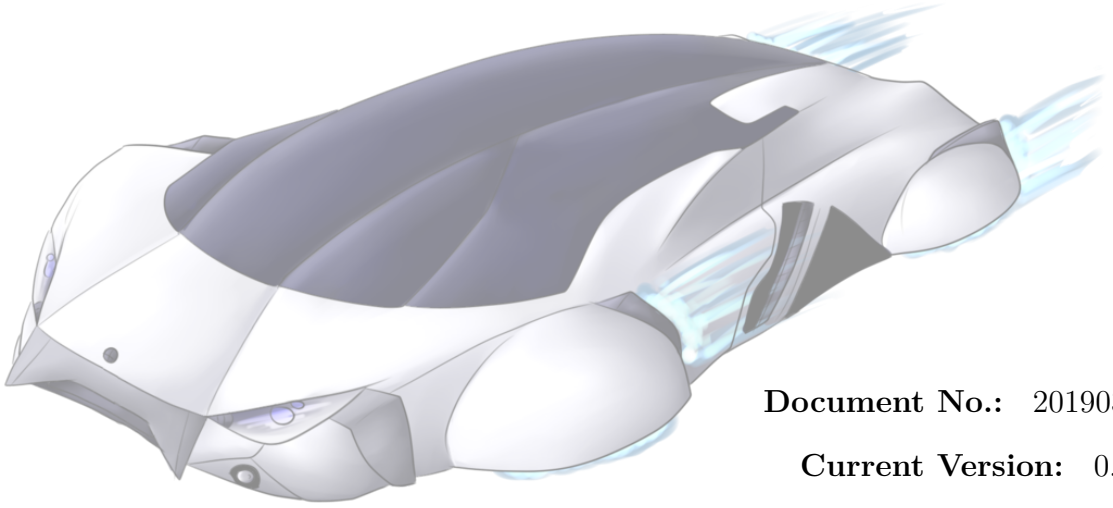
Flying Car Project Charter

Release



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Contents

Chapter 1

Introduction of Projrct Charter

§ 1.1 Overview

As a pioneer in the automobile-aviation industry, in order to promote the development of this industry, make the airplane commonplace, perpetuate the company and strengthen the public image and its position in the current markets, Ethane Autoplane Co., Ltd. decided to launch this project of Flying Car. This project charter, as a multi-agreement document, will include definitions of project objectives, development of implementation strategies, validation of project components and responsibilities and planning of project work. In order to ensure that the project implementation achieves the desired goals, the signing of the document will give the company implementation team authority and responsibility to carry out the work.

§ 1.2 Background

Flying car is a personal vehicle that is capable of door-to-door aerial transport conceptually without the need of special take-off and landing as is required in an aircraft while also providing the comfort of a roadable car. Flying car would be used for shorter distances, at higher frequency, and at lower speeds and lower altitudes than conventional passenger aircraft. Though the concept seems to be a workable one but bringing it on the commercial front has been very challenging task and a surprising number of companies have been working to bring up an acceptable model. Many prototypes have been built since the first years of the twentieth century using a variety of flight technologies, but no flying car has yet reached production status.

The mechanical challenges of flying car are so strict that every opportunity must be taken to keep a minimum weight but at the same time a typical lightweight airframe is easily damaged. On the other hand, a road vehicle must be able to withstand significant impact loads from casual incidents as well as low-speed and high-speed impacts, and the

high strength this demands can add considerable weight. Thus, a practical flying car must be both strong enough to pass road safety standards and light enough to fly.

Since the flying car would be used at lower speeds and lower altitudes than conventional passenger aircraft, and the optimal fuel efficiency for airplanes is obtained at high altitudes and high subsonic speeds, the flying car's energy efficiency would be low compared to a conventional aircraft. Similarly, the flying car's road performance would be compromised by the requirements of flight, so it would be less economical than a conventional motor car as well. Our goal is to strike a balance between the two and maximize the benefits.

