Pragmatic Aspects In Manual Of Radiotelephony (Doc 9432) International Civil Aviation Organization Based On Speech Act Theory

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Abstract

Speech act theory is used for analyzing 709 utterances in manual of radiotelephony (doc.9432) published by ICAO. Specific software will be used to know the frequency, percent and statistic. The specific one is Statistical Package for the Social Sciences (SPPS) Software. The conversation will be analysed using quantitative method. Chi-square will also be used to know the distribution level in this document. The result shows that the highest frequency based on the speech act classification in the conversation in manual radiotelephony between ATC, pilot, and other unit is directive. The second position is representative. Commissive is in the next position. It is founded that declarative is in fourth position. The last is expressive which is at the amount of 0,8% and its frequency is at the amount of 1%. For the future research the speech act theory may be applied for field research by recording the conversation in real situation of airport between pilot, atc, and the other unit using the same theory.

Keywords: *Speech act theory, manual of radiotelephony, directive, representative, commissive, declarative, expressive.*

Introduction.
Radiotelephony

The core of radiotelephony for atc, pilot and other unit in the aerodrome of ICAO is a standard phraseology. Brian in flight path by Philip Shawcross (2011) cited when controllers and pilots better understand that language is an imperfect medium and is easily misinterpreted, they will be careful in their use of both standardized phraseology and plain language – and the airways will be safer because of it. It means that language is not a perfect media for communicating between pilot and atc sometimes they cannot interpreted well about the sentence that utterance by the pilot to the ATC or vice versa. The pilot and ATC must realize that language they use can make accident or incident in the aviation they should be careful when they use the language whether in plain language or phraseology. The airlines and the related adjacent unit will feel safer when the other related unit in the vicinity of the aerodrome using the language especially English carefully so misinterpreted can be avoided. Even phraseology consists of the efficient, clear, concise and unambiguous sentences but when the speakers do not follow the rules so the huge accident or incident will happen because of the misunderstandings between the adjacent unit. ICAO standard phraseology must contain not only effective sentences without any distraction which are clear, short, effective without any ambiguity, but also without any other meaning when the adjacent unit uses it. It is needed to avoid miscommunication and misinterpretation between pilot, atc and other unit in the vicinity of aerodrome. Misunderstanding may involve half-heard word or guessed at the number cited in flight safety foundation ALAR briefing note 2.3: Pilot-controller communication, flight path by Philip Shawcross (2011). The misunderstanding arises because the words that utterance by the man can be misheard. It also happens because there is a slot time or interference in the transmission due to the words or the numbers are incorrectly

pronounced or because the man thinks that he hears other words or numbers which have different interpretation with the speakers. ICAO-standardized phraseology shall be used in all situations for which it has been specified, but only when standardized phraseology cannot serve on intended purpose, plain language shall be used (ICAO Annex 10 volume ii 5.1.1.1). Based on that statement, using standard phraseology for pilot, atc and other unit in the area around aerodrome which is visible from tower is a must whether in the ground or in the air. Plain language is used in aviation communication that is not determined in phraseology in case of abnormal situation.

ICAO standardized phraseology is a set of clear, concise, internationally recognized, formulaic messages designed for use in most routine situations. Standard phraseology, however, cannot address all of the non-routine, abnormal or, occasionally, emergency situations that occur, nor is it sufficient to convey additional information about any situation such as: reasons for a delay, the state of a sick passenger, the weather situation, the nature of a failure, or an obstacle on the runway (ICAO Circular 323, para.3.8.3). The standard phraseology has standard words, phrases and abbreviations which have intended meaning for each of them, height is expressed as altitude or flight level, distance is in nautical mile, time is universally coordinated, described position is referenced by clock and there is a standard method of addressing ground or aircraft station. Standard phraseology cannot convey all of the situation related with the non-routine abnormal or emergency situation. In those situations the adjacent unit must use plain language because in that situation the adjacent unit need additional information about any situation. The example of the situation are the conversation between the pilot and the ATC in a delay situation, when the pilot and the cabin crew found a sick passenger in the cabin, when the pilot and ATC report about the weather in their vicinity, and also when the pilot and ATC report or give information that there are obstacle on the run way and can make accident or incident.

