

Cairo University

Faculty of Engineering

Department of Computer Engineering

**Chef w Nos**

[Insert project image, if any]

A Graduation Project Report Submitted

to

Faculty of Engineering, Cairo University

in Partial Fulfillment of the requirements of the degree

of

Bachelor of Science in Computer Engineering.

**Presented by**

Karim Amr Mohamed Amr

Abdallah Ahmed Omar Magdy

**Supervised by**

Dr.Magda Fayek

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**General Guidelines**

* The document is intended to be a template for the graduation project report in the department of Computer Engineering, Cairo University
* After reading this page, you have to remove it from the report
* Red texts should be removed and replaced by similar ones, related to your project
* The color of the cover page should be green
* Throughout your text, use the font type, font size, and spacing, as in this template. In general, Arial font should be used. Chapter headings should be of size 24. Sections should be of size 18, and regular text should be of size 12. Your text should be justified on both left and right sides.
* The reference list should be written using a font size of 10. Ensure that the references are written correctly and all fields are included. References should be ordered according to their appearance in the text “[1], [2], [3] … etc”
* The table of content is a tentative one. You could add more sections as required. However, the mentioned sections should be included in your report
* For the appendices, add any appendix you see necessary. Remove any appendix that is not applicable to your project. However, the feasibility study and user guide should be included
* Ensure that the report is clear and self-contained, such that any future interested reader could completely understand your project “to the extent of building another one similar to yours”
* Use figures as much as possible to clarify and enrich your discussion. You have to draw all figures yourself. Ensure that the figures are clear and their size is suitable.
* Any figure caption should be inserted below the figure. Figures within any chapter should be numbered starting from 1. For example, the first figure of chapter 2 should be “Figure 2.1”. Similarly, the fourth figure of chapter 3 should be “Figure 3.4”
* Any table caption should be inserted above the table. Tables within any chapter should be numbered starting from 1. For example, the first table of chapter 4 should be “Table 4.1”. Similarly, the seventh table of chapter 5 should be “Table 5.7”
* Copy and paste from any other source is not allowed by any shape. Even for the background knowledge, you have to use your own wording.
* The complete report should be submitted 48 hours before the final project demonstration day. Ensure that you would meet this deadline to avoid any late penalty

# Abstract

With the fast-paced lifestyle that we are living, eating has become an afterthought, people want to eat to get through the day and don’t want to spend time thinking and planning what to eat, which makes cooking even more difficult to do daily.

Figuring out what to eat every day is needless time wasting whether it’s just you eating alone or your whole family negotiating and discussing what to eat just to settle for an old recipe.

It leads to cooking the same recipes in a cycle which heavily limits recipe discovery and can turn cooking into more of a tedious chore.

After all the thinking and planning when you finally settle on a recipe it’s hard to follow the video’s steps and you end up pausing and rewinding which makes you wonder why I cooked in the first place.

To make the cooking process easier, faster, and more convenient the user should have fast access to recipes that he’s likely to make and that suit his inventory of ingredients, and be able to ask for certain recipes, ingredients, or cravings.

The user should also have a way to conveniently navigate the steps of the recipe that he chose to make.

We propose a system that accompanies the user and helps make cooking a simpler task.

The system should be able to chat with the user to understand their craving and can adjust on the fly to the user’s requests. The user’s request is then sent to a recommendation system that recommends recipes based on user’s request, favorite recipes, and past recipes, this process can go back and forth until the user is satisfied and chooses a recipe.

The recipe is then loaded and presented to the user as a collection of steps he can move through freely.

The system is presented in an application form where users can chat with their chef and can ask for similar recipes, recipes with certain ingredients and characteristics.

The application also provides relevant recommendations based on user’s likes and history.

An inventory system is also added to monitor ingredients and give users insights on their shopping and diet.

Recipe understanding is also presented to segment recipes video to logical steps to allow the user to freely navigate the recipe’s steps.

# الملخص

مع نمط الحياة السريع الذي نعيشه، أصبح الأكل مجرد فكرة ثانوية، حيث يرغب الناس في تناول الطعام للمضي قدمًا في يومهم ولا يرغبون في قضاء الوقت في التفكير والتخطيط لما يجب تناوله. وهذا يجعل عملية الطبخ أكثر صعوبة في القيام بها يوميًا.

قرار ما يجب تناوله كل يوم يستهلك الكثير من الوقت عن طريق التفاوض ومناقشة العائلة بشأن ما يجب تناوله فقط للوصول إلى وصفة قديمة. هذا يؤدي إلى تكرار نفس الوصفات بشكل متكرر، مما يقيد اكتشاف وصفات جديدة ويجعل عملية الطبخ مهمة مملة.

