Operational Concept Description (OCD)

Mobile Application for Mobile-Controlled Lighting

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Version History

Date	Author	Version	Changes made	Rationale
08/20/05	PP	1.0	• Original template for use with LeanMBASE v1.0	• Initial draft for use with LeanMBASE v1.0
08/28/05	PP	1.1	• Added section 3.2	• Section 3.2 was added to provide traceability for the outcome in the Benefits Chain
08/30/06	SK, RT	1.6	• Added Template for Tables and Figures	• Consistent format
10/04/06	SK	1.61	• Added section 3.3.1	• Section 3.3.4
09/14/07	SK	1.9	• Updated Section 2.4, 3.3.1, 3.3.2, 3.3.3	• Consistent with LeanMBASE V1.9
08/25/08	PA	2.0	• Swapped sections 3.4 and 3.5. • Renamed section 2.4 title from "Benefits Chain (Initiatives, Expected Outcomes, and Assumptions)" to "Benefits Chain" • Replaced References section (1.2) with "Status of the OCD" • Edited Table 1 structure to be consistent with the Instructional ICM-Sw OCD Guideline. • Added Figure 2, Figure 3, and Figure 4 • Edited Table 2 to be consistent with the Instructional ICM-Sw OCD Guideline	• Initial draft for use with Instructional ICM-Sw v2.0 modified from LeanMBASE v1.9
05/22/09	SK	2.1	• Embedded description in each Table • Removed section 3.5 Prototype • Moved all goals to the Section 3.1 • Removed Section 4. WikiWinWin Result • Added Section 3.1.4 Constraints • Added Section 3.1 Current System	• To be consistent with ICM EPG template set standard V2.1 • To leanify and rearrange data presentation • Moved Prototype information to Prototype report • To document information about current system
08/15/12	TK	2.2	• Added Program Model • Updated index of subsections in section 2 Shared Vision	• To be consistent with ICSM EPG
10/11/14	SS	3.0	• Updated all the sections of the document	• Draft Foundations Commitment Package
10/20/14	SS	3.1	• Updated for DCP submission	• DCP Submission
12/07/14	SS	3.2	• Version and date change in footer	• Final review of documents

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1. Introduction

1.1 Purpose of the OCD

This document provides the shared vision and goals of the stakeholders of the Mobile-Controlled Lighting System for Advanchip. The success-critical stakeholders of the project are Alice Law who is the project owner, Advanchip Corporation which is the company owned by Alice Law, software developers and maintainers working on the project.

1.2 Status of the OCD

The scope of the Mobile-Controlled lighting system has been changed to remove the 0 cloud downtime and also IOS app development. The requirement to implement single protocol throughout the application has been negotiated with client. The scope of the project has been finalized to include making the application more robust and include more requirements.

2. Shared Vision

Table 1: The Program Model

| Assumptions			
• User is willing to adopt using the system for use instead of conventional switches			
Stakeholders (Who is accountable for the initiatives)	**Initiatives** (What to do to realize benefits)	**Value Propositions** (Benefits i.e. Why)	**Beneficiaries** (Who derives value)
• Developers • Maintainers • Advanchip	• Training and knowledge transfer • Training, customer support, Development • Ensure Hardware Compatibility • Uses App to control switch • Add Gateways, switches • Implementing the system • Marketing, Develop / Supply Hardware, Develop, Support & Maintain, Take survey	• Improved, Reliable and Scalable System • Reduced time & effort to control • Automated-switch free (reduced time, reduced effort, reduced energy)	• Enterprise customers • Home users • Old people
COST		BENEFITS	
Development Costs, Maintenance Costs, Support, Marketing costs Training costs		Automation Increased : Sales, Power Saving Reduced : Energy ,Construction and Renovation costs, time and efforts	

