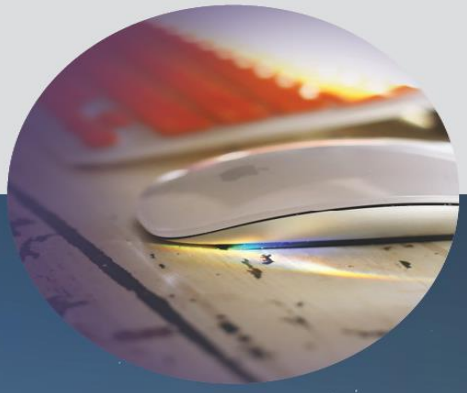
ONC CONSUMER HEALTH DATA AGGREGATOR CHALLENGE

HELP CONSUMERS GET AND USE THEIR HEALTH INFORMATION



May 31, 2016

Booz | Allen | Hamilton

TABLE OF CONTENTS

ISSUE ANALYSIS

The healthcare industry is transforming to reduce cost and increase quality of care for consumers. These goals have given way to new models of care that embrace consumer engagement, personalization, and incentivize quality over quantity. Changes in technology, regulatory policy, and consumer expectations are key drivers of this transformation. Using new technology and data standards such as, Fast Healthcare Interoperability Resources (FHIR) can help unlock consumer data and enable consumer-centric connected health. New standards coupled with new technology will provide consumers the ability to access, view and control their data. Connected health promises to increase consumers' health knowledge and personalization of care through novel forms of Patient Generated Data (PGD), such as sensors, wearables, Personal Health Records (PHRs), and genomic data. Together these solutions can help accelerate providers to meet Meaningful Use and Medicare Access CHIP Reauthorization (MACRA) Act regulations, and achieve better national health and healthcare.

This consumer health industry is a booming $28B market and is flooded with new technology solutions to include mobile apps, PHRs and patient portals, yet adoption remains low. Consumers need the ability to easily discover, share, use and act on their data. Significant barriers to achieve patient engagement exist, such as, proprietary systems, inconsistency of EHR implementation, variability in standards and disparate consumer health information resulting in low adoption of patient portals and apps (e.g. PHRs). Key challenges preventing consumers from accessing their health data and taking a more active role in the coordination of their own care are outlined in Exhibit 1.

Exhibit 1: Key Challenges in Consumer Health Data Access

CHALLENGES	WHAT IS NEEDED	CRITICAL SUCCESS CRITERIA
1. **Low Adoption:** Thousands of health apps exist yet PHR adoption is low in part due to limited consideration for continuum of consumer care.	Human-Centered Design	Address unmet engagement needs of consumers; help answer key questions and make it easy for consumers to discover, explore, share, and act on their data.
2. **EHR Incompatibility:** Consumers see multiple providers over their lifetime, all with proprietary EHRs that prevent easy user access and control of data from a single central location and the ability to share data with multiple vendor EHR systems.	Interoperability	Reduce the variability in implementing a standard like FHIR; use common models and ontologies to allow flexibility to account for change; incentives for providers to unlock data into FHIR standard (increased consumer engagement to support MACRA regulations).
3. **Disconnected Information:** To paint the whole picture of a consumer's health clinical data must be integrated with behavioral, environmental, and community-level information.	Social Networking & Open Data	Allow consumers to connect their health data with open data sets and existing digital tools. Engagement can improve if data is ubiquitous and consumers are empowered to control where, when, and how their health data can be used.

To address these issues, a human-centered approach to interoperability that facilitates Open Data and Social Networking is needed to empower consumers to discover, explore and share health data across the continuum of care.

1. Human-Centered Design (HCD): HCD is a research and design methodology that develops solutions to problems by involving the human perspective. Implementing HCD methodology may be a solution to addressing challenges in patient adoption of consumer-facing apps. Research shows that more and more consumers want the ability to use PHRs and other health and wellness apps. However, adoption is low because they are not developed to empower patients to discover, explore, or share their data. Patient portals and PHR's are designed only to meet technology and business needs of providers and insurance companies. Whereas, Consumers want the ability to access their data in one central location and use it in coordination with their healthcare providers to help manage their continuum of care. Using the HCD approach, we can improve consumer engagement in their health by giving them access to their data on demand.

2. Interoperability: A central challenge in improving offerings to consumers lies in the interoperability gaps between consumer applications and health care provider systems. From 2008 to 2014, provider adoption of EHRs increased from less than 10% to over 80%. However, ensuring interoperability of proprietary EHRs has often been cost-prohibitive. The FHIR specification is a potential solution to the interoperability problem, but its success is dependent on widespread adoption. Providers are reliant on vendors, and due to variability of standard, implementations for each EHR, implementation of FHIR is unique. Thus, the Meaningful Use mandate and open health data standards set forth by HL7 have yet to provide consumers with a comprehensive and canonical source of their health record, in a central location, as they switch between care providers with different systems.

