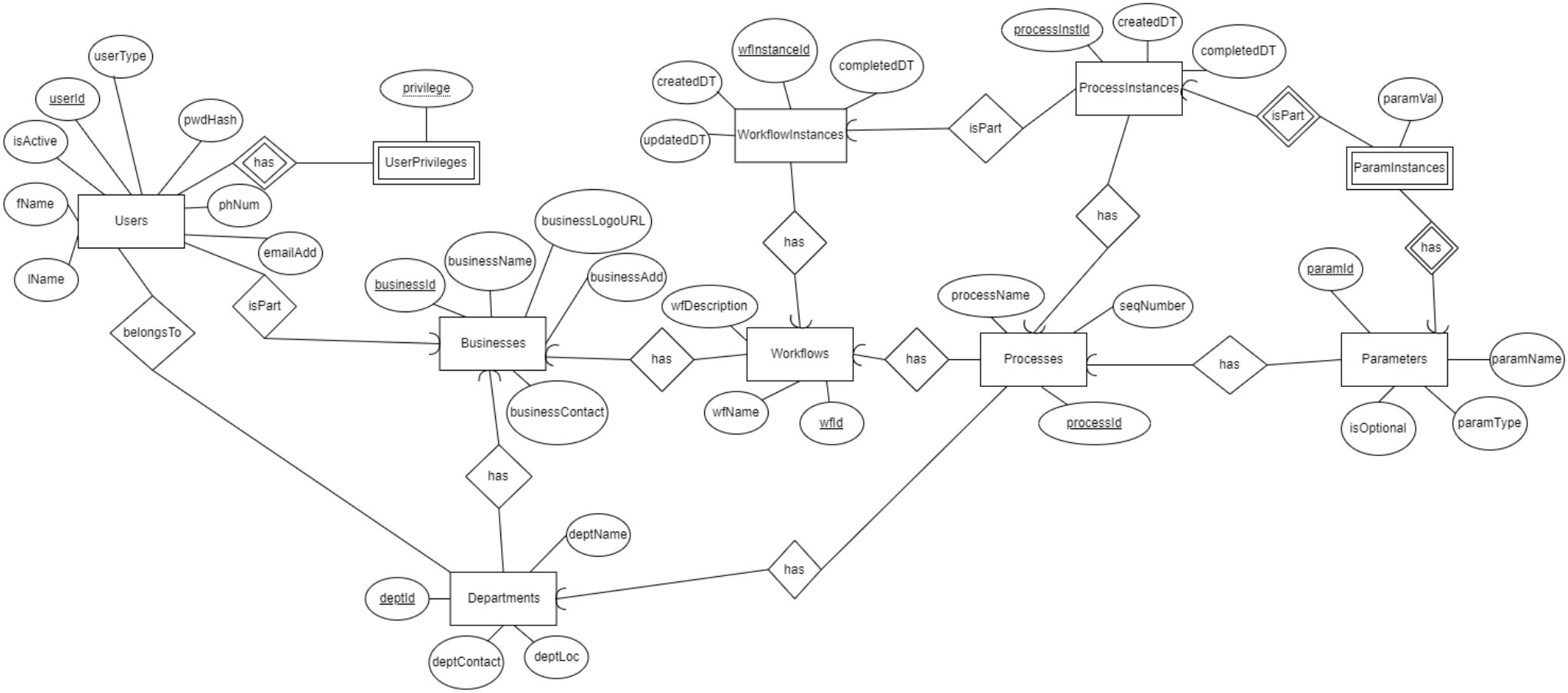
Generic Workflow Management, Monitoring and Reporting Application

ER Diagram



Relational Schema

Users (
    userId: INTEGER [PK],
    businessId: INTEGER [FK to Businesses.businessId],
    userType: ENUM,
    emailAddress: VARCHAR(255),
    pwdHash: VARCHAR(255),
    isActive: BOOLEAN,
    fName: VARCHAR(255),
    lName: VARCHAR(255),
    phNum: VARCHAR(15)
)

UserPrivileges (
    userId: INTEGER [PK] [FK to Users.userId],
    privilege: ENUM [PK]
)

Departments (
    deptId: INTEGER [PK],
    businessId: INTEGER [FK to Businesses.businessId],
    deptName: VARCHAR(255),
    deptLoc: VARCHAR(255),
    deptContact: VARCHAR(255)
)

