

“A STUDY ON ARTIFICIAL INTELLIGENCE AND ITS IMPACT ON FUTURE OF FOOTWEAR INDUSTRY WITH SPECIAL REFERENCE TO SPORTS SHOE SECTOR”

Ashok Kumar Sahai
Research Scholar (M. Phil – Management)
School of Business Studies
Shobhit University, Meerut

Dr. Anuj Goel
Associate Professor
School of Business Studies
Shobhit University, Meerut

ABSTRACT:

Today in the urban class society people are very much conscious about their health and fitness and becoming the sports freak. As with the rapid urbanization in cities are becoming more health conscious due to which they prefer to join various clubs or sports meets in order to keep them fit. Which leads to increase the demand of sports goods & accessories and out of which footwear is consider as one of the important role to play which is required in all the physical and sports related activities Indian sports shoe market is covered by four big global players namely ADIDAS, REEBOK, NIKE and PUMA

All Global footwear giants are keep on manufacturing sports shoes by identifying the upcoming technologies, attributes of games and personality of players, because gone are the days when companies manufacture sports shoes as per the requirement of sports. Now companies primarily focus on the latest technologies and their application the sports along with the physical requirement of players.

In short we can say now these companies or brands using lots of innovative technologies specially artificial intelligence in the footwear manufacturing which make the footwear a very productive item, which easily accommodate their life style and make their performance more effective.

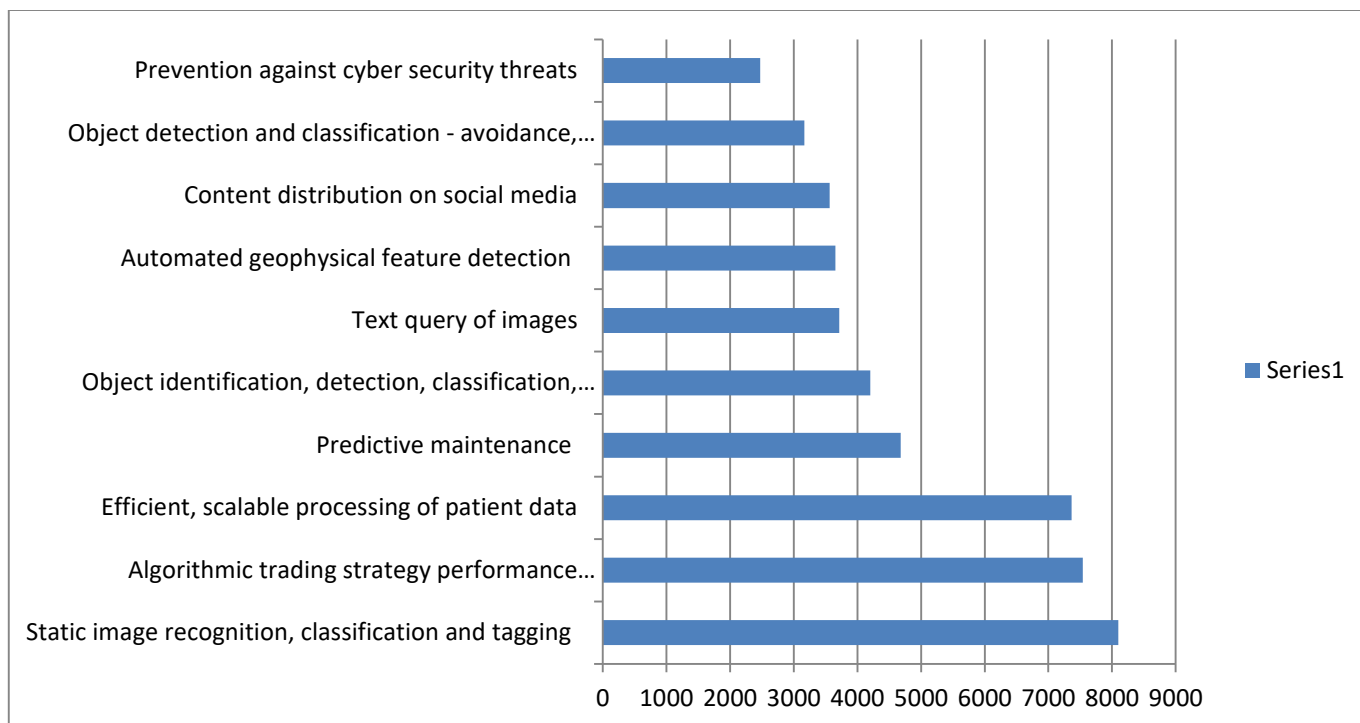
Key words: Increase in demand, upcoming technologies, artificial intelligence, accommodate.

INTRODUCTION:

Footwear: Especially shoes are an important part of our wardrobe collection of dresses. Our footwear is designed to keep our feet safe, clean & comfortable from the tough environment, as mankind has been wearing them for thousands of years.

They may have turned into somewhat of a fashion statement in the modern world but there are still shoes being designed and developed to aid us in a number of ways. There have been many technologies are going to embed in the future of the footwear. There are now shoes targeting foot problems such as running shoes targeting people with flat feet, shoes that generate electricity to charge mobile devices, shoe are able to calculate calories burnt due to daily feet movement. Smart shoes coupled with some form shoes wearable technology can accurately track & display a person's fitness progress. Power lacing is also very new and innovative concept in the footwear world. Lethal haptic footwear, which when coupled with our smart phones can help us navigate through new places.

THE FUTURE OF ARTIFICIAL INTELLIGENCE: Forecasted cumulative global artificial intelligence revenue 2016-2025, (in U.S. million \$).



In this paper we analyze few new and innovative footwear technologies and their implications what we can expect to see in the future.

LITERATURE REVIEW:

BEC CREW (2015, Oct 22) stated in his article: Nike's Power-Laced 'Back to The Future' Shoes Will Be Available in 2016 about the **Power Lacing technology**. Nike has manufactured sneakers with power laces last year in 2014 and sometime in the near future we can actually expect to see a lot of them around and it won't just be limited to sneakers. To have a pair of boots with power laces must be amazing experience. Boots are probably the most comfortable shoes you can wear anywhere, be it at work or dates.