2.1 Benefits Chain
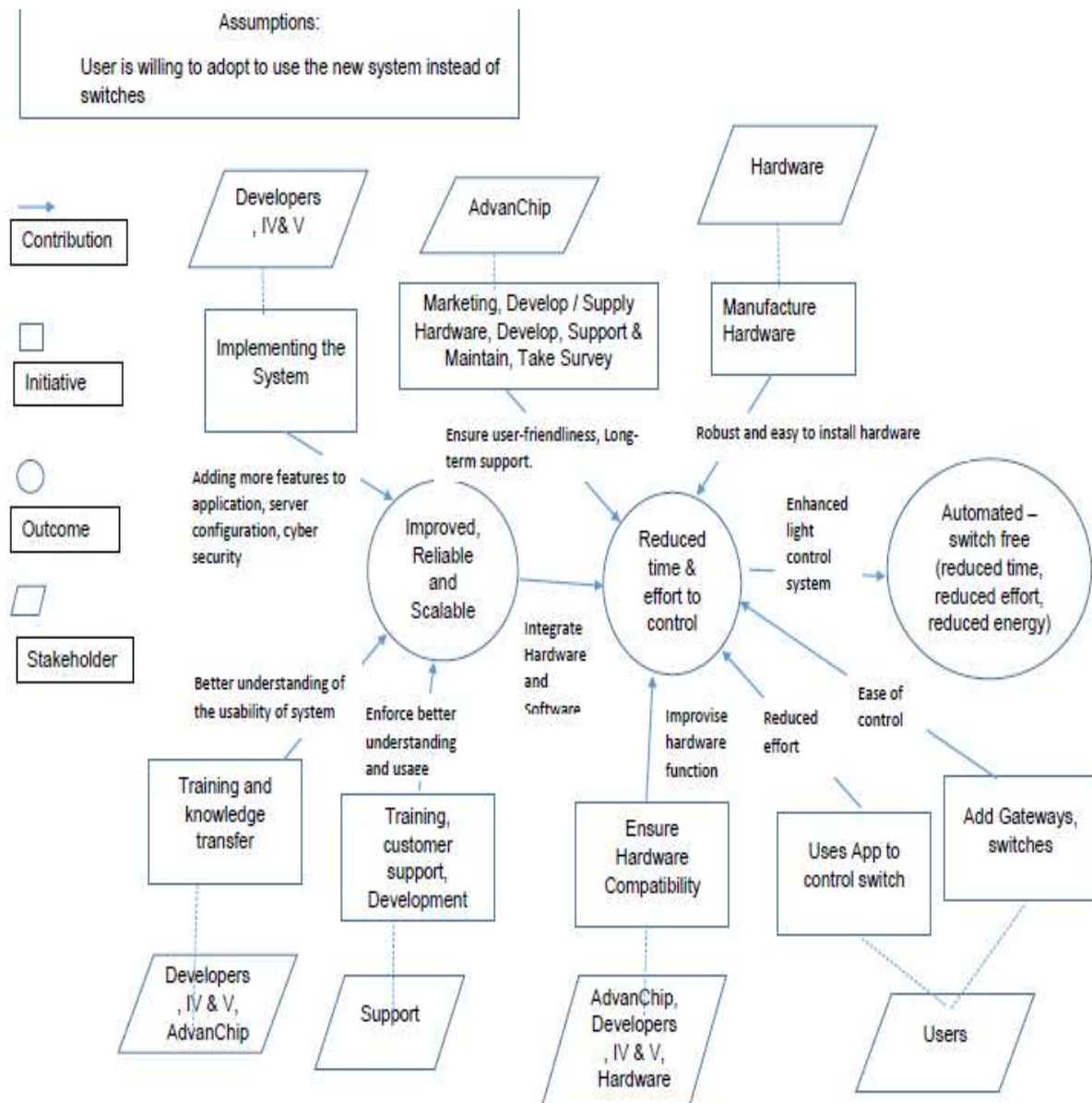
Figure 1: Benefits Chain Diagram

2.2 System Capability Description

This is a cloud based system in the Internet of Things Domain. The system will interact with the lights using mobile and tablet applications for power on and off. This system will be helpful to old people, travelers as well as enterprise customers. Using this system will reduce power wastage and increase financial savings. It is very convenient for anyone to turn the lights on and off by just one click. With the boom in the mobile and tablet industry practically everyone today owns a mobile or a tablet. The biggest benefit that our system will have is it will be specialized for lighting purposes.

