

**IMPLEMENTATION OF NODEJS BACKEND IN LUNASBOS
APP WITH MICROSERVICES ARCHITECTURE**

UNDERGRADUATE THESIS



Arranged by
Nanda Nugraha
14.62.0020

**UNDERGRADUATE THESIS
BACHELOR INFORMATION SYSTEM
FACULTY OF COMPUTER SCIENCE
UNIVERSITY OF AMIKOM YOGYAKARTA
YOGYAKARTA
2019**

**IMPLEMENTATION OF NODEJS BACKEND IN LUNASBOS APP WITH
MICROSERVICES ARCHITECTURE**

UNDERGRADUATE THESIS

to meet the requirements for achieving a bachelor's degree
Information System Study Program



arranged by
Nanda Nugraha
14.62.0020

**UNDERGRADUATE THESIS
BACHELOR INFORMATION SYSTEM
FACULTY OF COMPUTER SCIENCE
UNIVERSITY OF AMIKOM YOGYAKARTA
YOGYAKARTA
2019**

APPROVAL

UNDERGRADUATE THESIS

**IMPLEMENTATION OF NODEJS BACKEND IN LUNASBOS APP
WITH MICROSERVICES ARCHITECTURE**

prepared and arranged by

Nanda Nugraha

14.62.0020

was approved by undergraduate thesis supervisor

at April 27, 2019

Supervisor,

Hanif Al Fatta, S.Kom., M.Kom.

NIK. 190302096

LEGALIZATION

UNDERGRADUATE THESIS

IMPLEMENTATION OF NODEJS BACKEND IN LUNASBOS APP WITH MICROSERVICES ARCHITECTURE

prepared and submitted by

Nanda Nugraha

14.62.0020

has been maintained in front of the board of examiners
on August 14, 2019

Composition of the board examiners

Examiners

Signature

Hanif Al Fatta, S.Kom., M.Kom.
NIK. 190302096

Andi Sunyoto, M.Kom., Dr.
NIK. 190302052

Arif Akbarul Huda, S.Si, M.Eng
NIK. 190302287

this undergraduate thesis has been accepted as one of
the requirements for obtaining computer degree
at August 14, 2019

DEAN FACULTY OF COMPUTER SCIENCE

Krisnawati, S.Si, M.T.
NIK. 190302038

STATEMENT

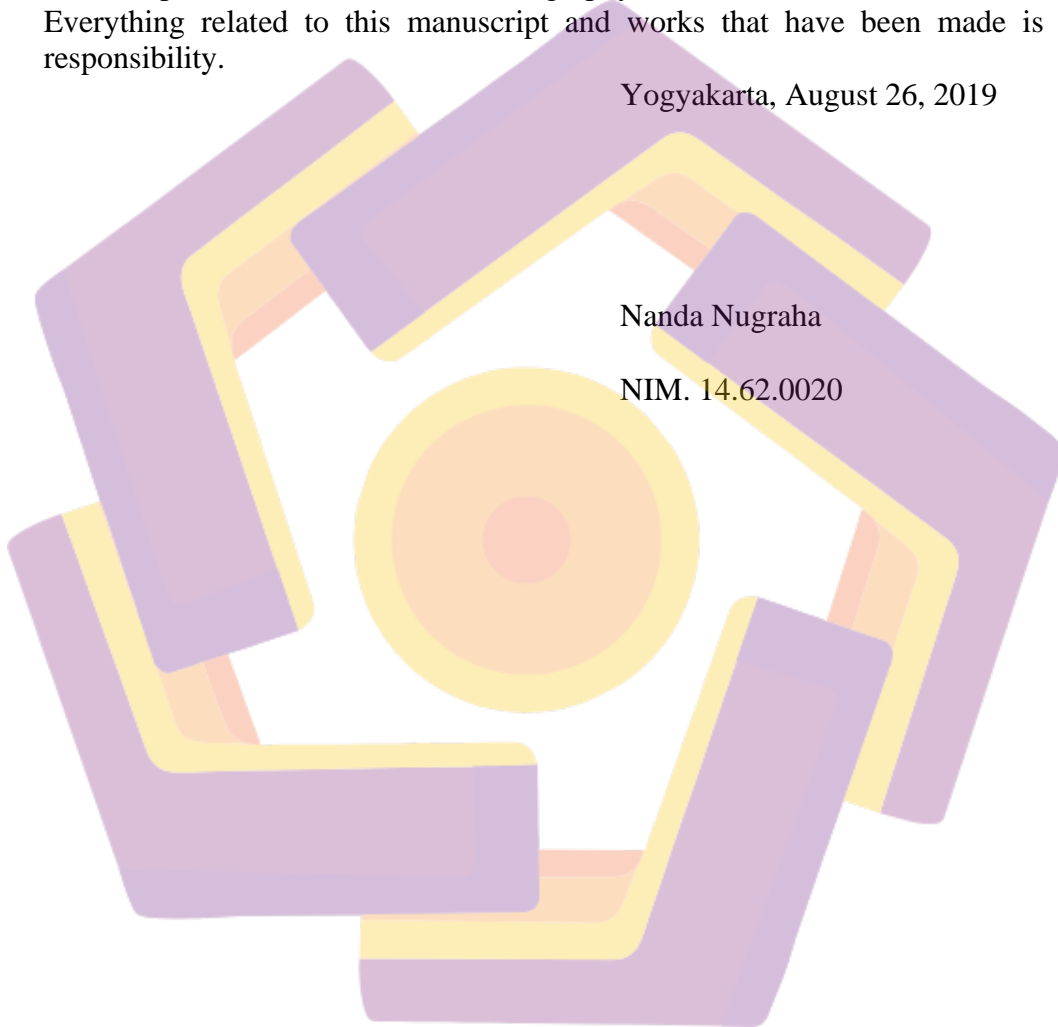
The undersigned, declare that this thesis is original work, and the contents of this thesis have not been submitted by anyone else to obtain an academic degree at any education institution, and as far as my knowledge, there's no works or opinions that have been written and/or published by others, except those referred to this manuscript and mentioned in the bibliography.

