Poet

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1.   INTRODUCTION

Description of idea

Poet greatly simplifies the process of creating websites. It intelligently automates the rigorous construction phase while liberating users from personalization restrictions sanctioned by the difficulty to code, giving them the freedom to create websites they could only imagine before using poet. Poet uses deep learning to generate websites from a multitude of sources, including digital mockups, a screenshot of the target website, and even structural drawings with a representation of layout structure. Poet is unparalleled in it's website creating capabilities as it automates the whole development process and require minimal effort for users to build their dream website. The code for websites will be automatically generated after a user clicks submit. After the code for a website has been completely generated, users can use our graphical editor to edit and refine the generated websites without having to know how to code.

Rationale of project

Problems:

1. Websites are prominent and ubiquitous, and tend to be easy to access and navigate. However, creating professionally personalized websites is difficult, time-consuming, and requires the skill of coding.
2. The current solutions to simplify web development like wix and weebly provide pre-made themes and do not encourage users to manifest their creativity upon crafting and using customized designs in their website. They also offer a graphic abstraction of the website code which superficially seems helpful but compromises personalization, and ironically adds an inevitable layer of complexity to the development process.

We empathised with the user and aimed to build something that abstracts the complexity of coding while giving the users full control over the website without knowing how to code. We wanted to make things simple to use but preserve the degree of control. Bridging the gap between imagination and code was what we set out to do, and we believe this product encompasses this ideal.

Target audience

As poet greatly simplifies the process of building websites, it is useful for everyone who needs to create websites and it does not matter if the user knows how to code.

- People who do not know how to code: They can just easily upload an image of a sketch or mockup of the website onto Poet and Poet can help them build and deploy the website.

- Professional website designers: Poet automates the tedious upfront work, allowing them to create websites with complicated interfaces without spending a lot of time on the coding.

2.   LITERATURE REVIEW

Research findings

There are some existing website building services available to help people create websites. However, these services have some drawbacks, and employ very different methods to help people create websites when compared with our project. Our project mainly uses deep learning and allow people to create websites by inputting an image of the desired website but typical existing website building services only have drag-and-drop interfaces for people to design their websites on the spot.

Case Study — Wix and Weebly

Wix and Weebly are similar popular cloud-based web development platforms that allow users to create HTML5 websites and mobile sites through the use of online drag and drop tools. Identified problems:
- The provision of pre-made themes and discourages users from manifesting their creativity upon crafting and using customized designs for their website
- The interface may be daunting and complex for new users who may need to take some time to get used to the interface

3.   STUDY & METHODOLOGY

a. Needs analysis
- Online survey done in May with 100 respondents
- Key findings
  i. 60% of respondents did not know how to code and needed an alternative way to create websites
  ii. 72% of users found other web-building services troublesome to use
  iii. 85% of them would use our product

b. Development platforms/tools used
- React and Webpack were used for front-end design
- Tensorflow and Keras were used for model and back-end
- Photoshop for design

c. Members role and job distributions
  i. Morgan - Poet developer and designer
  ii. Kai Xuan - Research, survey design and data collection and presentation

d. Project Timeline: Please refer to diagram in <u>Annex 1</u>.

4. OUTCOMES & ANALYSIS

Features
1. Input
    a. Image-to-code = Poet directly transcodes an image into code (html) with little to no human effort or errors. May be subject to slight discrepancies that may be corrected by the graphical editor
    b. Sketch-to-code = Poet takes a drawn sketch and runs it through a generative model to produce code that renders to a website that resembles the input.
2. Graphical editor = The graphical editor directly modify the generated website's structure and attributes. Styles can be edited and attributes can be added to the webpage to personalize the website or enhance the quality of result.
3. Full exportability, the generated and edited result may be downloaded for free, to deploy or adding functionality in code, for personal and commercial use.

Please refer to the screenshots and flowchart at <u>Annex 2</u>.

A pilot test was conducted in from 15 to 31 July 2019 with 53 student users to gather their feedback about Poet. 50 of them thought that Poet would be useful in helping them create their own websites and 39 felt that Poet was practical. 45 of them preferred poet to conventional website building services because of Poet's usability and the degree of customisation poet offers.

5. IMPLICATIONS AND RECOMMENDATIONS

Limitations
Since compute is expensive, the dataset is not extensive and Poet cannot handle complex image inputs. Until compute gets cheaper or a more efficient method is used to transcode images to code, the model can only generalize within what the dataset spans.

Possible further extensions
1. Model can be scaled up by a few times in the future
2. Can be integrated with more services to help with deployment and development
3. A broader and more complex dataset with more tags can be used to represent other elements in html.

