Contents

1 Goals & Objectives

Whilst reading this documentation, it is important to keep the following goals and objectives in mind:

The Doubtfire Helpdesk Ticketing System will provide:

- A way to improve efficiency of helping students
- A way for tutors to track which students need help
- A way to manage tutor clock-on times
- A way for convenors to see how much their students utilise the helpdesk and at what times
- A way for convenors to to see how their tutors are clocking on at the helpdesk

Refer to the extended planning documentation for more on this.

2 Entities

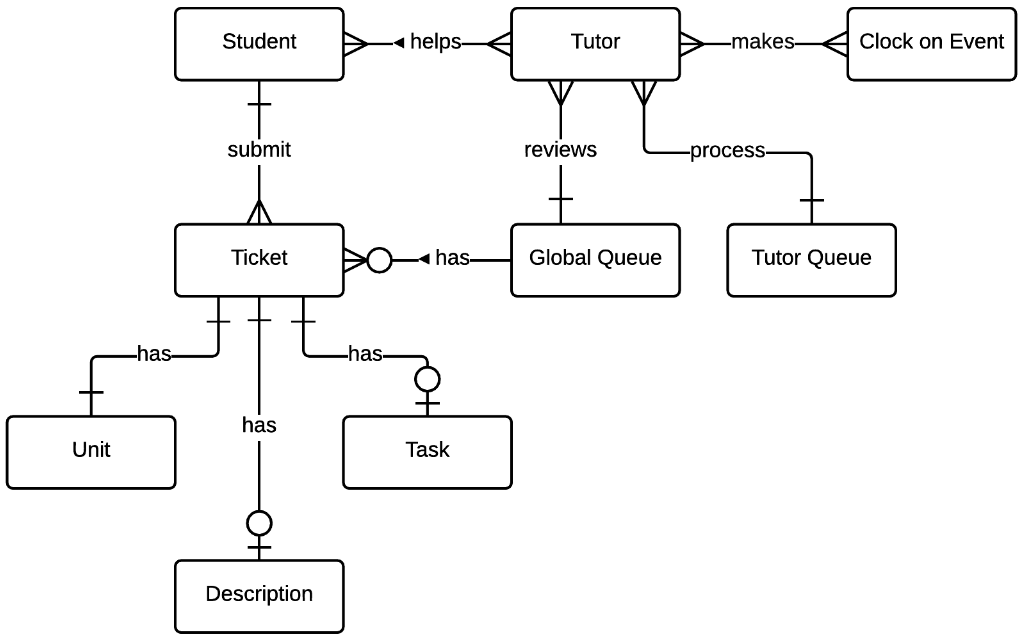

Figure 1: Entity Relationship Diagram highlighting fundamental entities

Figure 1 shows a basic ERD, highlighting the fundamental entities that the helpdesk ticketing system works with.

There is a distinction between a **tutor's queue** and the **global queue**.

A **tutor's queue** is a group of a number of students that a tutor rotates through as he/she helps those students at the helpdesk. It is sorted by the **inverse** time the ticket was last reviewed by the tutor (i.e., last reviewed a while ago or never reviewed at all first, just reviewed a few seconds ago at the end etc.)

A **global queue** is a list of *all unallocated tickets* that have been submitted at the helpdesk. Tutors working at the helpdesk aim to keep this global queue as minimal as possible; when a new ticket comes to the global queue, tutor's may:

1. accept a new ticket, which will move that ticket to the tutor's own queue or,
2. refer that ticket to another tutor, which will move that ticket to the referral's queue.

3 Use Cases

Refer to a summary of use cases in Figure 2.

3.1 Students

3.1.1 Submit a ticket

3.1.1.1 Primary Use Case

Step 1. Student signs into Doubtfire
Step 2. Student selects Helpdesk from header
Step 3. Student selects unit they want help with
Step 4. Student submits the ticket. Doubtfire adds their ticket to the **global queue**
Step 5. Student views an estimate of wait time

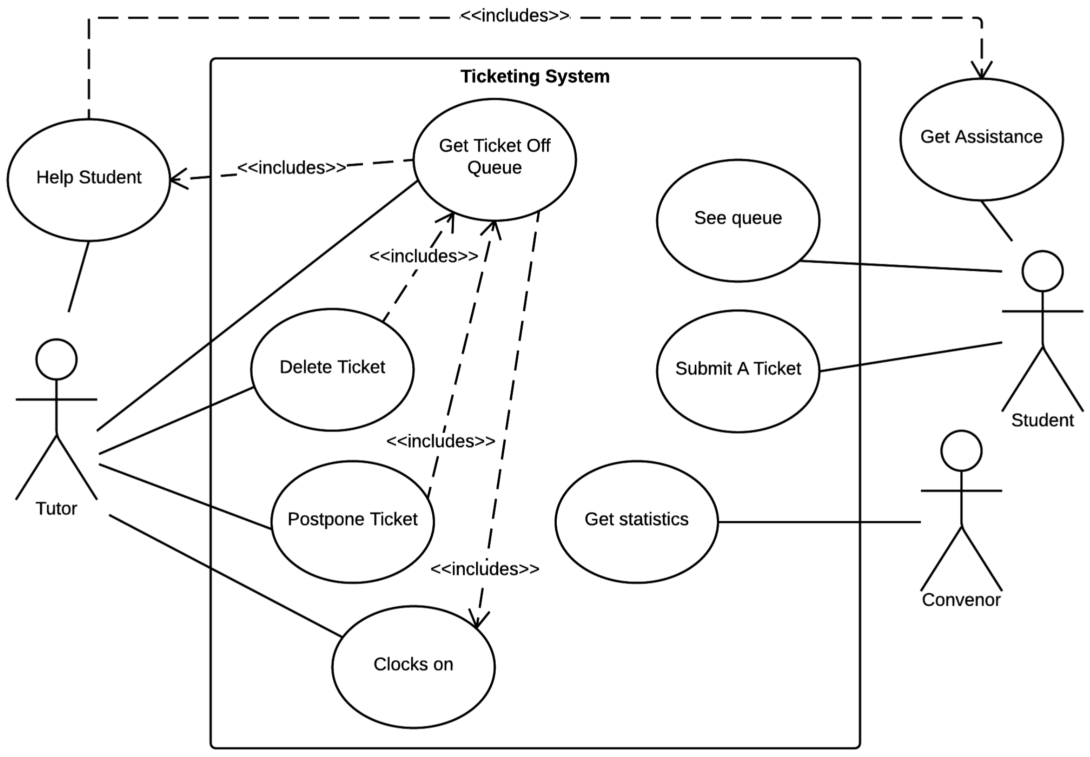

Figure 2: Summary of use cases and interacting actors of the system

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3.1.1.2 Alternate Use Cases

Student doesn't have a computer

Step 1a. Student goes to instructor PC
Step 1b. Student enters in their student ID
Step 1c. Continue from (3)

Helpdesk ticket queue is overloaded

Step 2a. Student is given a visual notice that they might have to wait a while to get help
Step 2b. Student *optionally* cancels the process
Step 2c. Student *optionally* continues from (3)

3.2 Tutors

3.2.1 Clocking On

3.2.1.1 Workflow Diagram

Refer to the workflow diagram provided in the Appendix, Figure 4. This diagram outlines the basic preconditions required for the use cases to be accepted.

3.2.1.2 Primary Use Case

Step 1. Tutor approaches the vicinity of the helpdesk
Step 2. A push notification is received on the tutor's smartphone. See Figure 5.
Step 3. Tutor accepts the push notification and they are clocked on. See Figure 6.

3.2.1.3 Alternate Use Cases

Tutor isn't yet signed into the helpdesk app **or** *bluetooth is disabled*

Step 2a. No push notification is sent
Step 2b. Tutor follows sign in process as indicated in workflow diagram above

Push notifications are disabled **or** *tutor dismisses the notifica tion*

Step 3a. Tutor opens the Helpdesk app on their smartphone and manually clocks on. Refer to Figure 7.

3.2.2 Getting the next ticket off the global queue

3.2.2.1 Primary Use Case

Step 1. Tutor taps the name of the student
Step 2. Tutor accepts the ticket and it is added to the top of their queue

3.2.2.2 Alternate Use Case

Tutor has too many students at the moment and wants someone else to see the s tudent

Step 2a. Tutor refers the ticket to another tutor
Step 2b. Tutor selects a tutor from a list of tutors currently clocked on at the helpdesk
Step 2c. Doubtfire adds that ticket to the queue of the selected tutor

3.2.3 Reviewing the topmost ticket from the tutor's queue

3.2.3.1 Primary Use Case

Step 1. Tutor taps the name of the student
Step 2. App shows details about that ticket
Step 3. Tutor marks the details about the ticket as resolved
Step 4. Ticket is removed from their queue and is purged

3.2.3.2 Alternate Use Case

Tutor indicates that they'll come back later and review the student late r on

Step 3a. Tutor marks the ticket and says that they'll come back later
Step 3b. Ticket is pushed down to the end of their queue; time last saw is updated to now.

Student isn't physically present

Step 2a. Tutor postpone's the ticket; run use case above.

4 High Level Architecture Diagram

A monolithic architecture is to be discouraged whilst developing the helpdesk ticketing system. This is because the one API will keep expanding and become far too big when it doesn't necessarily need to be. This may lead to the APInest becoming too unmaintainable.

In addition, some of the technologies considered, namely Redis and other realtime application frameworks (Socket.IO), cannot be implemented into the existing Rails architecture. An independent microservice will be created to handle this instead.

Refer to Figure 3 for more.

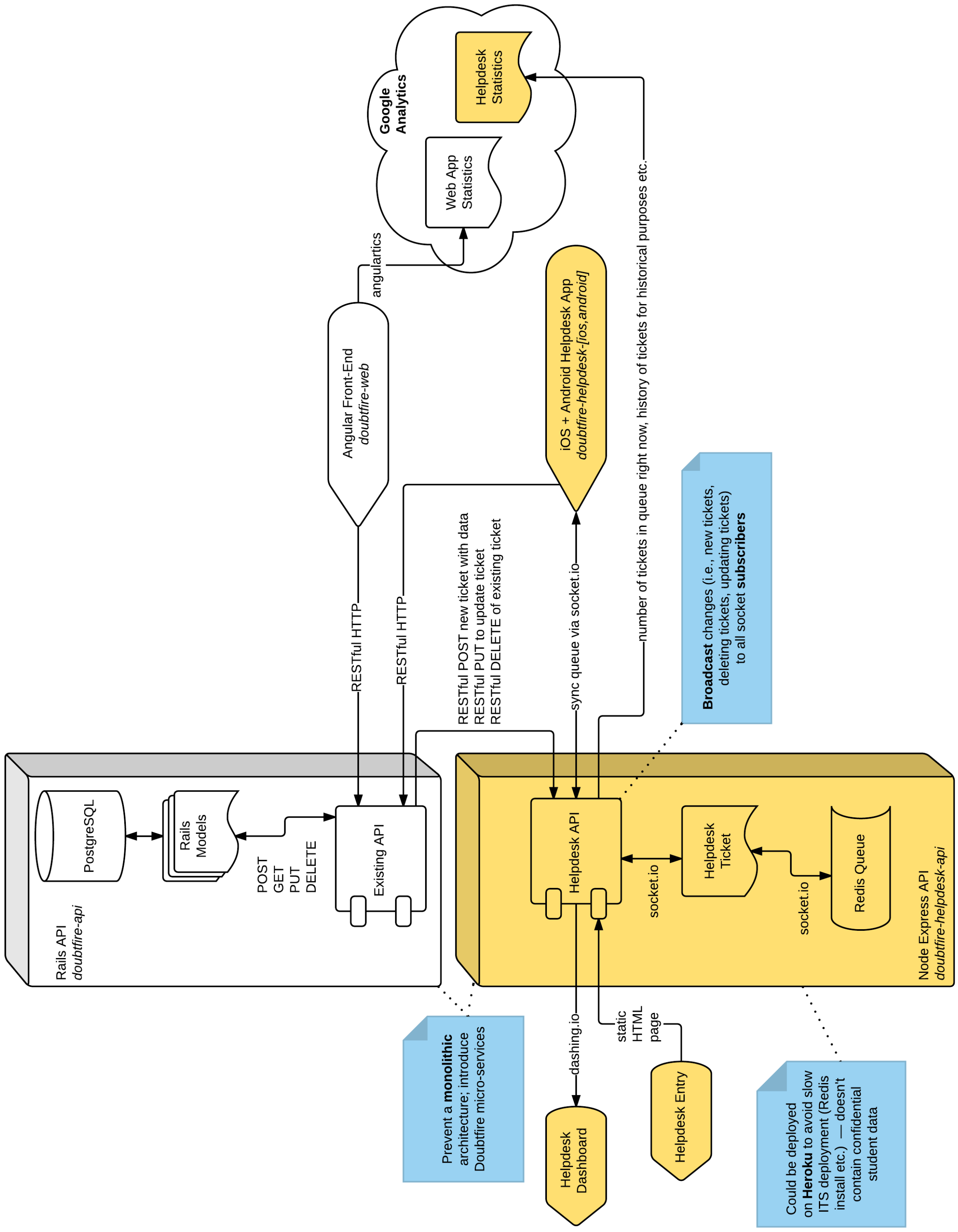

Google Analytics
Helpdesk Statistics
Web App Statistics
angulartics
Angular Front-End
doubtfire-web
iOS + Android Helpdesk App
doubtfire-helpdesk-[ios,android]
number of tickets in queue right now, history of tickets for historical purposes etc.
RESTful HTTP
RESTful HTTP
RESTful POST new ticket with data
RESTful PUT to update ticket
RESTful DELETE of existing ticket
sync queue via socket.io
Broadcast changes (i.e., new tickets, deleting tickets, updating tickets) to all socket subscribers
PostgreSQL
Rails Models
POST
GET
PUT
DELETE
Existing API
Rails API
doubtfire-api
Helpdesk API
socket.io
Helpdesk Ticket
socket.io
Redis Queue
Node Express API
doubtfire-helpdesk-api
dashing.io
static HTML page
Prevent a monolithic architecture; introduce Doubtfire micro-services
Helpdesk Dashboard
Helpdesk Entry
Could be deployed on Heroku to avoid slow ITS deployment (Redis install etc.) — doesn't contain confidential student data

Figure 3: High Level Architecture Diagram

A Supporting Use Case Images

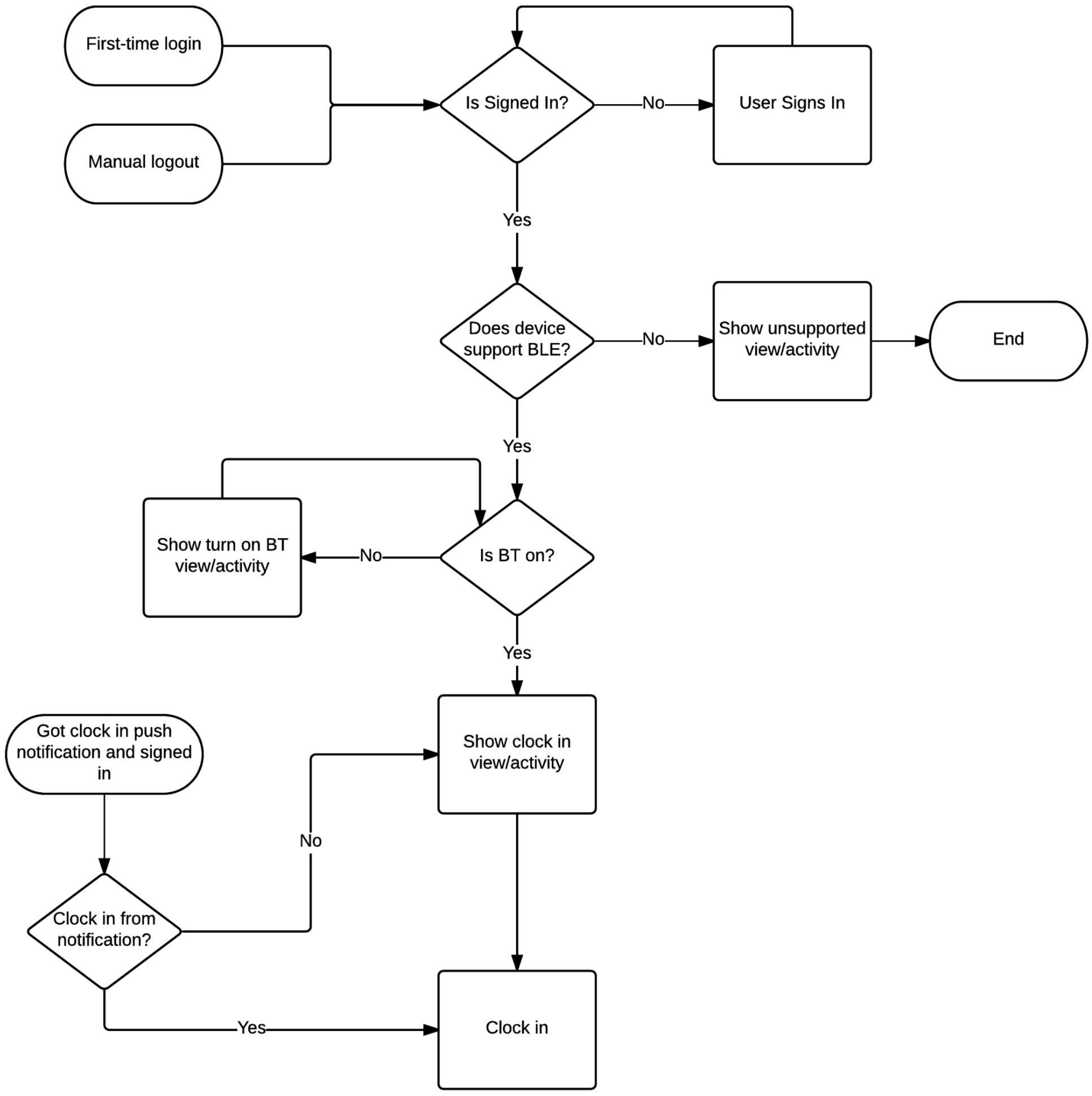
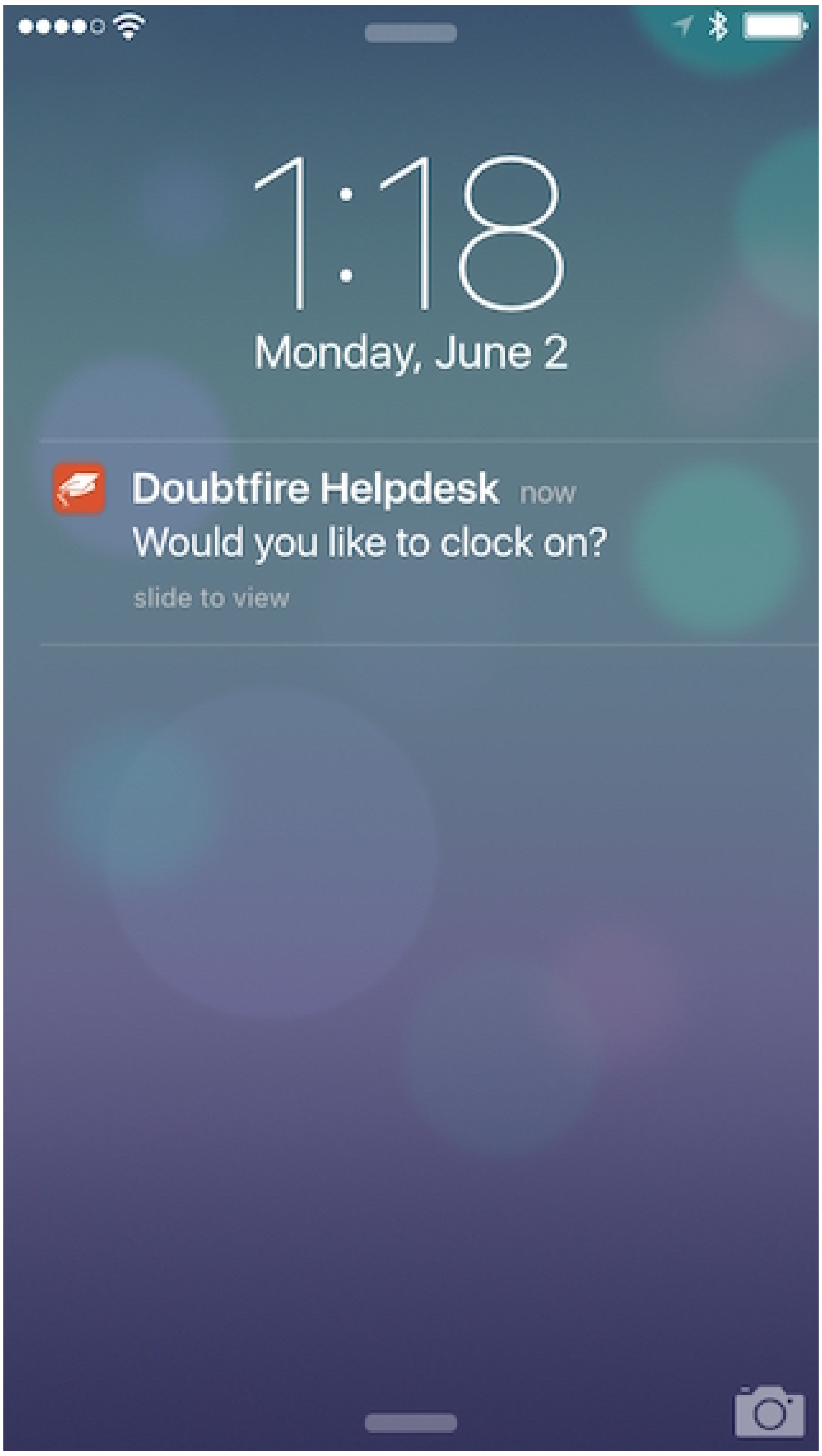

