CONTEXT FOR USER STORIES

Business Need: CBRE client Powers Development Corp. recently finished construction on a new baseball stadium. However, after operating for a few months they experienced greater than expected utilities costs causing a significant loss to investors.
Problem: CBRE commercial real estate investors face unexpected losses due an inability to anticipate utility costs accurately.

Solution: Build a machine learning algorithm that projects yearly electricity costs for a planned commercial real estate project. The algorithm will take into account multiple factors including building activity, climate, lot size, building size and zoning codes.

Below, you will find an API and UI user story that feed into a new feature we'll call "Utility Estimator". There would be several more stories associated with this new feature.

User Story Title: Breakdown by building activity

User Story: As a commercial real estate investor, I want to be able to break down my building space by how its used i.e. building activity so that I can use this data to project my utilities costs.

Background and Business Need: Powers Development Corp. recently finished construction on a new baseball stadium. They severely underestimated the cost of electricity because they used an industry-wide per sqft cost multiple that did not capture their building activity accurately. The data collected will be used by the Utility Estimator algorithm.

Functional Requirement:

The user will break their building space down by building activity as a percent. Building activity codes will come from a system developed by the U.S. Energy Information Association.

Requirement	Example
A user will be able to name a space within their building	E.g. Office Space, Stadium Seating, Retail Max # of characters: 40
A user will be able to assign a percent of the total building to a space	E.g 20, 35, 60 Must be an integer between 1-100
A user will be able to assign a space to a specific use based on EIA-defined building activity codes	E.g Education, Lodging Nursing *See table below for all codes and API endpoint
When added together all spaces must add up to 100% of the total building space	E.g A user cannot enter a space "Office" 20% and then move on.

Source:
https://www.eia.gov/consumption/commercial/data/2012/bc/pdf/pbaplus%20examples%20and%20definitions.pdf

Building Activity and Code

Education	14
Food Sales	06
Food service	15
Health-Care Inpatient	16
Health-Care Outpatient	08
Lodging	18
Nursing	17
Mercantile	25
Strip shopping mall	23
Enclosed mall	24
Office	02
Public assembly	13
Public order and safety	07
Religious worship	12
Service	26
Nonrefrigerated Warehouse	05
Refrigerated Warehouse	11
Other	91
Laboratory	04
Vacant	01

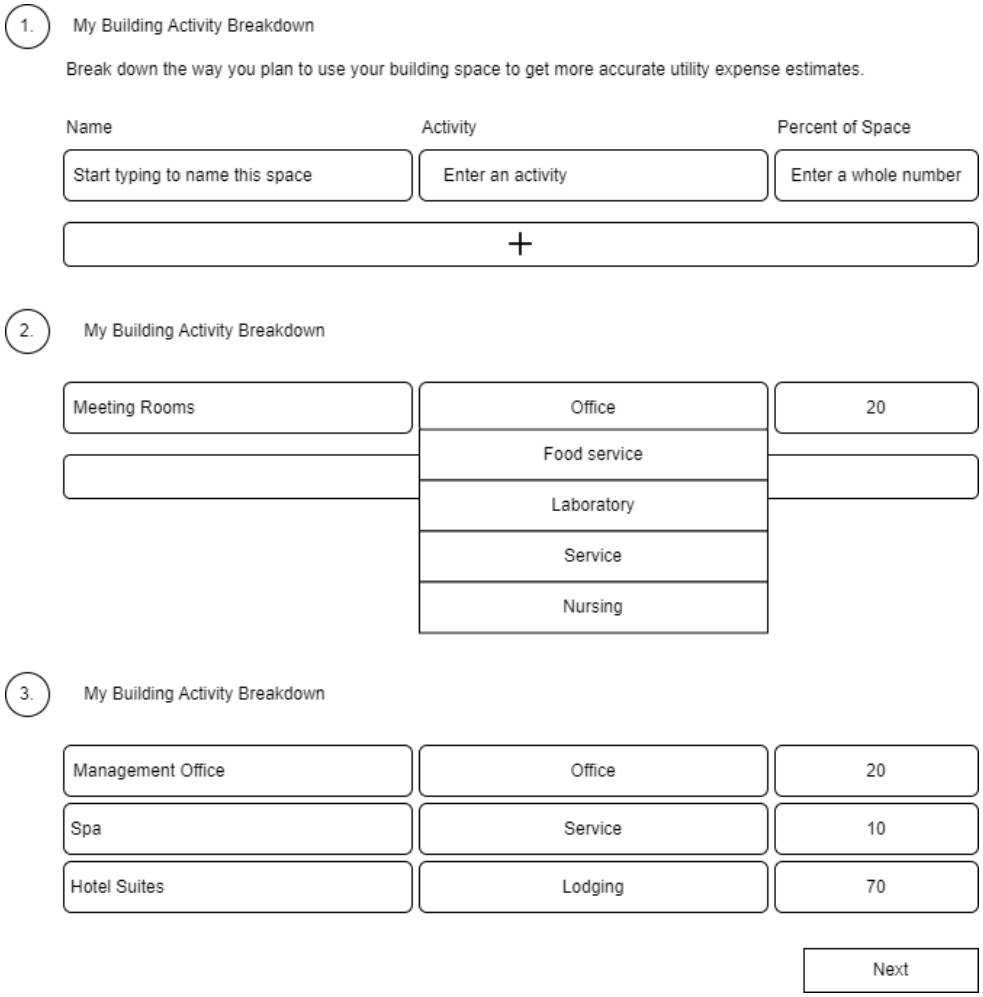
Implementation Note:

