# THE MEASUREMENT SCALE FOR INDONESIA'S DOMESTIC AIRLINES PERFORMANCE

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## Abstract

*The aim of this research is to obtain a consensus from the experts in airline on the instruments for the measurement of domestic airlines performance in Indonesia. The measurement is essentially divided into two major aspects, namely flight safety aspect and economic or airline business aspect. The beginning stage will focus on the proposed design of measurement of airlines performance that can be used objectively to measure the performance of all national airlines in Indonesia, thus it will be easier for the policy makers to make a comprehensive evaluation based on the safety performance and the economic or business performance of the airlines. The research method uses questionnaires to obtain answers and inputs from the selected respondents using Delphi method. The data is processed using SPSS version 17.00. The result of this research shows that the 41 respondents who answer consider all the indicators as valid and agree with the design of instruments for measuring the airlines performance.*

*Keywords: Measurement design, airline business, safety performance, financial performance*

## INTRODUCTION

From the aspect of flight traffic growth, both the passengers and cargoes carried by air transport, there has been a significant increase over some years, especially since the issuance of the aviation deregulation policy in 2000 (INACA, 2007). However, in line with the traffic growth, in fact the Indonesia's national aviation has some fairly fundamental weaknesses, especially in the aspects of safety performance and economic performance, causing terrible chronic decline of national airlines performance viewed from both aspects. The period of 2005 to 2009 is a bad time for the performance of national transportation, including airlines, due to the high number of accidents happening at the high level of fatality. At the same time, some national airlines faced financial crisis which ended in a bankruptcy, such as the cases of Indonesia Airlines, Jatayu, AWR, Star Air, Bouraq Airlines, Adam Air, and so on, of which the cause is presumably due to capital inadequacy and unprofessional company management (mismanagement). In the peiod of 2005 to 2015, averagely one airline company went bankrupt each year.

One of the causing factors is the weak supervision from the government as the regulator and aviation administrator, in addition to the unprofessional management of airline company especially which is related to the financial management or capital. There has not been a clear and comprehensive monitoring system and mechanism over the performance of national airlines comprising both the abovementioned aspects. Only in 2007 the government carried out an evaluation and monitoring from the aspect of safety performance using the parameter of airlines compliance with the safety regulations of civil aviation.  It is just after there has been a strong signal from the aviation authority of European Union who prohibited Indonesian airlines from flying to Europe (Directorate General Air Transportation/Ditjen Hubud, 2007). But how is the monitoring and evaluation toward the airlines from other aspects such as economic aspect (finance/capital), as well as the aspects of punctuality/on time, services, and efficiency?

Therefore, it is necessary and very urgent to hold a research in order to find a comprehensive model for measuring airlines performance, so that the national airlines performance can be well monitored for the sake of better quality, productivity, and competitiveness of Indonesia national airlines in the future.

The result of this research is expected to be useful for the policy makers, in this case the government/aviation regulator, in executing the function of supervision and evaluation over the performance of national airlines, thus by this measuring device the government and people as well as the airlines themseleves can assess the level of quality or health of the company from the aspect of flight safety and the aspect of economic/financial health.

Act No. 1/2009 on Aviation (Undang-undang Republik Indonesia Nomor 1 tahun 2009 tentang Penerbangan) is expected to be able to answer the challenge of era in the national aviation in line with the change of paradigm, strategic environment, and the rules of modern aviation based on the principles of benefit, joint venture and mutual cooperation, fairness and equality, balance, harmony and conformity, public interest, integration, law enforcement, independence, openness and anti-monopoly, environment conception, national sovereignty, nationality, and archipelagic conception. From the aspect of supervision, aviation is under the state control and the supervision is carried out by the government (in this case the Ministry of Transporation) and comprises the regulation, control, and supervision.

Learning from the previous experience, what are still less done by the government as the aviation regulator are the aspects of control and supervision (control and evaluation functions). One negative impact of the government's weak control and supervision in the last time is the uncontrollable emergence of many operators with no professionalism in the management of airline company, both in the aspect of general management of aviation and in the aspect of finance management, so that the basic product of national airlines has low quality either of the flight safety and security or of the service delivered. It seems that the airlines management only pursue the volume of passenger using the strategy of as lowest ticket price/tariff as possible without regarding the quality of safety and service.

With the existence of Act No. 1/2009 (UU RI No. 1 Tahun 2009), the responsibility of air transport license holder is added and sharpened; commercial air transport license holder must have and own aircrafts in a certain number (at least 10 units); comply with the regulations of compulsory transportation, civil aviation, and other regulation in line with the legislation; cover the insurance of carrier with the insurance value as much as the benefit/compensation for the commercial air transport passenger which is proven by an agreement of insurance coverage; serve prospective passengers fairly without discrimination pertaining to ethnic, religious, racial, and intergroup relations, as well as economic and social strata; submit the report on the air transport activities, including the flight delay and cancelation, every month latest on the 10th day of the following month to the Minister; submit the annual report on the financial performance that has been audited by a registered public accountant office which contains at least balance sheet, financial statement, cashflow, and detailed costs every year latest in the end of April in the following year to the Minister; report to the Minister whether there are changes in the person in charge or owner of the commercial air transport enterprise, the domicile of the commercial air transport enterprise and the aircraft ownership; and comply with the prescribed standard of service.

In this context, the functions of control and supervision must be executed in a real, measurable, structured, regular and sustainable way, and the result is published to public. It is a different matter if up to now the government has presumably have no measuring device as the instrument to comprehensively measure the airlines performance, both from the aspect of flight safety quality as the government's main program through *Road Map to Zero Accident* and the motto of 3S+1C (*safety, security, services,* and *compliance*), and from the aspect of economy/efficiency/financial health of the company as the principle of airline business viability.

## LITERATURE REVIEW

This research is to complete what the government of Indonesia has done so far, especially in appraising or classifying the national airline companies by the level of compliance with the standards of flight safety which are grouped into three categories: category I (score between 161 and 200). Included in this category are airline companies which fulfill the safety requirements of civil aviation; category II (score between 120 and 160) includes the airline companies which fulfill the minimum safety requirements of civil aviation but have not fulfilled some other requirements, and category III (score less than 120) includes the airline companies which fulfill the minimum safety requirements of civil aviation but have not fulfilled some other requirements which are potentially lowering the safety level.

