OpenHIM:
PSI’s Platform for Consumer Digital Health
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Summary
Since 2022, PSI has been scaling up the use of Open Health Information Mediator (OpenHIM) as the organization's middleware solution to connect and engage with consumers across digital touchpoints during their healthcare journeys as well as route client information across data storage solutions. While many implementers of OpenHIM have primarily used the tool for health management information systems integration, PSI sees strong potential for the open-source global good as a foundational platform for omnichannel consumer digital health engagement.

Background
Over the next decade, PSI aims to reimagine healthcare worldwide by placing our consumer at the center and bringing quality care closer to them. We live in a rapidly changing world, and advancements in mobile technology access coupled with increased connectivity in low and middle-income countries (LMICs) presents an unprecedented opportunity to make healthcare more accessible by changing the way we engage with consumers.

Consumers in LMICs often have challenges accessing reliable health information in the digital channels they already use, including knowing where they can access high-quality health products and services. Further, health systems and providers struggle to continually engage with consumers around their health at scale, leading to irregular healthcare uptake. Health management information systems also have significant challenges aggregating data from consumer touchpoints with the health system in different digital channels and aligning this data with unique client profiles to facilitate continuity of care.

Across PSI’s global network, PSI takes advantage of mobile phones as an entry point to bring consumers a click away from curated, high-quality health information and advanced self-care tools in digital
channels, such as WhatsApp, Instagram, Facebook, SMS/USSD, web, and voice. PSI also supports community health workers and providers using digital tools and systems to register and manage clients for health service delivery, including capabilities to enroll consumers to receive health reminders and notifications in various digital channels to encourage continuity of care. From 2019-2022, PSI used a custom, internally developed middleware solution to connect and engage with consumers across all these digital touchpoints as well as route and aggregate client information across data storage solutions such as DHIS2 and MongoDB. In 2019, PSI evaluated several proprietary and open-source API orchestration products before developing an internal solution. At the time, PSI was unable to find an open-source product that was mature enough to meet needs, and most proprietary solutions were cost-prohibitive to scale to PSI’s global network.

Transitioning to OpenHIM

Over a four-year period, PSI developed and implemented its own middleware solution and successfully scaled its adoption to support digital consumer health solutions in over 20 countries across PSI’s global network. In 2022, PSI partnered with Vital Wave to re-evaluate the solution against others in the market to further prioritize longer-term sustainability, transferability, and alignment with global public goods. While PSI’s own solution had achieved global scale internally with high performance and relatively lower costs than most proprietary products, it lacked critical transferability to PSI’s partners and governments or a community beyond PSI teams to support the ongoing development and continued growth of the solution.

PSI and Vital Wave’s 2022 analysis reviewed the current state of proprietary and open-source API middleware solutions, such as Apache Camel and MuleSoft, and ruled them out for adoption due to high initial investment requirements and ongoing costs. Open Health Information Mediator (OpenHIM), an open-source interoperability solution developed and managed by the Open Health Information Exchange (OpenHIE) community, emerged as a clearly viable alternative to PSI’s internal solution due to its existing functionality, technical architecture, the potential for transferability, and engaged community supporting its ongoing development as an open-source global good. The architecture of OpenHIM also makes it highly feasible to repackage many of the microservices and API tools that PSI had developed for our own platform, including message scheduling and queuing, unique referral generation, and gamification for consumer engagement and retention as OpenHIM mediators to contribute to the community. As of July 2022, PSI has adopted OpenHIM for new digital health implementations and will transition existing implementations to OpenHIM where feasible.

PSI Use Cases

PSI’s first use case for OpenHIM was deployed in Vietnam in September 2022 in collaboration with Babylon Health, launching an AI-powered symptom checker in Bac Ninh province and the Hanoi Capital Region. Consumers can use the Babylon app free of charge via the privacy and convenience of their mobile devices to access self-screening tools and referrals to nearby health facilities offering relevant services. In this implementation, OpenHIM acts as the intermediate security layer for PSI’s various FHIR servers, as well as facilitates the integration of Matomo to generate detailed usage analytics.

After demonstrating this successful proof of concept, PSI is now extending the implementation of OpenHIM further in 2023:
In collaboration with the Kenya Ministry of Health, PSI is launching a national health WhatsApp chatbot in Q2 2023 to provide consumers with on-demand information on health topics such as COVID-19 and where to access vaccination sites. OpenHIM’s architecture as an open-source, global good allows PSI to support the Kenya MoH to install the solution on-premise within the government’s data centers for ownership and sustainability. OpenHIM will simultaneously orchestrate integration with the chatbot conversation manager, RapidPro, connected with WhatsApp, host microservices to allow for scheduling of notifications for users as they interact with the tool, as well as register clients and capture data from their interactions in an MOH-instance of HAPI FHIR that PSI is supporting the Kenya MoH to implement.

In collaboration with the eSwatini Ministry of Health, PSI will implement a FHIR native application for community health workers to register and capture HIV and sexual and reproductive health services provided to consumers. OpenHIM will be implemented in this project to handle the orchestration of ongoing reminders and notifications to consumers to facilitate continuity of care, and it is expected to go live by Q3 2023.

Over the course of 2023-24, PSI’s Social Business Unit will launch Viya, a digital platform supporting women’s sexual health and wellness journeys in over fifteen countries globally. OpenHIM will power the platform’s omnichannel communications objectives to connect with women in the digital channels they already use, including WhatsApp, Facebook, Instagram, web, and SMS, schedule relevant reminders and notifications, and support gamification as a microservice for client retention and ongoing engagement. OpenHIM will also manage the registration, synthesis, and anonymization of consumer data from their engagement in different channels into unique client profiles in HAPI FHIR data storage.

What’s next for PSI
PSI plans to increase our engagement with the OpenHIM community in 2023, including contributing new mediators to the platform focused on serving consumer engagement use cases such as message scheduling/queuing, electronic referrals, client data anonymization (“forget me”), and gamification; services the platform currently lacks in its primary focus around HMIS data systems integration. PSI will also be seeking further investment in the ongoing developments of mediators for consumer-facing use cases within OpenHIM coupled with strong integration with other open-source global goods and standards such as FHIR, as well platforms such as the Android FHIR SDK for consumers to access and more easily manage their own care and health data.