Building activity codes can be retrieved from the endpoint GET https://api.cbre.com/api/V1/utility-estimator/building-activity-codes

See documentation here - <link to documentation>

See next page for UI design

Wireframe:



Acceptance Criteria:

A real estate developer can add the following breakdown to the UI:

- Office: 20
- Laboratory: 30
- Food Sales: 50

A user cannot proceed to the next step after entering the following breakdown since decimals are not allowed:

- Office: 21.5

- Laboratory: 28.5
- Food Sales: 50

A user cannot proceed to the next step after entering the following breakdown since the percentages do not add up to 100:

- Office: 20
- Laboratory: 30

User Story Title: Get building activity codes endpoint

User Story: As a user, I want to be able to get a list of all Energy Information Agency building activity codes.

Background and Business Need: Building activity codes describe how a space is used and are valuable for analyzing a property's worth, its utility costs, and potential investment return. These building activity codes will be used in a feature called Utility Estimator that will help real estate developers estimate their utility costs prior to construction.

Functional Requirement

Requirement	Example
Return list of Energy Information Administration building activity codes complete with activity name and code Source: https://www.eia.gov/consumption/commercial/data/2012/bc/pdf/pbaplus%20examples%20and%20definitions.pdf ****Note:** ONLY use activity codes from the second column "Principal building activity variable available in public use data (PBA)"	E.g. Activity name: Office Code: 02 See table below for the complete list.

Building Activity and Code

Education	14
Food Sales	06
Food service	15
Health-Care Inpatient	16
Health-Care Outpatient	08
Lodging	18
Nursing	17
Mercantile	25
Strip shopping mall	23

Enclosed mall	24
Office	02
Public assembly	13
Public order and safety	07
Religious worship	12
Service	26
Nonrefrigerated Warehouse	05
Refrigerated Warehouse	11
Other	91
Laboratory	04
Vacant	01

Request:

GET https://api.cbre.com/api/V1/utility-estimator/building-activity-codes

Response:

HTTP Status Code	Description	Response

200 Ok	Successful	{
		“building_codes”: [
		{
		“activity”: “Education”,
		“code”: 14
		},
		{
		“activity”: Food service”,
		“code”: 15
		}
		…
		]}

Acceptance Criteria:

When a call is made to GET https://api.cbre.com/api/V1/utility-estimator/building-activity-codes, 20 activity codes are returned each having a code.