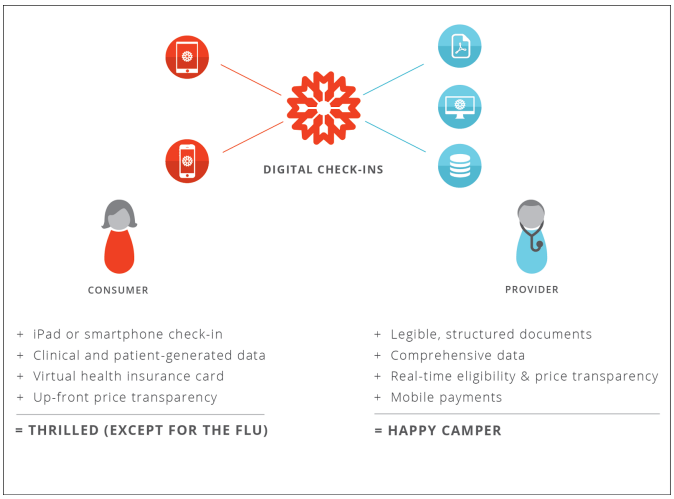
**Problem:**

Going to see the doctor is a stressful and time-consuming process for patients. They don't understand their health insurance benefits. They don't know what their care costs. They have to fill out pages of paper forms, asking questions they don't know the answers to… and, to top it all off, they're sick.

It's no picnic for the doctor, either. Office staff have to scan the medical forms and insurance card. They have to manually key in the already error-prone information provided by the patient. It kills staff productivity, introduces critical errors that cause 70% of downstream insurance claims denials, and results in inaccurate and incomplete medical records, which could ultimately affect the quality and efficacy of care.


**Solution:**

Medlio offers a digital check-in solution that allows consumers to use a smartphone-based "virtual health insurance card" application to complete the traditional check-in process. The user simply downloads the application, enters their insurance information and receives a current status of their health insurance benefits, including deductible and maximum out-of-pocket accumulators if they are on a high-deductible health plan (HDHP). They then have the option to connect to both clinically-generated data sources, such as EHRs or patient portals, as well as patient-generated data sources, including wearables and other consumer-facing applications. Although they cannot change the information downloaded from other sources, the user can add comments or annotations to it. They can also add their own patient-generated data elements, for instance, an over-the-counter medication that might not otherwise be reflected in any of their clinical records.




Medlio creates a "Mint"-like experience (which enables consumers to download and consolidate financial transaction data from disparate sources) whereby consumers can authenticate to all of their data sources, download their data, and own/control it. Our initial goal is to simplify the collection and management of health data to overhaul the existing check-in experience; however, Medlio's virtual health insurance card is not limited to office visits. The app gives consumers complete control of their health information, including the ability to share that information with whomever they choose, under terms that they define.