3. Social Networking & Open Data: Available consumer health apps encourage awareness, but are incompatible with the EHRs providers use to manage health. Provider consumer portals, on the other hand, are often proprietary, read-only, and overly clinical. For consumers to become coordinators of their own care, they need unmitigated, integrated access to data not just from their various healthcare encounters, but also from consumer-generated and open-source data sets. This includes consumer-facing genomics data (23andme, Panorama), product purchases (prescription history, loyalty cards), and data from wearables and sensors (fitness trackers, glucose monitors). By allowing consumers to securely share and integrate their data, consumers are able to participate as coordinators of care alongside their providers, and can tap into the collective ecosystem for health data.

The next section describes our proposed technical solution to enable consumers to overcome these challenges by managing their health data in a central location.

SOLUTION DESCRIPTION

Our solution, CareMap, is a human-centric design that empowers users to manage health information in one central location. Exhibit 2 outlines the three key components of CareMap: 1) Universal App, 2) Data Hub, and 3) Social Channel. These features provide an intuitive user experience to securely access, aggregate, unlock, and enable individuals and caregivers to interact with their heath information. This is not a PHR; it does not store health data. It leverages existing health data sources to provide usable and actionable on-demand health information for individuals and caregivers.

Exhibit 2: Technical Solution Mapping to Addressing Needs to Improve Consumer Health Data Access

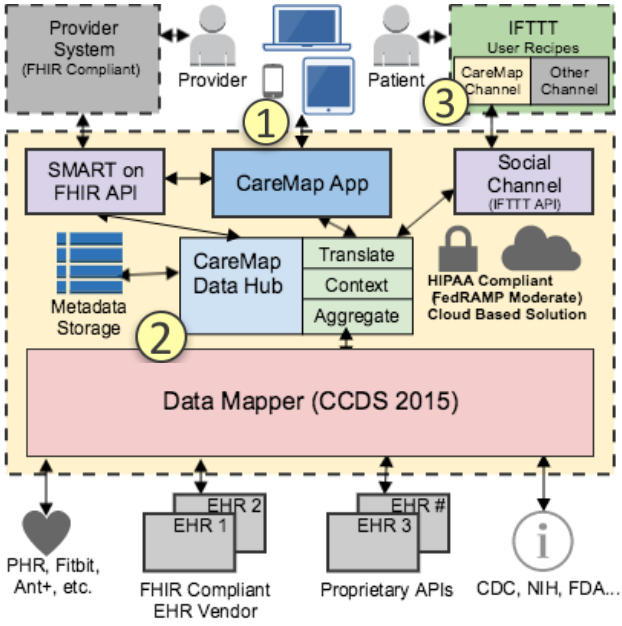
WHAT IS NEEDED	OUR CAREMAP SOLUTION	BENEFITS OF THE SOLUTION
1. Human-Centered Design	Universal App	We don't need another PHR, we need an engagement solution to deliver aggregate health data in an intuitive and simple format ,to drive NEW interactive experiences for consumers to navigate their health
2. Interoperability	Data Hub	Unlock disparate health data by integrating, transforming, and routing health and personal data from multiple sources to a Common Clinical Data Set (CCDS 2015) and exposing via FHIR and IFTTT APIs
3. Social Networking & Open Data	Social Channel	The ecosystems of digital solutions are ever changing (Drobox, SnapChat, etc.); tapping into the digital ecosystem allows solution to evolve and remain current. CareMap enable users to use their health data daily (e.g., CareMap) IFTT data channels, and recipes allow users to set reminders, notifications, access and share data in existing consumer tools they use daily - SMS, email, Drobox and with open data like FDA drug recalls, adverse events and other environmental data

1. **CareMap App** is a universal (mobile, tablet, PC) interactive and personalized consumer engagement app that enables consumers to better manage their health. The CareMap app addresses user's unmet need to discover, explore, share and act on their health data.

- **Discover**: What health information do I have available to me?
- **Explore:** How can I understand my health information?
- **Share:** How can I securely share my health information with Caretakers and other services?
- **Empower:** How can I make my health information actionable?

The information a consumer collects through this journey, empowers them to act on their health information and become their own health custodians. The Mock-ups / Wireframes section (page 8) illustrates our human-centric design and how a patient focused approach engages the end-user.

Exhibit 3: CareMap Solution Architecture (Logical)



2. **CareMap Data Hub** helps users connect to all types of health information sources (EHRs, PHRs, and Open Data). It maps these sources to a Common Clinical Data Set (CCDS) 2015-based ontological model, aggregating the data, setting context for the data, and translating and exposing it for consumption through two primary interfaces: FHIR API and "If This Then That" (IFTTT) API. FHIR API enables the health industry while IFTTT API enables the consumer. Each EHR will leverage the FHIR standard differently. While much of the information and exchange protocols will be standardized, their health payloads will be different. These incompatibilities will be even more pronounced with EHRs, PHRs, and Open Data sources that do not leverage the standard. The Data Mapper will use an ontological model to normalize and aggregate this information and enable. To make health data information usable, a context engine is applied that understands how to filter, analyze, and stage the information for specific health scenarios. This health information is then translated to make it available for different usages: visually consumable information for the universal app, as a FHIR compliant API for system-to-system integration, and an IFTTT API for enabling 'creative control over the products and apps you love' (https://ifttt.com/wtf).