Everything related to this manuscript and works that have been made is my responsibility.

Yogyakarta, August 26, 2019

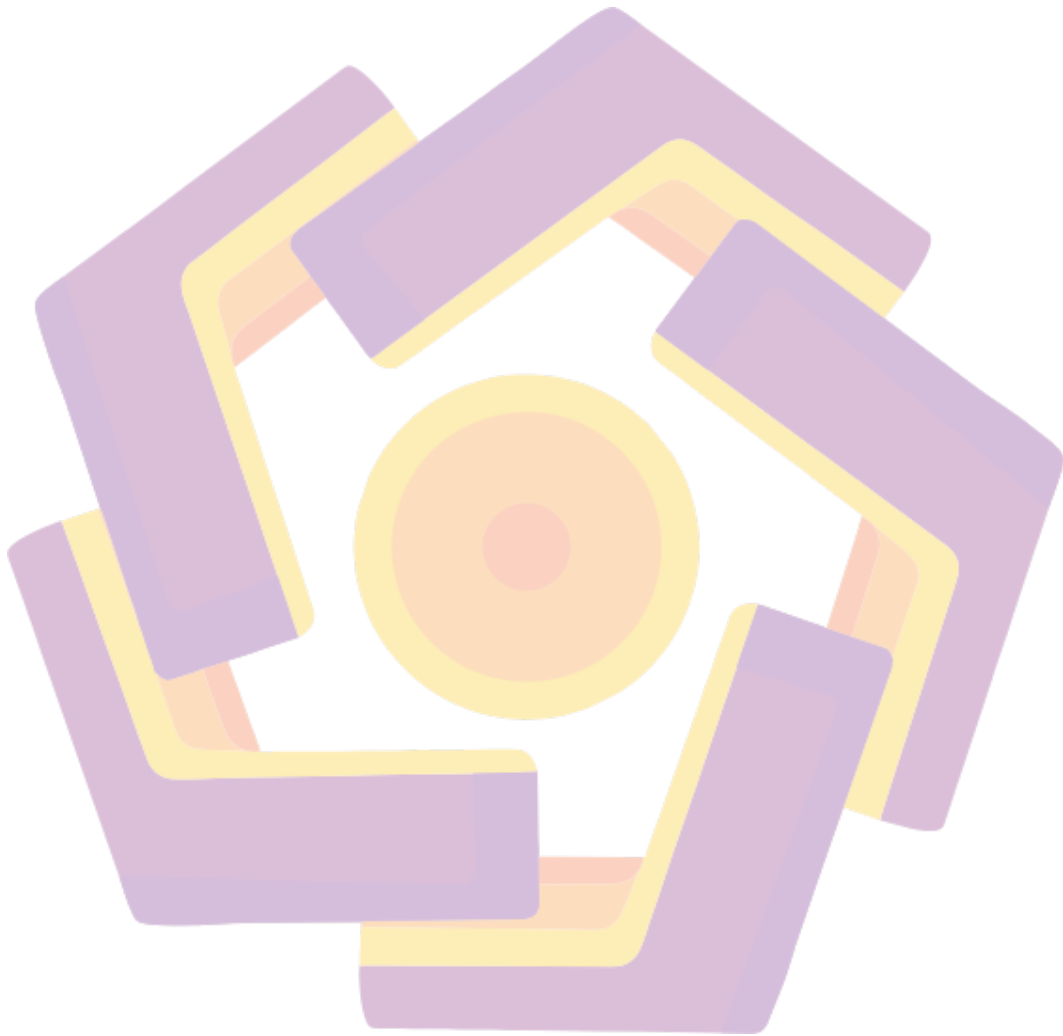
Nanda Nugraha

NIM. 14.62.0020



MOTTO

“Iqra” - QS. Al ‘Alaq: 1



OFFERINGS

This thesis is presented for:

1. Allah S.W.T. who have given the opportunity and energy to work on this thesis.
2. Families who have helped morally and materially in working on this thesis.
3. Muflikhah Isna Nur Aini, Winda Sekar Dewi and Burhanuddin Yusuf which has provided strong motivation in working on this thesis.
4. Supervisor, Hanif Al Fatta, S. Kom., M. Kom. who have been faithfully helping with the completion of this thesis.
5. Lunasbos management which has given an opportunity to become an object in this thesis.
6. All lecturer of University of Amikom Yogyakarta who have taught the author, although the author often does not attend classes, but the knowledge provided is very useful for the work of this thesis.
7. Everyone in BCIS at 2014 who have gone with the journey during the academic period.

INTRODUCTION

Assalamualaikum Warahmatullahi Wabarakatuh, all praise is due to the Lord of the owner of the universe who allowed the writer to write this thesis. This thesis is dedicated to the University of Amikom Yogyakarta to improve the thesis standard for the next generation, hopefully, this thesis will bring good progress for academics.

