

Types of Jobs and Career in the Automotive Sector for Graduates of the Automotive Engineering Department

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ABSTRACT

The research aims to describe the types of jobs in the automotive sector and record jobs entered by automotive department engineering graduates. Research is a type of qualitative descriptive, the data used is in the form of qualitative data from interviews, field observations, document analysis, and survey results. The research sample was 93 respondents, 69 respondents used a questionnaire, and 24 respondents spread over 13 companies were conducted using interview and observation techniques. The results of the study show that there are several types of jobs, which are grouped into four career fields, namely: technician, sales marketing, training instructor, and teacher. For a career in mechanics, the career paths are: mechanic, mechanic team leader, mechanic chief, service advisor, workshop head, and service manager. Career paths in sales marketing, namely: sales during training, sales marketing 1 (s1), sales marketing 2 (s2), sales marketing 3 (s3), sales supervisor, marketing manager, and branch head. Career paths in the field of instructor training, namely: training instructor, head instructor, instructor manager, head of the HRD division, and HRD manager. Career paths as a teacher, namely: teachers, heads of workshops, heads of departments, vice principals, school principals, school supervisors, and heads of the education offices. In addition to the four fields of work and career paths, there are several other types of work, which are also chosen and made careers by graduates from the automotive engineering department, such as: analysis of a coal power plant laboratory, heavy equipment operator, aircraft maintenance, few are self employed in the automotive sector (car repair, car buying and selling, car rental business).

Keywords: *Automotive engineering graduates, Types of jobs in the automotive sector, Career in the automotive sector.*

1. INTRODUCTION

The growth of the automotive industry has become a trend in the industrial sector which is one of the fastest growing sectors in the world, because the demand for vehicles continues to increase from year to year. This triggers an increase in the demand for workers in the automotive sector, and of course has an impact on the types of jobs and career paths available therein. The growth of the automotive industry has become a trend in the industrial sector and one of the fastest growing sectors in the world [1]. According to data from Statista, in 2020, world car sales will reach around 64.5 million units, and are expected to continue to grow in the future. Intense global competition: The automotive industry is a highly competitive industry, with many major players vying to

produce better and more innovative products. To be able to compete, automotive companies need a workforce that is qualified and has adequate capabilities, so that the types of work and career paths in them need to be considered carefully [2].

Human resources, technology and innovation are the main keys in the growth of the automotive industry. In addition, the development of electric vehicles, independent mobility and vehicle connectivity is also the latest trend showing rapid growth [3]. The development of automotive technology in recent years, and the automotive industry is experiencing rapid progress in terms of technology, such as electric cars, autonomous vehicles and more sophisticated security systems. This makes the types of jobs and career paths in the automotive sector more diverse and demands more

specialized and up-to-date skills. Besides that, social and environmental challenges, such as the issue of exhaust emissions and environmental impacts generated by vehicle production. This triggers the demand for a workforce that can overcome these challenges and create more sustainable solutions, so that the types of jobs and career paths in the automotive sector need to be adapted to these needs [4].

The automotive field includes the design, development, manufacture and sale of motor vehicles, as well as their servicing and maintenance. There are various kinds of jobs related to automotive, such as automotive engineer, automotive technician, automotive designer, automotive production manager, automotive market analyst, and many more. A good educational background in engineering, such as mechanical engineering, electrical engineering, civil engineering, or industrial engineering, can help someone to start a career in the automotive field. In addition, experience in production, manufacturing and sales can also be useful. In the automotive industry, technology is constantly evolving and innovation is always being carried out, therefore, jobs in the automotive field often require skills and knowledge that are continuously updated [5].

The aims of this research are to describe the types of jobs in the automotive sector and to record the types of jobs that have been entered and occupied by graduates of the automotive engineering department, as well as to find out the stages of career paths that can and have been achieved by graduates of the automotive engineering department.