§ 1.3 Objective

A mass-produced affordable and practical airplane product would be made, marketed, sold, and maintained just like an automobile. And our flying car must be capable of safe, reliable and environmentally-friendly operation both on public roads and in the air. For widespread adoption it must also be able to fly without a qualified pilot at the controls and come at affordable purchase and running costs. We initially plan to complete all conceptual model designs by 2025 and achieve industrial production by 2030. And the pre-orders should be held before the industrial production undergoes. The further plan to launch the fully automated version is by the year 2035.

§ 1.3.1 Safety

A major problem, which increases rapidly with wider adoption, is the risk of mid-air collisions. Another is the unscheduled or emergency landing of a flying car on an unprepared location beneath, including the possibility of accident debris. In mid-air collisions and mechanical failures, the aircraft could fall from the sky or go through an emergency landing, resulting in deaths and property damage. In addition, poor weather conditions, such as low air density, lightning storms and heavy rain, snow or fog could be challenging and affect the aircraft's aerodynamics.

§ 1.3.2 Reliability

A basic flying car requires the person at the controls to be both a qualified road driver and aircraft pilot. This is impractical for the majority of people and so wider adoption will require computer systems to de-skill piloting. These include aircraft maneuvering, navigation and emergency procedures, all in potentially crowded airspace. Fly-by-wire computers can also make up for many deficiencies in flight dynamics, such as stability. A practical flying car may need to be a fully autonomous vehicle in which people are present only as passengers.

§ 1.3.3 Environmentally-friendly

A flying car capable of widespread use must operate safely within a heavily populated urban environment. As people's awareness of environmental protection gradually increases, when the products are marked with "green labels", it will further promote the company's development in the market. Therefore, the lift and propulsion systems must be quiet, and have safety shrouds around all moving parts such as rotors, and must not create excessive pollution. Green energy sources such as solar energy, wind energy and other clean energy sources should also be considered if conditions permit.

§ 1.4 Cost

Since the Skyrunner' s first flight-capable personal vehicle is now available (but has not yet achieved mass production) on sale price of 119 thousand dollars. In order to attract customers, popularize our products and strengthen the company's position in the market, our initial pricing for the product is 100 thousand dollars. Therefore, maximizing the company's interests requires controlling costs at every stage.

The design and determination of the concept model is crucial, and it was carried out by a professional research team using numerical simulation technology, which cost within 10 million dollars. The adoption of new structural materials, the development of automated driving and the need for the propulsion system to be both small and powerful can at present only be met using advanced and expensive technologies. The cost of manufacture could therefore be as much as 100 million dollars. For product promotion and sales, the cost should be controlled within 1 million dollars.

Chapter 2

Project Scope

§ 2.1 Stakeholders

Terrafugia, AeroMobil, PAL-V One, Moller International, Zee.Aero and Urban Aeronautics are among the few well-known names in this regard who are trying to make future Flying Cars real one day. Volkswagen, Toyota are the established mobile companies that have also been working on the concept of Flying Car. Besides, there are others like NASA, US military backed organisations and the Boeing company that are working on to bring up a flying car that can serve civilian as well rescue operations needs. The following picture is the stakeholder mapping.

插图

§ 2.1.1 Project Sponsor

§ 2.1.2 Project Team Members

Companies Terrafugia, AeroMobil, PAL-V One and Zee.Aero are considered to be the major components of the project team along with the companies Citroen, Volkswagen and Airbus who provide the technical support aviatic and terrestrial.

1. **Terrafugia**

   Terrafugia, founded by MIT Grads is a company that is expected to launch the Transition Model after testing to check meeting standards for air and road safety underlined by Federal Aviation Regulatory body.

   The company has already intended to receive about 100 pre-orders on Transition mode after announcing launch in upcoming years. Besides the next generation model Terrafugia TF-X would also be developed with increased automation and scheduled for commercial availability after ten years post its debut in 2019 if it undergoes all tests successfully.

2. **Aeromobil**

   Aeromobil, a company has come up with an upgraded prototype of flying car AeroMobil 3.0. After an initial test crash, AeroMobil 3.0 finally made a successful maiden flight in the last decade. The CEO Juraj Vaculik had suggested the company' s plans to launch the model commercially. The importance of meeting regulatory standards for a flying vehicle cannot be understated and thus it would not be surprising if there occurs further delay by a couple of years before the final launch. Besides, AeroMobil also plans to make a fully automated version of the prototype for increased safety and comfort standards.

