

Banking Security and SSO

Proposed user flows for Banking Security and SSO

Migrations

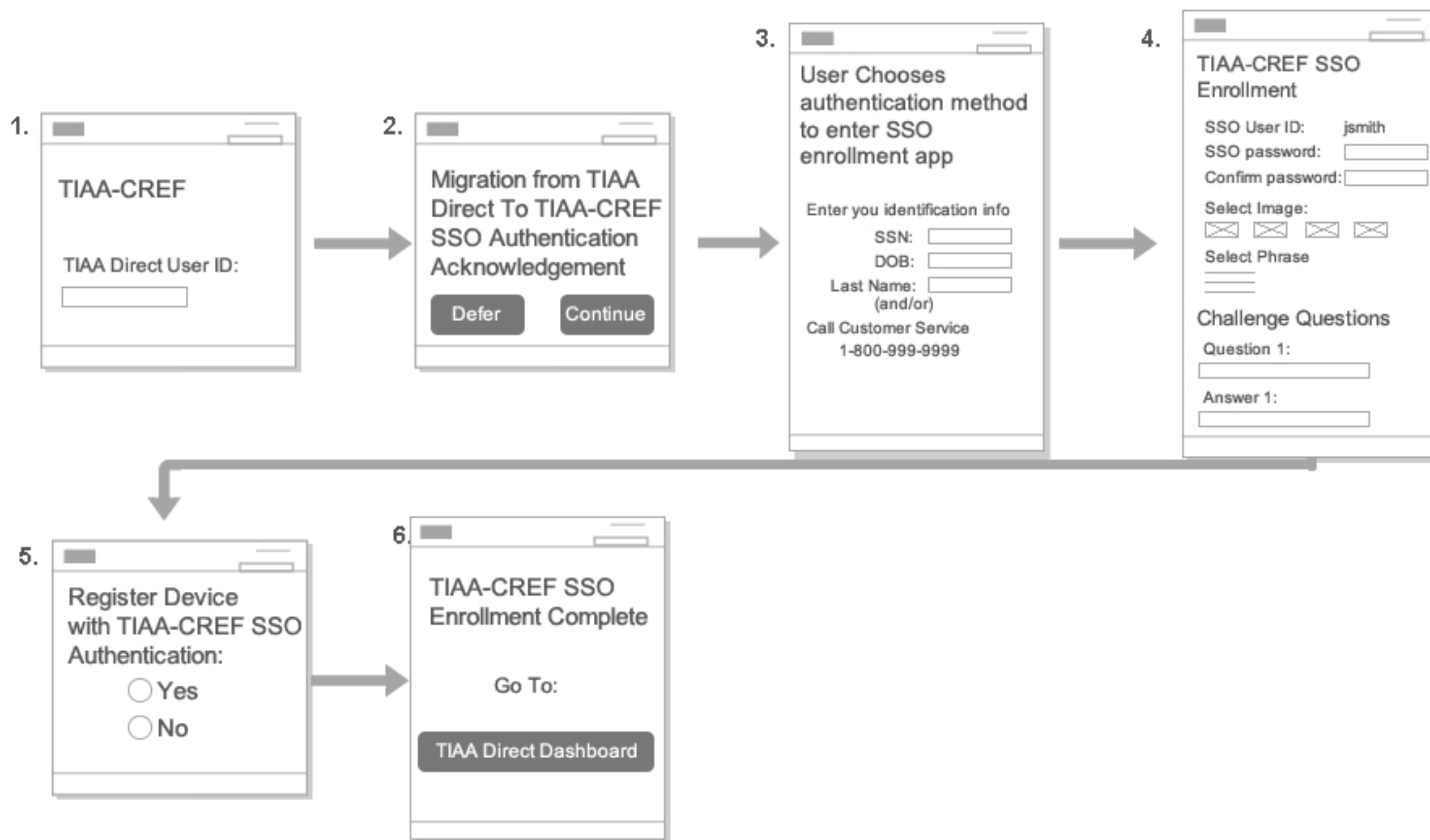
Existing account holder first time logging in since launch of SSO. Their authentication process needs to migrate from FIS to TIAA-CREF.

Assumptions:

1. Entry point: TIAA Direct homepage (except for 1.2 entry point is TIAA-CREF homepage).
2. We can get the User ID, SSN, DOB, Last Name, and email addresses from FIS/PHH
3. We cannot get existing passwords or any other RSA data.
4. For existing TIAA-CREF customers, the goal is to use their existing RSA data as their SSO credentials.

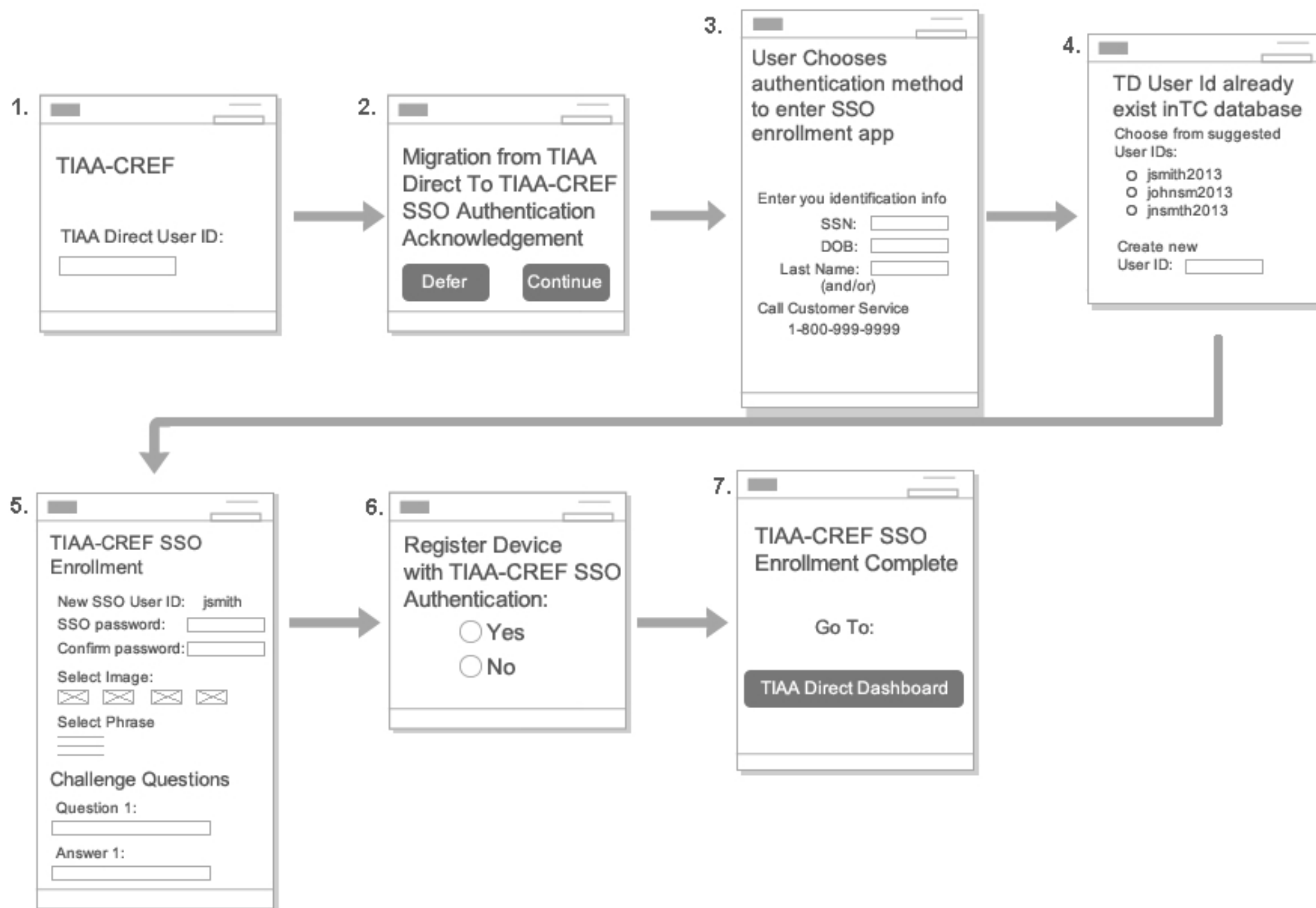
1.0 Migration: existing TIAA Direct customer only; no collision or valid collision of user ids

