A CASE STUDY ON THE IMPACT OF AUTOMATION AND USE OF ARTIFICIAL INTELLIGENCE ON THE EMPLOYABILITY IN FOOD PRODUCTION DEPARTMENT IN HOTELS OF DELHI-NCR

Abstract

This research paper was based to analyze the latest trend of automation and AI in the kitchen department, another objective of my study is to identify the major impact of Artificial Intelligence and automation in the kitchen department and in the other objective which is to analyze the effect of automation on the employability in the food production department. A questionnaire was prepared and got responses from the kitchen staff of various, Delhi-NCR hotels. In I got to know about how Artificial Intelligence reduces the work pressure of an employee, and then I got to know if the kitchen department would be fully automated in future or not. The quality of work done by machines after getting the Artificial Intelligence in the restaurant and how it will impact the efficiency in the kitchen with the use of Artificial Intelligence and automation in the restaurant of Delhi-NCR.

Keywords: *5-star restaurant, kitchen, Artificial intelligence, Automation, machinery.*

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I. INTRODUCTION

It is all part of the human evolution that evolves the hotel operations of the kitchen department and the search to do things faster, better and to gain higher profit. It was a long time back when Cloud EPoS was the new technology in the market and was limited to fewer people.

Now only some operators can sustain themselves without the extensive features provided by Cloud EPoS platforms such as real-time kitchen management tools, food preparation surveillance, live kitchen status reporting, tracking inventory and managing staffing.

As the washing jobs got vanished by the dishwasher cleaner. Machines (robots) will do monotonous work such as chopping, flipping burgers and wiping, but there are still many jobs that require human employees to perform them. The focus is to provide better service, experience and increase the gross margin.

The era of Artificial Intelligence, automation and robotics has arrived, and it will not take much time for the natural computer language to run our EPoS platforms for more precise data reporting and automation levels.

As per (Blasco, et al., 2014) the kitchen environment is one of the scenarios in the home where users can benefit from Ambient Assisted Living (AAL) applications. Whether we agree with it or disagree, labour is one of the major factors in the profitability of a restaurant. The minimum wage criteria and increased food costs result in many chains to begin testing the advanced technologies for sustaining in this competitive era. All this could remarkably lead to a reduction in the number of human workers in the restaurant in all the departments, mainly in fast food in the future

A research paper published by Oxford University stated that most of the restaurants up to 90% that serve fast- food would be completely automated in upcoming decades.

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And it will not be a surprise to us that advanced technologies are getting adopted by a few chains in the restaurant sector for automating food preparation. Mcdonald's has started adopting these advanced technologies. Chick-N-Tots at Dodger Stadium in Los Angele, and Caliburger in Pasadena, California, have been using robots for keeping their burgers moving 24 hours a day. (Hassan, et al., 2022) reiterates Automation can now be found in nearly every industry. Not just labour costs can be lowered using robotics and automation technology. We must accept the fact that these technologies are way more precise in measuring the ingredients and consistency as compared to human beings, providing compatible food quickly and at a lower cost to the customer.

II. OBJECTIVE OF STUDY

The objective of this research is:
- To analyse the latest trends of Automation and AI in the Kitchen department.
- To identify the major impact of AI and automation in the Kitchen department.
- To analyze the effect of automation on employability in the Food Production department.

III. LITERATURE REVIEW

According to (Paul Berryman, 2019) the era of Artificial Intelligence is arriving, and nothing can avoid it. Artificial intelligence (AI), automation and robotics are coming to every street and if you are a restauranteur the next restaurant may be yours – and it is coming sooner than you think.

Aarni Tuomi, Lis P Tussyadiah, Jason Steinmetz (2020) -A study on Applications and Implications of Service Robots in Hospitality. In the study, it has been stated that Machines are basically robots used for serving pursue to pervade and automate the restaurant sector. In this, these advanced technologies fundamentally substitute ongoing delivery methods, service practices and, as a result, how to manage services and marketing ideas. The research examines the different kinds of influence of automation in the hospitality and service sector by providing first factual representations of the present state of service robots. The result suggests that robots will support or replace human employees in service. It also provides a new differentiator for hospitality businesses. Ultimately, the automation of works, processes

and ultimately jobs will have extreme socio-economic impacts at major and minor levels. As a result, hospitality leaders must consider where and how to deploy robotics in order to balance operational efficiency while matching customer expectations.

(Todd Wassermann, 2022) Article on Robot cooks are rapidly making their way into restaurant kitchens – *CNBC*

Robots are coming into the kitchen around the world as it becomes affordable and locating human workers have become arduous. There are a few restaurants such as Chipotle, Wing Zone, and White Castle that are spending in robotics. Stellar Pizza founded by former SpaceX engineers, invented a machine that require no touch that can be fitted into the back of a truck which can make pizzas in a minute.