3. **PALV**

   PALV is a company from Netherlands that has developed a Personal Air And Land Vehicle Prototype PAL-V One that it claims can give experience of driving a sports car on road and at the same time like a flying bird in the sky giving a dimension of freedom by taking off from one island and landing to another, flying over mountain ranges and rivers.

4. **Aero**

   Aero, a small company inZhongguancun Science and Technology Park is working on to flying car concept to build up a VTOL machine. A patent filed by the company states that the VTOL car is capable of getting parked in a shopping mall. The project lead Ilan Kroo, an aeronautics professor and NASA scientist. The Aero has been designed in an arrangement that is called as 'Canard wing' wherein the payload area lies between front and rear set of wings.

§ 2.1.3 Project Customer

The customer will originally be someone or some companies who have an interest or a gain upon a successful completion of the project. We will divide them into three parts.

First, several airlines such as China Southern Airlines and Air China. As the economic roars, the plane has sneaked into every inch of our transportation, this new concept "flying car" is possibly to lead a trend of new convenient method of transportation. Therefore the airlines may consider it as another type of aircraft. Furthermore , we could named it Boeing 797.

Second, as the flying car may serve as a powerful alternative and prioritized option of car in the future, by which the vehicles like private cars are potential to be replaced. Looking at the future development, the car companies such as BMW group and Toyota Motor Corporation are also supposed to renew their products, they launch am annual release of a new system, attend the annual conference and conduct academic research. Supposing that the flying cars will be gradually accepted by the public, it is high time for them to introduce this new product.

What’ s more, the flying cars could attract individuals who are obsessed with cars or planes. The flying car is exactly a consummate combination which not only offers countless opportunities to maximize efficiency, but also spice up the journey on the road.

§ 2.2 Technology

§ 2.2.1 Modeling

In terms of the model of the flying car, the project will select the most compatible one among several models created by the software CATIA. The main function and part are same, however, we are about to simplify the model into an optimization problem and find the best. Optimization problems are often multi-modal; that is, they possess multiple good solutions. They could all be globally good (same cost function value) or there could be a mix of globally good and locally good solutions. Obtaining all (or at least some of) the multiple solutions is the goal of a multi-modal optimizer.

Classical optimization techniques due to their iterative approach do not perform satisfactorily when they are used to obtain multiple solutions, since it is not guaranteed that different solutions will be obtained even with different starting points in multiple runs of the algorithm. Evolutionary algorithms, however, are a very popular approach to obtain multiple solutions in a multi-modal optimization task.

插图

§ 2.2.2 Engine

Ion engine will be the major component that generate the flying car. Ion thrusters use beams of ions (electrically charged atoms or molecules) to create thrust in accordance with momentum conservation. The method of accelerating the ions varies, but all designs take advantage of the charge/mass ratio of the ions. This ratio means that relatively small potential differences can create high exhaust velocities. This reduces the amount of reaction mass or propellant required, but increases the amount of specific power required compared to chemical rockets. Ion thrusters are therefore able to achieve high specific impulses. The drawback of the low thrust is low acceleration because the mass of the electric power unit directly correlates with the amount of power. This low thrust makes ion thrusters unsuited for launching spacecraft into orbit, but effective for in-space propulsion.

They are categorized as either electrostatic or electromagnetic. The main difference is the method for accelerating the ions. Electrostatic ion thrusters use the Coulomb force and accelerate the ions in the direction of the electric field. Electromagnetic ion thrusters use the Lorentz force to move the ions. Therefore, this problem should also be solved.

§ 2.2.3 Material

The composite materials and the alloy will compose the main materials of the flying cars, especially the composite material like Fibre-reinforced polymers(FPR).

FRP include carbon-fibre-reinforced polymer(CFRP) and glass-reinforced plastic(GRP). If classified by matrix then there are thermoplastic composites, short fibre thermoplastics, long fibre thermoplastics or long fibre-reinforced thermoplastics. There are numerous thermoset composites, including paper composite panels. Many advanced thermoset polymer matrix systems usually incorporate aramid fibre and carbon fibre in an epoxy resin matrix.

