# A Technologist's View of Medication Reconciliation Hackathon 2019
Liz Turi | April 29th 2019

Working where I do, and with my background, I get exposed to a lot of really cool events. Most of them I pass up, because they're often times too far or too expensive. So when one of my coworkers, who is actively engaged with HIMSS New England, forwarded an invitation to a free event at a drivable distance away, I jumped at the chance. The event, MedRecHackathon2019 was to be held at UCONN Health, and was a Hackathon centered around coming up with innovative ideas and solutions to the problems associated with medication reconciliation - where we might also utilize FHIR[1] in our work.

At first, this seemed like an academic exercise - somewhere where I could put on my student hat and treat it as such. But as we got closer to the event, after some conversations around the office, and research about the event, this seemed like a much better opportunity to work with industry peers in a professional context, representing myself for my career and subject matter expertise. After all, most of my HIT project work for the past 9 years has centered around HIEs, Interoperability, and Integration efforts. My Masters of Engineering program in Healthcare Systems Engineering takes that experience and adds quantitative analysis skills, and fills in gaps that, in my experience, many HIT professionals don't fully appreciate. For example, for some who come to HIT through hospital systems, there may be gaps in understanding around HIE principles, or the impact of ACOs on a network, or Interoperability. For those who come to HIT from an HIE context, they may not be as familiar with some of the nuances of hospital billing systems and, as an example, why and how they can impact patient care as a system may integrate ambulatory and inpatient systems within the same hospital system for a more streamlined workflow. Context is key and understanding the entire system helps those of us working in HIT understand which key to use. Just understanding that there is a difference, sometimes, is the deciding factor between landing a position or project and not doing so.

The event itself was two days long. The first day centered around context setting, while the second day focused on producing and presenting. Attendees ranged from student to professor, clinician to business administrator, engineer to provider. We had more clinical and business representatives by far than we did technical representatives, and of the technical representatives, there were only a small handful of us that had any kind of development background. The rest of the technical track folks were in more technical, but business process-oriented roles, such as business and technical analysts.

The first day was kicked off with by discussing the state of the state of HIT in Connecticut, why this hackathon was important (as it would feed into the overall health strategy process for the state and specifically feed into the HIE development process), what the issues surrounding medication reconciliation are at a very high level, and then again at a high level, provide an overview of FHIR. The second part of the first day, we were split into groups. The technical track folks got a deeper dive into FHIR, and an introduction to the FHIR-PITs setup by Velatura that we would then have access to during the Hackathon. The clinical and business folks were broken up into four workgroups centered around different context settings having to do with medication reconciliation and would start to generate ideas for what they wanted to accomplish at this event. The four work groups centered around inpatient care, home health care, patient/caregiver, and ambulatory care. Once the workgroups developed their ideas, they were

asked to join the technical track attendees, and pitch their ideas so that technical folks could be matched up with a clinical/business group. As someone with a strong development background, I was one of the tech track folks, and so, the only other woman developer attending the event and I teamed up together to work with the ambulatory care group.

The second day was likewise broken into two parts - the first part was all about developing what we worked on the day before so that we could show some measure of what the vision for the group was. With large groups consisting of mostly non-technical members, this is where the fundamental work to identify where and what the problems associated with medication reconciliation was happening. What we ended up developing as a technical solution was something of icing on the cake, but the important part of what we ended up with was being done in discussing how our ideas worked, how they were innovative, how they changed the traditional model of medication reconciliation, how they solved problems faced by different groups of stakeholders. The second part was about presenting our vision to the overall group and understanding where those our four subgroups (ambulatory, home health, patient advocate/caregiver, and inpatient) overlapped and intersected.

All four approaches had meaning across stakeholder groups - each had their variation and nuances. One looked at a meaningful dashboard for ED providers that facilitated getting accurate, high confidence information about the meds a patient is on as they walk in the door so that appropriate treatment can be provided in real time. Another group looked at ways in which home health care personnel can accurately track medications and supplements in the home in a way that doesn't take 45 minutes minimum to complete. Another group looked at how patients and caregivers can communicate with providers about what they are taking in a meaningful way. Our group looked at a model of real time, cloud based, centralized, granular medication validation to increase confidence across a wide number of specialties, primary care providers, pharmacies, and patients. In all cases, we could see bits and pieces of where what we were doing could impact other groups. We could see UIs that had the potential to work across all groups, and we could see how the artificial boundaries we created really were fairly blurry lines - and that likely the best approach is probably to look at the output from each group and develop to come up with a service offering with associated workflows that is meaningful, timely, and provides a high level of confidence in the information presented.

In the end, while we utilized FHIR, this specific technology framework was just a means to an end - a common framework that we could all use to show current capabilities and limitations of current (DSTU3) FHIR resources, where gaps might be, and how we might need to work around them if a med rec system were to be implemented today. For example, MedicationStatement and MedicationRequest both had distinct information stored in each FHIR-PIT - and each had different types of information: indicator is available with MedicationRequest (intended for use when a provider orders a particular medication) but is not available in MedicationStatement (intended for use when a patient/caregiver reports use of a medication or if it is sourced from another EHR/System). Our group found this discrepancy particularly challenging because one of the things we wanted to do was to be able to group and sort medications by Indicator. Our solution to this quandry was to make data available via FHIR resource call, but that ultimately,

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we would need our own database to store metadata not available from in individual source systems and FHIR resources. It was also helpful to show cross-domain how easy it is to access discrete data via FHIR so that we're only using the data we need to do what we're trying to achieve (as opposed to, say, extracting medications from a C-CDA).

This was a good exercise and helped to really outline the types of impacts to systems that come out of working through technical aspects of a problem with providers, but the more important impact was the cross-domain, cross-expertise levels of conversation around medication reconciliation. This was the aspect that showed where each voice helped to identify where future work needs to be done - whether that's in compliance, in regulatory work, in consent models, in clinical workflow, in understanding the patient voice, in helping to ease the impact to providers, and in reducing the risk of provider burnout.

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[1] FHIR stands for Fast Healthcare Interoperability Resources and is an [HL7] specification for interoperability using [RESTful APIs].