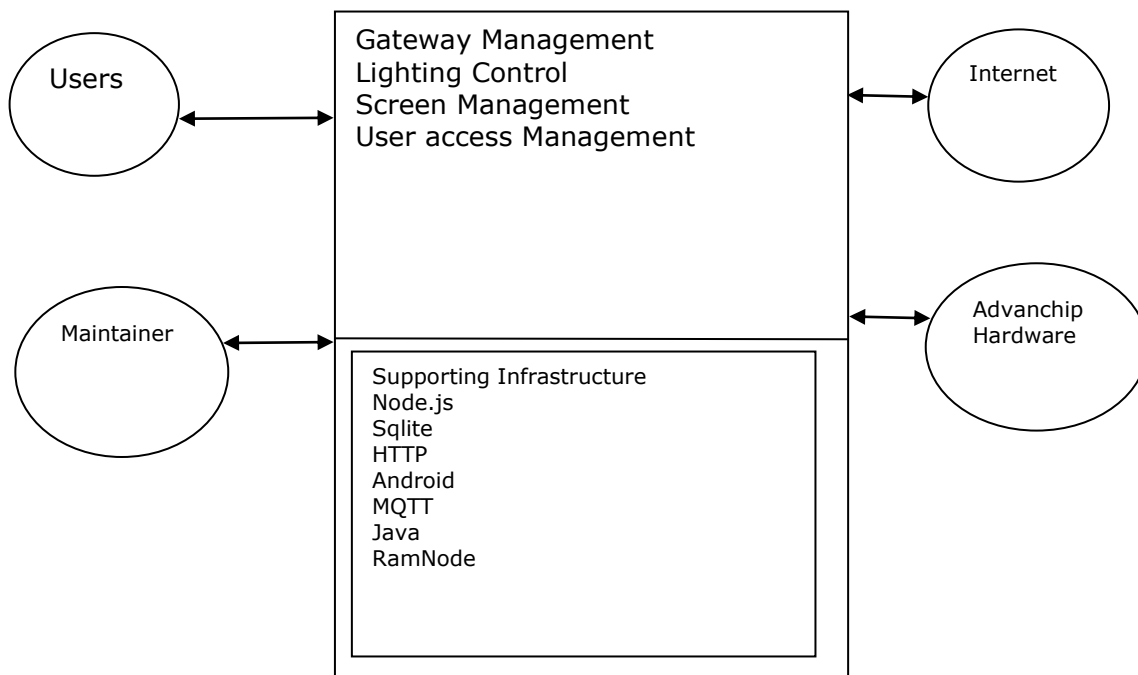## 2.3 System Boundary and Environment

Figure 2: System Boundary and Environment Diagram of Mobile-Controlled Lighting System

