

Using FHIR Workflows to Deliver Personalized Health Experiences

Kyle Thompson



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About Me



- Kyle Thompson
- Data Scientist
- Currently working at League
- Previously worked at a digital pharmacy PillPack

Agenda

1. Business Problem

- League Health Journeys

2. Mapping Health Journeys to FHIR

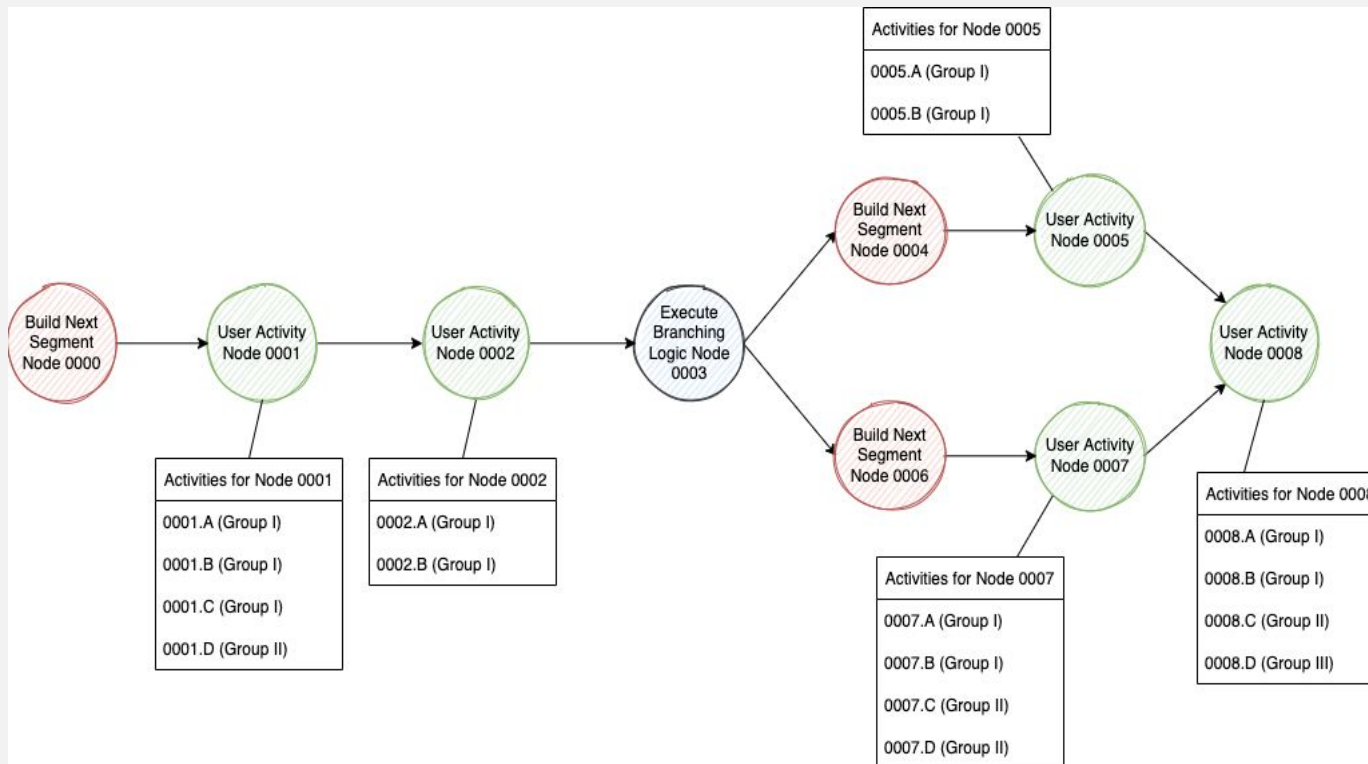
3. Conclusion

1. Business Problem

League & Health Journeys

- League is a digital health software company.
 - Gather health data
 - Ingest health data
 - Helps healthcare companies deliver digital health experiences
- Health Journeys
 - Helps users identify and track health goals.
 - *Identifies* activities users can work through in order to meet their health goals.

Health Journey Campaigns



- At League, we call a sequence of activities meant to help a user achieve a health goal(s) a **Campaign**.
- Campaigns are modelled using **Directed Graphs**.

