Architectural Thinking for Intelligent Systems

Assignment for Lecture A6

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1) select two quality criteria and give arguments on why you selected those
   - **Performance**: Performance as the quality is important because of the following aspects:
     The system should be very efficient and effective to use.
     It should be able to walk stably even with a load of 30 kilograms.
     The addition of products to the cart should be quick and accurately updated to the billing, which then can be used to make the payment which should be again very efficient. The entire payment process should be done within 15 seconds and should involve a max of 3 steps.

   - **Reliability**: Reliability is an important quality of the system as the system should be available in all the environments and constraints, it should be mature and trained properly. The system should be able to recover from any errors or faults and should work on any terrain or weather conditions.

2) select one of the subqualities for each criterion, discuss/review
   - **Performance (Time behavior):**
     The robot should move from point A to B in minimum time, Adding products to cart, making payment, UI response, all the major components of the system is time-dependent.
   - **Reliability (Availability):**
     The system should be available in any weather condition, during the festive season(density of the crowd), any terrains, hence availability is an important quality.

3) Write at least 4 scenarios, two for each quality

Scenario 1: Performance

Part of the Scenario	Description
Stimulus source	End User/Customer
Stimulus	Desire to finish the checkout process quickly.
Environment	Runtime
Artifact	Automated billing module, user interface for GUI display of bill
Response	whenever a new product is added to the cart a message is displayed in the UI 'Added to cart'.
Response measure	The message should be generated in less than 3000ms.

Scenario 2: Performance

Part of the Scenario	Description
Stimulus source	End User/Customer
Stimulus	After the shopping is complete, the user presses the 'Make Payment' option.
Environment	Runtime
Artifact	Payment Module, Automated billing module, user interface for GUI display of bill and payment.
Response	System shows all the payment options linked to the profile or makes the payment using the default option if enabled by the user.
Response measure	The entire transaction should be complete in less than 15000ms.

Scenario 3: Reliability (Availability)

Part of the Scenario	Description
Stimulus source	End User/Customer/Store Owner
Stimulus	facilitate shopping in any possible weather conditions(-30 to 50*C)
Environment	Runtime
Artifact	Locomotion, UI, Battery module, logic boards, electronic components.
Response	the device works flawlessly, and moves without any problem in extreme weather conditions.
Response measure	system should perform without any issues even if the weather condition is from -30 to 50*C

Scenario 4: Reliability (Recoverability):

Part of the Scenario	Description
Stimulus source	End User/Customer
Stimulus	system recovers in case of any crash, collision or rough terrain surfaces.
Environment	normal operation, overloaded operation
Artifact	Locomotive module, self-balancing module. path detection module.
Response	The system recovers from the failure state, collision, or from falling automatically.
Response measure	The system recovers from the collision or falling within 10000ms

4) 2 scenarios for usability in our project:

Scenario 1: Learnability:

Part of the Scenario	Description
Stimulus source	End User/Customer
Stimulus	desire to make a payment after shopping is complete
Environment	runtime
Artifact	Payment Module, Automated billing module, user interface for GUI display of bill and payment.
Response	the payment process should be intuitive to use.
Response measure	the payment process should be doable in less than 3 steps.

Scenario 2: Accessibility:

Part of the Scenario	Description
Stimulus source	End User/Customer
Stimulus	requirement of multiple payment options to complete a transaction
Environment	runtime
Artifact	Payment Module, Automated billing module, user interface for GUI display of bill and payment.
Response	the payment process should be convenient and there should be many alternatives to make the transaction
Response measure	There should be at least 4 payment alternatives(bank account, card, digital wallets, Paypal)