A BALANCED SCORECARD (BSC) TO ENHANCE MISSION READINESS OF COMBAT SQUADRONS IN THE INDIAN AIR FORCE (IAF)

A Dissertation submitted to the Panjab University, Chandigarh for the award of the degree of Master of Philosophy in Social Sciences, in partial fulfilment of the requirement for the Advanced Professional Programme in Public Administration

by

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DECLARATION

I hereby declare that the dissertation entitled "**A Balanced Scorecard (BSC) to Enhance Mission Readiness of Combat Squadrons in the Indian Air Force (IAF)"** is my own work conducted under the supervision of **Dr. Roma Debnath** from the Indian Institute of Public Administration (IIPA), New Delhi.

I further declare that to the best of my knowledge the dissertation does not contain any part of any work, which has been submitted for the award or any degree either in this University or any other University without proper citation.

I also declare that all reference material used for the dissertation has been taken from unclassified sources and studies. There is no classified matter in the text of the dissertation.

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Air Commodore

CERTIFICATE

I have the pleasure to certify that Air Commodore SA Nawathe has pursued his research work and prepared the present dissertation entitled "**A Balanced Scorecard (BSC) to Enhance Mission Readiness of Combat Squadrons in the Indian Air Force (IAF)"** under my guidance and supervision. The dissertation is the result of his own research and to the best of my knowledge; no part of it has earlier comprised any other monograph, dissertation or book. This is being submitted to the Panjab University, Chandigarh for the degree of Master of Philosophy in Social Sciences in partial fulfilment of the requirement for the Advanced Professional Programme in Public Administration (APPPA) of the Indian Institute of Public Administration (IIPA), New Delhi.

I recommend that the dissertation of Air Commodore SA Nawathe is worthy of consideration for the award of M. Phil degree of Panjab University, Chandigarh.

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ABBREVIATIONS

AD	-	Air Defence
AOC	-	Air Officer Commanding
AOC-in-C	-	Air Officer Commanding in Chief
AOR	-	Area of Responsibility
APPPA	-	Advanced Professional Programme in Public Administration
ASV	-	Aviation Specialist Vehicle
BSC	-	Balanced Scorecard
CAS	-	Chief of Air Staff
CASI	-	Command Air Staff Inspection
CASIO	-	Command Aerospace Safety and Inspection Officer
CO	-	Commanding Officer
CSG	-	Carrier Strike Group
DASI	-	Directorate of Air Staff Inspection
DGI&S	-	Director General Inspection and Safety
FCL	-	Fighter Strike Leader
FOD	-	Foreign Object Damage
FSL	-	Fighter Combat Leader
FTE	-	Flying Training Establishment
GSE	-	Ground Support Equipment
HQ	-	Headquarters
IAF	-	Indian Air Force
IR	-	Instrument Rating

IT	-	Information Technology
LMC	-	Low Medical Category
OJTC	-	On the Job Training
PFR	-	Physical Fitness Rating
SASO	-	Senior Air Staff Officer
SMSO	-	Senior Maintenance Staff Officer
SOA	-	Senior Officer in Charge Administration
SOP	-	Standard Operating Procedure
TRS	-	Turn Round Servicing
TTGE	-	Tools, Testers and Ground Equipment
U/T	-	Under Training
US	-	United States of America
VCAS	-	Vice Chief of Air Staff

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ABSTRACT

The purpose of this research is to develop a Balanced Scorecard (BSC) to enhance "Mission Readiness" of combat squadrons of the IAF. The study is undertaken to overcome certain limitations of performance metrics currently used in the IAF to evaluate the "Mission Readiness" of its combat squadrons. These metrics mostly focus on measurement of past performance (Lag Indicators) with drivers of future performance (Lead Indicators) being largely ignored.

The study employs a Mixed Research Strategy with a Three Phase Exploratory Sequential Design in which data collected and analysed is used to devise perspectives, objectives and metrics for formulating a BSC to measure the "Mission Readiness" of combat squadrons. The BSC is then validated with analysis of expert responses from serving IAF officers with relevant experience in all organisational levels in the IAF.

First, the organisation structure of the IAF is studied to identify the stakeholders and visualise the relationships between different entities in the hierarchy, in order to devise a set of relevant perspectives for the BSC which can be related to elements in the IAF organisation. This is followed by analysis of the current performance metrics in the IAF which reveals inadequate strategic linking of these measures to the long term strategic objective of "Mission Readiness", leading to a loss of focus in certain important activities.

The concept of the BSC and its applicability to not-for-profit organisations is then explored and the relationship between the BSC and "Mission Readiness" established,

thus paving the way to use the BSC as a tool to enhance “Mission Readiness” of combat squadrons of the IAF.

Next, a Strategy Map with three perspectives mapped to the Squadron CO’s level and the Wing/Command HQ level are developed, detailing the cause and effect relationships of various elements which would build up towards the desired strategic objective of “Mission Readiness” of the squadron. The relationship among these components has then been used to ascertain the key elements of each activity that, when implemented together, would lead to the desired results. The performance measures for these drivers are then devised and a BSC created to improve the “Mission Preparedness” of combat squadrons of the IAF.

For validation, a Google Form containing an anonymous survey questionnaire is sent to select IAF officers with experience in appointments at the organisational levels of the IAF mapped to the perspectives of the proposed BSC. The responses are analysed and stakeholders’ perceptions of critical perspectives, objectives and performance metrics for the BSC are presented.

Analysis of the responses indicates that the Mission Readiness Perspective is perceived as the most important perspective of the BSC, followed by the Employees and Organisation Capacity Perspective, with the Internal Processes Perspective seen as the least critical. Mission Capability, Training of Technicians and Training of Pilots are seen as the most important objectives of the respective perspectives. Missions Actually Flown to Total Missions Planned is the most important measure of Mission Capability, Planned versus Actual OJT is the most important metric of Training of Technicians and

IR/Operational Status of squadron pilots is the most important measure of Training of pilots. Based on recommendations of respondents; a few modifications are made to the proposed BSC to take into account field conditions.

Due to the short time span of the study, the impact of implementing the proposed BSC on the performance of combat squadrons is not tested. A longitudinal study after implementation of the BSC is required for the same. The BSC developed by identifying critical perspectives, objectives and metrics after due validation by IAF officers will help combat squadrons of the IAF to focus on improvement strategies in key areas to enhance their "Mission Readiness".

Key Words – Balanced Scorecard, Strategy Map, Performance Measures, Lag Indicators, Lead Indicators, Combat Squadrons, Mission Readiness.

CHAPTER I

INTRODUCTION

Missions of the IAF

The IAF's primary missions are to safeguard India's sovereign airspace and to conduct aerial warfare during armed conflicts. To achieve these missions, the IAF has a robust organisation structure, a force of motivated Air Warriors and a number of assets and infrastructure facilities. The IAF has also identified a set of Core Values; "Mission, Integrity and Excellence", which serve as the cornerstones of its operational concept. The vision statement of the IAF, "People First, Mission Always" clearly outlines that while its Air Warriors will remain its biggest strength, the primacy of the IAF's mission will always remain supreme.

Towards this end, there has been a considerable effort at the IAF and National levels to provide state of the art platforms and infrastructure to enable the IAF to carry out its missions. On their part, the combat squadrons of the IAF also strive to ensure that their levels of mission readiness are at the highest at all times. This mission readiness is measured using certain performance indicators that are compiled and exchanged between all stakeholders at the squadron and wing level and monitored by the higher echelons of the organisation at Air Command and Air Headquarters (HQ) level. These performance indicators usually include the following:-

- **Percentage of Flying Task Achieved**. Every unit of the IAF has an authorised monthly flying task which has to be planned and achieved in a phased manner. The percentage of flying task planned and achieved is a measure used to monitor daily/weekly/monthly progress of the squadron.

- **Serviceability Percentage of Aircraft**. All the aircraft held with the squadron may not be available for flying due to reasons like rectification of snags, maintenance inspections etc. This indicator measures the number of aircraft that were available to a squadron for flying during a day/week/month.

- **Flight Safety**. Flying and ground Accidents/incidents which take place during the year are used to evaluate the flight safety status of the squadron. These are further attributed to Human Error, Technical Defects etc.

- **Reports of Inspection Teams from Air Command/Air HQ**. Typically, these inspections are carried out once a year and evaluate the ability of the squadron to undertake its designated role in the IAF.

The Balanced Scorecard (BSC)

The BSC was introduced by Kaplan and Norton (1992) in the early 1990s in an attempt to reconcile problems in traditional management strategies which overemphasized financial measures over others to evaluate the success of businesses.

This resulted in short-term gains with a corresponding lack of attention to important areas critical for long-term success. To address this issue, the BSC uses what are known as “Lead” and “Lag” indicators. The “Lag” indicators are usually measures of past performance, generally related to the profitability of the organisation; whereas the “Lead” indicators measure aspects from which returns would accrue to fulfil the long-term objectives. According to Niven (2006, p. 13) these measures act as instruments for the top hierarchy of the organisation to effectively convey to the workforce and other stakeholders those aspects on which they need to focus in order to ensure that the organisation will be able to achieve its short term and long term objectives. As shown in Figure 1.1, this is achieved by providing four different perspectives of the organisation, each of which contains a range of measures indicating aspects of organisational performance (Kaplan and Norton, 1996, p.78).

The BSC also functions as a strategic management system that allows organisations to clearly communicate their strategy to their workforce and ensure that the focus of the business is directed to ensure the success of this strategy (Nachtmann *et al.*, 2015). While it is primarily applied in businesses to improve aspects like revenue and profitability, with a few minor adaptations, the BSC can also be used by governmental agencies, including the military, to considerably improve their performance.

STATEMENT OF THE PROBLEM

A review of the performance indicators for an IAF combat squadron mentioned above shows that they are mostly “Lag” indicators which measure past performance. The “Lead” indicators, those which highlight and measure the drivers of future performance, have been largely ignored. Another aspect which is evident is that the inspections by higher echelons of the IAF provide a “temporal snapshot” of mission readiness and do not assure the same on a consistent basis.

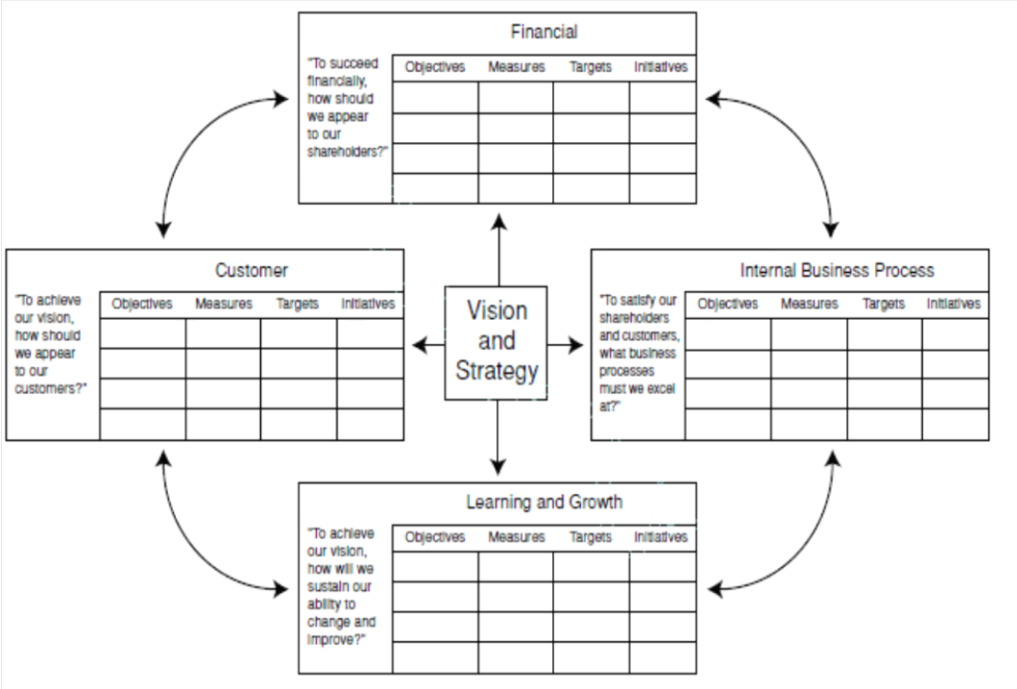

Figure 1.1 Perspectives of the Balanced Scorecard

Source: Kaplan and Norton, “Using the Balanced Scorecard as a Strategic Management System”, Harvard Business Review (Jan-Feb 1996)

The BSC on the other hand, not only takes into account the historical accuracy of the “Lag” indicators, but also harnesses the power of the “Lead” indicators to enable

consistent performance and continuous growth of the organisation. However, the BSC has been primarily designed to develop and measure metrics for improving the performance of businesses with the objective of increasing revenue and profits of the stakeholders. The challenge lies in adapting a traditional BSC to develop and measure performance metrics for an entity (an IAF combat squadron) that does not focus on profits but delivers "Mission Readiness" at all times to its stakeholders. This requires a complete review of the traditional BSC and its perspectives as well as an understanding of the various stakeholders and their concerns. This study will attempt to develop a suitable BSC to be used as a tool to measure the mission readiness of a combat squadron of the IAF at any point of time.

JUSTIFICATION OF THE STUDY

The IAF plays a crucial role in safeguarding the territorial integrity of India against any threats. This mandate requires a balanced, alert, well equipped and fully integrated force, manned by disciplined air warriors and led by competent leaders. To effectively carry out this mandate, combat squadrons of the IAF need to be "Mission Ready" at all times. The fundamental proposition that within organisations "what gets measured gets done" is true of the IAF too. Thus, it is necessary for the IAF to continuously measure the "Mission Readiness" of its combat squadrons and to ensure that the same is maintained on a consistent basis. Further, the optimum performance measurement system should also motivate stakeholders to direct every bit of their effort towards the fulfilment of this mandate. The present performance measurement system

used by the IAF fulfils these requirements only partially and in the long run may adversely affect the mission readiness of its combat squadrons, leading to a detrimental impact on the security of the nation. Hence, there is a need to develop a suitable tool that not only measures the performance of IAF combat squadrons, but also assures the stakeholders of consistent execution of all those activities that are necessary to maintain mission readiness in the long run.

OBJECTIVES OF THE RESEARCH

The research has the following objectives:-

- To explore the perspectives and performance measures of the BSC in non-profit organisations,

- To develop a BSC for measuring the mission readiness of combat squadrons in the IAF, and

- To validate the proposed BSC perspectives and the performance measures chosen through a survey of concerned officers in the field.

RESEARCH QUESTIONS

Towards meeting the objectives mentioned above, the study will attempt to answer the following Research Questions:-

- What is a BSC? What are the perspectives and performance measures used for BSCs in non-profit organisations?
- What are the modifications required to be made to the perspectives of a traditional BSC to enable it to be used as a tool to measure the mission readiness of combat squadrons of the IAF?
- Which are the performance metrics that need to be included in such a BSC?
- How will the performance metrics be assigned to the different perspectives of the BSC?
- Which of the devised perspectives and performance metrics are more critical for effective measurement of mission readiness as per the stakeholders in the field?

RESEARCH STRATEGY AND RESEARCH DESIGN

Research Strategy. A Mixed Research Strategy, comprising elements of both Qualitative and Quantitative Strategies has been employed for carrying out the study.

Research Design. The study employs a Three Phase Exploratory Sequential Design in which qualitative data has been collected and analysed in the first phase. The second phase involved formulation of a BSC for measuring the "Mission Readiness" of combat squadrons in the IAF. Subsequently, in the third phase, the BSC has been validated by collecting and analysing quantitative data from field units in the IAF.

SCOPE OF THE STUDY

The scope of the study is limited to the development and validation of a BSC for measurement of mission readiness of flying squadrons of the IAF. Non-flying combat units, non-combat units, training units and maintenance units have not been considered while developing the BSC.

RESEARCH METHODS AND DATA SOURCES

Qualitative data for the study was analysed through content analysis of the available literature. This data was used to identify the performance measures and construct the BSC for measuring the mission readiness of combat squadrons. The

perspectives of the proposed BSC and the performance measures were evaluated for correctness and criticality with the help of quantitative analysis of survey data collected from combat squadrons and other stakeholders in the field.

CHAPTERISATION

The Dissertation has been arranged in following chapters in order to facilitate logical presentation and analysis of collected data and ease of assimilation of the derived inferences:-

- **Chapter I – Introduction**. The first chapter outlines the issue by bringing forth the background and the statement of the problem which necessitates the study. It also covers the objectives of the study, research strategy and research design, the research questions, methods of data collection and analysis as well as the scope and justification of the study.

- **Chapter II – Review of Literature**. This chapter presents the details of the literature reviewed and the research gaps identified for finalising the area of research for the study.

- **Chapter III – Overview of IAF Organisation and Current Performance Measures**. This chapter provides a brief insight into the relevant organisation structure of the IAF to highlight the various

stakeholders with an interest in the Mission Readiness of combat squadrons. It also briefly explains the current measures used to monitor performance in the IAF.

- **Chapter IV – Overview of the BSC and Its Applicability to the IAF**. This chapter presents the basic concept of the BSC as a management tool, the importance of performance indicators and the modification of the perspectives and performance measures of the BSC for use in non-profit organisations, including military organisations like the IAF.

- **Chapter V – Developing and Validating the BSC to Measure Mission Readiness**. The fifth chapter analyses the qualitative data through content analysis and develops the BSC to measure the mission readiness of IAF combat squadrons. The proposed BSC perspectives and performance measures are then validated by analysis of quantitative data collected from the field.

- **Chapter VI – Findings, Recommendations and Conclusion**.

The findings of the research have been presented in the final chapter. The chapter also brings out recommendations for the IAF, limitations of the research and areas for further study.

CHAPTER II

REVIEW OF LITERATURE

The Origin of the BSC

Kaplan and Norton (1992) first developed the BSC as "a set of measures" after a research study involving many companies that were exploring new methods of performance measurement. These measures not only included the traditional financial metrics, but also operational measures like customer satisfaction, internal processes of the company as well as its innovation and improvement activities, which they opined were the drivers of future financial performance. Thus, the BSC can be described in simple terms as a judiciously chosen array of quantifiable measures derived from an organisation's vision and strategy (Niven, 2006, p.13). Kaplan and Norton (1996a, pp.1-2) highlighted the importance of the concept with the analogy of a fictional conversation with an aircraft pilot.

Q: I'm surprised to see you operating the plane with only a single instrument. What does it measure?

A: Airspeed. I'm really working on airspeed this flight.

Q: That's good. Airspeed certainly seems important. But what about altitude? Wouldn't an altimeter be helpful?

A: I worked on altitude my last few flights and I've gotten pretty good on it. Now I have to concentrate on proper air speed.

Q: But I notice you don't even have a fuel gauge. Wouldn't that be helpful?

A: You're right; fuel is significant, but I can't concentrate on doing too many things well at the same time. So, on this flight I'm focusing on airspeed. Once I get to be excellent at airspeed, as well as altitude, I intend to concentrate on fuel consumption on the next set of flights.

With this analogy the authors equated modern day business environments to the complex task of piloting a jet aircraft and explained that managers should not focus and make decisions based solely on the evaluation of financial indicators. On the contrary, modern managers, just like jet pilots, need to consider many aspects of their environments and performances in order to guide their organisations to success in the future (Kaplan and Norton, 1996a, pp.1-2).

The BSC in Government Organisations

While companies were quick to adopt this new system of performance measurement to maximise their profits, Kaplan (1999) brought out that it had tremendous potential to improve the performance of public sector institutions as well. He suggested that such organisations use the Financial Perspective as a constraint rather than an objective to ensure limiting expenses to budgeted funding. Rohm (2002) and Niven (2003) brought out that as government organisations were mandated to deliver essential

services to citizens in a cost effective manner and not generate profits, the traditional perspectives of the BSC needed to be changed to reflect the mission centric working of the public sector. Accordingly, there was a fundamental shift in the logic of building and implementing the BSC by renaming the financial perspective as the budget perspective to emphasise the public accountability of funds, and increasing the focus on the citizen by interchanging the positions of the budget and customer perspective. In a complete turnaround from Kaplan's view on use of the BSC in government, Norton, the other founder of the BSC, in an interview with Foster (2006, pp. 102-105), stated that the BSC was not just a corporate tool but was actually more applicable to the public sector because the public sector did not have the compulsion of the financial dimension like the private sector; hence there was greater freedom for public sector managers to define the mission and the measurable indicators for success. He highlighted this by giving examples of a number of public sector organizations like the Royal Canadian Mounted Police, the School System of Atlanta in the US, the City Government of Brisbane in Australia, the Korean Development Agency and the Economic Development Agency in the US Government which had shown tremendous success in implementing the BSC to achieve their objectives.

The BSC as a Strategic Management System

The origin of the BSC was from the need to balance purely financial measures of performance with drivers of future performance. However, as more and more organisations started using the concept they discovered that this powerful tool could also

be used in a number of ways to make their strategy actionable. Kaplan and Norton (1996, p. 19) explained that the BSC achieved this by allowing organisations to:-

- Clarify and translate vision and strategy.
- Communicate and link strategic objectives and measures.
- Plan, set targets and align strategic initiatives, and
- Enhance strategic feedback and learning.