(S Shanthi, 2021) emphasizes that Kitchen Automation Is Revolutionizing the Food Industry-

After the pandemic, the hospitality industry especially the restaurant industry has been obliged to gear up itself to sustain in the competitive business world. The kitchen department is adapting to the advanced technologies and automation.

It can be a robotic arm flipping burgers or serving the pizza or robots that take accurately measuring the ingredients, automation is solving the biggest challenge encountered by the food industry since ancient times, which includes regularizing of taste, temperature, and quality. Automation has enabled consistency which is the major key in cooking. Startups in these sectors are investing in these advanced technologies to build a loyal customer base.

Will fully automated cooking robots rob humans of their jobs? – *gigazine.net (2021)*

As of June 2021, the US Department of Labor stated that the number of employment available in the hospitality industry has almost hit twice almost to 1.5 million. Hospitality industries are hit by the lack of workers and minimum wage criteria and are trying on automating customer service, ordering online, and preparation of the food itself. Automating food preparation is adapted by White Castle, (a Fast-food restaurant). It is developing a technique for automating food cooking that is primarily done by human hands. A robot 'Flippy ' is introduced at one of the White Castle stores in Indiana.

According to an article written by Marc Perrone, president of a union known as United Food and Commercial Workers, which represents grocery workers published in *Times India* –

All the human workers were an extremely essential part of the food service industry, they were the heroes. Now after 6 months ago, everyone is trying to get rid of them as machines are doing their part more effectively.

(Ben Casselman .2021) reiterates on Pandemic Wave of Automation May Be Bad News for Workers – *The Print,* Social distancing has led restaurants and stores to adopt advanced technologies for the betterment in productivity but could result in job loss.

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The Future of Automation in Foodservice – (Dana Tanyeri,2018) states that we are not yet in an era where the only choice left is either die or automate, but the replacement of human workers with advanced automated technologies is rapidly becoming an aid for many foodservice operators. And robots cooking, taking orders and delivering food may not be available in your nearby restaurant or may not be available anytime soon but advanced automated technologies of other types are somewhat surrounding all of us. From the biggest industries to businesses, the shift from humans to machines confirms that the automation genie is knocking on our doors. Applications such as online ordering and getting their food delivered to their doorstep and payment done via online services have been already automating the processes that have traditionally had many steps and interactions. It is all done to provide high-quality service. Robots working with human cooks. Meals getting delivered by drones and robots. Chatbots to provide online assistance to customers.

15th August 2022, Pazzi Robotics: The Future of Fast-Food Automation - *bwmonline.com*

Since when the pandemic hit, the restaurant and service industry, due to insufficient staff, is facing a major deadlock condition. There are approx 1.5 million and 300 000 jobs presently vacant in the US and France in fast-food as due to the toxic work environment. Rather than expecting humans to perform like robots, why not robots do that work in the kitchen and keep humans to what they are best at in significant human interactions, recipe design, service etc? PAZZI Robotics is the most advanced technological solution for food operators, preventing restaurants from a worker crisis by developing robots that can do operations in the kitchen and help humans -with better precision and accuracy.

IV. RESEARCH METHODOLOGY

1. Introduction

The strategy and methodology is to gather the information is to accomplish the points and targets of this review. Primary and Secondary information are gathered. The subject that we will talk about in this part incorporates the exploration plan, information assortment techniques and test plan.
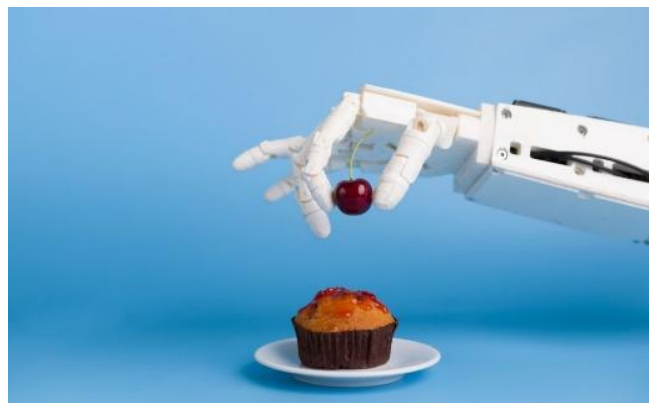
2. Research Design

The assessment arrangement is an end-all system deciding the methodologies and techniques for variety and exploring the expected information. A construction plans the action for the investigation project, similarly, as to oversee us in dealing with issues. Quantitative investigation has been used to coordinate this assessment concentrate in view of the colossal number of respondents who took a premium and where evidence is evaluated, and hypotheses are made. As a quantitative report, experts need to proper the survey to respondents to make an end. Data is accumulated by using structure, accommodating assessment design and Results which are fair, and less expert notification included. Additionally, the assessment shrouded greater people in this way quantitative method is more suitable rather than abstract methodology where a little model is used and incorporates meet. Thusly, it will be extra monotonous.