Personalizing Campaigns (the Data Science Problem)

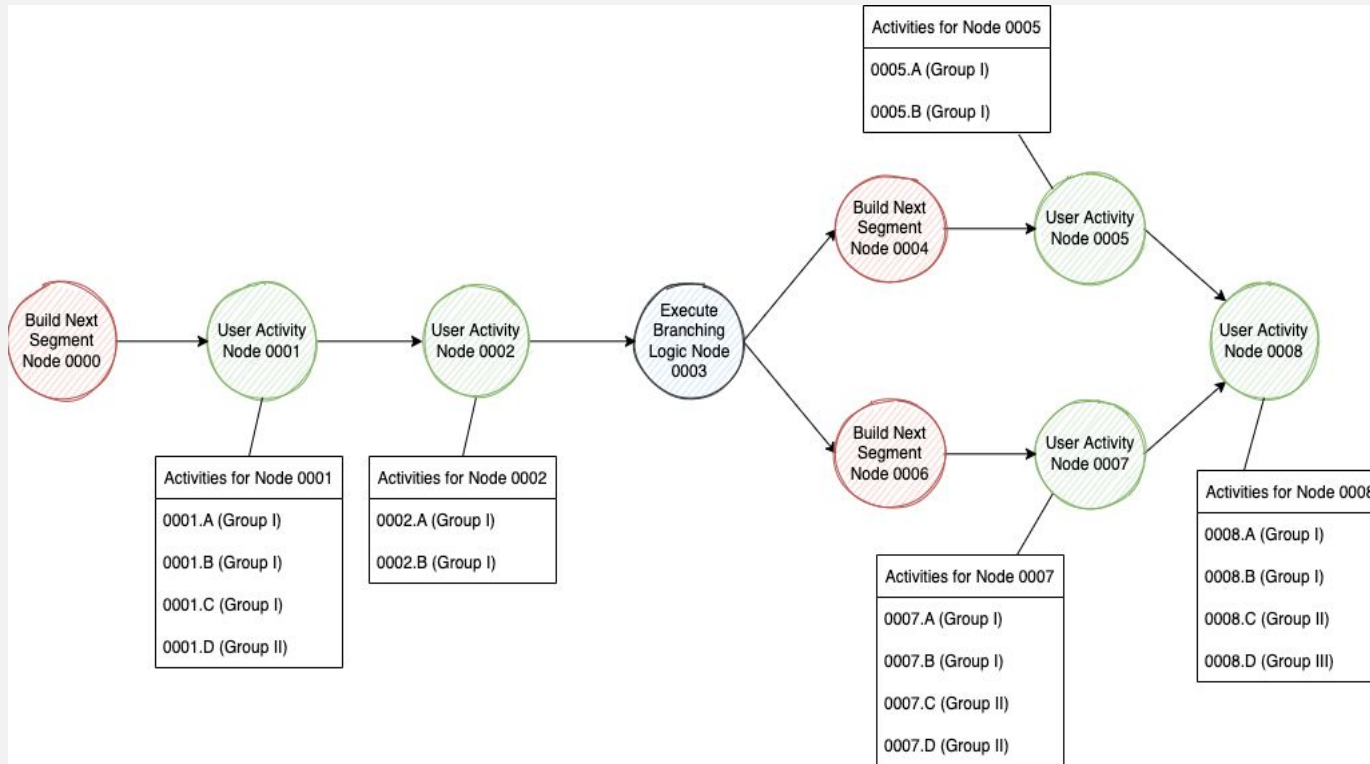
- Given a user's health goals, which Campaigns should they go through?
- At each activity node, there is a choice of which activity to include in a users campaign.
- At each branching node, there is a choice of which branch to go down.

Why am I (a data scientist) so interested in FHIR?

- Need a lot of health data to build Machine Learning models.
- Comes from many different sources (EMR, Claims, etc..). Adding new sources all the time.
- Cleaning data is tedious and hurts.
 - 80% of my time is spent understanding and cleaning data on a typical data science project.
 - FHIR reduces this time significantly.

2. Mapping Health Journeys to FHIR

Campaigns are FHIR Plan Definitions



- **nodes** are actions in the *Plan Definition*
- **edges** are defined in `PlanDefinition.action.relatedAction`
- actions are defined using *Activity Definitions*.

