



## The Study of Career Advancement for Female Technicians in The Aircraft Maintenance Field

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### Abstract

This qualitative research aimed to 1) study the factors supporting career advancement among female technicians in the aircraft maintenance field who worked for the air operator or repair station and 2) explore the career path of female technicians who successfully possess the legal authority to certify the airworthiness. The researcher used a purposive sample technique to screen female technicians following the objectives of the research study. An in-depth interview, an unstructured interview on eighteen individuals' key informants that consisted of ten female technicians from Thai Airways International PCL and eight female technicians from Asia Aviation PCL., was conducted to collect detailed information for the research analysis and conclusion. The result indicated that internal factors related to personal demographics and competency associated with the external factor referred to the organization's policy and structure helped improve human resources management's effectiveness that suits the organization's stipulation in quantity and quality. The broadening understanding of self-efficacy and attributes that reflected behaviors helped promote female technicians' career advancement, which showed a significant linkage towards their career path and competency. The training roadmap designed according to the competency helps to support a career opportunity as a licensed aircraft engineer. Moreover, it also helps facilitate career advancement for female technicians in the aircraft maintenance field to become career successors.

**Keywords:** *Female technician, Aircraft maintenance, Career advancement*

### 1. Introduction

The number of Thai women pursuing professional in aviation has increased drastically in many areas throughout the industry. Although many young female students want to pursue their careers in the aviation maintenance field, there were several controversies over career appropriateness, physical limitations, work environment safety, social acceptance, and advancement opportunities. Considering that a country's culture influences an organization's culture towards women's careers in that organization (Khapova, Bricose, & Dickman, 2016) as a result in limiting women's promotion opportunities due to women's perception as less committed to their employment (Tharenou, Latimer, and Conroy, 1994). The study of females succeeding in the career of aircraft maintenance field in Thailand remains exceptionally low. Many female technicians have genuine talents and abilities that need to be put to good use to overcome obstacles and reached the top of their dream career of possessing an authorized licensed aircraft engineer. Some are on their tracks to a career goal. Nevertheless, women's job opportunity embarked upon a career in the male-dominated area has not been thoroughly investigated.

#### 1.1 Theoretical Background - Definitions of Key Terms

##### 1.1.1 Competency

A professor from Harvard University named David McClelland was recognized as the revolutionary based on his famous paper's competency in 1973. Excellent performance can be predicted through a person's competency rather than intelligence. He demonstrated the importance of assessing the "strength" of people's achievement, affiliation, and power motives in determining individuals. McClelland and his colleagues began to wonder if these motives could be aroused and developed (McClelland, 1997).



- Parry (1997) found a cluster of related knowledge, skills, and attitudes that affects a significant part of one's job, which correlates with the performance measured and improved. He discussed the combination of self-values, personality traits in the competencies.
- Spencer, L.M. and Spencer, S. M. (1993) described "Competency" in three aspects: knowledge, technical skills, and attributes in terms of motive, traits, and self-concept that were underlying characteristics of each individual.
- Raven and Stephenson (2001) referred to "Competency" as the direct consequence of the "Strength of Achievement Motivation," which depended on how the affective and cognitive components of effective behaviors engaged in the intellectual activity. People will only reveal the level at which they can display these abilities while they are interested in carrying out tasks.
- Competency was relevant to the assessment based on behavioral activities and attitudes towards their job concerning a particular position rather than merely functional analysis (Moore, Cheng, & Dainty, 2002).

### 1.1.2 Self-efficacy

When experiencing difficulty, will you feel like you can soar and achieve your goal, or will you just give up in surrender? Would you rather defeat the challenges that work throws your way or doubt your capabilities to grow? The term "self-efficacy" was first coined by psychologist Albert Bandura (1977), a Canadian-American psychologist and a Stanford University professor. He primarily described the concept using the word "personal judgment," of how well a person can carry out an action required to deal with difficulty in a specific situation. It is the belief in the capability of their ability to succeed in a particular case.

- Self-efficacy reflects confidence in exerting control over self-motivated and one's behavior. These cognitive self-evaluations influence a person's abilities that include the goals oriented, the energy contributed to goal-achievement, and the type of expressed action related to job performance (Bandura, 1999).
- The stage of mind that influences one's capabilities, for example, stress or depression, can decrease confidence and influence how you judge your self-efficacy and tension and interpreted as signs of vulnerability to poor performance. In contrast, positive emotions can boost our skills in the opposite way (Seligman, 1998).
- McShane and Von Glinow (2018) referred to self-efficacy as a person's capability to truly motivate a person's beliefs, support positive perceptions, and favor the situation to complete a task successfully.
- Self-efficacy determined which goals we choose to pursue, which direction we go about to accomplish those goals, and how we choose to react to our performance when facing challenges (Maddux, 2002).
- C.R. Snyder, Shane J. Lopez, and Jennifer Teramoto Pedrotti (2011) mentioned self-efficacy as the belief in our ability to succeed that affects how we believe, think, act, and feel about ourselves.