§ 2.2.4 Flight control system

A conventional fixed-wing aircraft flight control system consists of flight control surfaces, the respective cockpit controls, connecting linkages, and the necessary operating mechanisms to control an aircraft's direction in flight. Aircraft engine controls are also considered as flight controls as they change speed.

The fundamentals of aircraft controls are explained in flight dynamics. This article centers on the operating mechanisms of the flight controls. Our flight control system are determined to imitate the technology of Airbus, and will be gradually transformed to an unmanned aerial vehicle(UAV), commonly known as a drone.

§ 2.2.5 Test-analysis

The simulation of the flying car will use the method of Verification and Validation(V&V).

Verification is the process of determining that a model implementation accurately represents the developer' s conceptual description of the model and the solution to the model.

Validation is the process of determining the degree to which a model is an accurate representation of the real world from the perspective of the intended uses of the model.

Verification and validation are processes that collect evidence of a model' s correctness or accuracy for a specific scenario; thus, V&V cannot prove that a model is correct and accurate for all possible conditions and applications, but, rather, it can provide evidence that a model is sufficiently accurate. Therefore, the V&V process is completed when sufficiency is reached.

Chapter 3

Project Organizational Structure

§ 3.1 Project Organizational Chart

The Flying Vehicle Design and Production project team consists of a project steering committee, a customer service team, a project manager, a functional team, and a technical team. The project was initiated by the Project Steering Committee, which is also the main decision maker and strategy maker for the project. All project matters are coordinated and managed by the project team. The project team will consist of full-time project managers, technicians, and business owners and experts in key functional areas.In addition, the project team will include technical and functional consultants from the client side.

插图

§ 3.2 Responsibility

The work of this project is completed by a project team composed of Ethane Autoplane Co.Ltd. and the client side, which means that the two parties form a common working group in the project to complete each project task. The main consideration of this arrangement is to ensure that the design and manufacturing of the flight and the car meet the customer's requirements during the project, and when necessary, communicate with the customer about the design details of the flying car, and coordinate the design between the designer and the customer. Only in this way can the order of the design and manufacturing of the flying car be guaranteed.

Specifically, the division of labor and responsibilities of Ethane Autoplane Co.Ltd and the client are:

§ 3.2.1 Project management team responsibilities

Role	Personnel	Description
Steering Committee Member/Project Director	**Related personnel**	
		Support and monitor project actions;
		Review/approve the project plan with the leader;
		Review/modify/approve the guidelines proposed by the project team with the leadership;
		Provide advanced project management guidance and assistance;
		Evaluate the design and manufacture of products to ensure that quality meets certain requirements, timely delivery and cost control.
Blue print design		
Manufacturing		
Acceptance of delivery		

§ 3.2.2 Product development team

§ 3.2.3 Project Promotion Team and Coordination Group

§ 3.2.4 Other participants and groups of the project

§ 3.3 Responsibility matrix

Chapter 4

Project Plan

This project will follow the system implementation methodology summarized by the company in the field of manufacturing system implementation. The project will follow this implementation methodology.

§ 4.1 Project phases and key tasks

WBS 分解

According to the implementation methodology, the whole process of the project is devided into 4 following phases.

- **Project preparation** — *Object definition*
- **Blue print design** — *Target decomposition*
- **Manufacturing** — *Aims achieved*
- **Acceptance of delivery** — *Customer value realization*

Each step of the four-step implementation method is divided into tasks in detail, and the specific work content, work time, work mode, person in charge and work results of each step are defined.

§ 4.2 Timeline

According to the above implementation methodology, the specific implementation plan of this project is as follows, and the project work will be carried out according to this plan.