Nair (2004, pp. 5-6) further explained that the BSC provides a framework to fill the existing gap between business strategy and tactics and their corresponding measures (Figure 2.1).

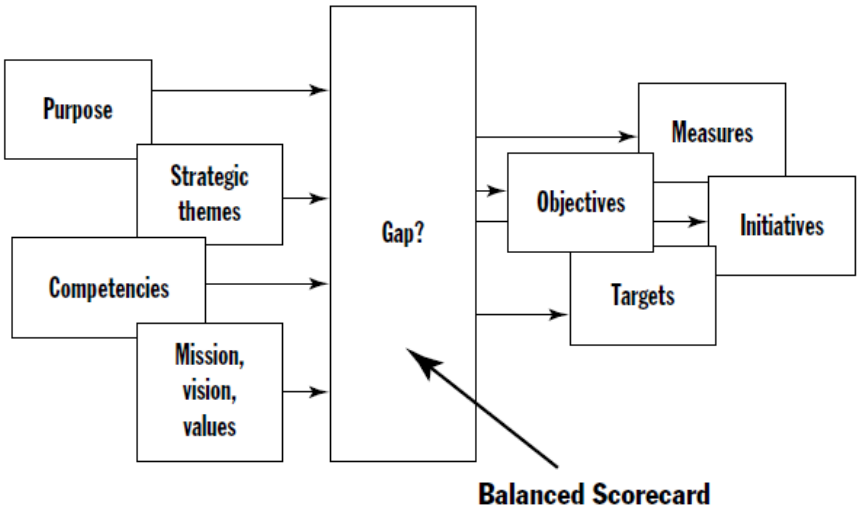

Figure 2.1 The Balanced Scorecard to Bridge the Gap Between Business Strategy and Tactics

Source: Nair, "Essentials of Balanced Scorecard", John Wiley and Sons, 2004

When used in this way to manage strategy over a long term timeframe the BSC can become an extremely effective Strategic Management System for modern organisations (Figure 2.2) (Kaplan and Norton, 1996, p.80).

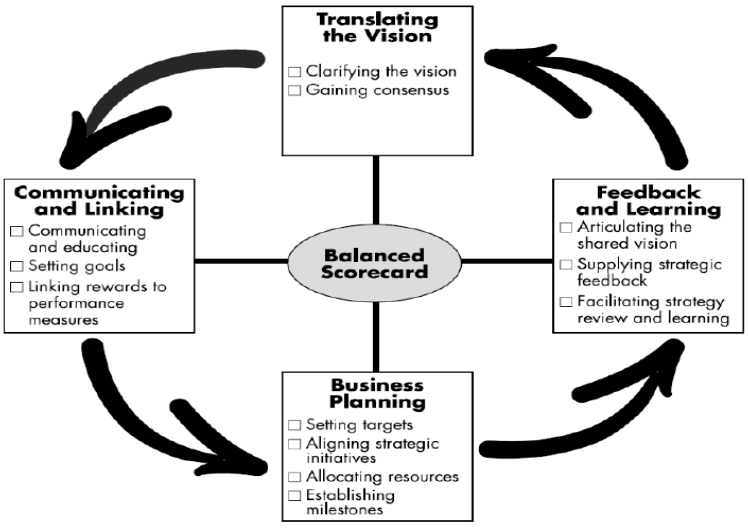

Figure 2.2 The Balanced Scorecard as a Strategic Management System

Source: Kaplan and Norton, "Using the Balanced Scorecard as a Strategic Management System", Harvard Business Review (Jan-Feb 1996)

The BSC as a Communication Tool

Niven (2006, p. 13) explained how the BSC in combination with its Strategy Map also acts as a powerful communication tool, signalling to all stakeholders, whether within the organisation or outside, what the organisation must do well to achieve its long term goals. Though the BSC appears to be a simple tool for improving the performance of an organisation, its actual implementation is quite complex and involves breaking down each of the four perspectives into their contributing parts and understanding the linkages between them. This is done by using Strategy Maps which clearly bring out the cause and

effect relationships among all the four perspectives and their constituents. Construction of the Strategy Maps involves breaking down the organisation's strategy into easy to assimilate themes and pictorially highlighting the cause and effect relationships between the perspectives of the BSC. This enables every member of the organisation to understand the things that need to be done, who is to do them and what the results of these activities are.

The BSC in the Defence Forces

A number of military organisations have successfully implemented the BSC as part of the changes required to improve their performance in critical areas ranging from strategic level objectives like transforming the Organisational Structure and Culture of a defence force or development of a National Security Strategy, to tactical objectives like mission accomplishment. Given the confidential and sensitive nature of the subject, not many specifics of these BSCs are available in the open domain for study and analysis. However, there is plenty of scholarly work available, examining or suggesting the use of the BSC in the defence forces. A brief review of this body of work is given in subsequent paragraphs.

Woodley (2006) examined the implementation of the BSC in the Royal Navy and its inter-relationship with the organisational culture of related institutions to develop a model for understanding organisational culture and its linkages with the BSC, mainly through organisational strategy. He then designed and validated a cultural development

tool to demonstrate how the measurement of organisational culture could be integrated into the implementation of the BSC and investigate likely management issues in the organisation. Further, he used the organisational culture model to evaluate the implementation of the BSC in other organisations and showed how cultural issues affected the development of the BSC in these organisations.

Hepler (2008) assessed the use and implementation of the BSC in the US Air Force Materiel Command, which started a BSC programme in 2001. He used a meta synthesis approach to analyse qualitative BSC data and came up with eleven key areas essential for the successful implementation and use of the BSC in organisations (Figure 2.3) (Hepler, 2008, p.10). He also reviewed the history of Materiel Command in each of these key factors to identify gaps in its BSC and the body of literature on the subject and provided recommendations to improve the BSC in use.

Implementation Order	Key to Successful BSC Implementation and Use	
1	1	Deploy BSC from the Top Down
2	2	Establish BSC Framework
3	3	Standardize Within the BSC--but Do Not Standardize Content
4	4	Select the Right Objectives and Performance Measures
	5	Quantify Objectives or Their Performance Measures
	6	Ensure Objectives Present a Causal Pattern
	7	Implement Strategy Maps
5	8	Select Software to Help--Not Hinder
6	9	Select BSC Goals and Timelines for Their Completion
7	10	Simplify Management Systems--Do Not Just Add To Existing Framework
8	11	Cascade the BSC

Figure 2.3 Keys to Successful Implementation of Balanced Scorecard

Source: Hepler, "Balanced Scorecard: Evaluation of Air Force Materiel Command's Implementation and Use", Air Force Institute of Technology, Air University (2008)

Ivancik and Necas (2012, pp. 141-150) emphasised the role of software applications in efficient implementation of the BSC by relaying relevant information of performance measures to the correct person in real time. However, they also highlighted that mere implementation of the software applications was not enough to signal successful implementation of the BSC. For that to happen, it was imperative for the BSC to be seamlessly integrated into the everyday management practices at all echelons of the organisation's management. They further drew attention to instances of successful implementation of the BSC system in various levels of the military like the Royal Norwegian Air Force, the United States Army and the United Kingdom Ministry of Defence, thus proving the versatility of the BSC as a tool to achieve long term strategic goals.

Brandao *et al.* (2013, pp. 171-176), in a case study of the Brazilian Air Force, used the BSC to formulate an action plan for solid waste management by defining strategic goals in line with the national policy on the subject. These goals were then amalgamated to design the sustainability BSC for the Brazilian Air Force (Figure 2.4). The plan included a set of compliance targets based on national laws for which the researchers created appropriate indicators to be measured including products prioritised based on environmental aspects rather than only financial parameters, environmental licenses for relevant operations at air force bases, agreements with recycling cooperatives, training programmes on environmental sustainability for employees and investment in effectively communicating the sustainability efforts undertaken to both internal and external stakeholders.

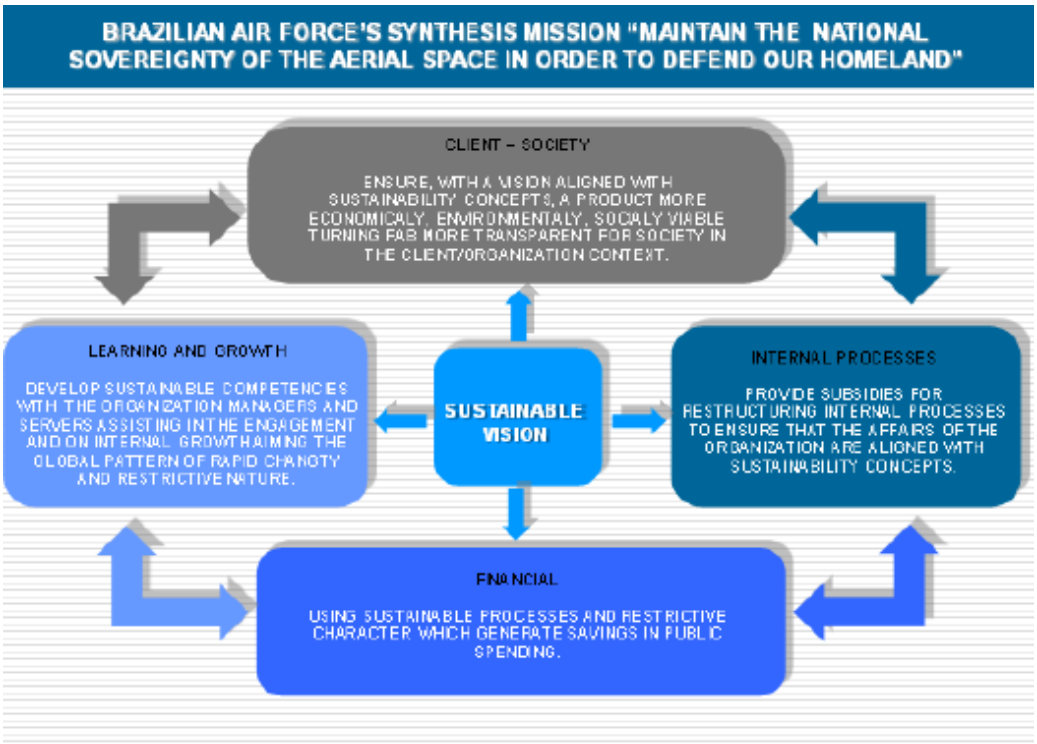

Figure 2.4 Sustainability Balanced Scorecard of the Brazilian Air Force

Source: Brandao *et al.*, "Balanced Scorecard as a Tool for Sustainable Management Control: A Case Study of the Brazilian Air Force", Journal of Economics, Business and Management, Volume 1, Number 2, (2013)

Kankaras *et al*. (2014) designed a generic BSC with modified perspectives of Outcomes, Resources, Processes and Development to measure and manage defence performance. Since overall defence performance depends on a number of complex aspects, some of which are more important while others are less so, the authors developed a system of weightages for each performance measure within its respective perspective to ensure that the BSC measured performance in a realistic manner. They further suggested the use of "defence dashboards" to display the current status and future trends of performance in the various perspectives to help in understanding the bigger picture at a

glance, to easily spot key issues and take quick and informed decisions for remedial actions (Figure 2.5).

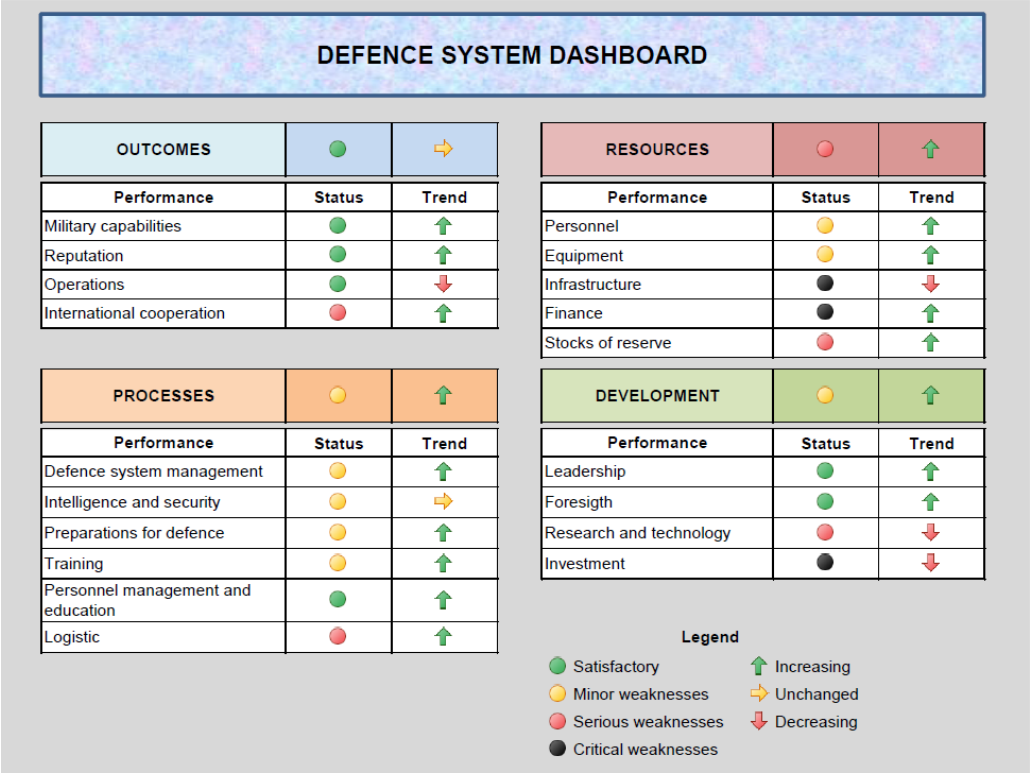

Figure 2.5 Defence Dashboard to Monitor Performance at a Glance

Source: Kankaras *et al.*, "Application of the Balanced Scorecard in Defence Performance Management", Symorg International Symposium Paper (2014)

Nawathe (2014) developed and validated a BSC to measure seemingly intangible criteria for the evaluation of the Flight Safety Climate of Flying Training Establishments (FTEs) in the IAF. The BSC aimed to improve the Flight Safety Climate by providing different perspectives to the organization, each with its own range of measures to indicate the performance level achieved. He utilised models from various state and organisation sponsored aviation safety climate studies, duly adapted for the environment at IAF FTEs, to derive various strategic themes, strategy components and identify the key performance drivers that could be used to track progress towards the desired outcomes.

Albright *et al.* (2014) proposed a BSC for a United States (US) Navy F/A-18 strike fighter squadron and concluded that the customer and financial perspectives are not always relevant in military organisations where the deliverable is “mission readiness”. They substituted these perspectives with the organisational levels to which the non-financial deliverables are made and developed a BSC with only three perspectives, a significant departure from the traditional structure of the BSC. However, this BSC was not validated by quantitative methods.

Nachtmann *et al.* (2015) developed a BSC for flight line maintenance activities in an aircraft maintenance unit in the US Air Force. They integrated different maintenance measures into the four perspectives of the BSC in a measurement framework that ensured that flight line maintenance activities were aligned to the long term strategies and missions of the US Air Force. The researchers then validated the BSC perspectives and measures by administering an anonymous questionnaire to 26 experts to rank the criticality of perspectives and measures proposed and suggest any measures which they felt had been omitted by the authors. They concluded that such a BSC developed through identification of mission critical performance measures would lead to better maintenance performance, improve aircraft availability to operational units and better achievement of mission objectives.

Sales *et al.* (2016) combined System Dynamics with the BSC to develop a dynamic model for Information Technology (IT) governance in the Brazilian Army. The dynamic BSC thus developed was then subjected to simulations to forecast both positive

and negative impacts of the chosen IT governance strategy on the Brazilian Army's Telematic System. This allowed the researchers to mitigate the likely structural problems in application of the BSC to IT governance and, in a significant development, allowed for dynamic correction of the strategic measures of the BSC based on the outputs of the simulations.

Arif and Rahman (2017) studied the usefulness of the BSC to create synergy in the defence forces of Pakistan towards the achievement of national defence objectives. The researchers amalgamated aspects of Resource Based Theory with the basic conceptual model of the BSC and collected quantitative responses from more than 300 officers of the Pakistani defence forces with at least graduate or higher educational qualification. They then used simple and multiple regression analysis to conclude that "Purpose of the Defence Forces, Resources, Enabling Processes and Building for Future were the predictors of Achievement of National Defence Objectives"; and that these four predictors could be used as perspectives to create a BSC for improving the synergy and overall functioning of the Pakistani defence forces.

Identification of Research Gap

As can be seen from the review of literature in the paragraphs above, a large body of work is available on the development and evolution of the BSC, from its origin as a purely corporate tool in 1992, to its progression as an equally useful tool for performance measurement and enhancing the functioning of non-profit oriented or governmental

organisations. Later, it was realised that the BSC along with its strategy maps could also be used as a strategic management system and strategic communication tool for organisations. The available literature also indicates that a number of scholars have proposed BSCs to measure and improve performance in military organisations across the world. These BSCs have been used to resolve strategic issues like formulation of National Security Strategy or handling changes in Organisational Culture; tackle operational issues in diverse fields such as logistics management, solid waste management and IT governance; and even to resolve tactical level issues for better mission accomplishment by field units. BSCs have also been used in conjunction with other tools and conceptual frameworks to generate hybrid models for improvement in defence performance.

In the field of operational performance measurement and monitoring, Ivancik and Necas (2012) brought out the remarkable turnaround in the performance of the Royal Norwegian Air Force after the implementation of the BSC. However, the details of this BSC are not readily available in the open domain, probably due to security concerns. A non-traditional BSC proposed by Albright *et al.* (2014) for measuring "mission readiness" of a strike fighter squadron of the US Navy was not validated by carrying out field studies. Further, with the exception of a study on the use of the BSC to improve the Flight Safety Climate in FTEs by Nawathe (2014), there has been no such study carried out pertaining to the operations domain in the IAF. It is this gap that the present study aims to fill by developing and validating a BSC to measure and enhance the mission readiness of combat squadrons in the IAF.

CHAPTER III

OVERVIEW OF IAF ORGANISATION AND CURRENT PERFORMANCE MEASURES

Introduction

Before moving towards the development of a BSC for measuring "Mission Readiness" in combat squadrons of the IAF, there is a requirement to understand the broad organisational structure of the force. This will assist in identification of the stakeholders, visualising the relationships between different entities in the set up and planning a set of relevant perspectives which can be related to crucial elements in the organisation.

Air HQ

The topmost body of the IAF is the Air HQ located at New Delhi. It is headed by the Chief of Air Staff (CAS) who is of the rank of Air Chief Marshal and is the Executive Head of the IAF. The CAS is assisted by six Principal Staff Officers (PSOs) of the rank of Air Marshal. These PSOs head the six branches of Air HQ, each of which comprises a number of line directorates that look after the day to day working of the IAF. The organisation chart of Air HQ (IAF Website, 2023) is as shown below (Figure 3.1).

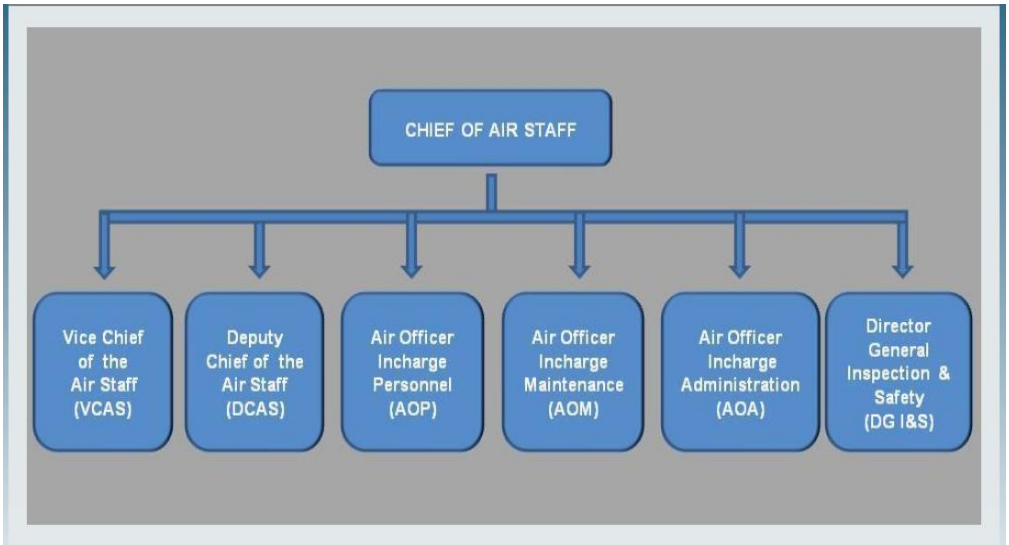

Figure 3.1 Organisation Chart of Air HQ

Source: IAF Website https://indianairforce.nic.in/air-hq-org-chart/ (2023)

Since this study deals with the aspect of "Mission Readiness" of combat units of the IAF, the Operations Branch of Air HQ which centrally controls conduct of all operations of the IAF, with the Vice Chief of Air Staff (VCAS) being responsible to the CAS for the same, is one of the major stakeholders from whom inputs will be taken for preparing the BSC. Another stakeholder is the Director General Inspection and Safety's (DGI&S) Branch, especially the Directorate of Air Staff Inspections (DASI), to analyse the measures in use for assessing the performance of combat units.