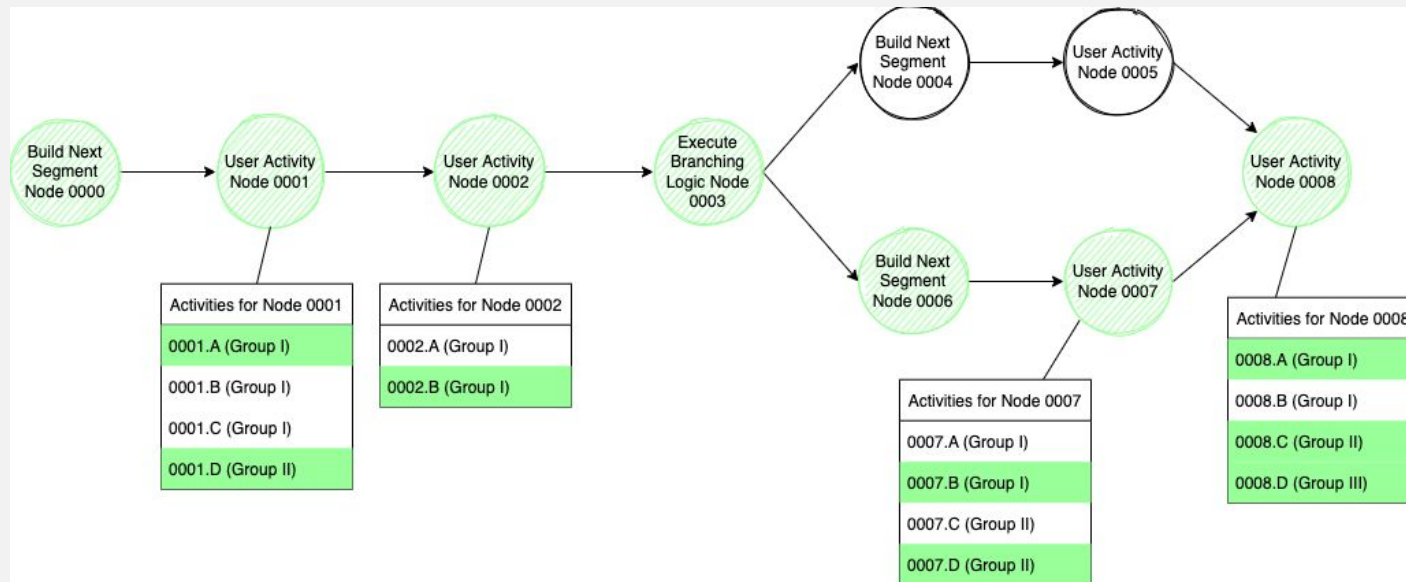
Building a Campaign

1. Experts create Directed Graph using 3rd party tools. Authors define
 - a. who the campaign is for
 - b. actions
 - c. branching logic
 - d. etc..