3. **CareMap Social Channel** enables users to take action on their data and address the gap where health information alone is insufficient to enable users to coordinate their own health. In order for users to take action on their data, they will leverage the CareMap hub to unlock data. With the unlocked data, users now can connect their clinical data with other services, devices and tools people currently use today to navigate their daily activities. In addition to built-in control capabilities (workflow, notifications, scheduling, etc.), our Social Channel provides a CareMap IFTTT API, Channel, and recipes that provide access to an ecosystem of existing services and integrations. IFTTT is a popular web-based service that allows individuals to connect two application services (referred to as Channels) together with simple conditional triggers and actions. IFTTT recipes are specific Channels, triggers, and actions that produce a helpful automated set-it and forget-it capability. Our CareMap Channel and specific recipes will empower the consumer to connect their health information (including any FHIR data) and interact with cloud based services and devices such as SMS messages to them and provides to alert them of important health issues.

Our team has partnered with MedStar Health to further develop and test the innovative CareMap solution using their Cerner EHR platform to connect consumers to their health information. Our solution will natively meet all HIPAA security standards, as it is built on HIPAA compliant cloud infrastructure, Platform as a Service (PaaS – Azure compute and storage), Software as a Service (SaaS – Sophos Unified Threat Management), and Open Source solutions (Cognition big data platform). We will handle Information Assurance by using Booz Allen's existing HIPAA Compliant and FedRamp certified 24x7 Operations Center.

Exhibit 4: Chronic Care Carlos Persona

"Chronic Care Carlos"
Statistics: 80% of healthcare costs are driven by chronic conditions; 50% of patients with chronic conditions do not adhere to a care plan.

Exhibit 5 illustrates the CareMap app journey using our "Chronic Care Carlos" use case (Exhibit 4). Carlos is interested in focusing on his heart health: heart rate monitoring, managing medications, eating healthy, and exercise. He registers with the CareMap App and creates a profile with his two EHRs (Primary Care and Cardiology Specialist) and his two PHRs (HR Monitor, Diet and Exercise tracker). With his CareMap account securely linked to all his health information, he is now able to leverage a central location, CareMap, which will guide his ability to discover and explore his medical information related to his cardiac care. Data from his EHRs and PHRs that were incompatible before using CareMap, are now mapped to a common ontology, aggregated, and put into context and translated to usable health information that he can now use to manage his disease. Leveraging the CareMap IFTTT Channel and recommended recipes, he sets up an HR monitoring service that provides email alerts to Caretakers when there is a problem detected by the HR monitor, allowing for quicker, possibly lifesaving treatment. Likewise, using the CareMap IFTTT Channel and recipes, Carlos links his prescribed meds to his calendar, SMS notification, and registers for recall notifications. Now he receives SMS alerts reminding him to take his Meds and alerting him if they are recalled. Furthermore, through the CareMap App and the FHIR standard, Carlos can share his meds, HR, diet, and exercise information with his Primary Care and Cardiac Specialist EHR systems enabling them to monitor and coordinate better care (he no longer has to be the go-between). Through this, personalized CareMap journey and simple set it and forget it IFTTT integrations, Chronic Care Carlos is engaged and empowered as his ultimate care coordinator.

Exhibit 5: Chronic Care Carlos Journey Map

PHASES	Discover	Explore	Share	Empower
DRIVERS	Connect & Aggregate Clinical Data; Fetch Other PGD Data Sources	Demonstrate Catalogue of Patient Data; Configure Personal Settings; Simple Contextualized Views	Interface to Allow Sharing of Information with Providers & Others	Patient Empowerment Features; Measuring & Tracking Interfaces
DOING	Connect to PGD Data; Create Profile; Integrate IFTTT Channels; Authenticate & Aggregate EHR Data; Browse and Validate Data	Add Configurable PGD & Health Data Channels; Learn From Full PHR	Identify Authorized Recipients; Selectively Share PHR with Family; Selectively Share PHR With Provider(s)	Be Empowered By Owning Health Data; Share Advice & Learn from Users Like You; Stay Ahead with Configured Notifications
THINKING & FEELING	• *I want to find the important health information I need– fast* • *It's hard to track all my Meds* • *Want to impress me? Enable me to take control of my heart health*	• *Make my life easier - connect the dots for me* • *What do I need to look at for my heart health?* • *I want to understand what Meds my providers are prescribing*	• *Make it easier for me to share my health information with my providers – why do I have to be the go between?* • *I hate having to remember all the meds doses and names*	• *What can this information do for me?* • *I want HR notifications* • *I want to have a schedule and alerts for taking my Meds.* • *I want to know when a Med I am taking is recalled.*
CareMap	• Carlos creates a CareMap account and adds his Cerner EHR, Primary Care EHR, and Cardiologist EHR credentials as well as his PHR (diet and exercise) and Open data • All his health data is aggregated and available to him	• Intuitive heart centric CareMap journey provides assisted access to a view of cardiac health • Carlos can explore his Meds for a better understanding of what he is taking and how they benefit him	• With a couple clicks, he is able to share this selected health information with all his providers and family. • Information is available through the CareMap User Interface, FHIR API, and IFTTT API	• Using CareMap's scheduling feature, he now has all his meds coordinated • Suggested IFTTT recipes provide ability to sync with online calendar and alert him whenever the FDA announces a drug recall

In the next section, we provide our estimated costs for our phased approach to develop and test CareMap, in partnership with MedStar and other industry sponsors.

