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SETTING THE WORLD ON FHIR®

Published by HL7® International, a not-for-profit organization, Fast Healthcare Interoperability Resources (FHIR®) is a standard for exchanging healthcare information electronically

A series of case studies illuminating how HIT professionals are using HL7®FHIR® to improve and advance modern healthcare

CASE STUDY

MAYJUUN

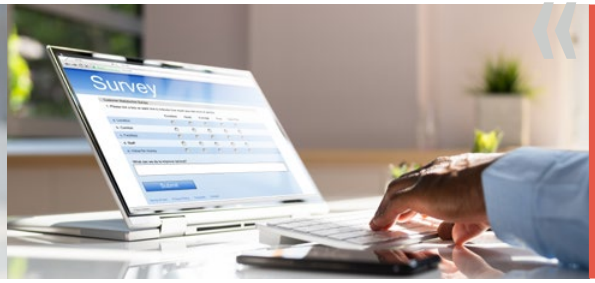
MayJuun is a physician-led software development company that was founded by practicing clinicians. Its mission is to create digital solutions that advance health and well-being, where interactions mirror workflow. MayJuun takes pride in creating highly customizable, interoperable, user-friendly applications that scale.

Goal

To allow non-technical users to develop, distribute, and analyze healthcare forms, surveys, and questionnaires at scale, in any language desired

Opportunity

To develop an application using HL7®FHIR® so users can design their own questionnaires from a simple spreadsheet



To help remove barriers, we created a process to streamline the creation of almost any type of question, from any type of questionnaire, in any language, which can be almost instantly structured using HL7 FHIR.

— Grey Faulkenberry, MD, MPH, CTO, MayJuun LLC, Children's Hospital of Philadelphia

Project

In 2020, MayJuun and Zane Networks, a health technology consulting company, were awarded a contract from the New Jersey Integrated Care for Kids program (NJ-InCK) to build an online needs assessment tool solution to identify risk factors for physical and behavioral health conditions among program participants. This need for surveys and related forms of data collection is ubiquitous across the healthcare industry, but many users lack both the technical expertise to develop custom questionnaires and a streamlined process for distributing and analyzing the surveys. To help simplify these processes, MayJuun developed an HL7 FHIR suite of microservices known as Cuestionario ("Questionnaire" in Spanish).

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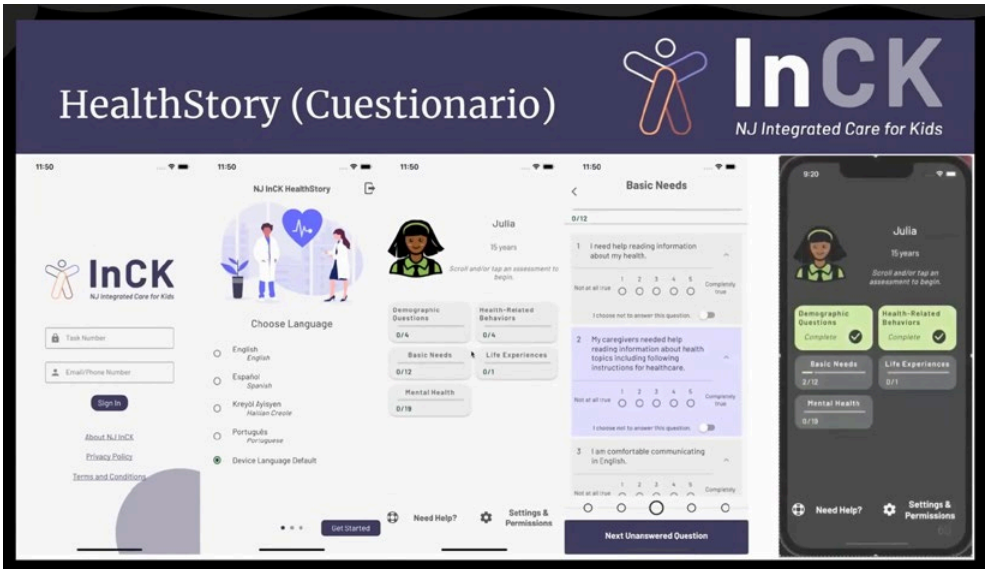