6. CONCLUSION

Reflections

- Morgan - Through this project, I have learnt more on machine learning and honed my skills in development and design to write Poet. Poet was not at all easy to develop, and required me to be very aware of the data that I was feeding the model and how it behaves. The whole training process was tedious getting the model to converge on something useful took many tries. Furthermore, the cost of this project is immense, in time and in money. We spent over $500 just on the electric bill and the whole process took over 300 hours to perfect. However, this is the price of the project we adventured out to accomplish, and it was all worthwhile. Through it, I have learnt seq2seq predictive modelling and solved great amounts of problems throughout. I have also learnt how to work with my teammate Kai Xuan to improve the project. I believe that the product we have created will democratize the DOM and catalyze web development in the near future.

- Kai Xuan - I have learnt that a lot of commitment is needed and the team needs to work together and have teamwork to complete projects in time. I had to invest a lot of time and effort into the product design and presentation. I worked hand in hand with Morgan to build the final product, and met frequently (twice every week) to work on the project together. Though I did not contribute much to the development of Poet, I have learnt a great deal on how to manage and market other aspects of the product, playing a pivotal role in the group. I have learnt a lot on how to develop products which is crucial for future projects that I will embark on, since this project has also sparked my interest in computers.

7.   BIBLIOGRAPHY

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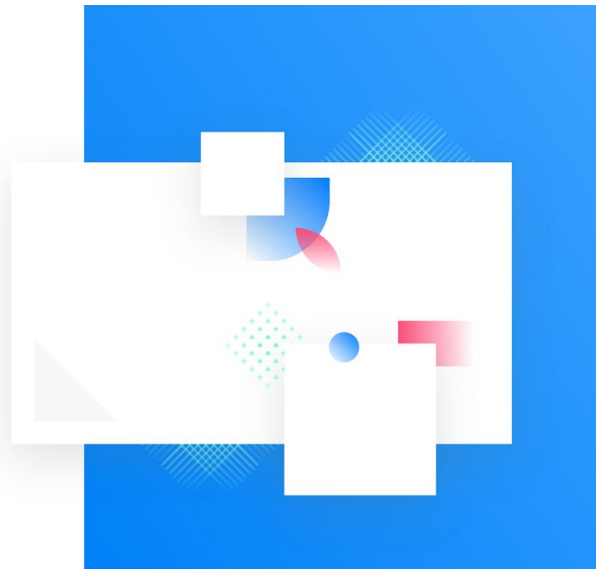- Carmichael, C. (2019, March 12). Website Builder Reviews | Top 10 Website Builders (Jun 19). Retrieved May 17, 2019, from https://www.websitebuilderexpert.com/website-builders/reviews/

ANNEX 1 - PROJECT TIMELINE

April to May 2019	May 2019	June 2019	July to August 2019

Research
- Needs analysis survey

Design and planning
- Design and planning of service and user interface

Develop
- Develop and train

Refine
- Pilot testing
- Improvements based on feedback

ANNEX 2 - FEATURES AND FLOWCHART

Create websites. Fast.