MATTHIAS NEUNER (2016, Sept 22) elaborated in his write up: An update on smart shoes on the technology IOFIT: World's first smart golf shoe which helps you improve your game. It measures the metrics, which is extremely important in golf like balance, pressure distribution and weight shift information. Even more it highlights your mistakes and shows you ways to improve through a smart-phone app. Sportsman can compare and compete with friends, and the shoe's waterproof sensors are designed to detect slight changes in the pressure distribution in a matter of milliseconds. Shoe can communicate with users using Bluetooth through their IOS system or Android system app, which includes optional video-syncing capabilities, a professional swing library, and many other features to help track progress.

MATTHIAS NEUNER (2016, Sept 22) elaborated in his write up: An update on smart shoes on the technology Hype8 Kicks are truly connected shoes integrating Lucie Labs technology to offer an incomparable experience. With this smart shoe one can experience the best of breed interactivity, creativity and performance. By this users are able to command their smart shoe from the smart-phone. It has three main functions. When driving in the night it provides assisted navigation. With unique vibrations the smart shoes will show you the way. With hyper personalization one can choose the color, rhythm and order of lightning. This different experience makes it even possible to vibrate and light up to the rhythm of the music.

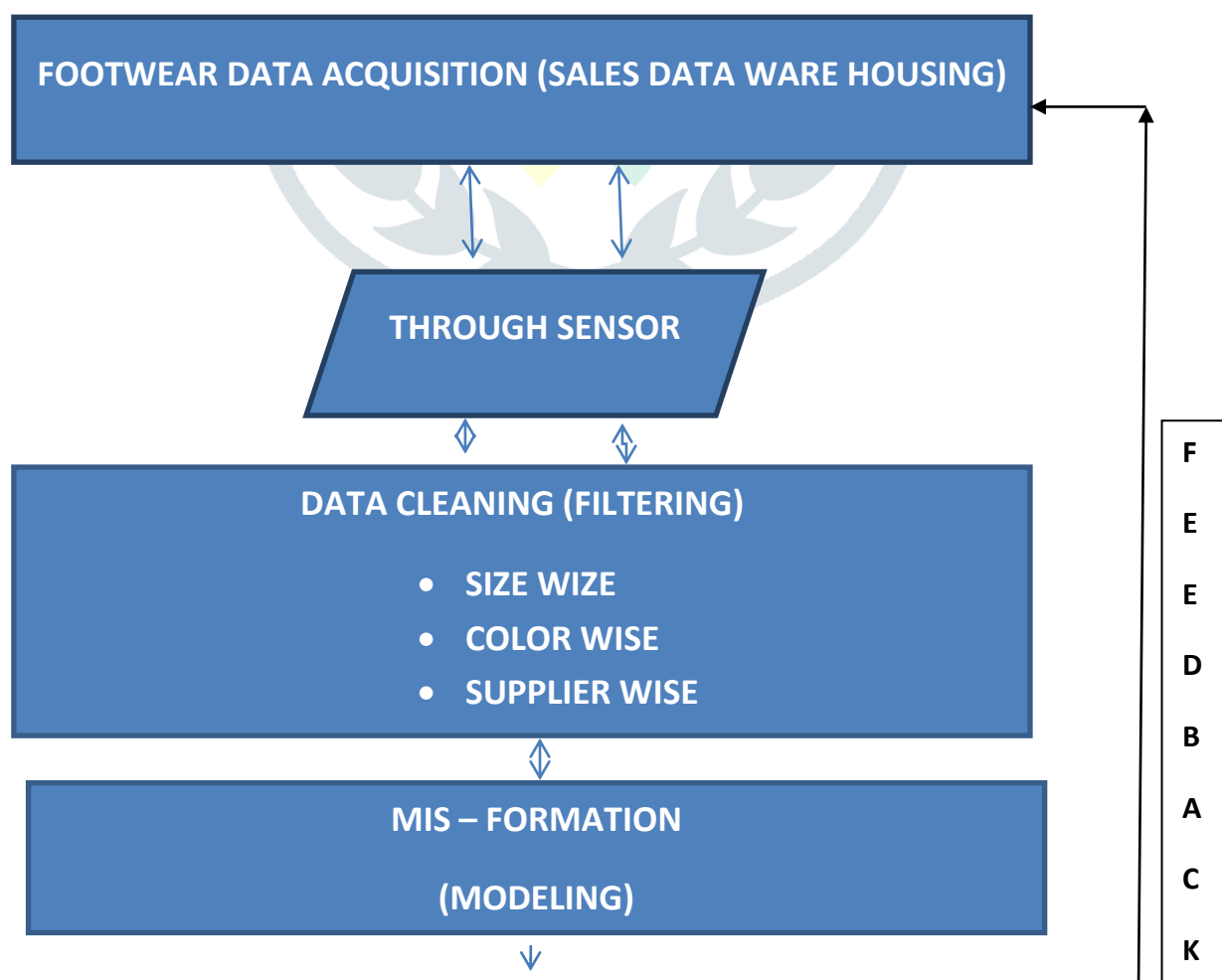
SAHASH KHANAL (2016, Oct 14) explained in his article: the Future of Footwear Technology about the Navigation Shoes technology. HP designed the Lechal haptic footwear, when coupled with our smart-

phones can navigate us through new places. This footwear communicates with a custom smart-phone app via Bluetooth. The shoe produces unique vibrations in the sole that tells you where you go. There are lots of copies of the Lechal haptic footwear and we can expect them to be much more widespread network in the near future.

SAHASH KHANAL (2016, Oct 14) explained in his article: the Future of Footwear Technology about the Shift Sneakers is high-tech shoes whose color can be changed based on preference via a smart-phone app. We target specific important areas of the shoes and which change the colors such that the sneakers can match our other apparels. These sneakers use a special kind of fiber which can be programmed to reflect wavelengths of light.

ANDRIA CHENG (2018, May 18) explained in her article: “How Adidas Plans to bring 3D Printing to the Masses” about the benefits of 3D printing (based on Artificial intelligence technology). New balance used this technology to create personalized shoe spikes, which enables the runners to give increase their performance. Adidas announced their mass production of 3D-printed shoes, and plans to manufacture 100 000 pairs under this process until 2018. 3D printers are very efficient and cost effective, especially in mass production; there are already some benefits companies can gain from using them i.e. allowing young buyers, who value individualization, to design and produce their own shoes.