The speech act theory

The speech act theory is a language theory which is brought by Austin (1962) and his pupil, Seale (1976). According to Austin (1962), in the process of saying an utterance using a language may not only generate row of sentences but also it also makes someone do an activity through those sentences. It means that when a man uses a language he is either doing something or making someone else do something.

Austin (1962) stated that there were three acts which can emerge simultaneously while someone says a statement. They are locutionary act, illocutionary act, and perlocutionary act. Locutionary act is the act when a man pronounces something, it refers to the words of the message itself. Illocutionary act is performing something while saying an utterance. It means that when a man intends to do action while he says an utterance. The last is perlocutionary which is related to the conclusion of something said. It refers to hearer's reaction to speaker's message. Speech act theory by Searle (1962) is illustrated in figur 1.
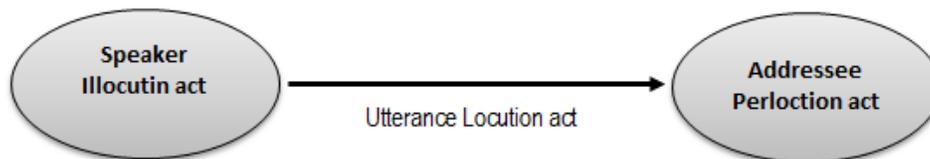

Figure 1. The diagram of speech act

Seale (1976) argued that there were five basic kinds of action than one could perform in speaking. They are representative, directive, commissive, expressive, and declarative. One or more illocutionary acts can be performed in every utterance at the same moment. Those

classifications are used in trying to understand what people do with language. Representative is a kind of illocutionary act which tries to represent a situation or condition, for the example, stating, claiming, hypothesizing, describing, predicting, and telling, insisting, suggesting, or swearing that something is the case. Expressive is a kind of illocutionary act that only expresses a psychological behavior or feeling of the speaker about some situations or conditions, such as congratulating, thanking, deploring, condoling, welcoming, and greeting. Directive is a type of illocutionary act that has a function for asking the addressee to do something, for the example, requesting, commanding, pleading, inviting, questioning, daring, and insisting or suggesting someone to do something. Commissive is a kind of illocutionary act that requires the speaker to do something. He must be responsible for his utterance, for example, promising, theatering, and vowing. Declaration is a kind of illocutionary act which is able to change a particular situation or condition, such as, blessing, firing, baptizing, bidding, passing, sentencing, arresting, marrying.

The classifications above are used in trying to understand what the objects which are pilot, atc and other unit in the vicinity of aerodrome do with the utterance in manual of radiotelephony.

Goal of the study

This study attempts to analyze the conversation parts in the manual of radiotelephony doc. 9432 between pilot, atc and other unit in the vicinity of aerodrome. Manual of radiotelephony doc. 9432 is published by International Civil aviation Organization in fourth edition 2007. Speech act taxonomy is used for analyzing the conversations. They will be classified in different types based on speech act theory. What kind of classification used in the conversation in the manual of radiotelephony doc. 9432 and how the frequency of speech act used will be discussed in this study.

Method
Materials
Manual of radiotelephony which consists of the procedure of communication using radiotelephony used by pilot, atc and other unit in fourth edition 2007 published by International Civil Aviation Organitation is chosen to analyse. The conversation between the pilot, ATC, and other crew will be used in this study.

Data collection procedure

There are 12 chapters in manual of radiotelephony. Chapter 1 consists of glossary which contains definition of principal terms in the manual, commonly used abbreviation, explaining of scenario. There is no conversation in chapter 1. The data is started to be collected from chapter 2. Chapter 2 is about general operating procedure, a procedure that is used for any operation. Chapter 3 tells about general phraseology. It is the information and instruction transmitted for safe and expeditious operation of aircraft in standard phraseology. Chapter 4 is about aerodrome control: aircraft. It describes an air traffic control for aerodrome traffic in the vicinity of aerodrome including airside and landside and it is specialized for aircraft. Chapter 5 tells abut aerodrome control: vehicles. The content of this chapter is mostly same as chapter 4 but it is more specific about vehicles. In chapter 6 shows about general ATS surveillance service phraseology. It consists of phraseology which is used for ATS surveillance service. It is usually used for radar operation service. Chapter 7 is about approach control. It is an air traffic control for flight arrival or departure in one or more aerodrome. Chapter 8 is about area control. It is an air traffic control for controlling flights in control areas. It usually controls aircrafts on en-route position and maintain its cruising level in IFR condition. Chapter 9 is about distress and urgent

procedure and communication failure procedure. It contains procedures used for distress and urgent situations. These procedures are used when an aircraft transmits a mayday or pan-pan messages. It also consists of procedures used for communication failure condition when aircraft and controller are unable to establish communication. Chapter 10 is about transmission of meteorological and other aerodrome informations. It sends information related to meteorological condition. Chapter 11 tells about miscellaneous flight handling. It is the procedure for controlling aircraft in abnormal situation. All of the conversations will be used as the materials to be analyzed. The conversations consist of the conversations between ATC, pilot, and other unit.