1.1. Types of Jobs in the Automotive Sector

Job is a detailed description of the duties and responsibilities that must be carried out by a worker in a job position [6]. Work is a collection of tasks and responsibilities that must be carried out by someone who is given by an organization [7]. The automotive sector offers a wide variety of job and career opportunities, including in engineering, manufacturing, design, marketing, sales and customer service. These positions can be available in a variety of settings, such as original equipment manufacturer (OEM), supplier, dealer, or service center.

Some common job types in the automotive field include mechanics, electricians, software engineers, quality control inspectors, production supervisors, sales managers, marketing specialists, customer service representatives, and technicians. The job structure in the automotive field varies widely and includes areas such as engineering, manufacturing, design, marketing, sales, and customer service. Some common positions in the automotive sector include: a. Mechanical Engineer: Responsible for designing, developing and maintaining mechanical systems and components on vehicles; b.

Electrical Engineer: Responsible for designing, developing and maintaining electrical systems and components in vehicles; c. Software Engineer: Responsible for designing, developing and maintaining on-vehicle software, such as engine control systems and infotainment systems; d. Automotive technician: Responsible for carrying out maintenance and repairs on vehicles, including diagnostics, component replacement, and periodic maintenance; e. Production Supervisor: Responsible for supervising and managing production of vehicles in the factory; f. Sales Manager: Responsible for managing vehicle sales and achieving company sales targets [8].

1.2. Career paths and career development in the automotive field

Career is the series of professional experiences that a person goes through during his working life. Careers include jobs taken, education and training received, as well as achievements and experiences that have been achieved during work [9]. Career is a lifestyle in a job that an individual has throughout his life [10]. Career is a person's experience in adopting certain behaviors in work or activities taken in life {Formatting Citation}.

Career development is a series of actions taken by individuals to improve their abilities and competencies in their current job or to prepare themselves for future jobs. This includes career planning, skills development, education and training, as well as relevant work experience [12].

Career paths in the automotive field can vary depending on the company and specialization chosen by the individual. However, here are some general career paths in the automotive field: a. Technician A technician is responsible for carrying out the repair and maintenance of vehicles, such as cars and trucks. Technicians may have certification or special training in a particular field, such as machinery, electricity or electricity; b. Engineers Engineers in the automotive field design, develop and repair vehicles. Engineers can be involved in a variety of fields, such as machine design, materials technology, or vehicle electronics; c. Production manager Production managers in the automotive field are responsible for overseeing vehicle production, ensuring that vehicles are produced to a high quality, and ensuring that production targets are met [13]; d. Marketing managers Marketing managers in the automotive field are responsible for planning and executing marketing strategies for vehicles, as well as ensuring that vehicles are properly promoted and sold successfully [14].

Types of careers and career paths for graduates of vocational high schools majoring in automotive, namely: as: a. Technician This career path is suitable for graduates of automotive vocational schools who have technical skills, such as mechanics and technicians. The main task

of this position is to perform vehicle repairs and ensure that the vehicle is in good working order; b. Spare Parts, this career path is suitable for graduates of automotive vocational schools who have skills in logistics and supplies. The main task of this position is to manage the stock and inventory of vehicle parts [15].

Types of careers and career paths for automotive engineering graduates, namely as: a. Automotive Engineer, an automotive engineer is responsible for designing, developing and repairing vehicles. The duties of an automotive engineer include improving engine performance, increasing fuel efficiency, and developing new technologies in vehicles; b. Automotive R&D Manager, automotive R&D manager is responsible for planning, organizing and overseeing all research and development activities in the automotive field. His duties include developing and evaluating new designs and technologies in vehicles, as well as ensuring that these developments comply with established quality standards [16]; c. Automotive Consultant, an automotive consultant is a professional who provides advice to automotive companies on how to improve their business. His duties include market analysis, strategic planning and product development; d. Automotive Production Director The automotive production director is responsible for managing all production activities at the automotive factory. His duties include planning, organizing and supervising all production activities, as well as ensuring that vehicle production meets established quality standards [17].