Command HQ

Execution of operations in the IAF is decentralised to five operational Commands, each with a defined geographical Area of Responsibility (AOR) and two functional Commands. These are as follows:-

- Western Air Command
- Eastern Air Command
- South Western Air Command
- Central Air Command
- Southern Air Command
- Maintenance Command
- Training Command

Each of the Commands is headed by an Air Officer Commanding-in-Chief (AOC-in-C) of the rank of Air Marshal. The operational Commands are tasked by Air HQ with planning and conduct of air operations in their AOR during peacetime and during hostilities, while the functional Commands carry out activities to enable operations and maintain combat readiness. In the operational Commands, the AOC-in-C is assisted by a Command HQ which consists of three broad staff branches, the Air Branch, the Maintenance Branch and the Administration Branch. The organisational chart of each of the operational Commands is as shown below (Figure 3.2).

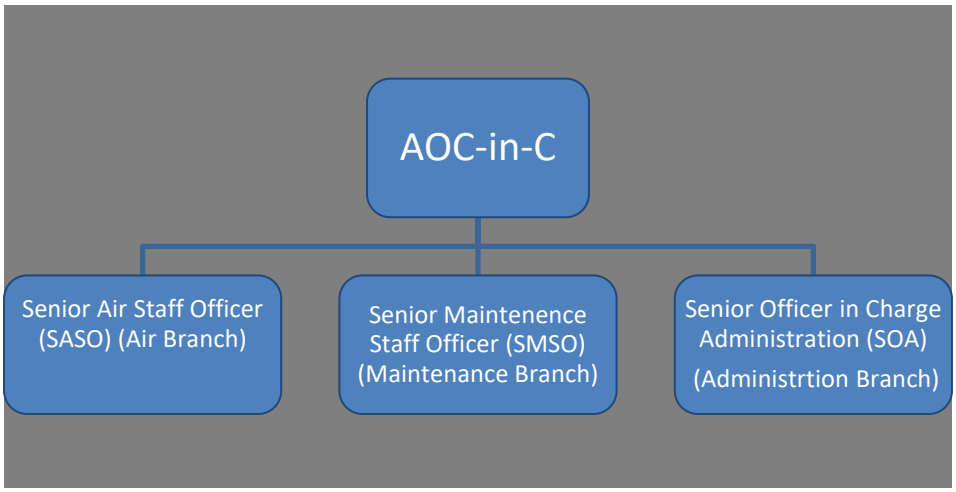

Figure 3.2 Organisational Chart of Command HQ.

Source: Author

With the responsibility of planning and conduct of air operations reposed in the Air Branch at each Command HQ, this Branch is another major stakeholder to be considered in the preparation of the BSC for measuring "Mission Readiness" of combat squadrons. The Air Branch further consists of various staff officers as shown in Figure 3.3 below:-

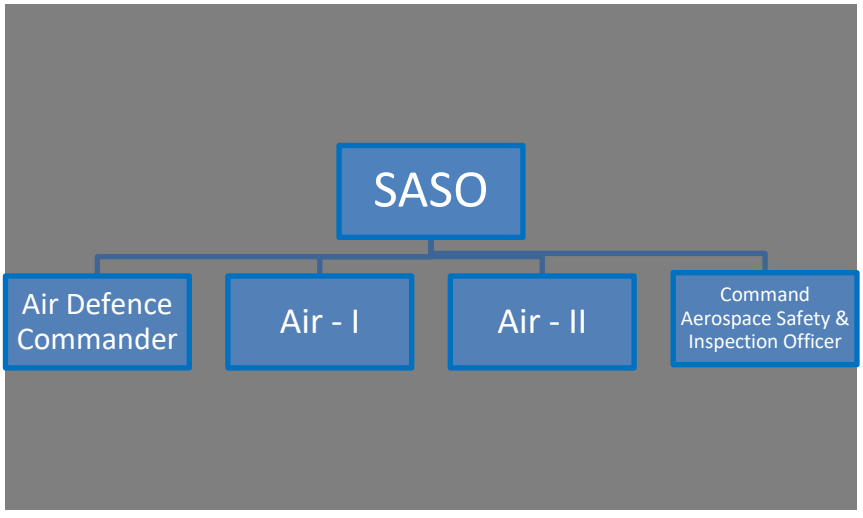

Figure 3.3 Composition of Air Branch in Operational Command HQ.

Source: Author

The duties and responsibilities of these staff officers are as follows:-

- **SASO**. He holds the rank of Air Marshal and is the head of the Air Branch reporting directly to the AOC-in-C. He is responsible for maintaining the highest level of operational readiness of all elements under the control of Command HQ. He is also responsible for conduct of all air operations in the AOR of the Command as well as for adherence to aerospace safety standards during the conduct of operations.

- **Air Defence (AD) Commander**. An officer of the rank of Air Vice Marshal, he is responsible for the planning and conduct of AD operations in the AOR of the Command. He exercises operational control over the assets allocated, including aircraft, weapons and radars etc., and ensures their effective utilisation for conduct of AD operations.

- **Air I**. He holds the rank of Air Commodore and works directly under the SASO. He is responsible for conduct of fighter aircraft operations and all related activities in the Command. This includes planning and conduct of operational and training flying of fighter squadrons, planning and conduct of operational level exercises and periodic assessments of combat squadrons through Command Air Staff Inspection (CASI) visits.

- **Air II**. He also holds the rank of Air Commodore and reports to the SASO for all operational and training related issues pertaining to transport and helicopter assets of the Command. He ensures that these assets are optimally utilised for the execution of tasks of the Command and also carries out periodic assessments of the transport squadrons and helicopter units through CASI visits.

- **Command Aerospace Safety & Inspection Officer (CASIO)**. The CASIO is of the rank of Group Captain and is responsible to the AOC-in-C through the SASO on all matters pertaining to aerospace safety during conduct of flying operations. His duties include dissemination and ensuring proper implementation of Air HQ Aerospace Safety policies to all units in the Command, reporting and analysing aircraft accidents/incidents and hazards, and conducting periodic assessments of all units through the Aerospace Safety Inspections and Interactions.

Wings

Each operational Command of the IAF consists of a number of Wings. Wings are generally static bases that provide maintenance and logistics, accounting, administrative and operational support to operational squadrons. A Wing is an intermediate formation that functions as the link between a Command HQ and combat squadrons. It consists of two or more combat squadrons of fighter/transport aircraft or helicopter units. Depending on the size and roles undertaken, Wings are headed by a Station Commander/Air Officer

Commanding (AOC) of the rank of Group Captain/Air Commodore. A Wing is tasked by the Command HQ with ensuring that its combat units are in a state to carry out designated operational tasks and thus forms another stakeholder in the formulation of the BSC to measure "Mission Readiness" of combat units.

Combat Squadrons/Units

Combat squadrons/units are the operational units in each wing that are actually responsible for executing the air operational tasks allocated by Command HQ. These could be fighter squadrons with a strength of 16 to 18 fighter aircraft; transport squadrons with a strength of 10 to 12 transport aircraft or helicopter units with a normal strength of 10 helicopters. These squadrons/units are commanded by Commanding Officers (COs) of the rank of Group Captain/Wing Commander. Needless to say, since this research aims to prepare a BSC to measure the "Mission Readiness" of these squadrons/units, they are the most important stakeholders in the process. While surface to air or surface to surface missile units are also combat units and are also referred to as squadrons in the IAF, these units are beyond the scope of this study and hence have not been considered in the list of stakeholders.

Current Performance Measures in Use in the IAF

Having seen the broad organization of the IAF and identified the various stakeholders in the execution of air operations, it is now time to examine the performance

measures currently used in the IAF to assess the operations of combat units. After interviewing several representatives from the stakeholders identified earlier in this chapter as well as using this researcher's own knowledge built up over more than 30 years of service in the IAF, the following performance measures in current use in the IAF have been shortlisted:-

- **Percentage of Flying Task Achieved**. Every combat squadron of the IAF has an authorised monthly flying task which has to be planned and achieved in a phased manner. The percentage of flying task planned and achieved is a measure used to monitor daily/weekly/monthly performance of the squadron.

- **Serviceability Percentage of Aircraft**. All the aircraft held with the squadron may not be available for flying due to reasons like rectification of snags, maintenance inspections etc. This indicator measures the number of aircraft that were available to a squadron for flying during a day/week/month.

- **Flight Safety**. Flying and ground Accidents/incidents which take place during the year are used to evaluate the flight safety status of the squadron. These are further attributed to Human Error, Technical Defects etc.

- **Reports of Inspection Teams from Air Command/Air HQ**. Typically, these inspections are carried out once a year by the CASI teams and once in two years by DASI teams. They assess the ability of squadrons to

undertake their designated roles in the IAF. Some of the performance measures that are used in these inspections are as given below:-

- **Air to Ground Scores**. All combat squadrons carry out Air to Ground range firing practices to hone their skills for attacking ground targets using either bombs or rockets. The individual range scores of pilots as well as the overall range scores of the squadron are measures used to rate the performance of the squadrons in this extremely important aspect of operational flying.

- **Aircrew Qualification/Training Status**. This performance parameter is measured in two ways. The first one is called the Categorisation Status of aircrew. All pilots enter their squadron after completion of training as unrated pilots. Thereafter, as they build up flying experience, they appear for categorisation tests with examining agencies and are awarded aircrew categories/Instrument Ratings (IR) like “White”, “Green” and “Master Green”, depending on the proficiency they display in handling the aircraft in flight and during recovery and landing. The other aspect of this measure is the Operational Role Clearances of squadron aircrew. While new entrants to the squadron are “Under Training (U/T)” and not cleared for any operational roles, as they undergo training and gain experience in the squadron, they are cleared for more and more complex operational roles of the aircraft/squadron like “Day/Night Flying

Operations", "Two Aircraft Formation Leader", "Four Aircraft Formation Leader", "Fully Operational on Type of Aircraft" etc. After building up adequate experience, aircrew who demonstrate required performance are selected to undergo supervisory training and awarded qualifications like "Fighter Combat Leader (FCL)", "Fighter Strike Leader (FSL)" etc. FCL/FSL aircrew posted to the squadrons are in turn responsible for training and operational clearances of less experienced aircrew in the squadron.

- **Proficiency of Technicians**. Just like the aircrew, the aircraft maintenance technicians who join squadrons after completion of basic training need to build up adequate experience and proficiency in their trade duties. This is done by providing them training on the job for their trade related duties and evaluating their performance by administering tests for award of skill levels like "C", "B", "A" and "Ustaad" etc. A squadron is usually composed of a mix of technicians of various trades and skill levels.

- **Serviceability State of Tools, Testers and Ground Equipment (TTGE)**. All squadrons hold aircraft servicing tools according to laid down scales based on the number of aircraft, flying task etc. Testers refer to equipment used for calibrating or testing the functioning of other tools

or aircraft components. These are normally not held at squadron level but are a part of the scaled equipment at Wings. Ground Support Equipment (GSE) may be held by both squadrons as well as Wings and include battery starter trolleys, specialist generators to provide alternating current requirements to start aircraft etc. As these support equipments undergo wear and tear with regular usage, it is important to maintain them in a condition where they are able to perform the tasks that they are meant for in order to enable the squadron to carry out its operational tasks.

- **Operational Logistics**. Another performance parameter assessed during these inspections concerns aspects of operational logistics like availability of aircraft weapons including specialist weapons, availability of spare parts to cater for aircraft snag rectification. These are usually held in stores at the Wing level. In case a required spare is not available, an aircraft may become unfit for flying. At times, squadrons resort to “cannibalisation” of components from already unserviceable aircraft in order to prevent aircraft from going off the flight line. This increases the workload on aircraft technicians and reduces the operational efficiency of a squadron. Thus, the rate of “cannibalisation” is an important indicator of the performance of the squadron and the Wing.

- **Other Performance Measures**. In addition to the quantifiable and objective measures mentioned above, a number of

subjective measures are also used in annual inspections. These include assessments of tactical knowledge and familiarity of aircrew with the area of operations, handling of aircraft emergencies, both in air by the aircrew and on ground by the technical and safety staff; health and hygiene, morale of air warriors etc.

Analysis of Performance Measures

A closer look at the performance measures in use in the IAF mentioned earlier in this chapter reveals some interesting points. These are given in the subsequent paragraphs:-

- A number of the day to day performance measures used in the IAF like percentage of flying task achieved, serviceability percentage of aircraft, aerospace safety indicators like accident/incident statistics, air to ground scores etc., are actually “Lag” indicators, which focus on the results of activities or strategies that have been already implemented by the squadron. Thus, they are quite useful in understanding whether the strategies implemented by the squadron are producing the desired results. However, they are in no way indicative of whether the squadron will be able to maintain the same performance or “Mission Readiness” in the future.

- Some of the performance measures like the training and operational status of squadron pilots, skill levels and categorisation status of technicians, manning levels of the squadron, health of personnel, status of operational logistics indicators like ready availability of requisite weapons, spare parts, “cannibalisation” rates etc., are the “Lead” indicators for squadrons to identify the areas which would help it to fulfil its objectives in the future. These drivers of future performance either do not form part of the information monitored by higher echelons of the organisation on a regular basis or are not strategically linked to the objectives of the squadron resulting in a loss of focus and inadequate importance bring given to these indicators. Measurement of these aspects during inspection visits by higher formations of the IAF only provide a temporal snapshot of “Mission Readiness” and does not guarantee that these will be maintained continuously. In fact, squadrons and Wings at times focus efforts to improve these scores during inspections even when they know that sustaining them later would not be possible.

- Another aspect that needs to be considered is that some of these “Lead” and “Lag” indicators act in opposition to each other and need to be carefully balanced for long term results. For example, “cannibalisation” is an easy solution which looks to remove components from an already unserviceable aircraft and fit them in other aircraft to make them serviceable. However, not only does it take more time to rectify an aircraft by “cannibalising” spare parts, it directly reflects a failure in the operational logistics process and also results in increasing the

difficulty of making the “cannibalised” aircraft serviceable once again. Thus, though it helps improve serviceability percentage in the short run, it affects the same adversely in the long term.

- Hence, there is a requirement to compile a set of performance measures for squadrons in order to enable continuous measurement and monitoring of their “Mission Readiness”. These measures need to include “Lag” as well as “Lead” indicators which have to be strategically linked to the objective of “Mission Readiness” and clearly indicate to each stakeholder the cause and effect relationships of these measures contributing to the final objective, as well as the role to be played by the stakeholder in the achievement of the chosen objective. The BSC is an ideal tool to form such a framework, with its synthesis of measuring indicators of past performance along with drivers of future performance linked to achievement of objectives and formulating a strategy map to communicate the same to the rank and file of the organisation.

CHAPTER IV

OVERVIEW OF THE BSC AND ITS APPLICABILITY TO COMBAT SQUADRONS OF THE IAF

What is the BSC?

At this juncture, it is necessary to understand the concept and components of the BSC in order to evaluate whether it can be used to measure and enhance the performance of combat squadrons of the IAF. The BSC uses a set of quantifiable measures that act as instruments for the top hierarchy of the organisation to effectively convey to the workforce and other stakeholders those aspects on which they need to focus in order to ensure that the organisation will be able to achieve its short term and long term objectives (Niven, 2006, p. 13). This is accomplished by providing four different perspectives of the organisation, each of which contains a range of measures indicating aspects of organisational performance (Kaplan and Norton, 1996, p. 78) as shown in Figure 4.1 below.

- **Financial Perspective**. While the BSC is based on the belief that only financial metrics are inadequate to evaluate and chart an organisation's progress in the complex business environment, it still retains the Financial Perspective since financial measures provide a valuable and quick summary of the effects of strategies already implemented (Kaplan and Norton, 1996a, p. 25).

They thus largely form what are known as “Lag Indicators” or measures of past performance. These measures are generally related to the profitability of the organisation with the objectives measured consisting of typical pointers like Return on Capital Employed, Return on Investment, Operating Profit, Asset Utilisation, Cash Flow etc.

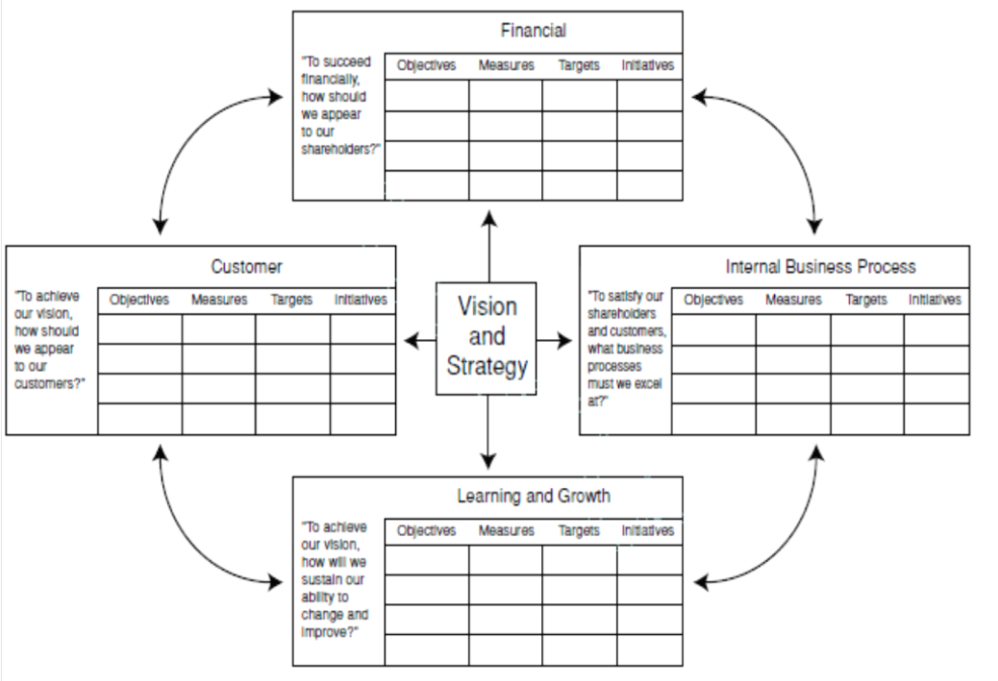

Figure 4.1 Perspectives of the Balanced Scorecard

Source: Kaplan and Norton, “Using the Balanced Scorecard as a Strategic Management System”, Harvard Business Review (Jan-Feb 1996)

- **Customer Perspective.** In the Customer Perspective of the BSC, organisations attempt to answer the questions: “Who are our target customers?”, “What is our value proposition in serving them?”, and “What do our customers expect or demand from us?” (Niven, 2006, p. 14). Measures in this perspective usually include customer satisfaction, customer loyalty or retention and market

share of the organisation's product or services. This enables the organisation to identify and measure the exact needs of the customer and develop the drivers to improve performance in these measures. The Customer Perspective enables the organisation to identify the areas from which the returns would accrue to fulfil the objectives of the Financial Perspective. It thus provides some of the "Lead Indicators" or drivers to improve future revenues.

- **Internal Business Process Perspective.** Kaplan and Norton (1996a, p. 26) brought out that the Internal Business Perspective of the BSC allows organisations to ascertain and quantify important internal activity cycles which will make it possible for the organisation to offer products that will not only retain existing customers but also attract new ones. These processes must also live up to the investors' expectations of profitability and value addition. Further, they emphasised the differences between traditional business approaches which look for improvements in short term operations processes to create profits in the near term; and the BSC which uses a combination of these and long term innovation processes in the Internal Business Process Perspective to create value for the business in both short term and long term timeframes. Thus this perspective has both "Lag" and "Lead" indicators. Since this perspective involves almost every activity that an organisation might undertake, Kaplan and Norton (1996b, pp. 53-79) developed a framework to focus the attention on those critical processes that would be applicable to virtually any organisation (Figure 4.2). These processes are as follows (Kaplan & Norton, 1996a, pp. 96-115):-

- **The Innovation Process.** Organisations use the Innovation Process to find new markets and potential clients, research the unfulfilled or latent needs of those clients, and then develop the goods or services that will satisfy those needs. The measures used for this process typically include money spent on product development and research, the quantity of new goods or services introduced, the share of sales generated by new goods, the time required to develop a new generation of goods, etc.