Data analyze procedure
The conversations in this study that come from the document will be analyzed with specific procedures. The specific software is used to know the frequency, percent and statistic. The specific one is Statistical Package for the Social Sciences (SPPS) Software. conversations The will be analyzed using quantitative method. Chi-square will also be used to know the distribution level in this document. Each unit has its own conversations which are related with its tittle. There are 709 data which will be analyzed using speech act theory by Austin (1962).
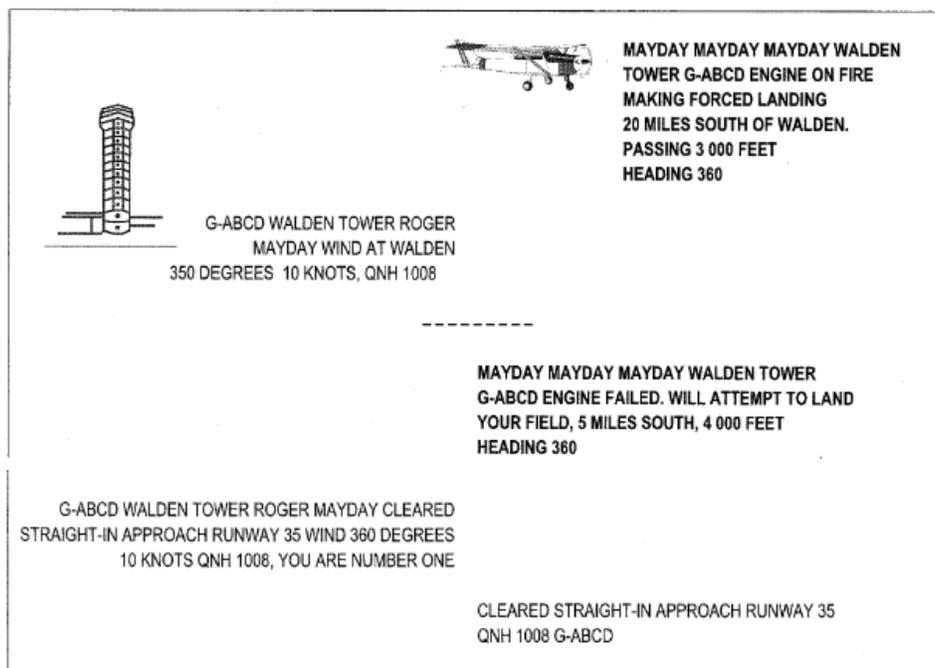
Procedures
Firstly, the conversations of each unit are prepared. They are put in a table. The conversations between pilot, ATC, and other units are spread and analyzed using speech act theory. The second, each message from pilot, ATC, and other units are analyzed whether they are included in representative, commissive, directive, declarative or expressive. After this process, the frequency and the percentage of each message are counted using SPSS.

Data Analysis
　　Before the analysis is begun, an introduction of manual of radiotelephony (doc.9432) is needed in order to make the conversations are easier to analyze. They are 709 utterances and 12 symbols in this document which has different meaning one and another. It consists of 11 chapters, each chapter discuss different materials. Chapter one is glossary contain of definitions of principal terms used in the manual of radiotelephony, and abbreviations which are frequently used, the explanation of the scenario which will be used in the next chapter. Chapter two is about general operating procedures. It tells the technique how to transmit. The pilot, ATC and the adjacent unit in the vicinity of the aerodrome have different way to pronounce specific items. So this chapter arrange how to transmit the letters, numbers, time, standard words and phrases, call sign, and the last is communications. Chapter three tells about general phraseology, it is composed an explanation of the role of phraseology and plain language in radiotelephony communications, level instructions, position reporting, flight plans. Chapter four concerns aerodrome control for aircraft, it has information about departure information and engine starting procedure, push-back, taxi instructions, takeoff procedures, aerodrome traffic circuit, final approach and landing, go around, after landing and essential aerodrome information. Chapter five against with aerodrome control related with vehicles, it consists of movement instructions, crossing runways, and vehicles towing aircraft. Chapter six concerns general ATS surveillance service phraseology has information about identification and vectoring, vectoring, traffic information and avoiding action, secondary surveillance radar, radar assistance to aircraft with radio communications failure, and alerting phraseologies. Chapter seven discuss approach control describes IFR departures. VFR departures, IFR arrivals, VFR arrivals, vectors to final approach, surveillance radar approach, and precision radar approach. Chapter eight has