Poet uses deep learning to generate highly complex and personalized websites with very little effort. Websites are fully exportable and absolutely free.
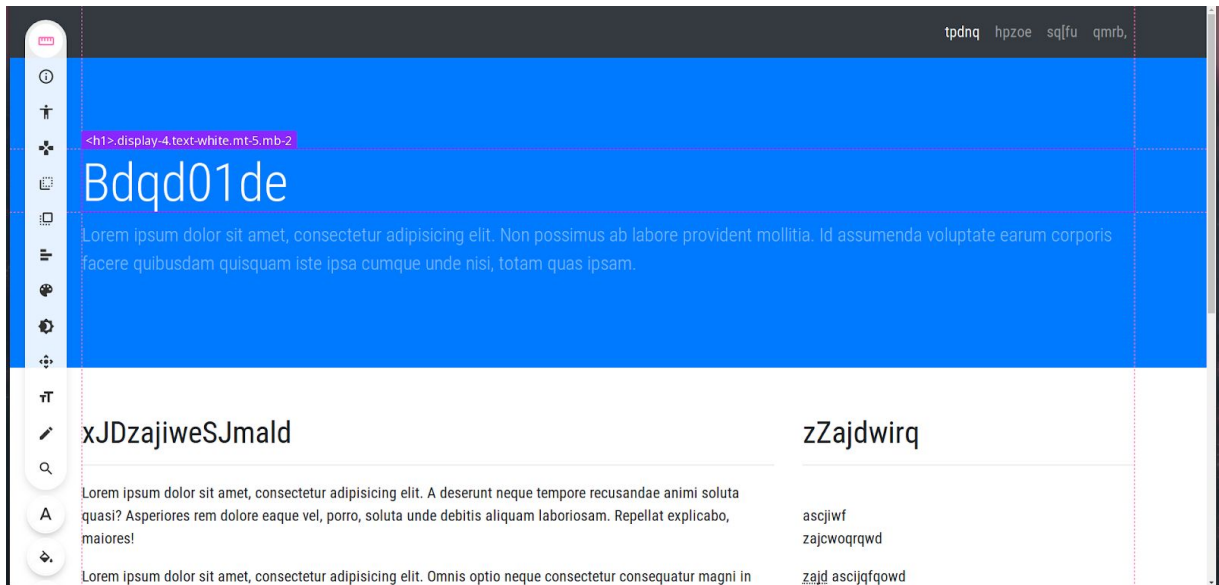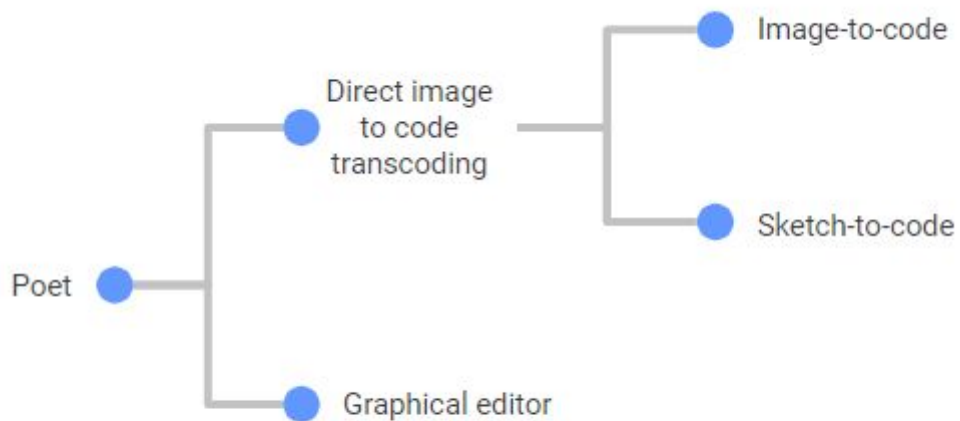
Get Started

Landing page

Mockups   Assets

Upload your mockup

Drag & Drop to upload a mockup of the website you intend to create
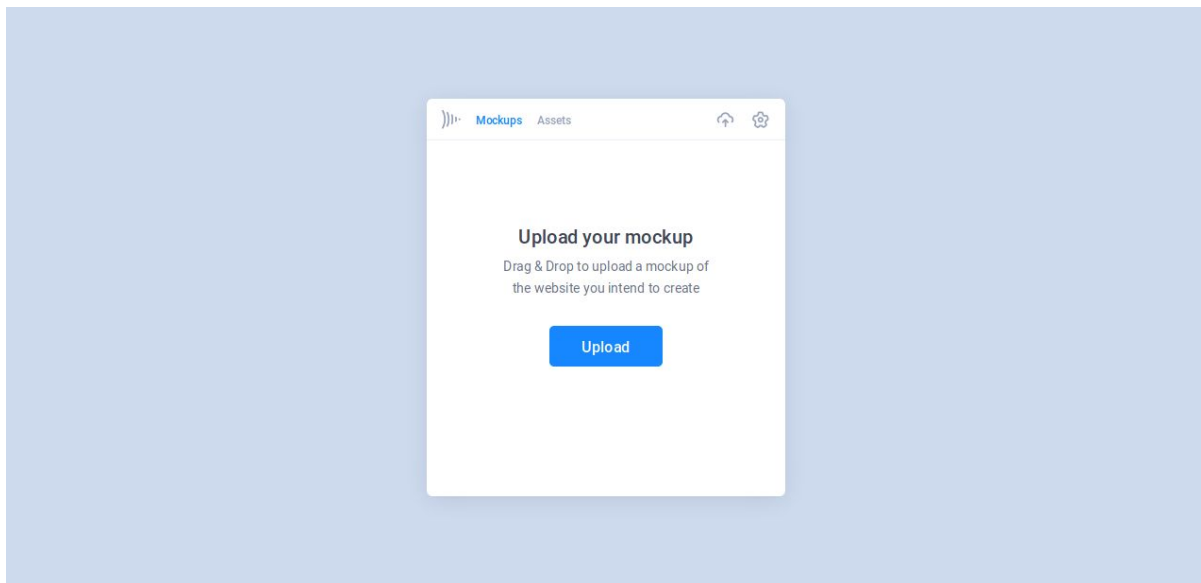
Upload

Upload page

Interface of graphical editor

The flowchart above shows the architecture of the features for Poet.