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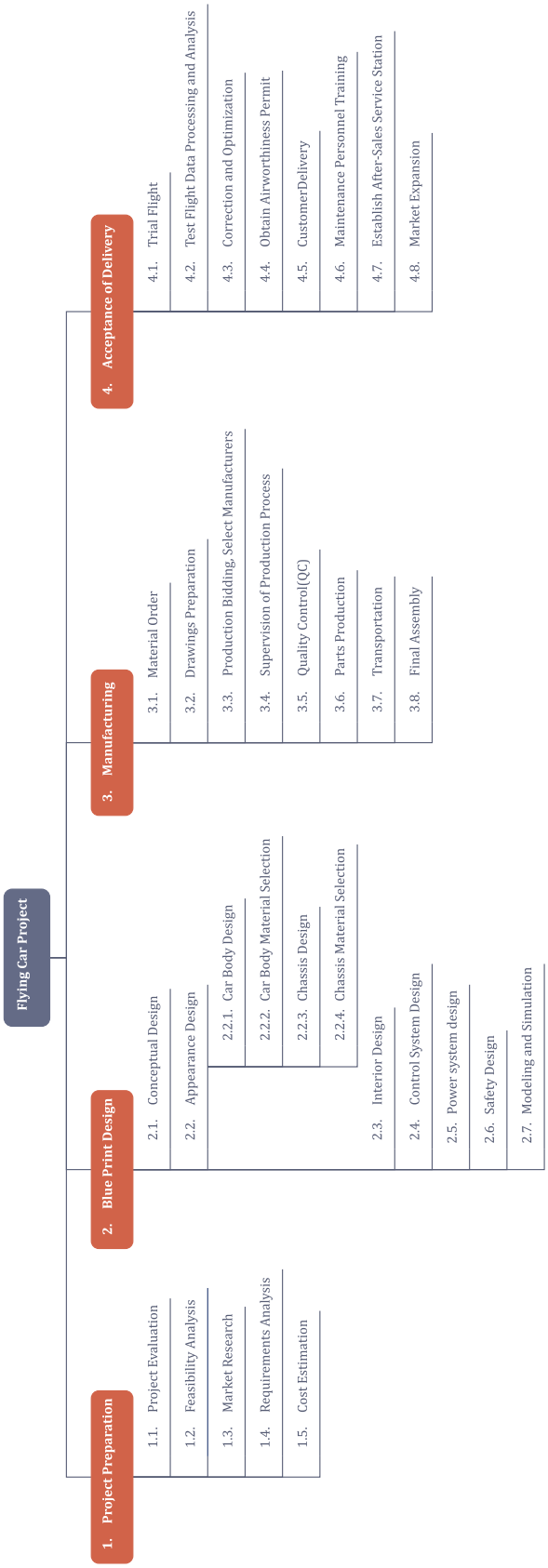

Figure 4.1-1 WBS

§ 4.3 Milestone

A milestone is a point in time used to mark the events or major accomplishments of the project team, as well as to mark the progress of the project. The major milestones and associated timelines for the Flying Car project are as follows:

Table 4.3-1: **Project milestones**

Project phase	Milestone	Planned date
Project preparation		
Blue print design		
Manufacturing		
Acceptance of delivery		

§ 4.4 Project plan execution and report

The project manager is primarily responsible for monitoring the progress of the project. The project plan is the key document used to inform the progress and current status of the project. The project plan includes project phase, task, duration, resources, scheduled start and end dates, milestones, persons responsible, and deliverables. The Project plan will be maintained by **XXX** and will reflect the Project methodology planning phase.

Only in two cases can the entire baseline plan be redesigned. One is that the entire baseline plan should be updated whenever there is any scope change that fundamentally affects project progress. Similarly, when schedule or budget deviations are significant, benchmark plans need to be reworked to make performance reports meaningful again.

The execution and reporting of the project plan shall be carried out in accordance with the following procedures: each project team member shall be responsible for updating the actual progress according to the project plan and estimating how long it will take to complete the tasks assigned to him/her as part of the weekly project report meeting. The project management team meets every Friday to review project progress against the project plan. The review is based on a review of delays, focusing on identifying existing or potential task delays, assessing the impact on the project, and agreeing on action plans to be taken to mitigate the impact. Project managers highlight tasks that may be delayed (e.g., expected completion time is later than planned). The person in charge of the task should develop an action plan for potential delays to minimize the impact on other project work. The project team leader shall indicate the possible task delay in the problem section of the weekly status report, including a brief description of the problem, a brief description of the action plan to prevent the delay or the date of the new task, and the date shall indicate the impact on other tasks.