### 1.1.3 Career Advancement

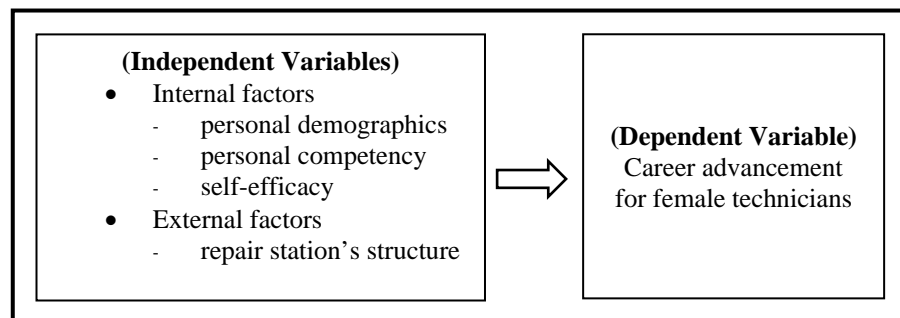
Career Advancement is how employees across industries use their skills and drive to achieve new career development and more challenging career opportunities. Some organizations offer career advancement programs that allow current employees to move up within the career path structure.

- Career Advancement usually refers to promoting to a managerial level and attaining high administrative levels and income (Tharenou, 1997).
- Harlan, S. (1989) explained career advancement as the organizational path that influences hierarchical progress opportunities.
- According to this research study, Career Advancement was found essential for several reasons:
  - It will prevent job dissatisfaction by allowing employees to take on extra roles and responsibilities within the same department.



- It creates development to chase other areas of interest by encouraging employees to follow their desires and seek new opportunities.
- It allows for the expected salary increases and crafting to push themselves to be better and run after more responsibilities with a higher income rate.
- It will encourage continuous improvement and development because employees may need additional certifications or qualifications to ride on a senior level or position.

### 1.2 Conceptual Framework



**Figure 1** The factors that influence female technicians' career advancement

## 2. Objectives

### 2.1 The objective of this study was

- 1) To study the factors supporting career advancement among female technicians in the air operator or repair station's aircraft maintenance field
- 2) To explore the career path of female technicians who successfully possess the legal authority to certify the airworthiness

### 2.2 Research Questions

- 1) Which competency contributes to career advancement opportunities to become a career successor?
- 2) Does self-efficacy towards own personal traits affect the career advancement of female technicians?

## 3. Materials and Methods

3.1 Key informants: The eighteen individual key informants were selected using the purposive sampling technique following the study's objectives. All key informants were native Thai, had been working in the aircraft maintenance field for over five years and holding authorized legal licenses, and had all the qualifications required by ICAO according to Annex1-Personnel Licensing. The female technicians were divided based on their company and the required licensing type as shown in table 1 below.

**Table 1** Scope of the population according to the research study's objectives

Air Operator / Repair Station	Legal Licensing		Number of key informants
	Aircraft Mechanic License	Licensed Aircraft Engineer	
Thai Airways International PCL.	10	0	10
Asia Aviation PCL.	3	5	8
Total number	3	15	18



3.2 Instrument: The in-depth, non-structured interviews took place one-on-one with each individual to collect qualitative data that unfolds in a conversational manner offering the key informants the chance to express their opinion freely. The researcher also conducted in-depth interviews with their team leaders to deepen understand and to cross-check data collection's validity and reliability for the research analysis and conclusion.

3.3 Research Methodology: The researcher applied three qualitative methods: in-depth interview, deep listening, and observation to describe the individual experience in the area that contributed to the research questions.

#### 3.4 Data Collection

1. The primary source of information was derived from the in-depth interview with the eighteen key informants.
2. The secondary source of data was obtained from the content analysis of the following documents:
  - The ICAO Convention Annex 1 on Personnel Licensing.
  - The EASA Part-66-Maintenance Certifying Staff.
  - The requirements on the application for the issuance of personnel license and endorsement of rating on personnel license as referred in the Civil Aviation Authority of Thailand (CAAT) No. 15
  - The protocol on the aircraft technicians' legal rights and qualifications referred to the Regulations-1 of Civil Aviation Board No. 77, (2009)

## 4. Results and Discussion

### 4.1 Results

The instrument was utilized to collect primary data concerning personal demographics, including age, educational level, experience in work, and current type of aircraft mechanic license that affected female technicians during the recruitment process compared with the career advancement that focused on personal development behaviors. The researcher interviewed concentrating on three aspects: (1) the overall goals and aspirations that female technicians bring to their pursuits to stand out from the rest, (2) the attitudes towards their self-efficacy, and (3) the personality traits of female technicians and how they compare to male counterparts' technicians. According to technicians' competency, the knowledge, technical skills, and attributes currently used by aircraft technicians as defined by the Regulations-1 of Civil Aviation Board Number 77 (2009) on applicants' qualifications and privileges for the aircraft technicians were determined. Besides, the aircraft engineer must not be less than eighteen years of age, must have professional experience in the maintenance servicing and inspection of the aircraft, including its components, and have excellent health conditions suitable to the performed jobs. Often a position requires knowledge of the subjects and technical skills to function a given task; the aircraft maintenance license holder shall have demonstrated the use of standard tools and show a level of professionalism concerning knowledge and abilities to the responsibilities regarding the following:

- A. Aviation law and airworthiness requisitions concerning:
  1. Rules and regulations related to the type of license holder
  2. Airworthiness requisitions regulated the continuing airworthiness of the airplane
- B. Physical science and common airplane knowledge concerning:
  1. Fundamental mathematics
  2. The units of measure
  3. Principles of physics and chemistry appropriated to aircraft maintenance jobs
- C. Aircraft engineering concerning:
  1. The figure of aircraft construction, its functions, and characteristics
  2. The essential of airplane structures and their functioning
  3. The techniques of fastening



4. The powerplants systems and their associated network
5. The power sources of electrical and mechanical
6. The basic aircraft instruments
7. The airplane control systems
8. The airplane navigation and transmission system

D. Aircraft maintenance concerning:

1. The required job to assure the continuing airworthiness of an airplane.
2. The inspection, modification, repair, replacement, overhaul, or rectification of the defected airplane structures and their components, regulated in the maintenance manuals.

E. Human factors concerning the aircraft technicians described in Doc 9683.

Nevertheless, the result indicated that attributes played a better role in motivated female technicians to become career successors who possessed legal authorization of aircraft maintenance licenses. Keeping them on their chosen path showed a firm associate career advancement than specific knowledge and technical skills. All the key informants agreed that top performance required an attitude of achievement as the achievement-motivated people generally make things happen and get results. It is about doing according to the job's execution rather than gender, physical limitation, or working in a masculine culture. As the attributes reflect personality traits, they can be best described in terms of behaviors. The excellent female performers revealed the behavioral characteristics or "strengths" that caused a significant impact on their career advancement and career success in the area, for example, collaborative team-player and communication, as shown in Table 2 below.

**Table 2** The attributes of successful female technicians' background in the aircraft maintenance field

<b>The behavioral characteristics of the excellent female technicians</b>		
1. Adaptive to change	11. Coordination	21. Language Usage
2. Admin. Management	12. Creativity	22. Listening and Feedback
3. Report Management	13. Empowering Others	23. Motivation
4. Assertiveness	14. Endurance	24. Negotiation
5. Attention to Details	15. English Literacy	25. Observing
6. Change Leadership	16. Flexibility Awareness	26. Oral Communication
7. Change Management	17. Follow up	27. People Development
8. Communication	18. Human Relation	28. Emotional Control
9. Conflict Management	19. Influencing Others	29. Presentation
10. Consulting	20. Information Seeking	30. Self-Control

However, as reported by female technicians, their inferior performance was referred to as the lack of essential behavioral characteristics that limit their potential growth of advancement opportunity, as shown in Table 3 below.

**Table 3** The attributes that challenge female technicians' career improvement in the aircraft maintenance field

<b>The behavioral characteristics of the inferior female technicians</b>		
1. Analytical Thinking	4. Decisiveness	7. Information Analysis
2. Calculation	5. Forecasting	8. Time Management
3. Coaching	6. Proactive Working	9. Task Management

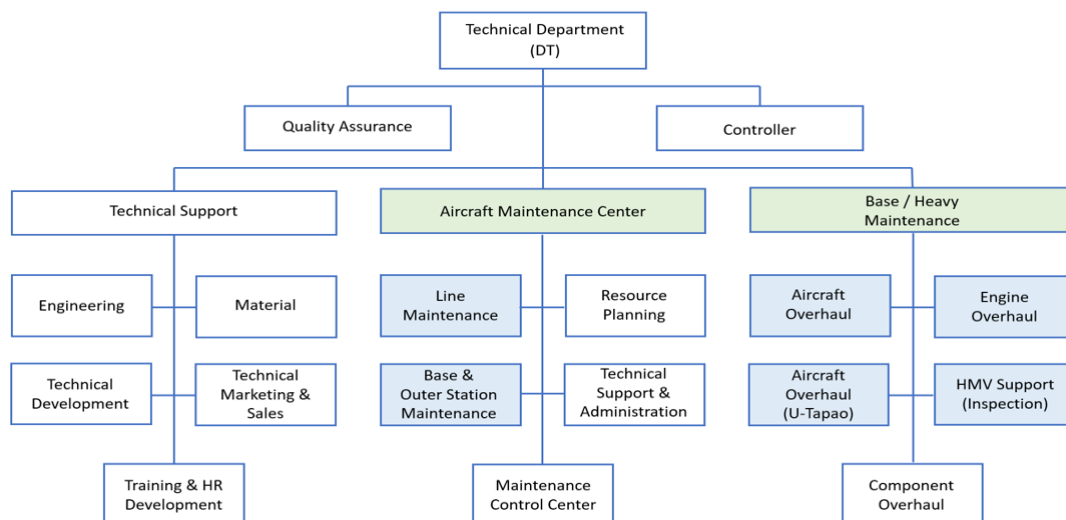


Besides, the results showed female and male technicians, who can deliver the desired results, achieve the level of outcome relative to the behavioral characteristics determined by the licensing authority, which describe the required performance as shown in Table 4.