1. Sample of Study

The study aims to collect information from the possible people we can reach through our survey form and know the perceptive of the employees in the hospitality industry regarding the automation of the Kitchen department in Restaurants and Hotels.

2. Data Collection Methods

Information assortment is a significant part of an exploratory study. Wrong information assortment can affect the consequences of an examination and at last lead to a void of the consequences. Information can be characterized as the quantitative or subjective upsides of a variable. Information can be numbers, pictures, words, figures, realities, or thoughts. Information cannot be perceived and to get data from the information one should decipher it into a particular data. There are different techniques for deciphering information fact. Information sources are highly grouped into essential and additional information.

Primary information: Primary information is the information noticed or gathered straightforwardly from direct insight. It alludes to that information which is gathered for a particular reason from the field of request and is unique in nature and is more solid, bona fide a goal. For the venture essential information was gathered basically through study strategy, utilizing the apparatus poll. Subsequently, it is legitimacy is more prominent than auxiliary information.

Secondary information: Secondary information is the information gathered from a source that has effectively been distributed in any structure. It is the user data about an occasion that has not been as expected saw by the analysts. A survey of writing in any examination depends on auxiliary information for the most part from books, Google, research papers, diaries and periodicals, the intention is to expand the exactness of the investigation.

V. DATA ANALYSIS & INTERPRETATION

This is the result of the data collected from the survey taken in hotels of Delhi-NCR. I have received 56 surveys. There are several questions in my questionnaire which I have mentioned above such as Demographic analysis in which I mentioned the Name, Age and

gender. Then I focused on the main preferences of emotional intelligence and its impact on job performance. Below mentioned is the interpretation of the data which I gathered from the employees working in hotels of Delhi-NCR.

The survey received 56 responses from the different people among which few are listed above.
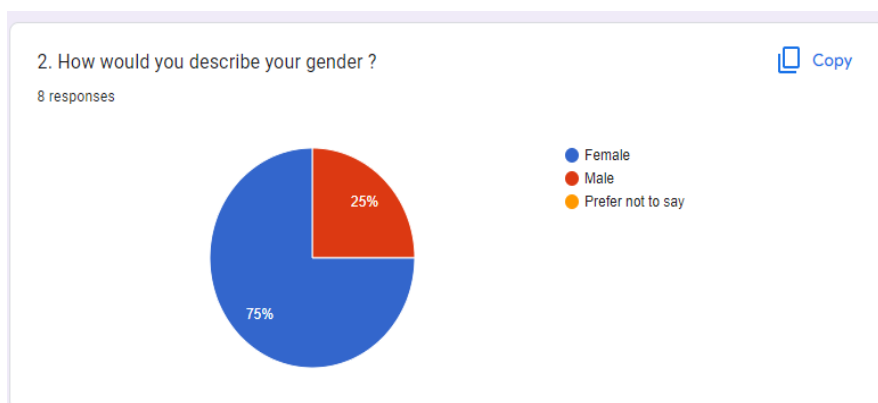

As this graph shows that 25 % people are Male that is represented by the red color.75 % are female, represented by blue colour.
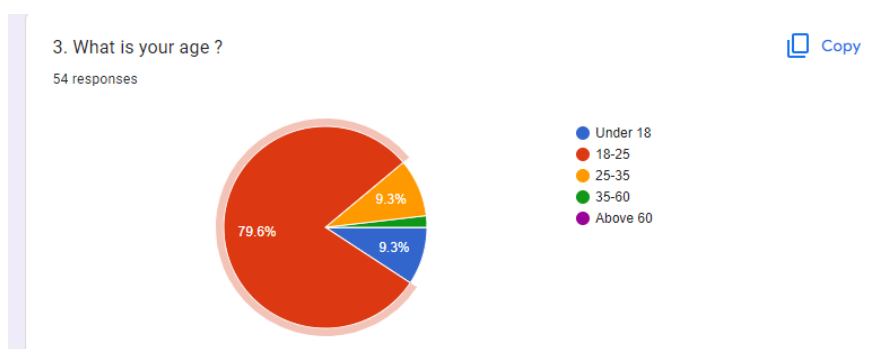