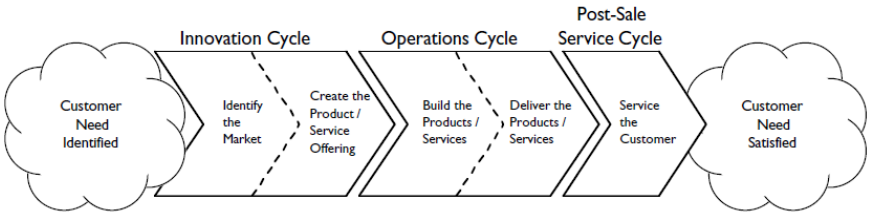

Figure 4.2 The Internal Perspective of the Balanced Scorecard

Source: Kaplan and Norton, "Linking the Balanced Scorecard to Strategy", California Management Review (Fall 1996)

- **The Operations Process.** This process focuses on the organisation's routine and repetitive activities, commencing with the acceptance of a client order and concluding with the supply of the goods or services to the consumer. By using scientific management practices, these activity chains can be regulated and improved. It is important to ensure that measures of "Lead" indicators like breakeven time, production cycle time and defect rates (parts per million) are included in the analysis rather

than just financial metrics and “Lag” indicators like labour and equipment utilisation rates.

- **The Post-sale Service Process.** The final aspect of the Internal Business Perspective covers actions related to warranties and repairs, handling of returns due to faults or customer dissatisfaction and payment processing. Metrics for this process include the availability of customer databases, the speed with which customers are served, the volume of warranty claims, the length of the billing cycle, recovery of dues etc. It also includes community involvement and relationship development through sustainable environmental practices as well as safe disposal of waste and hazardous by-products from the production process. Even though these actions may result in a little rise in overall production costs, they are important responsibilities of the organisation in a world focussed on environmental protection and sustenance. Measures for these issues may include greenhouse emissions, waste reduction, management and disposal, participation in community projects, etc.

- **Learning and Development Perspective**. The fourth perspective of the BSC serves as an enabler for the other three perspectives by identifying the infrastructure that the organisation has to develop in order to produce long-term growth and improvement. Organisations will encounter gaps in the current capabilities of their personnel, information systems, and organisational climate

compared to what is necessary to attain the desired levels of performance and long-term objectives as they improve the other three perspectives. Thus, the Learning and Development Perspective seeks to design goals to bridge these gaps and serve as enabling forces for obtaining the desired results in the first three perspectives. Measures for the perspective include the proportion of employees with advanced degrees, the number of employees with multiple skill sets, the number of hazards and accidents that are reported, awareness of key business strategies, procedure violations and standard of work environment etc (Kaplan and Norton, 1996a, pp. 126-146).

Adapting the BSC for Non-Profit Organisations

Since its launch in the early 1990s, businesses all across the world have embraced the BSC, with profit oriented businesses using the system to increase financial performance, promote responsibility, align staff with corporate objectives, improve resource allocation choices, develop teamwork, and, most importantly, to implement their strategies (Niven, 2003, p. 10). Therefore, it was only a matter of time that government and not - for - profit organisations took notice of this powerful tool and started to utilise it for improving their performance, albeit with certain modifications. The most obvious change was in the way these organisations looked at the Financial Perspective of the scorecard. While the Financial Perspective offered a clear long-term objective for private businesses, Kaplan (1999) suggested that it should act as a restraint for public sector organisations, entailing such organisations to keep an eye on their expenditures and

adhere to their financial budgets. However, it soon became clear that this was only a superficial adjustment, and further research was required to fully realise the concept's enormous potential for enhancing the management of these organisations.

According to Rohm (2002), with increasing studies on implementing the Balanced Scorecard in government and public sector organisations, it became clear that unlike the private sector, where the focus was on maximising profitability, the desired long-term outcomes for these organisations were focused on their mission to provide necessary and affordable services to citizens. It was therefore necessary to modify the BSC design in order to take into account the Mission Centric operations of the public sector. The rising relevance of the citizen or taxpayer as a stakeholder in the effective operations of the organisation, and not just a customer whose interest was confined to consumption of its products, was another factor that needed to be taken into account. To do this, the positions of the Financial and Customers Perspectives in the BSC Framework were switched, and the latter was renamed the Customers and Stakeholders Perspective. Another change included renaming the Financial Perspective as the Budget Perspective to emphasise the public accountability of funds. The nomenclature of the Learning and Growth Perspective was revised to the Employees and Organisation Capacity Perspective to emphasise the significance of the human component and of capability enhancement due to a trained and well informed workforce and well organised information technology systems. These comprehensive changes represented an important modification in the fundamentals of developing and executing the BSC, while at the same time retaining its

focus on long term strategy (Rohm, 2002). The basic design of a revised BSC for the public sector is shown in Figure 4.3.

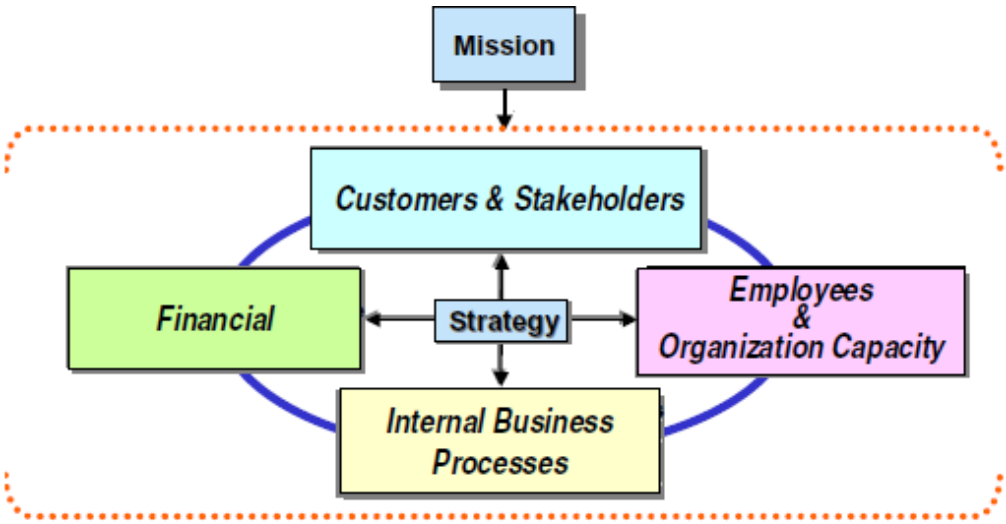

Figure 4.3 Modified Balanced Scorecard for Non-Profit Organisations

Source: Howard Rohm, "A Balancing Act",
PERFORM, Volume 2 Issue 2 (May 2002)

Measures Used in BSCs for Non-Profit Organisations

It is evident from the above paragraphs that BSCs can be used very effectively to improve the performance of government or non-profit organisations as well. However, what are the kinds of measures used in these BSCs? Are they similar to the ones used in the traditional BSC or do public sector organisations need to develop different measures for their performance? Niven (2003, p. 191) mentioned that the hardest part of the task of developing performance measures for these organisations is getting started with the process. The types of measures to be used will depend largely on the kind of work done or services provided by the organisation and cannot be generalised. However, he did

provide guidelines for the kind of measures that should be considered for each perspective of the BSC by non-profit organisations and adapted to suit their requirements. These are as given below:-

- **Measures for the Customer Perspective**. He (Niven, 2003, pp. 191-193) suggested that the measures for this perspective should focus on the following categories:-

  - Access. Organisations should look for metrics that reflect how simple it is for clients to use their goods or services.

  - Timeliness. Metrics that measure the amount of time spent by citizens to avail the services provided by the organisation or the time saved by them as a result of the organisation's services.

  - Selection. The organisation might be providing a number of products or services. In such instances, metrics should aim to find out whether these were products living up to the demands of the citizens.

  - Efficiency. Citizens prefer that services provided by the public sector be availed at a single location and in a single visit. This can be measured and included as a performance metric.

- He also suggested the inclusion of measures to convey to citizens what the public sector organisation expected from them in return for providing services. This could take the form of greater compliance with regulations, communicating word about the services available to others etc. This would ensure that such services would benefit all citizens.

- **Measures for the Internal Business Processes Perspective**. Niven (2003, pp. 194-197) brought out that while each organisation will have different processes due to its individual mission and nature of work, there were several core processes common to all organisations which must be measured as drivers of performance. These were as follows:-

  - Quality. Cautioning organisations about the need to strike an achievable balance between the desirable objective of quality improvement and other aspects of the Internal Processes Perspective, he suggested the adoption of performance measures to indicate whether the changes in quality were providing the citizens greater value as compared to costs, time spent etc., in order to avoid erosion of performance.

  - Innovation. Highlighting the importance of innovation to achieve success in a rapidly changing operating environment, he suggested incorporating a well thought out innovation process in all public sector organisations. Measures for these could include the number of cross

stream groups working on problem areas, the encouragement provided by organisational leadership to creativity etc., which would foster new ideas for the improvement of performance.

- Partnering. Niven suggested developing synergy between public sector and private organisations and within non-profit agencies to improve their performance and prospects. This could take the form of Corporate Social Responsibility funding for improvement of services or collaboration for data sharing between public sector bodies to cut down time for identifying potential beneficiaries, simplifying service delivery etc. Measures for this could include number of partnerships for improving own performance, funds received from collaborators etc.

- Communication. Another vital process for success is the communications process. Agencies must be able to disseminate information about the availability of their services to the citizens in an effective manner. In today's connected world, measures for this could include the number of hits and time spent by citizens on the organisation website, citizen following on social media platforms etc.

- **Measures for the Employees and Organisation Capacity Perspective**.

Niven (2003, pp. 197-203) spoke of his experience as a consultant and brought out the worrisome pattern of organisations not paying enough attention to

the value of human capital. He suggested three areas for measurement of this vital perspective of the BSC. These are as follows:-

- Human Capital. Measurement or improvement of human capital capacity can be achieved through well designed training programmes to develop skills and good habits. However, the metrics used for training need to consider both, the time spent in training as well as the results achieved due to the training. Another measure could be the retention rate of employees which becomes especially important for the defence forces with a large number of middle level soldiers and officers choosing to hang up their uniform while still relatively young, leading to deficiency of manpower.

- Information Capital. In today's IT dominated world, government agencies are among the largest users of IT resources. The important metrics in this regard need to focus on how the use of IT systems has made availing the services easier/quicker and more convenient for the citizens. This could include measures like reduction in timelines for service delivery, enabling doorstep delivery of services, tracking citizen responses/complaints, building of necessary databases etc.

- Creating a Climate for Positive Action. This is a pre-requisite for enhancing organisational capacity and hence successful mission

accomplishment. Niven suggested surveys to measure employee satisfaction, communication related measures like awareness of organisational goals, organisation expectations from employees and vice versa.

- **Measures for the Financial/Budget Perspective**. Even though the prominence of this perspective is less in the public sector BSC as compare to its corporate counterpart, there is no denying that it is still a very important aspect that deserves adequate attention of the organisation. Some performance metrics to balance economy and effectiveness in providing the necessary services to citizens could be cost of service delivery, accuracy and reliability of financial systems, diversification of funding sources etc (Niven, 2003, p. 203).

Applicability of the BSC to Combat Squadrons of the IAF

It is evident from the review of available literature that many military organisations have successfully used the BSC framework to achieve exceptional improvements in their performance. Can the BSC framework be used by the IAF to enhance the "Mission Readiness" of its combat squadrons? The answer to this question lies in the relationship between the BSC and "Mission Readiness". According to Woodley (2006), the BSC directs the various constituents and stakeholders of an organisation towards the achievement organisational vision and mission by focussing them towards common objectives and key success factors which are effectively

communicated to each individual in the organisation. Over a period of time, this strategic focus manifests itself in the form of gradual changes in the procedures and practices of the organisation in order to improve effectiveness, which, in the case of a combat squadron is its enhanced “Mission Readiness”. This enhancement can be seen by measureable “snapshots” of performance in key indicators over a period of time. This point of view gets further reinforced when we study the measures of performance that the IAF has been using till date. The analysis of these measures carried out in the previous chapter indicates that most of them are like the “Lag indicators” of the BSC which show that a desired “Mission Readiness” outcome has either been met or has not been achieved. While these indicators cannot be totally discounted; what is also required is to measure the “Lead indicators” of “Mission Readiness” in order to improve the same even further. These measurements will provide a more hands on assessment of the organization's “Mission Readiness” performance and help to identify areas where improvement efforts should be made. Thus, the BSC with its four interrelated perspectives to provide a balance between relatively opposing forces in the organisation like internal and external influences, “Lead” and “Lag” indicators etc., provides an ideal framework with which to measure and improve the “Mission Readiness” of combat squadrons of the IAF.

CHAPTER V

DEVELOPING AND VALIDATING A BSC TO ENHANCE "MISSION READINESS" OF COMBAT SQUADRONS OF THE IAF

Introduction

The IAF's Vision Statement "People First, Mission Always" makes it clear that combat squadrons have to be ready to launch a mission any time they are directed to do so. Thus, "Mission Readiness" is the ultimate objective of all the activities carried out in a combat squadron. The organisational structure of the IAF studied in Chapter III clearly brings out the stakeholders with an interest in this objective, viz., the Command HQ headed by the AOC-in-C, the Wings where combat squadrons are based, headed by the AOC, and the squadrons themselves headed by the CO. A closer scrutiny allows us to draw an analogy between this organisation structure and that of a US Naval Carrier Strike Group (CSG) as brought out by Albright *et al.* (2014, p. 22), with a CSG Commander placed above several components, one of which is the Air Wing comprising several strike fighter aircraft squadrons (Figure 5.1).

Designing the BSC

As seen earlier, the BSC has been used by various profit oriented and government agencies to select a balanced set of metrics as part of four processes to measure and

improve organisation performance. The perspectives used by not for profit agencies are the Customer and Stakeholders Perspective, Employees and Organisation Capacity Perspective, the Internal Business Processes Perspective and the Financial or Budget Perspective. Rohm (2002) emphasised that variations in the design of the BSC are quite

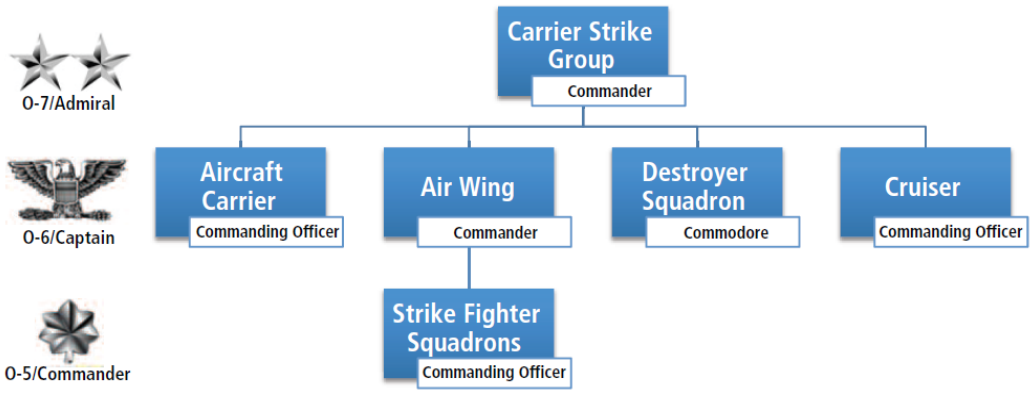

Figure 5.1 Organisation Structure of a Carrier Strike Group of the US Navy

Source: Albright *et al.*, "How Naval Aviation Uses the Balanced Scorecard", Strategic Finance (October 2014)

common, including the addition of a fifth or even a sixth perspective. This could be the Environment Perspective, in keeping with today's sustainable development efforts, or a separate Citizens' Perspective in view of the Citizen Centric approach to governance. There could also be a BSC that utilised less than four perspectives, and this would not be a problem, as long as the BSC was tied in with the mission and business strategy of the organisation. Albright *et al.* (2014, p. 24) used this flexibility to develop a BSC with only three perspectives to improve the deliverable of operational readiness of an F/A-18 strike fighter squadron of the US Navy (Figure 5.2). They argued that while all organisations needed to focus on the "Employees and Organisation Capacity" to improve their "Internal

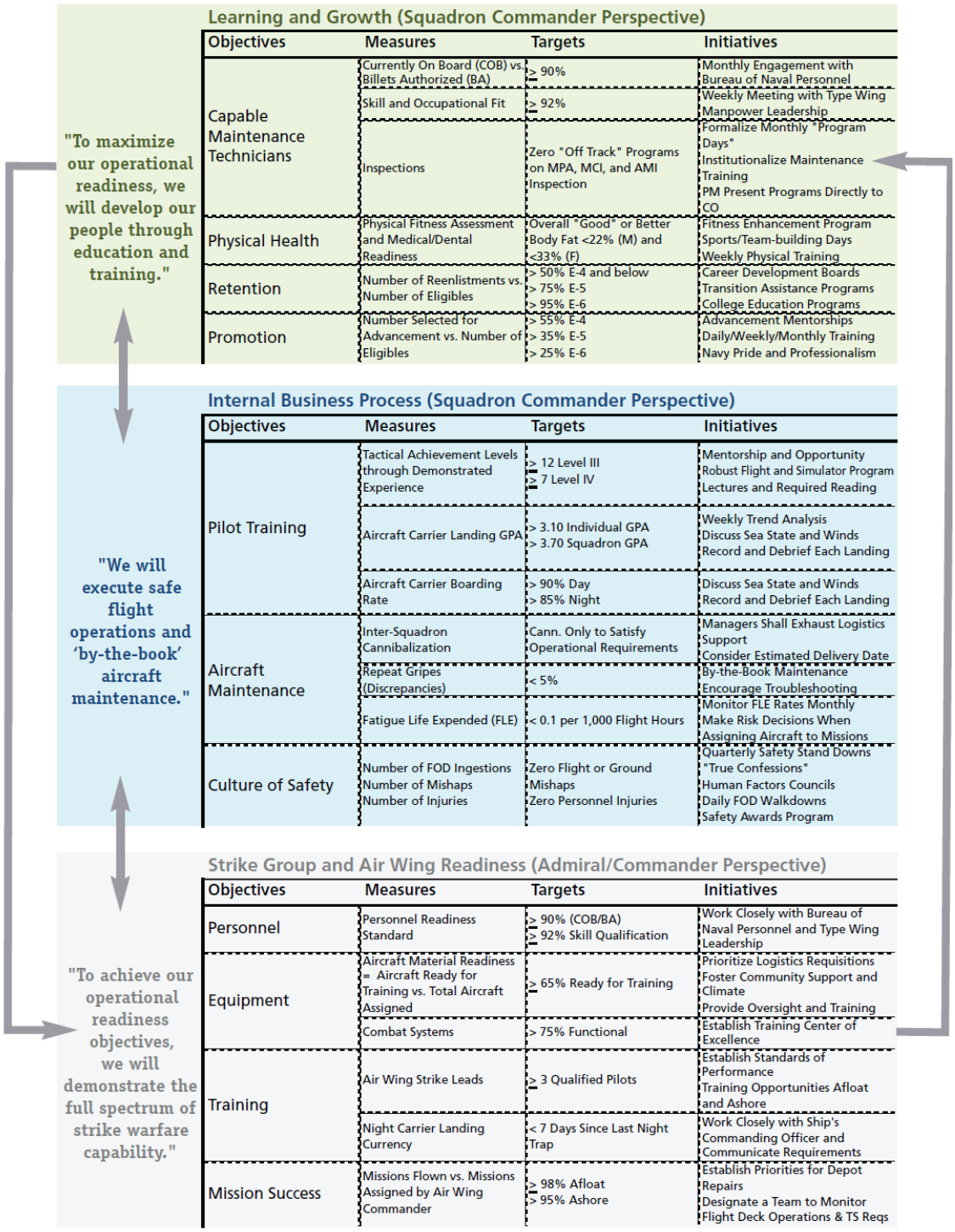

Figure 5.2 BSC for F/A-18 Strike Fighter Squadron of the US Navy

Source: Albright *et al.*, "How Naval Aviation Uses the Balanced Scorecard", Strategic Finance (October 2014)

Business Processes"; the traditional "Customer" and "Financial" Perspectives lost relevance in the case of lower echelons of the US Navy, where the only deliverable was operational readiness and the customers were the commanders in the hierarchical chain who were responsible for the same. They substituted these perspectives with the organisational levels to which the non-financial deliverables are made while ensuring that the strategic focus on operational readiness was maintained. This researcher has attempted to adapt the BSC designed by Albright *et al.* (2014) in the context of an IAF combat squadron to deliver "Mission Readiness" to the Wing and Command HQ placed above it. The perspectives chosen for this BSC are the "Employees and Organisation Capacity" Perspective and the "Internal Business Processes" Perspective linked to the Squadron CO level and the "Mission Readiness" Perspective linked to the AOC and the AOC-in-C level.

