```
static_diagram DAO
    component
        deferred class DATA_ACCESS_OBJECT[T]
            feature
            deferred create : BOOLEAN -> t : T
                require
                    t /= Void;
                    t.FullyInitialized();
                ensure
                    t member_of Read(o such_that o.PrimaryKey = t.PrimaryKey)
            end


            deferred create : BOOLEAN -> t : SET [T]
                require
                    t /= Void;
                    for_all ts : T such_that ts element_of t it_holds
                        ts.FullyInitialized();
                ensure
                    for_all ts : T such_that ts element_of t it_holds
                        ts member_of Read(o such_that o.PrimaryKey = ts.PrimaryKey);
            end


            deferred read : SET [T] -> predicate : FUNCTION[T, bool]
                require
                    predicate /= Void;
                ensure
                    for_all t : T such_that t member_of Result it_holds
                        predicate.evaluate(t) = true;
            end


            deferred update : BOOLEAN   -> predicate : FUNCTION[T, bool]
                                        -> t : T
                require
                    predicate /= Void;
                    t /= Void;
                    t.PrimaryKey == Void;
            end


            deferred delete : BOOLEAN   -> predicate : FUNCTION[T, bool]
```

```
        require
            predicate /= Void;
        ensure
            read(predicate) = {};
    end
end


class PESSIMISTIC_VOTER_DAO
    feature
    startTranscation

    endTranscation
        require
            transactionStarted();
        ensure
            not transactionStarted();
    end


    transactionStarted : BOOLEAN

    read : VOTER_DO -> id : INTEGER
        require
            transactionStarted();
        ensure
            Result /= Void -> Result.PrimaryKey == id
    end

    update : BOOLEAN    -> id : INTEGER
                  -  > votedStatus : BOOLEAN
        require
            transactionStarted();
        ensure
            read(id) /= Void -> read(id).Voted = votedStatus;
    end
end

class VOTER_DAO
    inherit DATA_ACCESS_OBJECT
    feature
```

```
        effective create : BOOLEAN -> t : T
        effective create : BOOLEAN -> t : SET [T]
        effective read : SET [T] -> predicate : FUNCTION[T, bool]
        effective update : BOOLEAN  -> predicate : FUNCTION[T, bool]
        effective delete : BOOLEAN  -> predicate : FUNCTION[T, bool]
    end


class MUNICIPALITY_DAO
    inherit DATA_ACCESS_OBJECT
    feature
        effective create : BOOLEAN -> t : T
        effective create : BOOLEAN -> t : SET [T]
        effective read : SET [T] -> predicate : FUNCTION[T, bool]
        effective update : BOOLEAN  -> predicate : FUNCTION[T, bool]
        effective delete : BOOLEAN  -> predicate : FUNCTION[T, bool]
    end


class LOG_DAO
    inherit DATA_ACCESS_OBJECT
    feature
        effective create : BOOLEAN -> t : T
        effective create : BOOLEAN -> t : SET [T]
        effective read : SET [T] -> predicate : FUNCTION[T, bool]
        effective update : BOOLEAN  -> predicate : FUNCTION[T, bool]
        effective delete : BOOLEAN  -> predicate : FUNCTION[T, bool]
    end


class POLLING_STATION_DAO
    inherit DATA_ACCESS_OBJECT
    feature
        effective create : BOOLEAN -> t : T
        effective create : BOOLEAN -> t : SET [T]
        effective read : SET [T] -> predicate : FUNCTION[T, bool]
        effective update : BOOLEAN  -> predicate : FUNCTION[T, bool]
        effective delete : BOOLEAN  -> predicate : FUNCTION[T, bool]
    end


deferred class DATA_OBJECT
    feature
```

```
        primaryKey -- The primary key of this entity.

        deferred fullyInitialized : BOOLEAN -- Have all fields been assigned a non-null value?

        deferred UpdateValues -> dummy : DATA_OBJECT
            require
                dummy /= Void;
                dummy.Class = Current.Class;

        deferred resetAssociations
end

class VOTER_DO
    inherit DATA_OBJECT
    feature
    name: String
    cpr: int -- Unsigned
    address: String
    city: String
    pollingStationId: INTEGER
    voted: BOOLEAN
    cardPrinted: BOOLEAN

    cprString : String
        require
            cpr /= Void;
        ensure
            Result.Length = 10;
    end

    effective fullyInitialized : BOOLEAN
    effective UpdateValues -> dummy : DATA_OBJECT
    effective resetAssociations

    invariant
        (cpr >= 101000001 and cpr <= 3112999999) or cpr == Void
        -- 101000001 is equal to a person born on the first of january 2000 or 1990
        -- and with the serial number 0001 = 010100-0001.
        -- Equally, 3012999999 is equal to a person with 301299-9999
```

```
        end


class POLLING_STATION_DO
    inherit DATA_OBJECt
    feature
    id: INTEGER
    address: String
    name: String
    municipalityId: INTEGER

    effective fullyInitialized : BOOLEAN
    effective UpdateValues -> dummy : DATA_OBJECT
    effective resetAssociations
end


class MUNICIPALITY_DO
    inherit DATA_OBJECt
    feature
    id: INTEGER
    address: String
    city: String
    name: String

    effective fullyInitialized : BOOLEAN
    effective UpdateValues -> dummy : DATA_OBJECT
    effective resetAssociations
end


class LOG_DO
    inherit DATA_OBJECT
    feature
    time: TIME
    table: INTEGER
    cpr: CPRNO
    activity: Activity

    effective fullyInitialized : BOOLEAN
    effective UpdateValues -> dummy : DATA_OBJECT
    effective resetAssociations
```

```
        end


    class ACTIVITY
        feature
        value: CHARACTER

        invariant
        value element_of { 'W', 'R', 'U' }
        end
end


--Comment: Change Log

-- Updated to conform with implementation of DBComm (07/12).
-- Updated Data object (13/12)
```