Career paths in the automotive field for graduates of automotive engineering education are also quite diverse. Some career references that can be taken as a reference are as follows: a. Technical Service Engineer: As a technical service engineer, his job is to provide technical support to customers in repairing or maintaining vehicles. Graduates from an automotive engineering education degree can become technical service engineers and be responsible for solving technical problems on vehicles or providing advice on vehicle maintenance; b. Quality Control Inspector: As a quality control inspector, his job is to ensure that the vehicles or automotive components produced meet the specified quality standards. Graduates from an automotive engineering education degree can become quality control inspectors and are responsible for carrying out tests and analyzes to ensure these products meet requirements. c. Production Engineer: As a production engineer, his job is to ensure that the production of vehicles or automotive components runs smoothly and efficiently. Graduates of automotive engineering education can become production engineers and are responsible for optimizing production processes and reducing production costs; d. Technical Writer: As a technical writer, his job is to write technical documents such as user manuals, repair guides and technical specifications for vehicles or automotive components. Graduates of automotive engineering education with

good writing skills can become technical writers and help build quality technical documents; e. Sales Engineer: As a sales engineer, his job is to promote and sell automotive products. Graduates of automotive engineering education with good communication and interpersonal skills can become sales engineers and assist companies in marketing their products [18].

2. METHOD

The data used are in the form of qualitative data and quantitative data, in the form of interviews, field observations and document analysis, and are supported by survey data. The research sample was 93 respondents, consisting of 69 respondents. The research data was obtained using a survey method by sending questionnaires to the research sample respondents, and 24 respondents spread across 13 companies using interview and observation techniques, as well as document analysis.

Graduate data collection is carried out using a tracer study questionnaire, namely: a. Tracer study of 2022 bachelor degree graduates (graduates who are already working) with the filling link <https://forms.gle/34noSA5ygxVZHb939>; b. Tracer study of 2022 undergraduate graduates (graduates who continue their studies) with a filling link <https://forms.gle/dR19sX4haqWSGyUU6>; c. Tracer study of 2022 bachelor degree graduates (entrepreneurial graduates) with the filling link <https://forms.gle/kftPRmewmgN8r1iE9>; and D. Tracer Study Graduates 2022 S1 (Graduates Not Yet Working) Completion Link <https://forms.gle/QqwXHq3Tifci5n7N7> [19]. In addition, data was also used with the 2022 Study tracer UPT PKK Padang State University, UNP Career Development & Entrepreneurship Technical Implementation Unit, <https://uptpkk.unp.ac.id/forms/site/login/pid/ts-new> [20].

3. RESEARCH RESULTS AND DISCUSSION

The research data collected were 93 respondents, consisting of 69 respondents using the survey method by sending questionnaires, and 24 respondents spread across 13 companies using interview and observation techniques. For more details can be seen in table 1.

Table 1. Data on types of work and career paths for graduates of the automotive engineering department

No	Type of work and career path	Number of respondents	Percentage (%)
1	Mechanic (Technician)	26	27.96 %
2	Marketing (Sales)	12	12.90 %

No	Type of work and career path	Number of respondents	Percentage (%)
3	Training Instructor	15	16.13 %
4	Teacher (Educator)	40	43.01 %
	Total number	93	100.00 %

The results showed that there were several types of work that could be chosen and pursued as well as careers for graduates majoring in automotive engineering. Of the 93 respondents in this study, they could be grouped into four types of work and career paths, namely careers as mechanics (technicians), careers in sales (sales marketing), instructor training careers, and careers as teachers (educators), for more details can be seen in table 1.

