Artificial Intelligence (AI)

[Name of the Writer]

[Name of the Institution]

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**Introduction**

Artificial Intelligence is a branch of Computer Science that deals with the simulation of intelligent behavior in computers. It has revolutionized the field of Computer Science by producing robots of many simple and complex types. Robotics is the scientific discipline that is responsible for producing robots, but their cognitive aspect is related to AI. Therefore, the engineers of Robotics and AI work in integration to produce robots of cognitive capability. Artificial Intelligence is orthodoxly related to installing human cognition in computers as much as possible. It is one of the latest technologies in the contemporary world. A person who works in this field is called an Artificial Intelligence Engineer. The average salary of AI engineers is 110,000 USD per annum. An AI engineer enters the industry as a graduate having particular abilities regarding this field i.e. basic knowledge about programming, software, linear algebra, calculus, and statistics. An AI engineer is expected to have more capabilities than just technology-related knowledge, therefore he acquires these capabilities by getting enrolled in a Master's Program or joining a professional company (Russell, & Norvig, 2016). The following details discuss the qualifications of the people working in or the need for Artificial Intelligence.

**Body**

 Qualifications of a person are required to meet the expectations of a particular job, if he/she can meet the requirements or fulfill those requirements, s/he is considered qualified for that job. Therefore, before deciding someone’s qualifications, it is essential to determine his duties and responsibilities. An Artificial Intelligence Engineer has the following **roles and responsibilities** that s/he is supposed to fulfill effectively in his designated area to be a successful member of the AI community:

* The study and transformation of Data Science Prototypes
* The research and implementation of the Appropriate ML algorithms and AI tools
* The development of Machine Learning Applications
* The selection of Datasets and Data Representation Methods
* The training and restraining of systems when needed (Jarrahi, 2018).

Apart from that, an AI engineer should be well equipped to work efficiently with Electrical Engineers and Robotics Team, and s/he should stay updated about all the developments in the field to be a successful Artificial Intelligence Engineer (Ghahramani, 2015).

**Qualifications of the People Working in AI**

Being one of the latest technologies and having a wide scope, AI offers high profile jobs to its employees. Therefore, when a person wants to become a formal part of this field, it requires some prior abilities and capabilities so the employee would be able to meet the expectations of this field and will not spoil any project (Munich, 2017). The fundamental requirement of AI is a Bachelor’s degree from a recognized university in subjects like Computer Science, Mathematics, Information Technology, Statistics, Finance, or Economics. The noted subjects enable a person to comprehend and run simple operations at the computer. All these disciplines make a person eligible enough to learn the advance knowledge of Artificial Intelligence (Jarrahi, 2018). Artificial Intelligence engineers need knowledge of some extra skills to become successful in this file. The required skills are categorized into two types:

* + - 1. **Technical Skills**

Being a technical field, Artificial Intelligence demands from its employees (engineers) the knowledge of some technical skills. Theoretical and practical knowledge about these topics is essential for an Artificial Intelligence engineer:

1. Software Development Life Cycle
2. Modularity, OOPS, Classes
3. Design Patterns
4. Statistics and Mathematics
5. Machine Learning
6. Deep Learning & Neural Networks
7. Electronics, Robotics, and Instrumentation (Not a Mandate)

An engineer having the knowledge of these topics should also have command over the following skills:

1. **Programming Languages (R/Java/Python/C++)**

Artificial Intelligence literacy means the full command over programming languages like Java, Python, and C++. Some people rely on only Python, but you should know that the more knowledge about the field will widen your scope. Artificial Intelligence requires the most updated and knowledgeable engineers.

1. **Linear Algebra/Calculus/Statistics**

Matrices, vectors and matrix multiplication are also popular terms in Artificial Intelligence. AI engineers know their use and application. Models like the Hidden Markov Model, Gaussian Mixture Models and Naïve Bays are generally known by AI engineers.

1. **Applied Math and Algorithms**

Algorithm theory and its use is the part of an AI engineer’s knowledge. Subjects such as Gradient Descent, Convex Optimization, Lagrange, Quadratic Programming, Partial Differential equation, and Summations are discussed in Artificial Intelligence and people show their expertise in these subjects (Munich, 2017).

