Acknowledgments

We would like to take this opportunity to express our sincere gratitude to everyone who has

contributed to the completion of this project. First and foremost, we extend our heartfelt

appreciation to our Teacher, Mr. Fisseha W, for his valuable support and guidance throughout this

endeavor. His expertise and direction have been instrumental in shaping the project's trajectory

and ensuring its successful completion.

Additionally, we would like to express our gratitude to each other, as team members, for our

collective efforts and collaboration. Our ability to work together, share ideas, and support one

another has been crucial in overcoming challenges and achieving our project goals. Each team

member has brought unique perspectives, skills, and dedication to the table, contributing to the

overall success of the project.

We are also deeply thankful to our family members and friends for their unwavering

support and

encouragement. Their belief in our abilities and their constant motivation have been a source of

strength throughout this project. Their understanding and willingness to lend a helping hand

whenever needed have been invaluable.

Furthermore, we would like to acknowledge the assistance and cooperation we received from the

members of our group. Their contributions, whether in providing resources, technical support, or

feedback, have played a significant role in the project's implementation and outcomes.

Lastly, we extend our gratitude to all the individuals who participated in any way during the course

of this project, such as participants who provided valuable insights or feedback. Their involvement

has enriched our work and contributed to its overall quality.

In conclusion, we would like to express our

sincere appreciation to our advisor, team members,

family, friends, and all those who have supported us throughout this project. It is through your

collective efforts and encouragement that we have been able to successfully complete this

endeavor

BEKUR QUIZZES

Contents

Acknowledgments ---------------------------------------------------------------------------------------------------- 3

Definitions, Acronyms and Abbreviation--------------------------------------------------------------------------- 4

Definitions ---------------------------------------------------------------------------------------------------------- 4

Abbreviations and Acronyms------------------------------------------------------------------------------------- 5

Abstract -------------------------------------------------------------------------------

--------------------------------- 6

Title: Bekur Exam Website: A Platform for Online Examination---------------------------------------------- 6

Chapter One ----------------------------------------------------------------------------------------------------------10

1. Introduction--------------------------------------------------------------------------------------------------11

1.1. Background---------------------------------------------------------------------------------------------11

1.2. The Existing System -----------------------------------------------------------------------------------11

1.2.1. Overview of the existing website --------------------------------------------------------------12

1.2.2. Problems of the Existing System---------------------------------------------------------------12

1.3. The Proposed System---------------------------------------------------------------------------------12

1.3.1. General Objective -------------------------------------------------------------------------------

13

1.3.2. Specific Objective--------------------------------------------------------------------------------13

1.3.3. Significance of the Project----------------------------------------------------------------------14

1.3.4. Scope of the Project-----------------------------------------------------------------------------15

1.4. Methodologies and Techniques ---------------------------------------------------------------------16

1.4.1. Data Collection Methods and Techniques----------------------------------------------------19

1.4.2. System Analysis and Design and Development Tools---------------------------------------22

Chapter Two ----------------------------------------------------------------------------------------------------------24

2. System analysis-------------------------------------------------------------------------------------------------24

2.1. Introduction-----------------------------------------------------------

---------------------------------24

2.1.1. Overview -----------------------------------------------------------------------------------------24

2.1.2. Purpose-------------------------------------------------------------------------------------------24

2.1.3. Scope of the project-----------------------------------------------------------------------------25

2.1.4. Objective of the proposed system-------------------------------------------------------------26

2.2. Current system-----------------------------------------------------------------------------------------28

2.3. Proposed System--------------------------------------------------------------------------------------30

2.3.1. Overview -----------------------------------------------------------------------------------------31

2.3.2. Functional requirements -----------------------------------------------------------------------32

2.3.3. Non-Functional

requirements------------------------------------------------------------------35

2.3.3.1. User interface and human factors----------------------------------------------------------36

2.3.3.2. Documentation -------------------------------------------------------------------------------37

2.3.3.3. Hardware consideration---------------------------------------------------------------------38

2.3.3.4. Performance Characteristics----------------------------------------------------------------39

2.3.3.5. Error handling and extreme conditions----------------------------------------------------40

2.3.3.6. System interfacing----------------------------------------------------------------------------41

2.3.3.7. Quality issues ---------------------------------------------------------------------------------42

2.3.3.8. System modification -------------------------------------------------------------------------44

2.3.3.9. Physical

environment------------------------------------------------------------------------44