information about area control which consist of area control unit, position information, level information, flights joining airways, flights leaving airways, flights crossing airways, flights holding en route, ATS surveillance, automatic dependent surveillance (ADS), and oceanic control. Chapter nine about distress and urgency procedures and communications failure procedures, it contains of distress message, urgency messages, emergency descent, aircraft communication failure. Chapter ten pertains the transmission of meteorological and other aerodrome information, has information about runway visual range (RVR) and runway surface conditions. The last is chapter eleven about miscellaneous flight handling has information about selective calling (SELCAL), fuel dumping, wake turbulence, wind shear, direction finding and ACAS maneuvers.

Based on the document on manual of radiotelephony it is proved that in one conversation it can consist more than one basic kinds of action that atc, pilot and the adjacent unit in the vicinity of aerodrome perform in speaking. Those can be representative, directive, commissive, expressive, and declarative. One or more illocutionary acts can be performed in every utterance at the same moment. It can be seen in the conversation 9-2 on ICAO document about distress messages in aircraft in distress :

MAYDAY MAYDAY MAYDAY WALDEN TOWER G-ABCD ENGINE ON FIRE MAKING FORCED LANDING 20 MILES SOUTH OF WALDEN. PASSING 3 000 FEET HEADING 360

G-ABCD WALDEN TOWER ROGER MAYDAY WIND AT WALDEN 350 DEGREES 10 KNOTS, QNH 1008

MAYDAY MAYDAY MAYDAY WALDEN TOWER G-ABCD ENGINE FAILED. WILL ATTEMPT TO LAND YOUR FIELD, 5 MILES SOUTH, 4 000 FEET HEADING 360

G-ABCD WALDEN TOWER ROGER MAYDAY CLEARED STRAIGHT-IN APPROACH RUNWAY 35 WIND 360 DEGREES 10 KNOTS QNH 1008, YOU ARE NUMBER ONE

CLEARED STRAIGHT-IN APPROACH RUNWAY 35 QNH 1008 G-ABCD

The first dialog MAYDAY MAYDAY MAYDAY WALDEN TOWER G-ABCD ENGINE ON FIRE MAKING FORCED LANDING 20 MILES SOUTH OF WALDEN PASSING 3 000 FEET HEADING 360. It is not only classified as illocutionary act for declarative but also representative and directives. The specific one for declarative act is declaring emergency situation and for representative is informing. It means the pilot declares an emergency situation by saying mayday mayday mayday the aircraft definitely need more attention from the ATC than the other aircraft. The pilot also gives information about the condition of the aircraft in engine on fire , will be landing as soon as possible. The pilot informs the coordinate position of the aircraft. The atc replies G-ABCD WALDEN TOWER ROGER MAYDAY WIND AT WALDEN 350 DEGREES 10 KNOTS, QNH 1008. By saying roger mayday means the atc has received all of the pilot G-ABCD last transmission and

has already understood about the condition experienced by the pilot. The atc also informs the pilot about the condition of the weather.

Next conversations show the pilot also declare emergency. MAYDAY MAYDAY MAYDAY WALDEN TOWER G-ABCD ENGINE FAILED. WILL ATTEMPT TO LAND YOUR FIELD, 5 MILES SOUTH, 4 000 FEET HEADING 360. By declaring mayday mayday mayday the pilot demands atc to fully attention to the aircraft. The pilot not only gives information about aircraft condition in engine failed and need emergency landing in atc's aerodrome but also the position of the aircraft in that moment.