As this graph shows that 79.6% people fall in the age group of 18-25, represented by red colour. 9.3% people are under 18 age group, represented by blue colour. 9.3% people are between 25-35 age group, represented by yellow colour and the remaining are in the 35-60 age group, represented by green colour.
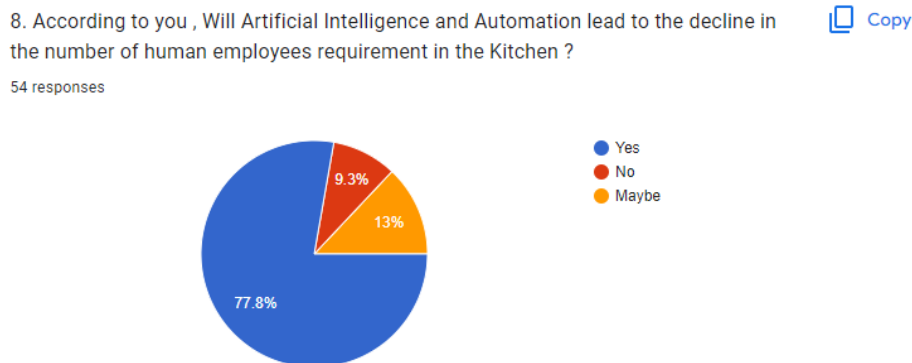
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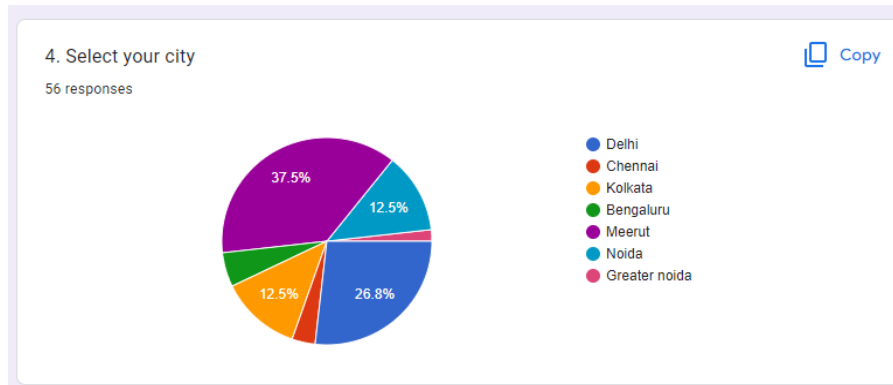
As the graph shows 37.5% people belongs to the Meerut, represented by purple color.26.8% belongs to Delhi, represented by blue color.12.5% belongs to Kolkata¸ represented by yellow color. 12.5% belongs Noida, represented by sky blue colour. And rest belongs to Bengaluru, Chennai and Greater Noida, represented by green, red and pink colours respectively.
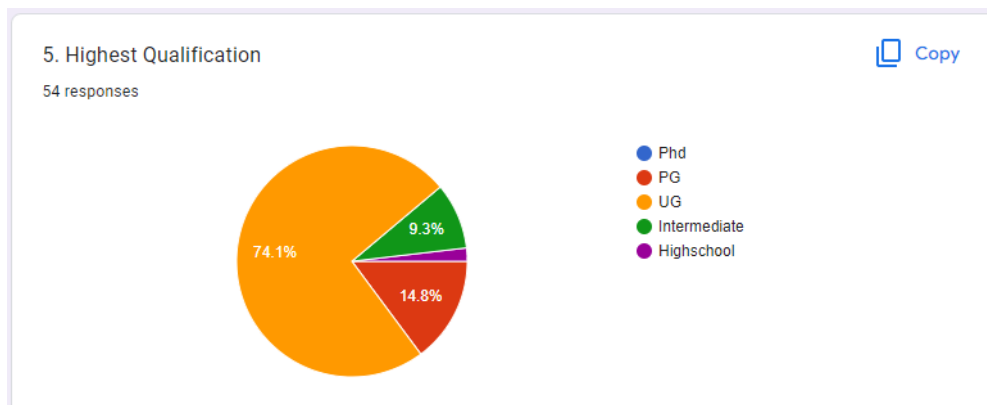
As the graph shows 74.1% of the people filled the survey are Undergraduate, represented by yellow colour. 14.8% are Post Graduate, represented by red colour. 9.3% have cleared their intermediate, represented by green colour. And rest high school passed, represented by purple colour.
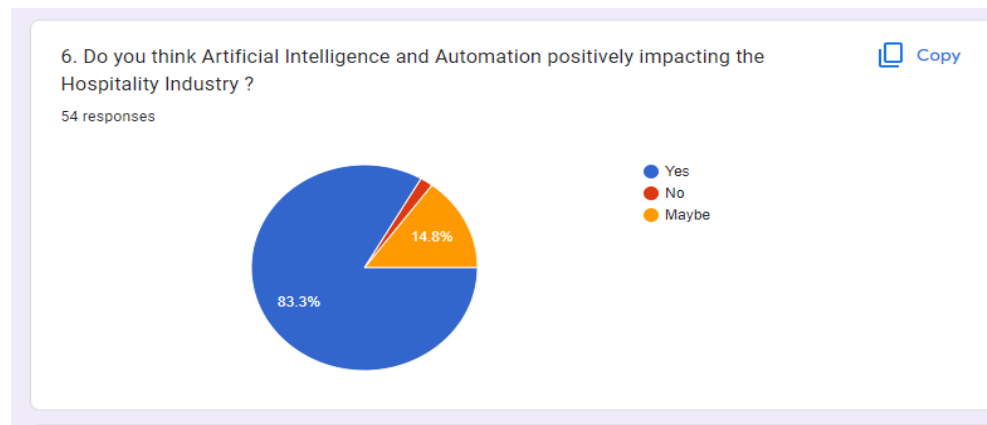
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As this graph shows that 83.35% people, represented by blue colour, thinks that Artificial Intelligence and Automation will positively impact the Hospitality industry. 14.8%, represented by yellow colour, thinks it will not have the positive impact and rest, represented by red colour, thinks maybe.
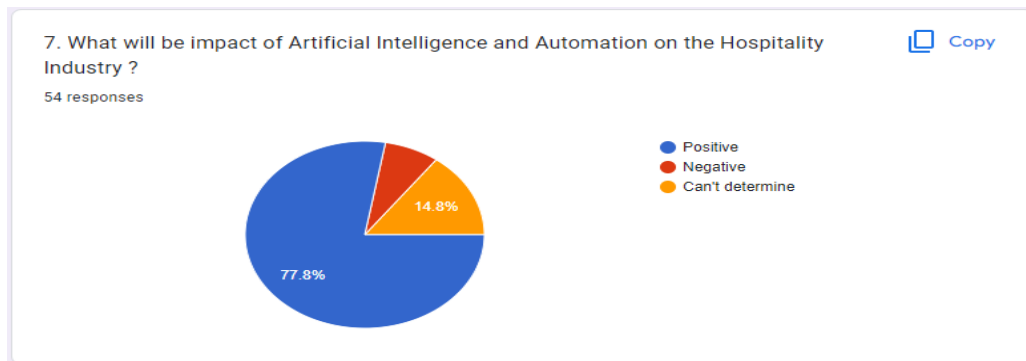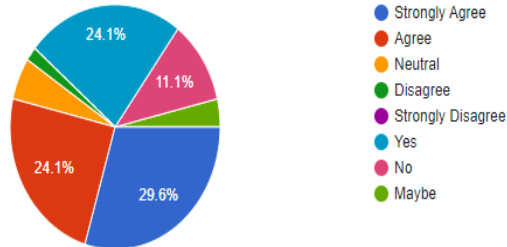

