

## Alternative Business Model: Solid

A Revolutionary Approach to Data Ownership and Privacy

Summary by Gina Markov



### General Information

Solid (**S**ocial **L**inked **D**ata) is a platform that aims to decentralize the web by allowing users to own and control their data.<sup>1</sup> At its core, Solid is a tech stack – a group of tools, conventions, and implementations – to build decentralized applications based on linked data principles. Initially released in 2016, the project is led by current MIT professor Tim Berners-Lee, who invented the World Wide Web in 1989.

**Background & Motivation:** Berners-Lee’s MIT research team partnered with the Qatar Research Computing Institute in 2015 to begin developing Solid. In [a Medium article](#), Berners-Lee discusses his motivation for creating Solid. Solid’s mission is rooted in the belief that the web is for everyone, and that data should empower the individual rather than being siloed to boost profit margins. Solid strives to change the current web model where users “hand over personal data to digital giants in exchange for perceived value.”<sup>2</sup> Instead, it gives every user complete control and agency over her data: where it is stored, which apps and people can access it, and greater privacy assurance.

**Influences:** “The web as I envisaged it we have not seen yet.”<sup>3</sup> These are Berners-Lee’s words in reference to the state of the world wide web today. Today, most of the web contains data produced through a one-way pipeline, which means most users can only view the information. Berners-Lee envisages a “read-write” web where users can interact and innovate. User privacy and technological innovation (which tech behemoths are often accused of stifling with their market control) are at the forefront of today’s conversations regarding the digital world. Solid takes on both of these issues by creating a web that people can trust, a web that is created for and controlled by the people and without ulterior motives, and a web that encourages individuals, developers, and businesses to innovate.

**How it works:** Solid implements data ownership and privacy via a two-prong approach: **Pods** and **WebIDs**.

Solid provides each user with a “Pod” (**p**ersonal **o**nline **d**atastore) where the user’s personal data is stored. Personal data refers to datasets with information ranging from physical attributes to preferences and behavior on the Internet. The Pod can take many forms, such as cloud storage or USB storage; a Solid user may rely on a Pod provider to set up and maintain her Pod, although establishing a Pod at home on a local drive or server is also possible. Pod Providers are responsible for instituting the underlying technology of the data storage, like offering data encryption capability. A user needs to

opt-in to allow an application to read and write to her Pod, and the user can revoke these privileges at any time.<sup>4</sup> Finally, a user can have multiple Pods reserved for different purposes, like home, work, and social.

