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Data Types:**User**

Attribute	Data Type	Allow Null
email	String	Not Null
pin	Integer	Not Null
first_name	String	Not Null
last_name	String	Not Null

CorkBoard

Attribute	Data Type	Allow Null
title	String	Not Null
date	Date	Not Null
category	String	Not Null

Private Corkboard

Attribute	Data Type	Allow Null
title	String	Not Null
date_updated	Date	Not Null
category	String	Not Null
password	String	Not Null

Public CorkBoard

Attribute	Data Type	Allow Null
title	String	Not Null
date	Date	Not Null
category	String	Not Null

PushPin

Attribute	Data Type	Allow Null
url	String	Not Null
date_added	Date	Not Null

description	String	Not Null
tags	List<String>	NULL

Comment

Attribute	Data Type	Allow Null
email	String	Not Null
date_added	Date	Not Null
description	String	Not Null

Business Logic Constraints:

User:

- Users cannot watch a private corkboard
- User cannot follow themselves
- Pin must be exactly 4 digits
- Name fields can only contain letters
- A user cannot follow themselves
- Email address must follow the format emailid@abc.com
- Users are added into the database by the DBA
- Automatically becomes owner of any CorkBoard they create

CorkBoard:

- Title must be limited to 50 characters
- The list of category is fixed and cannot be modified by user
- Only the 4 most recently updated CorkBoards show up in the Recent Updates window

PrivateCorkBoard:

- Password length must be at least 8 characters and a maximum of 20 characters
- May not be watched

PushPin:

- The URL must be a valid image URL with a .jpg, .png or .gif file extension
- Tags cannot contain commas
- Tags must be 20 characters or less
- Description must be less than 200 characters
- PushPins on a private CorkBoard never appears in search results
- PushPin cannot be liked by owner
- There are only 2 states for 'Likes' – Like or Unlike

Comments:

- A comment cannot be deleted from the database

Task Decomposition and Abstract Code:

Authenticate:

Task Decomp

Lock Types: Read-only on User

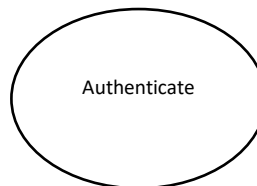
Number of Locks: Single

Enabling Conditions: None

Frequency: Approximately 200 logins per day

Consistency (ACID): Not critical

Subtasks: No mother task or decomposition



Abstract Code

- User enters *email* ('\$Email') and *pin* ('\$Pin') input fields
- If data validation is successful for both input fields then:
 - When **Login** button is clicked:
 - If \$Email is found in User and User.pin = \$Pin then:
 - Store the login information in the HTTP Session Cookie with \$Email as the ID of the current user
 - Go to **Home Screen** form
 - Else:
 - Redirect to **Login** form with error message displayed
- Else:
 - Redirect to **Login** form with error message displayed

Show Home Page:

Task Decomp

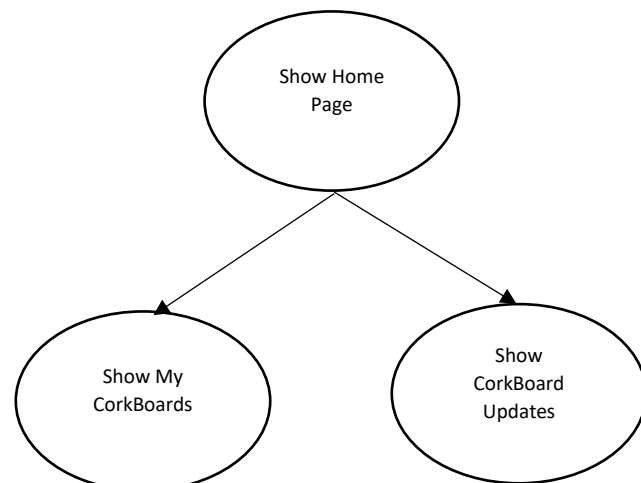
Lock Types: 2 Read-only lookups of Corkboards to get

Recent CorkBoard Updates and My CorkBoards

Number of Locks: Two

Enabling Conditions: This is enabled when the user authenticates

Frequency: Approximately 1,000 per day



Consistency (ACID): Not critical. If a corkboard is being updated while loading it's okay

Subtasks: A mother task is used to coordinate subtasks. The order doesn't matter.

