

Business Intelligence: Need and Usage in Indian Corporate Sector

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ABSTRACT: In today’s contemporary era, data plays a significant role in organizations. *Data* is at the core of business success. *Data* as a general concept refers to the fact that some existing information or knowledge is represented or coded in some form suitable for better usage or processing. *Data* is captured in the data warehouse where it is stored, organized, and summarized as per further utilization. *Data* is measured, collected, reported, and analyzed, whereupon it can be visualized using graphs, images or other analysis tools. Various methods or tools (like Capability maturity model (CMM), Analytical maturity model, BI development model, Business information maturity model, Gartner’s BI and performance management maturity model, HP’s BI Maturity Model, Ladder of business intelligence) are used to convert the data into information so that knowledge can be gained to make appropriate decisions. These results are shared with executives for the decision-making process. Organizations require correct information for any decision-making process. Business intelligence combines data warehousing, business analytics, performance, strategy, and user interface. Through this paper, we have attempted to verify the need for BI and its usage among various firms from the northern part of India. The result will help to get the knowledge about the need and extend of BI usage in India.

KEYWORDS: Business Intelligence, Data Analysis, OLAP

I. INTRODUCTION

BI offers [1] numerous strategic benefits to companies utilizing it. It helps in removing unnecessary guesswork within an organization and thus improves the communication within [24] departments. It helps in coordinating daily tasks and activities and facilitates the companies to respond rapidly. BI helps in improving the overall performance of the company. Information is often regarded as a prime resource of a company and a company takes decisions on available information, so the company can improve its performance only based [23] on timely and accurate information and its effective analysis. BI here plays a major role as it also supports the decision-making process.

BI also perks up customer experiences, allowing for the timely and appropriate response to customer related issues and priorities. In today’s customer-centric era, [22] managers are overloaded with information and are looking to derive understanding and intelligence from their organization’s data. One solution for this is to adopt a Business Intelligence (BI) model. But [2] at the same time many companies have been slow to take adopt due to a lack of awareness about BI effectiveness in businesses.



Fig 1. Usefulness of the BI (Source: Researcher)

BI can be useful for companies in the aspects of Data Analysis, Time – Series[21], Online Analytical [19,18] Processing (OLAP), Data Visualization, Reporting as shown in Fig No. 1.

1.1 BI Technologies

The requirements of information for different users as well as companies are different in nature. A particular IS needs to provide precise information. There [3] are number of methods and tools that provide platform for businesses to collect data. Also the [4] provide basis for analysis and creating analysis reports. Likewise BI tools also [5] facilitate businesses to get overview of business operations (both current and past). The various techniques used in BI are shown in Table 1.

Table 1. BI Techniques (Source: Wixom & Watson, 2010)

S.NO	Technique	Significance
1	Data Analysis	Finding hidden patterns in data and processing them to different desired models.
2	Time-Series Analysis	It is an predictive technique used to analyse the change in behavior over time of different elements of a business
3	Online Analytical Processing (OLAP)	Enables a user to extract and analysis data from different perspectives
4	Statistical Analysis	This technique is the utilization of mathematical formulae to qualify how significant or reliable the observed trends are.
5	Data Visualizations	It makes data easier to interpret can be employed in such cases, for instance, charts and graphs, typically referred to as Data Visualization
6	Reporting	It is the final document of the necessary information in a presentable form presenting the BI statistics and sent to a predefined distribution list

One of the most prominent advantages of BI reporting is the efficient presentation of reporting. A good effective analysis helps to understand the business and helpful in correct analysis.

According to Negash and Grey (2008), BI systems becomes vital for an organization in helping the management to come up with strategic thinking and action while Chaudhary (2004), and Olszak and Ziemia (2004) report that the value of a BI system in an organization is for decision-making, the establishment of a new set of rules, creating new markets, obtaining new customers etc.