1. **Neural Network Architectures**

Artificial Intelligence is the mimicry of human intelligence. Human intelligence has a complex neural structure that is the subject of the Biologists and the Psychologists. The AI engineers are scientists or doctors of computer, therefore, they work on a computer neural structure. The term of Machine Learning is used to analyze computer intelligence or Artificial Intelligence (Jarrahi, 2018).

1. **Language, Audio and Video Processing**

An AI engineer has a permanent communication with codified material. All the computer material appears as text, audio or video. Artificial Intelligence engineers cannot work if they have not the command over Gensim, NLTK and techniques like word2vec, Sentimental Analysis, and Summarization. Therefore, every AI engineer is supposed to have full command over these skills (Strohmeier, & Piazza, 2015).

* + - 1. **Business Skills**

 Business Skills are another essential quality of an Artificial Intelligence Engineer. Globalization has shrunk the world and Information Technology has played an important role in it. Now, only a multi-talented person has a scope in this age of competition. Artificial Intelligence demands all qualities from production to promotion and selling of ideas (goods) in one person (Munich, 2017). Artificial Intelligence engineers should know the following business skills:

1. Analytic Problem-Solving
2. Effective Communication
3. Creative Thinking
4. Industry Knowledge.

**Analytic Problem-Solving**

This capability helps the AI engineer to cope with technical and non-technical issues that occur randomly. The way of working in AI is different from the traditional workplace where the technical staff is concerned only with producing the items and those items are sold by the marketing staff. AI engineer works on new ideas that he/she thinks that are the demand of the society. Although s/he works on new ideas, different complexities create a challenge for him/her that s/he has to solve at his/her own (Strohmeier, & Piazza, 2015). Therefore, the people working in AI are trained for such circumstances.

**Effective Communication**

 Effective Communication is essential to deal with a variety of clients and to work in an organization. The 21st century is typical in challenging traditional techniques and strategies in almost every field including business. Communication skills help AI engineers to explain the worth of the ideas and products that they produce or introduce in the industry. AI engineers are taught effective communication skills with special consideration because neither they can sell their products to clients nor they can deliver their ideas to their colleagues and boss without this capability.

**Creative Thinking**

Variety and diversity are the only things that attract the client in this smart world. An AI engineer cannot rely upon set ideals and defined truths about market or business. This is the reason that AI engineers know the mental drills that can help them to do the job more effectively. Brainstorming and other mental drills are used to critically analyze the techniques to do the business in a better way (Munich, 2017).

**Industry Knowledge**

 Industry Knowledge is key to business. It has two faces; one indoor and the other outdoor. Indoor means that AI engineers do not show indifference to the operations and trends in their related industry, and they stay updated. Outdoor means that they know the market trends. No one can be a successful business person unless s/he has full command over industry trends and directions in the market. Artificial Intelligence requires its employees to have in-depth knowledge of the industry to sell the items successfully (Strohmeier, & Piazza, 2015). Social media surveys and many other techniques are used to know the industry trends.

Artificial Intelligence engineers qualify for the job in the field after having full command over all the above skills plus the prescribed academic qualification. Some people enroll in the Master's program to learn these skills whereas, others join industries to get qualified for Artificial Intelligence. The aspirants of Master’s degree can choose one degree from Data Science, Machine Learning (i.e. Edureka’s Machine Learning Engineer Masters Program), or Computer Science.

**Conclusion**

Artificial Intelligence, as its name refers, is a deliberate attempt to install cognitive capability in a computer. There have been given many attempts that have proved partially successful too. Automated machines and talking robots are manufactured with the collaboration of AI engineers, Electric Engineers and Robotics engineers. AI engineers are the people who work in Artificial Intelligence and do experiments as well. Artificial Intelligence engineers have a minimum Bachelor's degree qualification in the disciplines like Information Technology, Mathematics, Statistics, Economics, or Finance before they apply for a job in this field. Academic qualification is not enough to be a successful Artificial Intelligence engineer rather many additional skills are the requirements of this field which are but not only, programming skills and language, mathematical capabilities, command on networking as well as business, analytical, communication skills and industry. Hence, while defining the qualifications of the people working in or needed in Artificial Intelligence, we say that if one has the above mentioned skills and competencies, then he/she can hope to become a successful engineer in the field of Artificial Intelligence.

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