Pitt CS online advisor refactor: Design Document

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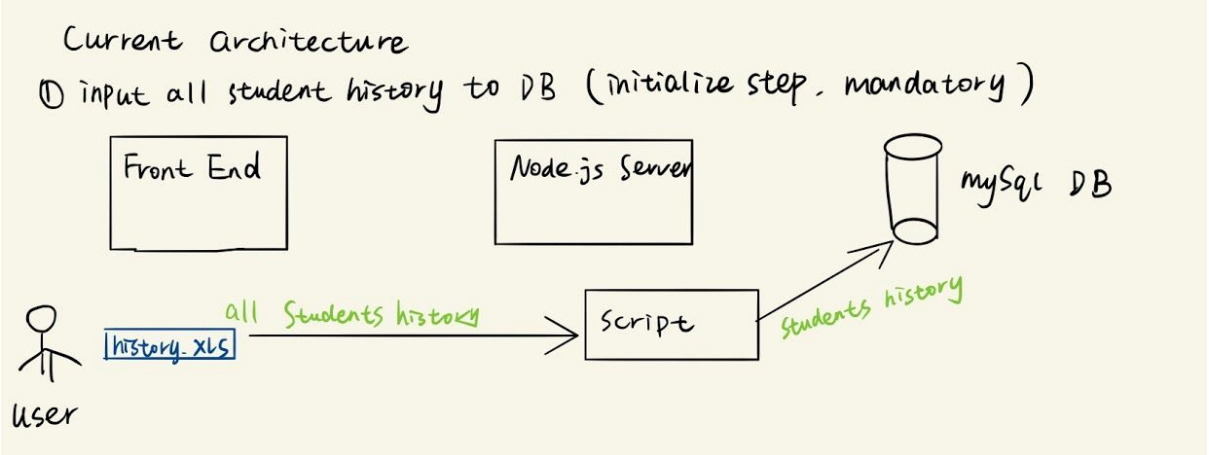
Use Cases Comparison (old design vs new design):

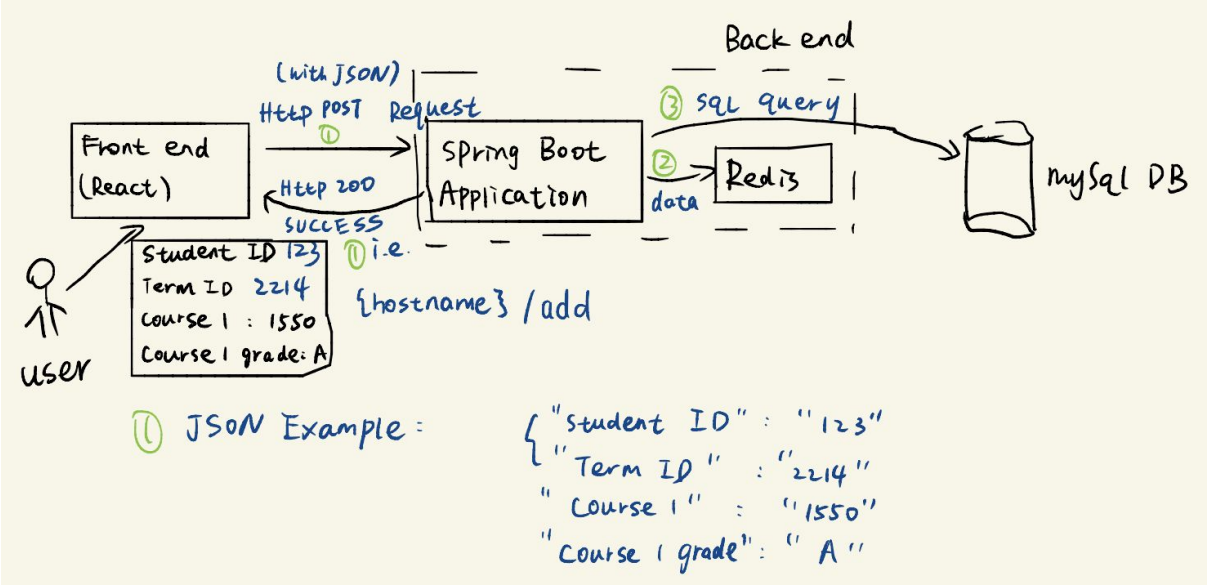
1. **Termly data synchronization (aka Add New Data)**

Description:
We want to add new data to our database after each semester.