There are 20 parameters or indicators of measurement: (1) *audit followup*, (2) *surveillance and ramp check,* (3) *key personnel*, (4) *safety department*, (5) *accident within 2 years*, (6) *serious incident within 2 years*, (7) *repetitive HIL and DMI within 3 months*, (8) *administrative sanction within 1 year*, (9) *Company procedures compliance to CASR,* (10) *HRD (pilot, FA, FOO, mechanic),* (11) *aircraft airworthiness*, (12) *independent safety award,* (13) *maintenance base*, (14) *outstation maintenance base*, (15) *flight following*, (16) *quality control department*, (17) *maintenance engineering*, (18) *operation training,* (19) *maintenance training*, and (20) *recording system*.

The measurement has been done since March 2007 regularly once in three months. It is done in a fairly deep grief atmosphere due to the accident frequently happening to national aviation, and at the same time it is to answer the warning and flying restriction from several developed countries, especially from the aviation authority of European Union that restrict Indonesia airlines from flying to European territory. The classification or ranking based on 20 parameters of the civil aviation safety and security standards are basically aimed (Directorate General Air Transportation/Ditjen Hubud, 2007):

(a) To improve the performance of air transport in Indonesia, with the spirit of improvement not for killing the companies.

(b) To reduce the deviation made by the operator and regulator in operating the aircrafts.

(c) Expectedly to boost the performance of flight safety aspect by implementing *safety management system* (SMS).

As a comparison, in such developed countries as the United States of America, Canada, European countries as well as Australia, the measurement of airlines performance has been very advanced and done since long time ago, either by the government agency (Ministry of Transportation) or by independent bodies that periodically hold the measurement and publish the results to public. Even in those countries, the measurement is not limited to the safety aspect but it has reached the aspect of quality of the company as a whole.

One of the most popular measurements in the United States is Airlines Quality Rating (AQR) method. It has been developed since 1991 as an objective method to compare the airlines performances, which is published monthly and comprising nine biggest airlines in the US (1997).

AQR method contains 19 factors or parameters to be examined and weighted. The factors are taken from 80 factors which are filtered to become 19 factors that fulfill two basic criteria. Those factors must be obtained from the published data and should be related to the consumer interest concerning the quality of airline companies. The data used is about: safety, on time performance, financial stability, lost baggage, denied boarding, stray baggage, age of aircraft, quantity of aircraft, load factor, pilot deviation, accident, frequent flyer awards, flight problems, ticket price, passenger's complaint, refunds, ticketing/boarding, advertisement, credit, average seat-kms cost, and so on (Syafei, 2007 and Sudjono, 2007).

The calculation formula of AQR is as follows:

$$AQR = \frac{W1F1+W2F2+W3F3+.....W19F19}{W1 + W2 + W3 + ...........W19}$$

Many ways or methods can be used for measuring the performance of a company, such as:

1. Cartesian Diagram to measure customer satisfaction. The use of this diagram method is to know or portray the satisfaction or dissatisfaction of a company or product's customers distributed in four quadrants ABCD, where A (main priority), B (maintain the achievement), C (low priority), and D (excessive).

2. Servqual Method to know the gap between what is provided/offered by the company and what is received/expected by the customer that can be done using *Gap Analysis.*

3. Balanced ScoreCard (BSC), a concept to measure whether operational activities of a company in a smaller scale are in line with the bigger target in terms of vision and

strategy. BSC is firstly developed and used at the company of Analog Devices in 1987. BSC helps provide more comprehensive view on a company which in turn will help the organization acts in accordance with its long term objectives.

4. Six Sigma, a business concept that tries to answer the customer demand on the best quality and flawless business process. Customer satisfaction and its improvement become the highest priority, and Six Sigma tries to ommit uncertainty in achieving the business objectives. The explanation of Six Sigma is divided into two perspectives, namely statistical perspective and methodological perspective.

5. Altman Z-Score Method. In order to overcome the constraint of financial ratio analysis, Altman has combined some ratios to become a prediction model of a company's bankruptcy called Z-Score. Z-Score is a score determined by the standard calculation multipled with the financial ratios which will show the probability level of a bank bankruptcy (Supardi and Mastuti, 2003). Those ratios detect the financial condition of a company related to liquidity, profitability, and company's activities (Muh Akhyar, 2001).

The formula established by Altman is as follows:

$$Z\text{-}Score = 0.717X1 + 0.847X2 + 3.10X3 + 0.420X4 + 0.998X5 \ 27$$

This Altman model (1984) can be applied to each group of companies both individually and in a group. Altman describes the application in a group of companies by classifying the companies into two categories: bankrupt and not bankrupt.

Based on his research, Altman finds five ratios for bankrupt and not bankrupt companies and calculates the value of Z for those two groups. In this model, score 2.90 is the treshold for healty companies. Thus, the companies with score above 2.90 can be said as healthy companies. Whereas the companies with score under 1.20 will be classified as potentially bankrupt companies. Then the companies with score between 1.20 and 2.90 are classified in a grey area.

Altman Z-Score method is used only if financial data for last two or five years is available. It means, this method will be effective for evaluating the company's performance from the aspect of financial health and can also be used to predict the potential bankruptcy of a company based the financial health. But this method will be meaningless if the financial data is not available. Meanwhile, the financial data of airline companies in Indonesia is relative difficult to find, with the exception of state-owned enterprises (SOEs) or go-public companies.

The problem is that those methods are used restrictively only for one company; it can not be used for all the companies in the same period of assessment. This research wants to reveal how "to measure the performance of an airline" where the size can be objectively used for other airline companies, so that it obtains the output in the form of "rating" based on the weight index.

## THE CONCEPT OF PERFORMANCE AND ITS MEASUREMENT

Performance can be seen both in macro and micro. In micro sense, performance is limited to individual/employee, goes up to become unit/group/department's performance, and then goes up again to become organization/company's performance, and goes up again to become area/regional performance, even state/national performance.

