Bamboo Health

North Carolina Department of Health and Human Services (NC DHHS) Behavioral Health Statewide Central Availability Navigator (BHSCAN)

Automated Bed Availability Pilot Phase 1

October 30, 2023

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Introduction

Pilot Purpose

A pilot is an initial small-scale implementation that is used to prove the viability of a project idea, involving a limited release of a particular product, scheme, or service in anticipation of a wider release if the pilot project is successful. The purpose of a pilot is to test whether the new concept is worth pursuing and assess existing implementation strategies. A pilot gives project teams the opportunity to gather feedback from users, make changes, and perfect an idea before moving to a larger scale release. The benefits of a pilot include:

- Ability to assess the popularity of the idea.
- Test the process.
- Make improvements before launch.
- Set realistic scope and timelines.

Engagement in a pilot project does not always result in a larger scale release or guarantee an outcome of a generally available product.

Pilot Goal

What Problem Were We Trying to Solve?

Hospitals are overcrowded in their Emergency Department and Inpatient segments. There is a need to broadly surface behavioral health unit available bed capacity in a timely and automated fashion to facilitate and expedite placement. Presently, available bed capacity is manually entered which reduces accuracy and is time consuming for providers.

Desired Outcome

An Application Programming Interface (API)-driven, shared service or tool that reflects the number of operational beds available at a behavioral health facility.

Assumptions

1. Users want to see the number of available beds.
2. Users want to see data that is as near to real-time as possible.
    a. The extent to which data needs to be real-time depends on the use case. For example, hourly is sufficient for the behavioral health use case given data is currently entered manually once per day.
3. Users want to see the contact information of the selected facility.
4. Users need a measure of the accuracy of available bed count.

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Pilot Overview

Pilot Project with Methodist Fremont

Hypothesis

Leveraging admission, discharge, and transfer (ADTs) feeds available to Bamboo Health, we can understand the beds that are available within our network by incrementing and decrementing beds as the related events are shared with us. Therefore, we can illustrate bed counts as beds become available at a facility.

Timeline

- February 2022
  - Project team assembled and discussions began.
- March 2022
  - Received direction from Bamboo Health legal, Bamboo Health product and data science teams defined problem statement, hypothesis, and approach.
- April 2022
  - Met with Methodist Freemont to discuss the overall goal and expected participation/effort, buy-in received.
  - Continued meetings with Methodist Fremont to confirm capacity, define patient criteria, identify trigger for available bed, bed availability update cadence, and define avenues for incoming referrals.
  - Focused on data migration, data storage, review of data model, and research of discrepancies and anomalies.
- May 2022
  - Continued discussions with Methodist Fremont to understand capacity and how to modify data model to accommodate room denominator (operational bed) changes and create a real-time data model.
- July 2022
  - Continued research into available bed usage and changes to bed purpose. I.e., how to determine when the purpose of a bed changes to a purpose other than behavioral health.
  - Performed additional interviews and research with both referring and receiving network providers.
- August 2022
  - Methodist Fremont fields are accessible and the team moved to the next phase of the pilot, which focused on identifying changes to operational beds and how to mitigate against.
  - Methodist Fremont agreed to provide manual context via email for regarding beds that are functional vs. closed for ~3 weeks.
- September 2022
  - Began discussions for how to process inputs received from Methodist Fremont and what the Minimum Viable Product (MVP) is for the pilot.

    - Met with NC DHHS to discuss interest in Automated Bed Availability and potentially select additional NC facilities to include in the pilot.
    - Reviewed Methodist Fremont data versus data being collected via ADT and determined that staffing and patient acuity are too variable for quantification of available bed count to occur and be determined after receipt by Bamboo Health. Two options surfaced:
        - ADT: Calculating the exact number of available beds did not prove possible. We are confident in being able to report on occupied beds, which would require the facility to also provide licensed bed count for ultimate determination of an available bed.
        - API: Offer an API where the facility determines and sends their count of available beds. This requires that facilities have a concept of and technology mechanism to report the count.
- October 2022
    - Consensus that proceeding with an API solution is the best path forward.

Parameters

Methodist Fremont agreed to provide 1 clinical resource and 1 technical resource for reporting bed counts twice per week for three weeks.

Outcomes

Calculating the exact number of available beds did not prove possible due to variation in staffing and patient acuity. I.e., patient needs and staff experience dictate whether an open bed may be made available. Bed availability was consistently inflated, resulting in more harm than good.

Pilot Project with UNC Health

Hypothesis

Leverage and API integration between the facility/provider and BH SCAN (aka OpenBeds) application for the purpose of real time intelligence on available beds.

This pilot will use JavaScript Object Notation (JSON) post to receive bed counts and surface total bed availability within the BH SCAN application. If successful, we will also consider how to incorporate automated bed counts into existing state reporting and analytics.