- Note: SSN, DOB, and Last Name associated with FIS provided TIAA-Direct User ID is queried against TIAA-CREF database for existing accounts and no matching account is found.



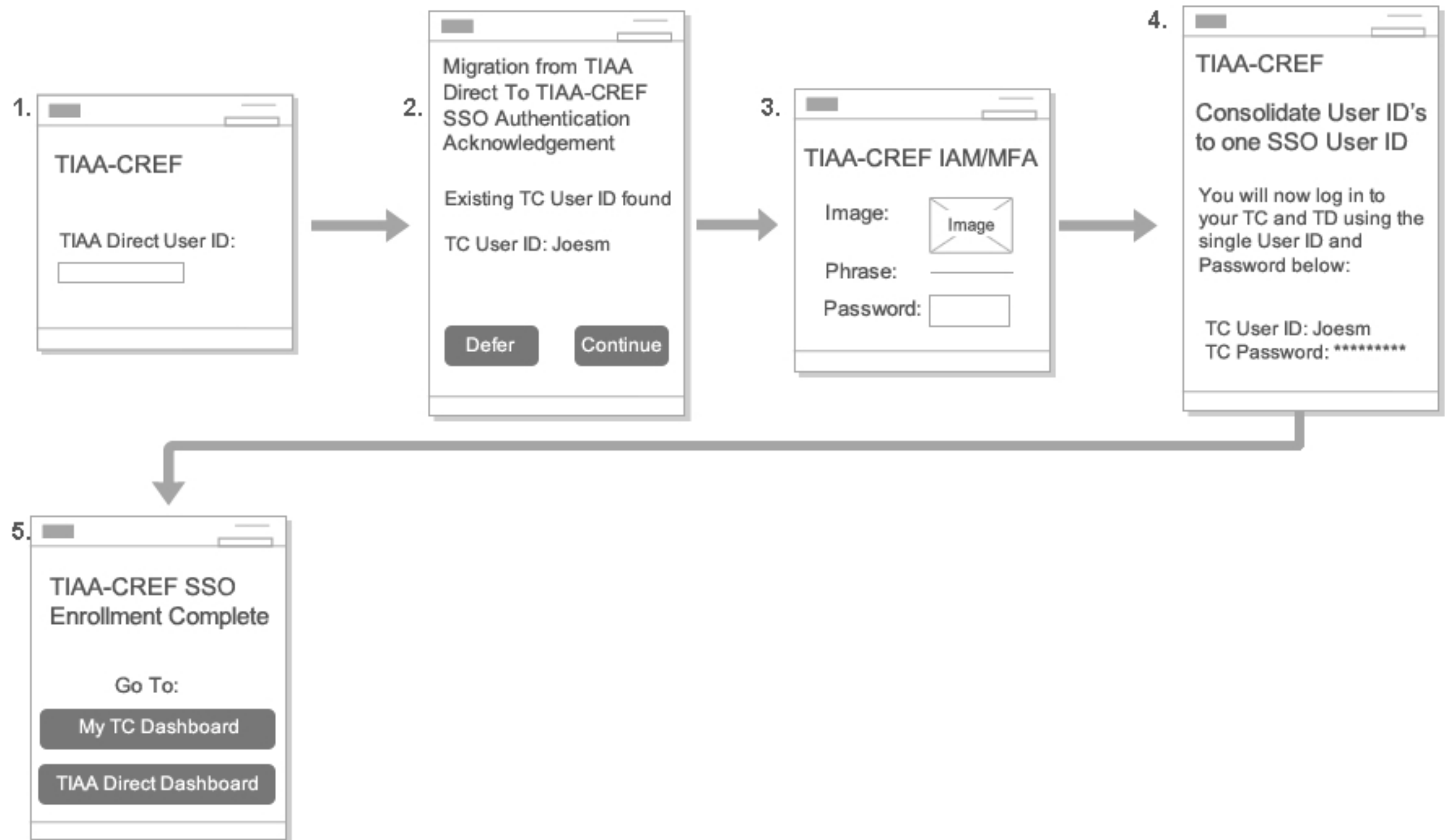
1.0-c Migration: existing TIAA Direct customer only; invalid collision of user ids

- Note: SSN, DOB, and Last Name associated with FIS provided TIAA-Direct User ID is queried against TIAA-CREF database for existing accounts and no matching account is found.