As this graph shows that 77.8%, represented by blue colour, people thinks that Artificial Intelligence and Automation will impact the Hospitality industry POSITIVELY. 14.8%, represented by yellow colour, thinks it will have NEGATIVE impact and rest, represented by red colour, cannot determine

As this graph shows according to 77.8% people, represented by blue colour, Artificial Intelligence and Automation will result in the decline in the number of human employees' requirement in the Kitchen. 13% says maybe, represented by yellow colour and 9.3% says no, represented by red colour.

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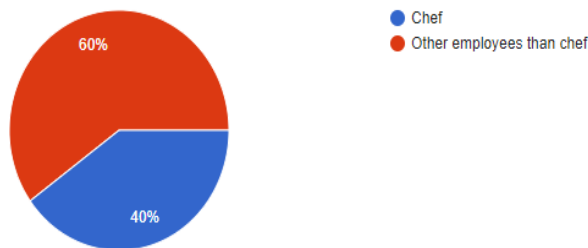

As this graph shows that 29.6% of people, represented by blue colour, strongly agree with this statement. 24.1% agree with the statement, represented by red colour. 24.1% say yes to the statement, represented by sky blue colour. 11.1% say no, represented by pink colour and the rest falls under the category of disagree, maybe and neutral, represented by green, light green and yellow colour, respectively.