FINANCIAL ESTIMATES

Booz Allen will deliver CareMap in a three-phased Release approach, as depicted in Exhibit 6. Release 1 begins with the concept & design phase as depicted in this high-level business sustainability plan. During Release 2, we will begin the development and testing of CareMap, consistent with Phase II of the ONC Challenge timeline. In Release 3, we will make improvements and enhancements to the concept & design of CareMap based on lessons learned and feedback provided by our customers and partners. Our approach provides active engagement and iterative feedback to ensure we continue to measure and learn during delivery, and minimize risk by leveraging our partnerships to develop the solution using industry best practices.

We believe in early and frequent delivery using a simple iterative digital design and build process. We have used this process to deliver Open Agile Software Development for our customers with continuous improvement while reducing project risk, increasing stakeholder engagement and enabling early realization of business benefits. Furthermore, we will leverage industry partners (e.g., Microsoft & Docker) to help accelerate innovation and "not go it alone" to reduce cost and risk to implement our transformational solution. Following our Open Agile Software Delivery process, we will build upon existing Booz Allen components to deliver a Minimum Viable Product (MVP) to test and field with real-world users during Phase 2 of the challenge. There are three key technology investments that make this solution highly feasible and with a high probability of success. 1) Our CareMap solution provides a clear and innovative ready to use user interface (see Mock-Ups/Wireframes). 2) Our ongoing EHR Health Information Technology (HIT) prototype integrated with FHIR provides key components for EHR interoperability (integration and health information aggregation). 3) Our DataLift big data platform provides the underlying engine and big data design patterns to power our hub solution. In collaboration with our industry partners, we will develop these components in three 4-week sprint releases to deliver a fully functional CareMap solution that delivers health information Discovery, Exploration, Sharing, and Empowerment.

Exhibit 6: CareMap Roadmap

	Release 1 'Aristotle' (3 months)	Release 2 'Herodotus' (3 months)	Release 3 'Hippocrates' (3 months)	...Future
Components	• FedRAMP Moderate HIPAA Compliant Infrastructure • Common Data Models • User Interface • Credential Manager • EHR 1 Data Connector	• EHR 2 & 3 Data Connector • Patient Generated Data Connector • Open Data Connector • Data Aggregator	• Context Engine • Translation Service • FHIR API • IFTTT API & Channel • Notifications & Alerts	• Analytics Engine • Genomics Data Integration • Biometrics Data Integration • Recommendation Engine • *Enhancements based on iterative requirements*
Capabilities	• CareMap MVP • CareMap registration • Login and interact with human-centric interface • Securely enter and store EHR credentials • Connect and visualize EHR 1 consumer data	• Connect to multiple EHRs • Connect to multiple PGDs • Connect to multiple Open Data Sources • Visual aggregated consumer data	• Meaningful use health information formatting • Information Permissions • Information Sharing (consumers, providers, devices) • User defined IFTTT recipes to perform custom interactions • Receive notifications & alerts	• Advance visualization and reports • Providers will receive treatment recommendations • Patients will receive recommendation for healthy living based similar health profiles
Engagement	• Kick Off and Issue Analysis • Market Research • Literature Review • Stakeholder Interviews • MedStar MI2 Partner Engagement	• UX/UI Design & Testing • Rapid prototyping • Communications planning and implementation • Immersive interviews • On-site Ethnography	• Channel Partner Outreach • Identify Change Champions • Support Stakeholder Working Groups • Social media/enterprise 2.0 • Marketing & Promotion	• Digital Listening • Trend Data & Real-time Dashboards • Evaluate Best Practices for Consumer Engagement • Loyalty/Engagement Benefits

Based on our experience building modern digital platforms for both commercial and federal customers we have projected the estimated cost, detailed in Exhibit 7, to complete the CareMap. Our cost model is based on a small agile team that will scale up as the product matures. Q1 produces the CareMap Open Challenge MVP that we will field and test with our partner MedStar. We have additional partners that have expressed interest although and we will continue to explore formal letters of intent with these partners in the coming weeks. Q2 is targeted as our Measure and Learn for the CareMap team to focus on lessons learned and feedback from our MedStar fielding. Moreover, we will continue to test our revenue models with perspective industry partners, existing clients and perspective healthcare providers. Based on the lessons learned and success of Q1 & Q2, we plan on ramping up and having full operational capability (FOC) for a beta launch. In Q4, we will continue to operationalize and add features to the CareMap ecosystem and build our partner model to add additional test sites to inform and mature our Open CareMap solution.

Exhibit 7 depicts the high-level cost by quarter minus the offset cost covered by industry partners and expected return on investment (ROI) from our targeted revenue models for the product.