Current Flow:



Flow After Refactor (without peoplesoft integration):



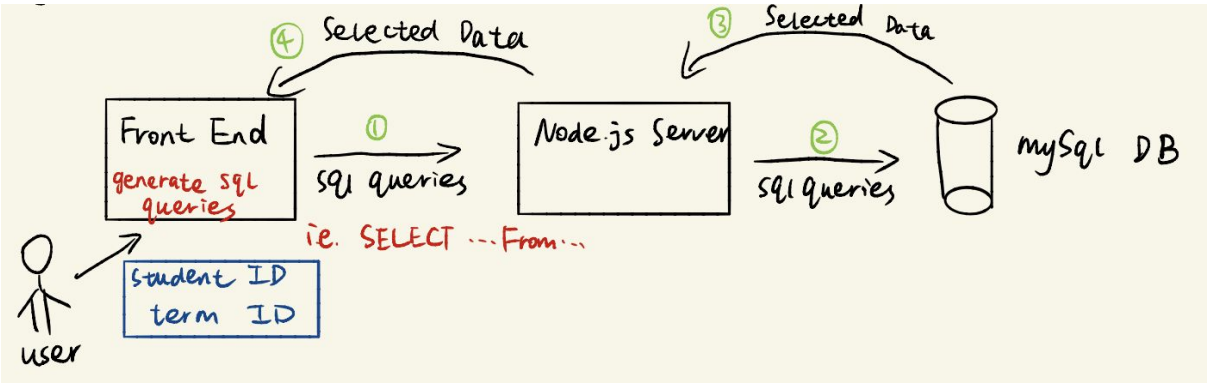
we have the all data in mySql DB, new data could be entered manually.

If we fully integrate with peopleSoft (no local DB), there is no need for data synchronization.

2. **Student Grade Prediction (advisor version)**

Description:
Given the student ID and current term ID, plus search settings (number of semesters to look into the future, number of semesters leeway, grade leeway by percent), returns back the grade prediction on all available CS courses.

Current Flow:

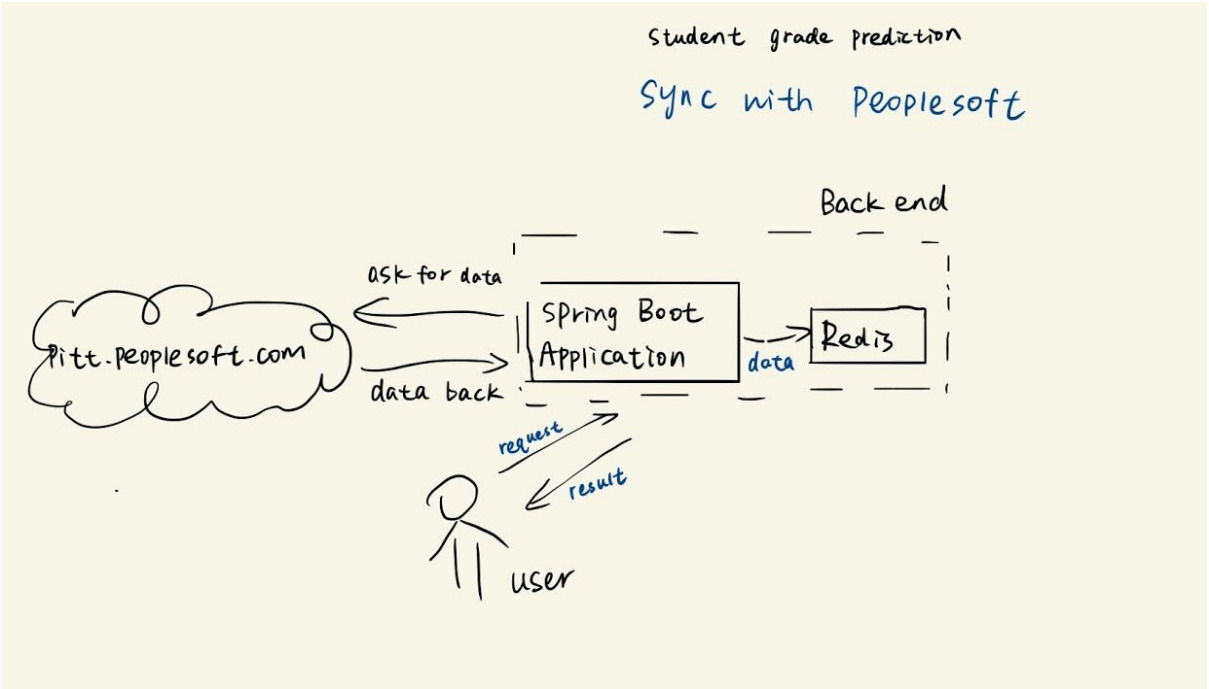


If we want to integrate with PeopleSoft:

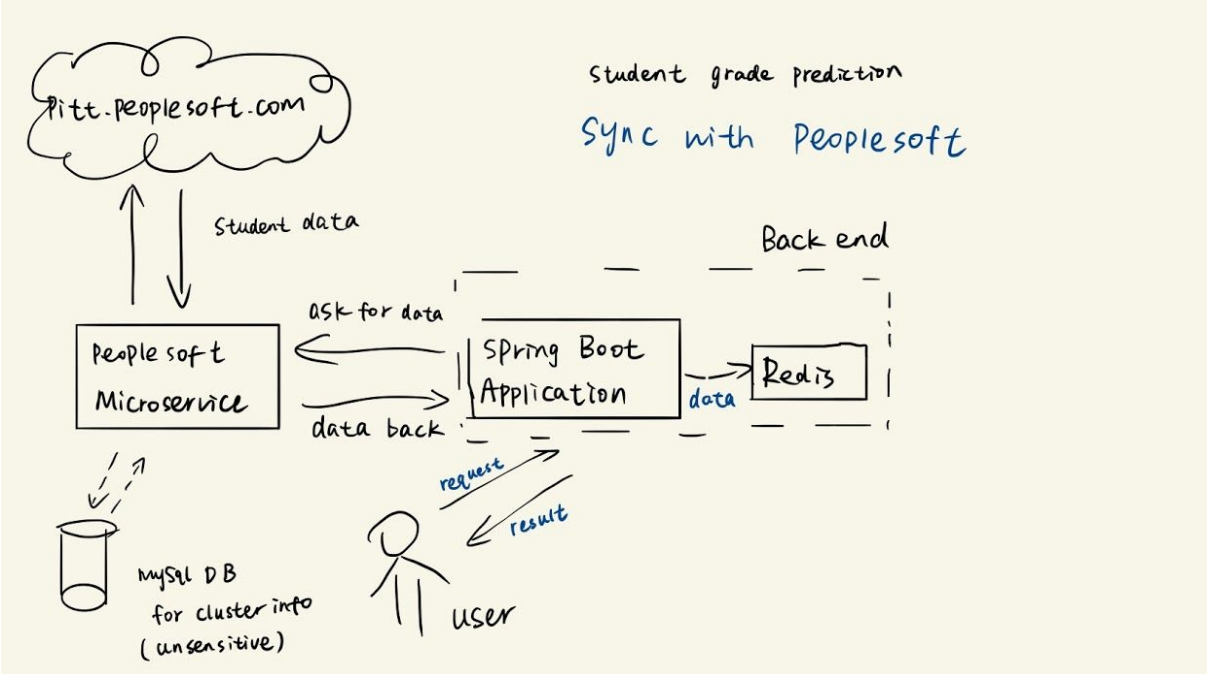
question: Can we have a DB in the system?

if not: It could be possible for us to use PeopleSoft as our primary Data Resource.

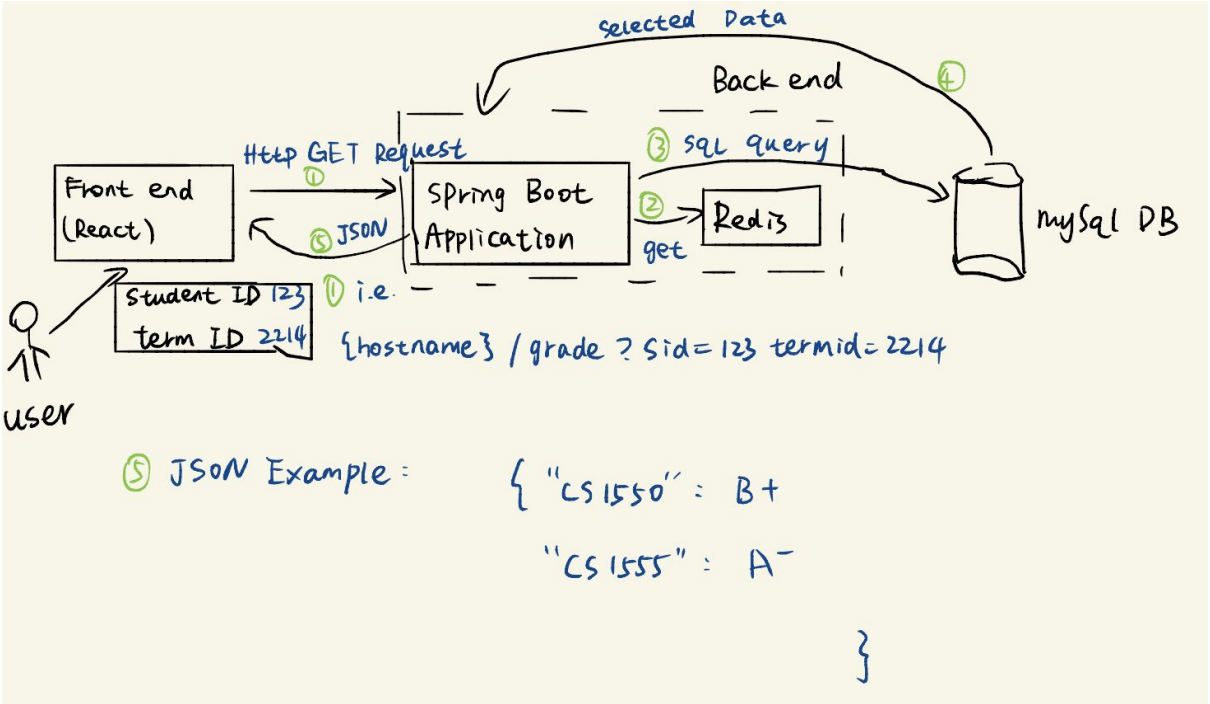
If we could store cluster information in peoplesoft:



if we can only read from peopleSoft:



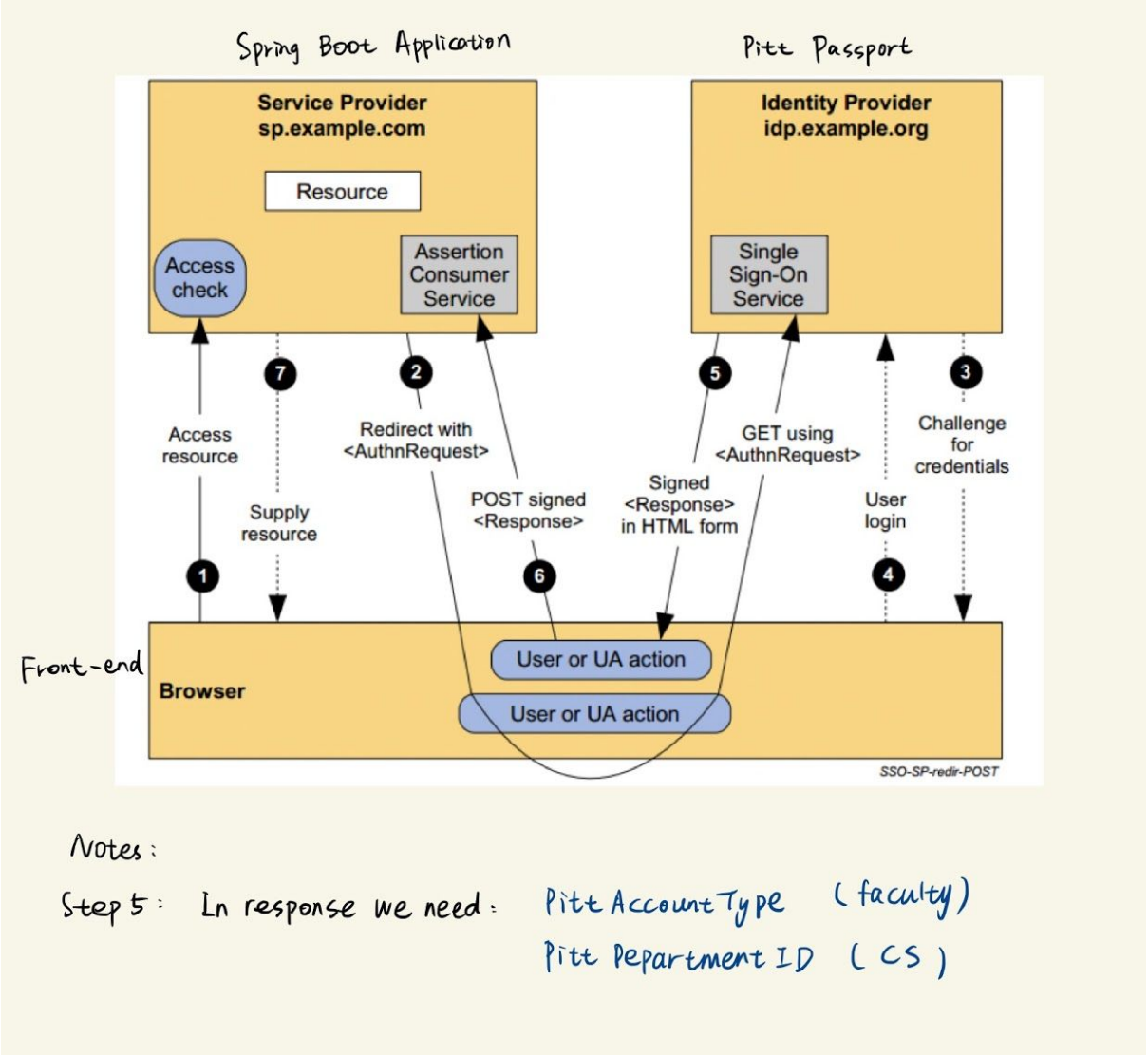
if yes: We still want to have a DB in the system that has students' history. We will sync DB with peopleSoft after each semester finished. (best practice)