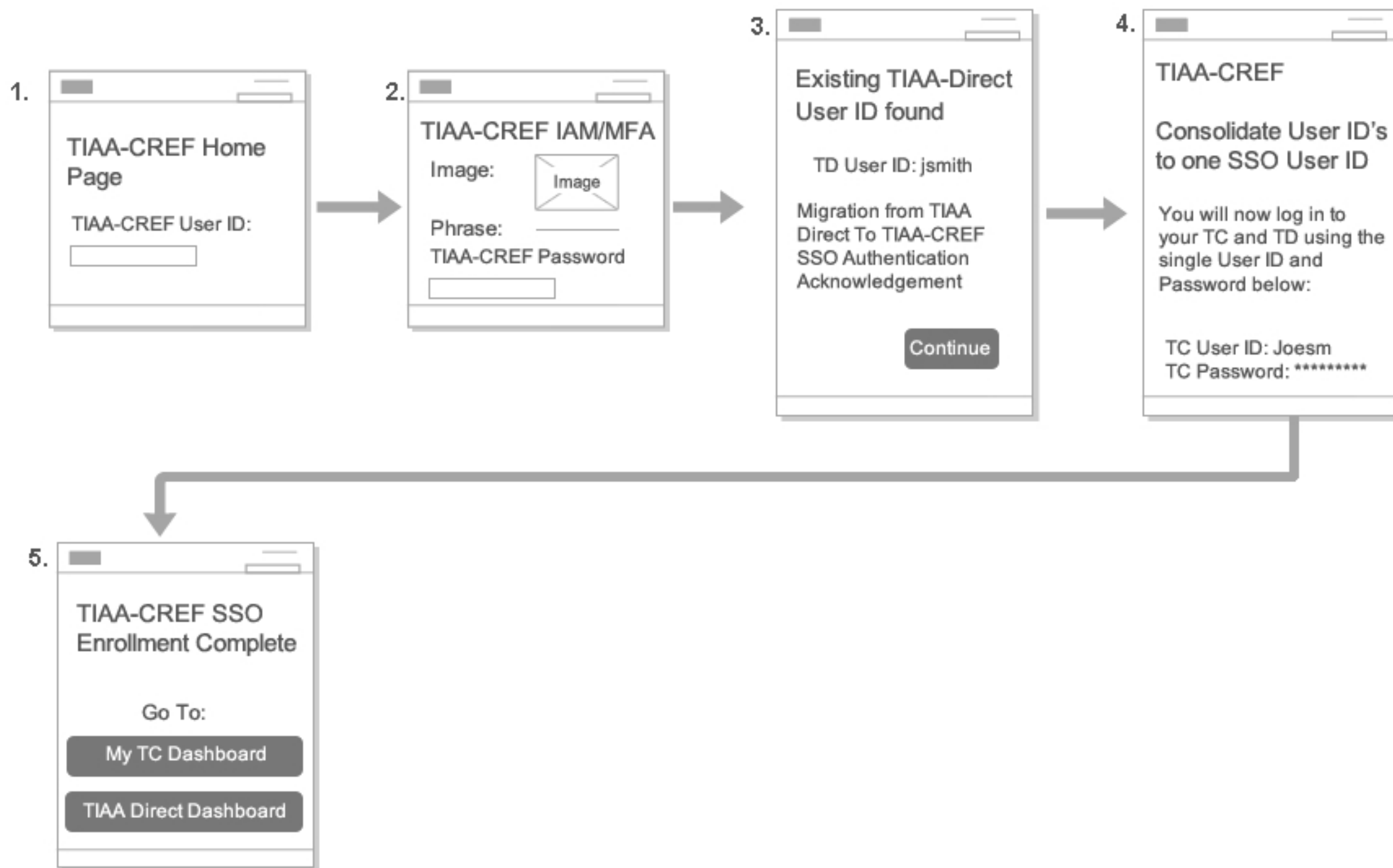
1.1 Migration: existing TIAA Direct and TIAA-CREF customer

- Note: SSN, DOB, and Last Name associated with FIS provided TIAA-Direct User ID is queried against TIAA-CREF database for existing accounts and a matching account is found.



1.2 Migration: existing TIAA Direct and TIAA-CREF customer and user entry point is TIAA-CREF Home Page

- Note: SSN, DOB, and Last Name associated with FIS provided TIAA-Direct User ID is queried against TIAA-CREF database for existing accounts and a matching account is found.



New Enrollment

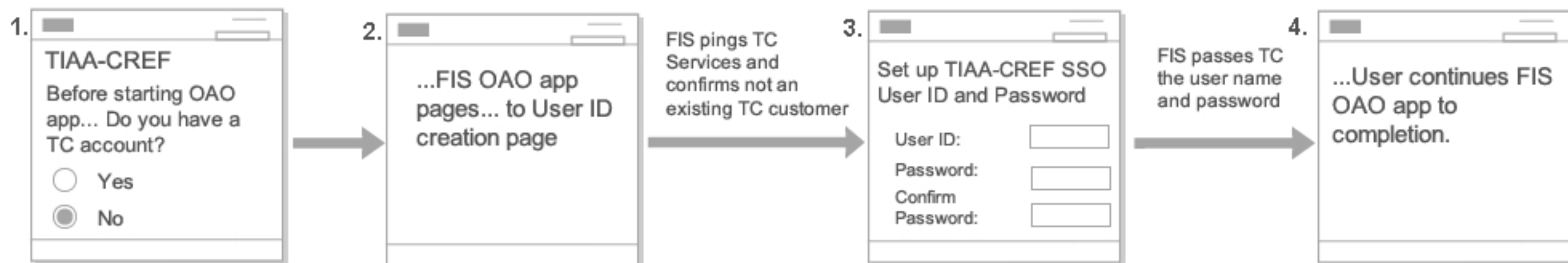
A completely new user (No existing TIAA Direct or TIAA-CREF accounts) opens a new TIAA Direct

Assumptions:

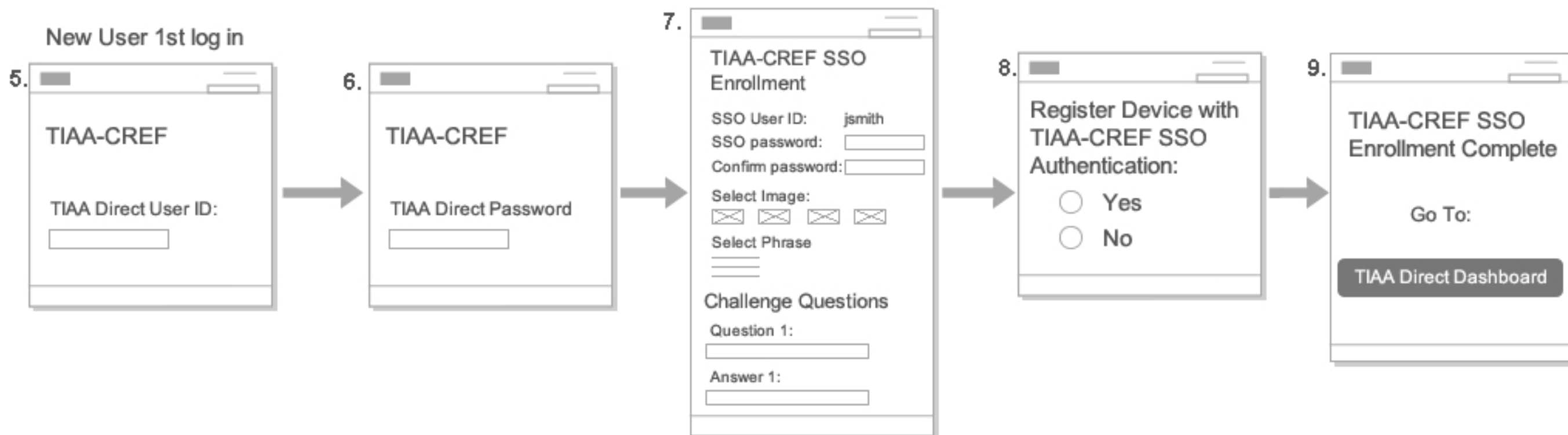
1. The entry point of the user is TIAA Direct home page
2. We cannot break FIS Online Account Opening (OAO) application to have the user enroll into TIAA-CREF SSO process.
3. We can get the new User ID and Password created during OAO from FIS.

2.0 New Enrollment for a completely new customer. This approach changes FIS OAO app process.

- Note: This approach adds a screen (which is on TC side) before entering the FIS OAO app, where the user self identifies as not being an existing TC account holder. This approach also requires an FIS connection to TC database to confirm that there is not an existing account. This will also avoid user ID collisions. FIS will pass TC the new User ID and Password created during the OAO process. The user will complete the SSO enrollment process upon first log in (step 5).