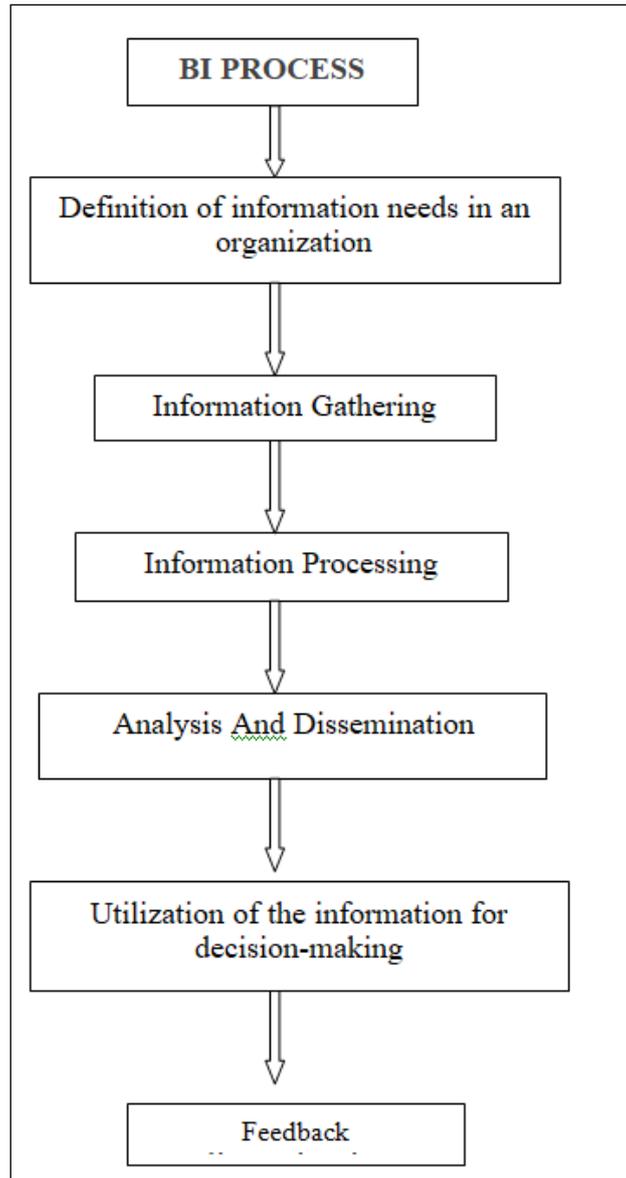


Fig 2.The BI Process (Source: Researcher)

1.2. TOOLS USED IN BI

The Business Intelligence process involves the [17, 16] definition of information needs in an organization; information gathering; information processing; analysis; dissemination; and utilization of the information for decision-making and giving feedback. Table 2 represents tools used in BI. These tools are used by different organizations under study to accumulate the data and make decisions based on that data. These [15] tools have different functionalities and interfaces but their main aim is to make strategic decision making and display the analytics that can be a decisive factor.

Table 2. Tools used in BI(Source: Researcher)

S.No.	Name of Tool
1	Sisense
2	Actuate Business Intelligence and Reporting

	Tools (BIRT)
3	icCube
4	Domo
5	Board Management Intelligence Toolkit
6	Clear Analytics
7	Ducen
8	Gooddata
9	Oracle BI
10	Oracle Enterprise BI Server
11	Oracle Hyperion System
12	Palo OLAP Server
13	Pentaho
14	Profit base
15	QlikView
16	Rapid insight
17	SAP business intelligence
18	SAP BusinessObjects
19	SAP NetWeaver BW
20	SAS BI
21	Silvon
22	Solver
23	SpagoBI
24	SQL Server Analysis Services
25	Style Intelligence
26	Syntell solutions
27	Targit
28	Vismatica
29	WebFOCUS
30	Yellowfin BI

When there is a large amount of disparate data is present and helps to look deep into the data.

BI provides an added [14, 13]benefit as it is competent to offer apparent data patterns and logic which can be used to supports in decision making as well as provides a new insight into the organization. Now as the firms have recognized the magnitude of importance of BI operations, some of them are listed below:

- Number of business issues has been resolved with the usage of superior BI tools.
- With BI tools, it is easy for the firms not only to identify their most profitable customers and their reasons for loyalty but also to identify future customers.
- Quickly detect money-laundering and other criminal activities.
- Analyze potential growth through customer profitability.
- Reduce risk through precise financial credit scoring of clientele.

- Verify the combinations of products and services that customers are likely to purchase and in which period.
- Decrease equipment downtime by using predictive continuance.
- Detect and deter fraudulent behavior.

II. NEED OF BI

The source of business intelligence can be anything that you track in business. Data of the company has enough power to evaluate ROI, profits, revenues, turnovers sales quantities and much more.

All the reports, charts [12,11] and dashboards are referenced the bigger picture comes into light. With BI, managers can see patterns, trends and [10] outliers from which the next strategic move can be planned. Following points are vital as far as understanding the need of BI.