At the national level, the measurement of economic efficiency has utilized various ratios of productivity. At the corporate level, the ratio of productivity has also been used with limited success. Companies are also concerned with the competitiveness and now measuring the performance with a wider base. This measurement is related not only to productivity but also quality, speed, reliability, innovation, and so on.

Performance according to Anwar Prabu Mangkunegara (2000) is the qualitative and quantitative results of work achieved by an employee in performing his/her task according to the responsibility given to him/her. Whereas according to Ambar Teguh Sulistiyani (2003), one's performance is the combination of ability, effort, and opportunity that can be assessed from the result of his/her work. According to Barry Cushway (2002), measuring performance is assessing how someone has worked compared with the specified target. According to Veizal Rivai (2004), performance is a real behavior shown by everyone as the work achievement resulted by an emeployee in accordance with his/her role in the company. John Witmore in *Coaching for Performance* (1997: 104) states that performance is the execution of functions demanded from someone or an act, an achievement, a general exhibition of skill. Performance is a condition that should be known and confirmed to certain parties in order to know the achievement level of an institution related to the vision of an organization or company as well as to know the positive and negative impacts of an operational policy.

Performance has a wider meaning, not only stating work result but also how the work process runs. Performance is about performing a work and the result achieved from the work. Performance is about what has been done and how it has been done. Performance is the work result that has strong relationship with the organization's strategic objective, consumer satisfaction, and that gives economic contribution (Amstrong and Baron, 1998).

Organization performance is also shown by the process of how activities are done in order to achieve the objective. In the process of activity execution, monitoring, assessment, and

review over the human resources performance should always be carried out. Through monitoring, periodic performance measurement and appraisal are done to know the progress and to predict the occurence of deviation in executing the plan that can disrupt the objective achievement.

Performance measurement is done to know whether there is a deviation between the planned progress and the reality. If deviation exists in the form of progress lower than planned, some actions need to be taken to boost the activities to achieve the objective. Toward the work result or achievement, performance evaluation is done. The evaluation on the organization performance will be used as feedback in the performance management process. In the other hand, the evaluation can be used for improving the organization performance in the future (Wibowo, 2007).

The organization objective leading up to quality and consumer satisfaction attracts the main attention in the discussion about performance. Customers define quality in various ways. Quality is defined as fulfilling or exceeding the customer expectation. Heizer and Render (2001) define quality as the ability of a product or service to meet the customer's need. It is also said as the totality of appearance and characteristics of product or service which does the best to satisfy a certain need (Russel and Taylor, 2000).

According to Bambang Wahyudi (2002), performance measurement is an evaluation carried out periodically and systematically about the work/job achievement of an employee, including its development potential. Whereas according to Cascio (1992), performance measurement is a systematic description about the strengths and weaknesses related to someone or a group. Performance measurement can only be done toward a real and measurable performance. If it is unmeasurable, it can not be managed. To improve a performance, it is necessary to know what is the performance like now. It the deviation is measurable, it can be improved. The measurement is only to measure what is important and relevant. Therefore, it is necessary to define what is important and relevant before determining what measure should be used. What is measured depends on what the stakeholders and customers consider important. The measurement settles the relationship between the customer-oriented strategy and objectives and the action.

A previous research carried out by the author in 2004 concerning *"The Consumer Satisfaction of Indonesia's Domestic Flight Service in the Era of Low-Cost tariff"* shows the low on-time performance of flight, where the level of consumer satisfaction for the punctuality of aircraft departure and arrival is the lowest among other attributes. This is supported by the research in 2007 concerning "*The Consumer Motives in Choosing Indonesia's Domestic Flight Service in the Era of Multi-operators"* where the consumer's main reason to choose domestic

flight service is dominated by the factor of affordable ticket price (44.58%), the factor of suitable flight schedule (19.28%) and the factor of comfort during the flight (10.24%). The factor of punctuality has not been the main choice yet, and even it is relatively low (2.41%). This describes the consumer experience and perception toward the airline performance in term of domestic flight punctuality which has not met the consumer expectation yet. Another research carried out by the author is about *The Ranking of Indonesia's National Airline Companies Based on the Flight On-Time Performance* in 2009 of which one of the results shows the still low achievement of on-time performance (OTP) of the national airlines and the still high delay rate of aircraft departure and arrival.

As described before, the performance of scheduled airline companies essentially consists of safety flight performance and economic/business performance. Safety flight performance becomes very important and crucial, because it is closely related to the characteristics of air transportation mode which is much dominated by the following things: *high technology, high capital/intensive, high skill, high regulation (strictly regulated),* and this industry is categorized in the high risk industry (T. Wells, 1996, and Nasution, 2006). However, the air transportation mode has very fundamental advantages which other transportation modes do not have, that is the aspect of speed due to its significant free movement and very far/high reach so that it is reliable for reaching remote areas and far places in a relatively short time.

The aspect of economic/business performance is another important side, because airline companies as business entities should be managed well and professionally to make a profitable income level. With this profit, companies can finance their operations and business activities and even their development in order to manintain their company's sustainability in the future. The aspect of economic/business performance is reflected from the financial report, whether the company's finance is healthy or not. The airline companies in an unhealthy financial condition (frequently lose) have potential to disrupt their performance or the quality of flight safety and security. Therefore, these two aspects should be maintained in balanced and healthy condition.

According to Francis et al (2005), Gudmundsson (2004), Schecfczyk (1993) in Manurung (2010), for companies at the branch level, the performance is measured from three dimensions, namely: operational performance, financial performance, and service performance. These three dimensions of performance are describes as follows.

**Operational Performance**

Based on the findings of Francis et al. (2005), there are five indicators used to measure the dimension of operational performance which are used by 90% of 200 big airlines around the world as seen in the following table.

Table 1. Operational Performance Indicators of 200 Big Airlines

| No | Type of performance indicator | Used | No. | Type of performance indicator | Used |
|----|-------------------------------|------|-----|-------------------------------|------|
| 1. | *Punctuality/on-time performance per operation (OTP)* | 100% | 4. | *Revenue passenger kilometers* | 95% |
| 2. | *Load factor per flight* | 100% | 5. | *Available seat kilometers* | 93% |
| 3. | *Daily aircraft utilization (hours)* | 98% | | | |

Source: Francis, et al., 2005

## Financial Performance

Based on the findings by Francis et al. (2005), in general there are four financial performance indicators used by more than 90% airline companies as seen in the following table of financial performance indicators.