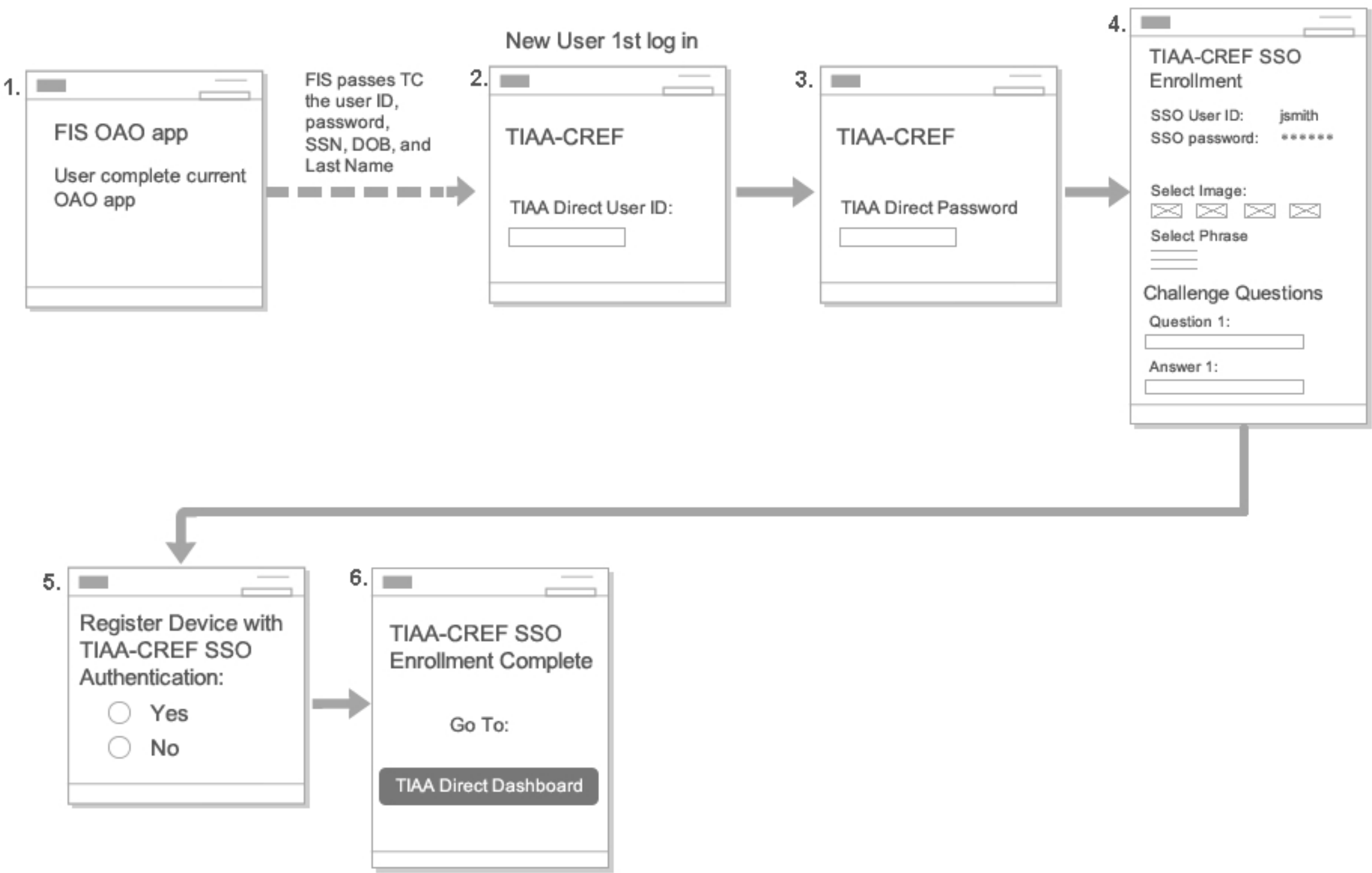


New User 1st log in



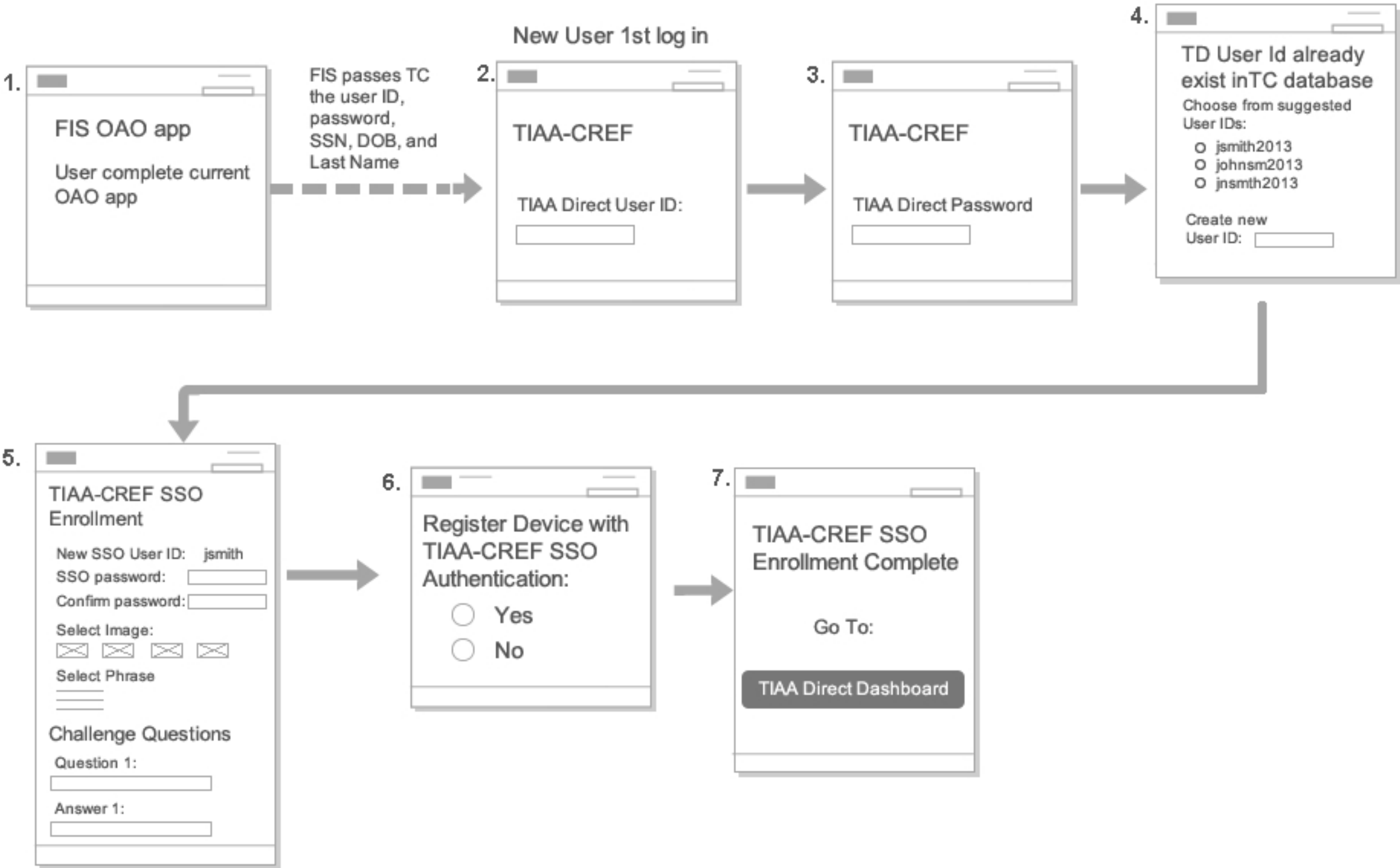
2.1 New Enrollment for a completely new customer. This approach does not change FIS OAO app process. No invalid collision found.