بعد كل التفكير والتخطيط عندما تستقر على وصفة معينة، يكون من الصعب اتباع خطوات الفيديو وتجد نفسك توقف وإعادة المشاهدة، مما يجعلك تتساءل لماذا طبخت في المقام الأول.

لجعل عملية الطبخ أسهل وأسرع وأكثر ملائمة، يجب أن يتمكن المستخدم من الوصول السريع إلى وصفات يحتمل أن يقوم بتحضيرها وتتناسب مع مخزونه من المكونات، وأن يكون بإمكانه طلب وصفات معينة أو مكونات أو رغبات.

يجب أيضًا أن يكون للمستخدم وسيلة للتنقل بسهولة في خطوات الوصفة التي اختارها.

نقترح نظامًا يرافق المستخدم ويساعده على جعل الطبخ مهمة أبسط.

يجب أن يكون النظام قادرًا على محادثة المستخدم لفهم رغباته ويمكنه التكيف مع طلبات المستخدم. يتم إرسال طلب المستخدم إلى نظام توصية يوصي بوصفات استنادًا إلى طلب المستخدم والوصفات المفضلة والوصفات السابقة للمستخدم، ويمكن أن يتم هذا العمل ذهابًا وإيابًا حتى يكون المستخدم راضيًا ويختار وصفة.

ثم يتم تحميل الوصفة وتقديمها للمستخدم على هيئة مجموعة من الخطوات التي يمكنه التنقل فيها بحرية.

يتم تقديم النظام في شكل تطبيق حيث يمكن للمستخدمين التحدث مع طاهيهم وطلب وصفات مماثلة أو وصفات تحتوي على مكونات وخصائص معينة.

يوفر التطبيق أيضًا توصيات ذات صلة استنادًا إلى تفضيلات المستخدم وتاريخه.

يتم أيضًا إضافة نظام للجرد لمراقبة المكونات وتزويد المستخدمين بإرشادات حول التسوق والنظام الغذائي.

كما يتم تقديم فهم الوصفة لتقسيم فيديو الوصفة إلى خطوات منطقية للسماح للمستخدم بالتنقل بحرية في خطوات الوصفة.

# ACKNOWLEDGMENT

First, we would like to thank God for helping us through this long and challenging journey. We would also like to thank our supervisors Dr. Magda Fayek for her support, guidance, and advice. During this journey we got a lot of support from our family and friends for which we are very thankful.

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# List of Abbreviation

[The abbreviations should be put in an alphabetical order]

AI Artificial Intelligence

EA Evolutionary Algorithms

GA Genetic Algorithms

SA Simulated Annealing

VLSI Very Large Scale Integration

# List of Symbols

[The symbols should be put in an alphabetical order. Greek symbols come first, followed by English symbols]

σ Noise standard deviation

B Buffer size

fop Operating frequency

# Contacts

**Team Members**

|  |  |  |
| --- | --- | --- |
| **Name** | **Email** | **Phone Number** |
| Name of Student 1 | [abc1@email.com](mailto:abc1@email.com) | +2 01xxxxxxxxx |
| Name of Student 2 | [abc2@email.com](mailto:abc2@email.com) | +2 01xxxxxxxxx |
| Name of Student 3 | [abc3@email.com](mailto:abc3@email.com) | +2 01xxxxxxxxx |
| Name of Student 4 | [abc4@email.com](mailto:abc4@email.com) | +2 01xxxxxxxxx |

**Supervisor**

|  |  |  |
| --- | --- | --- |
| **Name** | **Email** | **Number** |
| Name of Supervisor | [abc5@email.com](mailto:abc5@email.com) | +2 01xxxxxxxxx |

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1. Introduction

This chapter is to introduce your project, justify the need for it and explain the steps you follow to achieve it. The main outcomes from the project should be clearly stated. The organization of the document should finally be given

In this space, before the first section, write a general introduction to the project

## Motivation and Justification

In this section, you have to answer the most basic question “why your project is needed?”. As such, you have to clarify the problem that is addressed by your project. The significance of this problem, and hence the justification of your project, should be given in details. The usefulness and uses of your project should be also emphasized

## The Essential Question

Based on 1.1 summatize your essential question in a short paragraph along with its relevance to the Vision and Mission of the Faculty of Engineering at Cairo University

## Project Objectives and Problem Definition

In this section, you have to clearly state and explain the objectives of your project. Of course, all your objectives should be combined to solve the problem you mentioned in Section 1.1. and end by a formal definition of your problem including all the assumptios that may pause a limitation on the general problem (in case you are targeting a specific case of a general problem).

## Project Outcomes

In this section, you have to clearly state and explain the outcomes resulted from your project, such as hardware platforms, software packages … etc.

## Document Organization

In this section, you have to give the organization of the report and a quick description of the following chapters.