1. Take action: Managers can take action to improve business performances. Using BI insights, managers can choose and start marketing campaigns that help in bringing the best ROI. It also [3,4]helps in targeting the customers more accurately. The efficiency of operations and logistics can be improved along with forecast sales and adjust targets accordingly.

Begin transformation: Transformation[9] process begins when managers start taking action on the insights. Overall thinking pattern [1,2] changes in case of reassessment and make changes accordingly based on Business Intelligence operations.

Table 3. Primary job titles (Source: Researcher)

S.No.	Job Title	Number	Percentage
1	Project Lead	29	14.5
2	Software developer	24	12
3	Top Manager	23	11.5
4	Network Administrator	22	11
5	CEO	17	8.5
6	Business Level	11	5.5
7	Professional service	10	5
8	Database Administration Senior Analyst	8	4
9	Consultant DBA	7	3.5
10	DBA	6	3
11	IT Services	6	3
12	IT Manager	5	2.5
13	IT Associate	4	2
14	Software Developer	4	2
15	IT Support	4	2
16	Web development	3	1.5
17	Sr. Executive	3	1.5
18	Sr. Security administrator	3	1.5
19	Software engineer	2	1
20	iOS Developer	2	1

21	Product owner	2	1
22	Programmer	4	2
23	Development officer	1	0.5

Table 4: Respondents'BI experience(Source: Researcher)

S.No.	Work Experience	Number	Percentage
1	Less than 1 year	35	17.5
2	1 – 4 years	57	28.5
3	5 – 8 years	50	25
4	9 – 12 years	33	16.5
5	13 years and above	25	12.5

Get ahead: Opportunities to overtake the competition can only be availed when the act on trustworthy data and appropriate analytics applied to it. With this transformation in business can be [8,7,6]witnessed. Also it is important to find out weaknesses more importantly to strengthen them. BI helps to find and target these strengths. To get ahead it is essential to see into the future. This is where some BI visualization tools help you gain the advantage.

A very important aspect related to BI emphasized by Alaskar and Efthimios (2015),according to authors all the organizations cannot achieve success in BI solutions. For this, organizations need to be conscious of the key indicators of success in adopting BI solutions. Also it is important to overcome the challenges or risks that are associated with the BI project during its implementation Rasoul and Mohammad(2016).

III. RESEARCH METHODOLOGY

In order to study the need and usage of BI in the corporate sector, a sample has been taken from medium and large IT and non-IT firms. A detailed survey of 200 respondents from different firms has been carried out from the region of Punjab and Haryana with the help of examining the respondents. This study is descriptive and exploratory in nature.

Data has been collected both through online mode as well as field work. A structured and pre-tested questionnaire has been provided to the selected respondents and before that a pilot study has been conducted to check the depth and internal consistency of questionnaire. Also, reliability and stability is evaluated through a test-retest procedure that involves administering the questionnaire to the same individuals under the same conditions after some time.

IV. RESULTS AND DISCUSSION

To analyze the degree of BI usage, it is important to determine the demographics details of respondents under study.

Every organization deals with lot of data, information, and knowledge, but handling all the aspects of BI in the organization require basic leadership and fast decision making capabilities on the part of designed manager,Turban et al., (2010).

Table 3 shows the primary job title of respondents under study. Form the table, it has been noted that maximum percentage of respondents works either as project lead, software developer, top managers or network administrators.

Table 4 represents the respondent's work experience in BI. Maximum work experience lies in the range of 1-4 years while the minimum is observed in the case of 13 and above years. As per article published by Blitz (2017), an organization can have many different types of business intelligence users within the organization. The only biggest challenges are that who will be going to access the available data. Infact, BI can be used across departments in all the industries because data is a primary role everywhere.

For example, HR holds the key of asset management and therefore BI can be extensively used for HR processes. According to McFadden (2019), number of big multi-nationals and corporations has been using BI tools for years.

Elbashir et al.(2013), found that senior executives and data managers have been significantly attracted to BI systems. Blitz (2017) mentions other key areas where BI can be used:

1. The Data Analyst
2. The Executive
3. The Business User
4. The IT Team

It is important to classify the BI user based on the training they've received and/or on their analytical capabilities. This will help the organization in a long way. Structured data is the base of BI operations. Managers primarily relied upon numerical data Isik et al. (2013).

