

Smart Coffee Capsule Dispenser

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Main system:

Expected operation:

- The system shall be able to give coffee capsules.
- The system shall have multiple sections to storage different capsules.
- The system shall have a login screen.
- The system shall have a low capsule status.
- The system shall have an authentication status.
- The system shall have a login function
- The system shall allow users to log in using an NFC card.
- The system shall have regular and admin users.

Exceptions/Problems:

Authentication subsystem: composto pelo NFC reader e pelas tarefas de autenticação (comunicação com web services e processamento associado)

Expected operation:

- While there's no one authenticated the subsystem shall wait until the NFC reader detects a card.
- When an NFC card is read the subsystem shall identify the user.
- When the inserted password matches the user's password the subsystem shall authenticate the user.
- While a user is authenticated the subsystem shall have a logout function.

Exceptions/Problems:

- If the NFC card is not recognized the subsystem shall display the error on the screen.
- When the inserted password doesn't match the subsystem shall display an error notification on the screen.

Dispenser subsystem: composto pelos motores passo-a-passo responsáveis pela rotação da secção de armazenamento (escolher o sabor pretendido) e por ejetar a(s) cápsula(s) pretendida(s), e por sensor e um emissor infravermelhos responsáveis pela verificação da entrega da(s) mesma(s) ao utilizador.

Expected operation:

The subsystem shall have a function to dispense all the coffee capsules in each section.

While a user is authenticated when the user requests the selected coffee capsules the subsystem shall give the user all the coffee capsules selected.

While a user is authenticated when a coffee capsule is delivered the system shall update the number of capsules acquired by that user.

When the “admin” asks for the dispense of all the coffee capsules in one section the subsystem shall dispense all the coffee capsules in the selected section.

Exceptions/Problems:

When a flavor is chosen if the coffee capsule doesn't arrive to the user the subsystem shall call the “operator”.

If the capsule storage doesn't rotate then the subsystem shall notify the “operator”.

Storage subsystem: composto pelos sensores de proximidade. Responsável pela detecção e contagem de cápsulas em cada secção, assim como a transmissão de dados associados.

Expected operation:

The subsystem shall detect the presence of capsules.

The subsystem shall be able to calculate the number of capsules available in each section.

While at low capsule status the subsystem shall publish to an MQTT server how many capsules are left in each section.

When refilled the subsystem shall notify the operator of such act and report the number of capsules via email.

Exceptions/Problems:

When refilled If the proximity sensor can't detect capsules then the storage subsystem shall notify the “operator”

User interface: composto pelo ecrã tátil. Responsável por toda a interação com o utilizador.

Expected operation:

The subsystem shall be able to get a password typed by the user

The subsystem shall have a capsule selection screen.

The subsystem shall have a function in the capsule selection screen to give the selected capsules.

While there's no one authenticated the subsystem shall display a login screen.

When an NFC card is read the subsystem shall display a virtual keyboard on the screen.

When the virtual keyboard is displayed the subsystem shall request the associated password.

While an "admin" is authenticated the subsystem shall have a function to change the variety of coffee capsules in each section.

While a user is authenticated when a flavor is chosen the subsystem shall update the user's requested coffee capsules.

While a user is authenticated the subsystem shall display all the coffee flavors in the machine.

Exceptions/Problems:

When an error is displayed the subsystem shall return to the login screen.

While a user is authenticated if any of the flavors have no capsules left then the subsystem shall display that capsule variety in a black form.

While a user is authenticated when a user selects a coffee capsule represented in black the subsystem shall notify the user about the presence of that variety in the other machines.

If no password is inserted then the subsystem shall show a notification on the screen.