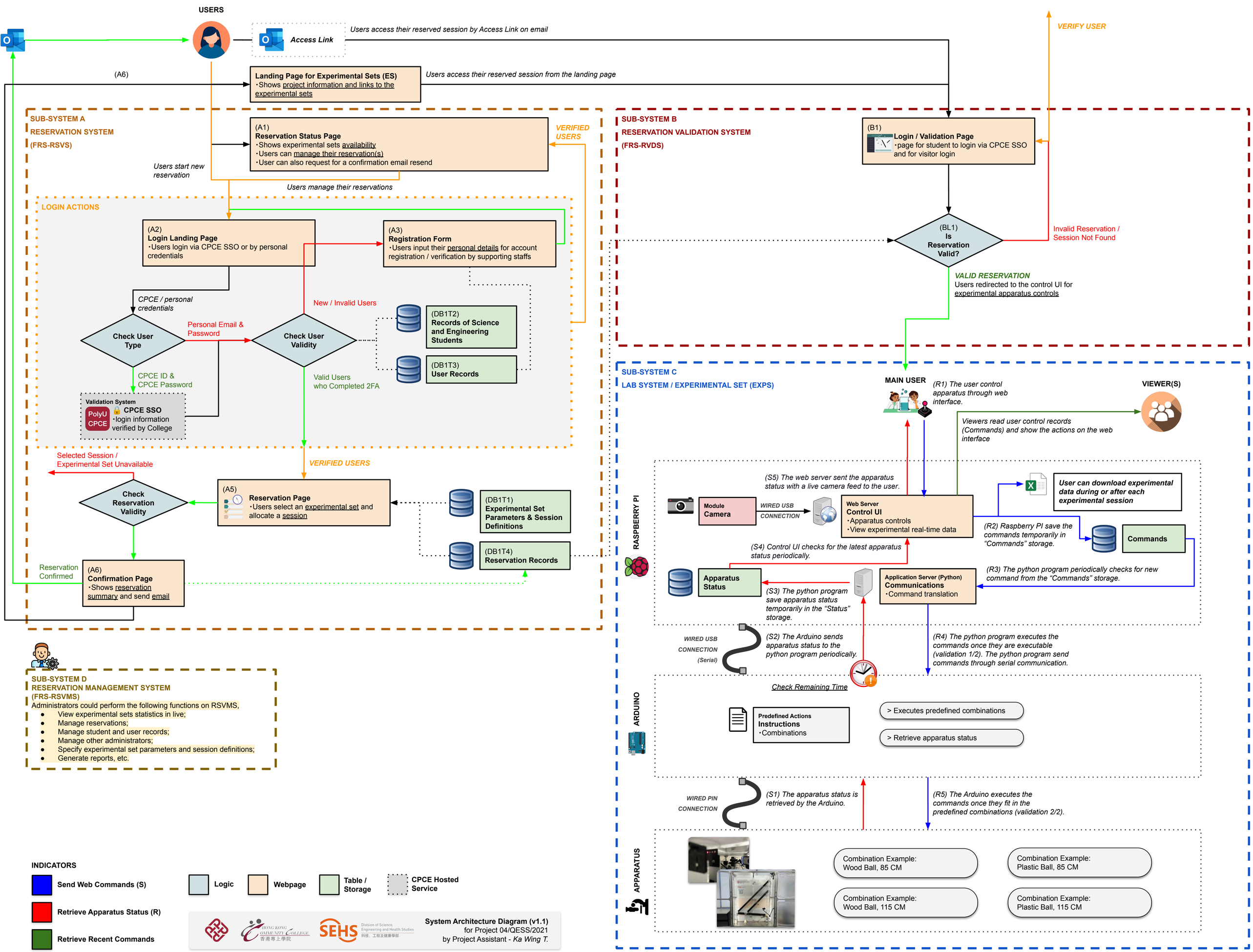
USERS
Access Link
Users access their reserved session by Access Link on email
VERIFY USER
(A6)
Landing Page for Experimental Sets (ES)
•Shows project information and links to the experimental sets
Users access their reserved session from the landing page
SUB-SYSTEM A
RESERVATION SYSTEM
(FRS-RSVS)
(A1)
Reservation Status Page
•Shows experimental sets availability
•Users can manage their reservation(s)
•User can also request for a confirmation email resend
VERIFIED USERS
Users start new reservation
Users manage their reservations
LOGIN ACTIONS
(A2)
Login Landing Page
•Users login via CPCE SSO or by personal credentials
(A3)
Registration Form
•Users input their personal details for account registration / verification by supporting staffs
CPCE / personal credentials
New / Invalid Users
Check User Type
Personal Email & Password
Check User Validity
(DB1T2)
Records of Science and Engineering Students
(DB1T3)
User Records
CPCE ID & CPCE Password
Valid Users who Completed 2FA
Validation System
PolyU CPCE
CPCE SSO
•login information verified by College
Selected Session / Experimental Set Unavailable
VERIFIED USERS
Check Reservation Validity
(A5)
Reservation Page
•Users select an experimental set and allocate a session
(DB1T1)
Experimental Set Parameters & Session Definitions
(DB1T4)
Reservation Records
Reservation Confirmed
(A6)
Confirmation Page
•Shows reservation summary and send email
SUB-SYSTEM B
RESERVATION VALIDATION SYSTEM
(FRS-RVDS)
(B1)
Login / Validation Page
•page for student to login via CPCE SSO and for visitor login
(BL1)
Is Reservation Valid?
Invalid Reservation / Session Not Found
VALID RESERVATION
Users redirected to the control UI for experimental apparatus controls
SUB-SYSTEM C
LAB SYSTEM / EXPERIMENTAL SET (EXPS)
MAIN USER
(R1) The user control apparatus through web interface.
VIEWER(S)
Viewers read user control records (Commands) and show the actions on the web interface
RASPBERRY PI
(S5) The web server sent the apparatus status with a live camera feed to the user.
Module
Camera
WIRED USB CONNECTION
Web Server
Control UI
•Apparatus controls
•View experimental real-time data
User can download experimental data during or after each experimental session
(R2) Raspberry PI save the commands temporarily in "Commands" storage.
Commands
(S4) Control UI checks for the latest apparatus status periodically.
Apparatus Status
(S3) The python program save apparatus status temporarily in the "Status" storage.
Application Server (Python)
Communications
•Command translation
(R3) The python program periodically checks for new command from the "Commands" storage.
WIRED USB CONNECTION (Serial)
(S2) The Arduino sends apparatus status to the python program periodically.
(R4) The python program executes the commands once they are executable (validation 1/2). The python program send commands through serial communication.
ARDUINO
Check Remaining Time
Predefined Actions
Instructions
•Combinations
> Executes predefined combinations
> Retrieve apparatus status
WIRED PIN CONNECTION
(S1) The apparatus status is retrieved by the Arduino.
(R5) The Arduino executes the commands once they fit in the predefined combinations (validation 2/2).
APPARATUS
Combination Example: Wood Ball, 85 CM
Combination Example: Plastic Ball, 85 CM
Combination Example: Wood Ball, 115 CM
Combination Example: Plastic Ball, 115 CM
SUB-SYSTEM D
RESERVATION MANAGEMENT SYSTEM
(FRS-RSVMS)
Administrators could perform the following functions on RSVMS,
• View experimental sets statistics in live;
• Manage reservations;
• Manage student and user records;
• Manage other administrators;
• Specify experimental set parameters and session definitions;
• Generate reports, etc.
INDICATORS
Send Web Commands (S)
Retrieve Apparatus Status (R)
Retrieve Recent Commands
Logic
Webpage
Table / Storage
CPCE Hosted Service
System Architecture Diagram (v1.1)
for Project 04/QESS/2021
by Project Assistant - Ka Wing T.