Table 2. Financial Performance Indicators of 200 Big Airlines

| No | Type of performance indicator | Used | No. | Type of performance indicator | Used |
|----|-------------------------------|------|-----|-------------------------------|------|
| 1. | *Operating Cost* | 95% | 3. | *Operating Revenue* | 93% |
| 2. | *Cash Flow* | 95% | 4. | *Profit* | 93% |

Source: Francis, et al, 2005

## Service Performance

Airline business is sensitive with the service quality, and this distinguishes it from other transportation modes. Based on the findings by Francis et al (2005), in general there are five service performance indicators used by airline companies as seen in the following table of service quality performance indicators.

It is seen in the service quality performance indicators that the measurement of quality performance consists of *lost baggage, customer complaints, level of service, check in waiting time,* and *baggage delivery time.*

From these five indicators, only lost baggage and customer complaints can be directly controlled by the branch management, because *level of service, check in waiting time,* and *baggage delivery time* are integrated with the airport facilities and authority (Gudmundsson, 2004; Doganis, 2006).

Table 3. Service Quality Performance Indicators of 200 Big Airlines

| No. | Type of Service Quality Performance Indicators | Used | No. | Type of Service Quality Performance Indicators | Used |
|-----|------------------------------------------------|------|-----|------------------------------------------------|------|
| 1. | *Lost Baggage* | 98% | 4. | *Check in waiting time* | 85% |
| 2. | *Customer Complaints* | 98% | 5. | *Baggage delivery time* | 78% |
| 3. | *Level of Service* | 86% | | | |

This research measures the indicators of service performance that can be controlled through direct authorization by the airline company, those are:

- *Lost Baggage,* an indicator of service performance that measures the rate of lost baggage or interleaved baggage in another flight in every flight
- *Customer Complaint,* an indicator of service performance that measures the number of passenger complaints in every flight or in all flights for a certain period.

The indicator of customer complaint can specially be used as the benchmark for the whole service performance. The less number of customer complaints the better the service performance of an airline company is.

Some airline companies with strong commitment to service have planned *zero complaint* as the main target in developing service quality and airline business as a whole. The main targets are consumer satisfaction and loyalty as the main supports for the long term performance of the whole company (Francis, et al, 2005; Doganis, 2006; Consuegra and Esteban, 2007).

**Definition of Safety**

According to Act No. 1 / 2009 on Aviation (Undang-Undang RI No. 1 Tahun 2009 tentang Penerbangan), the general definition of flight safety is "a situation of fulfilling the safety requirements in utilizing air territory, aircraft, airport, air transport, flight navigation, as well as supporting facilities and other general facilities."

This act also regulates the national flight safety program as meant by Article 308 paragraph (2) which contains: flight safety regulations, flight safety target, flight safety reporting system, data analysis and flight safety information exchange, investigation activities to the flight accident and incident, flight safety promotion, and law enforcement.

The execution of national flight safety program as meant by Paragraph (1) is evaluated continuously by a team established by the Minister.

Act No. 1 / 2009 (UU RI No. 1 tahun 2009) has mandated the importance of achieving the target of flight safety performance which is defined as flight safety performance to be achieved in a certain period based on the quantitative calculation of accident data ratio in the

most recent period. The flight safety performance to be achieved and established by the government should be less than the accident data ratio in the most recent period. Accident data ratio is a quantitative data of accident number that causes casualties compared with the number of landings, departures, and/or the number of flight hours of aircraft in the category of commercial transport. The flight safety performance target is established based on some considerations and inputs from stakeholders.

That act also mentions the flight safety performance indicators, namely quantitative measure used to know the achievement level of flight safety performance. It also mentions the importance of measuring the flight safety achievement, that is the activity carried out periodically and continuously to know the achievement of flight safety target.

Especially for air transport operators, in this case airlines, including airport operator, must continuously make, carry out, evaluate, and accomplish the Safety Management System based on the national flight safety program (Article 314 of Act No. 1 / 2009) (Pasal 314 UU RI No.1 Tahun 2009). In Article 314 it is said that the Safety Management System of flight service providers contian at least: safety policy and target, safety risk management, safety assurance, and safety promotion.

The safety policy and target as meant by Article 315 point a contain at least: the commitment of flight service provider leaders, the appointment of the main person in charge for safety, the establishment of safety management unit, the determination of safety performance target, the determination of safety performance indicator, the measurement of safety achievement, the documentation of safety data, and coordination in overcoming the emergence situation. Then, the determination of safety performance target to be achieved as meant by paragraph (1) point d must be at least the same or better than the national safety performance target. The target and achievement of safety performance should be publish to public.

## Definition of Security

According to Act No. 1 / 2009 on Aviation (UU No. 1 Tahun 2009 tentang Penerbangan), the general definition of flight security is "a condition that gives protections to the flight from unlawful actions through an integrated utilization of human resources, facilities and procedures." The national flight security program as meant by Article 323 paragraph (2) point b contains at least: flight security regulations, flight security target, flight security personnel, responsibility division for flight security, protection over airport, aircrafts and flight navigation facilities, security control and assurance against people and goods in the aircraft, the overcoming of unlawful actions, the adjustment of security system toward the threat level of security, as well as the flight security supervision.

**Definition of Flight Punctuality**

The definition of flight *punctuality*, either departure or arrival, refers to the provision issued by International Air Transport Association (IATA), that is the condition where the achievement of flight punctuality by a flight service provider is based on the published schedule (time table), with the tolerance of delay maximum 15 minutes from the published schedule (time table). Act No. 1 / 2009 (UU RI No. 1 Tahun 2009) defines delay as "the occurence of time difference between the scheduled time of departure or arrival and the real time of departure or arrival".