Abstract Code

- Run the **Show Homepage** task.
 - Query for information about the current user using \$Email
 - Find the current user and display User.FirstName and User.LastName
 - If current user owns at least 1 CorkBoard then:
 - Try: Select all CorkBoards where the current user participates in the Owns relationship with the CorkBoard and display in the **My CorkBoards** sub form on the **Home Page** form
 - Except: Display Error "Could not load My CorkBoards"
 - Else:
 - Display message "You have no CorkBoards"
 - Try: Query information to be displayed on the **Recent CorkBoard Updates** subform
 - Select all CorkBoards where the current user participates in either the Owns or the Watches relationship with CorkBoard
 - Order by TimePinned in descending order
 - Display the top 4 results in the **Recent CorkBoard Updates** subform of the **Home Page** form
 - If no recent updates exist then:
 - Display message "No Updates."
 - Except: Display Error "Could not load Recent Updates"
 - **Show "Popular Tags", "Add CorkBoard", "Popular Sites", "CorkBoard Statistics" and "PushPin Search" buttons**
 - If click **Popular Tags** button then jump to **Popular Tags** task
 - Else if click **Add CorkBoard** button then jump to **Add CorkBoard** task
 - Else if click **PushPin Search** button then jump to **Query PushPin Search** task

Authenticate Private:

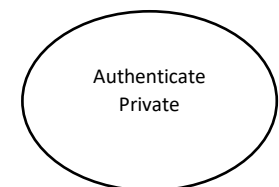
Task Decomp

Lock Types: Read-only on Private CorkBoard

Number of Locks: Single

Enabling Conditions: A user must authenticate and attempt to view a private corkboard

Frequency: Less than 200 per day



Consistency (ACID): Not critical, even if the private corkboard is being updated while being viewed

Subtasks: No mother task or decomposition

Abstract Code

- User clicked on a **CorkBoard** that was marked private
- Redirect to **Password Protected CorkBoard** form
- Display **OK** and **Cancel** buttons
- User enters the password ('\$Password')
- If data validation is successful for the password input field then:
 - When **OK** button is clicked:
 - If \$Password == PrivateCorkBoard.Password:
 - Jump to **Get CorkBoard Data** task
 - Else:
 - Redirect back to **Password Protected CorkBoard** form and display an error message
 - When **Cancel** button is clicked:
 - Redirect back to **Home Page** form

Get CorkBoard Stats:

Task Decomp

Lock Types: 4 read-only lookups on Private CorkBoard, Public CorkBoard, PushPin for Private CorkBoard and PushPin for Public CorkBoard

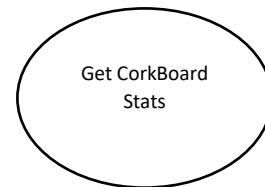
Number of Locks: Four

Enabling Conditions: User must have authenticated

Frequency: Very low

Consistency (ACID): Not critical

Subtasks: No Mother Task or Task Decomposition needed



Abstract Code

- User clicked on the **CorkBoard Stats** button on the main menu
- Query for information about all the CorkBoardIt Users
 - Sort all the users by the number of Public CorkBoards owned by them
 - If more than one user has the same number of Public CorkBoards then:
 - Sort by the number of Public PushPins

- If more than one user has the same number of Public CorkBoards and Public PushPins then:
 - Sort by the number of Private CorkBoards
- If more than one user has the same number of Public CorkBoards, Public PushPins and Private CorkBoards then:
 - Sort by the number of Private PushPins
- Display queried data on **CorkBoard Statistics** form
- Find the current user using \$Email stored in the HTTP Session Cookie
 - Color the current users row red on the **CorkBoard Statistics** form
- When user is finished they can click on ***CorkBoardIt*** logo button to return to **Home Page**

Get Site Data:

Task Decomp

Lock Types: Read-only on PushPins

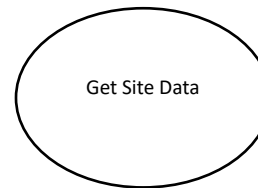
Number of Locks: Single

Enabling Conditions: User must be authenticated

Frequency: Very low

Consistency (ACID): Not critical

Subtasks: No mother task or decomposition



Abstract Code

- User clicked ***Popular Sites*** button from **Home Page**
- Select All PushPin.URL
- Trim each URL starting after “http://” or “https://” and until the next forward slash
- Group By trimmed URL and count all
- Display results on **Popular Sites** form
- When user is finished they can click on ***CorkBoardIt*** logo button to return to **Home Page**