UserDepartment (
    userId: INTEGER [PK] [FK to Users.userId],
    deptId: INTEGER [PK] [FK to Departments.deptId]
)

Businesses (
    businessId: INTEGER [PK],
    businessName: VARCHAR(255),
    businessLogoUrl: VARCHAR(255),
    businessAddress: VARCHAR(255),
    businessContact: VARCHAR(15),
)

```
Workflows (
        wfName: VARCHAR(50),
        wfId: INTEGER [PK],
        wfDescription: VARCHAR(255),
        businessId: INTEGER [FK to Businesses.PK]
)

Processes (
        processId: INTEGER [PK],
        processName: VARCHAR(50),
        seqNumber: INTEGER,
        wfId: INTEGER [FK to Workflows.PK]
)

Parameters(
        paramId: INTEGER [PK],
        paramName: VARCHAR(50),
        paramType:    VARCHAR(50),
        isOptional: BOOLEAN,
        processId: INTEGER [FK to Processes.PK]
)

WorkflowInstances(
        wfInstanceId: INTEGER [PK],
        createdDT: DATETIME,
        updatedDT: DATETIME,
        completedDT: DATETIME,
        wfId: INTEGER [FK to Workflows.PK]
)

ProcessInstances(
        processInstanceId: INTEGER [PK],
        createdDT: DATETIME,
        completedDT: DATETIME,
        processId: INTEGER [FK to Processes.PK],
        wfInstanceId: INTEGER [FK to WorkflowIntances.PK]
)

ParamInstances(
        paramVal: VARCHAR(255),
        processInstanceId: INTEGER [PK] [FK to ProcessInstances.PK],
        paramId: INTEGER [PK] [FK to Parameters.PK]
)
```

Description and Assumptions of Relations

- **Users**:
  - **Description**: This relation stores the users' login data and users' personal information.
  - **Assumption**:
    - Users can have only one user type which is an enum representing different types of users in our system.
    - Users can be a part of exactly one business.
- **UserPrivileges**:
  - **Description**: Different users will have different access levels depending on the configuration of their business. For example, some users may have the access to view reports and aggregates, while others may have the access to update workflow status.
  - **Assumption**: Users can have many privileges and each privilege can be given to many users. Eg. multiple users can write workflows and a user can have read as well write privileges.
- **Departments**:
  - **Description**: Stores information about the different departments in the business.
  - **Assumption**: Each department can belong to only one business that will handle a process in the workflow.
- **UserDepartment**:
  - **Description**: Stores the department of each user, and therefore defines the process the user is responsible for.
  - **Assumption**: Each user can be part of multiple departments and each department can have many users.
- **Businesses**:
  - **Description**: Stores information about the business.
  - **Assumption**: The business logo URL will always be a valid image URL.
- **Workflows**:
  - **Description**: Stores the workflow definitions, that is the schema of the workflow.
  - **Assumption**: A workflow can be a part of exactly one business and a business can have multiple workflows for different business needs.
- **Processes**:
  - **Description**: Stores information about processes that are part of workflows. Each workflow can have multiple processes which are sequential and their sequence order is identified by a sequence number “seqNumber”.
  - **Assumption**:
    - Each process can be part of only one workflow. If a user needs to add the same process to multiple workflows, then they will have to create another process definition for it.
    - At a given instant, there will be only one active process in every workflow instance.

- **Parameters**:
    - **Description**: Stores information about parameters/variable definitions which are specific to each process - these will be used to display the forms/ input values to be taken on each process instance page.
    - **Assumption**: Each parameter can be part of only one process. A parameter instance corresponding to a process instance cannot be updated by its subsequent process instance. It will have a name, paramType (which is an enum having values NUMBER, TEXT, YESNO, DATETIME representing the datatype of the parameter). A process can have many parameters.
- **WorkflowInstances**:
    - **Description**: Stores timestamp information of new instances of the fixed workflows of a business.
    - **Assumption**: Each workflow can have multiple workflow instances and a workflow instance can only be part of a single workflow.
- **ProcessInstances**:
    - **Description**: Stores timestamp information of new instances of the fixed processes of a business that are a part of a workflow.
    - **Assumption**: Each process can have multiple process instances and a process instance can belong to only one process.
- **ParamInstances**:
    - **Description**: Stores the runtime values of parameters defined in the Parameters schema.
    - **Assumption**: Each parameter can have multiple parameter instances (which will have values of the parameter type for different process instances). Each parameter instance can be of only one parameter type.