**Table 4** The required attributes that meet the desired outcomes of female and male technicians in the aircraft maintenance field

The behavioral characteristics of the best female and male technicians		
1. Accountability	11. Innovation Thinking	21. Quality Awareness
2. Business Ethics	12. Knowledge Transferring	22. Safety Awareness
3. Building Trust	13. Leadership Skills	23. Safety Management
4. Computer Literacy	14. Machine Understanding	24. Self Confidence
5. Continuous Improvement	15. Maintenance Management	25. Self-Independent
6. Delegation	16. Manpower Planning	26. Sharing Responsibility
7. Expertise	17. Personal Credibility	27. System Thinking
8. Goal Setting	18. Personal Mastery	28. Team Leadership
9. Honesty and Integrity	19. Problem Solving	29. Teamwork
10. Individual Learning	20. Project Management	30. Technical Expertise

Moreover, the researcher learned that both Thai Airways International Public Company Limited and Asia Aviation Public Company Limited developed their organizational structures based on various cafeterias. Employee portfolios focus on the required knowledge, practical skills, behavioral skills, and years of experience. Unfortunately, unlike the Asia Aviation Public Company Limited’s engineering department, Thai Airways International Public Company Limited’s Technical Department in Figures 2, 3, and 4 shows sophistication, complexity, and dynamics. It will nevertheless be necessary to encounter the communication problem. For the sophisticated organization, growth will require decentralizing to continue coherent operations, just like Thai Airways International Public Company Limited adopted the decentralization type of organizational structure. Top management delegates daily functions and decision-making responsibilities to middle management and lower-level leaders, freeing up top management to concentrate on significant decisions.