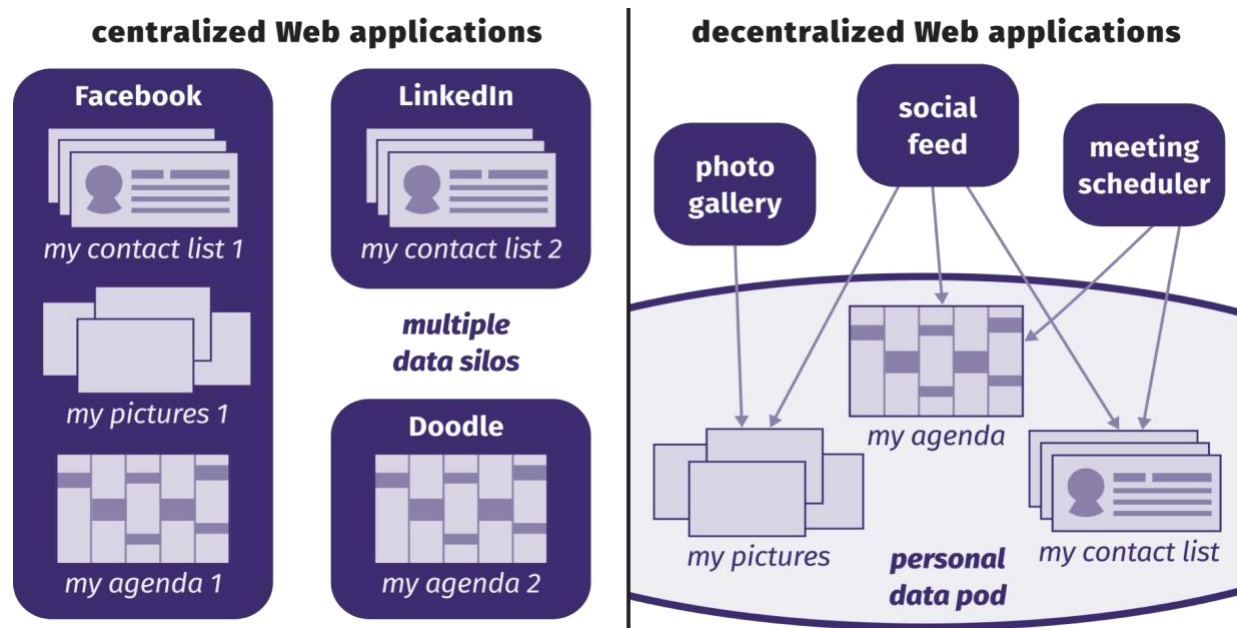


Figure 1<sup>5</sup>

A WebID is a unique identifier for each Solid user, maintained by an Identity provider. Users can share data with a third party by changing the sharing preferences of their WebIDs to associate with the WebID of the third-party source. This way, users no longer need multiple accounts for the different apps they use. Instead, a user has one account, identified by a WebID, which can be used to log into multiple apps. Pods and WebIDs are distinct: a Pod is a data storage place, and a WebID is an identifier that can be used to sign in to websites, just like Google offers users the “Sign in with Google” option. WebIDs can identify single people as well as organizations, companies, families, and teams. Having two or more WebIDs is comparable to having multiple email addresses – each can be used for a different purpose, like work and personal.

**Interoperability:** Solid is not a new version of the Web nor is it a company. It is an open standard and platform. It adds and overturns a couple features of the existing Web. For example, instead of signing into many websites or apps with Google or Facebook, a user can sign in to their Solid Identity provider; the user will not be tracked and their data will not be collected. iOS or Android app developers can make their apps Solid compatible by following standard Solid documentation. If a user downloads a Solid-affiliated app, the app will not store the user’s data; the data goes directly onto the user’s Pod. The vision

of the platform is that, eventually, there will be one interoperable Solid web. It will always be possible for users to leave to other competitor apps or Pods. All the benefits now achievable from huge data silos (like targeted advertising or search results) will ideally be echoed by Solid's Pods.

## Business Model

**Pod providers:** Pod providers are independent businesses using the Solid-approved infrastructure and regulations. Their business models will vary and be determined by the market. Possible revenue streams for Pod providers could be charging users (who may range from individuals to firms) for more storage or for better encryption and privacy. Incoming Solid users must select a Pod provider, which they can later change, if they do not wish to independently create a Pod. There are two current Pod providers, Inrupt (for use in USA) and Solid Authing (for use in China).

**Inrupt** is a commercial business founded in 2018 by Berners-Lee and John Bruce, a tech executive and cybersecurity entrepreneur, that is based on the Solid platform. Inrupt is partnering with top internet companies and developing technology to make a Solid-operable web a reality. They receive help from an open source community of developers as well as a team at Inrupt funded by investors. Inrupt claims that it is building Solid-based technology for private clients in healthcare, finance, and government that provides them with innovative and powerful ways to solve high-profile problems by overcoming limitations of data silos and burdens of collecting personal data and appealing to projects with pro-human values.<sup>6</sup> They are also working on making Inrupt technology available to open source developers to build Solid apps.

## Incentive and Demand

Currently, Solid is in a prototype phase, not widely used by individuals or companies. Right now, individuals can register to create a Pod prototype using Inrupt. Inrupt is working with private business clients to implement Solid-based infrastructure, and there are open-source developers who are currently building Solid-compatible apps. These apps range from Notepod, for storing notes on a Solid Pod, to Linked Beer, to search for and rate beers by brewery to share with friends.

User Incentive: Users using the Solid ecosystem benefit from owning and controlling the usage of their own data; having the freedom to easily revoke or change their data allowances; the ease of a single log-in process; and avoiding vendor lock-ins by being able to seamlessly switch between apps and data storage servers without fear of losing data or social connections.

Producer Incentive: Without the pressures of aggressive data collection, and with the added benefits of having access to data collected by other apps in a user's Pod, developers and companies are freer to innovate and improve their infrastructure. Berners-

Lee and the rest of the Solid team envision that the Solid ecosystem encourages creativity amongst developers and producers, as the competitive pressures for data collection and retention are relieved. In the Solid web, producers need to incentivize users to stay with their platform via new innovations and better services, rather than locking users into their platform because of their data silos. It also helps enterprises build trust with their customers regarding data management and collection. Sectors such as finance, law, and healthcare are natural clients for Solid, who might benefit from high security, personal data pods with an aggregated collection of data.<sup>7</sup>

