

The Impact of Artificial Intelligence on the Job Market and Workforce

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Abstract- A revolution is about to take place in the world of work as a result of the existence of artificial intelligence (AI) and the automation of employment. On the other hand, this might put a damper on human potential in terms of career opportunities. This study was carried out to investigate the impact that artificial intelligence (AI) and automation would have on human employment. A descriptive qualitative methodology will be used in the course of conducting this study. The data that was utilised in this study came from a variety of research outcomes and earlier studies that continue to examine the use of artificial intelligence and automation in the working environment. According to the findings of this research, AI and automation are presently taking the place of many employment. However, there are aspects of human intellect that are difficult for AI to replicate, such as intuition and empathy. These aspects are still in the process of being developed. Even though the existence of artificial intelligence and automation poses a potential risk to humans working in the workforce, the increase in human resource skills will ensure that humans who are able to adapt will not be replaced by machines. Instead, there will be an integration of human and machine labour, in which AI and automation do not replace humans but rather serve as tools for human work.

Indexed Terms- Artificial Intelligence, Automation, Work, Humans.

I. INTRODUCTION

Over the last two decades, there have been significant advancements made in artificial intelligence (AI) as well as automation. When it comes to artificial intelligence, this technology is fast expanding, and it is anticipated that it will bring about fundamental changes in the way things function all around the

globe[1]. AI refers to the technology or software that may display intelligent behaviour similar to that of a human being. The goal of developing AI is to construct computer systems that are capable of imitating human intellect and carrying out specified activities without the need for human interaction. Despite the fact that this technology promises to make work simpler and more efficient, there is a significant level of worry among those who are employed about this new technological trend, according to studies conducted in the area of human resources. They are worried about how the automation of jobs would affect both the labour market and overall productivity. On the other hand, there are some economists who believe that this new technical advance will result in the creation of new employment. This is because there is a growing need for qualified individuals who are able to run and maintain more complex AI and automation systems [2].

In addition to artificial intelligence, information technology is also seeing significant advancements. These developments have prompted some people to suggest that the fourth industrial revolution has altered the boundaries between the physical, digital, and biological spheres [3]. The proliferation of information technology and artificial intelligence has been extensively reflected in the kinds of services provided by a great number of businesses and organizations [4]. For instance, boring and repetitive human labour are gradually being replaced by robots in a variety of industries, including health care, hospitality, and food service . Virtual bots, also known as chatbots, are gaining popularity among major businesses as a means of transforming customer care into a kind of self-service and of assisting in the reduction of the waiting time that is often associated with human customer support[5]. In addition, artificial intelligence (AI) solutions based

on big data are increasingly being utilised to take the position of investment portfolio managers in the decision-making process about investments. According to Wirtz et al.'s research from 2021, social robots, also known as social bots, are becoming more popular as a replacement for a portion of customer care and are increasingly being employed by businesses to assist in answering frequently asked questions and providing answers to issues encountered by consumers[6].

Concerns over the future of human labour have been stoked by the development of artificial intelligence and automation technologies that can do some of these occupations. This is because artificial intelligence (AI) is becoming more capable of doing jobs that were previously exclusively capable of being done by humans[7]. It is possible that the influence of automation and the usage of AI in many industries would limit the number of jobs that are now accessible, particularly in tasks that are repetitive and readily mechanised. In the past, positions that required technical expertise were thought to be immune to the effects of automation; examples of such jobs include data analysts and programmers[8]. However, experts believe that the increasing complexity of AI will make these types of employment vulnerable to automation[9].

After providing a concise description of its purpose above, the purpose of this study is to investigate how the advancement of artificial intelligence and automation in the future would influence human employment[10].

- Automation

Automation, also known as robotization, industrial automation, numerical control, and self-study, is the process of replacing human operators of industrial equipment and process controls with automated systems that are controlled by control systems such as computers. Automation comes from the Greek word for "self-study." Humans carry out the concept of permanent mechanisation of industrial machines as operators by placing machines as assistants following physical work demands[11]. This results in a massive decrease in human needs as sensors as well as concerns work mentality. Industrialization itself is a stage in the implementation of mechanisation. Industrialization is a stage in the implementation of

mechanization[12].