**Figure 2** Thai Airways International PCL., Technical Department organizational structure

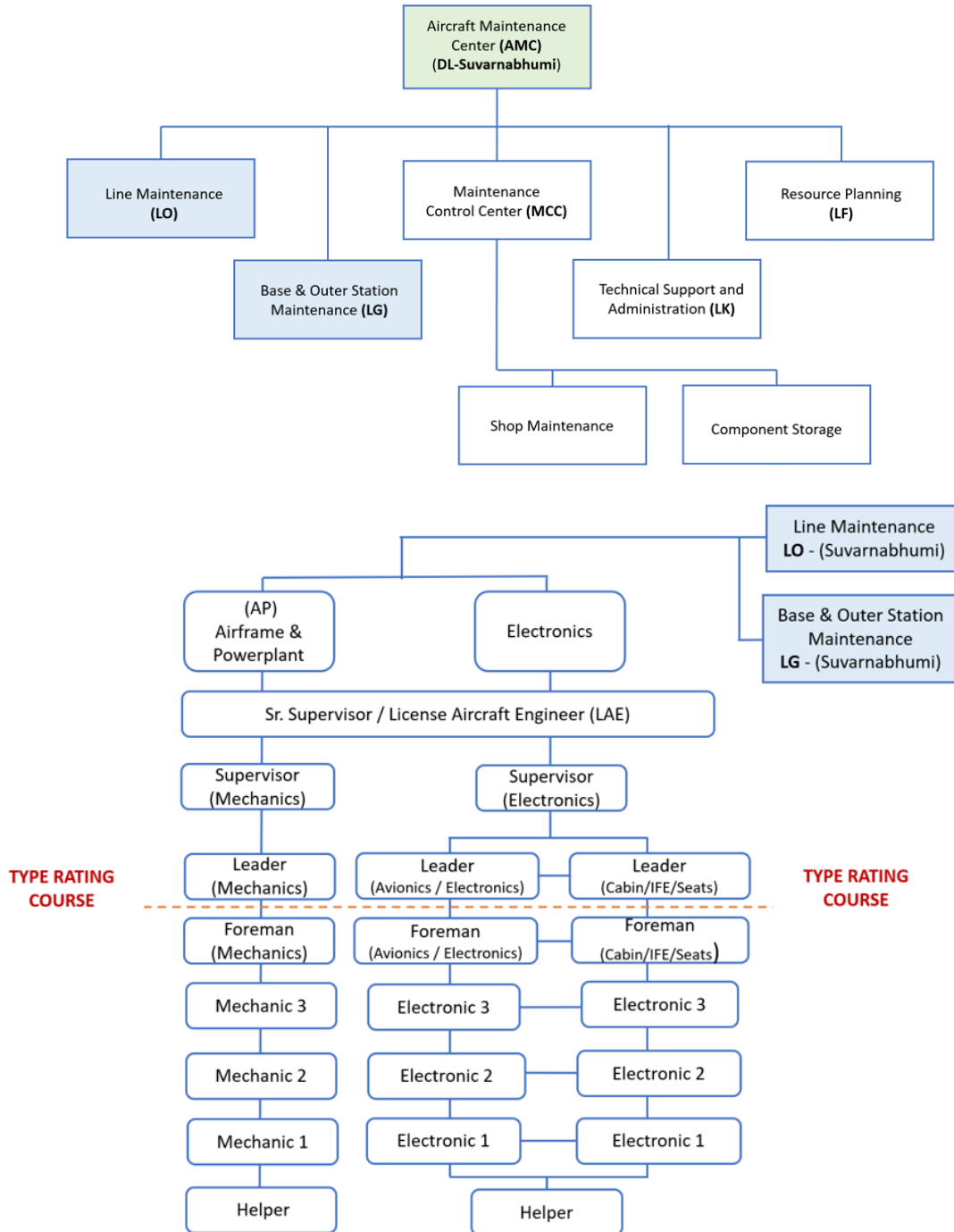
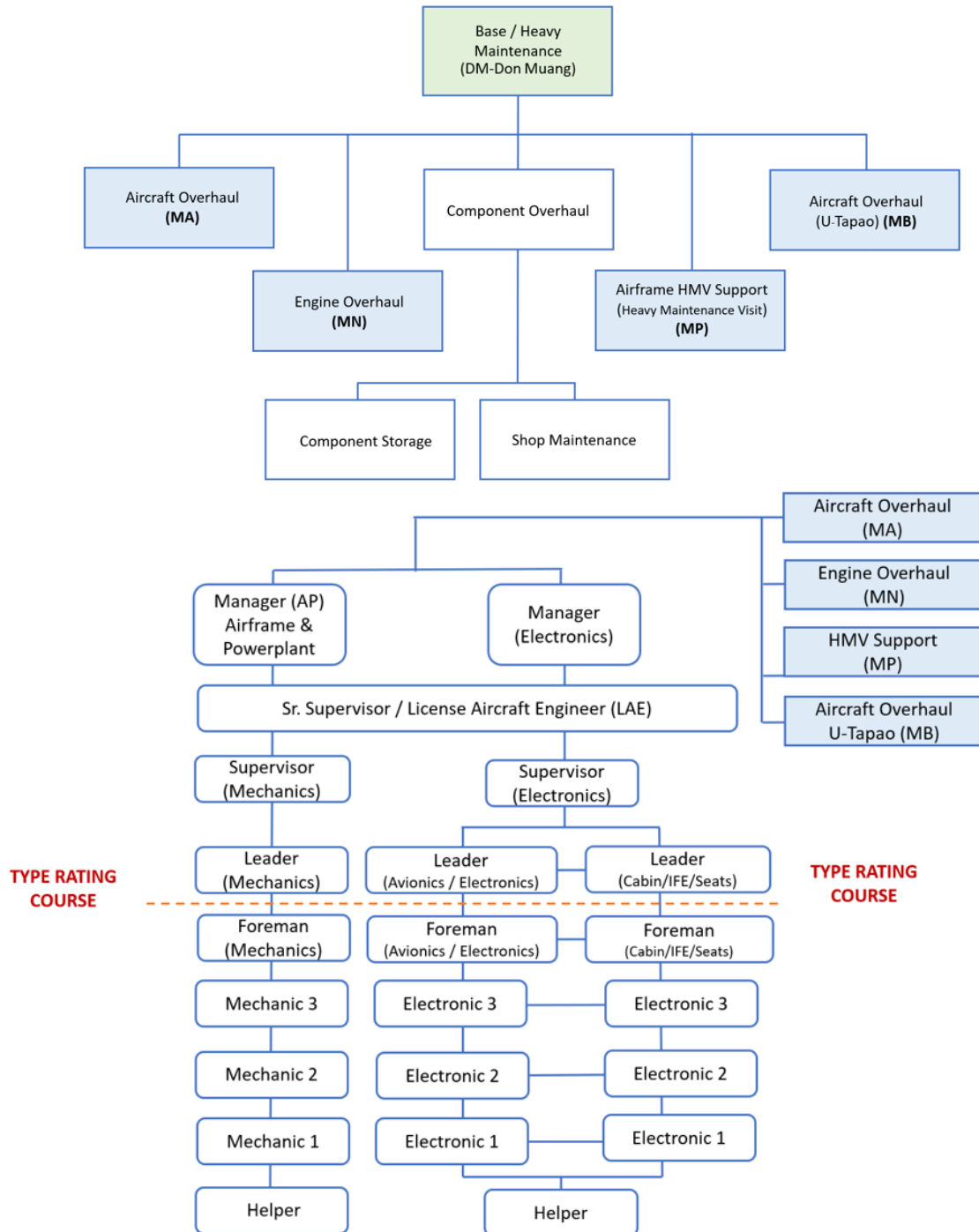