According to the Department of Transportation's Bureau of Transportation Statistics (Office of Airlines Information) as described in 14 CFR Part 234 of DOT's regulation of United States of America, 2008, OTP is defined as follows: *"A flight is counted as 'On Time' if it is operated less than 15 minutes after the scheduled time shown in the carriers' Computerized Reservation Systems (CRS)".* It means: "An airland company is said to be punctual if the flight is operated with the delay less than 15 minutes from the published scedule through a company's computer from the schedule published through a computer reservation system of the company."

**Definition of Service**

Kotler (1997) defines a service as follows: *"A service is any act or performance that one party can offer to another that is essentially intangible and not in the ownership of anything. Its production may be tied to a physical product".*

According to Sugiarto (2002), service is an activity, benefit, or satisfaction that is offered. Whereas serving is an action carried out to meet other people's need (consumer, customer, guest, passenger, client, buyer, patient, etc.) whose level of satisfaction can only perceived by the server and the people served.

According to Kotler (1994), there are five criteria that determine the quality of a service, namely:

1. *Reliability*: the company's ability to deliver services as promised in immediate, accurate and satisfying ways.
2. *Responsiveness*: the company's ability to help customers and its availability to serve them well.
3. *Assurance*: knowledge, officer's courtesy, and trusted traits that free the customers from risks.
4. *Emphaty*: concern to pay attention individually to customers, to understand customer's needs, and being easy to be contacted.
5. Physical appearance (*Tangible*): including physical facilities, employee's equipment, and communication devices.

The most recent research on the indicators of service performance of airline companies is carried out by James JH Liou et al (2010) with eight indicators to be measured: booking service, ticketing service, check in, baggage handling, boarding process, cabin service, baggage claim, and responsiveness.

**Definition of Efficiency**

Efficiency is a measure of success that is assessed from the amount of resource/cost to achieve the result of activities done. The definition of efficiency according to Mulyamah (1987) is: *"Efisiensi merupakan suatu ukuran dalam membandingkan rencana penggunaan masukan dengan penggunaan yang direalisasikan atau perkataam lain penggunaan yang sebenarnya"* (Efficiency is a measure to compare the planned use of input with its real use).

Whereas the definition of efficiency according to SP. Hasibuan (1984) quoting H. Emerson's statement is: Efficiency is the best comparison between input and output (the result and the utilized resources) as well as the optimum result achieved by utilizing limited resources. In the other word, it is the relationship among what have been accomplished. *("Efisiensi adalah perbandingan yang terbaik antara input (masukan) dan output (hasil antara keuntungan dengan sumber-sumber yang dipergunakan), seperti halnya juga hasil optimal yang dicapai dengan penggunaan sumber yang terbatas. Dengan kata lain hubungan antara apa yang telah diselesaikan.")*

**RESEARCH METHOD**

Primary data is obtained using questionnaires distributed to selected respondents, in this case experts in aviation, both from university academician and airline business practitioners/players.

The number of respondents involved in this research is 41 persons, consisting of 21 academicians and 20 practitioners. The selection of respondents is done in a simple random way using the criteria that have been established: For academician, the respondents have education background of aviation/transport management and profession as lecturers in air transport; whereas for practitioners, their profession is related to airline business (professional/manager/director).

Table 4. Respondents' Profile

| No. | Category | Number | Education | Experience |
|---|---|---|---|---|
| 1. | Academician (University) | 21 (51%) | S3 (7), S2 (14) | More than 20 years |
| 2. | Practitioner (Professional) | 20 (49%) | S2 (7), S1 (13) | More than 15 years |

Source: questionnaire and Focus Group Discussion (FGD)

The variable in this research is the performance of national airlines with six dimensions and 28 indicators which are translated into 28 statements.

Validity and reliability tests are done using SPSS software serial 17.00. The method of data analysis used in this research is using Delphi technique, that is (Umar, 2003) a step of data analysis developed by Rand Corporation in 1950s. At that time, it needed data of experts' opinion to know how many atomic bombs are needed by Soviet Union to destroy the United States of America. Their opinion has developed incrementally and finally reaches a consensus on a problem. The mechanism of Delphi technique is as follows:

1. The prepared questionnaires are distributed to experts in their own discipline.

2. Make a summary of the first round questionnaires that have been distributed (containing statistical mean, median, and quartile from the answers given by the respondents). Then the summary of the first round questionnaires is resent to the respondents who have answered the first round questionnaires. It is to check the answers they have given.

3. Make a summary of the second (final) round questionnaires. From this summary, the consensus established can be seen immediately. To avoid *blind agreement*, it is necessary to try to know their reasons, if their answers are not in accordance with the consensus.

## EMPIRICAL RESULTS AND DISCUSSIONS

The results of data processing show that from the academicians as many as 15 data are valid and 13 invalid, whereas from the practitioners, 25 valid and only 3 invalid. From the academicians, the indicators regarded as valid include:

Table 5. Valid Indicators (Academician version)

| No. | Number of Statement | Content of Statement (Indicator) | Dimension |
|-----|---------------------|----------------------------------|-----------|
| 1. | Number 1 | Rate of accident | Flight safety |
| 2. | Number 5 | Safety management system and work health program in accordance with OHSAS 18001: 2007 | Flight safety |
| 3. | Number 8 | Aircraft hijacking | Flight safety |
| 4. | Number 9 | Rate of passenger's lost baggage | Flight safety |
| 5. | Number 10 | Rate of passenger's broken baggage | Flight safety |
| 6. | Number 12 | Rate of flight delay | Flight punctuality (OTP) |
| 7. | Number 20 | Average Aircraft Utilization per day | Efficiency |
| 8. | Number 21 | Load factor | Economy/finance (*economics*) |
| 9. | Number 22 | Income | Economy/finance (*economics*) |

| 10. | Number 23 | Profit | Economy/finance (*economics*) |
|-----|-----------|--------|-------------------------------|
| 11. | Number 24 | ROI achievement | Economy/finance (*economics*) |
| 12. | Number 25 | Pax Km per Employee | Economy/finance (*economics*) |
| 13. | Number 26 | RTX per Employee | Economy/finance (*economics*) |
| 14. | Number 27 | BEP Analysis | Economy/finance (*economics*) |
| 15. | Number 28 | Debt Equity Ratio | Economy/finance (*economics*) |