As this graph shows that according to the 60% of people, represented by red colour, the chefs will be most benefited by the automation in the food production department. 40%, represented by blue colour, thinks employees other than chef will be benefited.
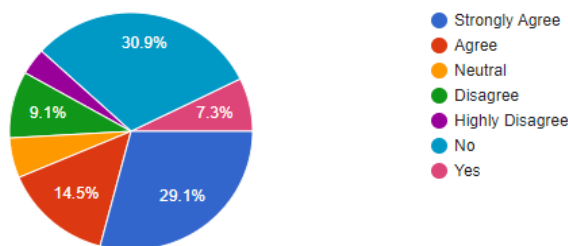
As this graph shows that 30.9% of people, represented by sky blue colour, says no. 29.1%, represented by blue colour, strongly agree with the statement. 14.5%, represented by red colour, agree with the statement. 9.1%, represented by green colour, says Disagree with the statement. 7.3%, represented by pink colour, say yes and the rest falls under the category of highly disagree and neutral, represented by purple and yellow colours, respectively.
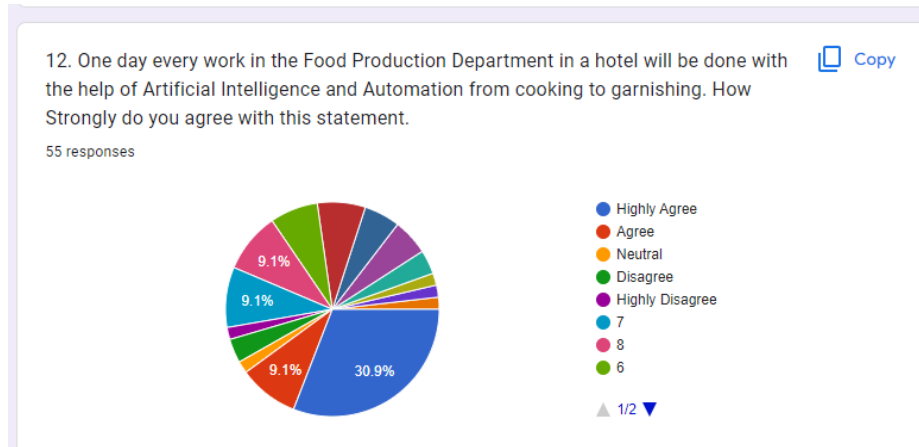
As shown in the graph, 30.9% of the people, represented by blue colour, highly agreed with the statement that every work in the food production department can be done with the help of automation. 9.1%, represented by red colour, agreed with this. 9.1%, represented by purple colour, highly disagreed with this statement. And the remaining people have mixed thoughts.
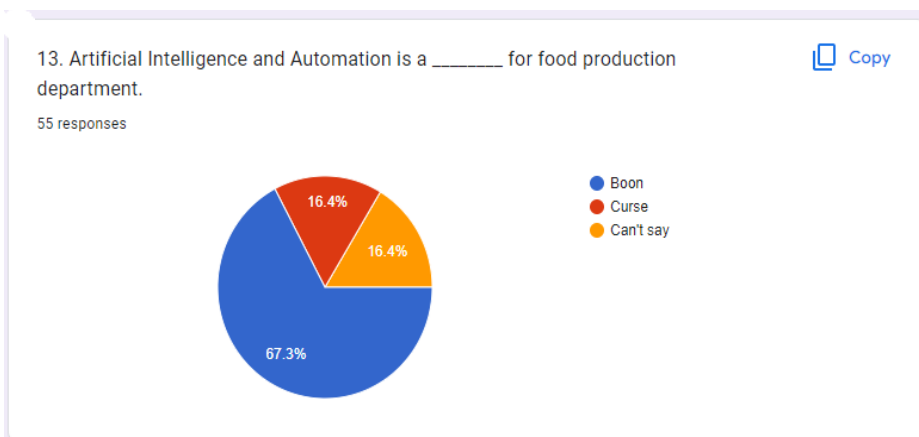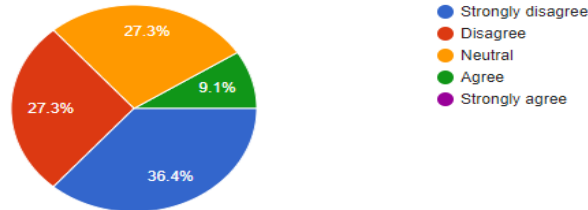

As shown in the above graph, according to 67.3% of the people, represented by blue colour, Artificial Intelligence and Automation is BOON for the food production department. Whereas 16.4% of people, represented by red colour, think it is a CURSE and 16.4% of the people, represented by yellow colour, can't say whether it is a boon or a curse.

A CASE STUDY ON THE IMPACT OF AUTOMATION AND USE OF ARTIFICIAL INTELLIGENCE ON
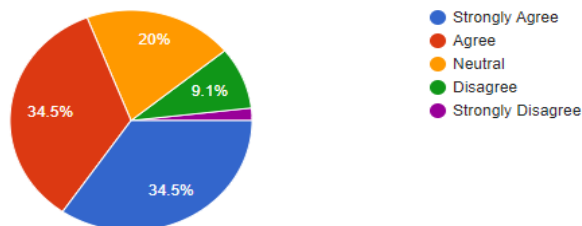THE EMPLOYABILITY IN FOOD PRODUCTION DEPARTMENT IN HOTELS OF DELHI-NCR