**Target Customers/Users:**

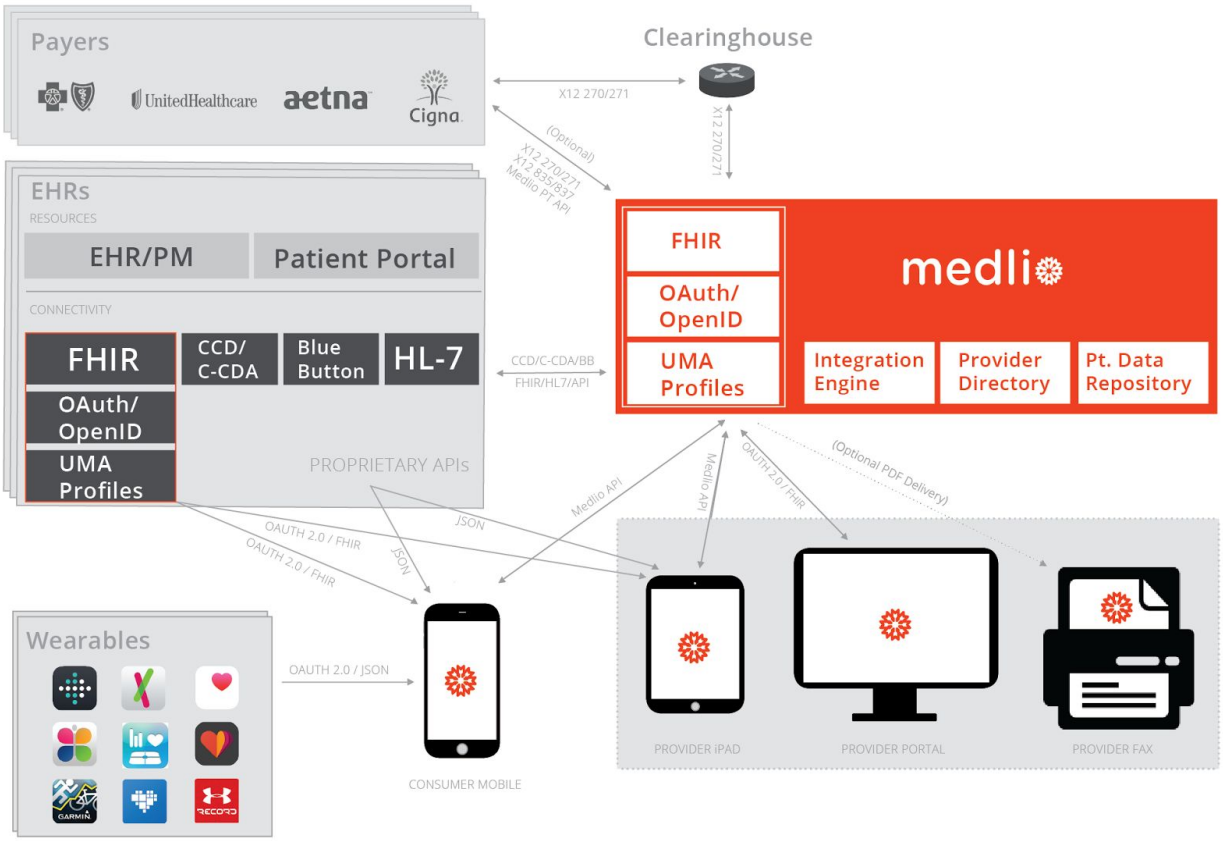
Medlio's virtual health insurance card application is incredibly valuable and useful to any and all health consumers. In fact, as we recently demonstrated in winning the Allscripts Open API Challenge supporting patient engagement, when there is broad support for open APIs, like FHIR (Fast Healthcare Interoperability Resources) - a reality likely to be forced with impending Meaningful Use Stage 3 (MU3) requirements - consumers will be able to aggregate, manage and control their health information. Our application currently supports OAuth 2.0 and OpenID. With the addition of User Managed Access (UMA), we are adding the final layer to empower consumers to not only own, but define and control how they share that information.

Healthcare providers and provider organizations represent our actual customers. Our digital check-in solution eliminates enormous inefficiencies while shoring up key revenue cycle management gaps. While we feel our solution is relevant to any healthcare organization that schedules appointments in advance, we are focusing our initial effort on those segments that most value the patient/consumer experience. For example, we recently secured a pilot to test our digital check-in solution at a large OBGYN

practice (150 providers, 50 locations). They were especially interested in enabling their highly-engaged patient population, including expectant millennial mothers, to use their smartphones to manage their health data.

**Methods and Technologies Used:**

Medlio is a cloud-based solution that supports a smartphone client (currently HTML5 with PhoneGap integration) for consumers, and a web application for provider organizations. Our server accesses insurance information via standard clearinghouses using ANSI X12 270/271 transactions for real-time eligibility verification. Additionally, our server interfaces to a number of additional resources, as well as our client applications, using RESTful APIs. While both consumer and provider applications are intended to communicate directly with one another, they were also designed to operate independently to eliminate dependencies. Furthermore, we can readily support direct integration to EMR/PM systems to enable a broader suite of communication functionality, including scheduling, data interchange, balance billing, as well as Blue Button Plus, CCD and C-CDA integration, HL7 and FHIR.




***HEART WG Implementation -***

Medlio acts as a data aggregator by pulling records from different provider systems supporting FHIR, C-CDA, HL7 or Blue Button. We use our own instance of FHIR to host the FHIR messages received from different sources. Patients have the ability to share their records selectively to healthcare and non-healthcare entities, as well as family members. When a patient shares their medical record, if the data being shared derives from a FHIR message, the patient will be setting Resource Authorization Policy (RAP) in our Authorization Server (AS). Our backend acts as the custodian of the data. It initiates with AS to get a one-time Protected Access Token (PAT). When the doctor (requesting party) requests data, their client application will be redirected to get a one-time Acquire Authorization API Token (AAT) from our Authorization Server. Using this token, their application will get a Requesting Party Token (RPT) which allows it to connect to our FHIR server where it can access the data. We are developing an API to manage the Resource Authorization Policies in our FHIR instance using the HEART WG's UMA specifications. Our backend also connects to non-FHIR source systems, such as practice management systems, to get C-CDA and financial transactions using vendor-specific proprietary APIs.