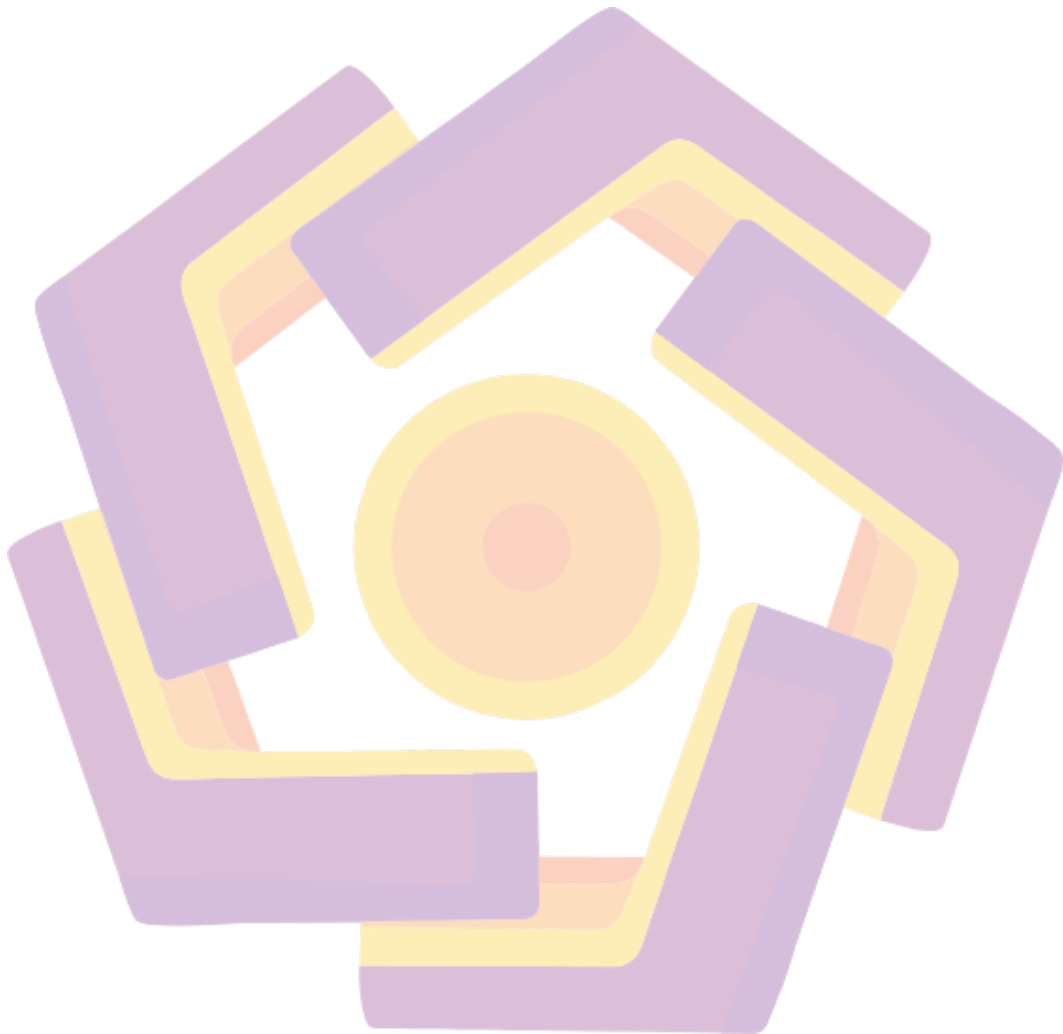


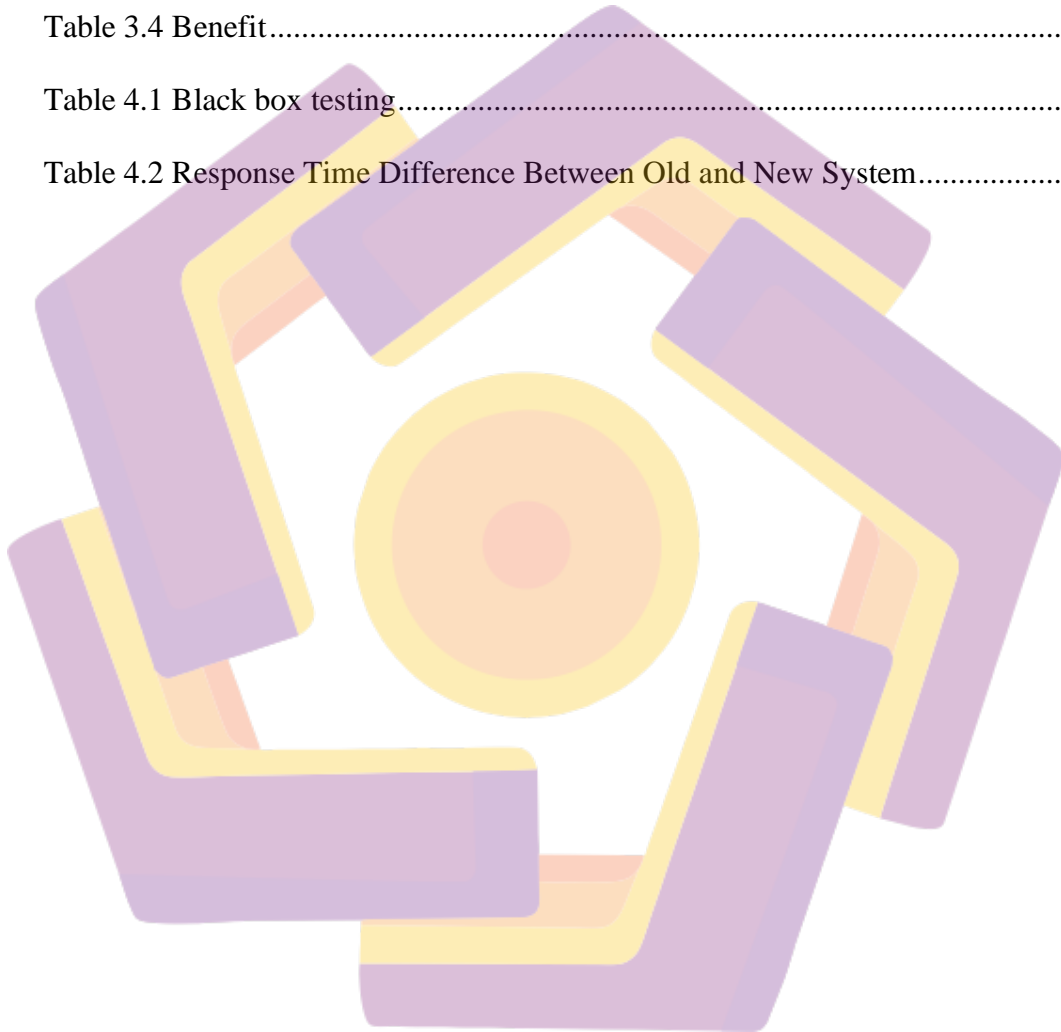
TABLE OF CONTENTS

TITLE.....	I
APPROVAL.....	III
LEGALIZATION	IV
STATEMENT.....	V
MOTTO	VI
OFFERINGS.....	VII
INTRODUCTION	VIII
TABLE OF CONTENTS.....	IX
LIST OF TABLES	XI
LIST OF PICTURES	XII
ABSTRACT.....	XIV
CHAPTER I PRELIMINARY.....	1
1.1. Background	1
1.2. Problem Formulation	2
1.3. Problem Limits.....	3
1.4. Purpose and Objectives of The Research.....	3
1.5. Research Methods	4
1.6. Writing System	6
CHAPTER II THEORETICAL BASIS.....	8
2.1. Literature Review.....	8
2.2. System Analysis	9
2.3. Design System.....	12

2.4.	Backend Concept	14
2.5.	Service Concept	15
2.6.	Microservices Architecture Concept.....	20
2.7.	Cloud Computing Concept.....	22
2.8.	Database Concept.....	23
2.9.	Tools Used	24
CHAPTER III ANALYSIS AND DESIGN		0
3.1.	General Review	0
3.2.	System Analysis	0
CHAPTER IV IMPLEMENTATION AND DISCUSSION		15
4.1.	Microservices Architecture Implementation.....	15
4.2.	Node.js Implementation	28
4.3.	Black box testing.....	34
CHAPTER V CLOSING		37
5.1.	Conclusion	37
5.2.	Advice	37
BLIBLIOGRAPHY		38

LIST OF TABLES

Table 3.1 PIECES	1