The first step was to lower the barrier to entry and allow a much broader audience to create and edit questionnaires to meet their needs. Rather than generate or modify FHIR JSON files manually, it became apparent that a different approach was needed in order to manage the scale required by NJ-InCK. Thus, a "Cuestionario Generator" was developed internally to better manage the 600+ resources needed to create surveys in English, Spanish, Portuguese, and Haitian Creole. To accomplish this, a spreadsheet was designed that contained the common and customizable aspects in a FHIR Questionnaire. This allows anyone who can use a spreadsheet to design, create, and edit questionnaires. Information from these spreadsheets is then converted into FHIR Questionnaires that include embedded language translations. This questionnaire (or in the case of NJ-InCK, the 40 questionnaires distributed over 17 age groups) can then be saved and stored as flat files, made available online, or stored on any server that supports FHIR Questionnaire resources.

The next step was to select and assign surveys. The tool Recetario ("Recipe Book" in Spanish) can be integrated into an electronic health record (EHR) as a SMART-on-FHIR application or it can be run independently. Recetario allows a clinician to select from multiple surveys and questionnaires and assign them to an individual. They are also able to check on progress or send reminders when needed.

Once assigned, the individual receives an email or text alerting them that they have been requested to complete the questionnaires. They click on a link via email or text that includes a one-time password, which quickly logs them into the Cuestionario "white label" application. This is called a "white label" application because it can be themed and branded in a manner that matches the needs of the client. For example, NJ-InCK's implementation is branded HealthStory, and CT-InCK's implementation is branded HealthJourney. Upon completion and submission of the surveys that are assigned to them, custom scoring and subscores may be created based on answer choices, and new conditions or diagnoses may also be created. Examples include social determinants of health data such as food or housing insecurity, in addition to more traditional medical diagnoses like diabetes mellitus (such as, if a questionnaire asks a patient to list their past medical history).

When a clinician logs back into Recetario, they are able to review the results of the surveys, overall scores and subscores, any new conditions or health concerns, and individual answers to specific questions.

As FHIR-based applications, the Cuestionario suite of tools allows data to be extracted and ingested in an efficient, flexible manner for information collection, care management, and referrals. Using SMART-on-FHIR authentication, they can be integrated into existing EHRs, but they can also be run as stand-alone applications for organizations that may not provide direct healthcare. They are built as "white label" applications to appear more seamless and follow a brand or theme that matches the needs of existing client applications and technologies. Finally, these applications are created in Flutter, which is Google's open-source UI toolkit and is the third largest repository on GitHub. Over 700,000 apps have been developed in Flutter since its initial release in December 2018. The assessment tool is the launching point for creating the cases that will be managed under the InCK model.

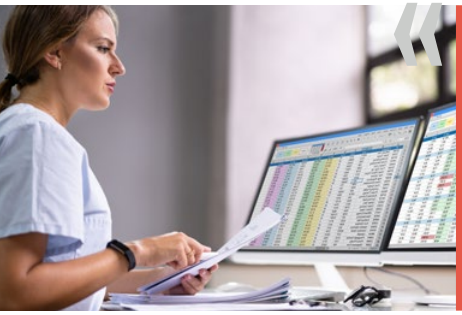
Progress

Using these tools, MayJuun was successfully able to manage over 40 distinct questionnaires in four different languages across 17 age groups. This culminated in over 600 distinct FHIR® Resources for each of the InCK projects in both New Jersey and Connecticut.

The project was successful in allowing non-technical users to edit spreadsheets, add questions, and include more languages that were generated, distributed, analyzed, and scored using the Cuestionario suite of apps. The end result was a "white label" application with different content, themes, and branding for each InCK program, that allowed for dynamic display of custom questionnaires.

Moving forward, the focus will be:

1. to broaden FHIR extensions and to expand to more systems.
2. to ensure the user experience is as smooth and streamlined as possible.
3. to allow clinicians and social care providers to more easily collect information that will further advance the opportunities of individuals who need health and social care services.



We are very excited to employ this new flexible approach to technology. We expect to revolutionize the process of engaging children, youth and families in identifying their strengths and areas of concern so that an interdisciplinary team can support that child and family in an informed and sensitive manner.

— Kristine McCoy, MD, MPH, New Jersey Integrated Care for Kids

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