Chapter 5

Project Document Management

§ 5.1 Importance of project document management

The implementation of the flying car project manufacturing management system is a complex system. To ensure the ultimate success of the project, it must be strict control is carried out at every stage of the purpose. The project's documentation reflects the project's work process and results and is the basis of project control. According to it, it is also a key carrier of "knowledge transfer", so it is necessary to fully document the entire process of the project.

This document specifies the documents that need to be written during the project process, including project management documents, project technical documents and projects function documentation, etc. In addition, this document also describes the specific requirements for documentation, and the project team members are making these documents. It must be carried out in accordance with these requirements and must be signed by the corresponding responsible person.

§ 5.2 Project document system

The corresponding documents need to be written at different stages of project implementation. The table below shows which documents are needed at which stages of the project, and the corresponding file format, encoding rules and required date of completion.

表格

The main contents and purpose of the report listed in the above table are explained below:

- **Project implementation and work plan:**

  At the beginning of the project, the overall time plan, key checkpoints, division of

duties and other things make it clear. In addition, in the specific implementation process, there must be a specific work plan, which is generally formulated and checked on a weekly basis.

- **User demand report:**

  Before the start of the project, collect all the user's needs for flying car products, and evaluate the rationality and operability of the demand.

- **Evaluation report:**

  It is the main work result of the system evaluation stage. It summarizes all current business processes, as well as all current business processes and current system inputs (forms, etc.) and outputs (reports, etc.). It should also include a series of function check tables that maps system functions to current business processes at a high level and finds differences from current processes/systems. Besides the report should also include key system interface requirements and data migration strategies.

- **Design Report:**

  Based on the design of the system, summarize what changes need to be made to the current business process. In based on the identified process, it should be summarized what configuration of the system is to meet the requirements of the process. For the system to be performed customized development includes reports, and it is up to the functional staff to develop requirements for the effects that development should achieve from a functional perspective.

- **Design evaluation report:**

  Conduct comprehensive experimental and simulation tests on flying car design, evaluate the test result data, analyze the rationality of the design change, and propose modifications to the design plan.

- **Material purchase application:**

  Determine the design drawings of all components and the type, quantity and price of the materials used, and apply for ensuring the rational use of the materials applied and minimizing production costs.

- **Test result report and assessment:**

  Collect and analyze the test flight results of the flying car model machine, propose revisions to the problems that arise in the flying car model, and summarize the impacts of subsequent problems, including human resources, material additions, extension of completion time and so on.

- **User test cases and results:**

  Flying car project team members should write system integration test cases according to their determined business processes. Make sure these cases include all of their business processes. Follow the impact of these business cases on the current process and the impact on other processes and steps should also be included in the case. When the user conducts the test, the actual test should be recorded. The results are compared with the expected results.

- **User Training Program:**

  Develop a training plan prior to the start of the training, and arrange the training process, course, and participants.

- **User Manual:**

  User's guidance and reference manual for operating the system. It should include all that is determined by Ethane Autoplane Co., Ltd. Business processes and the functions of the system are organized in a way that is a business process. After the new user has received training in system use, according to the policy of the manual and business process, the operation of the system should be completed. The manual will also serve as an end user part of the materials used in the system training.

- **User training materials:**

  The materials used for end-user training are combined with the user manual to train end users.

- **Maintenance Documentation:**

  A maintenance manual for the flying car administrators. It should be written in conjunction with policy. It should include a description of the flying car architecture and the software and hardware platforms used; distribution (production, development, testing, etc.); system startup, shutdown, backup, performance monitoring, and common maintenance instructions for use, etc.

- **Reconciliation Confirmation Report:**

  Verifies each month's salary calculation results during the support period.

- **Product Quality Check Report:**

  Summarize the status of the system up to date and analyze the main problems and solutions in the past. Advice on further improvements and improvements in system use.