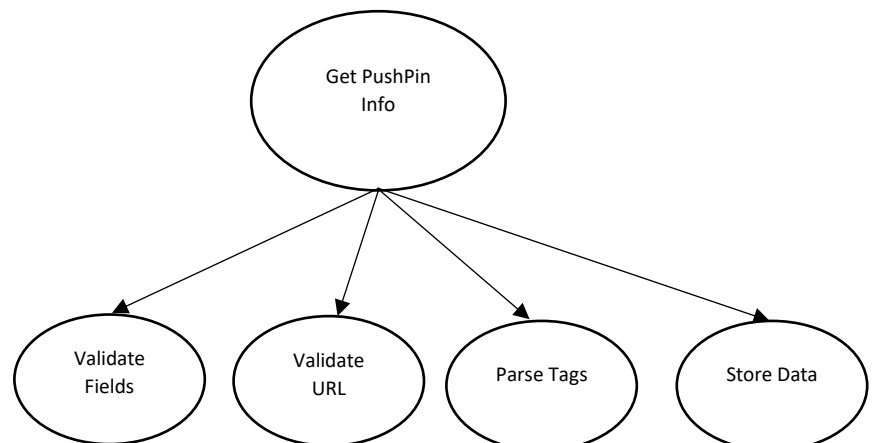
Get PushPin Info:

Task Decomp

Lock Types: Write to PushPin

Number of Locks: Single

Enabling Conditions: User must be



authenticated and User must own the
CorkBoard

Frequency: Between 1,000 and 5,000 daily

Consistency (ACID): Important. Same pushpin cannot be added to same corkboard more than once

Subtasks: A mother task is needed. Subtasks must be completed in the following order (1a and 1b can be done in parallel):

- 1a. Validate Required Fields Complete
- 1b. Validate URL
2. Parse tags
3. Store data in database

Abstract Code

- User clicks on **Add PushPin** button from **View CorkBoard** form
 - Current CorkBoard is stored in the HTTP Session Cookie using CorkBoard.Title
- User enters URL ('\$URL'), Description ('\$Description'), Tags ('\$Tags') input fields
- If all input fields are successfully validated then:
 - When **Add** button is clicked:
 - Parse \$Tags and create a list \$TagsList
 - PushPin with values \$URL, \$Description, \$TagsList is added to the current CorkBoard
 - Redirect to **View CorkBoard** form of current CorkBoard
- Else:
 - When **Add** button is clicked:
 - Redirect to **Add PushPin** form with error message displayed

Add Corkboard:

Task Decomp

Lock Types: Read-only on Categories, Write to Corkboard

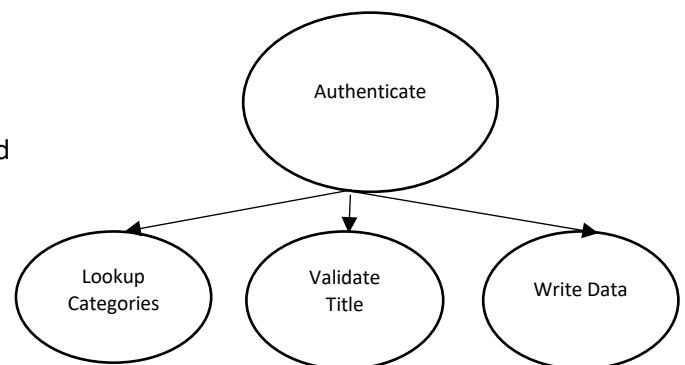
Number of Locks: 2

Enabling Conditions: User must be authenticated

Frequency: Less than 200 per day

Consistency (ACID): Important User cannot create same corkboard more than once

Subtasks: A mother task is needed. Subtasks must be completed in the following order:



1. Lookup Categories
2. Validate Title is unique by User
3. Write data to database

Abstract Code

- User clicked on **Add CorkBoard** button from the Home Page form
- Load Category list from database and populate drop down options
- User enters Title ('\$Title'), Category ('\$Category'), Visibility ('\$Visibility') and if \$Visibility == 'Private' then Password ('\$Password') input fields
- If all input fields are successfully validated then:
 - When **Add** button is clicked:
 - If \$Visibility == 'Private' then:
 - Create a new PrivateCorkBoard with values \$Title, \$Category, \$Password
 - Set the current user as the identifying entity of the CorkBoard
 - Redirect to View CorkBoard form, showing newly created PrivateCorkBoard
 - Else:
 - Create a new PublicCorkBoard with values \$Title, \$Category
 - Set the current user as the identifying entity of the CorkBoard
 - Redirect to View CorkBoard form, showing newly created PublicCorkBoard
 - Else:
 - When **Add** button is clicked:
 - Redirect to Add CorkBoard form with error message displayed

Query Pushpin Search:

Task Decomp

Lock Types: Read-only on PushPin

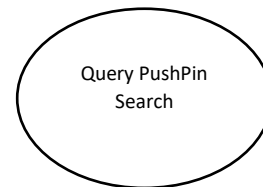
Number of Locks: Single

Enabling Conditions: User must be authenticated

Frequency: Between 1,000 and 5,000 daily

Consistency (ACID): Not critical

Subtasks: No mother task or decomposition



Abstract Code

- User entered a search term ('\$SearchTerm') into input field and clicked **PushPin Search** button from **Home Page** form
- If \$SearchTerm is successfully validated then:
 - Select All PushPin instances and related CorkBoard instances WHERE PushPin.Description contains \$SearchTerm AND WHERE the PushPin instance belongs to a public CorkBoard instance
 - Display the query results on the **PushPin Search Results** form
- Else:
 - Redirect to **Home Page** form and display an error message
- When user is finished they can click on **CorkBoardIt** logo button to return to **Home Page**

Get Popular Tags:

Task Decomp

Lock Types: Read-only on PushPin and CorkBoards

Number of Locks: Two

Enabling Conditions: User must be authenticated

Frequency: Very low

Consistency (ACID): Not critical

Subtasks: No Mother Task or Task Decomposition needed



Abstract Code

- User clicks **Popular Tags** button from the **Home Page** form
- Select a count of PushPin instances and a count distinct of CorkBoard Instances Grouped By Tag
- Display query results on **Popular Tags** form
- Display popular tags as hyperlinks buttons
- If user clicks a hyperlink jump to **Query PushPin Search**
- When user is finished they can click on **CorkBoardIt** logo button to return to **Home Page**

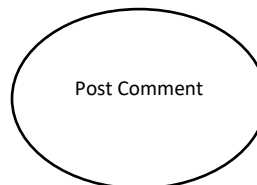
Post Comment:

Task Decomp

Lock Types: Write to Comments

Number of Locks: Single

Enabling Conditions: User must be authenticated & User must be allowed to comment



Frequency: 1,000 to 5,000 daily

Consistency (ACID): Not critical, users can leave comments simultaneously

Subtasks: No mother task or decomposition needed

Abstract Code

- User enters description ('\$Description') and clicks the **Post Comment** button from the **View PushPin** form
- \$Email of the current user is grabbed from the Session Cookie and the current users User.Name value is looked up
- If \$Description is successfully validated then:
 - When **Post Comment** button is clicked:
 - A comment is added to the database with the current PushPin participating as the identifying entity
 - The values \$Email, \$Description and the current system datetime is added as values for the new comment
 - Redirect back to the **View PushPin** form of the current PushPin with the new comment added to the list of comments
- Else:
 - When **Post Comment** button is clicked:
 - Redirect back to the **View PushPin** form of the current PushPin and display an error message
- When user is finished they can click on **CorkBoardIt** logo button to return to **Home Page**

Like/Unlike PushPin:

Task Decomp

Lock Types: Write to PushPin

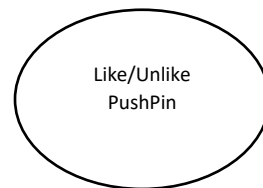
Number of Locks: Single

Enabling Conditions: User must be authenticated & User must not own pushpin

Frequency: 1,000 to 5,000 daily

Consistency (ACID): The same user can not like the same pushpin multiple times without first unliking the pushpin. Other users may like/unlike the same pushpin simultaneously without worrying about consistency in that instance

