

# Hello world

This is some test content. I am enjoying the search engine [kagi](#) btw. It is really cool how it provides a subtly different window into the internet as opposed to google/bing. DuckDuckGo became to samey, and that sucks. I'm really leaning towards paying for search!

There are many paragraphs of varying sizes and importances. The stuff I want to work with mostly are. Links, Lists, Code Blocks and paragraphs. If I could do all that, I would be legit chuffed with this scuffed implementation of a pdf renderer using fpdf

Features needed:

- links [the ruby doco](#)
- paragraphs
- headings
- lists
  - nested
  - numbered
  - styles? Well, glad you asked. I'm not sure I need them quite yet, but I would be open to extension
- code blocks
- images
- blockquotes!!! Why am I implementing this now?

Albert Einstein once described his rules of work: “One: Out of clutter, find simplicity. Two: From discord, find harmony. Three: In the middle of difficulty lies opportunity.

The Lakotas concept of teamwork was deeply rooted in their view of the universe. A warrior didn’t try to stand out from his fellow band members; he strove to act bravely and honorably, to help the group in whatever way he could to accomplish its mission. • Phil Jackson, Sacred Hoops: Spiritual Lessons of a Hardwood Warrior

Cloud apps like Google Docs and Trello are popular because they enable real-time collaboration with colleagues, and they make it easy for us to access our work from all of our devices. However, by centralizing data storage on servers, cloud apps also take away ownership and agency from users. If a service shuts down, the software stops functioning, and data created with that software is lost.

In this article we propose “local-first software”: a set of principles for software that enables both collaboration and ownership for users. Local-first ideals include the ability to work offline and collaborate across multiple devices, while also improving the

security, privacy, long-term preservation, and user control of data.

We survey existing approaches to data storage and sharing, ranging from email attachments to web apps to Firebase-backed mobile apps, and we examine the trade-offs of each. We look at Conflict-free Replicated Data Types (CRDTs): data structures that are multi-user from the ground up while also being fundamentally local and private. CRDTs have the potential to be a foundational technology for realizing local-first software.

We share some of our findings from developing local-first software prototypes at Ink & Switch over the course of several years. These experiments test the viability of CRDTs in practice, and explore the user interface challenges for this new data model. Lastly, we suggest some next steps for moving towards local-first software: for researchers, for app developers, and a startup opportunity for entrepreneurs.

This article has also been published in PDF format in the proceedings of the Onward! 2019 conference. Please cite it as: