# IoT System Design Methodology

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# **IoT Design Methodology**

Purpose & Requirements

Define Purpose & Requirements of IoT system

**Process Model Specification** 

Define the use cases

**Domain Model Specification** 

Define Physical Entities, Virtual Entities, Devices, Resources and Services in the IoT system

Information Model Specification

Define the structure (e.g. relations, attributes) of all the information in the IoT system

Service Specifications

Map Process and Information Model to services and define service specifications

**IoT Level Specification** 

Define the IoT level for the system

**Functional View Specification** 

Map IoT Level to functional groups

Operational View Specification

Define communication options, service hosting options, storage options, device options

**Device & Component Integration** 

Integrate devices, develop and integrate the components

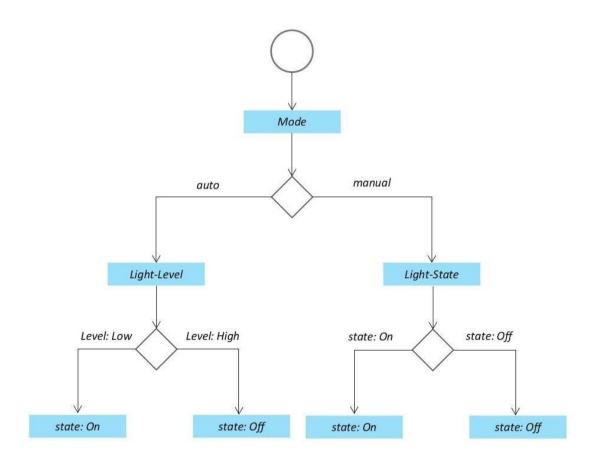
**Application Development** 

**Develop Applications** 

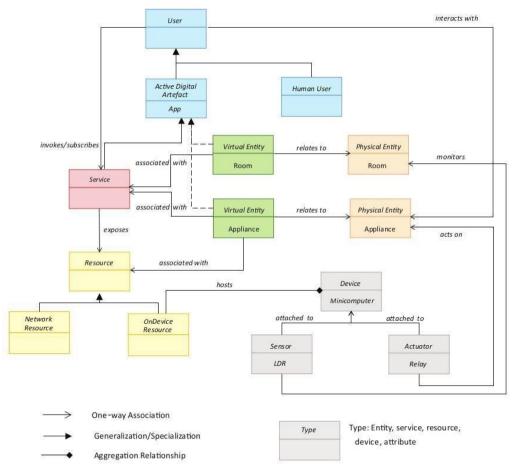
#### **Step:1 - Purpose & Requirements**

- Purpose : A system that allows controlling of the lights in a home remotely using a web application
- Behaviour : The home automation system should have auto and manual modes.
- Auto mode the system measures the light level in the room, switches light when dark.
- Manual mode the system provides the option of manually and remotely switching on/off the light.
- System Management Requirement : The system should provide remote monitoring and control functions.
- Data Analysis Requirement : system should perform local analysis of data
- Application Deployment Requirement : The application should be deployed locally on the device, but should be accessible remotely.
- Security Requirement: The system should have basic user authentication capability.

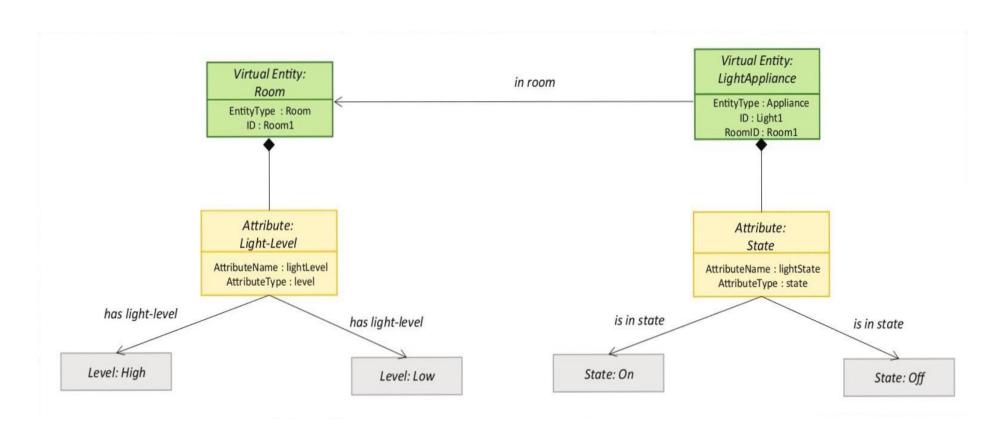
#### **Step: 2 - Process Specification**



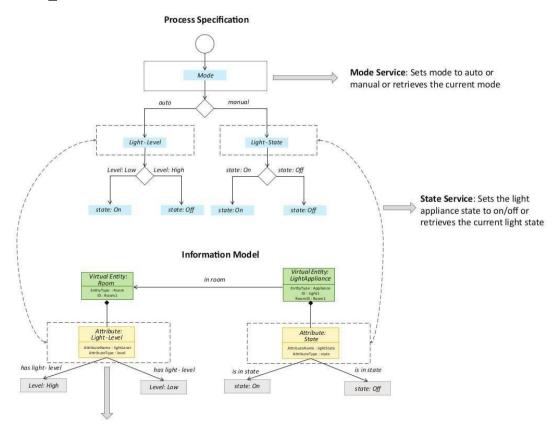
#### **Step: 3 - Domain Model Specification**



#### **Step: 4 - Information Model Specification**

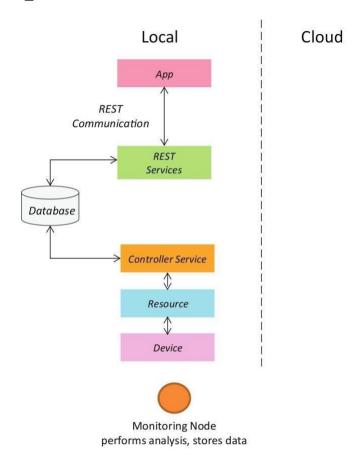


#### **Step: 5 - Service Specification**

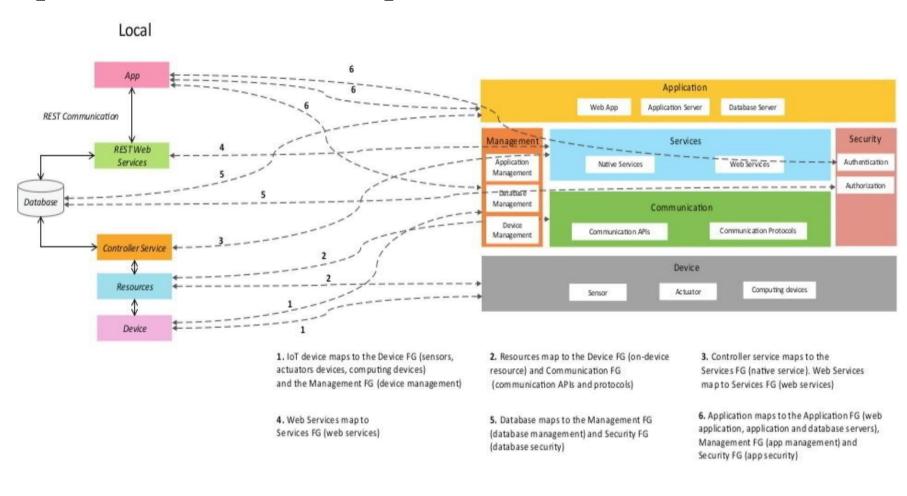


Controller Service: In auto mode, the controller service monitors the light level and switches the light on/off and updates the status in the status database. In manual mode, the controller service, retrieves the current state from the database and switches the light on/off.

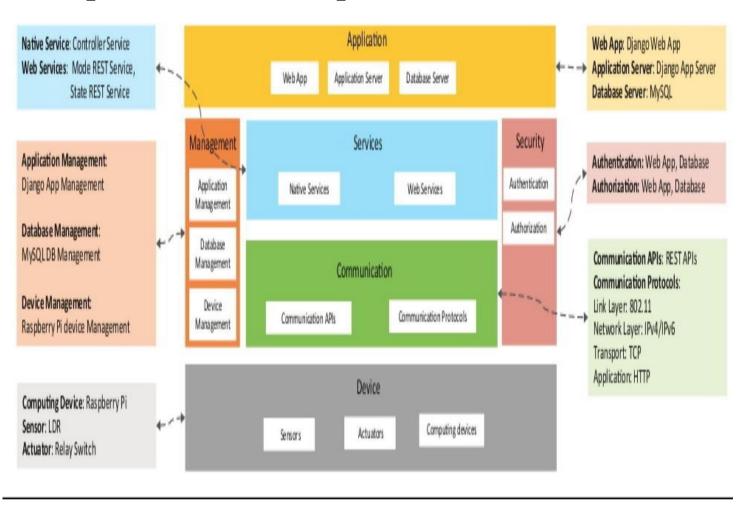
#### **Step:** 6 – **IoT Level Specification**



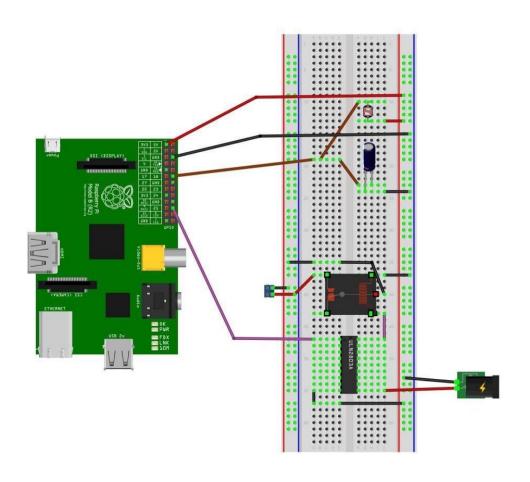
#### **Step:7 – Functional View Specification**



#### **Step: 8 – Operational View Specification**



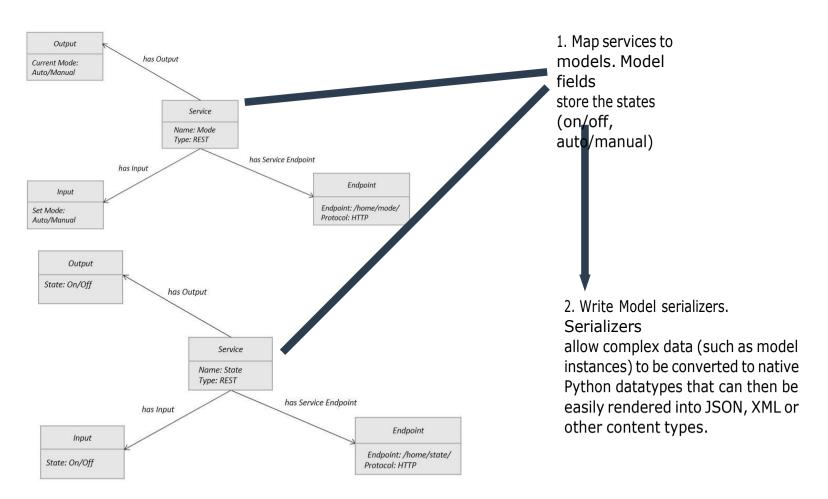
**Step: 9 – Device and Component Integration** 



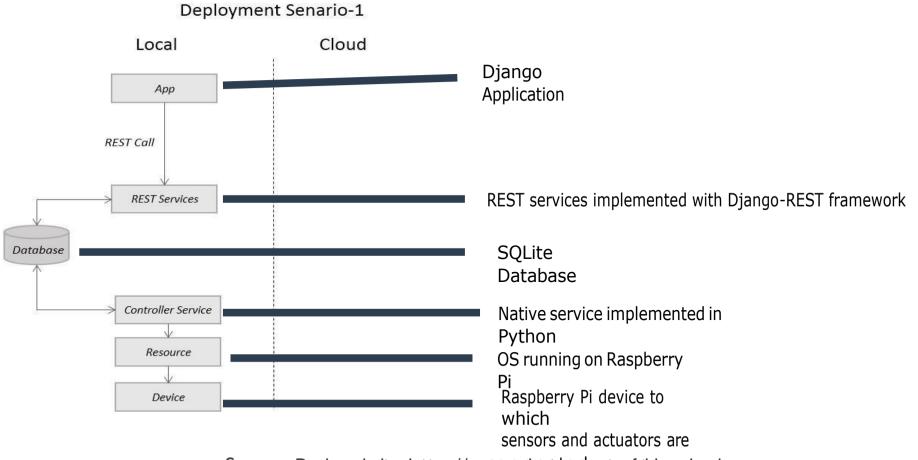
**Step:** 10 – Application Development (Interface)



#### **Step: 11 – Web Services Development**



#### **Step: 12 – Integrating the System**



Source: Book website: http://www.niecterchet-of-things-book.com