Table 2. Data on mechanic job respondents and their career paths

No	Type of work and career path	Number of respondents	Percentage (%)
1	Mechanic	9	34.62 %
2	Mechanic team leaders	4	15.38 %
3	Chief mechanic	3	11.54 %
4	Service advisors	4	15.38 %
5	Head of the workshop	3	11.54 %
6	Service manager	3	11.54 %
	Total number	26	100.00 %

Referring to table 2, for graduates from the automotive engineering department who choose and pursue a job and have a career in mechanics, the career paths they will go through are: as mechanics, mechanic team leaders, mechanic heads, service advisors, workshop heads, and service managers. Based on research results, to pursue a job and career path as a mechanic to become a service manager for an automotive company requires a relatively long time, around 8-12 years, with details, as a mechanic for + 2 years, as a mechanic team leader for ± 2 years, as a service advisor for $\pm 3-4$ years, as head of a workshop for $\pm 3-4$ years, then can become a service manager [21].

Table 3. Data on vehicle sales marketing job respondents and their career paths

No	Type of work and career path	Number of respondents	Percentage (%)
1	Sales marketing during training	2	16.67 %
2	Sales marketing 1 (s1)	2	16.67 %
3	Sales marketing 2 (s2)	4	33.33 %

No	Type of work and career path	Number of respondents	Percentage (%)
4	Sales marketing 3 (s3)	2	16.67 %
5	Sales marketing supervisor	1	8.33 %
6	Marketing manager	1	8.33 %
7	Branch head	0	0.00 %
	Total number	12	100.00 %

Graduates majoring in automotive engineering can also pursue jobs and careers in car sales, as shown in table 3 career paths in sales, namely: sales marketing during training, sales marketing 1 (s1), sales marketing 2 (s2), sales marketing 3 (s3), sales marketing supervisor, marketing manager, and branch head. Based on research results, to pursue a job and career path as sales marketing to become the head of a branch of an automotive company requires a relatively long time of about 8-10 years, with details, as sales marketing during training for ± 4 months, as sales marketing 1 (s1) for ± 1 year, as sales marketing 2 (s2) for ± 2 years, as sales marketing 3 (s3) for ± 2 years, as a sales marketing supervisor for ± 2 years, as a marketing manager for ± 2 years, then you can apply to become branch head [22].

Table 4. Data on respondents' job training instructors and their career paths

No	Type of work and career path	Number of respondents	Percentage (%)
1	Training instructor	7	46.67 %
2	Head of training instructor	4	26.67 %
3	Training manager	1	6.67 %
4	Head of Human Resource Development (HRD) division	2	13.33 %
5	HRD Manager	1	6.67 %
	Total number	15	100.00 %

Jobs and career paths as training instructors in the automotive sector can be chosen and occupied and used as careers for graduates majoring in automotive engineering, as shown in table 4, with career paths as follows: training instructor, head of training instructor, training manager, head of division the Human Resource Development (HRD), and HRD manager. Based on research results, to pursue a job and career path as a training instructor to become an HRD manager for an automotive company takes a long time, around 8-12 years, with details as a training instructor ± 2 years, as a head training instructor for ± 2 years, as a manager training for $\pm 3-4$ years, as head of the HRD division for

± 3-4 years, then you can be proposed to become an HRD manager [23].

Table 5. Data on teacher (educator) job respondents and career paths

No	Type of work and career path	Number of respondents	Percentage (%)
1	Teacher	14	35.00 %
2	Head of the workshop	4	10.00 %
3	Head of departemen	3	7.50 %
4	Vice principal of school	4	10.00 %
5	Head master of school	8	20.00 %
6	School superintendent	6	15.00 %
7	Head of education offices	1	2.50 %
	Total number	40	100.00 %

Referring to table 5, for graduates from the automotive engineering major who choose jobs and have careers as teachers (educators), the career paths they will go through are: as teachers, heads of automotive repair shops, heads of departments, vice principals, principals, school supervisors, and the head of education at the provincial or district/city education office. Based on the results of research to pursue work and career paths as a teacher to become head of education, it takes a relatively long time, around 12-20 years of service, however, the results of the study not all teachers can reach the level of head of school or head of education, but there are some who succeeded in becoming school supervisors, and some became school principals and only a few could become heads of education [24].