GAURAV RATURI (2018, Nov 15) explained in his article: AR E-commerce: Accelerate Conversion rates and engagement in 2019 on the requirement of augmented and virtual reality. VR and AR can definitely boost footwear shopping experience for consumers in future, as customers will see, try and feel footwear in a very fulfilling and immerse way and the brands won't even have to increase the physical store size for this. We are still witnessing the early days of the practical use of these new technologies, one thing seems to be certain, they will impact the footwear industry. The extent of its impact is still to be determined or to be calculated.





Data Flow Mechanism Used by Sports shoe companies

RESEARCH METHODOLOGY

Methodology: Primary & Secondary data has been collected for an analytical study to understand the impact of artificial intelligence on future of footwear sports industry.

Sample Design: The total sample size of 50 respondents was drawn from variety of consumer & retailer groups having diverse demographical background.

Tools & Techniques of Analysis: Statistical tools like Chi- Square test and Likert scale analysis have been used to test the association between the variables.

Research Design: Both descriptive & experimental research design has been taken into consideration by the researcher to find out the deep insight of the problem.

OBJECTIVE OF THE RESEARCH PAPER:

The proposed research paper will be an attempt to study the impact of artificial intelligence on the future of sports industry. The specific objectives of this based on the need of virtual and artificial intelligence (robotic mechanism) used by industrial people

1. To analyze the role of technological advancement like artificial intelligence in the transformation of sports shoe segment.
2. To evaluate the impact of artificial & virtual reality in the changing phase of sports shoe segment.

ANALYSIS OF DATA:

Total no. of respondents under taken for data collections is 50 from different segment.

To study the role of Artificial intelligence in footwear segment.

- | | | |
|------|------------------------|------|
| a) | Footwear manufacturer | - 10 |
| b) | Footwear retail sector | - 20 |
| c) | Sports shoe segment: | |
| (i) | Players | -10 |
| (ii) | Youths | -10 |

Table: 1 In order to identify that favor and disfavor condition about the future technologies like A.I &V.R in the footwear brands.

S. No	Respondent (footwear manufacturer)	Artificial Intelligence			Virtual Reality		
		Favoring	not favoring	%	Favoring	Not favoring	%
1	Bata	8	2	80	7	3	70
2	sketchers	8	2	80	8	2	80
3	campus	7	3	70	7	3	70
4	Nike	9	1	90	8	2	80
5	Adidas	9	1	90	8	2	80
6	Reebok	8	2	80	7	3	70
7	Puma	8	2	80	6	4	60
8	converse	6	4	60	5	5	50
9	lotto	6	4	60	6	4	60
10	Sprax	5	5	50	7	3	70