The Meaning of the Term "Automation" Automation is a type of technology that increases productivity, efficiency, and flexibility by combining the application of mechanics, electronics, and computer-based systems through processes or procedures that are typically arranged according to an instruction programme and combined with automatic control (feedback) to ensure that all instructions have been carried out correctly[13]. The Ford Motor Company in Detroit is credited with being the first to adopt the term automation. This word is used to describe the process of transforming a collection of machine tools and mechanical devices into an uninterrupted production line[14].

According to Santoso, automation is a procedure that automatically controls the functioning of a tool. This process has the potential to replace the role that people play in monitoring and making judgements[15]. According to Santoso et al.'s research from 2020, the current control system is beginning to transition towards control system automation[16]. This means that very little human interaction is required in the controlling process[17]. An equipment system that is controlled automatically is much more convenient than a system that is controlled manually since it is more effective, safe, and comprehensive than the manual system[18]. Then Ghifari stated that automation is a discipline of science that requires its users to transform manual machines to automated ones so that automation may simplify current living activities[19]. Ghifari's argument was based on the idea that automation can make life easier[20].

It is possible to draw the conclusion that automation is one of the realisations that have resulted from improvements in technology[21]. Automation is an alternate method of achieving a functioning system that is quick, accurate, effective, and efficient, which allows for more ideal outcomes to be reached[22].

- Employment

According to the traditional point of view, the human element is the single most important component that determines the level of a nation's prosperity. This is due to the fact that nature (land) is of little value if

there are no human resources that are able to digest it in a manner that is beneficial to life[23]. In this particular scenario, Adam Smith's classical theory acknowledges the fact that the driving force behind economic progress is the effective use of available human resources. To continue the expansion of the economy when it has already reached a certain level, extra (physical) capital must be accumulated. To put it another way, the effective management of the available human resources is essential to the development of the economy[24].

Following in the footsteps of Adam Smith as a prominent figure in the history of classical economic thought and one who made significant contributions to the expansion of economic ideas is Thomas Robert Malthus[25]. The Principles of Population is perhaps the most well-known book that Malthus wrote[26]. It is clear from reading the book that not all of Malthus' theories were in line with Adam Smith's, despite the fact that Malthus was considered to be one of Smith's disciples. Smith, on the one hand, is pessimistic about the possibility that the division of labour and specialisation would ever have a positive influence on the welfare of humans. Malthus, on the other hand, had a negative outlook towards the future of mankind[27]. It can be shown using numbers that land is one of the most important factors in productivity. The development of residences, industries, and various other structures, in addition to roadways, has often resulted in a reduction in the total amount of land that is suitable for agricultural use. Malthus believed that the growth of the human population was significantly outpacing the increase in agricultural output necessary to satisfy human needs[28]. Malthus was not of the opinion that technological advancement could keep pace with population growth; as a result, he was of the opinion that population control was essential. This is something that Malthus refers to as a moral constraint[29].

An economic system that is built on the resilience of the market mechanism will inevitably arrive to a state of equilibrium, as stated in the classics. When we are in a balanced position, we will fully use all of our resources, including our labour force[30]. Therefore, there is no such thing as unemployment in a system that is built on the dynamics of the market. When

there are no jobs available, people are more prepared to take lower-paying jobs in order to avoid having no income at all. This individual's willingness to accept a lower pay will inspire companies to recruit other people with this attitude towards employment[31].

John Maynard Keynes had a number of issues with the classical economic model, one of which was that there was no automatic adjustment mechanism to guarantee that the economy would reach equilibrium while it was operating at full employment[32]. The above traditional understanding of how the labour market works does not, in fact, accurately reflect how the market really works. Wage rates will be cut anywhere that employees are represented by a labour union in an attempt to safeguard the interests of those workers. It is possible that people's income levels will decrease even if the wage rate is dropped. A drop in the income of certain members of society will lead to a decline in the buying power of the general population, which will result in a decline in the overall level of consumption[33]. A fall in prices is likely to result from a reduction in the population's overall buying capacity.

Employers use the marginal value of the labour productivity curve as a standard for determining whether or not to hire employees; if prices fall, its value will decline as well[34]. In the event that the price cut is insignificant, the productivity-value curve will only slightly incline downward. However, the number of extra employees is not yet sufficient to match the number of workers that are available[35]. Even worse, if prices fall, the marginal productivity value curve of labour will fall as well. This would result in fewer employees being able to find work, which will lead to widespread unemployment.