All project documentation is written in English only. The signature of the document is, in principle, completed by the manufacturing operations leader. For the key project phase summary reports such as the system online report, it is necessary to report and discuss at the project meeting, and finally the leadership sign is confirmed. At the same time, due to the tight schedule of the project, to ensure that the project can proceed according to the plan and ultimately On the planned date, the signing of the project document should be completed within 5 working days of the submission of the document. If more than 5 jobs it is still not signed, it will be deemed to have been signed and confirmed, and the work of the project team will be carried out in accordance with these documents.

§ 5.3 Project document management environment

As part of project management best practices, project documentation should be maintained within a centralized and controlled environment. This not only ensures the standardization of the project documentation, but more importantly, it provides a convenient platform for the knowledge sharing of project stakeholders. The documentation for this project is maintained in the Flying Car Project Document Management Server. The specific address is: www.XXX.com.

Chapter 6

Project Communication Management

§ 6.1 Project decision process

The decision making and reporting processes described below are related to daily challenges and decisions. Some challenges may result in project scope, resources or time. The change of the table needs to be handled by the change control process described in the change management.

For decisions that do not have a significant impact on the scope, resources or timelines of the project, the project team has the discretion to decide. Decision making the first level escalation leader is the flying car project manager. The second-level reporting leader is the project director. Before reporting to a higher level, at a certain the level leadership office may not report more than twice. Need to get input from the steering committee or need to get most of internal consent decisions are limited to the following: (I) Decisions that have a significant impact on flying car project's existing business processes; (II) Decisions will affect flying car project key Policy decisions; (III) decisions that bring significant changes to the scope, timelines, functionality, or costs of the project. These are referred to as "significant Decision". A decision flow chart is given on the next page, which details the process.

流程图

§ 6.2 Project meeting

The Flying Car Project Communication Plan is used to clarify the objectives, scope, processes, and plans for communication for project implementation and training to ensure project leadership, guidance, consultants, and working groups receive timely and accurate information. The target audience for project communication is:

- Steering Committee

- Project Director
- project manager
- Core project team
- End user

Every Thursday 14:00-15:00 All members of the project team will meet once. The meeting was hosted by the project manager and worked for the past week. To summarize, discuss the problems and solutions in the project work, and arrange the work for next week. Project team and the special project meeting of the management team will arrange the dates according to the situation.

Every Friday 14:00-15:00 The project holds a management meeting, including flying car project director, project manager, and small group leader. At the meeting, the project status report submitted by the project management team will be received, and the project management status report submitted once a week will be taken as develop the main basis for the Steering Committee's report. Project director's development and submission of the steering committee status report and organization of the report work is primarily responsible.

Chapter 7

Project Risk Management

During project implementation, there will be inevitably some problems and risks. It's very important to summary timely, consider seriously, coordinate correctly and make the right decision.

Our budget is about 200 millions dollar at the beginning. We plan to cooperate with the government and some other companies later. As a result, we have a very strong risk tolerance. Trying to promote the development of the flying car, we prefer using the new technologies such as composite materials, AI. Though this preference will cause more risks.

From our brainstorm, research and interview, we conclude that the primary risks can be divided into the main risks and some additional risks for the Flying Car project. Their risk score is obtained by the risk matrix table attached at the end of this chapter.

§ 7.1 Main Risks

The main risks generally include the following four parts:

§ 7.1.1 Technology and Design Risks

The Flying Car need to fly and have the ability of collision. As a result, it have to balance the relation between the weight and the strength, which takes more challenges to our engineers and designers. These challenges will bring more risks to the project compared to the traditional car project. The project may be failed due to the technology and design challenges. It' s risk score is 1.

1. Use some advance technologies and materials to overcome the challenges.
2. Optimize the load factor on the body to decrease the material request.
3. Use some special structure design to balance the weight and the strength.

§ 7.1.2 Certification Risk

Our project Flying Car must obtain two certifications: the certification of the car and the certification of airworthiness. The certification will last for a long time especially the certification of airworthiness, the long-time certification procedure may block our project progress.

Something worse is that the structure or some systems need to be redesigned and then may restart the certification of the airworthiness. This risk will block the project progress seriously. The certification risk score is 1.

1. Store the technological documents for the future certifications.
2. Use the simulator to test and verify the product for the certifications.
3. Engineers and designers should think twice and verify the characteristics before handling on the final product.
4. Refer to the design and solutions of other similar products.