Strategy Map

A Strategy Map is a short illustrative depiction of what is important for the organisation in each of the selected perspectives so as to effectively implement the planned strategy (Niven, 2006, p. 99). With the perspectives chosen and mapped to the correct organisational level of the IAF in the previous paragraph, the next step has been to divide them into smaller components or activities to function as building blocks for the development of a Strategy Map indicating the cause and effect relationships of these components; which would build up towards the desired strategic objective of "Mission Readiness" of the squadron. The relationship among these components has then been

used to ascertain the key elements of each activity that, when implemented together, would lead to the desired results. Figure 5.3, illustrates the Strategy Map for a combat squadron of the IAF to improve its “Mission Readiness”. The map shows the cause and effect relationships between specified objectives, and how, when viewed as a whole, these objectives form a strategic sequence that leads from activities to the desired ends. While the Strategy Map as a whole is self explanatory, there are some design differences from the classical BSC that need to be explained in greater detail. Akin to the BSC proposed by Albright et al. (2014), the Strategy Map has done away with the “Financial” Perspective since financial success is not a deliverable for a combat squadron, nor is the squadron an independent financial entity controlling a budget of its own. The “Customer” Perspective has been modified into the “Mission Readiness” Perspective, which, as mentioned above, has been linked to the organisational levels (AOC of the Wing and AOC-in-C of the Command) to which the deliverable of “Mission Readiness” has to be made. Another difference is the classification of “Training of Pilots” as an “Internal Business Process” rather than a part of the “Employees and Organisation Capacity” Perspective. While it may appear illogical at first glance, this has been done because flying training, with its various sub-parts, is the most important everyday activity at which the squadron must excel in order to deliver “Mission Readiness”. The third difference is the inclusion of “Inspection and Interaction Visits” by external agencies as part of the “Employees and Organisation Capacity” Perspective as opposed to the “Internal Business Processes” Perspective. This is because the feedback reports of these visits allow squadron personnel to analyse and learn from their shortcomings and

improve their performance in routine activities i.e., their "Internal Business Processes" (Albright *et al.* (2014)).

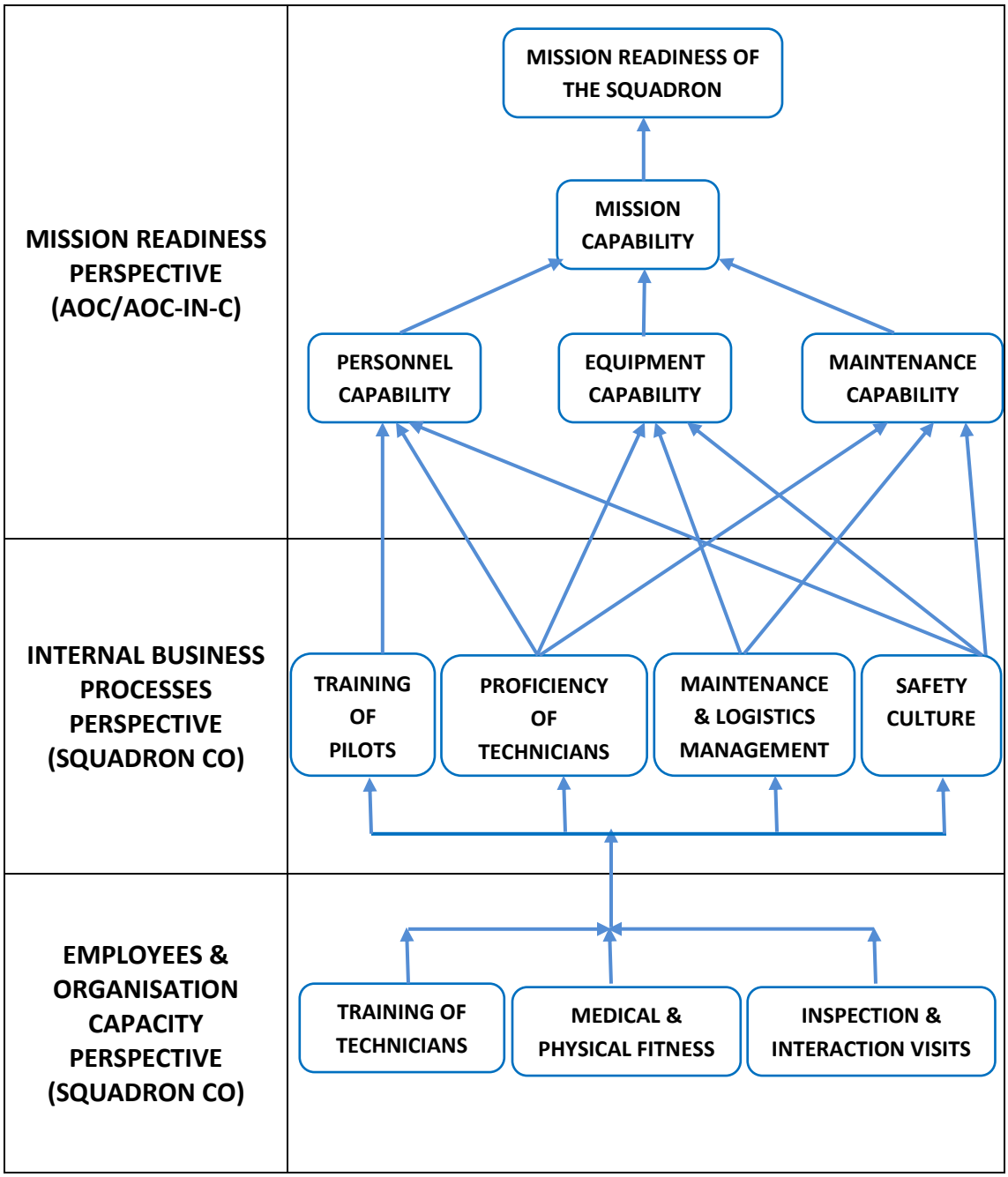

Figure 5.3 Strategy Map for Mission Readiness of a Combat Squadron of the IAF

Prepared by the Author (2023)

Performance Measures and the Complete BSC for "Mission Readiness"

Once the cause and effect relationships were established, the next step was to develop performance measures that would be used to track progress towards the desired outcomes. This was done by adopting the Logic Model proposed by Rohm (2002), which reinforces the logical relationships between inputs, processes, outputs, and outcomes. The measures chosen for various perspectives of the BSC are as follows:-

- **Employees and Organisation Capacity Perspective**. The objectives chosen for this perspective act as facilitators for the other two perspectives of the BSC and enable the squadron to move towards the long term objective of "Mission Readiness". Measures chosen for these objectives are mostly "Lag Indicators" which show the effect of actions taken in the past. These are as follows:-

    - Training of Technicians. The requisite number and appropriate training of technicians will lead to better maintenance of aircraft and equipment and a better safety culture in the squadron which in turn will ensure more aircraft available for training of squadron pilots. Measures chosen for this objective are the number of technicians posted to the squadron as against the number of technicians authorised, planned versus actual progress of On the Job Training (OJT) of technicians and planned versus actual progress of training of technicians as supervisors.

- Medical and Physical Fitness Standard of Personnel. This is an important objective as it ensures availability of capable personnel to carry out the various day to day activities of the squadron that are necessary to ensure “Mission Readiness”. Measures chosen are the number of personnel in Low Medical Category (LMC) due to lifestyle diseases, number of personnel in Good/Excellent Physical Fitness Rating (PFR) standards and number of obese personnel.

- Feedback/Reports of Inspection and Interaction Visits. These reports follow any Air Staff Inspection, Maintenance Inspection and Areospace Safety Inspection Visits carried out by higher formations of the IAF. This structured feedback allows squadron functionaries the benefit of expert analysis of their performance and provides guidance to overcome the observed shortcomings thus making a direct contribution to the improvement of “Internal Business Processes”. The measure chosen is the scores/grading earned during these periodic audits of the squadron’s performance.

- **Internal Business Processes Perspective**. This perspective is the next step in the strategic sequence that leads the squadron to the desired final objective of “Mission Readiness”. This has to be achieved by maximising the chosen sub-objectives of the perspective through optimum utilisation of the wherewithal

available, whether materiel or human resources. These comprise of “Lag” as well as “Lead” indicators and are as follows:-

- Training of Pilots. As mentioned in Chapter III earlier, pilots entering squadrons after completion of basic training undergo a training syllabus to build up experience and expertise to improve their ratings and operational status. They also build up familiarity with the squadron’s Area of Operations and intelligence about the adversary. The measures chosen for this objective are the number of pilots posted to the squadron as against the number of pilots authorised, planned versus actual progress of flying training syllabus of pilots, intelligence, technical and tactical knowledge test scores, and instrument rating and operational status of pilots.

- Proficiency of Technicians. Proficiency of technicians is tested by examining agencies of the IAF and they are awarded skill levels based on their performance. The higher the skill level of a technician, the more capable he/she is of carrying out the technical activities required to progress operational tasks and analysing and rectifying reported snags. If a particular snag is repetitive, it indicates inadequate analysis of the snag before rectification. The measures chosen for this are the number of technicians holding skill level “A”/”Ustaad”, the number of technicians cleared for supervisory roles, and the number of repetitive snags affecting serviceability of aircraft.

- Maintenance and Logistics Management. It goes without saying that a combat squadron must manage its maintenance and logistics processes well in order to ensure availability of adequate number of serviceable aircraft for flying. As mentioned in Chapter III, if adequate spares are not available, the technicians have to resort to "cannibalisation" of parts from other aircraft, which adversely affects the operational efficiency of the squadron. Sometimes, when components are very much in short supply, squadrons have to carry out necessary checks and authorise "life extensions" for components due to be withdrawn for servicing. The measures chosen for this objective are the rate of "cannibalisation" of spares, number of "life extensions" granted to keep an aircraft airworthy, and the lead time for outstanding demands for critical spare parts for aircraft and other technical equipment.

- Safety Culture. The objective of developing a safety culture in the squadron has a direct impact on its readiness to carry out a designated mission. Lack of the same can result in damage to aircraft and injuries to squadron personnel. Measures chosen are number instances of Foreign Object Damage due to ingestions by aircraft, number of accidents/incidents in the squadron and number of injuries/fatalities of squadron personnel due to accidents/incidents.

- **Mission Readiness Perspective**. This perspective looks at what the Wing and Command HQ expect as deliverables from the squadron. The objectives are again a mix of "Lag" and "Lead" indicators of the long term strategic objective, i.e., "Mission Readiness". These are as follows:-

    - Personnel Capability. This objective ensures availability of adequate numbers of suitably qualified personnel to enable the squadron to undertake its missions at all times. Pilots have to carry out practice exercises at regular intervals to maintain what are known as "currency requirements" for night flying, weapon delivery etc. Technicians have to continuously strive to upgrade their proficiency levels to ensure high quality maintenance of aircraft and ancillary equipment. The measures chosen are the number of pilots current in all operational roles of the squadron, and the number of technicians appearing for upgrading their skill level.

    - Equipment Capability. Improved equipment serviceability and ready availability of required weapons is another important objective to ensure availability of aircraft for operational flying. The measures chosen for this objective are serviceability percentage of aircraft, serviceability percentage of TTGE, Aviation Specialist Vehicles (ASVs), crash equipment, and actual versus authorised weapon holdings.

- Maintenance Capability. This objective works in consonance with the previous one to make sure that the required numbers of aircraft are available for missions. Aircraft have to be configured with the appropriate equipment for the type of mission planned and have to undergo “Turn Round Servicing (TRS)” after landing back from a mission before being available for flying once again. The measures chosen are time taken for aircraft preparation for mission, time taken for operational TRS the time taken for role modification of aircraft.

- Mission Capability. This objective reflects the results of all the activities in the squadron and leads up to the long term strategic objective of “Mission Readiness”. The measures for this are percentage of flying task achieved and the ratio of the number of missions actually flown to the number of missions planned by the squadron.

The proposed BSC for enhancing the deliverable of “Mission Readiness” of a combat squadron of the IAF is as shown in Figure 5.4. It is clarified that the target figures specified in the BSC are either arbitrary alphabets or approximations of actual target figures used in the IAF, which cannot be quoted in this report for security reasons.

Perspectives	Objectives	Measures	Targets
Mission Readiness Perspective (AOC/AOC-in-C)	**Personnel Capability**	Operational role currency of pilots	> 90 %
		Technicians applying for skill level upgrade	100 % (all eligible)
	Equipment Capability	Aircraft serviceability %	> 75 %
		TTGE/ASV/Crash Equipment Serviceability %	> 90 %
		Actual v/s authorised weapon holdings	> 90 %
	Maintenance Capability	Aircraft preparation time	< A minutes
		Operational TRS time	< B minutes
		Role change modification time	< C minutes
	Mission Capability	% Flying task achieved	Ahead of/On schedule
		Missions actually flown v/s Missions planned	> 90 %
Internal Business Processes Perspective (Squadron CO)	**Training of Pilots**	Ratio of pilots posted v/s authorised	> 95 %
		Planned v/s Actual flying training syllabus	Ahead of/On schedule
		Test Scores	> 90 % in Intelligence and Tactical tests, > 95 % in Technical Knowledge tests
		Instrument Rating / Operational Status	Commensurate with eligibility & experience of pilot
	Proficiency of Technicians	Skill level	> 25 % Skill Level A/Ustaad
		Supervisors	> 3 per technical trade
		Repetitive Snags	Nil
	Maintenance & Logistics Management	Cannibalisation Rate	< P %
		Life Extension Granted	< Z % components
		Lead time for critical spare parts	< Y weeks
	Safety Culture	Foreign Object Damage cases	Nil
		Accidents/Incidents	Nil
		Injuries/Fatalities to personnel	Nil
Employees & Organisation Capacity Perspective (Squadron CO)	**Training of Technicians**	Ratio of technicians posted v/s authorised	> 95 %
		Planned v/s actual OJT	Ahead of/On schedule
		Planned v/s actual supervisory training	Ahead of/On schedule
	Medical & Physical Fitness	LMCs due to lifestyle diseases	Nil
		PFR standards	> X % in Good/Excellent Standards
		Obese personnel	Nil
	Inspection Visits	Air Staff Inspection Grading	> Average plus
		Maintenance Inspection Grading	> Average plus
		Aerospace Safety Inspection Grading	> Average plus

Figure 5.4 Proposed Balanced Scorecard for Mission Readiness

Prepared by the Author (2023)

Validation of the Proposed BSC

To validate the proposed BSC, a Google Form containing an anonymous survey questionnaire was sent to 60 serving IAF officers who are currently serving or have served in various appointments at organisational levels of the IAF linked to the perspectives of the proposed BSC, i.e., CO of a combat squadron, Staff Officer in the Air Branch at any IAF Command HQ or Staff Officer in the Operations Branch at Air HQ. Respondents with more than 15 years of service were chosen to ensure that they would have been exposed to at least one organisational level to which the perspectives of the BSC have been linked. The survey gave them a brief insight into the research being carried out and asked them to rank the various perspectives, objectives and measures chosen in each perspective according to their order of importance. Respondents were free to recommend any changes which they felt would improve the BSC, including recommendations for restructuring, adding or deleting any of the perspectives, their objectives and measures. A copy of the survey questionnaire is placed at Appendix A**.**

Respondent Profile

A total of 40 responses spread across various ranks and levels of experience were received from the field, a response rate of nearly 67 per cent. The distribution of responses based on criteria like rank, years of service and appointments held in the IAF is placed at Appendix B. Some of the significant observations are as follows;-

- Of the total of 40 respondents, 35 (87.5%) have served as COs of combat squadrons, 14 (35%) have served as AOC/Station Commander of flying bases, 16 (40%) have served as staff officers at Command HQ and 11 (27.5%) have served as staff officers at Air HQ. Thus, all the stakeholders in "Mission Readiness" of combat squadrons discussed in Chapter III have been adequately represented in the survey.

- 2.5% (1) respondents have service experience of between 15 to 20 years, 25% (10) have service experience of between 20 to 25 years, 40% (16) respondents have service experience of between 25 to 30 years and 32.5% (13) have service experience of more than 30 years. They include one Air Vice Marshal, 13 Air Commodores, 25 Group Captains and one Wing Commander. This is a highly experienced cohort indicating adequate level of expertise in the field of "Mission Readiness".

Survey Results

The survey responses were studied and the number of times each perspective, each of its objectives and each measure within the objectives was given a specific rank by the respondents (1, 2, 3 etc.) based on its perceived order of importance was calculated, with 1 being most important, 2 being of relatively lesser importance and so on. These numbers are presented in the form of individual stacked bar graphs for each perspective, objective and measure in Appendix C. The numbers were then converted to percentages

to represent the proportion of questionnaires in which each perspective, objective or measure received that ranking by the respondents. Calculation of the percentages allowed the data to be presented in tabular form which is easier to interpret and assimilate for readers.

Importance of Perspectives

Table 5.1 shows the summary of the importance of the perspectives as perceived by the respondents. It is apparent that the Mission Readiness Perspective is the most important with 70% of respondents ranking it as 1. The Employees and Organisation Capacity Perspective, with 20% respondents ranking it as most important, is perceived next in order of importance and the Internal Business Processes is perceived as the least important perspective. This is as expected because improvement in the latter is the direct effect of improvement in the former.

Relative Importance	Mission Readiness	Internal Business Processes	Employees and Organisation Capacity
1	0.7	0.1	0.2
2	0.125	0.375	0.5
3	0.175	0.525	0.3

Table 5.1 Relative Importance of BSC Perspectives as Perceived by Respondents

Mission Readiness Perspective

Analysing the responses to the objectives of the Mission Readiness Perspective, it is clear that with 50% of respondents ranking it as number 1, Mission Capability is the

most important objective. Personnel Capability is the next, with 37.5% rating it as number 1 and 40% rating it as number 2. Maintenance Capability is relatively the least important with 85% respondents ranking it as either 3 or 4 (Table 5.2).

Relative Importance	Personnel Capability	Equipment Capability	Maintenance Capability	Mission Capability
1	0.375	0.1	0.025	0.5
2	0.4	0.35	0.125	0.125
3	0.175	0.425	0.35	0.05
4	0.05	0.125	0.5	0.325

Table 5.2 Relative Importance of Objectives of Mission Readiness Perspective

- Mission Capability Measures. In the Mission Capability measures, the Ratio of Missions Flown to Total Missions Planned (ranked 1 by 75% of respondents) is more important than the Percentage of Flying Task completed. This is because the ratio indicates effective success rate of missions flown by the squadron; and a lesser number of cancelled missions means better "Mission Readiness" of the squadron (Table 5.3).

Relative Importance	Percentage of Flying Task Completed	Ratio of Missions Flown to Missions Planned
1	0.25	0.75
2	0.75	0.25

Table 5.3 Relative Importance of Measures of Mission Capability

- Personnel Capability Measures. Among the measures of Personnel Capability the number of pilots current in operational roles of the squadron (ranked 1 by 92.5% of respondents) is more important than the number of technicians applying to upgrade their skill levels (Table 5.4).

Relative Importance	Pilots current in Operational Roles	Technicians applying for Skill Upgrade
1	0.925	0.075
2	0.075	0.925

Table 5.4 Relative Importance of Measures of Personnel Capability

- Equipment Capability Measures. In the measures of Equipment Capability, 87.5% 0f the responses indicate that Aircraft Serviceability is the most critical metric. However, subjective responses in the form of suggestions indicate that the Percentage of Mission Capable Aircraft would be a more appropriate indicator than merely the Percentage of Serviceable Aircraft. Accordingly the change needs to be incorporated in the final BSC. The responses to the other two measures viz., TTGE/ASV/GSE/Crash Equipment Serviceability and Actual versus Authorised Weapon Holdings are not conclusive with the latter scoring only marginally better than the former (Table 5.5).

Relative Importance	Aircraft Serviceability	TTGE/GSE/Crash Equipment Serviceability	Actual versus Authorised Weapon Holdings
1	0.875	0.05	0.075
2	0.05	0.525	0.425
3	0.075	0.425	0.5

Table 5.5 Relative Importance of Measures of Equipment Capability

- Maintenance Capability Measures. 50 % of the respondents ranked Time Taken for Operational TRS as the most important followed by 35% ranking Time Taken for Aircraft Preparation as most important measure. The Time taken for Role Change Modification was ranked the least important metric (Table 5.6).

Relative Importance	Time Taken for Aircraft Preparation	Time Taken for Operational TRS	Time taken for Role Change Modification
1	0.35	0.5	0.15
2	0.175	0.425	0.4
3	0.475	0.075	0.45

Table 5.6 Relative Importance of Measures of Maintenance Capability

Employees & Organisation Capacity Perspective.

Responses about the objectives for this perspective clearly demonstrate that respondents perceive that Training of Technicians is the most important, with 82.5% ranking it as 1. This is followed by Medical & Physical Fitness of personnel which was ranked 2 by 77.5%, with Grades of Inspection Visits being least important with 87.5% respondents ranking it at 3 (Table 5.7). Suggestions given by respondents brought out the importance of Morale and Motivation of Personnel which also need focus in the organisation. Accordingly, the same needs to be added as an objective for the final BSC and measures for the same will have to be worked out.

Relative Importance	Training of Technicians	Medical & Physical Fitness	Grades of Inspection Visits
1	0.825	0.125	0.05
2	0.15	0.775	0.075
3	0.025	0.1	0.875

Table 5.7 Relative Importance of Objectives of Employees and Organisation Perspective

- Training of Technicians. 45% of respondents ranked Planned Versus Actual OJT of Technicians as the most important measure of this objective. With 32.5% respondents who felt that the Ratio of Technicians Posted versus

Technicians Authorised should be ranked 1 as against 22.5% of the respondents ranking Supervisory Training of Technicians as 1, the former is next in importance as a measure for this objective (Table 5.8).