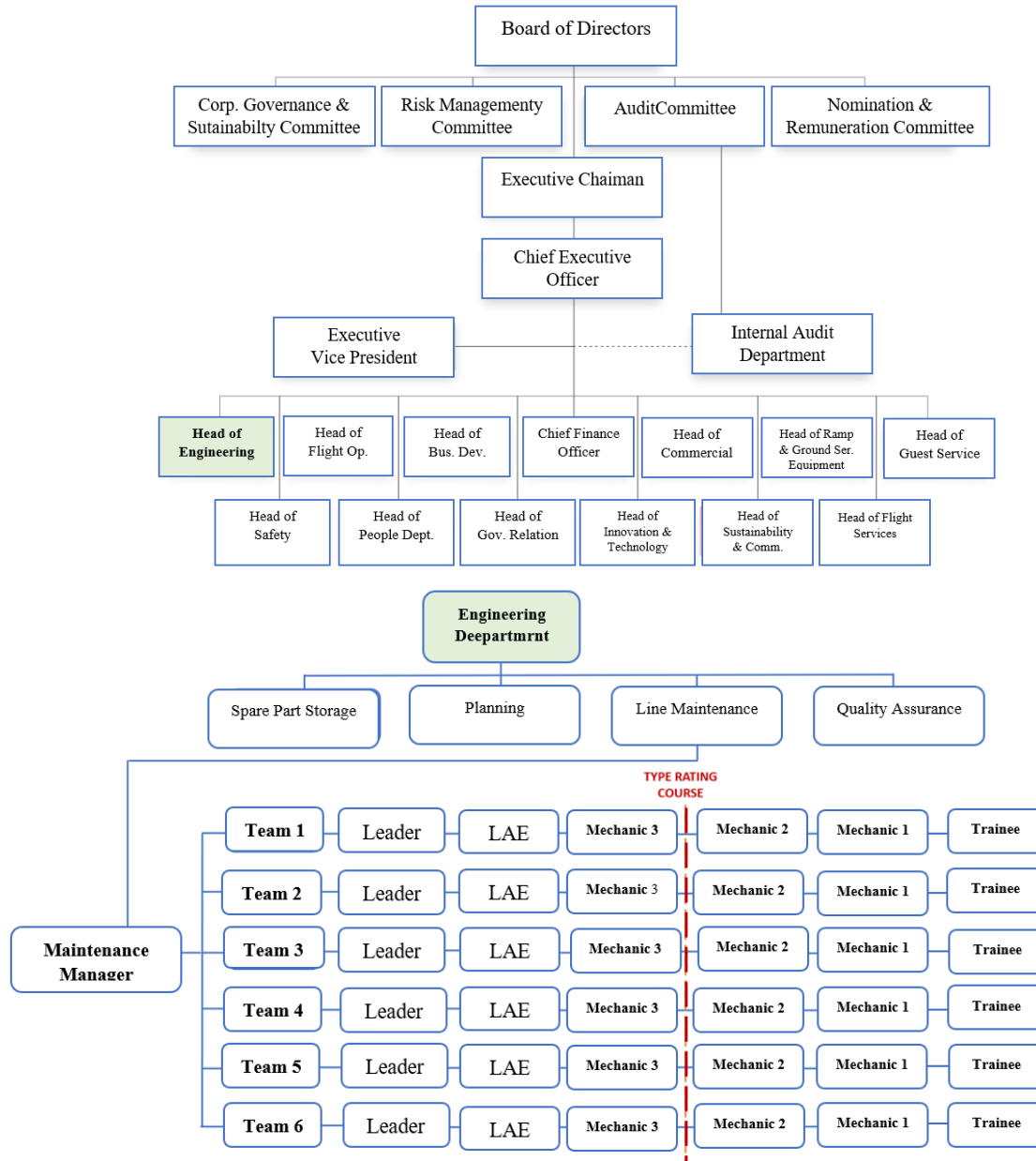
Figure 3 Thai Airways International PCL., Aircraft Maintenance Center (AMC), (Suvarnabhumi)



**Figure 4** Thai Airways International PCL., Base / Heavy Maintenance Station, (Don Muang)

In contradiction, Asia Aviation Public Company Limited adopted the centralization type of organizational structure style. They can benefit from a direct chain of command because each employee within the organization knows whom to report and whom to approach whenever they encounter problems concerning their jobs.