Subtasks: No mother task or decomposition needed



Abstract Code

- User clicks the **Like/Unlike** button on the **View PushPin** form

- If the user is currently participating in the Likes relationship with the current PushPin then:
 - Remove that instance of the Likes relationship
 - Redirect to **View PushPin** form with the ***Like/Unlike*** button flipped to 'Like'
- Else:
 - Add an instance to the Likes relationship with the current user and the current PushPin
 - Redirect to **View PushPin** form with the ***Like/Unlike*** button flipped to 'Unlike'

Follow User:

Task Decomp

Lock Types: Write to Follow

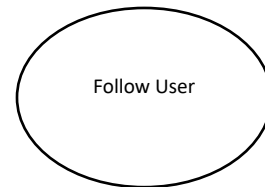
Number of Locks: Single

Enabling Conditions: User must be authenticated

Frequency: <200 daily

Consistency (ACID): Not critical

Subtasks: No mother task or decomposition needed



Abstract Code

- User clicked on ***Follow/Unfollow*** button from either the **View CorkBoard** or **View PushPin** form
- If current user does not participate in the Follows relationship with the target user then:
 - When current user clicks ***Follow*** button:
 - Add target user to list of users the current user follows
 - Redirect to the **View PushPin** form for the current pushpin with ***Follow*** button replaced with an ***Unfollow*** button
- Else:
 - When the current user clicks ***Unfollow*** button:
 - Remove target user from the list of users the current user follows
 - Redirect to the **View PushPin** form for the current pushpin with ***Unfollow*** button replaced with the ***Follow*** button

Get PushPin Data:

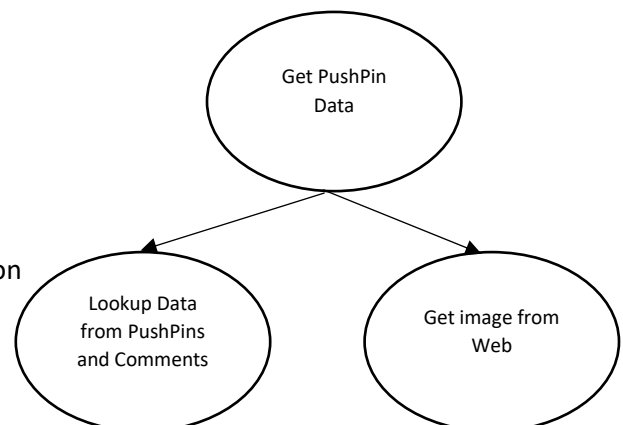
Task Decomp

Lock Types: Read from PushPin and Read from Comments

Number of Locks: 2

Enabling Conditions: User must be authenticated & If PushPin is on Private CorkBoard Then User must Authenticate Private

Frequency: 1,000 to 5,000 daily



Consistency (ACID): Not critical, users can view version while new comments & likes are being added

Subtasks: Mother task is needed. Subtasks must lookup data from PushPins and lookup data from Comments and a second subtask is needed to grab image from the web. Order is not important but all must finish before presenting the page to user

Abstract Code

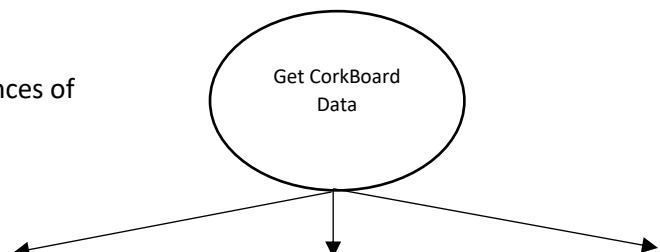
- User clicked on a PushPin from either the **View CorkBoard** or **PushPin Search Results** forms
- Redirect to **View PushPin** form
- If current user owns this PushPin then:
 - Show ***Post Comment*** button
- Else:
 - Show ***Follow/Unfollow, Like/Unlike, Post Comment*** buttons
- If ***Follow/Unfollow*** button is clicked then jump to ***Follow User*** task
- If ***Like/Unlike*** button is clicked then jump to ***Like/Unlike PushPin*** task
- If ***Post Comment*** button is clicked then jump to ***Post Comment*** task
- Query data related to the current PushPin
 - Try: Select User.FirstName and User.LastName and display the results
 - Except: Display error "Could not load User name"
 - Try: Select TimePinned and display the result under the user's first and last names
 - Except: Display Error "Could not load Date last updated"
 - Try: Select the CorkBoard the PushPin is pinned to and display the result as a hyperlink next to the TimePinned
 - Except: Display Error "Could not load CorkBoard Name"
 - Try: Select PushPin.Tags and display in alphabetical order
 - Except: Display Error "Could not load tags"
 - Try: Select all related comments and display the results in time order with newest comments first
 - Except: Display Error "Could not load comments"
 - Try: Select PushPin.URL and pull image from the Web. Display picture as a hyperlink to the original URL
 - Except: Display Error "Could not load images"
- If the hyperlinked CorkBoard is clicked then jump to ***View CorkBoard*** task
- When user is finished they can click on ***CorkBoardIt*** logo button to return to **Home Page**