As shown in the above graph, 36.4% of the people, represented by blue colour, strongly disagreed with the statement that machines are better options than human employees. Whereas 27.3%, represented by red colour, disagreed with the statement. 27.3%, represented by a yellow colour, were neutral. 9.1%, represented by green colour agreed with the statement and there were no people who strongly agreed with the statement.
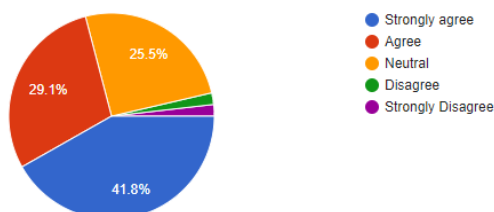

As shown in the above graph, 34.5% of the people, represented by blue colour, strongly agreed with the statement that the machines will improve the quality of work in the department. Whereas 34.5%, represented by red colour, agreed with the statement. 20%, represented by a yellow colour, were neutral. 9.1%, represented by green colour, disagreed with the statement and there were people, represented by purple colour, who strongly disagreed with the statement.
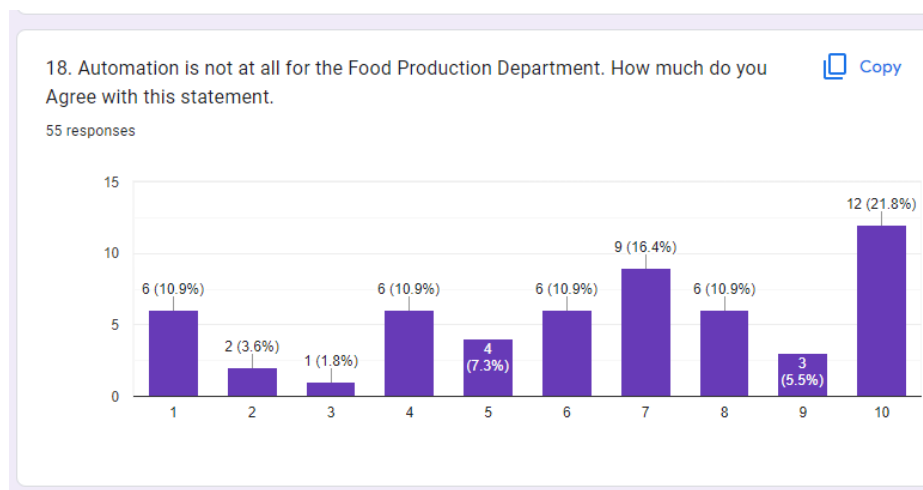
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As shown in the above graph, 41.8% of the people, represented by blue colour, strongly agreed with the statement that customers must spend less time waiting for food when Artificial Intelligence and Automation will be used in the food production department. Whereas 29.1%, represented by red colour, agreed with the statement. 25.5%, represented by yellow colour, were neutral and the remaining people, represented by purple colour, strongly disagreed and disagreed with the statement which is fewer in the number.
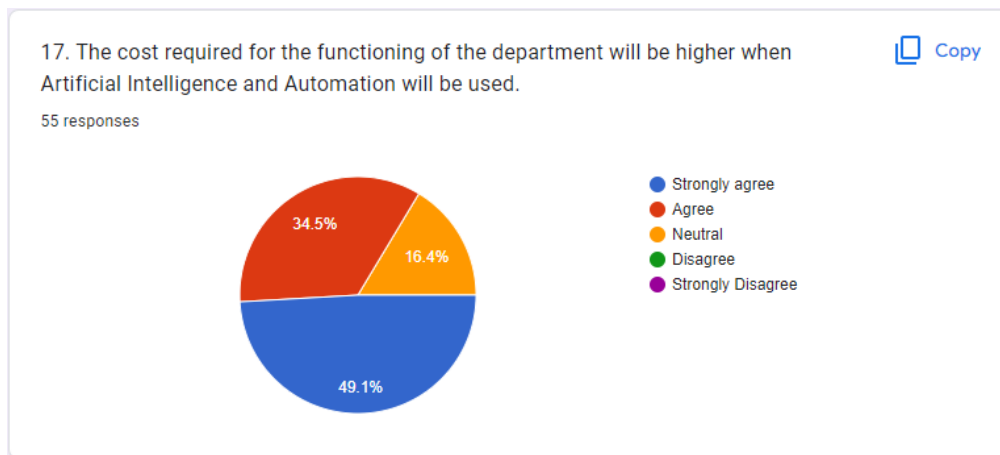
As shown in the above graph, 49.1% of the people, represented by blue colour, strongly agreed with the statement that the cost for the functioning of the department will be higher when Artificial Intelligence and Automation will be used. Whereas represented by red colour, 34.5% agreed to the statement. 16.4%, represented by a yellow colour, were neutral.

As shown in the above graph, the people rated how much they agree with the statement that the Automation is not at all for the food production department on the linear scale 1 to 10.