**Chapter 2: Market Visibility Study**

In this chapter, you survey the related market to your project. Other similar tools/platforms should be discussed. The drawbacks within them, which justify the need of you project, should be given.

In this space, before the first section, write an introductory paragraph on the project market

**2.1. Targeted Customers**

In this section, mention who are the intended customers of your project and explain how these customers benefit from it

**2.2. Market Survey**

In this section, list the competitive products to your work. Similar commercial tools/platforms should be mentioned and discussed. Write a subsection for everyone of them and explain its pros and cons in that subsection

**2.2.1. Competitive Project 1**

Explain and discuss each competitive project

**2.2.2. Competitive Project 2**

Explain and discuss each competitive project

**2.3**. **Business** **Case** **and** **Financial** **Analysis**

In this section you describe the success of establishing a company to sell your product (or service)

Two Aspects must be addressed

Business Case: Based on Market survey above you should anticipate how many products you will sell over the next 5 years and how will you set your price to counter the competition.

Financial Analysis: Based on the business case we must anticipate

1. The Capex (Capital Expenditure): These are one-time spending that you pay for development and buying things for the company
2. The Opex (Operational Expenses): These are recurring payments for salaries and marketing and … etc.

Then you create what we call a cash flow table (on an excel sheet). In this sheet you put down your monthly capex and opex on a set of rows and your reveneus (money you get back from selling product/services) on another set of rows.

The difference between both sums is your profit before tax.

It is likely that this difference is negative at beginning until your sales increase and counter the expenses.

From this cash flow analysis you find the date of the break even point wbich is the date at which all the money you get back equals the money you spent. From that date onward you will be making true profit ☺.

**Chapter 3: Literature Survey**

This chapter consists of two parts. In part one, give any necessary engineering and non-engineering backgrounds that you see important for the complete understanding of your project. These backgrounds include, but are not limited to, facts, theory, formulas, algorithms and techniques. In other words, any pivotal knowledge to your project should be given, discussed, and properly defined. In part two give a short literature review of the latest publications related to your project within past three years if applicable. Specially in this chapter, avoid lengthy unrelated discussion. More important, copy-and-paste should never be used. You have to write everything with your style and wording.

In this space, before the first section, write an introductory paragraph to describe the topics and organization of the chapter

**3.1. Background on Topic 1**

Give this section a title related to the topic you cover and then write the related information as explained above.

**3.1. Background on Topic 2**

Similar to the previous section, give this section a title related to the topic you cover and then write the related information as explained above.

Just choose the most two important topics however you make sure to cover all necessary facts, theory, formulas, algorithms and techniques.

**3.1. Comparative Study of Previous Work**

In this section give a comparative, classified short literature review of the latest publications the latest publications related to your project within past three years if applicable

**3.1. Implemented Approach**

Conclude this chapter by this section stating the approach chosen from those reviewed, **but more important your justification why you chose this approach** along with any modifications added to the approach.

Notice, you may be implementing several techniques however you must illustrate the general framework for your approach.

**Chapter 4: System Design and Architecture**

This chapter represents the main body of your project. It should describe the project in full details. This chapter should answer the questions: “what has been done?” and “how it has been done?”. As such, the steps you went through to realize the project should be highlighted and properly discussed. Your scientific approaches and methodologies should be clarified. The discussion should adopt a logical flow starting from the whole block diagram, to coarse modules, and finally to fine modules. While writing this chapter, try to give as much details as possible, such that an interested reader could easily replicate your work and improve it.

In this space, before the first section, write an introductory paragraph on how you design and build your project

**4.1. Overview and Assumptions**

In this section, introduce how you design you system and develop its underlying architecture. Any employed assumptions should be clearly enumerated and justified.

**4.2. System Architecture**

The architecture of your system should be given in this section. This architecture should be first represented as a block diagram (subsection 5.2.1), which clarifies different project modules and the connections between them. You may add more subsections to properly explain your design. If possible, flowcharts are better included to ensure that the big picture and the interaction between different modules are very clear to the reader. Thereafter, each module should have a separate subsequent section to clearly describe and discuss it.

Asd3 [1]

**4.2.1. Block Diagram**

Draw the block diagram of your architecture and generally discuss its modules. After reading this subsection, interested audience should have understood the big picture of your system design and architecture. The interaction between modules should also be conveyed in this subsection

Ad3[2]

**4.3. Module 1**

Each module within your architecture should have a distinct section to explain the design of the module itself. Again, give as much details as possible, so that the reader could easily understand how the module is designed and what are the constraints that affect its design?

**4.3.1. Functional Description**

Explain the functional description of the module

**4.3.2. Modular Decomposition**

Explain the modular decomposition of the coarse module into smaller fine ones

**4.3.3. Design Constraints**

Explain the constraints that affect the design of the module

**4.3.4. Other Description of Module 1**

Give any other necessary discussion of the module to ensure that it is clearly described.