**Risks/Mitigation Strategies:**

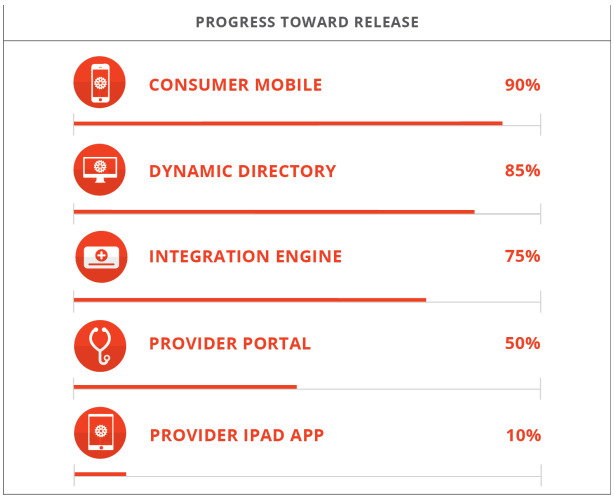
We have identified several potential risks associated with our solution, as well as mitigation strategies:

***Business -*** The primary business risks that we face include a lack of market interest, and/or a flawed business model. Having spent the last four years developing our solution, we are keenly aware of the difficulties aligning capabilities and associated value propositions with market awareness and demand. We are confident that a number of market forces are converging to drive interest and awareness around both consumer data access/control, as well as streamlined digital check-ins. The key drivers include MU3 (regulatory), rapid rise in patient bad debt attributable to the continued growth of HDHPs (financial), and a younger patient population entering prime healthcare consumption years (social). The fact that we are a bootstrapped company (with funds raised primarily from friends, family and founders, as well as a modest investment from Independence Blue Cross, Penn Medicine, and DreamIt Ventures) that has developed most of our core technology gives us a tremendous amount of flexibility in our pricing strategy. We are offering our consumer facing smartphone app, which includes real-time access to health insurance information as well as MU3-compliant access to clinical and patient-generated data sources, for free. We are charging a minimal fee for our provider-facing digital check-in solution, on top of which we will support several additional optional premium services.

***Operational -*** Our primary operational risk is scalability. While it's fairly simple to monitor the growth in our provider customers, it's a little more difficult to anticipate the growth in adoption of our consumer app broadly, or even within a specific customer's patient population. For example, our first major pilot site cares for more than 300,000 patients, whom our pilot organization will be actively promoting the app to. As more consumers use the app and integrate a growing set of data, our application and storage servers will need to scale appropriately. We are currently hosting our solution on IBM's SoftLayer, and have utilized AWS in the past. We are very conscious of these challenges and have chosen a technology architecture that can scale as needed, and on-demand.

***Security -*** Our absolute overall primary concern is securing protected health information (PHI), and other sensitive customer information. As such, we have developed our solution to support full HITECH and HIPAA compliance. We have implemented a number of protections to ensure encryption of data in motion and at rest, including the use of public/private key infrastructure. We have a business associate agreement (BAA) with our hosting service, which itself complies with HIPAA requirements. We do not persist sensitive information on the smartphone device. We require secure login, and force logout based on a predetermined period of activity. Finally, we are in the process of obtaining business liability insurance generally for our company, as well as a specific rider for participation in this ONC Challenge, which will provide $500,000 coverage for claims by a third party for death, bodily injury, or property damage, or loss resulting from an activity carried out in connection with participation in this Challenge.

**Development Timeline:**




The image to the left shows the key components of our solution, as well as our development progress to date.

Our consumer mobile app is nearly complete, and when we make it generally available (January 1, 2017) through both iOS and Android app stores, it will allow consumers to: (1) access health insurance benefits in real-time, (2) aggregate data from clinical and patient-generated data sources, and (3) share information with whomever they like, independent of system integration.

As previously mentioned, we have secured a pilot with a large organization to demonstrate the use of our consumer-facing mobile application to support office-based digital check-ins. We are slated to begin the pilot not later than late November 2016.

***Use of Funds -*** Phase 1 award of $5,000 will be used to support continued development of our consumer-facing mobile application, including adding UMA into our current architecture. If selected, Phase 2 award of $20,000 will be used to support our pilot, where we will demonstrate both the ability to push consumer specified data back to (1) the Medlio provider portal, and (2) Allscripts Pro EHR via the Unity API. If selected, Phase 3 award of $50,000 will be used towards hardening our overall platform and preparing for general availability.