Table 3.2 Cost	4
Table 3.3 Detail Firebase Flame Plan	5
Table 3.4 Benefit.....	5
Table 4.1 Black box testing.....	34
Table 4.2 Response Time Difference Between Old and New System.....	36



LIST OF PICTURES

Picture 2.2 Microservice Structure.....	21
Picture 3.1 Use case diagram	7
Picture 3.2 Activity Register	8
Picture 3.3 Activity Login.....	9
Picture 3.4 Activity Profile	9
Picture 3.5 Activity Bank Account	10
Picture 3.6 Activity Transaction	11
Picture 3.7 ERD	12
Picture 3.8 Class Diagram User	13
Picture 3.9 Class Diagram Transaction	14
Picture 4.1 API Gateway Homepage	15
Picture 4.2 Creating a new Gateway API.....	16
Picture 4.3 EC2 Homepage	17
Picture 4.4 Select AMI.....	17
Picture 4.5 Configures EC2	18
Picture 4.6 Message to the Auto Scaling Group	18
Picture 4.7 Launch Configuration	19
Picture 4.8 Auto Scaling Group	19
Picture 4.9 Auto Scaling Policies.....	19
Picture 4.10 Load Balancer Types	20
Picture 4.11 Load Balancer Configuration.....	21
Picture 4.12 VPC Load Balancer Configuration.....	21

Picture 4.13 Load Balancer Security settings	21
Picture 4.14 Load Balancer routing	21
Picture 4.15 Load Balancer Description	22
Picture 4.16 Edit Auto Scaling Group	22
Picture 4.17 NLB + Auto Scaling	23
Picture 4.18 API Gateway Dashboard	23
Picture 4.19 API Gateway New Resource	24
Picture 4.20 Add VPC Link	24
Picture 4.21 Added VPC Link	25
Picture 4.22 Add Method	25
Picture 4.23 Method Configuration	26
Picture 4.24 Deploy API Gateway	27
Picture 4.25 Add Stage Variable	27

ABSTRACT

Lunasbos is a smartphone app that helps users record their debts and credits to another people, with user growth, Lunasbos starts to feel slow because the server or backend is busy fulfilling many requests from the app.

Due to capital limitation, a cheap and robust solution is needed to solve this problem, the one is implementing the microservices architecture and self-made backend to keep the cost down, thus make backend server app requests faster.

NodeJS is a Runtime Environment that allows the Javascript language to be used to build an application for a server, with a server infrastructure built based on the microservices, the Lunasbos app can suffice many users demands while also being able to add features to the architecture easily.

Keyword: *Microservices, NodeJS, Lunasbos.*