Get CorkBoard Data:

Task Decomposition

Lock Types: Read from CorkBoard, Lookup all Instances of PushPin-CorkBoard Relationship

Number of Locks: Many

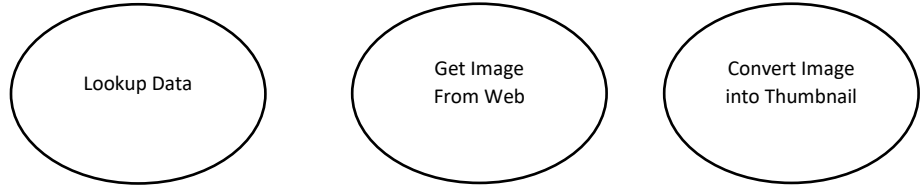


Enabling Conditions: User must be authenticated & If Private CorkBoard Then User must Authenticate Private

Frequency: 100 to 2,500 daily

Consistency (ACID): Not critical, users can view version while new PushPins are added

Subtasks: A mother task is needed to manage subtasks. Subtasks must look up data from CorkBoard as well as lookup all instances of PushPin-CorkBoard Relationship. A second subtask is needed to grab image from the web, a third is needed to convert the image to a thumbnail. The second subtask must finish before starting the third. The first and second can happen in parallel. All must finish before presenting page to user



Abstract Code

- User clicked on hyperlink to CorkBoard in one of many places on the site
- Redirect to **View CorkBoard** form
- Show ***Follow/Unfollow, Add PushPin, Watch*** buttons
- If ***Follow/Unfollow*** button is clicked then jump to **Follow User** task
- If ***Add PushPin*** button is clicked then jump to **Add PushPin** task
- If the current user owns this CorkBoard instance, the CorkBoard instance is private or the User is already watching the CorkBoard instance then disable the ***Watch*** button
- If ***Watch*** button is clicked then jump to **Watch CorkBoard** task
- Query data related to current CorkBoard
 - Select User.FirstName and User.LastName of the identifying user and display it on the **View CorkBoard** form
 - Select CorkBoard.Title, CorkBoard.Category and display them on **View CorkBoard** form
 - Select the newest TimePinned and display it on **View CorkBoard** form as the last updated date
 - Count the number of users watching the this CorkBoard instance
 - Select PushPin.URL for any PushPin instances that participate in the pinned relationship with the current CorkBoard instance
 - For each PushPin.URL pull image from the web and format it as a hyperlinked thumbnail leading back to the URL
- When user is finished they can click on ***CorkBoardIt*** logo button to return to **Home Page**

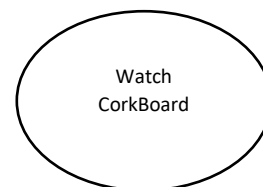
Watch CorkBoard:

Task Decomp

Lock Types: Write to CorkBoard

Number of Locks: Single

Enabling Conditions: User must be authenticated & CorkBoard must not be private



Frequency: 100 to 500 daily

Consistency (ACID): Not critical

Subtasks: No mother task or decomposition needed

Abstract Code

- User clicks on the **Watch/Unwatch** button from the **View CorkBoard** form
- If the user is currently participating in the Watches relationship with the current PushPin then:
 - Remove that instance of the Likes relationship
 - Redirect to **View PushPin** form with the **Watch/Unwatch** button flipped to 'Watch'
- Else:
 - Add an instance to the Likes relationship with the current user and the current PushPin
 - Redirect to **View PushPin** form with the **Watch/Unwatch** button flipped to 'Unwatch'
-
- Add CorkBoard instance to the list of CorkBoards that the current user is watching
- Redirect to the **View CorkBoard** of the current CorkBoard instance