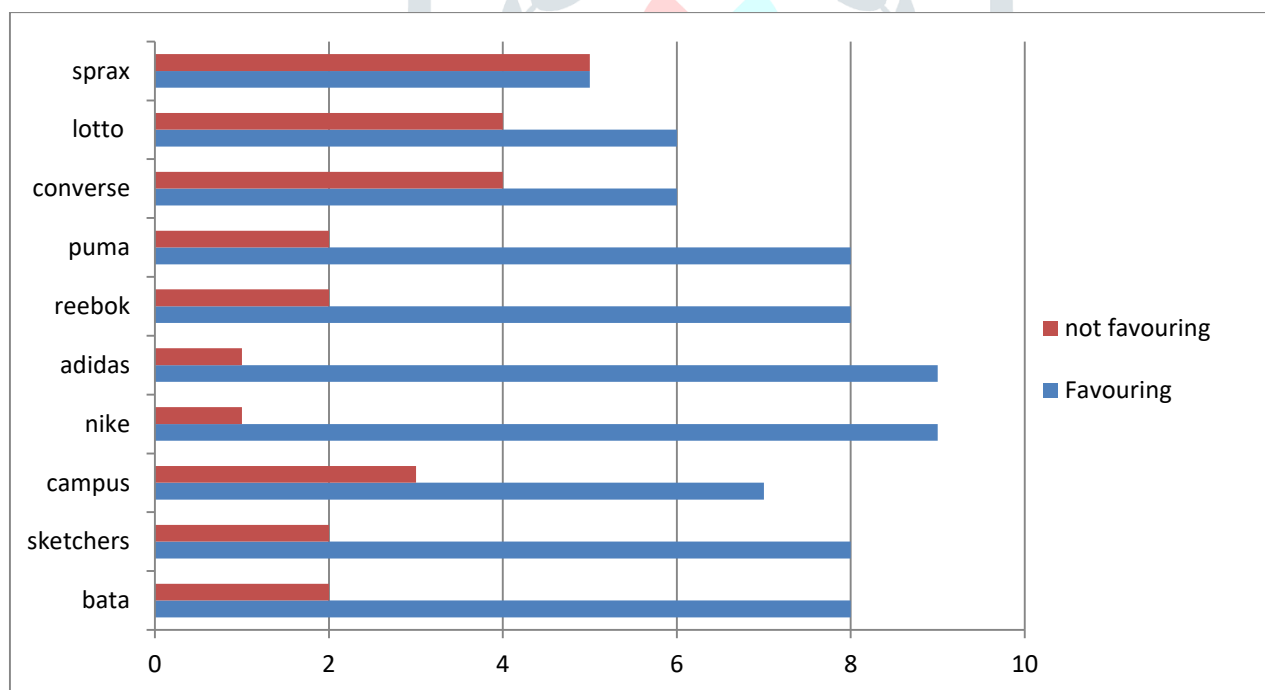


Figure 1.1 – Artificial Intelligence

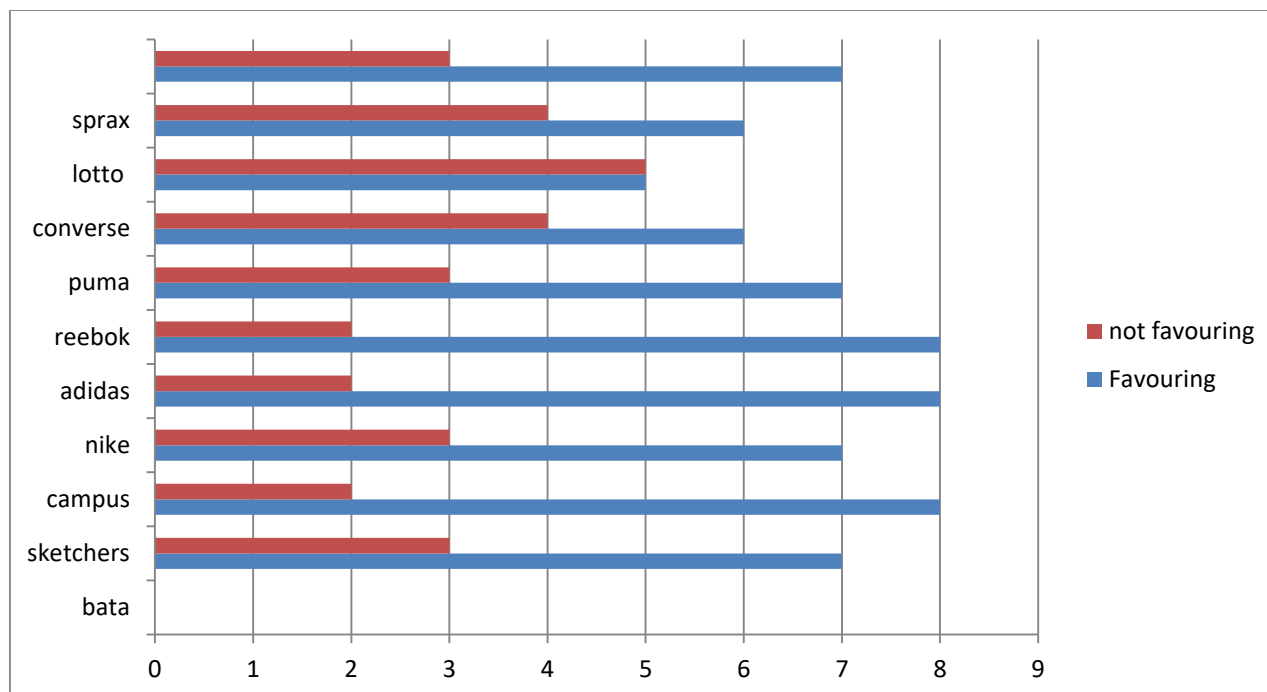


Figure 1.2 – Virtual reality.

Interpretation of Table 1: In order collect the primary data researchers has framed the scheduled questionnaire to fine out the numbers of respondent in favor and against of artificial intelligence and virtual reality. For such inferences to questionnaire are filled through footwear manufacturer and it has found that with the adaptation of technological advancement in form of artificial intelligence and virtual reality has significantly transfer the sports shoes segment because maximum footwear manufacturer are in favor of both A.I & V.R because it has improve their customer satisfaction level.

Table: 2 In order to identify that favor and disfavor condition about the future technologies like A.I & V.R in the footwear retailers.

S. No	Respondent (footwear retailers)	Artificial Intelligence			Virtual Reality		
		Favoring	Not favoring	%	Favoring	Not favoring	%
1	Bata	16	4	80	14	6	70
2	Big bazaar	14	6	70	12	8	60
3	campus	10	10	50	14	6	70
4	Nike	16	4	80	18	2	90
5	Adidas	16	4	80	16	4	80
6	Reebok	16	4	80	14	6	70
7	Puma	16	4	80	12	8	60
8	Relaxo	14	6	70	10	10	50
9	lifestyle	14	6	70	14	6	70
10	Sparx	16	4	80	12	8	60
11	shopper's stop	12	8	60	10	10	50

12	Globas	14	6	70	14	6	70
13	Pantaloons	14	6	70	10	10	50
14	Liberty	16	4	80	12	8	60
15	Lancer	12	8	60	14	6	70
16	Metro	14	6	70	16	4	60
17	Easy go	10	10	50	14	6	70
18	Planet sports	14	6	70	14	6	70
19	Columbia sports	14	6	70	10	10	50
20	Van sons	12	8	60	12	8	60