**4.4. Module 2**

Each module within your architecture should have a distinct section to explain the design of the module itself. Again, give as much details as possible, so that the reader could easily understand how the module is designed and what are the constraints that affect its design?

**4.4.1. Functional Description**

Explain the functional description of the module

**4.4.2. Modular Decomposition**

Explain the modular decomposition of the coarse module into smaller fine ones

**4.4.3. Design Constraints**

Explain the constraints that affect the design of the module

**4.4.4. Other Description of Module 2**

Give any other necessary discussion of the module to ensure that it is clearly described.

**Chapter 5: System Testing and Verification**

In this chapter, you have to explain all the steps you carried out to ensure that project outcomes are realized correctly. Your testing setup, strategy and environment should therefore be described. Your efforts for unit testing as well as integrated system testing should be given. Finally, the results from different testing scenarios should be highlighted and discussed.

In this space, before the first section, write an introductory paragraph on how you test and verify the correct operation of your system

**5.1. Testing Setup**

Explain the setup you are using in testing your project

**5.2. Testing Plan and Strategy**

Explain the methodology you follow while testing your project in details

**5.2.1. Module Testing**

Explain the steps you carried out to test different modules within the project. Give and discuss the results obtained from the testing of these modules

**5.2.2. Integration Testing**

Explain the steps you carried out to test the integrated system of your project. Give and discuss the results obtained from this whole project testing

**5.3. Testing Schedule**

Mention your testing schedule

**5.4. Comparative Results to Previous Work**

Give a summary of comparative results to previous work in Tabulated and or Graphical form along with a short commentary.

**Chapter 6: Conclusions and Future Work**

This chapter should summarize the whole project, it features and limitation. Moreover, you should give directions for future work

In this space, before the first section, write an introductory paragraph for the chapter

**6.1. Faced Challenges**

Mention all the problems/challenges that you faced while working with the project and how you overcome them

**6.2. Gained Experience**

Mentioned the experience/skills that you gained from working with the project

**6.3. Conclusions**

Write your conclusions regarding the project. Mention its features and limitations

**6.4. Future Work**

Give possible extensions, enhancements and future work of you project, such that subsequent students could build on your work and develop larger systems/platforms.

**References**

The references should be ordered according to their appearance in the text. Ensure that all references are cited throughout your report text. The following are examples of how to write different types of references “[1] Book, [2] Journal/magazine articles, [3] conference paper, [4] website, [5] thesis”. Replace the fields with those of your used references. Question marks “??” should be replaced by the corresponding number

1. Author1, Author 2,…, “Book title,” name of publishing firm, edition, year
2. Author1, Author2,…., “Title of journal article,” name of the journal, vol. ??, no. ??, pp. ??, year of publication
3. Author1, Author2,…, “Title of conference paper,” in proceedings of conference name, city, country, date, year, pp. ??
4. Author or Corporation name, “Title,” year, link for the website, last accessed: date of last access
5. Author, “Thesis title,” M.Sc./Ph.D. thesis, Department, University, year

[1] E. Guo *et al.*, “Learning to Measure Change: Fully Convolutional Siamese Metric Networks for Scene Change Detection,” Oct. 2018, [Online]. Available: http://arxiv.org/abs/1810.09111

[2] L. Zhou, C. Xu, and J. J. Corso, “Towards automatic learning of procedures from web instructional videos,” in *32nd AAAI Conference on Artificial Intelligence, AAAI 2018*, AAAI press, 2018, pp. 7590–7598. doi: 10.1609/aaai.v32i1.12342.

**Appendix A: Development Platforms**

**and Tools**

This appendix explains used tools, platforms, and hardware kits. Any ready-made module should be mentioned and discussed in this appendix. The appendix is divided into two main sections; one for the hardware and the other is for software. Within each section, you could add as much subsections as needed, according to the number of tools and platforms that you use in your project.

In this space, before the first section, write an introductory paragraph to the appendix

**A.1. Hardware Platforms**

A description of any used hardware platforms/kit should be written in this section. Each platform/kit is better described in a separate subsection. (A1.1..)

**A.2. Software Tools**

A description of any used software tool/package should be written in this section. Each tool/package is better described in a separate subsection (A2.1,..)

**Appendix B: Use Cases**

Include all your use cases

**Appendix C: User Guide**

Prepare a user guide for your project. Ensure that the guide is clear, detailed and easy for an ordinary customer to use your project. Employ figures and charts as needed to facilitate the use of your guide

**Appendix D: Code Documentation**

Your code or parts of the code you feel necessary could be included here (optional) however for one copy of this report an attached CD with all of the code is a must.

Remember you will deliver three copies of this report.

**Appendix D: Feasibility Study**

Give a detailed feasibility study of your project