Exhibit 7: CareMap Financial Model

Line Item	Q1 (MVP)	Q2 (IOC)	Q3 (FOC)	Q4	Totals
CareMap Build	$93,100	$93,100	$154,500	$213,900	$554,600
Engagement	$30,700	$33,700	$48,550	$65,400	$178,350

Industry Alliance Support	($27,500)	($27,500)	($27,500)	($27,500)	($110,000)
ROI	($15,000)	($50,000)	$0	($250,000)	($315,000)
Total Est. Cost	**$81,300**	**$49,300**	**$175,550**	**$1,800**	**$307,950**

Our ROI model includes Phase I & II awards of the ONC Challenges and future monetization targets from our product revenue models. Our expectation is to sign up five targeted Providers to engage with our solution in Q4. Post Q4 we will start to establish the following monetization models:

- Provider enablement: $ 50,000 subscription fee to sponsor CareMap product and get advanced integration. Depict benefits of improving patient engagement and compliance with new regulations. Assist providers to provide population health services (e.g., better manage care and cost for dual medical populations).
- Dataset collection/distribution and monetization: Enable the collection and distribution of health data for studies and research ($ 5,000 – $ 1,000,000). Leverage both aggregate data sets with consumer consent to share data for research community and for identification of candidates for clinical trials by targeted pharmaceutical partners.
- Advertisement: $ 5,000 for targeted advertisement on the CareMap App
- Kickstarter (or similar): Post FOC to scale the solution and provide advance features (~ $ 500,000)
- Freemium model for consumers: All but advanced features are free; power-users will have subscription ($20/yr.)

In the next section, we provide our high-level engagement plan outlining our approach to target our primary stakeholders and customer base for CareMap.

ENGAGEMENT PLAN

Stakeholder engagement is at the heart of the human-centered design and development process. Specifically, it allows us to be proactive and strategic in our interaction with key stakeholder groups using targeted communications, consultation, and participation. With our Stakeholder Engagement Strategy, we aim to accomplish the following:

- Improve the consistency and quality of consumer-provider interactions through our partnership with MedStar
- Respond strategically to consumer, provider, and MedStar partner needs
- Meet external stakeholder needs and add value to their operations
- Expand and improve public awareness and engagement in their health through use of CareMap and our MedStar partners

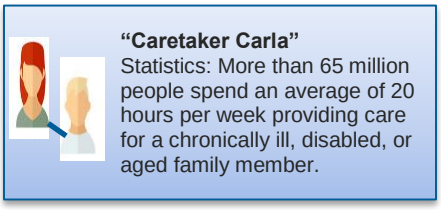
Our goal in embracing a strategic engagement is to understand internal and external stakeholder needs and concerns and proactively expand the CareMap user base and stakeholders. The Stakeholder Engagement Plan in Exhibit 9 provides activities throughout CareMap's development lifecycle.

Exhibit 8: Stakeholder Engagement Plan

Stakeholder Analysis	Immersive Research	Strategic Engagement	Championing Change
• Build on knowns and unknowns of stakeholders to refine key issue analysis • Kick off • Market research • Literature review • Stakeholder interviews • MedStar MI2 partner engagement We are HERE	• UX/UI design • Rapid prototyping • Pilot testing • Communications planning and implementation • Immersive interviews • On-site ethnography	• Channel partner outreach • Identify change champions • Support stakeholder working groups • Social media/enterprise 2.0 • Marketing & promotion	• Digital listening • Trend data & real-time dashboards • Evaluate best practices for consumer engagement • Loyalty/engagement Benefits

Where We Are

Exhibit 9: Caretaker Carla Persona



Phase I of the ONC Challenge has been the start of both our roadmap and stakeholder engagement- creating initial relationships with our target consumer base and strategic provider and health IT partnerships. Over the past two months, our team has performed rigorous analysis of the key issues preventing consumers from adequately accessing their health data, scanned the market and reviewed the literature for current thought leadership in EHR and PHR trends, health data integration and security. We have looked at the role regulatory stakeholder's play in the shift towards patient-centered and value-based care models. Finally, we have spoken directly with our key stakeholders, from our MedStar MI2 emergency room and innovation physicians, HIPAA compliance and PHI/PII regulatory subject matter experts, and most importantly: our target customer base. We have engaged consumers with chronic conditions, caregivers, and millennials to co-create a better way to discover, explore, and securely share the health information they need.

Consumers (Primary Consumer Base)

The mismatch between user needs and application features is often what leads development efforts to fall short of their potential. Directly soliciting the needs of an application's user-base can be difficult, and, when done as a secondary activity, results in inaccurate representation of true needs. Our partnership with MedStar Health, via the MedStar Institute for Innovation (MI2), opens up an invaluable opportunity to connect directly with our target consumer base. We will leverage MedStar Health, through MI2, to identify specific pilot testing sites and/or specific consumers, providers and other healthcare practitioners as pilot users of the solution developed as part of this challenge. Next, our team will perform research using ethnographic data, community surveys, regular user interviews, and observational feedback onsite with our MedStar partner, to develop a comprehensive understanding of the needs of our consumer base, including individuals with chronic conditions and those serving as Caretakers to continue improving our CareMap app personalization.

Provider-Partner Development Strategy

Providers are key players in the success of any consumer-facing health application. Developing a comprehensive application requires diligent consideration of the value-add to the provider and greater healthcare system. To this end, we have involved leaders at MedStar

in our ideation process from the start, and will continue to involve them throughout the development, implementation, and evaluation process.

