe how the code is executed in a hierarchical order.

Instance – a term used in object orientated programming an object of something.

Participatory design – a design method used for where the creator and the client participate in the development together.

Node.js – an opensource JavaScript environment used for server-side development.

Prefix – used as a term to call the product in this report. The product runs on a prefix otherwise Rin Tohsaka won’t know when it should be executed.
Public version – a version of the product that is available with a click of a button. Client does no need to set anything up and can run the product with no set up process unlike the developer version. The public version does not require knowledge of set up.

Rhizomatic - a philosophical term where a tree and roots multiply and never decrease in size.

Rin Tohsaka – product name used for this report and a character from an anime series name Fate Stay Night.

Stack Overflow (Stack Overflow, 2018) – a community for programmer.

SWOT analysis - an analysis used for analyzing strength, weakness, opportunity, and threat,

Team Husky – a community founded by Edgar Axelsson in purpose for helping with coding and creating programming projects.

Type-Moon – company behind the Fate Stay Night series and the owners of the name Rin Tohsaka.

web 1.0 – a term described to the birth of the web allowing the user to have access to information.

web 2.0 – a term described the web in a more modern era where social media, communities and share of information in the center.