§ 7.1.3 Market Risk

As a new kind of transportation, we can not assure our Flying Car market and whether the customers accept the product. It' s a risk that our product may not be very popular and the sells can' t meet our expectation.There is a big risk that our Flying Car may won' t have the available airspace. The market risk score is 5.

1. Cooperate with the government to apply for the airspace.
2. Propose a flying car management method.
3. Make some advertisements on TV, radio and the Internet.
4. Organize some test activities to show our Flying Car' s safety and efficiency.

§ 7.1.4 Budget Risk

Firstly, the usage of the advance technologies and materials like the aluminum alloy and the titanium alloy will require a big expense; Secondly, the certification of the airworthiness requires several fly tests. The fly test and the redesign will cost a lot and bring some useless expenses; Thirdly, the advertisements and the organization of the activities will cost a lot of our budget.

It' s very possible that these three factors lead us to run out of out budget and cause the project failed. The budget risk score is 8.

1. Cooperate with the government to get the financial subsidy.
2. Cooperate with other companies to be financed.
3. Decrease the predefined performance level.
4. Loan to banks.

§ 7.2 Additional Risks

There are some additional risks too, which are concerned with the implementation, the production and the management. They are listed as following:

§ 7.2.1 Implementation Risks

This project is involved with many departments who may have different implementation situation. It' s very possible that some departments can' t guarantee the progress and that there will be some implementation cycle delays. The implementation cycle delays will interrupt the project. This risk score is 6.

1.The hole company need to set a unique design-production timeline and apply the manage.

2.Build a clear information transmission and step synchronization at the beginning of the project.

3.Make a clear holiday arrangement at beginning to avoid the risk of the interruption by the holiday like the Christmas.

§ 7.2.2 Production Risks

To product a flying car, there are many manufactures to cooperate with each other. And these manufactures may come from different regions and different countries. So it will be a big problem to synchronize these manufactures and to guarantee their tasks. We may cause some misunderstands due to the different languages and different cultures. The production risks will block our flying car production procedure. This risk score is 7.

1. Send a quality checker and a progress monitor to the manufactures. They send back the report to the headquarters frequently.

2. Hire the qualified translator who has the ability of the foreign language, who knows well about the foreign culture and who has the relative diploma.

§ 7.2.3 Worker Risks

1. Worker has a negative response to the project implementation, lacks of passion, idleness, etc. The risk score is 6.

Solution: Establish effective reward and punishment measures and publicize it' s consequences.

2, invalid project organization. The risk score is 9.

Solution: According to the progress of the project, dismiss or reorganize the project organization.

3. Spread rumors and crack down on project implementation team members. The risk score is 10.

Solution: Regularly announce the progress of the project implementation and impose penalties on those who spread the rumors.

4. The middle and senior leaders arranged other affairs to the implementation people, resulting in the implementation progress not being completed on time. The risk score is 6

Solution: If the implementation people need to deal with other matters, he must be approved by the project implementation leadership team.

5. Because after the new process is established, it may affect the interests of relevant personnel, especially the interests of middle and high-level, leading to resistance to the project and ultimately affecting the project implementation process;The risk score is 5.

Solution: Convene a special middle-level and high-level coordination meeting to implement a unified understanding of the Flying Car project, clear goals, and coordinate their interests by the top leadership.

§ 7.2.4 Management Risks

1. The departments meet conflicts during the application process. The risk score is 6.

Solution: Senior leaders give arbitration from the overall interests of the company.

2. For the personal benefit, the business processing is performed without authorization. The risk score is 5.

Solution: The executives of each implementing unit must obtain the authorization.

3. The senior management should stand at the height of overall optimization at a critical moment and conduct arbitration. The risk score is 10.

矩阵

Chapter 8

Project Change Management

§ 8.1 Raise the change

§ 8.2 Response from the receiver

§ 8.3 Approval of the applicant

§ 8.4 Change implementation

§ 8.5 Flow of variation procedure

Chapter 9

Quality Control

Chapter 10

Acceptance Level

Appendix