The MACRA act introduced new Merit-based Incentive Payment System to link fee-for-service payments to quality and value. The Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) Survey is the first national, standardized, publicly reported survey of consumers' perspectives of hospital care, and allows valid comparisons to be made across hospitals. The Consumer Protection and Affordable Care Act (PPACA) specifically included HCAHPS performance in the calculation of the value-based incentive payment in the Hospital Value-Based Purchasing program. As the achievement threshold rises, hospitals must continuously outperform their latest accomplishments to remain competitive.

Our consumer solution aims to empower consumers, lower barriers to quality care, and raise medical literacy levels, all of which may improve HCAHP/MIPS outcomes for provider settings. By combining interoperability, secure open-source, and consumer-centered design, we are not just building something new, but providing consumers with a tool that can ultimately impact their perception of quality and value, unlocking the hidden value of consumer apps, consumer portals, and non-clinical health data.

Health care systems have acknowledged the importance in combining consumer engagement with social and technological interventions designed to increase activation and promote positive health behavior. Such interventions may positively impact hospital readmission rates, another key factor in reimbursement and financial viability.

Technical & Clinical Subject Matter Experts

Guiding an application from development to production is a process riddled with complexity and unforeseeable considerations. Developers create applications in environments with ideal conditions. Stress and smoke testing can point out potential problems in scaling to production, however these tests are often developed by the same team that developed the beta application, creating an inherent bias for success. Testing in a production with a controlled, limited release will allow our team to ensure success in reality. We will source bug reports and issues both internally and at the requests of consumers.

As members from MedStar MI2's National Center for Human Factors in Healthcare have already worked closely with the ONC on health IT usability, safety issues, and general policy matters, we will also leverage these close connections for the benefit of our engagement plan. These connections will facilitate improved outreach with many key health IT stakeholders including consumer advocacy groups, the Electronic Health Record Association, American Medical Association, and several EHR vendors that are representative of the diverse marketplace, including Cerner (see Provider Partnerships letter).

Strategic Communication and Engagement

In parallel with our engagement plan, we will employ strategic communications to develop and deliver key messages and facilitate understanding with our stakeholders. Our communications functional experts and domain/industry experts will produce targeted and effective strategic communications in support of CareMap and its partners-in-mission. Our approach to strategic communications blends multiple tools and tactics to build understanding, facilitate the buy-in process, and inspire ownership and action. Through stakeholder analysis, personalization, partnership strategies, and stakeholder intelligence, we will continue to develop and maintain the consumer-provider-partner relationships that support these goals:

- **Stakeholder analysis:** Starting with HCD-inspired stakeholder analysis, we identify key internal and external stakeholders. We understand that stakeholders, like customers, are unique and require consistent, yet targeted, communications and service. Our journey maps analyze their characteristics, needs, feelings, journey, and key pain points, and ideal impacts on each stakeholder group.

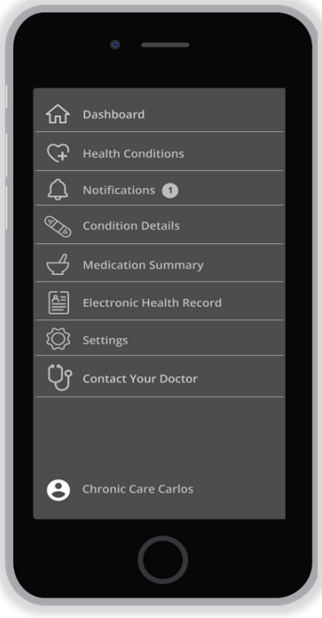
- **Consumer-Provider-Partner Personalization:** Our approach is further characterized by segmenting and prioritizing our target audiences. To do so, we assess organizational goals in light of stakeholders' information needs so messaging, partnering, and engagement strategies are consistent yet tailored.

- **Partnering Strategies:** Booz Allen knows organizations must partner with various stakeholders to address organizational or program goals and define the need for change. We will work with our partners to design a comprehensive strategy that focuses on networking and partnerships; incorporates best practices; and considers organizational history, operating environment, and culture.

MOCK-UPS/WIREFRAMES

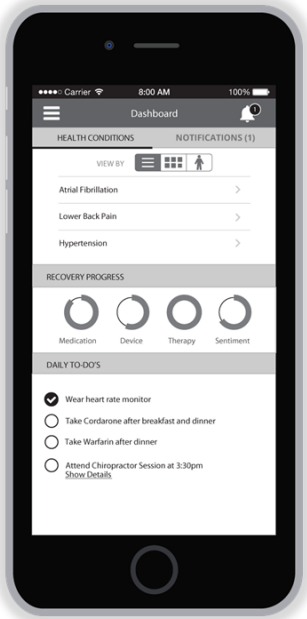
CareMap mock-ups presented here displays how it helps enrich the experience of Chronic Care Carlos. It helps Carols address the challenges of interoperability between EHR systems, enabling him to have a holistic and complete view of his data. Chronic Care Carlos can (1) **navigate** a single, user-friendly dashboard, (2) **discover** his health and wellness app information aggregated with provider systems, (3) **explore** and understand his health and wellness trends, and (4) securely **share** and integrate his data. The open-source app then 5) **empowers** Chronic Care Carlos to take an active role in managing his healthcare. Our mock-ups/wireframes provide a sense of the look, feel and interactions of the app. A CareMap interactive view can be found by visiting link provided: http://wideo.co/en/view/10600411438874478505-caremap-final.