Table 5. Category of company(Source: Researcher)

Category of the Company	Number	Percentage
Large	86	43
Medium	45	22.5
Small	69	34.5

As far as the category of the company is concerned Table 5 show that, 43% of respondents belong to Large sized companies, 22% of respondents were working with medium-sized firms and 35% respondents belongs to small-sized companies

Table 6. Type of organization(Source: Researcher)

S. No	Type of organization	Number	Percentage
1	IT	139	69.5
2	Banking/Financial	25	12.5
3	Retail	9	4.5
4	Manufacturing	8	4
5	Communication/Media	6	3
6	Insurance	5	2.5
7	ISP	5	2.5
8	Consulting	2	1
9	Educational services	1	0.5

Table 6 shows the type of organizations under study of BI technologies. It has been observed that IT is at the top with a 69.5% contribution in this study after that Banking and financial services with 12.5% contribution and educational services is at the last with a 0.5% presence.

According to Mihaelia and Rozalia (2012), there are the number of activities like data administration (from both inner and outside business environment), data identification, etc are related to every organization regardless of their size; but these activities leads to economic and finance-related decision-making problems if not administered appropriately.

Katzor, (2014), mentioned that almost every organization has a lot of data and also it is growing exponentially over time. Therefore, it means companies of all sizes (small, large or medium) and varied industries (finance, health care, consumer products, marketing, real estate, tourism and more) need BI for decision making and understanding their markets, evaluating KPIs, and monitoring real-time market conditions.

According to McFadden, (2019), BI is currently utilized by Universities for admissions, Cruise liners for leisure tour planning, Video games for entertainment, college or university libraries and Online shopping portals like Amazon and Flipkart, etc.

Table 7. Department of respondent (Source: Researcher)

S.No.	Department of Respondent	Number	Percentage
1	Accounting	1	0.5
2	Administrative	11	5.5
3	IT	157	78.5
4	IT Operations	9	4.5
5	Operations	6	3
6	Programs	1	0.5
7	Purchase	2	1
8	Research and development	8	4
9	Sales	4	2
10	Security	1	0.5

While the last table 6 represents the type of organization under study. Table 7 shows the department of respondent where he/she actually works. The table shows that maximum respondents belong to the IT department i.e. 78.5% while remaining other departments were comparatively less when considering the IT department.

Table 8. BI vendors (Source: Researcher)

S.No	BI Vendors	Number	Percentage
1	Oracle BI	56	28
2	IBM Cognos	39	19.5
3	Microsoft BI	34	17
4	BIRT	17	8.5

5	SAS	17	8.5
6	SAP	14	7
7	Others	12	6
8	Local	10	5
9	Zoho	1	0.5

As far as services of different vendors understudy have been concerned Table 8 shows that, most of the companies are found to be using Oracle BI (28%) while IBM Cognos usage is 19.5% and Microsoft BI is in third place with 17% usage. Remaining other BI vendors were found to be utilized less when compared to the top three BI vendors. According to select hub (2020) [14], the top 5 BI software providers include Looker, Birst, QlikView, Board and Logi Analytics.

Table 9.Usage of BI (in years)(Source: Researcher)

S.No	Usage of BI	Number	Percentage
1	Less than 1 year	13	6.5
2	1 – 2 years	37	18.5
3	3 – 4 years	17	8.5
4	5 – 6 years	48	24
5	7 – 8 years	13	6.5
6	9 – 10 years	16	8
7	10 years and above	56	28

While considering the usage of BI tools by various companies in Table 9, it has been found that 28% of the companies under study have been using BI tools from 10 years or above and 24% companies using the BI services from the 5-6 years. It means a majority of the companies have adopted BI technologies a decade ago.

Table 10. Type of software used as BI (Source: Researcher)

Items	Yes (%age)	No (%age)
Spreadsheets	70.5	29.5
Reporting and querying software: tools that extract, sort, summarize, and present selected data	78.5	21.5
OLAP	51.5	48.5
Digital dashboards	67	33
Data mining	65	35
Data warehousing	66	34

As per responses given by respondents Table 10 shows that most of them prefer either spreadsheets or Reporting and querying software, usage of Digital dashboards, Data mining, Data warehousing software is also considered while OLAP has been used comparatively less when considering other tools.