First-time login
Manual logout
Is Signed In?
No
User Signs In
Yes
Does device support BLE?
No
Show unsupported view/activity
End
Yes
Show turn on BT view/activity
No
Is BT on?
Yes
Got clock in push notification and signed in
Show clock in view/activity
No
Clock in from notification?
Yes
Clock in

Figure 4: Workflow diagram for clocking on



Doubtfire Helpdesk now
Would you like to clock on?
slide to view

Figure 5: Push notification to clock on

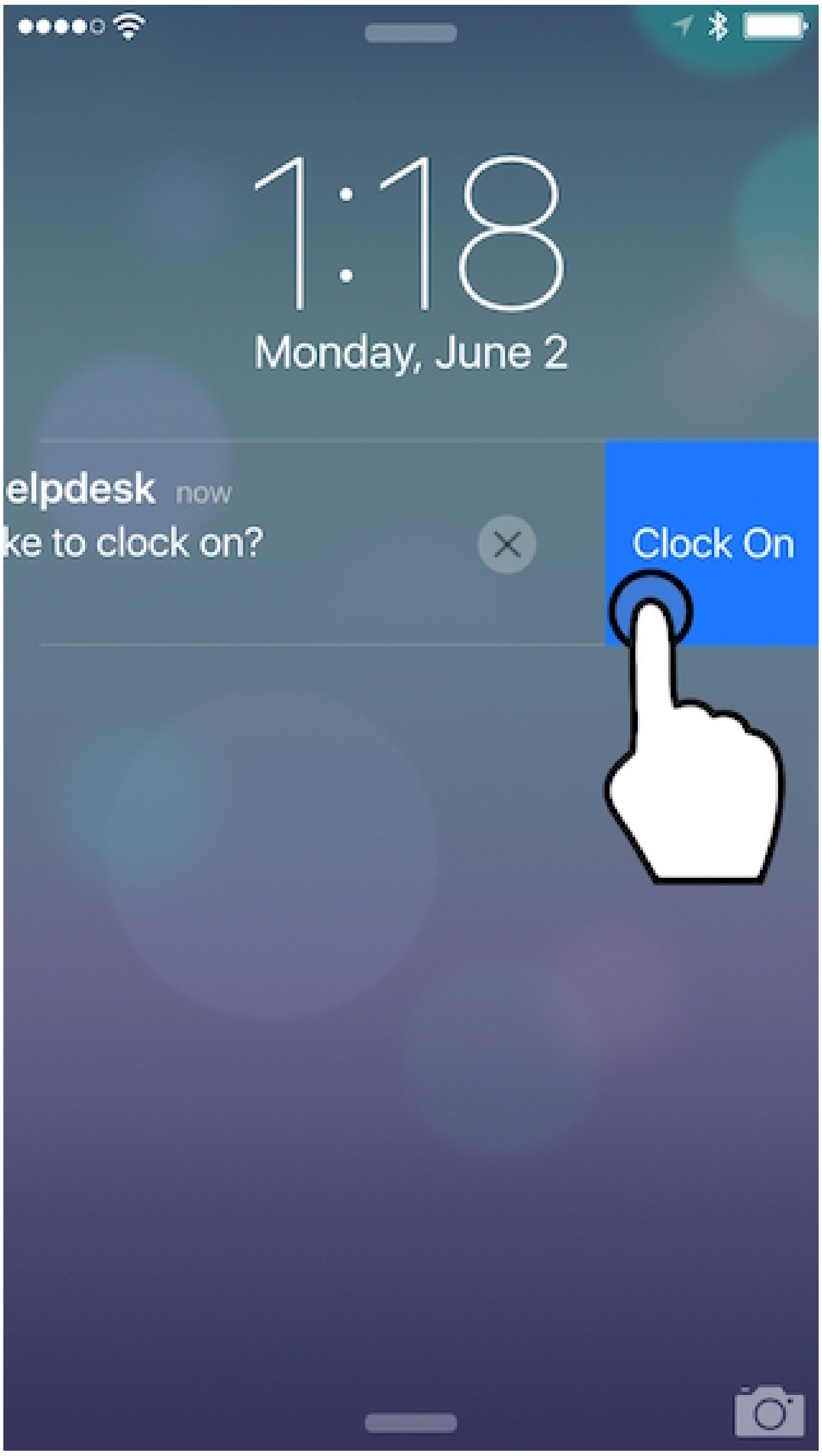


Figure 6: Clock on accept via notification

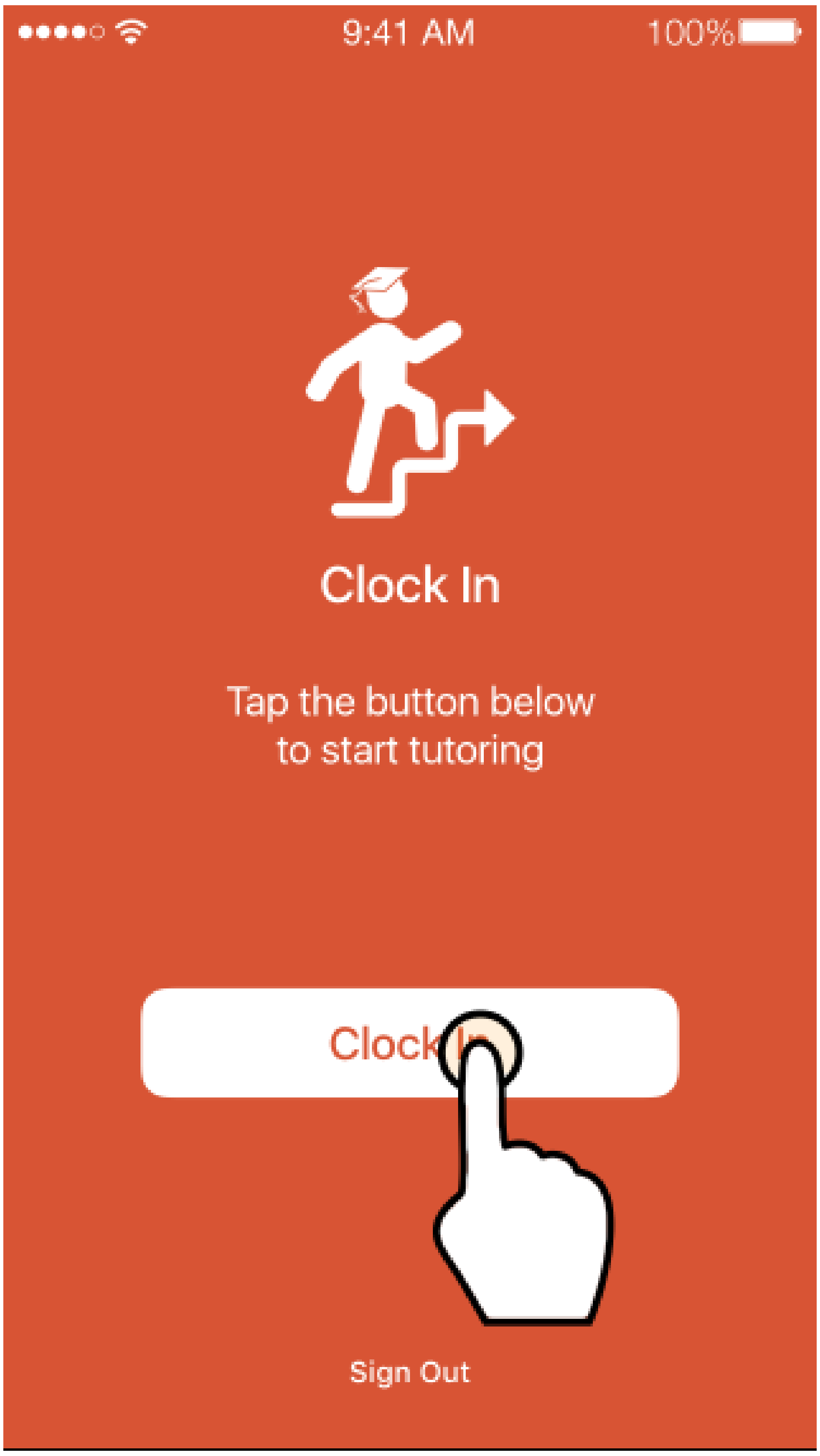


Figure 7: Clock on manually