1 Navigation



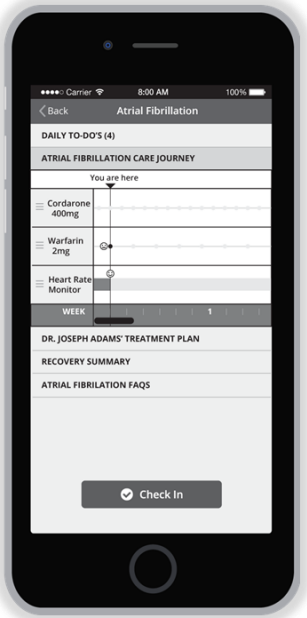
CareMap enables patients to move between core features of the app and personalized settings.

2 Dashboard



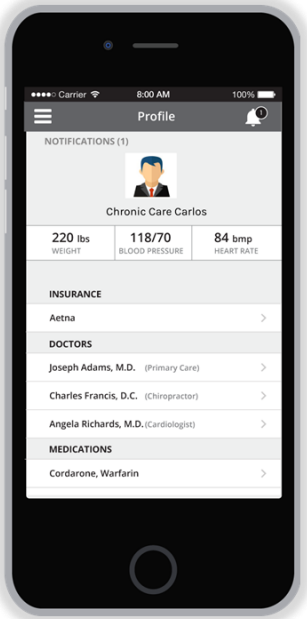
Discover: CareMap enables Chronic Care Carlos to access all of his health information from one convenient place providing an integrated, holistic view. The dashboard allows for a quick glance at most pertinent information, including his recovery progress, daily to-do's, and notifications.

3 Report Progress



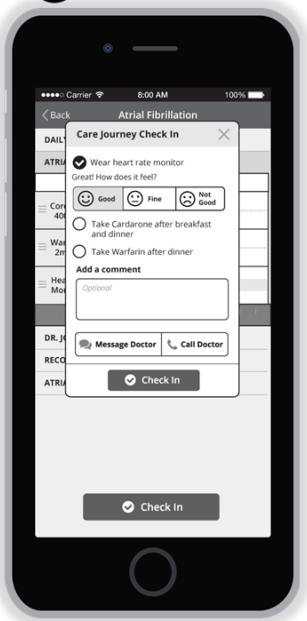
Explore: The data gathered from Carlos' health data sources and app activity populate together on Carlo's Care Journey. This allows him to understand and explore changes in his health over time, notice patterns between his lifestyle and his health, and personalize the app's settings to fit his needs.

4 Profile



Share: By registering his multiple EHRs and PHRs with CareMap and creating a view that syncs medications, vitals and care providers together, Carlos can contact and securely share this information between his caregivers through their existing EHRs. He no longer has to be the go-between.

5 Care Journey



Empower: Chronic Care Carlos can track and measure his health activity, treatment progress, and how he's feeling. This empowers Carlos to better self-care, improve his health literacy, and take a more active role in understanding and achieving his goals.

PERSONAS/USE CASES

"Caretaker Carol"

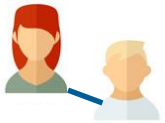
Oversees care for: Developmentally disabled child/elderly parent with medical complexities who cannot make healthcare decisions for themselves; constantly on the go, juggling all kinds of life obligations; ease of input and collection and communication of data across communities is valued.
Would use an app for: Communication across communities – family members, school, hired caretakers; storing provider contact info; medical history forms; tracking medicine brand names/dosages; setting configurable reminders and automated actions with IFTTT.
Needs: Synchronize with EHRs from all primary and specialty care visits, pharmacy data platforms, contact lists in email, IFTTT integration.

"Millennial Matt"

Guilty of: Utilizing wearables to map runs and track steps; tracking calories, nutrition (macros), and heart rate; tracking symptoms in "Notes" section on iPhone and self-diagnosing via WebMD; missing key annual appointment dates.
Interested in: Preventative care; desire to know how to prevent symptoms from re-occurring. Lack of time to see a doctor; would rather send symptoms via e-mail and get a diagnosis without an in-person visit; time and money saved.