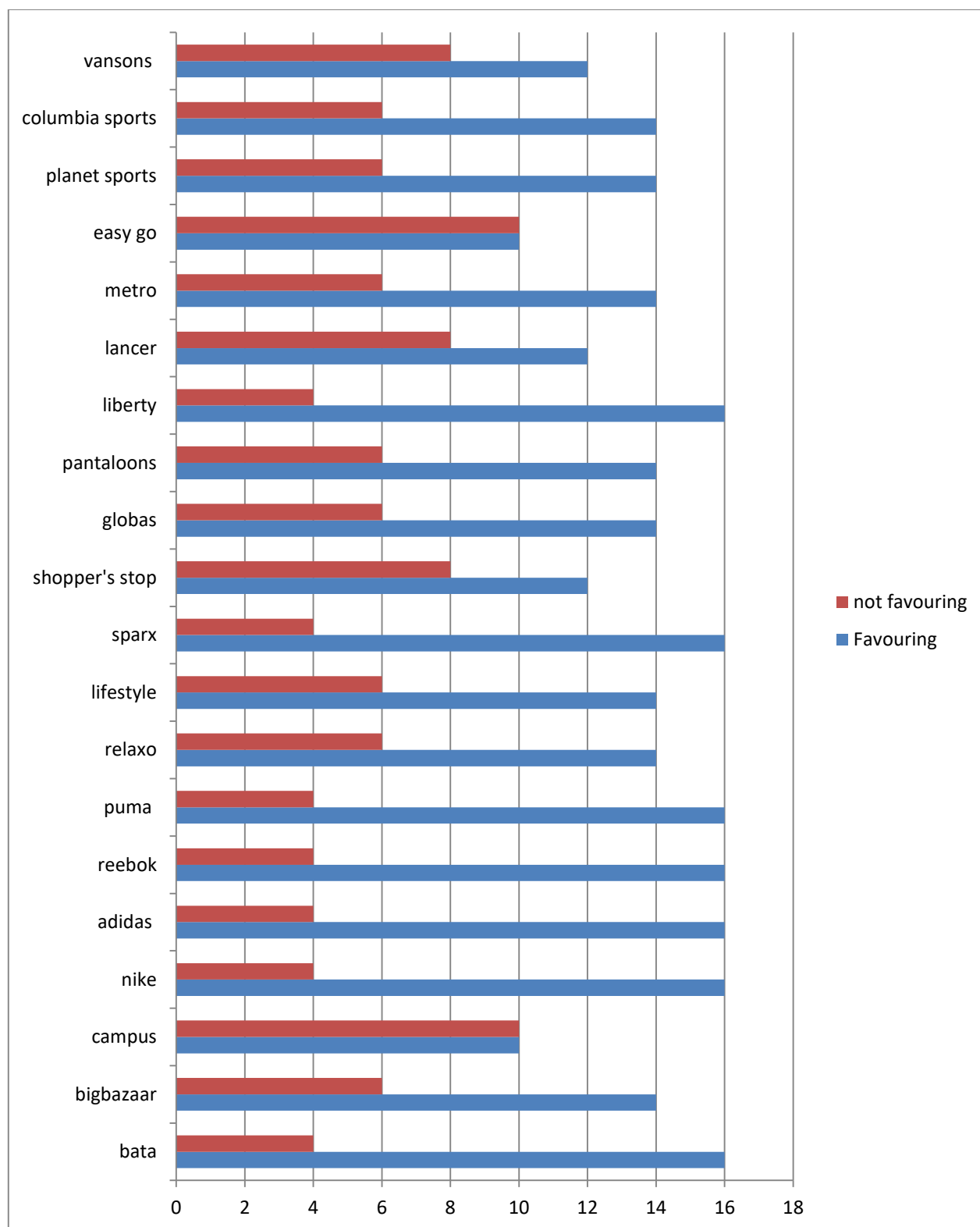


Figure 2.1 – Artificial Intelligence

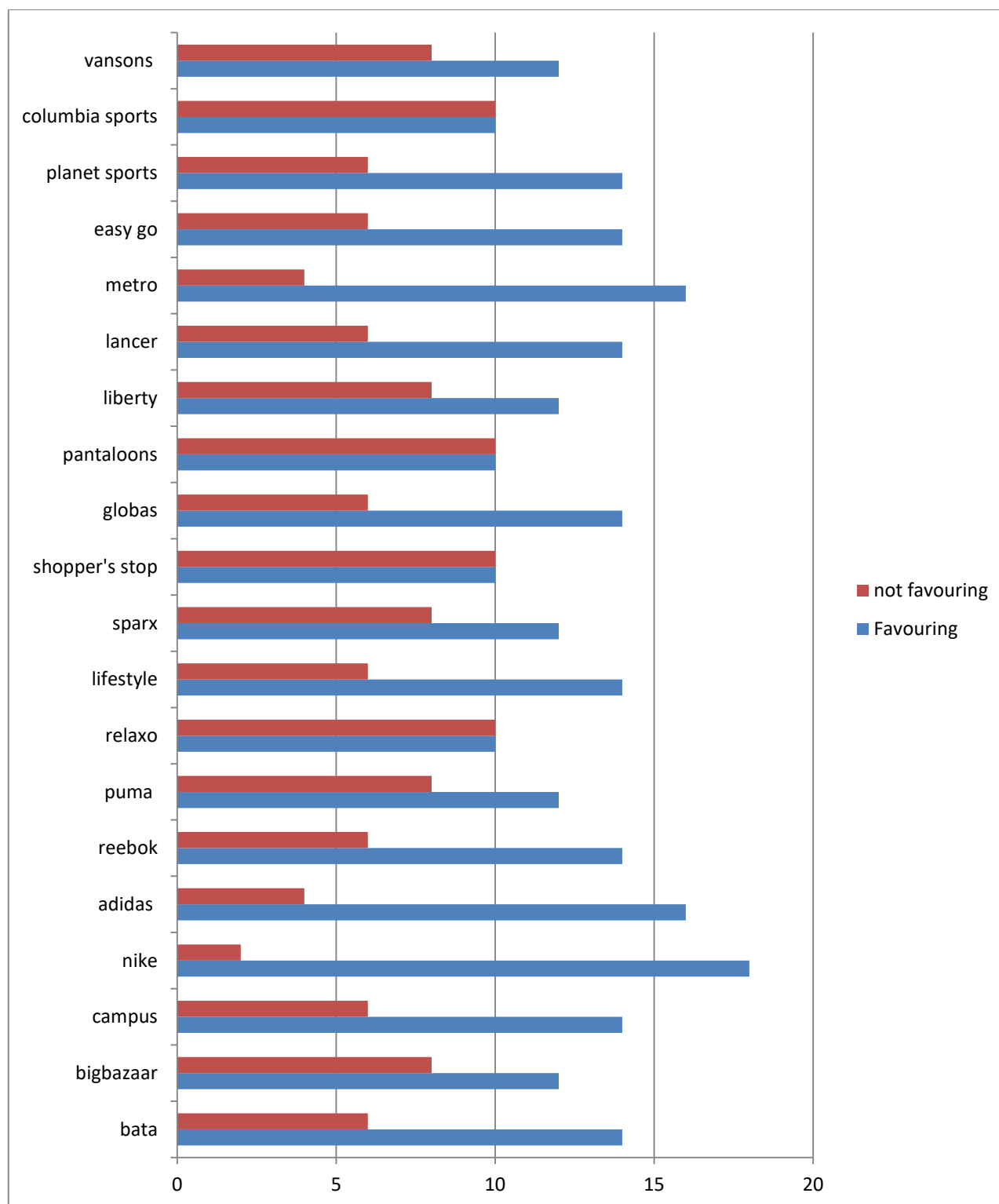


Figure 2.2 – Virtual reality.

Interpretation of Table 2: In order to identify that various elements of the technologies like A.I & V.R researchers collected data from above listed footwear retailers and to find out whether A.I. & V.R. has improved the sales potential, customers connection, brand promotion of their products & services. After analysis of data through questionnaire total (20), found that A.I & V.R has significantly improved their profitability, customer connection and brand promotion.

Table: 3: In order to get more depth information related to impact of upcoming future technology on sports shoe segment on sports personals and youths.