## Competition

### Relevant Market & Key Players:

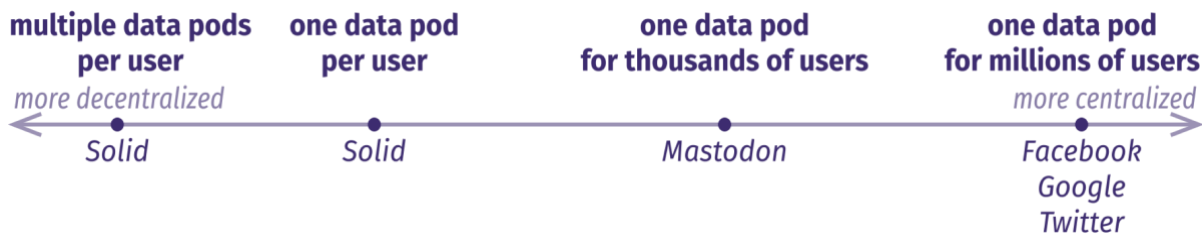


Figure 2<sup>8</sup>

The relevant market that Solid occupies is web decentralization in contexts like social networking and decoupling data from applications. There have been several attempts to decentralize the social web, like [Mastodon](#), [Diaspora](#), [Musubi](#), and [WebBox](#).<sup>9</sup> None of these systems have been widely adopted yet. Mastodon is a microblogging network (like Twitter or Weibo) that allows thousands of people to share a server, each with its own code of conduct and policies, and servers may interact with each other. Server instances may have distinct purposes and identities: qoto.org is a STEM-oriented instance, while toot.wales is described as a microblog for Wales and the Welsh. Mastodon currently has over 4.4 million users, but still remains a very small player in the field of microblogging and social networking amongst giants like Facebook and Twitter. Diaspora allows users to choose the server where their data is hosted, but Diaspora's main focus is hosting a social network, rather than running diverse applications on stored data like Solid. Musubi's focus is exchanging secured messages without an intermediary among friends on social media. Unlike Solid, these platforms do not have a mechanism like a Pod that provides users with ultimate access control over their data and specifies how apps can become "clients" of these Pod servers; Solid's distinguishing characteristic is decoupling data from applications with a wide variety of purposes, not just social networking. WebBox takes a similar approach to Solid by decoupling data from applications and using a WebID for a decentralized identity. Solid developers refer to WebBox as "complementary" to Solid.<sup>10</sup>

## Policy Implications

**Innovation and Competition:** Solid encourages competition and innovation on the web. Many apps and companies on the web right now exhibit “walled garden” characteristics – infrastructure where a company’s services are provided exclusively to its members, and the members’ data is owned and kept private to that company. Such a system threatens to be anticompetitive and monopolistic, since it reduces incentive for developers to continually innovate and increases incentive to lock consumers into a single platform. Solid offers a pro-innovation and pro-competitive alternative that reorganizes power on the web; users have power over their data and privacy, and producers need to gain a competitive edge based on quality of their services, not the strength of their data collection technology.

**Data protection and transparency:** Current data protection laws promote transparency and informed, explicit consent on the part of the user. Nevertheless, it is becoming increasingly difficult to understand companies’ privacy policies and provide genuine informed consent; furthermore, declining a company’s privacy policy comes at the risk of losing a platform’s benefits and utility. Solid provides the infrastructure to offer users ultimate control and transparency over how their data is used, to eliminate the tradeoff between privacy and utility, and to encourage applications to adopt pro-user data usage policies.

## Endnotes

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<sup>1</sup> Tim Berners-Lee, “One Small Step for the Web...” *inrupt* (October 23, 2018).

<sup>2</sup> Tim Berners-Lee, “One Small Step for the Web...” *Medium* (September 29, 2018).

<sup>3</sup> Ibid.

<sup>4</sup> “Frequently Asked Questions,” Solid Project, <https://solidproject.org/faqs>.

<sup>5</sup> Ruben Verborgh, “Paradigm Shifts for the Decentralized Web” (December 20, 2017), <https://ruben.verborgh.org/blog/2017/12/20/paradigm-shifts-for-the-decentralized-web/#two-markets>.

<sup>6</sup> “Frequently Asked Questions,” Solid Project.

<sup>7</sup> Ruben Verborgh, “Paradigm Shifts for the Decentralized Web.”

<sup>8</sup> Ibid.

<sup>9</sup> Andrei Vlad Sambra and others, “Solid : A Platform for Decentralized Social Applications Based on Linked Data.” (2016).

<sup>10</sup> Ibid.