2.3.3.10. Security issues-------------------------------------------------------------------------------46

2.3.3.11. Resource and management issues--------------------------------------------------------47

2.3.4. Constraints (“Pseudo requirements”)---------------------------------------------------------49

2.4. System models-----------------------------------------------------------------------------------------50

2.4.1. Scenarios -----------------------------------------------------------------------------------------50

2.4.2. Use case model----------------------------------------------------------------------------------55

2.4.3. Class diagram ------------------------------------------------------------------------------------58

2.4.4. Dynamic Models-------------------------------------------------------------------

--------------59

2.4.1.1. Sequences Diagrams-------------------------------------------------------------------------59

2.4.1.2. Activity diagram ------------------------------------------------------------------------------60

Chapter Three --------------------------------------------------------------------------------------------------------63

3. System Design -----------------------------------------------------------------------------------------------63

3.1. Introduction----------------------------------------------------------------------------------------------63

3.1.1. Purpose-------------------------------------------------------------------------------------------64

3.1.2. Scope----------------------------------------------------------------------------------------------65

3.2. Goals and trade-offs------------------------------------------------------------------------

-----------66

3.2.1. Goals----------------------------------------------------------------------------------------------66

3.2.2. Trade-offs-----------------------------------------------------------------------------------------68

3.3. System decomposition--------------------------------------------------------------------------------69

3.3.1. Layers and partitions----------------------------------------------------------------------------71

3.3.2. System Topology---------------------------------------------------------------------------------73

Fig 15: - System Topology------------------------------------------------------------------------------------75

3.4. Concurrency identification ---------------------------------------------------------------------------75

3.5. Hardware / software Allocation ---------------------------------------------------------------------77

3.5.1. System

performance----------------------------------------------------------------------------78

3.5.1.1. General system performance ---------------------------------------------------------------78

3.5.1.2. Input/ output performance -----------------------------------------------------------------80

3.5.1.3. Processor allocation--------------------------------------------------------------------------81

3.5.1.4. Memory allocation ---------------------------------------------------------------------------82

3.5.2. Connectivity--------------------------------------------------------------------------------------82

3.5.3. Network architecture ---------------------------------------------------------------------------84

3.6 Data management-------------------------------------------------------------------------------------85

3.7. Global resource handling -----------------------------------------------------------------------------86

3.8. Software control implementation-----------------------------------------------------

--------------87

3.8.1. External control flow (between subsystem)--------------------------------------------------87

3.8.2. Concurrent Control:-----------------------------------------------------------------------------88

3.8.3. Internal Control (Within a Single Process):---------------------------------------------------88

3.8.4. User Interfaces:----------------------------------------------------------------------------------89

3.9. Boundary Conditions----------------------------------------------------------------------------------90

3.9.1. Initialization: -------------------------------------------------------------------------------------90

3.9.2. Termination: -------------------------------------------------------------------------------------90

3.9.3. Failures:-------------------------------------------------------------------------------------------90

3.10. Design rationale

------------------------------------------------------------------------------------91

Chapter Four----------------------------------------------------------------------------------------------------------93

4. Implementation ---------------------------------------------------------------------------------------------93

4.1. Introduction/Overview -------------------------------------------------------------------------------93

4.2. Tools and Technology Utilized for Implementation -----------------------------------------------94

4.3. System implementation ------------------------------------------------------------------------------95

4.3.1. System Interfaces--------------------------------------------------------------------------------97

4.3.2. System Algorithm--------------------------------------------------------------------------------99

4.3.3. Source Code----------------------------------------------------------------------

-------------- 101

4.4. DevOps Integration and Installation Procedures ------------------------------------------------ 106

4.4.1. Continuous Integration and Deployment--------------------------------------------------- 106

4.4.2. Infrastructure as Code (IaC) ------------------------------------------------------------------ 107

4.4.3. Monitoring and Logging ---------------------------------------------------------------------- 107

Chapter Five -------------------------------------------------------------------------------------------------------- 109

5. Conclusion and future work------------------------------------------------------------------------------ 109

5.1 Conclusion-------------------------------------------------------------------------------------------- 109

5.2 Future work ------------------------------------------------------------------------------------------ 110

5.3. Closing Remarks------------------------------------------------------------------------------------- 111

Glossary ------------------------------------------------------------------------------------------------------------- 114

References: --------------------------------------------------------------------------------------------------------- 115