II. OBJECTIVES

1. To study artificial intelligence on the job market and workforce
2. To study artificial intelligence

III. METHOD

A qualitative methodology will be used in the course of conducting this study. The descriptive approaches will be used to conduct the analysis of the research

data[36]. The data that was utilised in this study came from a combination of the findings of earlier studies as well as studies that still have relevance to the subject matter of this research. After the data for the study have been gathered, they will be analysed right away so that the findings of this study may be discovered[37].

IV. RESULT AND DISCUSSION

- Human Intelligence in AI

When it comes to the sorts of work in service firms that may be done by artificial intelligence (AI), the workforce has to possess four different categories of human intelligence in order to be successful. These types of intelligence include mechanical intelligence, analytical intelligence, intuitive intelligence, and empathic intelligence[37].

The first kind is known as artificial or mechanical intelligence. The ability to do tasks that are repetitive or routine automatically is what is meant by the term "mechanical intelligence." Because mechanical operations have been carried out so often, it is possible to finish them with little or no high-level thinking[38]. This means that workers are not required to innovate as much while carrying out mechanical operations. The majority of workers in the machine intelligence industry are unskilled workers who do not need any further education or training to do their jobs[39]. Waitressing and working in contact centres in telecommunications, transportation, and financial service organisations are both examples of jobs that need a significant amount of mechanical expertise. The mechanical artificial intelligence that is used by service organisations is designed with restricted learning and adaptation abilities to maintain consistency. This is done in order to emulate human-like automation[40]. One of the most widespread examples of artificial intelligence in action is seen in robots. Service robots are technologies that are able to carry out physical duties, function autonomously without instructions, and are controlled by computers without the participation of a human operator[41]. A priori knowledge and continuous sensor perception are used by robots in order for them to recognise and react appropriately to both temporal and spatial changes that occur inside the service environment. Although

mechanical artificial intelligence offers relative consistency advantages over humans (such as being free from human weariness and reacting to the environment in a relatively consistent fashion), robots do not grasp the world, and not all robots are capable of automatically adapting to their surroundings[42].

The second kind of intelligence is an analytical one. The capacity to analyse information in order to solve issues that need information processing, logical thinking, and mathematical abilities is what we mean when we talk about analytical intelligence. Workers in the service industry, such as data scientists, accountants, and financial analysts, are known to display a high level of human analytical intelligence (Ponomareva, 2021). This level of intelligence is often the result of training, knowledge, and cognitive specialisation. The ability of humans to analyse data critically is being supplanted by AI-based tools and mechanisms such as machine learning and data analytics. Because of its capability of carrying out complicated activities in a way that is methodical, consistent, and predictable, it is extensively utilised in businesses that have features that are data- and information-intensive[43]. This methodical quality makes it simple for marketing departments in the business sector to carry out mass customization based on large amounts of consumer data. This benefit is directly related to the world of work.

The third kind of intelligence is intuitive intelligence. The ability to think imaginatively and successfully adjust oneself to new circumstances is a sign of intuitive intelligence. According to Hallo and Nguyen (2022), this kind of intelligence is referred to as wisdom and is founded on both holistic thinking and experience. positions in the service industry that demand intuitive intelligence include senior travel agents, marketing managers, management consultants, attorneys, and physicians. In addition, sales managers and management consultants are examples of positions that require intuitive intelligence. In the field of artificial intelligence (AI), intuitive intelligence is one of the human aspects of intelligence that is still being perfected to be replicated. This is due to the fact that the role of self-awareness, unique sensations, and experiences dominates the role in the creation of instincts that drive intuitive intelligence. Work that is difficult,

creative, holistic, contextual, and experience-based often falls under the purview of a company's customer relationship management (CRM) or investment management department, both of which make use of AI-based chatbots and trading software such as Tech Trader. In the world of work, this sort of labour is known as "complex work."