Whereas for practitioners, the indicators regarded as valid are:

Table 6. Valid Indicators (Practitioners version)

| No. | Number of Statement | Content of Statement (Indicator) | Dimension |
|-----|---------------------|----------------------------------|-----------|
| 1. | Number 1 | Rate of accident | Flight safety |
| 2. | Number 2 | Rate of incident | Flight safety |
| 3. | Number 3 | Maintenance, repair, and overhaul (MRO) program | Flight safety |
| 4. | Number 4 | Safety training program | Flight safety |
| 5. | Number 5 | Safety management system and work health program in accordance with OHSAS 18001: 2007 | Flight safety |
| 6. | Number 6 | Flight safety management system (SMS) program | Flight safety |
| 7. | Number 8 | Aircraft hijacking | Flight security |
| 8. | Number 9 | Rate of passenger's lost baggage | Flight security |
| 9. | Number 10 | Rate of passenger's broken baggage | Flight security |
| 10. | Number 11 | Percentage of OTP achievement | Flight punctuality (OTP) |
| 11. | Number 12 | Rate of flight delay | Flight punctuality (OTP) |
| 12. | Number 14 | Access to information and communication | Services |
| 13. | Number 15 | Rate of customer complaint | Services |
| 14. | Number 16 | Rate of customer satisfaction | Services |
| 15. | Number 17 | Number of work hours/time used for completing a flight operation | Efficiency |
| 16. | Number 18 | Number of human resources utilized for completing a flight operation | Efficiency |
| 17. | Number 19 | Amount of financial resources/costs utilized for completing a flight operation | Efficiency |
| 18. | Number 20 | Average Aircraft Utilization per day | Efficiency |
| 19. | Number 21 | Load factor | Economy/finance (*economics*) |
| 20. | Number 22 | Income | Economy/finance (*economics*) |

| 21 | Number 23 | Profit | Economy/finance (*economics*) | Table 6… |
| 22. | Number 24 | ROI achievement | Economy/finance (*economics*) | |
| 23. | Number 25 | Pax Km per Employee | Economy/finance (*economics*) | |
| 24. | Number 26 | RTX per Employee | Economy/finance (*economics*) | |
| 25. | Number 27 | BEP Analysis | Economy/finance (*economics*) | |

The result of joint data processing from academicians and practitioners show 100 percents of valid data.

Some respondents give inputs to complement, strengthen, and reduce some indicators considered as less or not relevant. So, the complete questionnaires are as follows:

Table 7. Dimensions and Indicators of Indonesia's National Airlines Performance based on the inputs from respondents in the first round (Pay attention to the bold print)

| No. | Dimension | Indicator | Comment from Respondents |
| --- | --- | --- | --- |
| A. | Safety | 1.Rate of Accident; 2.Rate of Incident; 3.Maintenance, Repair and Overhaul (MRO) Program; 4.Safety Training Program; 5.Safety management system and work health program in accordance with OHSAS 18001: 2007; 6.Flight safety manage-ment system (SMS) program; 7.Aircraft Rejuvenation Pro-gram; 8.Welfare program for aircraft crew, aircraft technician, and aircraft spare-parts logistic officer; 9.Human Resource Safety Awareness; 10.Compre-hensive Audit; 11.Aircraft crew "*Recurrent*" Program; 12."Medex" Program for all aircraft crews; 13.Result of Safety Audit;14.Flight Navi-gation Equipment and Facilities; 15.Level of Compliance with CASR-121.703 and 830.5 in Reporting; 16.Aircraft *Air-worthiness*; 17.Flight Safety Ranking from the Ministry of Transportation; 18.Crisis Center | • Psychological and physical welfares are very influential to human being's performance (Arief Boediman, academician, former pilot).<br><br>• Discipline in reporting shows the degree of *awareness* in improving the safety level, but the Regulator is expected not to judge that many reportings mean bad maintenance; however, what is assessed is how the operators/airlines resolve the problem in those reports. The age of aircraft does not indicate the level of safety. If the aircraft is maintained according to its specification, thus the aircraft can still be considered *safe and airworthy* (Masruri, practitioner, member of National Committee of Transportation Safety of the Republic of Indonesia).<br><br>• Comment from Idjon Sudjono (academician): The Regulator wants as little ALOS as possible, but not *zero* (ex 0,00001). The Operator wants the ALOS to be adjusted with the condition (ex 0,00099). Indonesian customers have *low* |

Table 7…

| | | | purchasing power. For aviation stakeholders, they must have commitment to safety. Accepted tolerable level of safety, USA= per 100 thousand departures. |
|---|---|---|---|
| B. | Security | 1.Aircraft hijacking; 2.Rate of Passenger's Lost Baggage; 3.Rate of Passenger's Broken Baggage; 4.Airline Safety Management System Program; 5.Passengers and Crew Safety; 6.Security in the Process of Loading and Unloading Baggage and Cargo; 7.Rate of Unlawful Interference Act; 8.Accurate Detection of Passenger's Iden-tity; 9.Detection of Passenger's Luggage against Forbidden Goods; 10.Implementation of Security Airlines SMS; 11.Conrol over the Safety of Equipment on Cabin; 12.Level of Passenger Comfort on board/ cabin;13.Standard of Flight Safety Information | • Bombs and law breakers go onto the aircraft from the airport. Awareness of secure behavior must be a part of corporate culture. (Arif Boediman, academician, former pilot); Unlawful Inter-ference concerns any action that breaks the law (Shadrach M. Nababan, practitioner, senior pilot A.330). • Control over the safety equipment on cabin such as life jacket is carried out by the operator. Loss or leting out to lose indicates that security control does not run well (Masruri, KNKT practitioner). • Comment from Masruri about hijacking: Aircraft hijacking does not indicate good/bad performance of the operator/ airlines, but it is rather a security disruption on the whole aviation system. |
| C. | Flight Punctuality | 1.Percentage of OTP achieve-ment; 2.Rate of aircraft delay; 3.Notification System with Firm Information to Passengers; 4.Monitoring System of the Execution of Operational Schedule; 5.Rate of Cancelation; 6.Reasons for Delay; 7.Length of Delay; 8.Dispatch Reliability; 9.Availability of Substitute Aircraft; 10.Work Scheduling Program for Aircraft Crew; 11.Level of Flight Rescheduling; 12.Connecting Time | • Comment from Arif Boediman on OTP: OTP depends on many interrelated factors. • Reasons for delay are intended to sharpen the rate of delay; Some operators/airlines do rescheduling to overcome the length of delay from the original schedule (Masruri). |
| D. | Services | 1.Quality Management System Program in accordance with ISO 9001; 2.The Easy and Open Information and communication; 3.Level of Customer Complaint; 4.Level of Customer Satisfac-tion; 5.Airline Serving Culture Implant Program; 6.Speed of Check in Counter service; 7.Cleanliness on board; 8."Service Excellence" | • Serving customers is an inseparable part of airlinr culture (Arif Boediman, academician, former pilot). • Easiness and speed in obtaining ticket indicates good performance in serving customers. Some operators implement once-used ticket purchase (unrefundable) for any |