2. Upon Publish, create a Plan Definition and send to FHIR server.

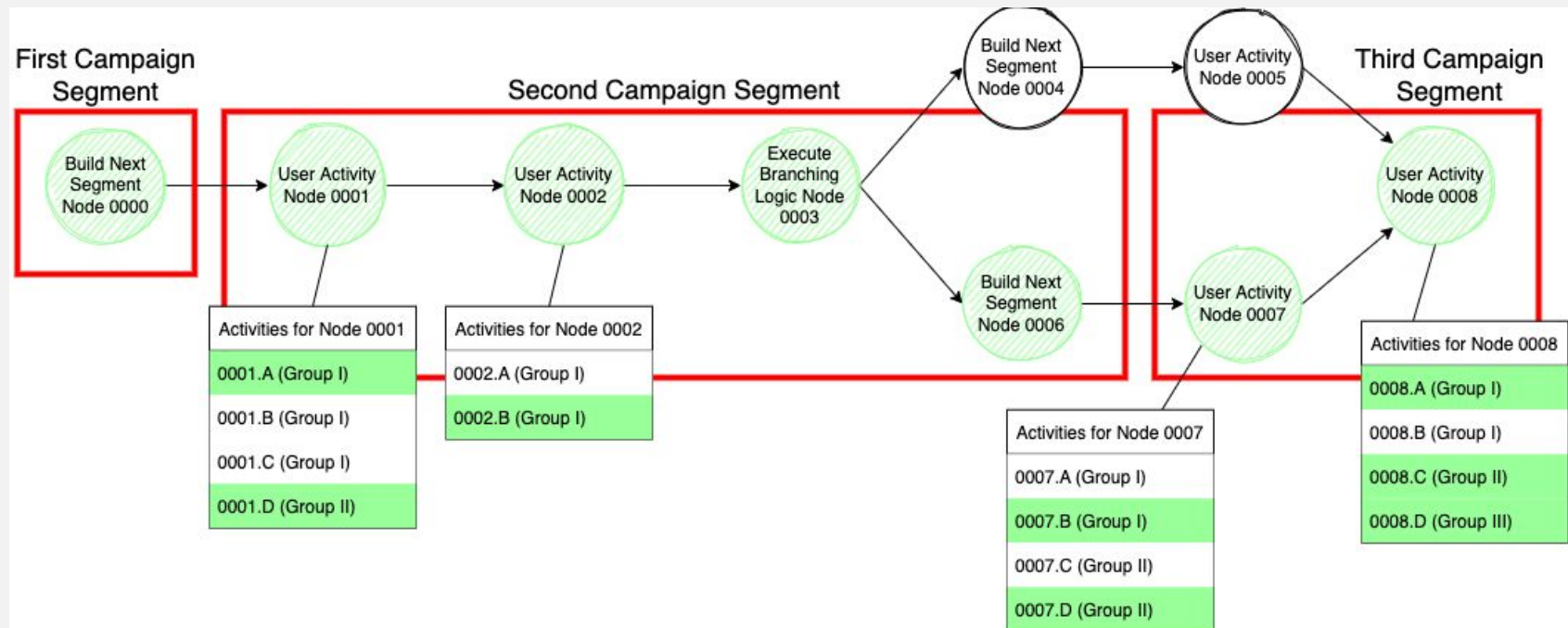
"Applying" the Plan Definition

- **\$apply** the Plan Definition to the user when they enrol in a campaign and as they work on a campaign.
 - Generates a FHIR Workflow.
 - Picks activities and a path through the Plan Definition.

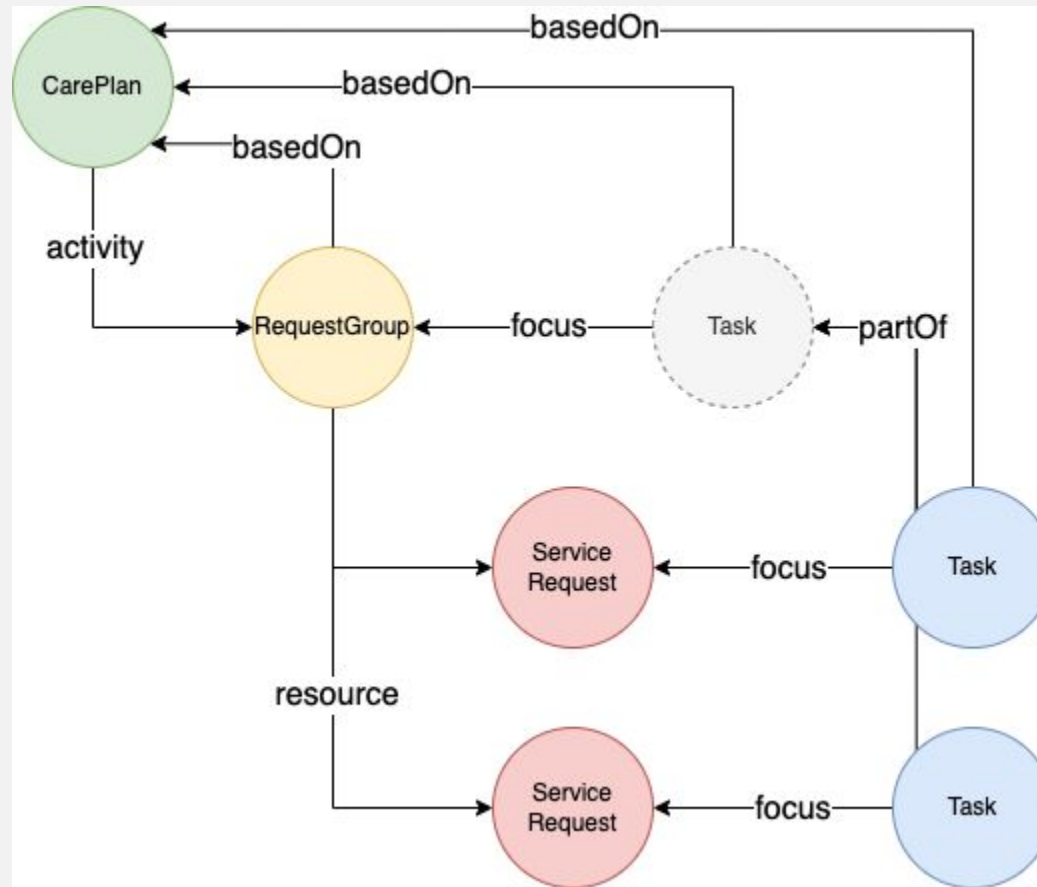


Workflow

1. Green nodes are Requests & Tasks.
2. Red boxes are Request Groups (i.e. collections of Requests).
3. Paths are Care Plans (i.e. Collections of RequestGroups).



ERD view of the output of \$apply



Reviewable

- We can publish the FHIR Workflow as a draft.
- Can present the draft to experts to review and modify before publishing.

3. Conclusion

Overview

- FHIR PlanDefinitions are excellent for modelling Directed Graphs representing sequences of activities with *choices*.
- FHIR Workflows can be used to build & deliver personalized health experiences.
- FHIR standardizes data collection, which reduces time spent understanding and cleaning data, and allows us to share Workflows that we create with our partners easily.

Contact

- During DevDays, you can find / reach me here:
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Q&A

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