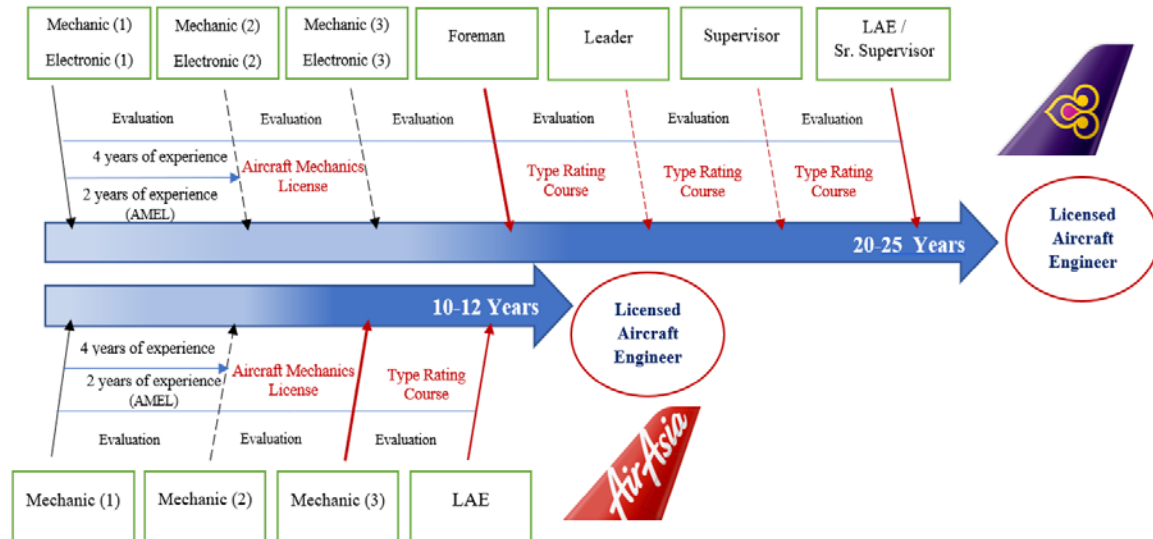




**Figure 5** Asia Aviation PCL., Engineering Division organizational structure

As shown in Figure 5, Senior Executives follow an uncomplicated plan of delegating authority according to employees' specific functions. The executives can ensure that there will be no overlapping when the delegated responsibilities to middle managers, lower-level leaders, and employees. A transparent chain of command will help the organization execute decisions quickly and cohesively.

Following Figure 6, while enhancing organizational performance and different outcomes, both organizations typically witness their employee's performance through skills assessment, skill development, and career goals in this endeavor.



**Figure 6** The career path of technicians in the aircraft maintenance field

#### 4.2 Discussion

According to psychologist Albert Bandura (1997), self-efficacy reflects confidence in exerting control over self-motivated and one's behavior. These cognitive self-evaluations influence a person's abilities that include the goals oriented, the energy contributed to goal-achievement, and the type of expressed action related to job performance. Self-efficacy affects every human endeavor area by determining the beliefs a person holds under the power to affect achievements. It strongly influences both the person's ability to face challenges competently and how they are most likely to decide. Self-efficacy is undoubtedly worth having. Whether you think you can or you cannot, you are right. It perfectly defines the essential role that self-belief plays in our living.

Despite the fact, female retention in aircraft maintenance remains a persistent problem in Thailand even after overcoming hundreds to enter the profession. The answer was found corresponding to a study by Rigotti, Korek, & Otto (2020), as well as research by Valcour and Ladge (2008), where self-efficacy in one's ability showed a positive correlation with high-performance work practices. Career success can be measured objectively and subjectively; the researcher also found a strong linkage between job satisfaction and career engagement in both means, such as job promotion, increasing salary levels, and personal's career objectives fulfillment. The interview was incorporated with the researcher's results, indicating that career advancement was influenced by professional engagement. The more engaged with their career, the more progress on their career development they succeeded, which in line with the study of Enache, Sallan, Simo, and Fernandez (2011), showed the positive relationship between attitude for success and career engagement in female workers.

Abele and Spurk (2009), together with Tymon et al. (2010), as mentioned in their research, the self-efficacy that transformed specific behavior patterns to action were essential factors affecting job satisfaction. It helped maintain the retention rate and reduce the personnel turnover rate and created self-confidence in oneself, encouraged a person to devote oneself to the best of the knowledge and ability to achieve excellent performance, and made a career commitment that resulted in employee engagement. In congruence with the researcher's finding, job satisfaction allowed a person to strive for development in their career of responsibility and show more efficient and outstanding results than those who do not have job satisfaction resulting in an exceptional performance and lead to career advancement.

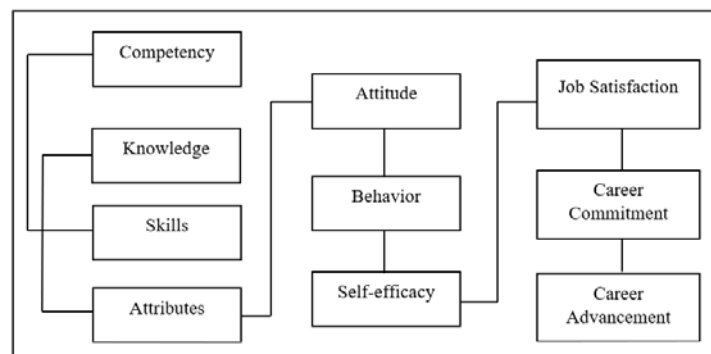
Day R., Allen D.T. (2004), in their studying, explained the relationship between self-efficacy, self-confidence, and career motivation when the supervisor introduced challenging assignments to subordinates,