As one of the leading automotive companies in Indonesia, Toyota Astra Motor (TAM) provides various career paths in the automotive field. The following are several career paths at Toyota Astra Motor and their references: Production Engineer: As a production engineer at Toyota Astra Motor, his job is to oversee the vehicle production process and ensure that production runs smoothly, efficiently and in accordance with specified quality standards. Quality Control Engineer: As a quality control engineer, his job is to ensure that the vehicles manufactured by Toyota Astra Motor meet the specified quality standards. Sales Engineer: As a sales engineer at Toyota Astra Motor, his job is to promote and sell the vehicles the company produces to consumers. After Sales Service Engineer: As an after sales service engineer, his job is to provide an explanation of vehicle specifications [25].

Astra Daihatsu Motor provides various career options in the automotive field. The following are several career paths at Astra Daihatsu Motor and their references: Production Engineer: As a production engineer at Astra Daihatsu Motor, his job is to oversee the vehicle

production process and ensure that production runs smoothly, efficiently and in accordance with specified quality standards. Quality Control Engineer: As a quality control engineer, his job is to ensure that the vehicles manufactured by Astra Daihatsu Motor meet the specified quality standards. Sales Engineer: As a sales engineer at Astra Daihatsu Motor, his job is to promote and sell the vehicles the company produces to consumers. After Sales Service Engineer: As an after sales service engineer, his job is to provide after sales services to consumers, such as vehicle maintenance and vehicle repair. Research and Development Engineer: As a research and development engineer, his job is to carry out research and development to create new technologies and improve vehicle performance [26].

Astra Honda Motor (AHM) is an automotive company that manufactures Honda motorcycles in Indonesia and is a subsidiary of Astra International and Honda Motor Co., Ltd. The following are several career paths at Astra Honda Motor: Production Operator This career path is suitable for employees who have technical and production skills. The main task of this position is to produce Honda motorcycles with an efficient and high quality production process; Quality Control This career path is suitable for employees who have expertise in product quality control. The main task of this position is to ensure that the Honda motorcycles produced meet the specified quality standards; R&D Engineer This career path is suitable for employees who have skills in engineering and research. The main task of this position is to develop and improve Honda motorcycle products through technology research and development; Marketing This career path is suitable for employees who have skills in marketing and sales. The main task of this position is to promote and market Honda motorcycle products to consumers; Supply Chain This career path is suitable for employees who have skills in logistics and inventory. The main task of this position is to manage the supply chain and inventory of raw materials to produce Honda motorcycles [27].

4. CONCLUSION

Based on the results of the analysis and discussion, there are several types of work that can be chosen and occupied as well as career paths for graduates majoring in automotive engineering, which can be grouped into four career fields, namely: technician (mechanic), sales marketing, training instructor, and Teacher. For a career in mechanics, the career paths are: mechanic, mechanic team leader, mechanic chief, service advisor, workshop head, and service manager. Career paths in sales, namely: sales during training, sales marketing 1 (s1), sales marketing 2 (s2), sales marketing 3 (s3), sales supervisor, marketing manager, and branch head. Career paths in the field of instructor training, namely: training instructor, head instructor, instructor manager, head of the HRD

division, and HRD manager. Career paths as a teacher, namely: teachers, heads of automotive repair shops, heads of departments, vice principals, school principals, school supervisors, and heads of the education sector (head of education) in district/city or provincial education offices. In addition to the four fields of work and career paths, there are several other types of work, which are also chosen and made careers by graduates from the automotive engineering department, such as: analysis of a coal power plant laboratory, water treatment of a paper mill, heavy equipment operator, aircraft maintenance, and others. few are self-employed in the automotive sector (car repair, car buying and selling, car rental business, and others). This research underlines that there are several types of jobs and career paths that can be chosen and entered and occupied by graduates of the automotive engineering department, which can be used as career paths in their work.

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