YouDanMu Product Backlog

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Problem Statement

YouTube is lacking the popular floating commenting feature, aka Danmaku. Our project is to develop a browser extension to append such feature to YouTube, enabling viewers on YouTube be able to watch Danmaku comments from different sources and also post floating comments on the video.

Background Information

Floating comment (Danmu in Chinese, or Danmaku in Japanese) is a comment system originated in Japan and China and now become popular being used on video-sharing website across Asia. Instead of traditional comment system, it features each comment on the video with a timestamp, and fly through the screen at the designated time, when the viewers are watching the video. It often creates another level of fun or being explanatory to the video. It all depends on how much the viewers participate in the video.

Nowadays, it's not only online video, but also online streaming even cinema has implement this feature. People get to talk about what is going on at that moment and express their thoughts on it. This has been a popular way to interact with the people with same interest.

Environment

Client Side Development
- JavaScript, CSS, HTML for core plugin logic and interface.
- Google Chrome extension API for browser integration.
- WebKit API for DOM manipulation and cross domain HTTP(S)/RESTful requests.
- YouTube video API to inject plugin handlers and event listeners.
- Customized Danmaku module for data XML parsing, generation, and rendering.
- Interface for different Danmaku rendering backends, use SVG for drawing.
- Gulp.js for extension compiling, hot update on development changes.

Functional Requirement

Backlog ID	Functional requirement	Hours	Status
1	As user, I would like to use this plug-in on different system and browser.	15	Completed in sprint 1. Partial: only support Chrome.
2	As user, I would like to load Danmaku from different kinds of Danmaku sources (our own server, websites like Bilibili, Nico Nico etc.) using references like URLs, or video IDs.	20	Incomplete: our own server. Completed: integrate Bilibili in sprint 1
3	As user,I would like to post Danmaku in different size.	1	Completed in sprint 2
4	As user,I would like to post Danmaku in different color using a color picker.	5	Completed in sprint 2
5	As user, I would like to post emoji in Danmaku.	1	Completed in sprint 2
6	As user, I would like to post my Danmaku at certain part of the screen (Still at top or bottom; Fly through).	5	Completed in sprint 2
7	As user, I would like to switch Danmaku feature on and off.	1	Completed in sprint 1
8	Scrolling marquee Danmaku should move from right to left, longer one moves faster. (speed = 0.22 * width + 113.78)	5	Completed in sprint 2
9	Scrolling marquee Danmaku mode should be layouted in way that, when a new Danmaku is about to enter the screen, it will select a vertical position closest to the top while in its lifecycle, it will collide least number of other scrolling marquee Danmaku.	10	Completed in sprint 2
10	Top Danmaku mode should be layouted in way that, it's horizontally centered relative to video screen, and then its vertical position is closest to the top while it has least number of collision with other existing top mode Danmaku.	5	Completed in sprint 2

11	Bottom Danmaku mode should be layouted in way that, it's horizontally centered relative to video screen, and then its vertical position is closest to the bottom while it has least number of collision with other existing bottom mode Danmaku.	5	Completed in sprint 2
12	As user, I would like to block/unblock some Danmaku with specific word.	3	Incompleted.
13	As user, I would like to adjust transparency of all the Danmaku.	1	Completed in sprint 2
14	As user, I would like to set the overall font size for all the Danmaku.	3	Incompleted.
15	As user, I would like to change the overall Danmaku border and shadow rendering styles (solid black border, shadowing etc.).	5	Incompleted.
16	As user, I would like to sync my settings to other machines through my browser account.	8	Completed in sprint 2
17	Settings changed in one tab should be synced to all other tabs.	5	Completed in sprint 2
18	As user, I would like to change the overall Danmaku font family.	1	Incompleted.
19	As user, I would like to report some insulting Danmaku	10	Incompleted.
20	As user, I would like to see the whole list of all the Danmaku on the video.	10	Incompleted.
21	As user, I would like to change the fly through speed of all the Danmaku.	5	Partial in sprint 2: fly though speed changes with video speed
22	As user, I would like to pause Danmaku with video.	2	Completed in sprint 1
23	As user, I would like to set maximum overlapping Danmaku density when too much floating comments appears.	10	Incompleted.
24	As user, I would like to set synchronization offset for specific Danmaku source in case their timing are out of sync.	5	Incompleted.

25	As user, I would like to automatically save my Danmaku settings for future visits.	10	Completed in sprint 2
26	As user, I would like to automatically apply the "most popular" Danmaku source for a certain video, "verified" by other users.	20	Incompleted.
27	As user, I would like to report mismatch of the "popular" Danmaku source.	20	Incompleted.

Non-Functional Requirement

Security Concerns
Our plugin modifies and provides content on users' web page, thus it's important to make it secure enough to prevent different forms of web application attacks. These includes XSS (cross-site scripting), MITM (man-in-the-middle), AJAX/JS/SQL Injections, CSRF (cross-site request forgery), Insecure Direct Object References, DDoS (distributed denial of service), and etc.

Scalability Concerns
In case our user base might grow in the future, we want to make sure our server is capable of handling significant amount of functional requests in a timely manner. Thus we may need to implement some sort of caching, load balancing and static content generating for CDN acceleration.