The respond from the ATC by saying G-ABCD WALDEN TOWER ROGER MAYDAY CLEARED STRAIGHT-IN APPROACH RUNWAY 35 WIND 360 DEGREES 10 KNOTS QNH 1008, YOU ARE NUMBER ONE. It means the ATC has accepted the transmission from the ATC perfectly. The ATC gives information about the weather in the vicinity of particular aerodrome. Giving sequence the first because of the emergency situation faced by the aircraft and instruct to the pilot for landing in runway 35.

CLEARED STRAIGHT-IN APPROACH RUNWAY 35 QNH 1008 G-ABCD here the pilot of the aircraft repeat the specified part of the message and obey the instruction given by the ATC.

The utterance in the conversation of manual of radiotelephony has been analyzed by using speech act theory and presented in the following tables.

Table 1. The Frequency and The Percentages From The Category Of Speech Act

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Representative	262	37.0	37.0	37.0
	Commisivess	169	23.8	23.8	60.8
	Directives	271	38.2	38.2	99.0
	Expressive	1	0.1	0.1	99.2
	Declarative	6	0.8	0.8	100.0
	Total	709	100.0	100.0	

Table 1 above consists of the frequency and the percentage of speech act category in manual of radiotelephony from the conversation between pilot, ATC, and other unit. Table 1 shows that frequency of directive speech act in doc.9432 is the highest one, followed by representative, commissive, declarative and the last is expressive.

The result of statistics of speech act from doc.9432 is presented in table 2. The valid, missing, mean, median, mode, minimum and maximum are explained in the table.

Table 2. The Statistics of Speech Act

N	Valid	709
	Missing	0
	Mean	2.0409
	Median	2.0000
	Mode	3.00
	Minimum	1.00
	Maximum	5.00

Table 3 consists of the result of chi-square test related to the speech act in doc.9432. frequency data is used in chi-square.

Table 3. The Chi-Square Test Statistics

	Speech act
Chi-Square	494.688[a]
Df	4
Asymp. Sig.	0.000

This study uses data frequency not ratio or scale. It is the result from the data classification in nominal. The data frequency is based on the types of speech act, they are representative, commissive, directive, expressive, and declarative.

Based on chi-square result, it can be calculated that a. 0 cell (0,0%) has expected frequency which is at the amount of less than 5. The minimum expected cell frequency is 141,8.

The output of asymp significant value from table 3 is 0,000. It means asymp significant value is 0,000 < 0,05. It can be concluded that the frequency of the types of speech act is substantial and important.

Discussion and conclusion

The objectives in this study are not only finding the classification which is used in the conversation in manual of radiotelephony but also the frequency of the speech act which is used. After analyzing the table 1, it can be concluded that the highest frequency based on the speech act classification in the conversation in manual radiotelephony between ATC, pilot, and other unit is directive. Instructing and requesting are forms of directive speech act which appear mostly. It indicates that most of utterances in doc.9432 have a function for asking the addressee to do something. The ATC transmit the radiotelephony to instruct the pilot to do what the intentions of the ATC based on his utterance from radiotelephony it also happen vice versa pilot to ATC. The second form is requesting, in this manual of radiotelephony doc. 9432 the pilots and ground personnel communicate with each other for requesting something to each other.

It is at the amount of 38,2%. Its frequency is 271 from 709. The second position is representative. It consist of 37%, its frequency is 262. Informing, reporting, and stating are forms of representative that occur more than the other forms in representative qualification. Commissive is in the next position which is at the amount of 23,8% and its frequency is 169. The most form which appears from commissive is obeying form. It means that the speaker who says the message intends to do something by obeying. It is founded that declarative reaches 0,8% and the frequency of declarative is 6 which make it in fourth position. Declaring an emergency situation is the only form from declarative. It shows that when emergency or urgency situation happens, a pilot must say that word so the condition or the situation will change suddenly. The last is expressive which reaches 0,8% and its frequency is 1%.

Since manual of radiotelephony doc.9432 is an important document for initial learner in aviation especially for ATC and pilot. It is very useful to analyze the utterance in this book using speech act theory. The finding of this study shows that the document 9432 is organized proporsionally. By analysing this document, it can be known that the findings of this study are very useful both for the lecturer and the cadets. They have known which part of speech act that the utterance what the effect when they utterance the sentences in manual of radiotelephony doc.9432. For the future research, the speech act theory may be applied for field research by recording the conversation in a real situation of airport between pilot, atc, and other units using the same theory.

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