- Note: This approach does not change the existing FIS OAO app. but it requires FIS to pass TC the new User ID and Password created during the OAO process and the user's SSN, Last Name and DOB. TC queries their database with this data and confirms that there is not an existing account and **there was no invalid collision**. The user will complete the SSO enrollment process upon first log in (step 2), which is completed in TC systems.



2.1-c New Enrollment for a completely new customer. This approach does not change FIS OAO app process. Invalid collision found.

- Note: This approach does not change the existing FIS OAO app. but it requires FIS to pass TC the new User ID and Password created during the OAO process and the user's SSN, Last Name and DOB. TC queries their database with this data and confirms that there is not an existing account but **there is a user id collision**. The user will complete the SSO enrollment process upon first log in(Step 2), which is completed in TC systems.



Re-Use of Existing Authentication Data

An existing TIAA-CREF customer opens a new TIAA Direct account

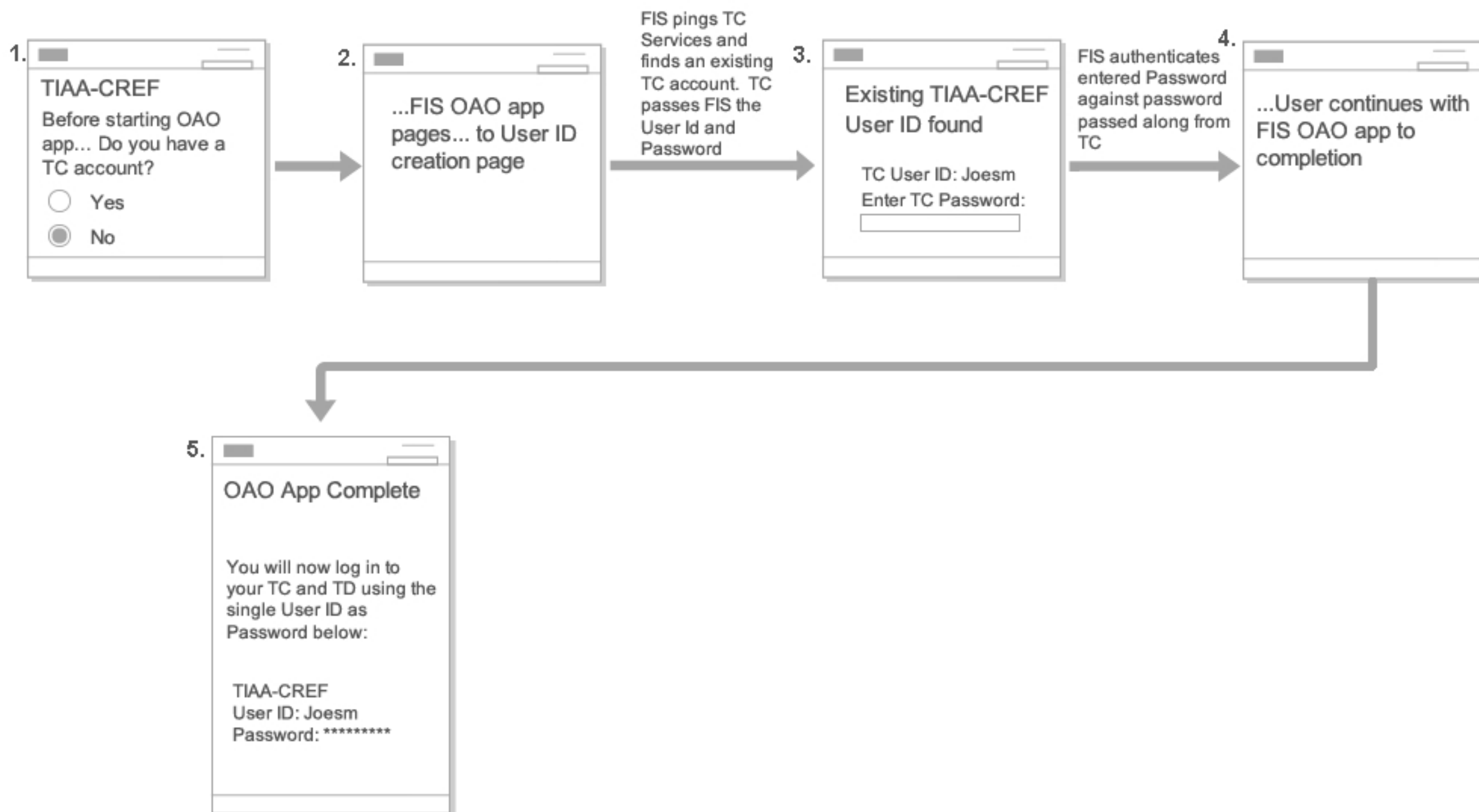
Assumptions:

1. Entry point: TIAA Direct home page (except for 3.3 entry point is TIAA-CREF home page).
2. We cannot break FIS Online Account Opening (OAO) secure app once it is started to have the user authenticated by TIAA-CREF.
3. The user can authenticate using their TIAA-CREF credentials but in FIS Systems.
4. After user authentication, the goal is to auto-populate form fields with any data from TIAA-CREF systems (like personal information), which will simplify the user input when completing the OAO.

Entry point: TIAA Direct homepage, except for 1.2, entry point is TIAA-CREF homepage