Relative Importance	Technicians Posted Versus Authorised	Planned Versus Actual OJT of Technicians	Planned Versus Actual Supervisory Training of Technicians
1	0.325	0.45	0.225
2	0.225	0.325	0.45
3	0.45	0.225	0.325

Table 5.8 Relative Importance of Measures of Training of Technicians

- Medical & Physical Fitness of Personnel. LMCs due to Lifestyle Diseases and PFR Test Standards were ranked as most important by almost similar number of respondents (16 and 17 respectively). However with 80% respondents rating LMCs as either 1 or 2, as against PFR Standards which was ranked either 1 or 2 by 65% of respondents, the former was selected as the most important measure. Number of Obese Personnel rated as least important (Table 5.9). An important suggestion from some stakeholders to include a metric for Mental Fitness in the objective needs to be included in the final BSC.

Relative Importance	Zero LMCs due to Lifestyle Diseases	%of Personnel in Good/Excellent PFR Test Standards	Zero Obese Personnel
1	0.4	0.425	0.175
2	0.4	0.225	0.375
3	0.2	0.35	0.45

Table 5.9 Relative Importance of Measures of Medical & Physical Fitness

- Grades of Inspection Visits. Respondents were unequivocal in their endorsement of Grades of Air Staff Inspection as the most important measure in this objective, with 80% ranking it as either 1 or 2. Aerospace Safety Inspection Grade was next with 32.5% responses rating it as 1. Maintenance Inspection Grade was perceived as least important with 47.5% ranking it as 3 (Table 5.10). This was an expected result as Maintenance Inspections are mostly carried out for Wings rather than combat squadrons in the IAF; hence the reduced importance of these in a BSC meant for combat squadrons. There were a few suggestions to include Administrative Inspections to check the viability of sustained administrative support for long duration operations with squadrons deployed away from home base. While the point is a valid one, it is not being included as part of the BSC as these aspects are checked and reported upon during Air Staff Inspections of squadrons and also during IAF level exercises which are conducted every alternate year.

Relative Importance	Air Staff Inspection Grade	Maintenance Inspection Grade	Aerospace Safety Inspection Grade
1	0.575	0.1	0.325
2	0.225	0.425	0.35
3	0.2	0.475	0.325

Table 5.10 Relative Importance of Measures of Grades of Inspection Visits

Internal Business Processes Perspective

Responses about the relative importance of the objectives of the last perspective clearly indicate that Training of Pilots is the most important, with 67.5% ranking it as 1.

Safety Culture is the next, with 52.5% rating it as either 1 or 2, making it the second most critical objective in the perspective. Despite no respondent ranking Proficiency of Technicians as 1, this is the third most important objective with 85% ranking it as either 2 or 3. 57.5% respondents ranked Maintenance & Logistics Management as 4, showing it to be the least important objective of this perspective (Table 5.11). This could be because major aspects of this objective appear to be beyond the control of the squadron; however this researcher's personal experience as CO of a squadron is quite the contrary. Squadrons can initiate actions like accurate forecasting of spares, components and in depth snag analysis to reduce lead times for spares, cannibalisation of components and life extensions. This will ensure that this objective remains in their control and contribute to "Mission Preparedness". The objective is therefore being retained in the BSC. A few respondents have suggested including Management of Administrative Services in the objectives; however the same is not being done due to reasons mentioned earlier.

Relative Importance	Training of Pilots	Proficiency of Technicians	Maintenance & Logistics Management	Safety Culture
1	0.675	0	0.075	0.25
2	0.225	0.45	0.05	0.275
3	0.075	0.4	0.3	0.225
4	0.025	0.15	0.575	0.25

Table 5.11 Relative Importance of Objectives of Internal Business Processes Perspective

- Training of Pilots. The most important measure in this objective is IR/Operational Status of Pilots, with 32.5% respondents ranking it as 1. Based on the total number of respondents ranking Planned versus Actual Flying Syllabus Completed as either 1 or 2 (55%), this measure is the next in importance,

followed by Ratio of Pilots Posted versus Authorised and Scores of Intelligence, Tactical and Technical Test Scores (Table 5.12).

Relative Importance	Pilots Posted versus Authorised	Planned Versus Actual Flying Syllabus Completed	Intelligence, Tactical and Technical Test Scores	Instrument Rating/ Operational Status
1	0.225	0.275	0.175	0.325
2	0.075	0.275	0.3	0.35
3	0.325	0.225	0.175	0.275
4	0.375	0.225	0.35	0.05

Table 5.12 Relative Importance of Measures of Training of Pilots

- Proficiency of Technicians. Number of Repetitive Snags with an endorsement as 1 by 47.5% respondents is the most important measure of this perspective, followed by the Number of Supervisors in Each Trade being second most important with 32.5% ranking it as 1 (Table 5.13). The Skill Level of Technicians has been rated as least important because it is not mandatory for technicians to have higher Skill Levels like "A"/"Ustaad" in order to be cleared to carry out all types of maintenance activity in a squadron. They do, however contribute, to the supervisory capacity available in the squadron and ensure long term stability in technicians' training.

Relative Importance	Technicians with Skill Level A/Ustaad	>3 Supervisors in Each Trade	Number of Repetitive Snags
1	0.2	0.325	0.475
2	0.35	0.475	0.175
3	0.45	0.2	0.35

Table 5.13 Relative Importance of Measures of Proficiency of Technicians

- Maintenance & Logistics Management. An overwhelming 77.5% of respondents ranked Lead Time for Critical Spares as 1, clearly making it the most important measure of this objective. This is followed by Number of Components Granted Life Extensions with 80% rating it as either 1 or 2, and finally, Cannibalisation Rate with 62.5% rating it as 3 (Table 5.14).

Relative Importance	Cannibalisation Rate	Components Granted Life Extensions	Lead Time for Critical Spares
1	0.05	0.175	0.775
2	0.325	0.625	0.05
3	0.625	0.2	0.175

Table 5.14 Relative Importance of Measures of Maintenance & Logistics Management

- Safety Culture. Number of Accidents/Incidents has been rated by respondents as the most important measure, with 52.5% ranking it as 1. Injuries/ Fatalities to Personnel is ranked next with 35% ranking it as 1. This is because every accident/incident does not lead to physical harm but does reflect on the safety culture of the squadron. Foreign Object Damage has been ranked the least important by respondents, with 62.5% ranking it as 3 (Table 5.15). This is because damage due to foreign objects like pebbles thrown up by aircraft tires while taking off or landing or manoeuvring on the taxiways is not always in the control of the squadron, hence the lesser emphasis on this measure as an Internal Business Process of the squadron. A suggestion by some respondents to include Standard Operating Procedure (SOP) Violations as a measure of Safety Culture is valid and will be included in the final BSC.

Relative Importance	Foreign Object Damage to Aircraft	Number of Accidents/Incidents	Injuries/ Fatalities to Personnel
1	0.125	0.525	0.35
2	0.25	0.375	0.375
3	0.625	0.1	0.275

Table 5.15 Relative Importance of Measures of Safety Culture

CHAPTER VI

FINDINGS, RECOMMENDATIONS AND CONCLUSION

Introduction

Having completed the research study titled "A Balanced Scorecard to Enhance Mission Preparedness in Combat Squadrons of the Indian Air Force", this Chapter presents the findings and recommendations of the study. It will also examine the limitations of the research and suggest areas for future studies by researchers.

Summary of Findings from Data Analysis

The survey data indicates that the Mission Readiness Perspective was perceived as the most important perspective of the BSC, followed by the Employees and Organisation Perspective, with the Internal Processes Perspective seen as the least critical.

Among the objectives of the Mission Readiness Perspective, Mission Capability was ranked as most important by respondents followed by Personnel Capability, Equipment Capability and Maintenance Capability. Respondents perceived that the Ratio of Missions Actually Flown to Total Missions Planned was the most important measure of Mission Capability, while the number of Number of Pilots Current in Roles of the

Squadron was the top measure of Personnel Capability. While choosing Aircraft Serviceability as the most critical metric of Equipment Capability, the respondents have recommended replacing it with Percentage of Mission Capable Aircraft to give a more accurate measure linked to “Mission Readiness”. The same has been incorporated in the modified BSC in the current Chapter. Respondents also chose the Time Taken for Operational TRS as the most critical measure of Maintenance Capability in this perspective.

A very large number of respondents ranked Training of Technicians as the most important objective of the Employees and Organisation Capacity Perspective, with Medical & Physical Fitness Standards and Grades of Inspection Visits rated as second and third in order of importance. Respondents also recommended including Morale and Motivation of Personnel as an objective under this perspective. This suggestion has been carried out and the new objective along with its measures has been included in the modified BSC. Respondents ranked Planned versus Actual OJT as the most important metric of the Training of Technicians objective. The importance given by the respondents to long-term and holistic well being of personnel was apparent, with LMCs due to Lifestyle Diseases being ranked most important measure of Medical and Physical Fitness. In view of today’s stressful environment, a recommendation by respondents for including a metric for Mental Fitness in this objective has also been implemented in the modified BSC. Performance in Air Staff Inspection Visits was ranked as the most important measure of the objective Grades of Visits & Inspections.

Training of Pilots was rated as the most important objective of the Internal Business Processes Perspective, followed by Safety Culture, Proficiency of Technicians and Maintenance & Logistics Management. The most important metric for Training of Pilots was IR/Operational Status of squadron pilots, while for Safety Culture, Proficiency of Technicians and Maintenance & Logistics Management; the most important measures were Number of Accidents/Incidents, Number of Repetitive Snags and Lead Time for Critical Spares respectively. A recommendation by respondents to include Standard Operating Procedure Violations as a measure of Safety Culture was examined and found to be valid. The same has been included in the modified BSC presented in this Chapter.

Modified BSC for "Mission Readiness"

As mentioned in the paragraphs above some relevant recommendations made by the respondents for inclusion of certain additional objectives and performance metrics were evaluated and the relevant ones were used to modify the proposed BSC. The modified BSC is as shown at Figure 6.1.

Limitations of the Research Study

Key limitations of this research study are as follows:-

- The study was undertaken over a very short period due to the time constraints of the Advanced Professional Programme in Public Administration

Perspectives	Objectives	Measures	Targets
Mission Readiness Perspective (AOC/AOC-in-C)	**Personnel Capability**	Operational role currency of pilots	> 90 %
		Technicians applying for skill level upgrade	100 % (all eligible)
	Equipment Capability	% of Mission Capable Aircraft	> 75 %
		TTGE/ASV/Crash Equipment Serviceability %	> 90 %
		Actual v/s authorised weapon holdings	> 90 %
	Maintenance Capability	Aircraft preparation time	< A minutes
		Operational TRS time	< B minutes
		Role change modification time	< C minutes
	Mission Capability	% Flying task achieved	Ahead of/On schedule
		Missions actually flown v/s Missions planned	> 90 %
Internal Business Processes Perspective (Squadron CO)	**Training of Pilots**	Ratio of pilots posted v/s authorised	> 95 %
		Planned v/s Actual flying training syllabus	Ahead of/On schedule
		Test Scores	> 90 % in Intelligence and Tactical tests, > 95 % in Technical Knowledge tests
		Instrument Rating / Operational Status	Commensurate with eligibility & experience of pilot
	Proficiency of Technicians	Skill level	> 25 % Skill Level A/Ustaad
		Supervisors	> 3 per technical trade
		Repetitive Snags	Nil
	Maintenance & Logistics Management	Cannibalisation Rate	< Q %
		Life Extension Granted	< P % components
		Lead time for critical spare parts	< Z weeks
	Safety Culture	Foreign Object Damage cases	Nil
		Accidents/Incidents	Nil
		Injuries/Fatalities to personnel	Nil
		Violations of SOP	Nil
Employees & Organisation Capacity Perspective (Squadron CO)	**Training of Technicians**	Ratio of technicians posted v/s authorised	> 95 %
		Planned v/s actual OJT	Ahead of/On schedule
		Planned v/s actual supervisory training	Ahead of/On schedule
	Medical, Physical & Mental Fitness	LMCs due to lifestyle diseases	Nil
		PFR standards	> Y % in Good/Excellent Standards
		Depression/Anxiety/ Anger Cases	Nil
		Obese personnel	Nil
	Morale & Motivation of Personnel	Representations & Complaints posted on CO's Forum	< X per month
	Inspection Visits	Air Staff Inspection Grading	> Average plus
		Maintenance Inspection Grading	> Average plus
		Aerospace Safety Inspection Grading	> Average plus

Figure 6.1 Modified Balanced Scorecard for Mission Readiness After Validation

Prepared by Author (2023)

(APPPA) course curriculum. Thus, even though a tool to measure "Mission Readiness" and its constituents has been developed and validated, its effectiveness in improving the same over a longer period has not been tested. Hence, it is recommended that a longitudinal study be carried out after implementing the proposed BSC in a combat squadron of the IAF.

- The study was conceptualised and conducted by the undersigned without any official or institutional sanction by the senior management of the IAF. Though the respondents are senior officers in the IAF hierarchy, their participation in the study was purely voluntary and the views they provided were their personal opinions which may not represent the institutional viewpoint of the IAF. Studies of this nature need a dedicated commitment by the top echelons of the organisation to generate the resources required for research, creation of an environment that facilitates the study and provides free access to the researcher. Thus, for the longitudinal study recommended above, organisational sponsorship from the topmost hierarchical levels of the IAF is a must and has been included in the recommendations.

Recommendations

Considering the responses obtained from the stakeholders in the field, it is seen that the proposed BSC will aid in improving "Mission Readiness" of combat squadrons of the IAF. The following is recommended:-

- The proposed BSC may be considered to be the first iteration of a “work in progress” and be implemented in one of the combat squadrons as a Pilot Project for a period of 24 months after adapting it for local conditions. During this period, the difficulties faced and the lessons learned by squadrons in implementing the BSC should be carefully compiled and used to further modify the BSC. At the end of this period, a special team comprising members from all stakeholders should evaluate the performance of the squadron to ascertain the success of the BSC in improving overall “Mission Readiness”. If the BSC is found to be successful, it may then be applied to all combat squadrons of the IAF.

- The BSC can be successful only if it is implemented with consistent backing at all levels of the organisation. Hence, it is recommended that the concept be applied following a top down approach with the Pilot Project being sponsored at the topmost level in the IAF.

- Since the understanding of the concept of the BSC may be limited, especially among the lower echelons of the IAF hierarchy, a concerted effort needs to be made to communicate the changes that may be required in the organisational culture, work ethics and individual attitudes of personnel in order to ensure that combat squadrons can achieve the best possible “Mission Readiness” at all times. It needs to be understood by all personnel that no matter how good the perception of existing “Mission Readiness” may be, there is always scope for further improvement.

Areas for Further Research

- Further validation of the BSC by carrying out an institution sponsored longitudinal study of its implementation in combat squadrons of the IAF.

- The current study focuses only on combat flying units of the IAF. There is scope for carrying out further research on the application of the BSC to improve performance in non-flying combat units, non-combat units, training units and maintenance units of the IAF.

- The BSC proposed in this study is meant to be used in the smallest organisational component of the IAF viz., the combat squadron. Further research on the subject can focus on upward integration of the concept by developing interlinked BSCs at the Wing, Command HQ and Air HQ levels to move towards the achievement of the IAF's Vision Statement "People First, Mission Always".

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APPENDIX A

SURVEY QUESTIONNAIRE

USING THE BALANCED SCORECARD (BSC) TO ENHANCE "MISSION READINESS" OF COMBAT SQUADRONS OF THE IAF

Section I

The BSC is a business tool introduced by Kaplan and Norton in the early 1990s to reconcile problems in traditional management strategies which overemphasized financial measures over others to evaluate the success of businesses. This resulted in short-term gains with a corresponding lack of attention to important areas critical for long-term success. To address this issue, the BSC provides four different perspectives of the organisation, each of which has a range of measures indicating aspects of organisational performance. These measures act as instruments for the top hierarchy of the organisation to effectively convey to the workforce and other stakeholders those aspects on which they need to focus in order to ensure that the organisation will be able to achieve its short term and long term objectives However, the BSC was primarily designed for improving the performance of businesses with the objective of increasing profits of stakeholders. The challenge lies in adapting a traditional BSC to develop and measure performance metrics for an entity (an IAF combat squadron) that does not focus on profits but delivers "Mission Readiness" to its stakeholders. This requires a review of the traditional BSC and its perspectives as well as an understanding of the various stakeholders and their concerns. This study attempts to quantify attributes of "Mission Readiness" in combat squadrons of the IAF and suggest the use of the BSC as a tool to improve the same (See Figure below).

This survey is part of the research project being undertaken by the undersigned as part of the 48 APPPA course curriculum at the Indian Institute of Public Administration (IIPA), New Delhi. **THIS SURVEY IS ONLY MEANT TO BE FILLED UP BY IAF OFFICERS OF THE FLYING BRANCH WITH MORE THAN 15 YEARS OF SERVICE.** Your participation in this study is voluntary and your responses to the survey questions will remain confidential at all times. The Survey consists of four sections. Section I gives a brief overview of the BSC and the background of the study. Section II pertains to profile data like your appointment, service profile etc. In Section III, you are requested to rank the various perspectives of a proposed BSC to enhance "Mission Readiness", in the order of their importance. In Section IV, you are requested to rank the objectives of various perspectives of a proposed BSC to enhance "Mission Readiness" and the measures for each objective in the order of their importance. **The rankings use a numeric scale to portray relative importance, the lower the number, the greater the importance; with 1 being the most important. You are also requested to recommend any changes which you feel would improve the BSC, including recommendations for**

restructuring, adding or deleting any of the perspectives, their objectives and measures. There is no time limit for survey completion. However, it is anticipated that the survey should take you approximately 20-25 minutes to complete. Ultimately, it is hoped that the analysis will assist in identifying a pathway of continuous improvement of "Mission Readiness" for the future. Thank you in advance for taking the time to complete this survey.

Air Cmde SA Nawathe
Participant Officer
48 APPA
IIPA, New Delhi

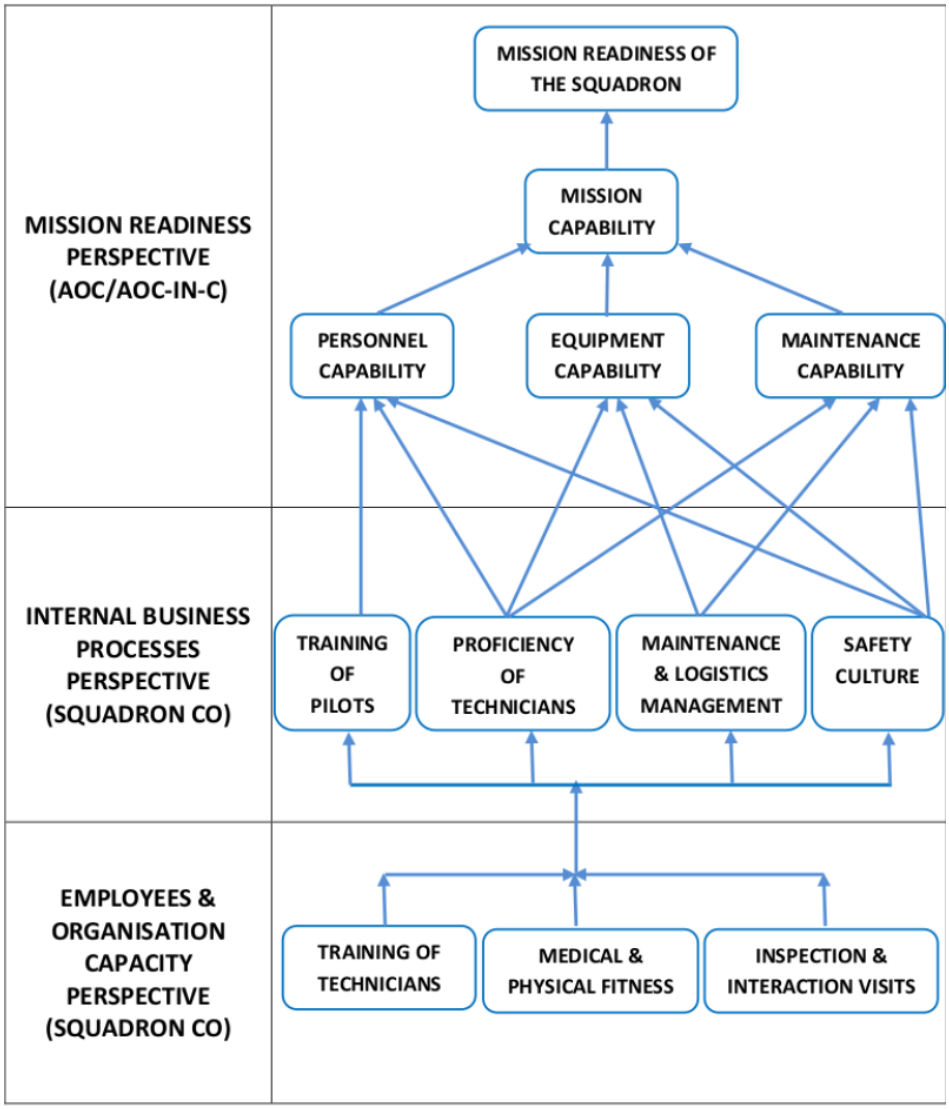

Figure : Strategy Map for Mission Readiness of a Combat Squadron of the IAF

Section II

Profile Data. This section collects profile data for use during analysis.