3. Single Sign-On Integration

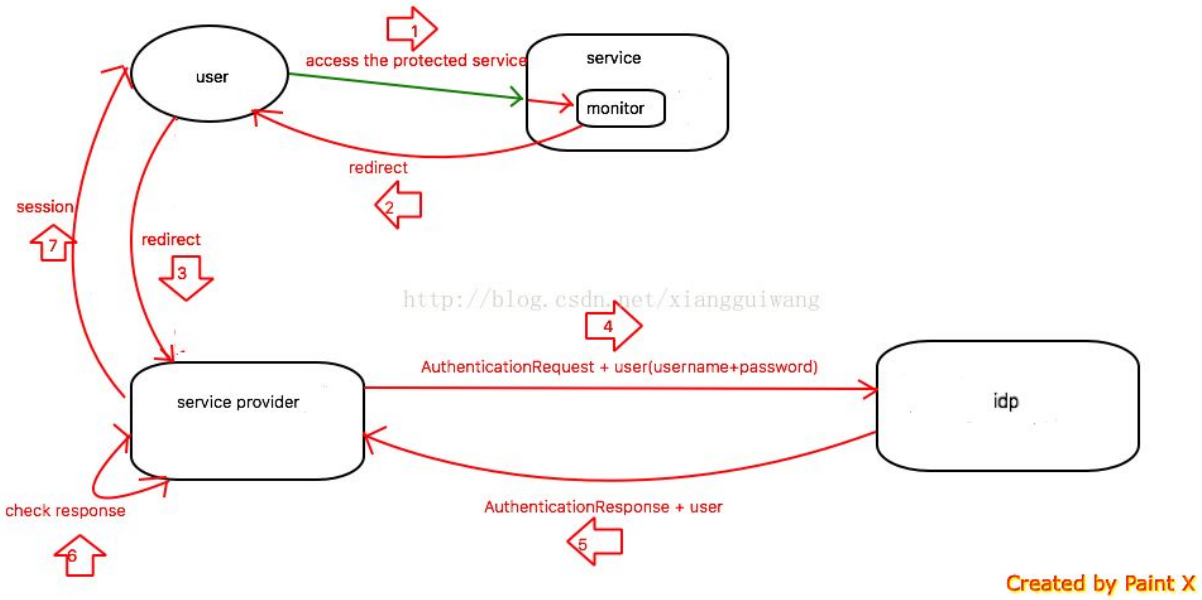
reference:
https://www.technology.pitt.edu/security/leverage-pitt-passport-for-your-application

Spring SAML / Shibboleth plugin



Notes:

Step 5: In response we need: Pitt Account Type (faculty)
Pitt Department ID (CS)



Online Advisor HTTP API:

Operation	**Description**	**Method**	**URI**
create record	Create a new student grade record.	POST	/add
grade prediction	Get all course grade prediction for a student at a certain term (with arguments)	POST	/predict
grade prediction with ML	Get all course grade prediction for a student at a certain term using ML approach (with arguments)	POST	/mlpredict

PeopleSoft microservice:

Operation	Description	Method	URI
get data	Get original data from PeopleSoft with a SQL query	POST	/get
get data with cluster info	Get original data with cluster information	POST	/getwithcluster

Commitments:

Milestone 1:

Back-end: (february's focus)
Build up app structure, migrate current features to new structure.

Front-end: (late february & march)
Refactor the website to make it look like other pitt websites. Re-structure all layers and create new pages, to improve user experience. Keep the data lay-out method the same.

Milestone 2:

Back-end: (at the end of the semester)
Integrate Jiaye's ML algorithm. Jiaye wants to try some RNN approaches. He will train the model and provide me with a pre-trained model. I will keep the pre-trained model in the back-end and use it to process requests.

Deployment: (April's focus)
Deploy to pitt server in distributed fashion, open for usage, testing.

Bonus:

SSO integration (priority). (february and march) (start talking with IT staff from february, will continuously work on this throughout the whole semester, until done)

peopleSoft integration. (Start from April, if I have time)