which somehow associated with personal's traits and the increased of excellent performance. It was consistent with the researcher's data during the interview that key informants referred to when these female technicians were motivated by their team leader to take on managerial roles because they could have good people skills. It inspired them to build up confidence in believing that one can accomplish tasks with higher responsibility when career advancement has a strong connection with career commitment based on trust in one's abilities, known as self-efficacy. The research study results also aligned with Mrayyan and Al-Faouri (2008) that career engagement is a set of perceptions expressed in behavior in dealing with challenges and obstacles for a person to achieve their career goals. The robust attributes developed after going through a challenging personal or professional situation. Tims, Bakker, & Derks (2014), in their research, described the same ideal as the researcher that low-performance workers with a fixed mindset usually discouraged themselves and tended to avoid challenging work. The lack of self-confidence found in low self-efficacy workers limited them to explore the opportunity to develop their abilities. In contrast, the highly motivated worker who realized one's abilities often chose to challenge themselves, which all the eighteen key informants had this self-efficacy lied in themselves.

Bell and Kozlowski (2002), the researcher from Cornell University and The Michigan State University, examined the direct relationship between achievement orientation and cognitive ability with self-efficacy and the learning outlook. Consistent with the researcher's study that all the key informants agreed on mistakes and failures they learned from their experience did not affect their career goals. On the other hand, they believed that career advancement happened once the obstacles and difficulties were presented. These female technicians focused on the synergies between their professional roles rather than the conflict. They valued themselves for the company's benefit as those with technical, organizational, communication proficiencies and never perceived that their contributions were less valued.

Figure 6 shows all key informants' perspectives that described career success as the attitude while dealing with obstacles or failure regardless of gender, physical limitation, or working environment. They believed self-efficacy showed some association with their growth mindset-oriented that helped support their ability to succeed and make specific progress with their career commitment, leading to career advancement.



**Figure 6** The attributes associated with the attitude for excellent performance reflected behaviors to promote female technicians' career advancement in the aircraft maintenance field

The female technicians also need to be conscious about taking on specific tasks, roles, and career paths. When extended with career opportunities, they must develop a mindset of asking themselves the question that "Are they taking on this role because I like it and it fits with my career goals?" and "Would it allow them to succeed?" It does not mean they should turn down challenging roles without exploring them; instead, they may want to tune into themselves for feedback on what tasks and functions suit them. Besides, female technicians need to learn to embrace their talent of being female with scientific values rather than forcing themselves to fit into socially constructed gender. Their versatile ability will allow them to embrace



the uniqueness they bring to the professional, thus reducing feelings of dissonance and tension in a male-dominated working environment.

In this research study, the researcher derived the career path ideas from many different levels of analysis. According to the interview with female technicians at Thai Airways International PCL, the researcher received complaints about the time consuming before their career development happened due to the Technical Department's complexity organization shape, presented in Figures 2, 3, and 4. In contrast, the report received from the Engineering Department's female technicians at Asia Aviation Public Company Limited revealed their fast progress in their career development, shown in Figure 5. It is common to imply advancement in an organization, typically connected with job responsibilities, which provide a proficiency ladder according to the sophisticated function to achieve career development. On the other hand, the concept pointed away from the organizational structure towards the individual's perception. The idea subjectively means individuals contributed towards their jobs in the sense they made of their future becoming according to its self-esteem.

Following the interview, the result indicated that all the key informants seek to understand and follow opportunities within their company, especially for ambitious employees seeking career opportunities to be motivated at work, regardless of its size and complexity. They need support for effective career path planning and development. Cummings (1995) interpreted the relationship between the dynamics for organizational centralization and decentralization. The researcher found the result agreed with his research study. Both organizations need to balance the two poles between organization development regarding the return investment on business and its employee's career development.

At the individual stage of the analysis, the two groups of female technicians were explicitly about their working life stories regarding their expectations between Asia Aviation's small size organization and Thai Airways International's supra-organizational structure. The matter discussed in terms of interest objects was the working areas' geographical location, the plasticity within organizations, and employees' generations. The focus of concerns included individuals' role choice that influences shaping the careers, the socioeconomic factors and fringe benefits that restrict their preferences, or how the individuals' experience might dictate constraints.

## 5. Conclusion

Female technicians' career advancement in the aircraft maintenance field research has provided us that the reliability and validity of attributes measured in terms of various constructed behaviors are very challenging resources of information that help predict a person's career advancement. The instruments intended to assess self-efficacy for excellent performance measured by actions based on female technicians' experience when working in male-dominant culture. The researcher investigated eighteen female technicians' competencies in three areas: knowledge, technical skills, and attributes. The result indicated, among the three criteria, the personality traits, referred to as personal attributes, were the significant factors that keep them on their chosen path and showed a firm associate with career advancement than knowledge and technical skills. The self-efficacy reflected self-confidence in exerting control over their attitudes, behaviors, and motivation to become career successors. All the key informants agreed that this cognitive self-evaluation influenced their perceptions that they experienced in a masculine culture environment, including the goals they strive for, the amount of energy expended towards a career goal, and extended desire for career achievement.

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