# Reflection on Design and Implementation

## What changes, if any, were made to your original design, along with updated design documentation

- Removed addTags method in the tagger class and its subclass, use article as the parameter of extract function instead of text
- Removed ProperNounsTagger and SourceNameTagger, and add EnglishTagger and RakeTagger
- Add Tag class in the tagging sequence diagram, and its function add(taglist) is called by taggers
- Removed JsonImporter and RssImporter
- Add array of articles to Importers
- Add MailRecording model to guarantee users are receiving unique articles
- Add administration panel in the mail controller, which can send to each user their interesting articles at the same time

## Aspects you found challenging

We find it is too difficult to use all five tagging method on each article since 3 of them require to request the API and it take more than 10s to tag one article, which would seriously influence users' experience.  Also, with some of the tagging APIs it is very easy to reach its request limit which can abruptly cause the app to crash. We encountered a similar problem with the email API, which only supports sending 25 emails per hour. After reaching the limit, it was difficult to test and fix any issues.

## Your thoughts on the value of spending time and effort developing a thorough design prior to implementation.

For Project 1 and 2, we skipped the design stage and went straight into implementation. Going straight into coding without a design in mind, the implementation required multiple iterations and refactoring to improve the code structure. On the other hand with Project 3, which is a larger scale project which is distributed across 3 team members, the design process was necessary and highly valuable for coordination of the project. By spending time on design prior to implementation, the final outcome was large savings in time and frustration, since we avoided having to perform major refactoring and iteration. The final state of the project is also more maintainable and suitable for extension.