Timeline

- September 2022
    - Met with NC DHHS to identify a pilot partner.
- October 2022
    - Reviewed the bed automation initiative with UNC Health.
- November 2022

    - Performed discovery to determine how we could leverage Electronic Health Record (EHR) fields to pull bed availability data.
- December 2022
    - Developed and refined build specifications for Automated Bed Availability, based on discovery learnings.
- February 2023
    - Build specifications provided to UNC Health to begin development build out.
- March 2023
    - Completed development build out.
- April 2023
    - Completed development build out.
- May 2023
    - Completed development build out.
- June 2023
    - Completed development build out.
    - Engaged with NC DHHS to modify reporting and analytics solutions to accommodate Automated Bed Availability enabled organizations/services.
- July 2023
    - Testing completed in the Prep environment for Automated Bed Availability.
    - Reporting updates enabled for NC DHHS.
    - Automated Bed Availability enabled in Production environment for pilot start on July 31, 2023.
- August 2023
    - Monitored data in Production for 30 days for quality assurance.
    - Supported UNC Health and NC DHHS with service changes during pilot.
    - Automated Bed Availability pilot completed on August 30, 2023.
- September 2023
    - Completed Automated Bed Availability pilot postmortem to capture what went well and learnings.

Parameters

UNC Health agreed to commit project management, technical, and clinical resources over the course of multiple months while pilot planning, development, and testing were completed.

Outcomes

- **Resource Quantification:** UNC Health provided approximately 120 resource hours to complete. Bamboo Health provided over 340 hours of Engineering resources for development and support of the pilot, as well as product management, client relations, network engagement, and other resource time.
- **Timely Updates:** Bed availability data was updated every hour for service participating in the pilot, in comparison to previous cadence of once per day, with daily bed updates increasing by 1362% as a result.

- **Solution Application:** Automated Bed Availability was leveraged by nine facilities on the BH SCAN network with 12 out of 14 services updating the beds via automation. Two of the services were unable to leverage the solution due to an inability to distinguish between adult and adolescent beds. 100% of the UNC Health organizations were able to leverage the solution.
- **What Went Well:** From a technical perspective it was awesome. Bamboo Health Engineering was prompt in responses. Having demo videos for end users was beneficial and made a difference in understanding. UNC was a great partner in moving the project along and responsiveness.
- **Learnings & Opportunities:** The test environment used different UUID keys than the production environment, which caused confusion. There's difficulty when matching UUID keys to services. A master plan/source of truth would have been beneficial.
- **Net Promoter Score (NPS):** UNC Health gave a score of 7.6 to the question, "How likely are you to recommend Automated Bed Availability to another health system in the network? *NPS methodology uses a single-question survey with a 0-10 scoring system. Scores of 0-6 are detractors, 7-8 are passives, and 9-10 are promoters.
- **Pilot Resources & Artifacts:**
    - Technical Resources: Automated Bed Availability implementation resources for technical audiences can be found at Bed Availability/Automated Bed Availability Specifications.pdf.
    - Operational Resources: Automated Bed Availability management resources for operational audiences can be found at:
        - BH SCAN Receiving Organization User Guide.pdf
        - Automated Bed Availability icons.jpg
        - Pilot - Automated Bed Availability Guide
        - Automated Bed Availability Demo Video
    - Communication Artifacts: The following communication was drafted by Bamboo Health for NC DHHS to notify users of Automated Bed Availability changes.

What is Automated Bed Availability?
Automated Bed Availability will allow Bamboo Health to receive real-time bed counts via automation and surface total bed availability within the BH SCAN web application. When Automated Bed Availability is configured, users will no longer need to manually update bed availability for their services. The goal of this solution is to optimize the bed availability workflow, increase accuracy in bed availability for referring providers, and place patients into available beds more efficiently.

What is changing?
As part of the UNC Automated Bed Availability pilot, Bamboo Health will be enabling Automated Bed Availability updates for UNC in the BH SCAN web application. When the pilot is enabled, the following changes will occur for certain UNC services that are piloting bed availability automation:

1. A new icon will be presented in the Last Updated column for services updating automatically.
2. Service availability for adults and adolescents will be indicated by a blue check mark.
3. Only Total Bed Availability will be supplied for each service.

When will this change occur?
This change is scheduled to occur on **Monday, July 31st**. If there are any changes to the release timeline, we'll provide notification.

How will this change impact BH SCAN users?
Outside of the Service Availability changes mentioned above, this should not impact BH SCAN users.

When can my hospital or health system participate in Automated Bed Availability?
North Carolina DMHDDSUS, UNC, and Bamboo Health will be engaged in the Automated Bed Availability pilot for approximately 30 days. Following pilot completion, we will review learnings and provide an update to our hospital and health system partners regarding expanded participation and onboarding.

State escalations should be sent to: BH_SCAN@dhhs.nc.gov

Please let us know if you have any questions/concerns.