The fourth kind of intellect is empathy. The ability to recognise and understand the emotions of others, respond appropriately emotionally, and influence the emotions of others is referred to as empathic intelligence. This ability encompasses interpersonal, social, and people skills that enable humans to be sensitive to the feelings of others and to collaborate effectively with others (van Kleef & Côté, 2022). Negotiators, psychiatrists, psychologists, and consultants are just few of the professions that involve social skills (communication, interaction, and relationships), expertise in understanding consumer emotions, and the ability to provide solutions to their issues. Empathic intelligence is required for these types of positions. This intelligence cannot be easily broken down into elements and binary computational processes due to the inability of AI to empathise with human emotions. As a result, empathic AI has become the most advanced generation of AI technology available today, as demonstrated by bots like Replica and Sophia that look and behave like humans[44].

- Stages of Job Replacement by Artificial Intelligence

At the beginning of the process, mechanical AI takes the role of regular, repetitive service tasks (mechanics), providing benefits in terms of cost-effectiveness and consistency. Therefore, at this point in time, AI is starting to replace routine duties on a big scale. Sawhney made the observation that the most talented persons have been able to keep their employment even if manufacturing has replaced repetitive manual occupations. Therefore, in order for employees to progress into jobs demanding a higher level of intellect and abilities, they need to improve their skills[45].

In the second stage, AI will replace the analytical intelligence that human employees now have as their competitive advantage. At this point, AI is capable of

replacing both analytical and mechanical labour. At this point, AI is capable of completely replacing human intelligence in the completion of regular labour and can provide assistance in decision-making via analytical intelligence[46].

In the third stage, artificial intelligence (AI) starts to take over labour that is mechanical, analytical, and intuitive in nature. At this point, AI not only takes over work that is routine and conducts data analysis for decision-making, but it also makes judgements that are adaptable to their surroundings and based on their interactions with people. In addition, the intuitive intelligence that is recorded in the brains of employees (humans) is often needed to finish work or make judgements that require reconnection with prior experiences, which is not always captured in big data. Big data can only collect a limited amount of client information thanks to the integration of microchips, software, and sensors into AI gadgets. Therefore, the development of high-level AI is being geared towards making it more intuitive by capturing different languages and expressions of consumers in order to assemble questions that will assist deliver answers that are tailored to the requirements of individual customers[47].

The fourth level of artificial intelligence involves replacing labour that is mechanical, analytical, and empathetic. Back-end developers may benefit from emotional insights provided by sympathetic AI systems, which can improve both the user experience and the level of engagement with the product. Affectiva, for example, monitors what customers are saying as well as how they are feeling by measuring and analysing human expressions and classifying them into emotions like as sorrow, pleasure, worry, and joy. This information may be utilised to better serve customers. Therefore, employees will be able to provide the proper response, and the company will be able to provide the relevant service at the appropriate time[48].

The fifth and final step is artificial intelligence, which totally supplants human labour due to its ability to duplicate all forms of intellect. This application of AI might take the form of machines serving people, with AI completing duties and labour that humans do not want to undertake so that humans can pick the tasks

and employment they want to keep and have a greater quality of life overall. A second approach of implementation involves integrating humans in some way, either physically or physiologically, with robots that are powered by AI. The relationship between the human brain and the Internet of Things (IoT) networked with AI is shown by the concept of "internet of brains," in which people use their own brains to control how they use the internet. These situations imitate AI networking for collective intelligence, which significantly speeds up the learning process in settings that are associated with service enterprises.

- **Replacement of Human Intelligence by AI**
Industries are being disrupted as a result of the rise of automation and artificial intelligence (AI), which will ultimately lead to increased productivity and the expansion of the economy. The nature of labour itself, as well as employment itself, will undergo parallel transformations as a consequence of these technological developments. This technology has made a broad variety of goods and services more valuable, and companies in the service sector use it in a number of different ways to personalise product recommendations, detect production anomalies, identify fraudulent transactions, and more. Among the most recent developments in artificial intelligence (AI) that are being made are enhancements to techniques that solve classification, estimation, and grouping challenges. The use of artificial intelligence to do tasks traditionally performed by humans has advanced to the third stage of development, which indicates that AI can now imitate mechanical, analytical, and intuitive intelligence. The jobs that have been eliminated include those in the health care industry (robots for checking blood samples, delivering food and medicine to Covid-19 patients), in the financial sector (AI-based software services for data selection of prospective debtors and assessment of investment portfolios), in the tourism and hospitality industry (customer service and ticket booking), and in the financial sector (AI-based financial software services for data selection of prospective debtors and assessment of investment portfolios)[49].