S.No	Respondent (sportsmen)	Artificial Intelligence			Virtual Reality		
				%			%
		Favoring	Not favoring		Favoring	Not favoring	
1	Anil	4	6	40	5	5	50
2	Sheenu yadav	6	4	60	7	3	70
3	Geeta	5	5	50	8	2	80
4	Neena	6	4	60	7	3	70
5	Gajendra	6	4	60	6	4	60
6	Vishal	7	3	70	7	3	70
7	Smriti	8	2	80	8	2	80
8	Kaamna	7	3	70	9	1	90
9	Prasanth	7	3	70	7	3	70
10	Sunil	5	5	50	5	5	50

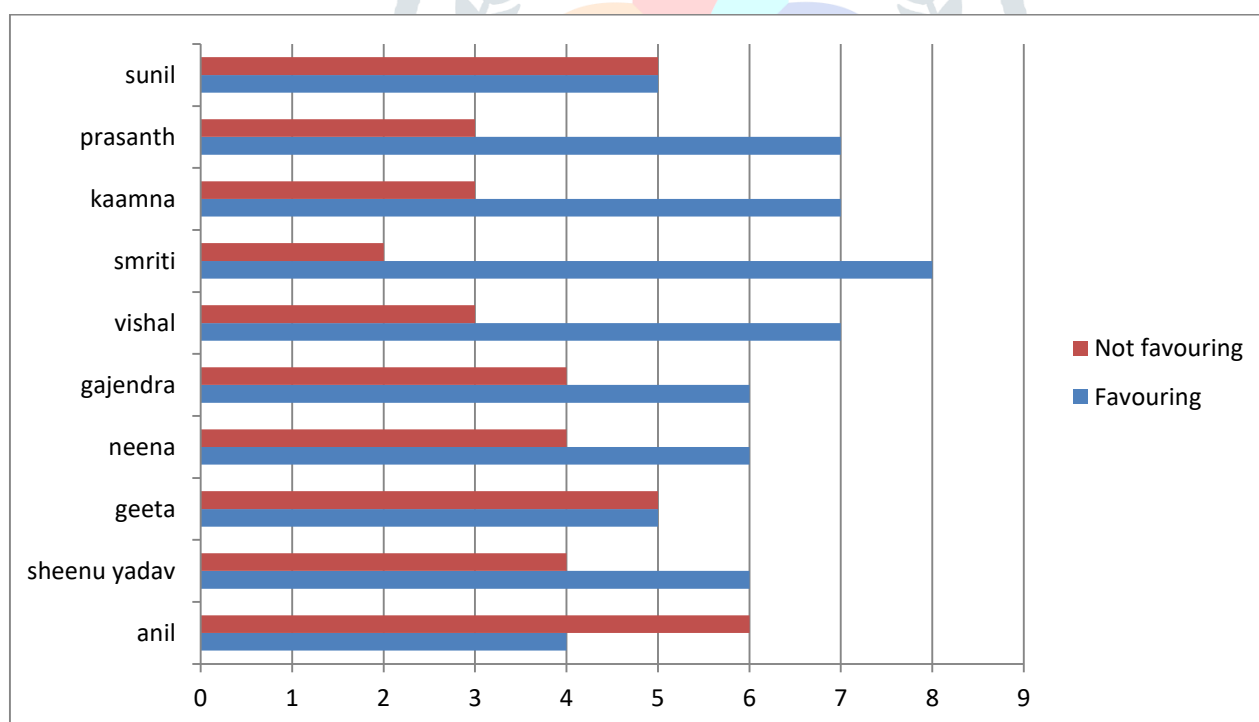


Figure 3.1 – Artificial Intelligence

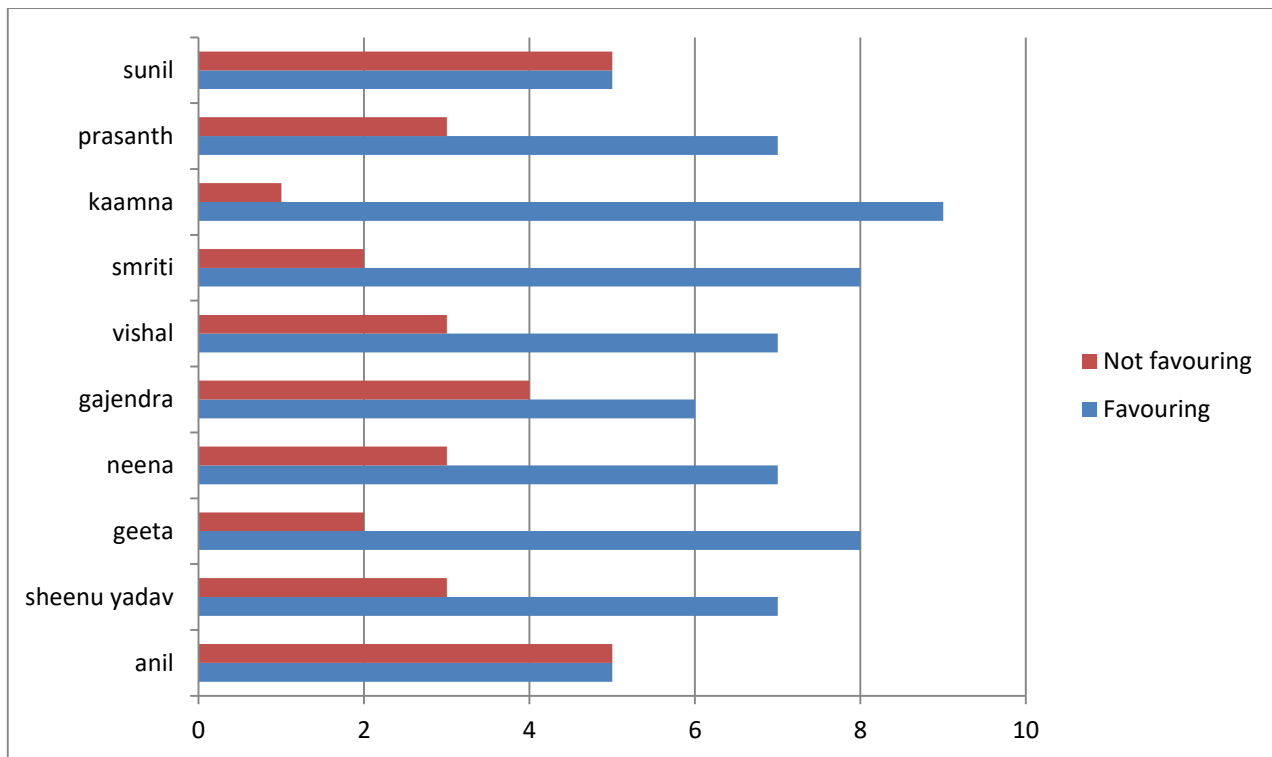


Figure 3.2 – Virtual reality.