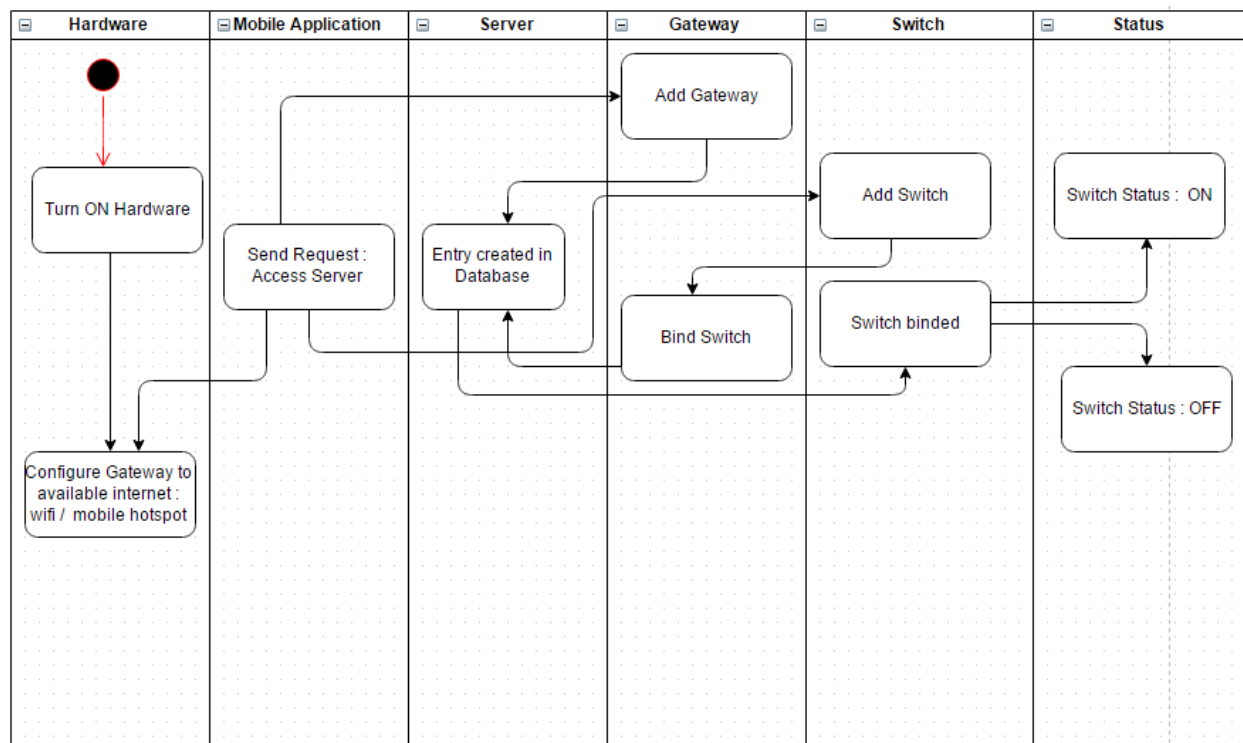# 3. System Transformation

3.1 Information on Current System

3.1.1 Infrastructure

1) Nodejs Server
2) MongoDB database
3) Using MQTT to communication with gateway
4) Using http to communication with Android app
5) Server Hosting Company: RamNode
6) OS: GNU/Linux 3.14.5-1-ARCH x86_64

3.1.2 Artifacts

1) Android Application with ON and OFF functionality
2) Adding Gateways and Switches
3) Hardware required for the implementation
4) MONGO database, MQTT, HTTP are currently being used in the android application

3.1.3 Current Business Workflow

Hardware	Mobile Application	Server	Gateway	Switch	Status
Turn ON Hardware	Send Request : Access Server	Entry created in Database	Add Gateway	Add Switch	Switch Status : ON
Configure Gateway to available internet : wifi / mobile hotspot			Bind Switch	Switch binded	Switch Status : OFF

3.2 System Objectives, Constraints and Priorities

3.2.1 Capability Goals

Capability Goals	Priority Level
OC-1 Gateway Management	Must have
OC-2 Lighting Control	Must have
OC-3 Screen Management	Must have
OC-4 User Access Management	Must have

3.2.2 Level of Service Goals

Table 2: Level of Service Goals

Level of Service Goals	Priority Level	Referred WinWin Agreements
The system reponse time should be within 10 seconds	High	WC_3469

3.2.3 Organizational Goals

OG-1: Create a switch free world

OG-2: Increased convenience for the users

OG-3: Supply the system to enterprise users

3.2.4 Constraints

CO-1: The maximum project budget is $500
CO-2: The system must be developed in Android using Java
CO-3: MongoDB database should be used