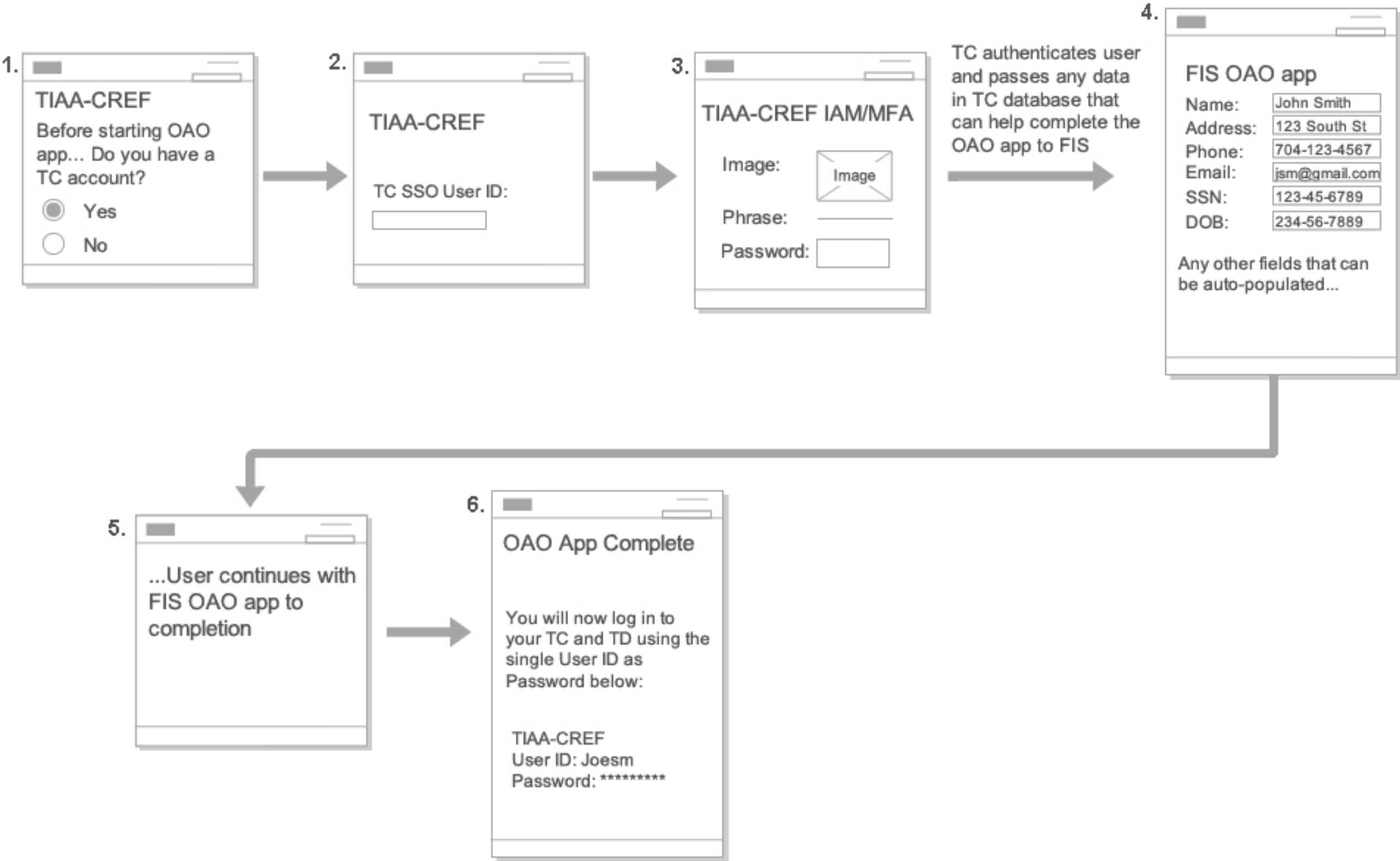
3.0 Re-use of existing TIAA-CREF customer authentication data when opening a new TIAA-Direct account. This approach changes FIS OAO process. User mistakenly acknowledges they do not have an existing TIAA-CREF account.

- Note: This approach adds a screen (which is on TC side) before FIS OAO app where the user self identifies as not being an existing TC account holder, before entering FIS OAO app. This approach also requires an FIS connection to TC database to confirm the user selects and find that there does exist an account for this user in TC database. FIS will validate user using data provided from TC database. User will use existing authentication data in TC database.



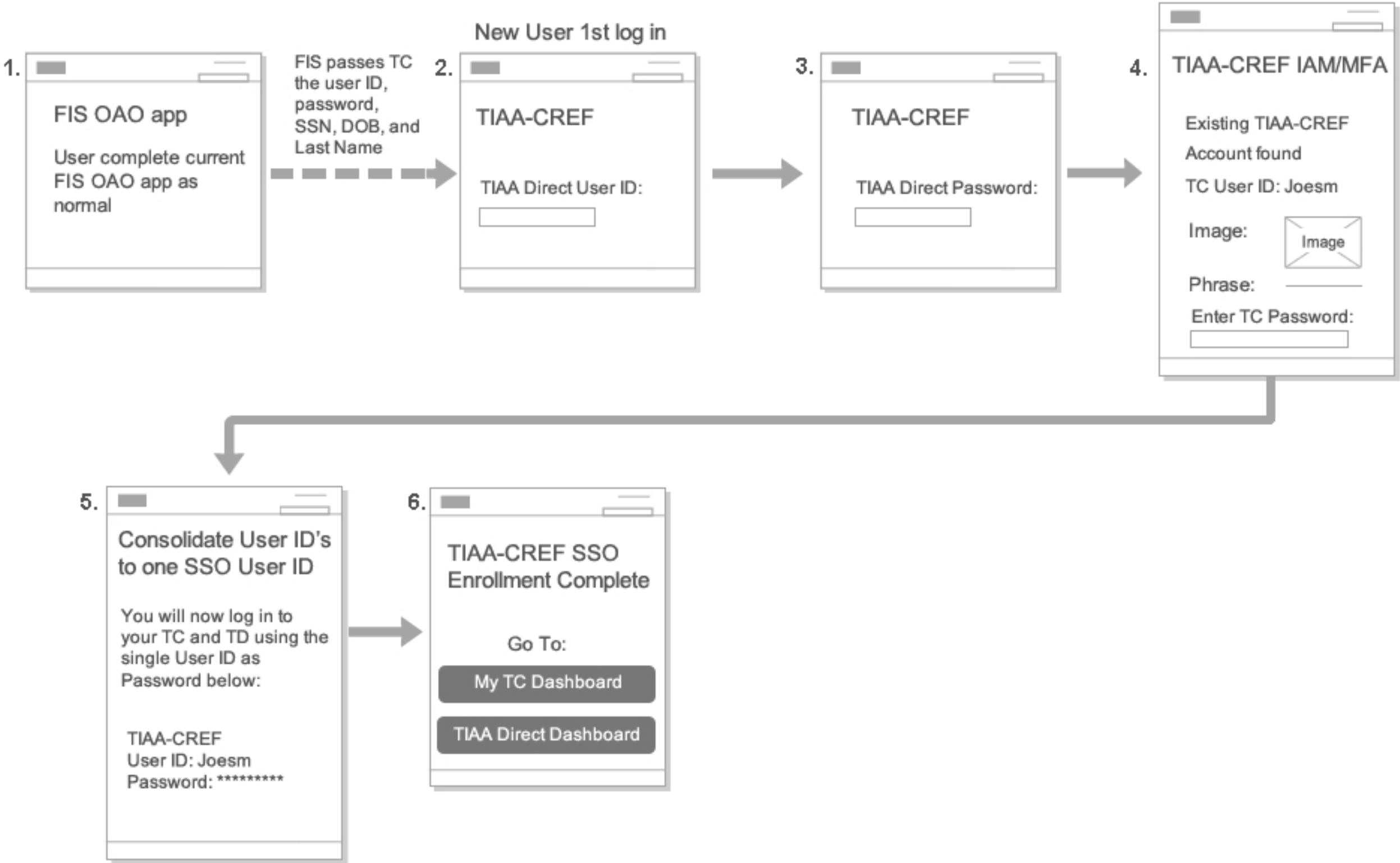
3.1 Re-use of existing TIAA-CREF customer authentication data when opening a new TIAA-Direct account. This approach changes FIS OAO process. User correctly acknowledges that they do have an existing TIAA-CREF account.