S.No	Respondent (youth) Age (18-25)	Artificial Intelligence			Virtual Reality		
				%			%
		Favoring	Not Favoring		Favoring	Not Favoring	
1	Yogesh deewan	8	2	80	8	2	80
2	Sumit kumar	7	3	70	6	4	60
3	Neeraj bhasin	5	5	50	7	3	70
4	Amit tripathi	6	4	60	7	3	70
5	Naresh singh	7	3	70	6	4	60
6	Vivek sharma	6	6	60	5	5	50
7	Md. Khalid	5	5	50	4	6	40
8	Riya	7	3	70	5	5	50
9	Hemlata	8	2	80	6	4	60
10	Sangeeta	6	4	60	7	3	70

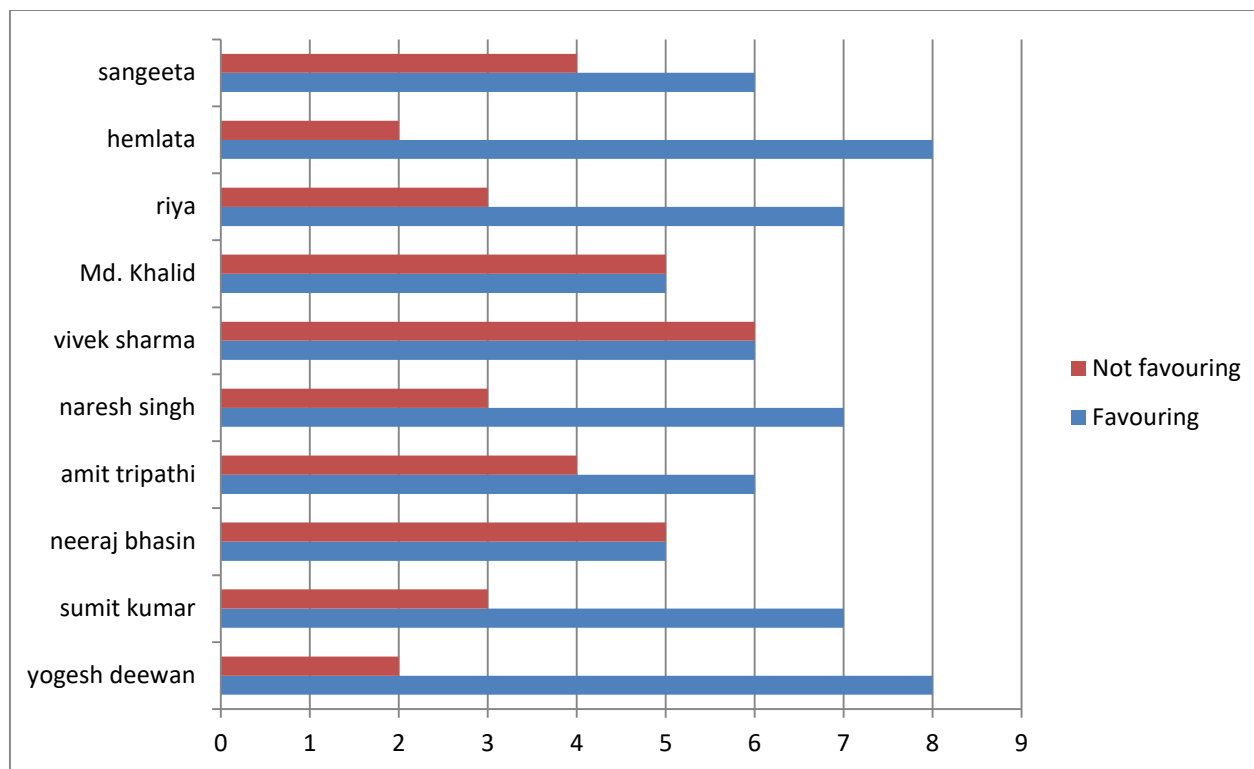


Figure 3.3 – Artificial Intelligence

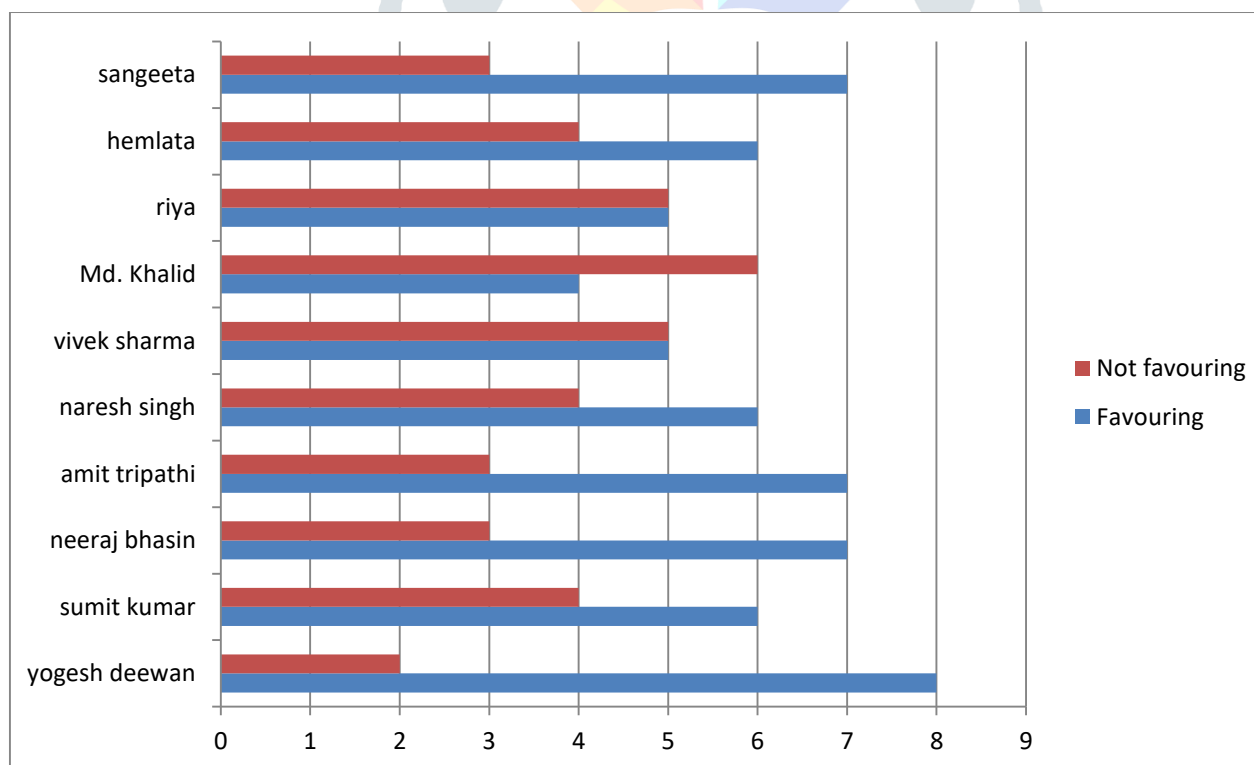


Figure 3.4 – Virtual Reality.

Interpretation of Table 3: In order to get more depth information related to impact of technology on sports shoe segment. Researchers also collected data from sports shoes personals & youth age group (18-25) and

the total numbers of questionnaire are filled in 10 in each category. Through this researcher has concluded that for youth & sports personal A.I & V.R helps them in identifying sports shoes which are trendy, special features, sports compatibility, suits their personality according to the requirement of the game. For sports person and youth A.I & V.R are beneficial for their brand endorsement and product positioning.

FINDINGS/ SUGGESTIONS:

1. AI helps in creating footwear designs according to the customers.

The technology of artificial intelligence offers us a way around designing process. If customer crave for any captivating shoe design got from any social sites the artificial intelligence can give a strong starting point that is based on individual deep learning.

As customer's individual interests are often homogenous, colors, patterns that they purchase in the past will, more often than not, be integrated into their shoe purchase. Apart from that Artificial intelligence can present distinct shoe designs that the customer may not have thought of before – making the customer experience more seamless and interesting.

2. Artificial intelligence can helps in footwear search:

Sometimes Consumers are disappointed with e-commerce experience because the product results showed are often irrelevant. Artificial intelligence uses natural language processing to narrow, contextualize and improve search results for online shoppers to tackle this problem and also allows having visual search capabilities, finding and matching products. Like Consumers may take a picture of a friend's new shoes or new gym clothes, upload it and then AI enables consumers to easily find similar items through e-commerce stores. For example Amazon has this option, which allows you to point at product that you like and Amazon will identify it and gives you the results you will most probably like because it will be exactly what you were searching for is an excellent example of artificial intelligence.

3. AI improves the footwear sales cycle and support.

Artificial intelligence could help strongly with enhancing the sales cycle, by tailoring your problem-solving solutions and creating a strong sales message that reaches consumers at the right time at right platform. Nowadays, some AI systems that enable NLP and voice input, for example, Siri, Alexa, etc and this allows CRM system to answer customer queries, solve their problems and even identify new opportunities for the sales team. The North Face, a large e-commerce retailer use IBM's AI solution Watson to better understand their consumers. They can help their customers find their perfect clothes, by asking the customer questions such as "where and when will you be using your running clothes and customers can answer by saying it or writing it. IBM's software then scan and search hundreds of products to find perfect matches based on real-time customer input and does additional research to find out the weather conditions in the that area, etc.