- Please state your Rank and Name (You may choose not to disclose your name. However please do fill in your rank)

- What is your service bracket?

  >15 years

  > 20 years

  >25 years

  >30 years

- Have you ever served in any of the following appointments?

  CO of a Combat Squadron

  Station Commander/AOC of a Flying Station

  Staff Officer in the Air Branch at Command HQ

  Staff Officer in the Operations Branch at Air HQ

Section III

Perspectives of Proposed BSC

In this section, please rank the various perspectives of a proposed BSC to enhance "Mission Readiness", in the order of their importance. **The rankings use a numeric scale to portray relative importance, the lower the number, the greater the importance; with 1 being the most important, 2 being relatively less important and so on.**

- Rank the perspectives of the proposed BSC to enhance "Mission Readiness" of an IAF combat squadron.

	1	2	3
Mission Readiness Perspective			
Internal Business Processes Perspective			
Employees and Organisation Capacity Perspective			

Section IV

Objectives & Measures of Various Perspectives

In this section, please rank the objectives and performance measures of various perspectives of the proposed BSC to enhance "Mission Readiness", in the order of their importance. **The rankings use a numeric scale to portray relative importance, the lower the number, the greater the importance; with 1 being the most important, 2 being relatively less important and so on.**

- Rank the objectives of the "Employees & Organisation Capacity" Perspective of the squadron in their order of importance, as per your perception.

	1	2	3
Training of Technicians			
Medical & Physical Fitness			
Grades of Inspection Visits			

- Your suggestions to add or delete objectives to improve the "Employees & Organisation Capacity" of the squadron.

_____

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_____

- Rank the performance measures of the objective "Training of Technicians" in their order of importance, as per your perception.

	1	2	3
Ratio of technicians Posted versus Authorised			
Planned versus Actual OJT of Technicians			
Planned versus Actual Supervisory Training of Technicians			

- Your suggestions to add or delete performance measures to improve the "Training of Technicians" of the squadron.

_____

_____

_____

- Rank the performance measures of the objective "Medical and Physical Fitness" in their order of importance, as per your perception.

	1	2	3
Zero LMCs due to Lifestyle Diseases			
% of Personnel in Good/Excellent PFR Standards			
Zero Obese Personnel			

- Your suggestions to add or delete performance measures to improve the "Medical and Physical Fitness" of the squadron.

_____

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- Rank the performance measures of the objective "Grades of Inspection Visits" in their order of importance, as per your perception.

	1	2	3
Air Staff Inspection > Average Plus			
Maintenance Inspection > Average Plus			
Aerospace Safety Inspection > Average Plus			

- Your suggestions to add or delete performance measures to improve the "Grades of Inspection Visits" of the squadron.

_____

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- Rank the objectives of the "Internal Business Processes Perspective" of the squadron in their order of importance, as per your perception.

	1	2	3	4
Training of Pilots				
Proficiency of Technicians				
Maintenance & Logistics Management				
Safety Culture				

- Your suggestions to add or delete objectives to improve the "Internal Business Processes" of the squadron.

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- Rank the performance measures of the objective "Training of Pilots" in their order of importance, as per your perception.

	1	2	3	4
Ratio of Pilots Posted versus Authorised				
Planned Versus Actual Flying Syllabus Completed				
Intelligence, Tactical & Technical Test Scores				
Instrument Rating/Operational Status Commensurate With Eligibility & Experience				

- Your suggestions to add or delete performance measures to improve the "Training of Pilots" of the squadron.

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- Rank the performance measures of the objective "Proficiency of Technicians" in their order of importance, as per your perception.

	1	2	3
Number of Technicians With Skill Level A/Ustaad			
> 3 Supervisors in Each Technical Trade			
Number of Repetitive Snags			

- Your suggestions to add or delete performance measures to improve the "Proficiency of Technicians" of the squadron.

_____

- Rank the performance measures of the objective "Maintenance & Logistics Management" in their order of importance, as per your perception.

	1	2	3
Cannibalisation Rate			
Number of Components Granted Life Extensions			
Lead Time for Critical Spares			

- Your suggestions to add or delete performance measures to improve the "Maintenance & Logistics Management" of the squadron.

- Rank the performance measures of the objective "Safety Culture" in their order of importance, as per your perception.

	1	2	3
Foreign Object Damage To Aircraft			
Number of Accidents/Incidents			
Injuries/Fatalities to Personnel			

- Your suggestions to add or delete performance measures to improve the "Safety Culture" of the squadron.

- Rank the objectives of the "Mission Readiness Perspective" in their order of importance, as per your perception.

	1	2	3	4
Personnel Capability				
Equipment Capability				
Maintenance Capability				
Mission Capability				

- Your suggestions to add or delete objectives to improve the "Mission Readiness Perspective" of the squadron.

_____

_____

_____

- Rank the performance measures of the objective "Personnel Capability" in their order of importance, as per your perception.

	1	2
Number of Pilots Current in Operational Roles of the Squadron		
Number of Technicians Applying for Skill Level Upgrade		

- Your suggestions to add or delete performance measures to improve the "Personnel Capability" of the squadron.

_____

_____

_____

- Rank the performance measures of the objective "Equipment Capability" in their order of importance, as per your perception.

	1	2	3
Aircraft Serviceability %			
TTGE/ASV/GSE/Crash Equipment Serviceability %			
Actual versus Authorised Weapon Holdings			

- Your suggestions to add or delete performance measures to improve the "Equipment Capability" of the squadron.

_____

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_____

- Rank the performance measures of the objective "Maintenance Capability" in their order of importance, as per your perception.

	1	2	3
Time Taken for Aircraft Preparation			
Time Taken for Operational TRS			
Time Taken for Role Change Modification			

- Your suggestions to add or delete performance measures to improve the "Maintenance Capability" of the squadron.

_____

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_____

- Rank the performance measures of the objective "Mission Capability" in their order of importance, as per your perception.

	1	2
% Flying Task Achieved		
Ration of Missions Actually flown versus Total Planned Missions		

- Your suggestions to add or delete performance measures to improve the "Mission Capability" of the squadron.

_____

_____

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APPENDIX B

RESPONDENT PROFILE

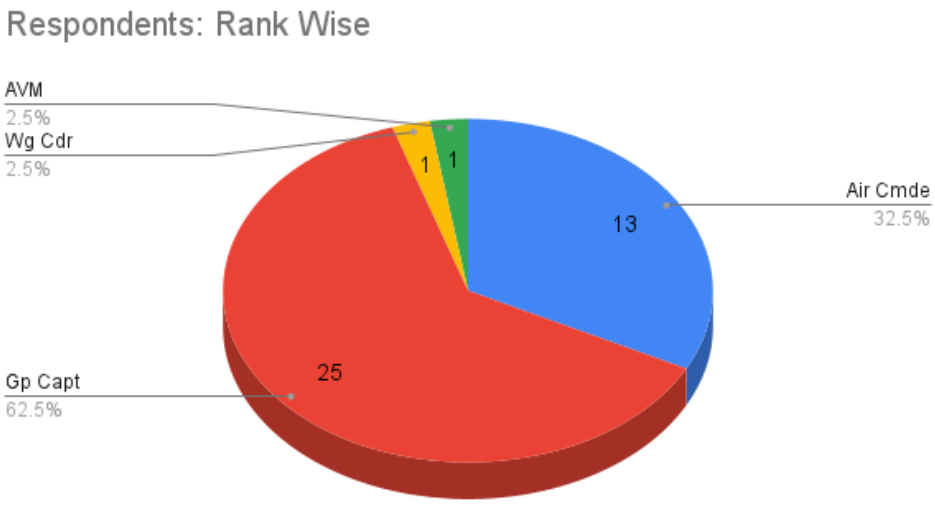

Chart B1: Rank Wise Profile of Respondents

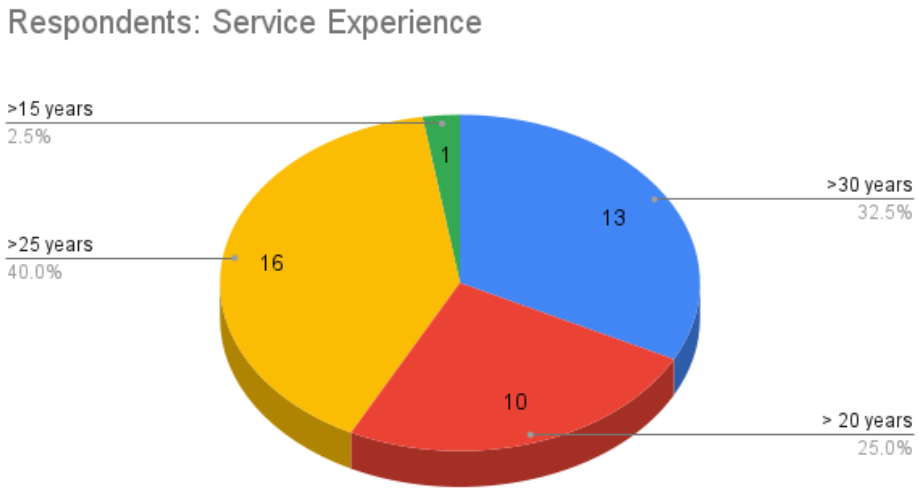

Chart B2: Service Experience Profile of Respondents

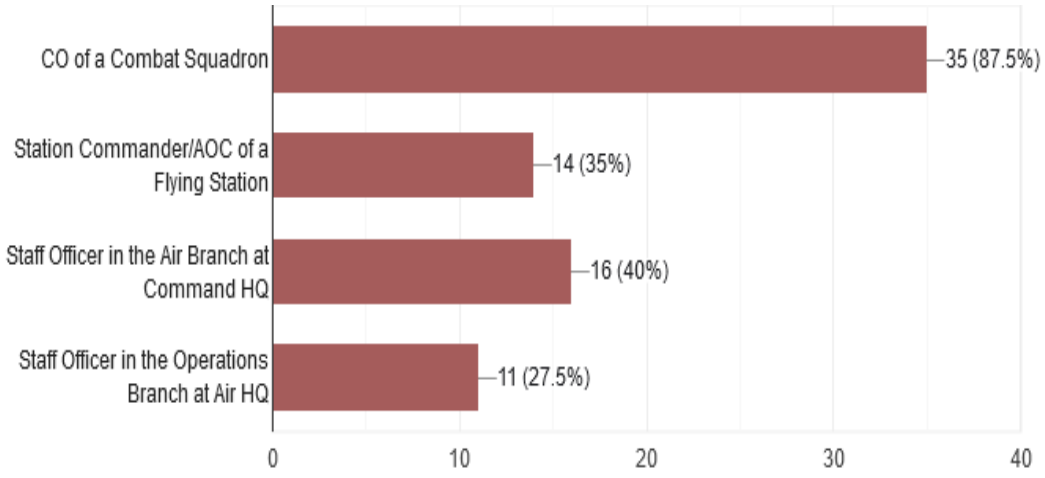

Chart B3: Appointment Profile of Respondents

APPENDIX C

SURVEY RESULTS

- Rank the perspectives of the proposed BSC to enhance "Mission Readiness" of an IAF combat squadron.

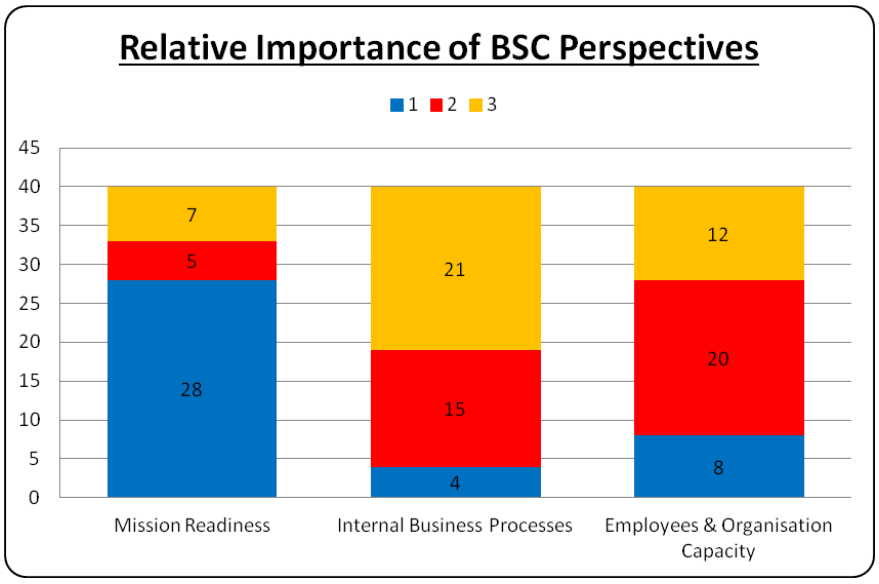

Chart C1: Relative Importance of BSC Perspectives

- Rank the objectives of the "Mission Readiness Perspective" in their order of importance, as per your perception.

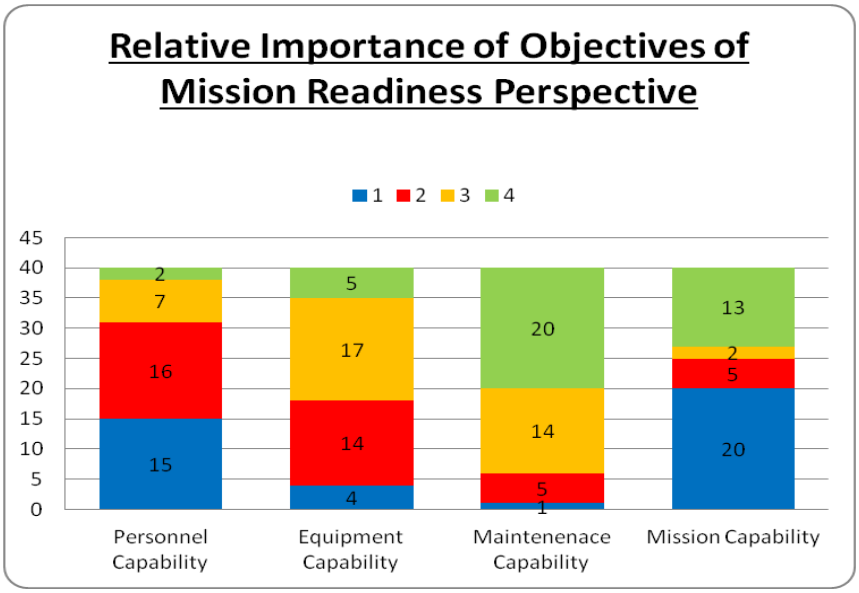

Chart C2: Relative Importance of Objectives of Mission Readiness Perspective

- Rank the objectives of the "Mission Readiness Perspective" in their order of importance, as per your perception.

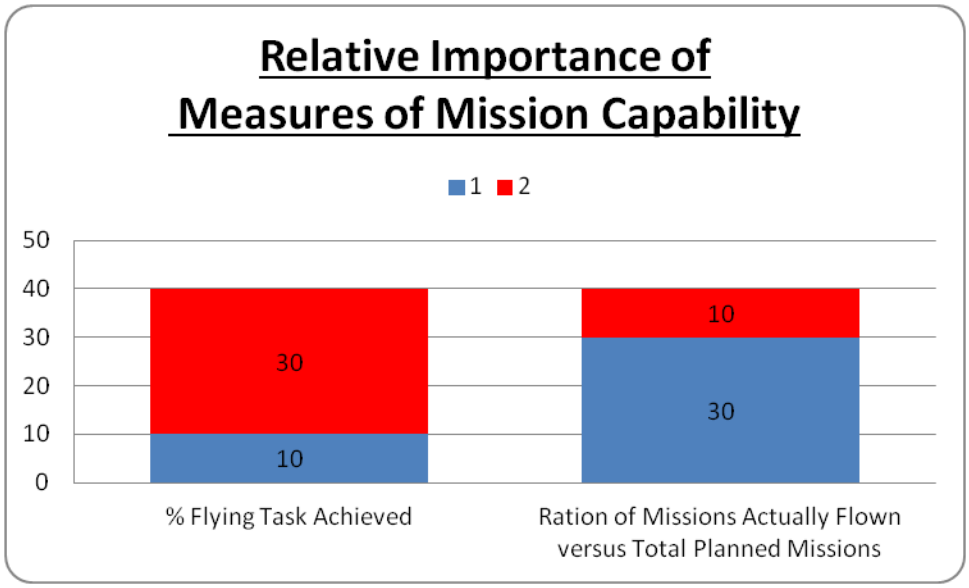

Chart C3: Relative Importance of Measures of Mission Capability

- Rank the performance measures of the objective "Personnel Capability" in their order of importance, as per your perception.

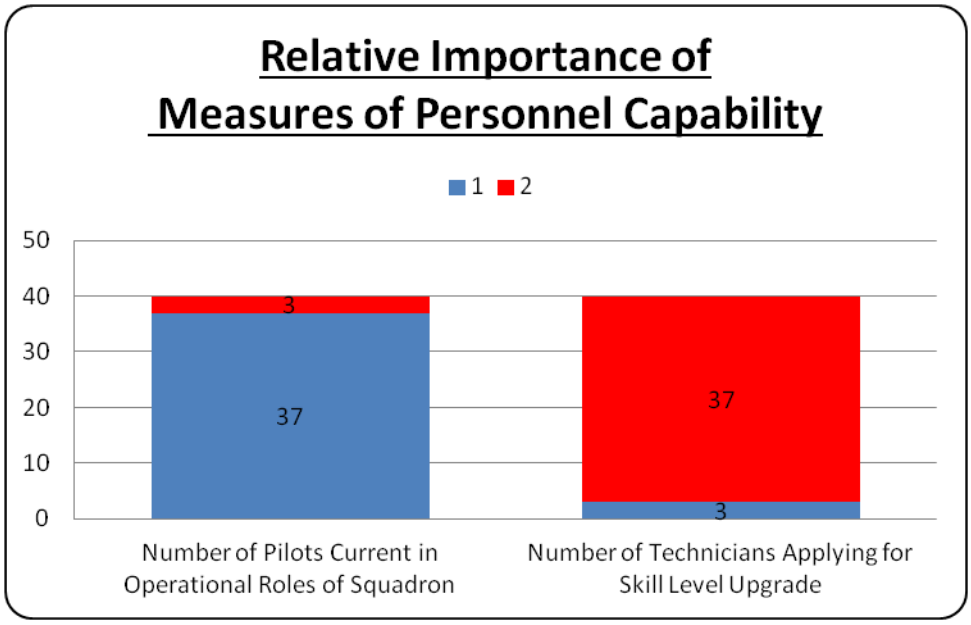

Chart C4: Relative Importance of Measures of Personnel Capability

- Rank the performance measures of the objective "Equipment Capability" in their order of importance, as per your perception.

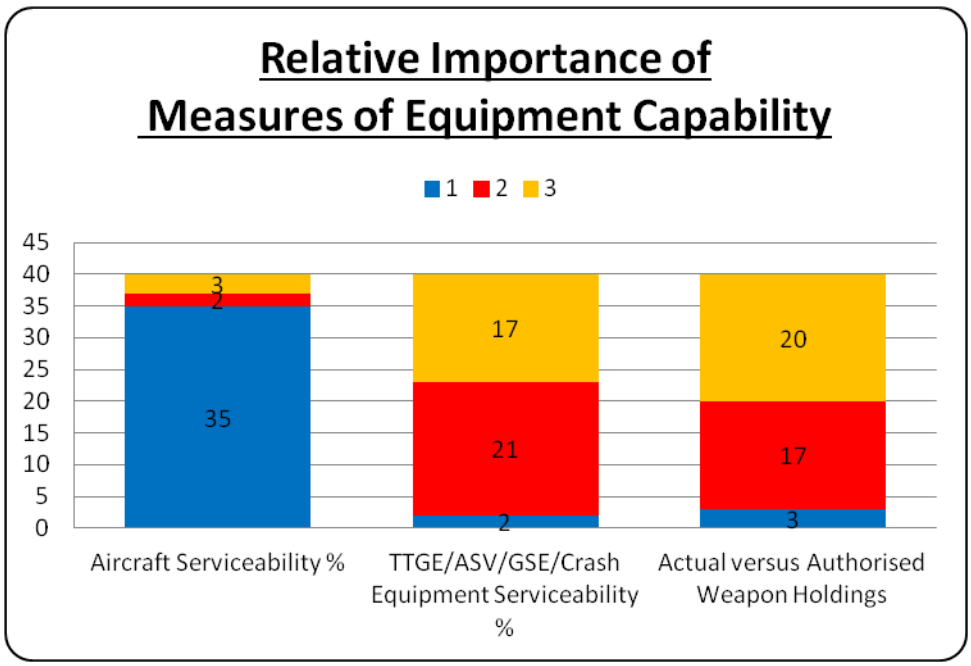

Chart C5: Relative Importance of Measures of Equipment Capability

- Rank the performance measures of the objective "Maintenance Capability" in their order of importance, as per your perception.