- Note: This approach adds several screens (which is on TC side) before FIS OAO app where the user self identifies as being an existing TC account holder, the user logs in using existing TC credentials, and TC authenticates the user on their side. TC then passes along any relevant data to FIS systems that can be used to auto-populated FIS OAO app. The user is not required to complete the SSO enrollment process because TC will use the authentication info associated with the existing TC account.



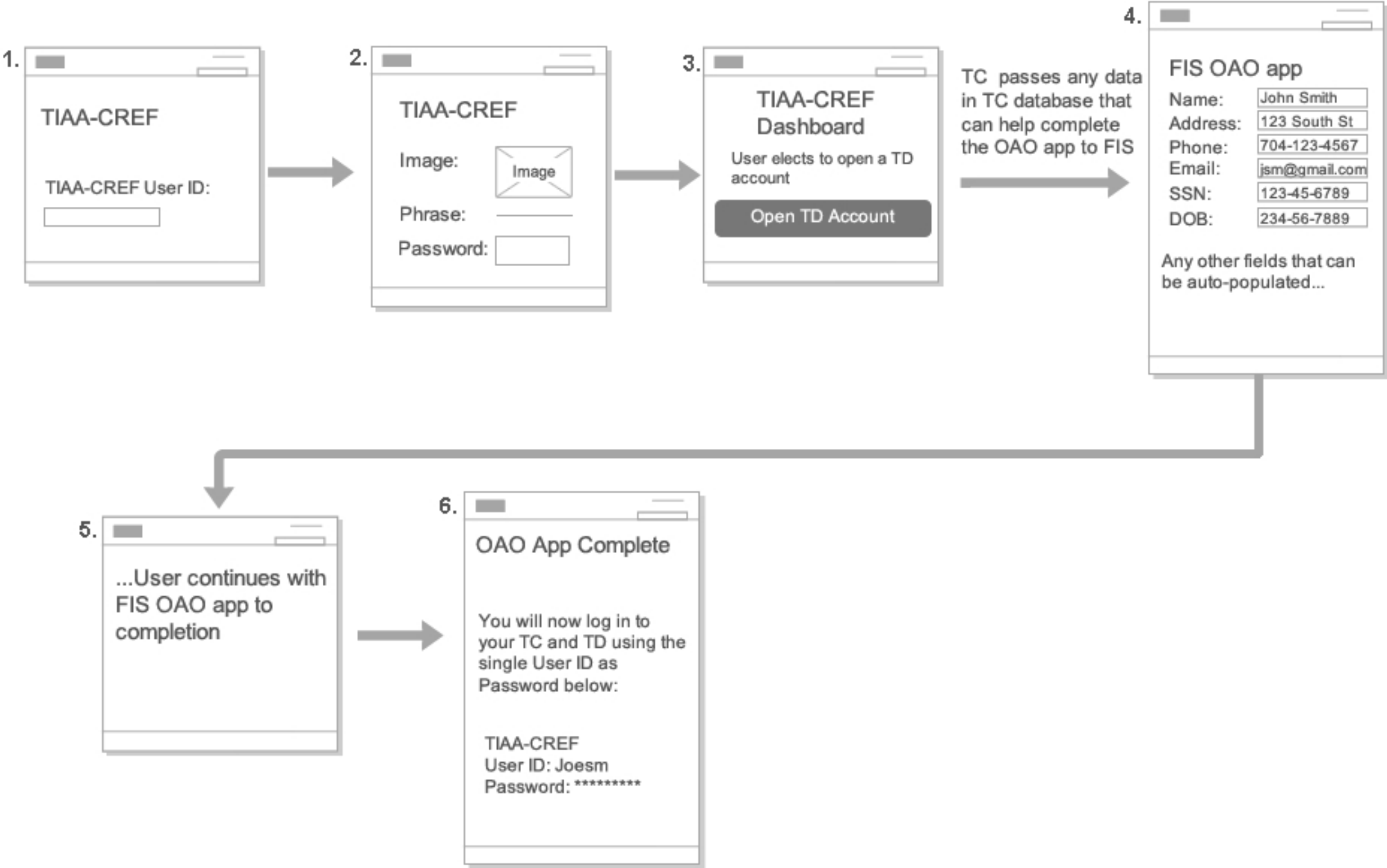
3.2 Re-use of existing TIAA-CREF customer authentication data when opening a new TIAA-Direct account. This approach does not change FIS OAO process.

- Note: This approach does not change the existing FIS OAO app., but it requires FIS to pass TC the new User ID and Password created during the OAO process and the user's SSN, Last Name and DOB. TC queries their database with this data and confirms that there is an existing TC account for this user. The user will authenticate their existing TC account within TC systems and confirm consolidation of accounts. The user is not required to complete the SSO enrollment process because TC will use the authentication info associated with the existing account.



3.3 Re-use of existing TIAA-CREF customer authentication data when opening a new TIAA-Direct account from the user's MyTC dashboard.

- Note: User logs in to TC account as normal and accesses their new dashboard after TD integration into the My TC dashboard. User elects to open a new TD account via the new dashboard. TC then passes along any relevant data to FIS systems that can be used to auto-populated FIS OAO app. The user is informed that their existing TC (SSO) user id and password will provide them access their new TD account.



