ProTrackS: CTSA Hub Project Tracking System
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Introduction
The National Center for Advancing Translational Science, National Institutes of Health has funded over 50 Clinical and Translational Science Awards (CTSA) Program Hubs to accelerate the development, demonstration and dissemination of new health interventions by the advancement of translational science processes. In order to support these research activities each hub needs to match, prioritize and allocate infrastructure, resources and services across multiple projects initiated by individual investigators, maintain a trajectory of services utilized within projects, and record service utilization events for supporting billing, evaluation and meta-research. In addition, researchers, service providers and CTSA Hub administration require information about availability of resources, status of projects, recharge costs and other critical information. Capturing, consuming and disseminating these information has three major challenges: 1) Information collection affecting normal workflows of investigators and CTSA staff; 2) Disparate nature of data from multiple institutional sources; and 3) Shareability of information within and across CTSA Hubs.

Methods, Results, Discussion
We inventoried various services (including costs), cores, investigators and projects utilizing translation research artifacts. We then characterized existing workflows, processes and communication between these actors to design the architecture of the Project Tracking System (ProTrackS). Due to its familiarity with investigators, we adopted REDCap for its user facing survey and dashboarding functionalities of ProTrackS, and developed a Spring Framework based data integration and orchestration layer for collecting and dissemination various services related data streams (Figure 1). We followed a participatory model in its design in order to provide a single point of access to the same data and support its main stakeholders: investigators and services providers/CTSA hub staff. Investigators access the system via a REDCap survey link to initiate new projects and service requests, and use the REDCap’s Survey Queue feature to initiate subsequent requests for existing projects. Service provider and Hub staff are notified about incoming requests via a Notification module. Both investigators and service providers are provided with up-to-date information of various project activities via custom REDCap Dashboards. A Project Budget Calculator module developed at the University of Iowa interfaces with ProTrackS and provides users with costs and billing information for various services. Future versions of ProTrackS will include a core integration and orchestration functionality with added abilities to configure to specific needs at each Hub. ProTrackS provides a virtual mall for investigators to shop for translational research services, and Hubs a FAIR ecosystem for streamlined and seamless management services.

Statement of the Degree of Deployment & Demonstration
ProTrackS has been implemented and utilized by the Center for Clinical and Translational Science, University of Utah since July 2019, and has so far supported 424 projects initiated by 313 investigators with services provided by all cores (Figure 1) including 313 informatics services. In this demonstration, we discuss the architecture of ProTrackS, its implementation and translational research management impact at Utah, and its generalizability to other institutions.