Table 11.Respondent education level (Source: Researcher

S.No	Factors	Number	Percentage
1	Change management process	7	3.5
2	Commitment from business	22	11
3	Commitment form IT	30	15
4	Data quality	78	39
5	Skills and competencies	23	11.5
6	Sponsorship and funding	2	1
7	Technologies and tools	18	9
8	Training	14	7
9	Vision, strategy, goals	5	2.5
10	Others	1	0.5

According to an online article presented by Technology Advice, (2020), OLAP, digital dashboards and ETL are mostly utilized for corporate reporting. Data analysis and the resulting insights make the BI alluring to business users due to several insights.

Table 11 shows the level of education of respondents under study. The majority of respondents have master's degrees while almost the same percentage of respondents has bachelor's degrees.

Table 12.Important aspects of BI(Source: Researcher)

S.No	Previous work experience relevant to BI profile	Number	Percentage
1	Yes	56	28
2	No	144	72

Table 12 is very much important as far as the impact level of various factors related to business and BI tools usage is concerned. Out of the 10 factors specified in the questionnaire, majority of respondents (39%) have mentioned that quality of data has the biggest impact while Commitment from business (11%), Commitment form IT (15%) and Skills and competencies (11.5%) also considered important that can impact BI usage.

As per information shared by Colavito (2017), an analysis conducted by business intelligence tools removes the guesswork from businesses. This is done with the help of quantifying solutions to complex problems and not relying on vague information or instincts. On the same lines, Richardson (2018) mentioned that BI helps in accelerating Return-on-Investment.

Table 13.BI related work experience(Source: Researcher)

S.No	Duration of Business Operation	Number	Percentage
1	1-2 years	57	28.5
2	3-5 years	47	23.5
3	> 5 years	96	48

As far as previous work experience relevant to the BI profile is concerned Table 13 shows that, the majority of respondents (72%) mentioned here that they had no work experience before started on this particular job profile. This means that companies have to themselves train the employees before putting them on to the BI process.

Table 14. Duration of business(Source: Researcher)

S.No	Use of technologies	Number	Percentage
1	Strongly disagree	0	0
2	Disagree	0	0
3	Neutral	46	23
4	Agree	80	40
5	Strongly agree	74	37

Table 14 shows the duration since the business is operating. As per the respondent's responses, the majority is businesses (48%) are operating for more than 5 years. while 23.5% of respondents mentioned that business is operating from 3-5 years and 28.5% of respondents said that business is operating from 1-2 years.

From Table 15, it has been noticed that the majority of respondents either agreed or strongly agreed that their companies use BI technologies, while there are no respondents who were found to have disagreed with this aspect. It suggests that usage and adoption of BI in companies is sufficient.

Also, the radius of business life cycle becomes shorter and therefore to gain competitive advantage managers need to must take quick and proper decisions Farjami(2015).

V. CONCLUSION

In conclusion, it can be stated that BI plays a major role in helping the organizations as it also supports the decision-making process. BI uses various technologies such as OLAP, Time series analysis, etc. as well as tools which are Sisense, Demo, IcCube, oracle BI, etc. from the survey of various companies I reached at this stage that project leaders mostly uses BI than the persons with another job role. If we compare the usage of BI in various types of companies then it can be said that large companies are using BI at greater scale than small and medium-sized companies. Reporting and querying software are being used as BI technology by most of the companies than other software. The majority of the respondents suggested that the usage and adoption of BI in companies is sufficient.

VI. REFERENCES

[1] Alaskar, T., &Efthimios, P., (2015). "Business Intelligence Capabilities and Implementation Strategies", International Journal of Global Business, Vol. 8 (1), pp. 34-45.