Additional TIAA Direct Account

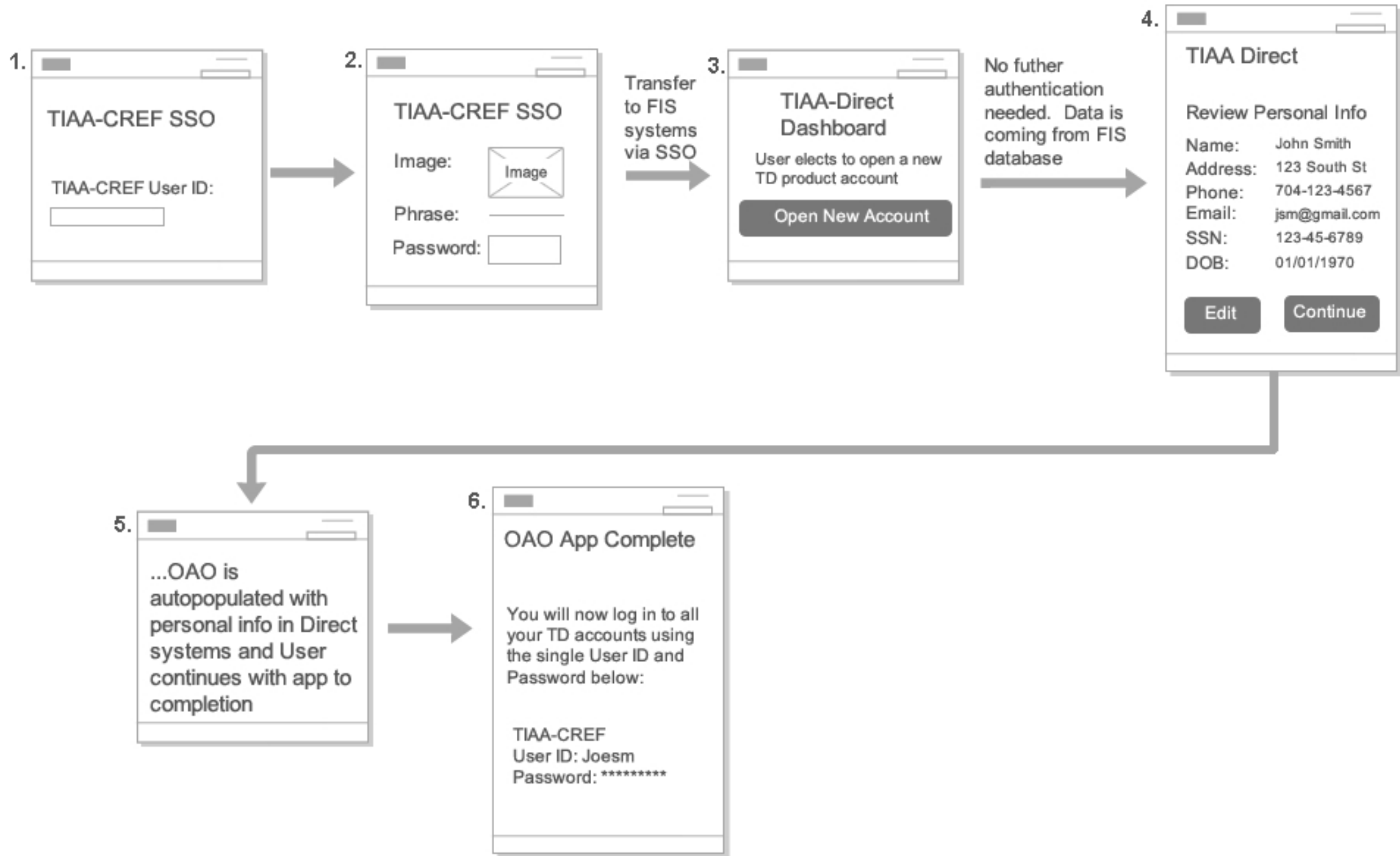
An existing TIAA Direct customer opens a new TIAA Direct account

Assumptions:

1. The entry point of the user is TIAA Direct home page
2. The user can authenticate using their existing TIAA-CREF SSO authentication Data.
3. After user authentication, the goal is to auto-populate form fields with any data from FIS systems (like personal information), which will simplify the user input when completing the OAO.

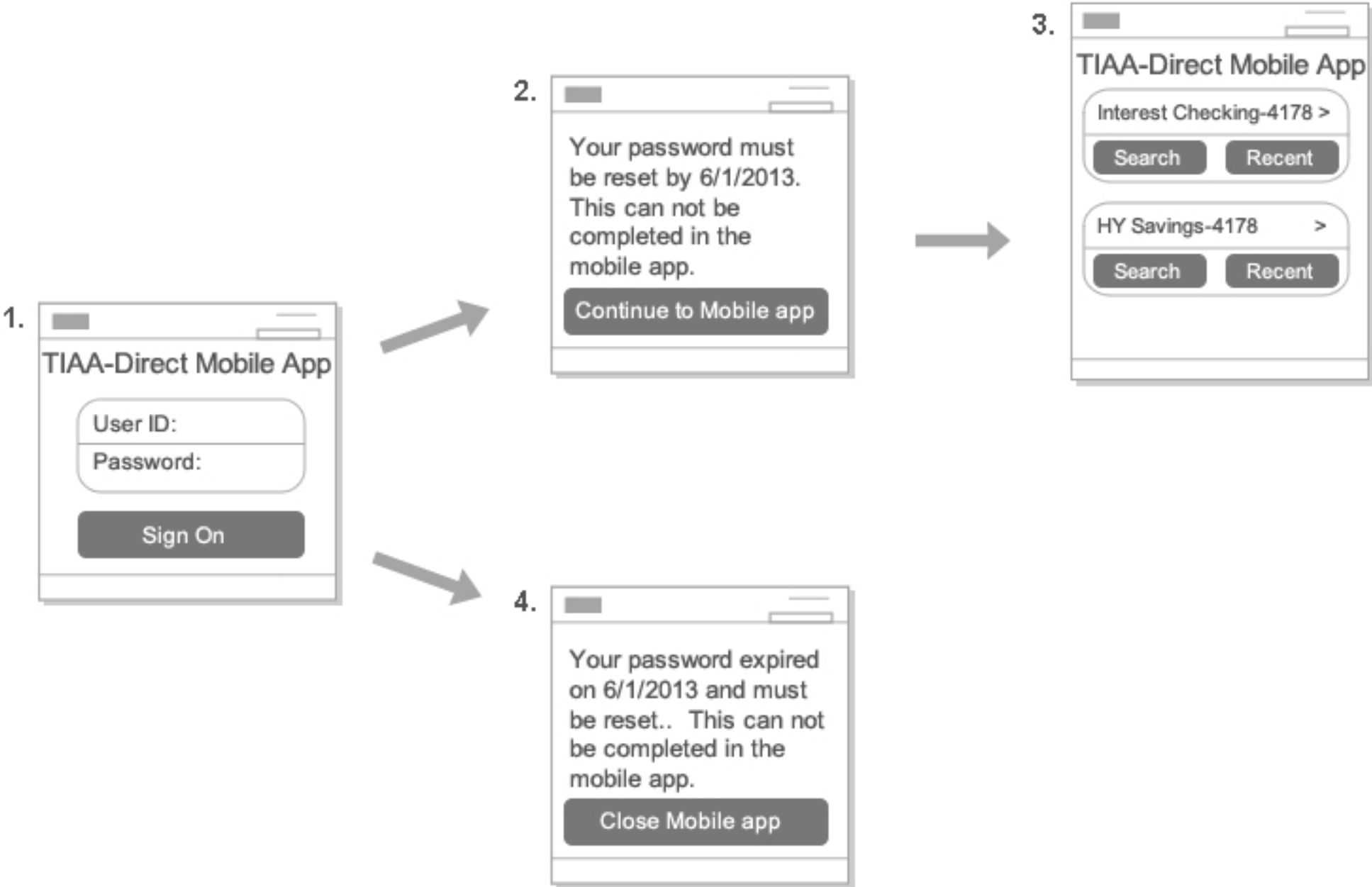
4.0 Additional TD Account: an existing TIAA Direct customer opening a new TIAA Direct Account after migration.

- Note: User logs in to TD account as normal and accesses their new dashboard after TD integration into the My TC dashboard. User elects to open a new TD account via the new dashboard. FIS systems auto-populates FIS OAO app. The user is informed that their existing TC (SSO) user id and password will provide them access their new TD account.



5.0 Migration Notice: Mobile App

- Note: Notice of password reset requirement to occur after logging into the app. FIS will present screen 2 before the deadline and 3 after deadline.



5.1 MFA Log In Approach for Mobile App