Table 7…

| | | | | |
|---|---|---|---|---|
| | | Program for all front-line employees; 9.*Irregularities;*10.Speed of Departure and Arrival Services; 11.Easy Service in Ticket Purchase;12.Easy cancelation in Ticket Purchase; 13.Easy Schedule Exchange; 14.Easy Transit and Flight Transfer; 15.Comfort in the boarding process; 16.Comfort on Cabin; 17.Availability of Magazine, Newspaper, and other Readings;18.*Baggage Delivery Time;* 19.Quick and Easy SIM; 20.*Continued Customer Satisfaction Program;* | | reason. In certain condition, some customers want to change the schedule of their trip. Good airlines will accommodate the change wisely. Waiting time when exchanging the ticket with boarding pass at the *check in counter* may indicate the efficiency of service to customers. Easy transit much helps the customers to arrange their time, moreover if the transit requires them to move to another airline. Waiting room is shared by the operator and airport, but how the operator delivers its service in the waiting room will indicate the level of professionalism in handling customers. The establishment of operator is reflected in the appearance of aircraft cabin. Sometomes it is not necessarily luxurious, but what is necessary to be shown to customers are cleanliness, sufficient light, comfortable temperature setting, integrity of *cabin structure* (no loose panels or messy chairs, and clean windows). The existence of flight entertain-ment sometimes amuses the customers who are bored dirung thr flight. The longer waiting time for taking the baggage, the more boring it will be (Masruri, Practitioner, KNKT) |
| E. | Efficiency | 1.Number of working hours/time used for completing a flight operation; 2.Number of human resources utilized for completing a flight operation; 3. Number of resources/costs used for completing a flight operation; 4.Average Utilization of aircraft per day; 5.*Underloads* (Loading capacity which is not utilized); 6.Implementation of Electronic system of FOQA in every aircraft; | | • Maintenance Cost: it is usually indicated in the total operating cost (\$/FH). It does not mean *the lowest is the best*. For healthy Operators, the maintenance cost is around 25% to 35% of total operating cost. (Masruri, practitioner, KNKT) |

| | | 7.*Pax Km per Employee* | | Table 7… |
| | | 8.*Work Load Unit per Employee* | | |
| | | 9.*Average Fuel Cost per Mile* | | |
| F. | Economy/ Finance | 1.Level of Average *Load factor*; 2.Level of Income; 3.Level of Profit; 4.ROI Achievement; 5.BEP Analysis; 6.(*Debt- EquityRatio*); 7.*Yield;* 8.*Seat Km Production;* 9.*Ton Km Production;* 10.*Payload;* 11.*Pax RevenueKm;* 12.*Total Operating Cost per Hour;* 13.*Capital Cash Flow;* 14. *Overhead Cost;* **15.Cost per Mile;** 16.Change of Stock price; 17.*Dividend Pay Out Ratio;* 18.Ratio of Aircraft and Employee quantity | • *Payload* certainly generates revenue, whereas *seat km production* and *ton km production* are the aircraft's production in a certain route. *Yield* is to know whether in a certain route the tariff and number of passengers transported are fairly profitable or not. Flying hours has a relationship with Number of human resources utilized for completing a flight operation (Eddy Suhaedi, academician) | |
| G. | Learning and Growth | 1.*Skill Coverage;*2.*Quality Work Life Index* | | |
| H. | CSR & Environment | 1.*CSR/Profit Ratio* 2.*Green Programs* | | |
| I. | Interaction with the Regulator (DKUPPU) | 1.Number of findings when checking airworthy label is carried out; 2.Number of findings when Surveilance Audit is carried out; 3.Assessment of Airlines Category | • The high number of findings when checking airworthy label is carried out indicates a poor maintenance system. The high number of findings when audit is carried out indicates a poor operation and maintenance system. Assess-ment of airlines category by DKUPPU/Regulator can become one indicator of the operator/airlines performance (Masruri, practitioner, KNKT) | |

Based on the table above, there are additional dimensions and indicators related to performance measurement of scheduled commercial airline companies. In accordance with its target, that is for airlines, then the indicators related other than to airlines, such as to airport (for example the implementation of airport SMS), are neglected or considered irrelevant.