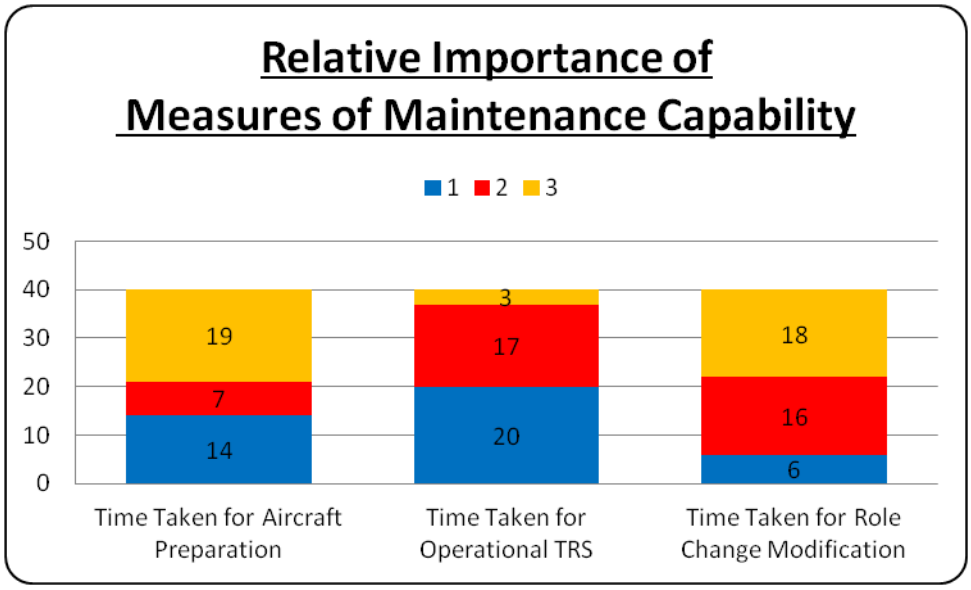

Chart C6: Relative Importance of Measures of Maintenance Capability

- Rank the objectives of the "Employees & Organisation Capacity" Perspective of the squadron in their order of importance, as per your perception.

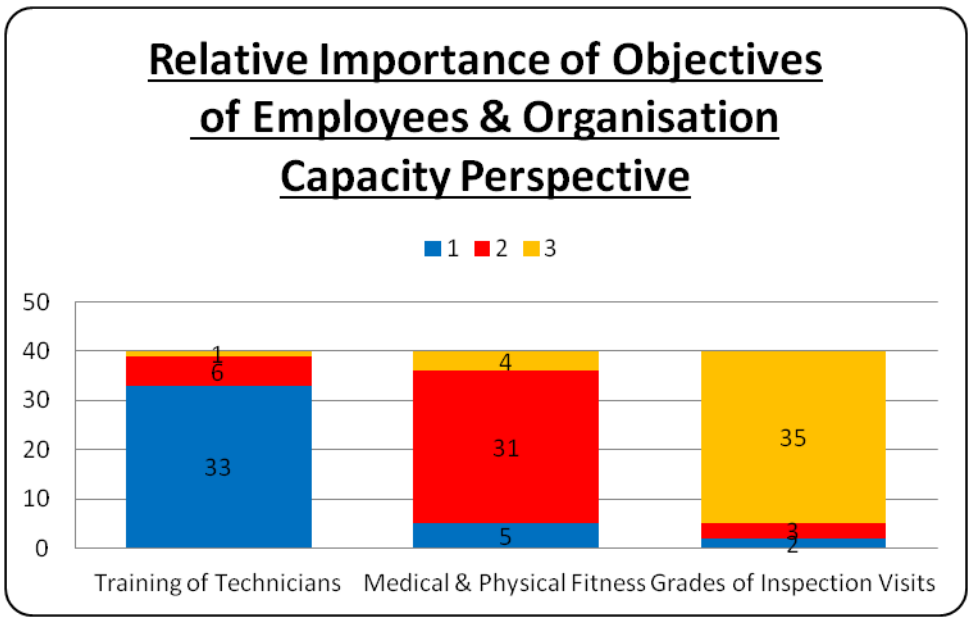

Chart C7: Relative Importance of Objectives of Employees & Organisation Capacity

- Rank the performance measures of the objective "Training of Technicians" in their order of importance, as per your perception.

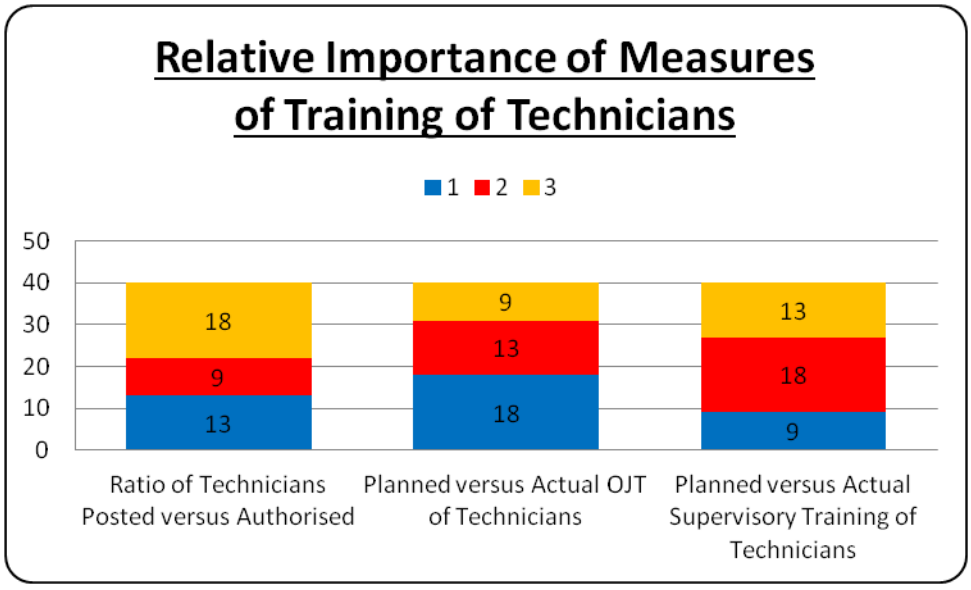

Chart C8: Relative Importance of Measures of Training of Technicians

- Rank the performance measures of the objective "Medical and Physical Fitness" in their order of importance, as per your perception.

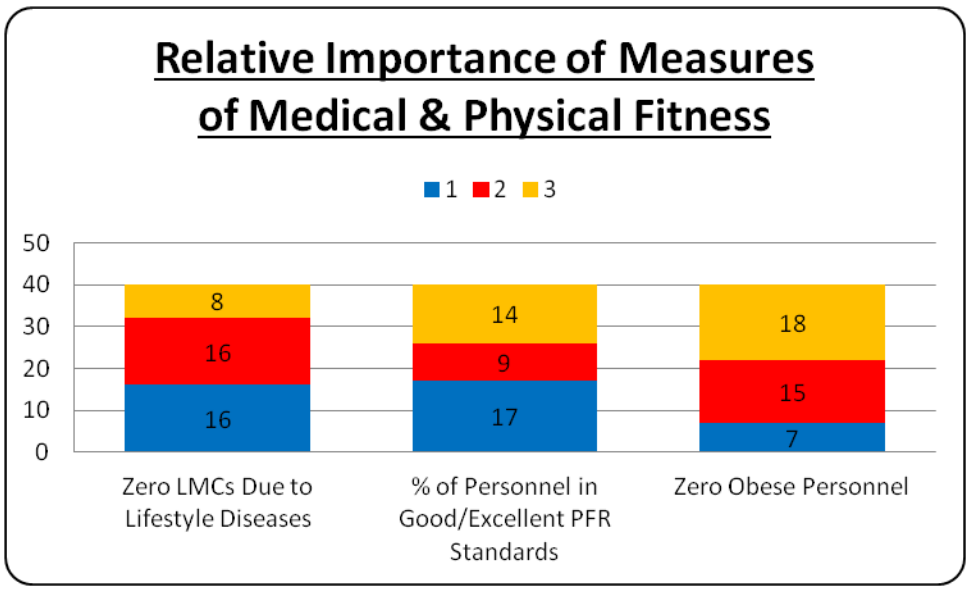

Chart C9: Relative Importance of Measures of Medical & Physical Fitness

- Rank the performance measures of the objective "Grades of Inspection Visits" in their order of importance, as per your perception.

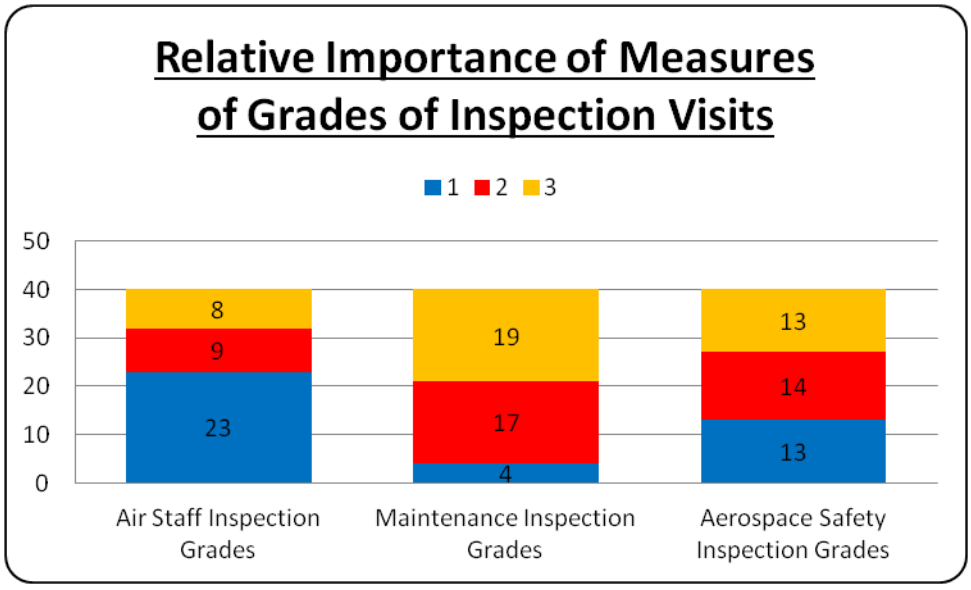

Chart C10: Relative Importance of Measures of Grades of Inspection Visits

- Rank the objectives of the "Internal Business Processes Perspective" of the squadron in their order of importance, as per your perception.

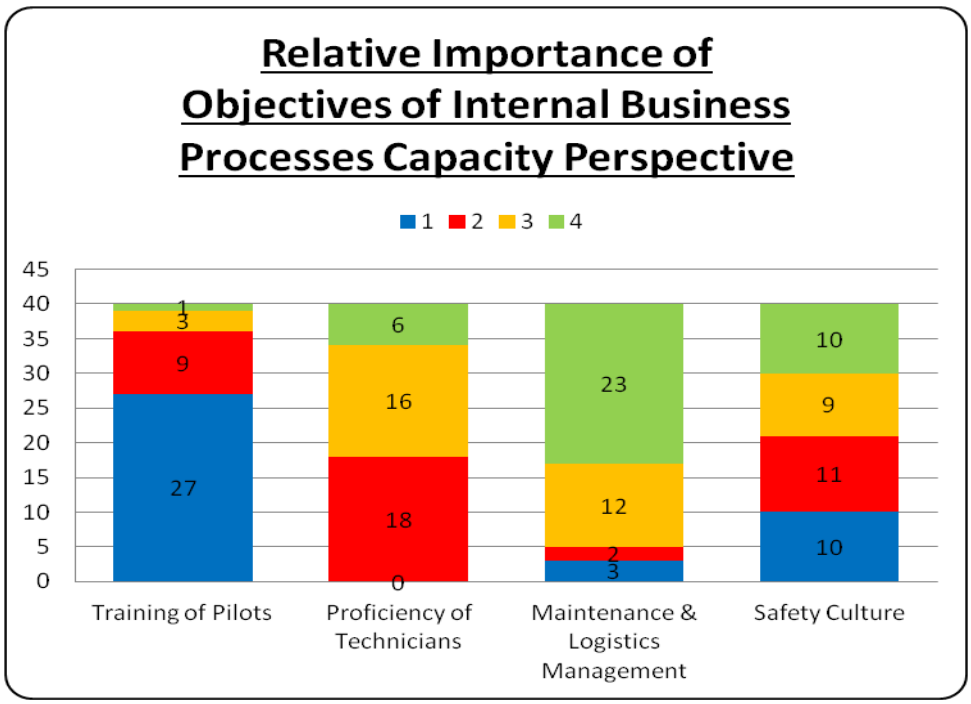

Chart C11: Relative Importance of Objectives of Internal Business Processes Perspective

- Rank the performance measures of the objective "Training of Pilots" in their order of importance, as per your perception.

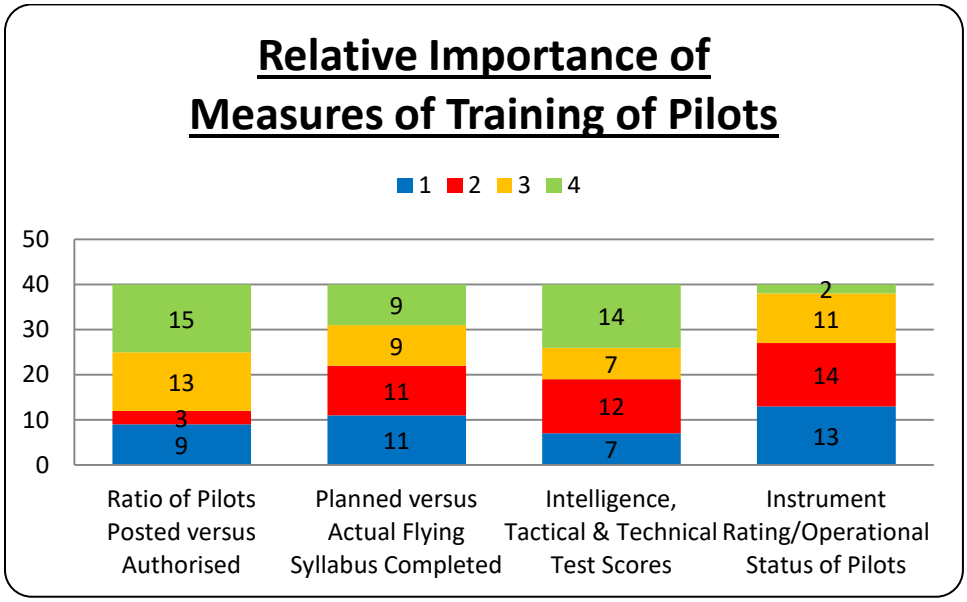

Chart C12: Relative Importance of Measures of Training of Pilots

- Rank the performance measures of the objective "Proficiency of Technicians" in their order of importance, as per your perception.

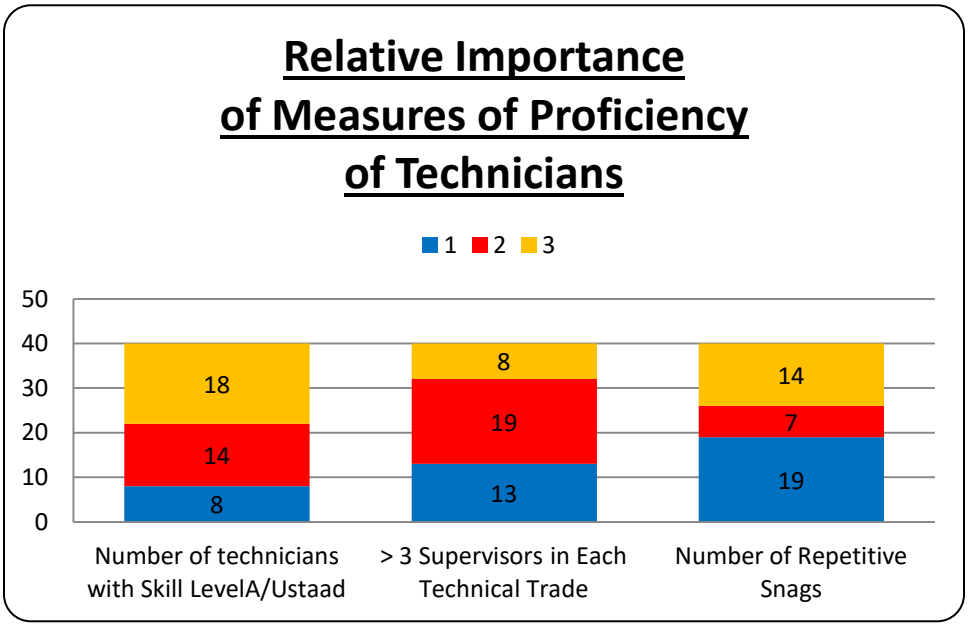

Chart C13: Relative Importance of Measures of Proficiency of Technicians

- Rank the performance measures of the objective "Maintenance & Logistics Management" in their order of importance, as per your perception.

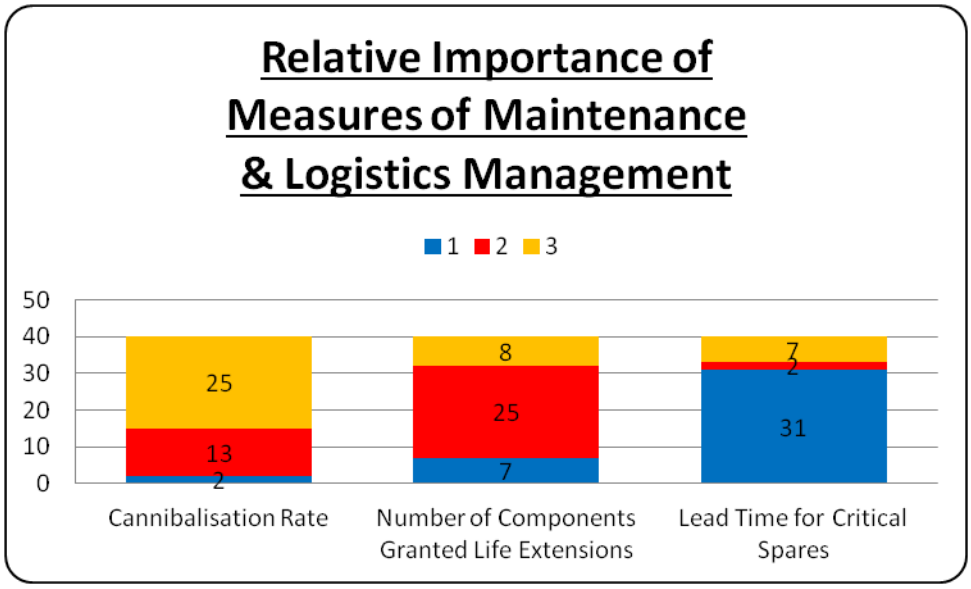

Chart C14: Relative Importance of Measures of Maintenance & Logistics Management

- Rank the performance measures of the objective “Safety Culture” in their order of importance, as per your perception.

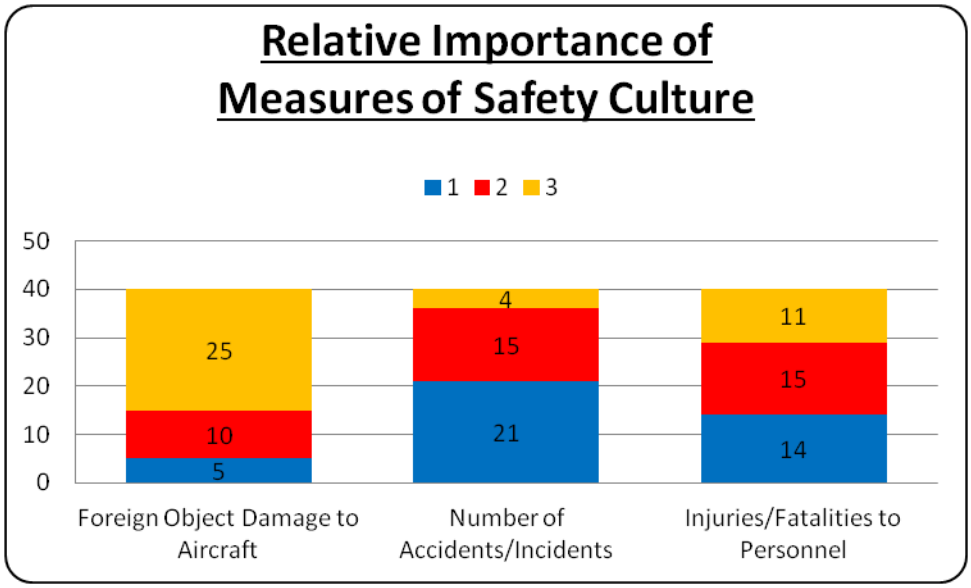

Chart C15: Relative Importance of Measures of Safety Culture