4. AI can help in identifying buyers' behavior:

The Boomtrain analyzes different touch points to help the business analyze how customers are interacting online: via mobile app, web, email, etc. and AI engine is monitoring all devices and channels to create a universal customer view. It extremely helps the e-commerce retailers to deliver a seamless customer experience across all platforms which will help to send relevant messages at the right time.

5. Creating customer's profile.

AI technology can more intelligently and efficiently predict customer behavior and demand, and offer relevant and helpful recommendations. Excellent example is Starbucks; it uses AI to analyze all the data it

has gathered to deliver more personalized suggestions. The algorithm and charts takes into account: customer's information, customer preferences, purchase history, third-party data and contextual information.

6. Automation of footwear promotional strategies.

Robots offer opportunity to retailers to provide precisely what the customer wants, when they want it, by using technology and algorithms. As e-commerce industry continue to expand and that means having a growing number of customers, automation becomes a must and became one of their top investment priorities for e-commerce stores. Robots can take them over in the each activity from publishing new products on multiple channels to scheduling sales, giving discounts to loyal customers, etc.

REFERENCES:

<https://www.forbes.com/sites/andriacheng/2018/05/22/with-adidas-3d-printing-may-finally-see-its-mass-retail-potential/#5a7cf9674a60>

<https://hackernoon.com/how-to-enhance-sale-with-the-use-of-augmented-reality-in-ecommerce-282ebe6a8353>

<https://www.wearable-technologies.com/2016/09/an-update-on-smart-shoes/>

<https://www.sciencealert.com/nike-s-power-laced-back-to-the-future-shoes-will-be-available-in-2016>

<https://www.engadget.com/2016/10/14/the-future-of-footwear-technology/>

<https://www.statista.com/chart/6810/the-future-of-ai/>

<https://emerj.com/ai-sector-overviews/virtual-reality-shopping-and-artificial-intelligence/>

<https://emerj.com/ai-sector-overviews/ai-in-fashion-applications/>

<https://footwearnews.com/2018/business/technology/augmented-reality-and-vr-will-change-the-way-we-shop-489353/>

<http://blog.else-corp.com/2017/10/else-corp-on-shoe-intelligence-strong-interest-for-else-corps-virtual-reality-and-personalization-system/>

<https://www.financialexpress.com/industry/technology/top-10-hot-consumer-tech-trends-for-2017-artificial-intelligence-ai-and-virtual-reality-vr-to-gain-traction/466351/>

<https://www.digitalistmag.com/customer-experience/2017/11/28/artificial-intelligence-in-retail-05465813>

https://www.researchgate.net/publication/257581255_Augmented_reality-based_design_customization_of_footwear_for_children

<https://www.journals.elsevier.com/artificial-intelligence>

<http://www.ceser.in/ceserp/index.php/ijai>

https://www.researchgate.net/publication/265424473_What's_New_in_Running_Shoe_Technology_Computers_hitech_materials_and_design_changes_have_led_to_improved_footwear