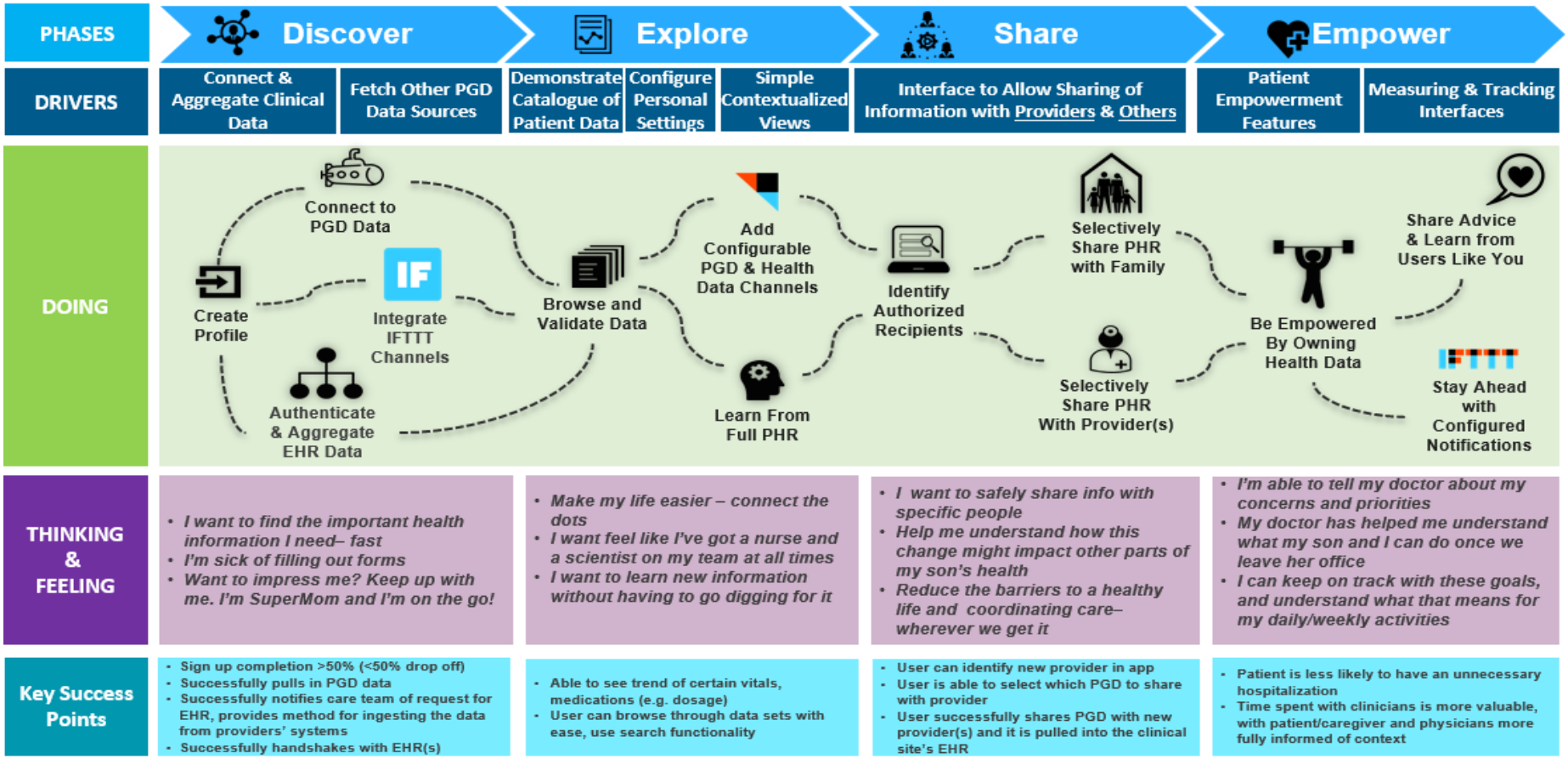
"Chronic Care Carlos"

Mantra: Doing the best he can; he has been through the health system as one of the highest frequency consumers of in-person and on premise care.
Interested in: Categorically relevant data, including medical history timeline information (specialist care distinct from primary care); being able to contact multiple specialists, and have them communicate with one another; tracking long-term health data, multiple treatment plans, and risk; schedule appointments and/or receive reminders for follow-ups.

USE CASE 1: CARETAKER CAROL	USE CASE 2: MILLENIAL MATT	USE CASE 3: CHRONIC CARE CARLOS
 **Caretaker Carol's** two boys, Chris and Flynn, were diagnosed with Cystic Fibrosis in infancy. Administering 15 medications 3x/day is exhausting, and Carol worries she's not keeping up. Luckily, she subscribes to CareMap, which allows her to track her boys' medications, and how they are feeling. She can easily share this information with the boys' Gastroenterologists and Respiratory Therapists– even the dieticians and social workers if needed. In addition, if the FDA recalls one of the supplements her sons take, that they have in the past – she will be notified immediately via SMS text. Lastly, comparing her family's 23andme results with ClinicalTrial.gov announcements, breaking news just got relevant.	 **Millennial Matt** has been a bit of a nomad– moving across the country for college, and then back again for a new job. He knows he had a primary care physician growing up. But with his knee acting up after this year's Tough Mudder, where should he go? Luckily, his records are all in one place. When he is referred to a physical therapist, he tracks his PT religiously, populating it alongside his Fitbit data all in one spreadsheet on his Google Drive and key updates are also tracked in his EHR for his physical therapist to view. Now if he could just use Venmo for his copay.	 **Chronic Care Carlos** has an internal cardiac defibrillator. This small computer wirelessly transmits medical data to a monitor on his bedside every evening while he sleeps, including his heart rate and electrical irregularities in the potentially life-saving devices. Using "Home + Heart", if Carlos' wifi goes out for any reason, he receives an SMS text message alerting him of the loss in connectivity. A notification is sent to his cardiologist and primary care physician if the issues continue. Easily understood trends from his MyCareLink Smart Monitor are logged in his record via FHIR compliant template.

CAREMAP JOURNEYMAP

We applied our service design and human centered design approach to build CareMap. This journey map provides a holistic experience for personas identified in our personas/use cases section and their interaction with our CareMap solution.



PROVIDER PARTNERSHIP

MedStar Letter of Support - BAH ONC