The limits of artificial intelligence may be broken down into two categories: those that are technical in

nature, such as the requirement for vast amounts of training data, and those that are more philosophical in nature, such as the difficulty of generalising algorithms across many kinds of services that demand intuitive and sympathetic decision-making. The capacity of organisations to embrace AI technology is another obstacle that must be overcome when putting artificial intelligence into practise. This includes features like human data sources, the availability of big data, hardware, and software. Because of their predictable and organised environments, as well as their widely available data collecting and processing, the banking sector, the healthcare industry, and the telecommunications industry are leading the charge in the adoption of artificial intelligence. The expenses of implementation, the dynamics of the labour market, the quantity, the quality, pay connected to the supply of labour, corporate culture, and societal acceptability are some other aspects. As a direct consequence of this, artificial intelligence (AI) systems are progressively embracing at least some level of automation, as computers increasingly augment human labour. For instance, an artificial intelligence programme that is able to effectively read diagnostic scans may aid medical professionals in evaluating patient cases and determining the most relevant therapies. Job replacement AI is causing a shift in the demand for stage 4 jobs, which require analytical, intuitive, and empathic intelligence with activities that are difficult to automate. Some examples of stage 4 jobs include managers, healthcare professionals, and technologists. AI is also causing a shift in the demand for jobs that take place in unpredictable physical environments, such as residential plumbing services. As a consequence of the adoption of artificial intelligence in the workplace (stage 5), workflows and workplaces will continue to evolve, which will make it possible for people and robots to collaborate. For example, before self-checkout devices were made available in retail establishments, cashiers were permitted to help customers with the checkout procedure in the event that the technology malfunctioned[50].

- **Job Replacement AI In Employment**
AI technology has achieved level 3 of job replacement, which means it is capable of replacing mechanical, analytical, and intuitive labour. When

seen from the perspective of human intellect, AI technology has reached this level. In industries that rely on customer service interactions, such as hotels, cruise ships, and airports, autonomous AI is used for routine and repetitive mechanical tasks. Some examples of these tasks include using telephone voice recognition to automate service delivery, utilising process technology to streamline service processes, and providing consistent services, such as pepper, a humanoid robot with facial recognition capabilities. Workers in service industries, where the analytical function is being phased out, have an opportunity to keep their positions by developing their intuitive abilities. For instance, front-end developer services, which include developing displays or applications through HTML, CSS, and Javascript, require analytical skills that AI can replace. On the other hand, more complex services, such as ensuring that websites and applications can continue to function properly, require more intuitive intelligence (stage 3). Another illustration of this may be seen in hospitals, where neural network image identification powered by AI has the potential to replace the job of dermatologists in the classification of skin cancer and the kind of therapy that should be administered using mechanical-analytical intelligence. In the meanwhile, a hotel in the United States that has introduced a customer application that can be used to access hotel doors and personalise entertainment and room service amenities is an example of intuitive intelligence. Another example of this would be a chatbot at an online store that is pre-programmed with a buyer-seller messaging feature and is backed up by an enormous database. Its functions include not only assisting buyers and sellers but also providing answers to queries posed by consumers (with a response time of less than 30 minutes for 24 hours). Similar to how utilising AI in investment management businesses may give recommendations for trading choices based on historical data, patterns, and decisions to provide the proper trading or investment decisions, AI can also be used to make investment judgements.

According to the findings of a number of research, the development stage of empathetic intelligence is still in its early stages and needs additional refining. For instance, the study conducted by Xiao and Ding indicates that artificial empathy necessitates a model-

based approach in order to infer the interior states of customers (cognitive, emotive, and physical) based on information (audio, video, or other plentiful media). An example of this would be the use of artificial intelligence (AI) in conjunction with face-mapping to conclude consumer reactions and recommend them to businesses in order to determine interesting things to include in advertisements in order to attract more consumers and revenue; another example would be an experimental technology for medical services that connects the brains of paralysed people to mechanical devices using implants or brain monitors in order to assist them in writing and moving using only their minds; this would allow them to move and write using only their thoughts. When used from the task level rather than merely the job level, artificial intelligence has the potential to be more successful in enhancing corporate productivity and performance, as may be deduced from the findings of the aforementioned study. This will allow the firm time to prepare for the phase of transition to automation, which will be less destructive to personnel and more cost-effective for the organisation overall as a result of rationalising the workforce. For instance, businesses could think about integrating AI if they examine the following factors:

- a. The specifics of the activity. Initially, artificial intelligence will be able to take over jobs that need less intellect. There will be less need for unskilled labour in proportion to the number of tasks that can be replaced by AI.
- b. The character of the service. Transactional services that are regular, repetitive, and have homogenous customer preferences will be more successfully substituted by AI technology in the near term, but relational services will still need a human workforce that is more perceptive and empathic. It will be difficult for artificial intelligence to fully replace services that need contact with humans.
- c. The strategic focus of the corporation (generally, the strategic focus of businesses). Companies that use a cost leadership resources strategy will use AI, while companies that use a quality leadership resources strategy will focus on increasing human capital capabilities so that AI does not replace them. This is due to the fact that AI applications tend to be driven by considerations of lower operational costs in the long term.

Therefore, the managerial consequence for businesses in the service sector is the need to redesign workflows and workspaces so that they are compatible with the era of AI. This presents both an opportunity and a problem in terms of establishing a culture, standard operating procedure (SOP), integrated work environment, and AI optimisation training for different kinds of work that can be done efficiently and safely. As work becomes more collaborative and calls for non-hierarchical decision-making, it is reasonable to anticipate that company organisations will undergo changes. When using corporate data, one must constantly keep in mind the need of protecting customer privacy as well as company data. Service providers may get a head start on integrating artificial intelligence by improving the connectedness of their human resources with collective intelligence. Collective intelligence refers to the capacity of individuals working inside an organisation to exchange information, think and behave in unison, and work in concert with one another to accomplish organisational objectives.

- Adaptation of Work Skills in the Age of Artificial Intelligence

Workers have an obligation to acquire the appropriate skills in accordance with the requirements of the industry and to have an understanding of the types of intelligence that businesses need to adopt job-replacing AI. According to the findings of a number of research, service providers need to give business analytics training in decision-making and concentrate on building analytical abilities through optimising AI-based machine learning. The development of analytical decision-making abilities need to place an emphasis on imaginative and intuitive reasoning as well as empathic understanding while analysing facts. The underlying theory and applications in dynamic individual and organisational development techniques have been shown to be supported by this study. Both of these 'dynamic' techniques highlight important talents that workers need to have in order to remain with the firm and advance in their careers. The first one is called dynamic capability, and it provides a methodology for organisations to measure change and how their employees adapt to changing and complex challenges. The second one is called career dynamism, and it provides a career development model that enables employees to

develop adaptive qualities to career uncertainties. Both of these concepts are related to the idea that organisations should be able to measure change and how their employees adapt to it. Therefore, the management consequence is that service firms need to have adaptable abilities that will enable them to integrate, create, and reconfigure both internal and external competences in order to deal with surroundings that are always changing. Individuals who have characteristics such as professional resilience may demonstrate qualities such as independence, the drive to study, and a good self-concept. These abilities allow individuals to be flexible and proactive in their lives. Career dynamism emphasises vital attributes such as human talents in creativity, openness, and the capacity to develop meaningful connections, all of which tend to be irreplaceable by computers or robots in most cases. Companies can also organise special skills training programmes in collaboration with universities, such as emotional intelligence, creativity, and communication in STEM (Science, Technology, Engineering, and Mathematics) education. The goal is for universities to produce graduates who understand the opportunities and challenges posed by automation. Companies can help universities achieve this goal by organising these programmes.

CONCLUSION

There are a variety of occupations that traditionally depend on human labour that have started to be replaced by computers and robots. Some of these occupations include banking, telecommunications, and even health care. However, AI and automation will not be able to completely replace all activities and kinds of employment in the service sector. This is due to the fact that human intelligence's intuitive and sympathetic traits still need further development before they can be duplicated by programmes based on artificial intelligence. The exceptional capacity of humans to adjust their behaviour in response to the surrounding environment is a major contributor to the intuitive and empathetic intelligence that they possess. It is envisaged that this theory of AI job replacement will give a road map for how AI takes over activities requiring a diversified intelligence, how AI can and should be employed to undertake service jobs, and how employees can and should alter

their skills to accomplish the integration of human workers.

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