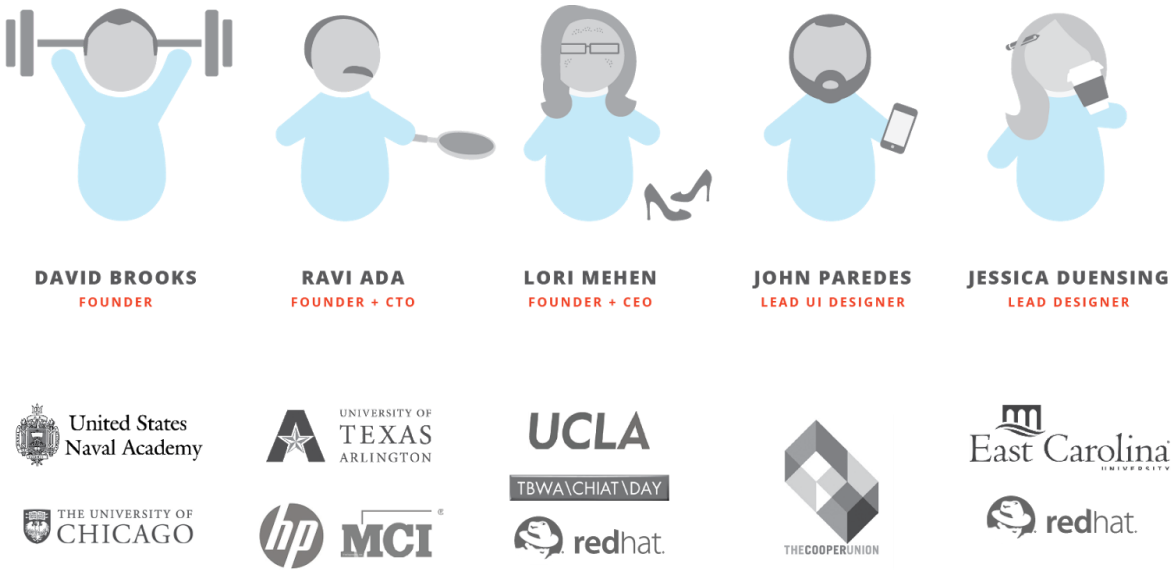
**Financial Projections:**

| Financials | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|
| Performance Metrics | | | | | |
| Providers | 150 | 1,000 | 10,000 | 30,000 | 50,000 |
| Patients | 8,625 | 230,000 | 2,300,000 | 6,900,000 | 11,500,000 |
| Financials | | | | | |
| Sales | $7,350 | $514,500 | $7,296,000 | $21,880,000 | $36,480,000 |
| EBITDA | $(389,317) | $(2,475,500) | $1,746,000 | $13,188,000 | $23,280,000 |

***Key Assumptions -*** The above financial forecast makes several key assumptions, including availability of premium software features. Specifically, Check-In and Scheduling functionality will be available during the last two months of 2016. Payments will be available Q1 2017, and Virtual Consults beginning 2018. We assume 100% of provider customers will be using our basic Check-In solution, 50% will be using Scheduling and Payments, and 20% Virtual Consults. Pricing for our software components is $49, $49, $49, and $59, for Check-Ins, Scheduling, Payments, and Virtual Consults, respectively.

***Key Metrics -*** We have two primary metrics - provider customers and consumer/patient end-users. Provider customers are important because we generate revenue from them, but they also drive adoption of our consumer-facing mobile application. Consumer adoption is also important because it reinforces the value of the provider investment, but it also serves to drive broader provider and consumer awareness as users increasingly share their data. Therefore, both metrics are essential to our go-to-market strategy of creating a virtuous adoption cycle.

**Team:**

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**David Brooks** / Founder + CEO - An accomplished entrepreneur and digital health expert, David has 15+ years of health technology experience. He served as the primary product and business strategist that helped mobile health pioneer, MercuryMD, to scale from two to 75 employees, which led to the company's eventual sale to Thomson Corporation. David also started and ran a successful multi-provider primary care medical practice with his physician wife. David received his BS in English from the US Naval Academy, and his MBA from the University of Chicago, Booth School of Business.

**Ravi Ada** / Founder + CTO - Ravi is a hands-on entrepreneurial technologist who possesses 18+ years of experience managing the architecture, development, and implementation of new technologies. Ravi has led large integration teams at HP, Yum Brands, and General Motors, and has also started a number of early-stage technology companies, including qliqSoft - a HIPAA-compliant secure messaging platform - and, most recently, Medlio. He received his BE in Mechanical Engineering from Osmania University, India, and his Masters in Computer Science from the University of Texas, Arlington.

**Lori Mehen** / Founder + CCO - Prior to Medlio, Lori managed the global brand campaign at Red Hat. Previously, she was employed by ad agency Chiat\Day, where she worked on various technology accounts, including Apple's "Crazy Ones" campaign, Earthlink's "Get Linked" campaign, as well as healthcare accounts including FluMist and Epipen. Lori received her BA in English from UCLA.

**Jessica Duensing & John Paredes** - Jessica & John represent the perfect one-two combination of Medlio's dynamic design duo. Jessica manages Medlio's overall brand design, while John leads UI/UX design for Medlio's mobile and web apps.