- [2] Blitz, S., (2017). "4 Business Intelligence Users You'll Encounter in Any Company", accessed from <https://www.sisense.com/blog/4-business-intelligence-users-youll-encounter-company/> as on March 2020.
- [3] Chaudhary, S. (2004). "Management factors for strategic BI success. In Business intelligence in digital economy. Opportunities, limitations and risks", IDEA Group Publishing.
- [4] Colavito, J., (2017). "The Importance of Business Intelligence in Organizations", accessed online at <https://www.smartdatacollective.com/importance-business-intelligence-organizations/>, as on January 2020.
- [5] Elbashir, M.Z., Collier, P.C., Sutton, S.G., Davern, M.J., Leech, S.A., "Enhancing the Business Value of Business Intelligence: The Role of Shared Knowledge and Assimilation", *Journal of Information Systems* 2013; 27:2 pp. 87–105
- [6] Farjami, Y., &Molanapour, R., (2015). "Business intelligence (from Idea to Practice)", Ati-Negar Press, 1st Edition.
- [7] Isik, Ö.; Jones, M.C.,&Sidorova, A., (2013). "Business intelligence success: The roles of BI capabilities and decision environments", *Information & Management*, Vol. 50(1), pp. 13-23.
- [8] Katzor, I.R., (2014). "Business Intelligence: What companies use BI (size, industry)? For what purposes? How much are they ready to spend on BI?", assessed online at <https://www.quora.com/Business-Intelligence-What-companies-use-BI-size-industry-For-what-purposes-How-much-are-they-ready-to-spend-on-BI>, as on Feb 2020.
- [9] McFadden, C., (2019). "7 Interesting and Unexpected Uses of Business Intelligence Tools", assessed online at <https://interestingengineering.com/7-interesting-and-unexpected-uses-of-business-intelligence-tools>, as on Feb 2020.
- [10] Mihaelia, F. T., &Rozalia, V. R., (2012). "Business Intelligence Solutions for SMEs. Economics and Finance", Vol. 3, pp. 865-870.
- [11] Negash, S., & Gray, P. (2008). "Business Intelligence, in Burstein, F., Holsapple, W. Clyde (Editors)", *Handbook on Decision Support Systems 2*, Springer, pp. 175-193.
- [12] Olszak, C. M., &Ziemba, E. (2004). "Business intelligence systems as a new generation of decision support systems". *Proceedings PISTA 2004, International Conference on Politics and Information Systems: Technologies and Applications*. Orlando: The International Institute of Informatics and Systemic.
- [13] Rasoul, D. G., and Mohammad, H., (2016). "A model of measuring the direct and impact of business intelligence on organizational agility with partial Mediatory role of Empowerment: Tehran construction Engineering Organization (TCEO) and EKTA organization industries.co. Social and Behavioral Sciences", Vol. 230, pp. 413-421.
- [14] Richardson, M., (2018). "7 Reasons Business Intelligence Is Vital To Business Success", accessed online at <https://www.maximizer.com/7-reasons-why-business-intelligence-is-vital-to-business-success/>, as on December 2019.
- [15] Selecthub, (2020). "Business Intelligence Software Tools Comparison", accessed online at <https://www.selecthub.com/business-intelligence-tools/>, as on March 2020.
- [16] TechnologyAdvice, (2020). "Guide to Business Intelligence Software", accessed online at <https://technologyadvice.com/business-intelligence/>, March 2020.
- [17] Turban, E., Sharda, R., &Delen, D., (2010). "Decision Support and Business Intelligence Systems", 9th ed., Prentice Hall Press, Upper Saddle River NJ.
- [18] Wixom, B. H., & Watson, H. J. (2010). "The BI-based organization", *International Journal of Business Intelligence Research*, 1,13-28.
- [19] Sharma, R.K.; Ghandi, P. 2017. Estimate Reliability of Component Based Software System Using Modified Neuro Fuzzy Model. *International Journal of Engineering & Technology*, v.6, n.2, pp. 45-49.
- [20] Ravi Kumar Sharma & Parul Gandhi, "Quality Assurance of Component Based Software Systems", 2016 International Conference on Computing for Sustainable Global Development (INDIACom), 978-9-3805-4421-2/16\$31.00@2016 IEEE.
- [21] R Sharma, "Embedded Systems Dilemma of Chip Memory Diversity by Scratchpad Memory for Cache On-chip Memory", "International Journal of Engineering, Pure and Applied Sciences", Vol 1 No 1, PP 1-4.
- [22] Ravi Kumar Sharma, Parul Ghandi, "Reliability Estimation and Optimization: A Neuro Fuzzy Based Approach", "International Journal of Computer Science and Information Security (IJCSIS)", Vol 16 No 12.
- [23] Ravi Kumar Sharma, Parul Gandhi, "Evaluation of Software Consistency for Component Based System Through Soft Computing Technique", "MR International Journal of Engineering & Technology", Vol 8 No 1, PP 40-43.

- [24] Ravi Kumar Sharma, Parul Gandhi, "Study of Reliability of Object-Oriented Structure Consuming CK Metrics", "2019 6th International Conference on Computing for Sustainable Global Development (INDIACom)", 828-831, IEEE.