In accordance with its name, airlines performance measurement as described in the section of Bibliographical Review, performance here is related not only to what have been resulted as an achievement of a unit/organization (*out put*) but also to what have been done (work process) by a unit/organization. Thus, by seeing or knowing the process activities in which something is done, we can also know the seriousness, honesty, and reputation of a unit/organization so that other parties/people will believe in what is done, achieved, and

resulted. Therefore, the indicators to be measured in this research have two dimensions, namely work result dimension (*ouput*) and process dimension (*how to work*). Of the 28 indicators arranged and offered by the Researcher, regarding the additional inputs, the total indicators become 97 distributed in nine dimensions. The detail is as follows:

**Eighteen (18) indicators** for **Safety dimension** include:

1.Rate of Accident; 2.Rate of Incident; 3.Maintenance, Repair, and Overhaul (MRO) Program; 4.Safety Training Program; 5.Safety Management System and Work Health Program in accordance with OHSAS 18001: 2007; 6.Flight safety manage-ment system (SMS) program; 7.Aircraft Rejuvenation Program;  8.Welfare program for aircraft crew, aircraft technician, and aircraft spare-parts logistic officer; 9.Human Resource Safety Awareness; 10.Comprehensive Audit; 11.Aircraft Crew "*Recurrent*" Program; 12."Medex" Program for all aircraft crews; 13.Result of Safety Audit;14.Flight Navigation Equipment and Facilities; 15.Level of Compliance with CASR-121.703 and 830.5 in Reporting; 16.Aircraft *Air-worthiness*; 17.Flight Safety Ranking from the Ministry of Transportation; 18.Crisis Center

**Thirteen (13) indicators** for **Security dimension** include:

1.Aircraft hijacking; 2.Rate of Passenger's Lost Baggage; 3.Rate of Passenger's Broken Baggage; 4.Airline Safety Management System Program; 5.Passengers and Crew Safety; 6.Security in the Process of *Loading* and *Unloading* Baggage and Cargo; 7.Rate of *Unlawful Interference Act;* 8.Accurate Detection of Passenger's Iden-tity; 9.Detection of Passenger's Luggage against Forbidden Goods; 10.Implementation of Security Airlines SMS; 11.Conrol over the Safety of Equipment on Cabin; 12.Level of Passenger Comfort on board/cabin;13.Standard of Flight Safety Information

**Twelve (12) indicators** for **Flight Punctuality dimension** include:

1.Percentage of OTP achievement; 2.Rate of aircraft delay; 3.Notification System with Firm Information to Passengers; 4.Monitoring System of the Execution of Operational Schedule; 5.Rate of Cancelation; 6.Reasons for Delay; 7.Length of Delay; 8.Dispatch Reliability; 9.Availability of Substitute Aircraft; 10.Work Scheduling Program for Aircraft Crew; 11.Level of Flight Rescheduling; 12.Connecting Time

**Twenty (20) indicators** for **Service dimension** include:

1.Quality Management System Program in accordance with ISO 9001; 2.The Easy and Open Information and communication; 3.Level of Customer Complaint; 4.Level of Customer

Satisfaction; 5.Airline Serving Culture Implant Program; 6.Speed of Check in Counter service; 7.Cleanliness on board; 8."Service Excellence" Program for all front-line employees; 9.Irregularities; 10.Speed of Departure and Arrival Services; 11.Easy Service in Ticket Purchase; 12.Easy cancelation in Ticket Purchase; 13.Easy Schedule Exchange; 14.Easy Transit and Flight Transfer; 15.Comfort in the boarding process; 16.Comfort on Cabin; 17.Availability of Magazine, Newspaper, and other Readings; 18.Baggage Delivery Time; 19.Quick and Easy SIM; 20.Continued Customer Satisfaction Program.

Some proposed indicators which are neglected (deleted) are the indicators under the responsibility of airport management, including facilities and readiness/authority of airport such as waiting room. Thus these are not relevant to be displayed. Therefore, in practice, collaboration/synergy between the air transport service operator and the airport management is needed to provide/display a waiting room that gives comfort to passengers.

In this case, the availability of *meal service* and *flight entertainment* is neglected/deleted, because it is related to the phenomenon of airlines development with the concept of LCC (*No Frills*) in Indonesia, which surely do not provide meal service and entertainment on board. These facilities exist only for the airlines with the concept of *Full Service Airline.* If meal/snack is available in LCC flight, then the passengers should pay to have it.

Concerning this case, it is the government who determines the category of *full service, medium service*, or *no frills* flights based on the proposal from the operator. The government will assess and evaluate and then determine the airline group/category. The government will also determine the airlines responsibility to provide the minimum service which should be available based on the category. It will also regulate the responsibility of air transport carriers for their users, especially the passengers and cargo they carry.

**Nine (9) indicators** for **Efficiency dimension** include:

1.Number of working hours/time used for completing a flight operation; 2.Number of human resources utilized for completing a flight operation; 3. Number of resources/costs used for completing a flight operation; 4.Average Utilization of aircraft per day; 5.Underloads (Loading capacity which is not utilized); 6.Implementation of Electronic system of FOQA in every aircraft; 7.Pax Km per Employee; 8.Work Load Unit per Employee; 9.Average Fuel Cost per Mile

**Eighteen (18) indicators** for **Economy/Finance dimension** include:

1.Level of Average Load factor; 2.Level of Income; 3.Level of Profit; 4.ROI Achievement; 5.BEP Analysis; 6. Debt-Equity Ratio; 7.Yield; 8.Seat Km Production; 9.Ton Km Production; 10.Payload; 11.Pax Revenue Km; 12.Total Operating Cost per Hour; 13.Capital Cash Flow;

14.Overhead Cost; 15.Cost per Mile; 16.Change of Stock price; 17.Dividend Pay Out Ratio; 18.Ratio of Aircraft and Employee quantity;

The new dimensions and indicators proposed by respondents are as follows:

- Learning and Growth dimension, with 2 (two) indicators: *Skill Coverage* and *Quality Work Life Index.*
- CSR and Environment dimension, with 2 (two) indicators: *CSR-Profit Ratio* and *Green Programs.*
- Dimension of Interaction with Government/Regulator, with 3 (three) indicators: Number of Findings when checking airworthy label is carried out, number of findings when Surveilance Audit is carried out; 3.Assessment of Airlines Category

## CONCLUSIONS

A consensus from experts is obtained which generally agree with the dimensions and indicators for measuring the national flight performance. There are additions of new dimensions and indicators to complement and enrich the instrument design of airlines performance measurement, making the dimensions become 9 items with the total indicators as many as 97 items.

Some additional new dimensions are proposed: (a) learning and growth with the indicators of *skill coverage* and *quality work life index, (b) CSR and environment* with the indicators of *CSR-profit ratio* and *green programs,* (c) Interaction with Regulator (Directorate General Air Transportation) with the indicators of the number of findings when checking airworthy label is carried out, the number of findings when Surveilance Audit is carried out; and assessment of airlines category.

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