Reliability Concerns
Since most of our data providers, such as our Danmaku content sources, YouTube videos, are third party providers. And not surprisingly, in order to use their data, we may need to integrate with their non-public APIs, which may change in the future without any notice. Thus we have deal with these kind of compatibility issues with these interface providers, by constantly checking interface status, and provide patches and updates once they changes. We have to give reasonable explanation to our users when services went down because of the above or any other problems.

Easy Recovery
We want to implement most of the third party data integration on our server side. Thus if any interface changes, we can patch our server only, but still provide constant data and interface to our user clients. In this way, our user don't necessarily need to upgrade their extension to cope with our patches, and most of the integration errors can be resolved on air.

In the same time, we want to provide user friendly interface when services are unaccessible, invalid, or any kind of client side error raised up. It should provide information to the user about how to report bugs to us.

User Stories

Case	Action	System Response
Open the YouDanMu panel	1. Navigate to any YouTube page. 2. Click the YouDanMu icon on the browser extension bar. OR: If you are at a video page, click the "Danmaku" icon on the video control bar. OR: Right click at the page, in the poped up context menu, click the Danmaku option.	3. The YouDanMu panel should shows up. 4. If no video is on the current page, "Post Danmaku" and "Danmaku Source" features are grayed out.
Close the YouDanMu panel	1. When YouDanMu panel is showed up. 2. Click the "X" button at the top right of the panel. OR: Click the YouDanMu icon on the browser extension bar again. OR: If you are at a video page, click the "Danmaku" button again.	3. The YouDanMu panel should close up.
Load a Danmaku source	1. Navigate to a YouTube video page. 2. Enter Bilibili video URL at the "Danmaku Source" text box in YouDanMu panel. 3. Click "Load" button.	4. System will start fetching Danmaku, it will take a second. 5. If fetching succeed, Danmaku will start playing with video. Should raise warning if source are invalid or incorrect.
Unload a Danmaku source	1. When a Danmaku source is loaded and playing. 2. Click "Unload" in "Danmaku Source" section.	3. Danmaku should be cleared, and will not appear again unless manually load them again.
Pause/Resume Danmaku with video	1. When a Danmaku source is loaded and playing. 2. Pause the video. 4. Resume the video.	3. Danmaku should also be paused. 5. Danmaku should resume from their previous position.
Seek Damaku with video timeline change.	1. When a Danmaku source is loaded and playing. 2. Click somewhere before or	3. The video will seek to the new time. 4. Danmaku will also seek to the

	after the time point in the video timeline. OR: use left and right arrow key to step forward or backward	new time and start playing. All Danmaku living at the new time will be rendered.
Autoplay should unload Danmaku	1. When a Danmaku source is loaded and playing. 2. Turn on YouTube "Autoplay" feature. 3. When video ended, wait until next video starts playing.	4. Old Danmaku is unload, no Danmaku should appear on new video unless manually load again.
Loop should restart Danmaku	1. When a Danmaku source is loaded and playing. 2. Right click the video, and enable the YouTube "Loop" feature. 3. Wait until the video ends and start looping.	4. Danmaku should restart playing from the start with the video looping.
Restart video also restart Danmaku	1. When a Danmaku source is loaded and playing. 2. Ensure "Loop" and "Autoplay" features are disabled. 3. When video ends, click the "Replay" button (use to be the play/pause button) to restart video.	4. Danmaku should restart playing from the start with the video restarting.
Post a Danmaku	1. Enter text/emoji in the "Post Danmaku" text field in YouDanMu panel. 2. Select "mode" for the position of the Danmaku. 4. Select "font size" and color of Danmaku. 6. Click "Post" button. (Danmaku can be posted without setting the position, font and color, which will be set as default)	3. The active "mode" is changed to the selected option. 5. The active "font size" is changed to the selected option. A color picker is displayed for color selection. 7. Danmaku will appear on video as soon as the video is playing. 8. Danmaku is correctly layouted as specified in functional requirements. 9. If Danmaku is invalid or incorrect, a warning should be raised on the panel 10.Delete return character

Switch Danmaku Feature on/off	1.Click the disable button in YouDanMu panel. 4. Click the enable button in YouDanMu panel.	2. Features in YouDanMu panel should be grayed out. 3. Playing Danmaku should be cleared. 5. Features in YouDanMu panel should be available again. 6. If previous playing Danmaku, should start playing again.
Adjust opacity of Danmaku	1. When Danmaku is loaded and playing. 2. Drag the opacity slider in YouDanMu panel OR: enter a decimal value next to the slider.	3. Danmaku opacity is immediately updated to the value we specified.
Sync settings between tabs	1. Open several browser tabs with YouDanMu panel opened. 2. Change on of the following settings from any tab: YouDanMu enable/disable; Danmaku Opcity; Developer Mode.	3. Observe that the settings changes is synced with all other tabs.
Save settings locally	1. Change some YouDanMu settings. 2. Exit the browser. 3. Reopen the browser then the YouDanMu panel.	4. Observe that the settings changed is reloaded after relaunch.
Sync settings remotely.	1. Login your browser account and enable data sync. 2. Change some YouDanMu settings. 3. On another machine, login with same browser account and enable data sync. 4. Open YouDanMu panel.	5. Observe that the settings changes are synced with the new machine.