3.2.5 Relation to Current System

Table 3: Relation to Current System

Capabilities	Current System	New System
Roles and Responsibilities	Advanchip hardware designer	Advanchip hardware designer
User Interactions	User can turn light on and off	User can group lights, turn all on all off
Infrastructure	Node.js, MongoDB, Android	Node.js, SQLite, Android
Stakeholder Essentials and Amenities	N/A	User should be able to turn all light on and off, group lights.
Future Capabilities	N/A	System should have access control for different users

3.3 Proposed New Operational Concept

3.3.1 Element Relationship Diagram

In the following Element Relationship Diagram,
   a) Blue boxes represent 'Elements'
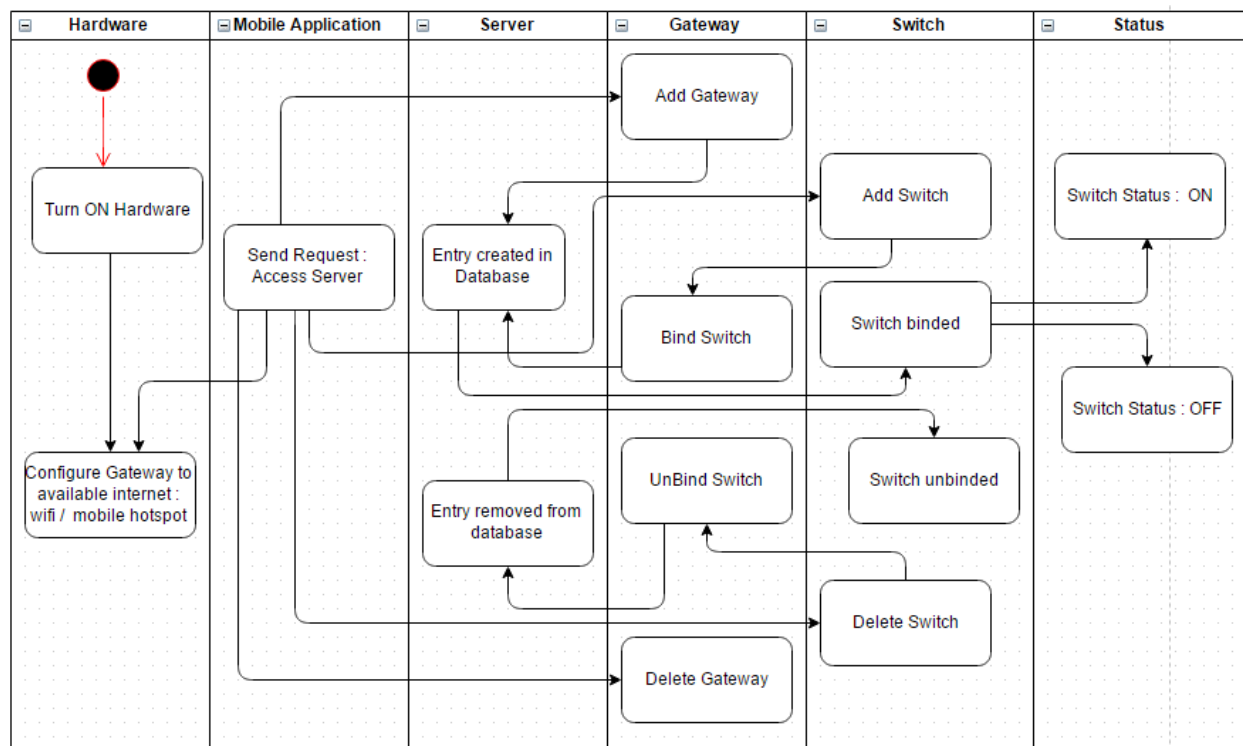   b) White boxes represent 'Relationship between Elements'
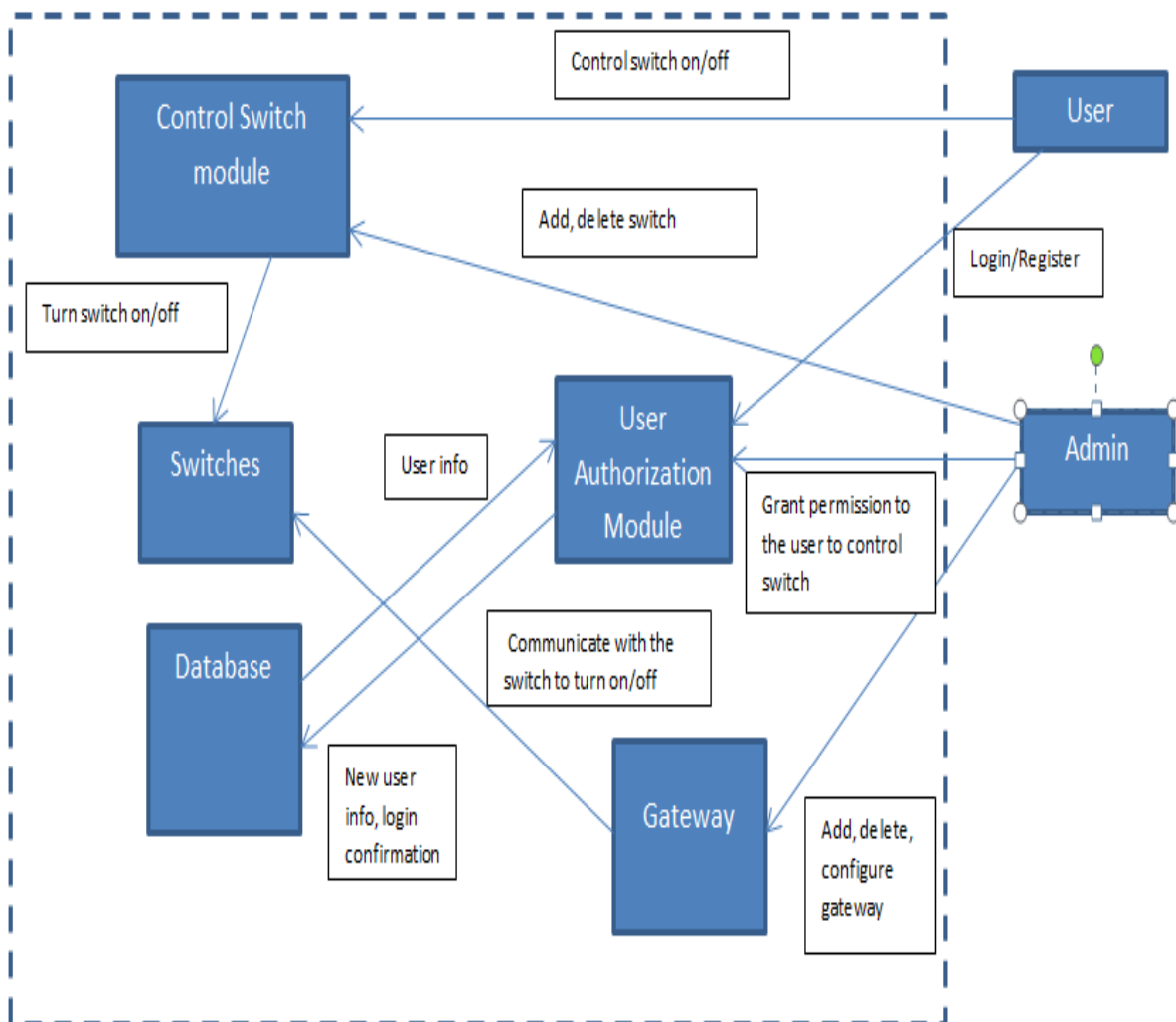
3.3.2 Business Workflows

Figure 3: Business Workflow Diagram of Advanchip

3.4 Organizational and Operational Implications

3.4.1 Organizational Transformations

- The software developers should work closely with the hardware manufacturers and the testers to improve the robustness of the software.

3.4.2 Operational Transformations

- The option to group switches in hierarchy into rooms, floors
- Having the ability for the users to grant access to other users.
- User should be able to turn all the lights on and off at once.