Where 1 is least agreed and 10 is most agreed.
10.9% of the people marked 1
3.6% of the people marked 2
1.8% of the people marked 3

10.9% of the people marked 4
7.3% of the people marked 5
10.9% of the people marked 6
16.4% of the people marked 7
10.9% of the people marked 8
5.5% of the people marked 9
21.8% of the people marked 10

So, if the compare the linear scale ratings higher number of people agreed with the statement with different level of confidence in their agree.
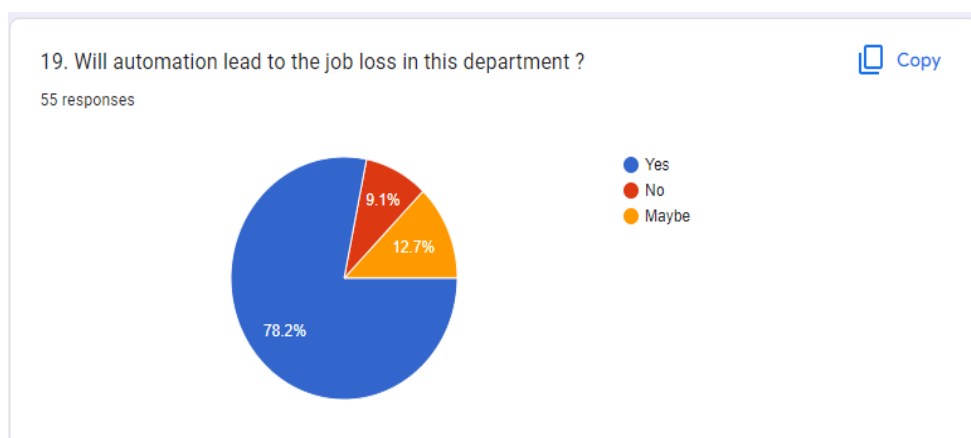
As the graph shows 78.2% of people, represented by blue colour, believes that Automation will lead to the loss of job in the department. 12.7%, represented by a yellow colour, says maybe and 9.1%, represented by red colour, says no.
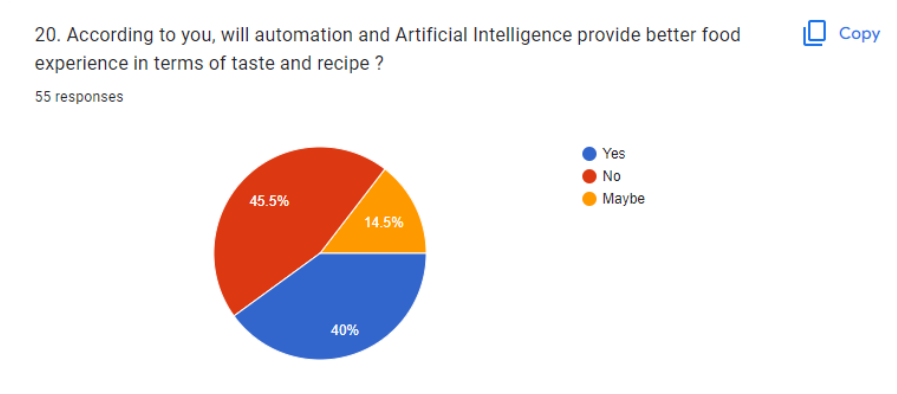
As shown in the above graph, 45.5% of the people, represented by red colour, say that automation and artificial intelligence will not be able to provide a better food experience in terms of taste and recipe. 40%, represented by blue colour, says it will be able to provide a better food experience in terms of taste and recipe and 14.5%, represented by a yellow colour, says maybe.

VI. CONCLUSION

The restaurant workers may lose their job due to the machine taking over the tasks and work such as chopping, food preparation, wiping and serving to the customers, which could lead to a reduction in the income but overall reduced restaurant industry spending.

Jobs that are monotonous are highly automated in the restaurant industry. These are tasks such as wiping, cleaning dishes, preparing food, and accepting orders. Automation is coming into its full shape by taking over these monotonous jobs in a few restaurants as machines do the work faster and more efficiently as compared to humans, which can raise the concern of jobs lost in this industry just because of automation in the future. As per (Berezina, et al., 2019) Chatbots, voice-activated and biometric technology, robot hosts, chefs, and bartenders, tableside ordering, conveyors, and robotic food delivery are already commonplace in the restaurant sector. However, automation in specific tasks has the ability for bettering the conditions of working in restaurants for the employees, either by knocking out the requirement of workers to do hazardous work or releasing them to do more important work.

And only a few tasks can be automated, but there could not be any replacement for good chefs, taste and good service.

Generally, the impact of automation on employability in the kitchen department has been mostly positive. It has made restaurants more efficient and profitable and helped in creating new jobs in the restaurant industry.

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