

INTRODUCTION

The tourism sector in the SADC region has captivating landmarks and a plethora of wild life which presents the tourism industry the opportunity to give tourists different experiences. An aerial luxury tour of the major land marks in Southern Africa could expand the tourism industry and also offer tourists who enjoy “God’s view” of land marks and wild life a broader experience. The itinerary will start at Kruger National Park followed by an exploration of Victoria falls in Zimbabwe and the Okavango Delta in Botswana. The luxury experience continues through the Skeleton Coast of Namibia, and comes to an end at the scenic view of Table Mountain in Cape Town.

PROJECT 83: SADC AERIAL SAFARI

Student NO: 732537
RM Khoza
MECN4005A
Coordinator: Prof Polese



KNP-VicFalls = 1300km



VicFalls-OkoDelta= 700km



OkoDelta-SkelCoast= 995km



SkelCoast-Cape town= 995km

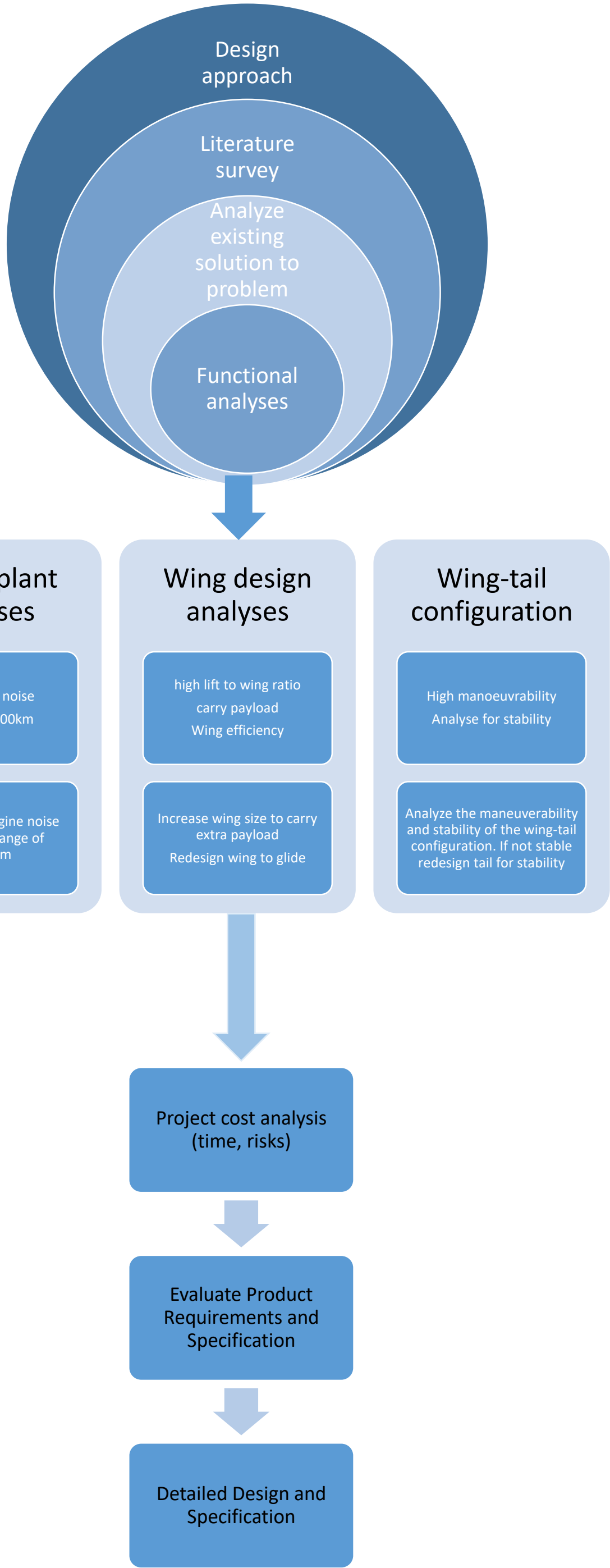


FUNCTIONAL REQUIREMENTS AND LIMITATIONS.

1. Cabin furniture should be aesthetically pleasing and comfortable during the tour.
2. The aircraft should be able to maneuver land marks to give the tourists best view experience.
3. Aircraft noise must be considered as some areas may have noise restrictions to not startle the wildlife.
4. The safari must be undertaken during the day at clear skies so that the landmarks and wild life are visible for the tourists to see.

DESIGN LIFECYCLE / PROCESS

The Design Lifecycle is illustrated using the following flowchart. The flowchart is a road map to two design solutions that will be reiterated to meet project requirements within the given constraints



EXISTING SOLUTIONS ANALYSIS

	Private jet	Bush plane	Helicopter	Hot air baloon
Aesthetics	high	Moderate	High	Low
Range	5000-13800 km	700-2000 km	320-740km	10-17 km
Aircraft noise	Moderate	High	Very high	Low
Passenger view	Moderate	High	Very high	Very high [360 degrees]
Confort	High	Low	Low	Low
Flight duration	5-7 hrs	3-4 hrs	2.5-h hrs	1hr depends on windspeed
Manuevreability	High	Very High	Very High	Very Low
Cost	Very high	Moderate	High	Moderate
Passenger	8-20 passengers	4-13 passangers	4-12 passengers	3-5 passengers

AIRCRAFT DESIGN REQUIREMENTS AND LIMITATIONS.

Functional requirements and constrains directly inform the design requirements of the aircraft solution.

To achieve comfort and luxury the aircraft weight will increase to accommodate extra furniture, aircraft lavatory, cabin décor, cabin stewards, food and drinks payload:

- High payload
- High wing to lift ratio

To achieve best view experience the aircraft should be able to maneuver and loiter:

- Maneuverability and stability.
- Wing configuration and fuselage should not obscure site viewing.

The engine should have low noise or be silent:

- Silent engine
- Glide i.e. switch of engine during wildlife loiter

To achieve long flight duration

- Engine type vs fuel consumption.
- Efficient flight path.

SUMMARY

The design process allows for reiterations and depth computations to justify or validate product requirements and specifications and the overall success of the proposed solution. The design principles and theorems are obtained from engineering text books, journals and all computations and analyses are in accordance with EASA, FAA, NASA and SACAA standards and procedures for aircraft design. Aircraft data is obtained from Pilots Handbook and analyses are done using Matlab, Excel and CAD. The project solution will promote appreciation of the environment and shift innovative drive in travel and tourism. The less noisy aircraft will bring harmony and serenity to the wildlife ecosystem.