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## **Research Domain Of Innovative Work Behaviour: A Bibliometric Analysis Of Fifteen Years Research(2005-2020)**

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### **Abstract**

This study has designed to give an overview of all the research work done on innovative work behavior. The bibliometric analysis has been conducted to understand the knowledge domain of Innovative work behaviour. The Web of Science (WoS) was searched with "innovative Work Behaviour\*" OR "innovative Work Behavior\*" using wild card character to know all related terms. The word spelling of behavior had American and British spelling, therefore both terms were searched with the option of "OR" to have maximum publications in WoS. The search was done with topics, ranging from 2005 till 2020 customizing the years resulted in 209 publications. The articles with the English language were included resulting in final 208 documents for analysis, only one publication in the Dutch language was excluded. The data was retrieved and exported on 20 May 2020. The findings of the study suggests that the sports sciences, health care science services, and Anthropology are quite less explored and immature research areas in the IWB domain. Innovation is needed in these sectors. Whereas, yearly research data indicates that the research in this field so far shows the IWB got the researchers' attention and realization of its importance in the second decade of the 21<sup>st</sup> century. And with time the yearly graph of published papers on IWB kept increasing.

**Keywords:** Innovative work behavior, Creativity, Knowledge Sharing, Organization, Innovation

## **Introduction**

Innovative work behavior (IWB) is a modern concept. It is no doubt in the fact that humankind is innovating since their birth, but modern research work has been started in this field in the early 21<sup>st</sup> century and published. But this field is still in its evolution stage as emphasized by practitioners and scientists (de Jong & den Hartog, 2010). Micro-level research in the field of IWB by (Radaelli, et al., 2014), provided the latest insights on how IWB of employees' has been affected by their knowledge sharing behavior. IWB has also being studied based on various theories. The theoretical framework of job characteristics theory and achievement goal theory used to study the stimulation of IWB by the individual, job-related, and team-level characteristics (Cerne, et al., 2017). For the Leader-member exchange theory's effects on innovative work behavior, empowerment acts as a mediator (Schermyly, et al., 2013).

The importance of innovative organizational behavior can be understood by the development in the field in the past decade. IWB is a key competence of an organization (Korzilius, et al., 2017). To understand this factlet's take into account the public and private sectors. The public sector employees consider IWB as an extra-role for which they have been compensated, whereas, private sector employees consider IWB necessary for their career advancement (Bysted & Jespersen, 2014). Furthermore, innovative processes and products are needed to resolve the emerging challenges and problems in an organization (Gerhard & H., 2011).

Also, innovative work behavior is comprised of idea search, idea generation, idea communication, starting activities of implication, overcoming obstacles, and involving others. Managerial support influence innovative work behavior (Lukes & Stephan, 2017). The researchers also studied other antecedents of innovative work behavior. The focus of most studies was on work requirements, work conditions, and high challenges at work as the innovative work behavior drivers (Maria, 2015). The innovative work behavior also enhanced by different HR practices like training and development, autonomy, job security, reward, feedback, job demand, and task composition (Bos-Nehles, et al., 2017). Not only is this but innovative work behaviour also dependent on teamwork. Team activity, sharing, learning behaviors, and team reflection impact strongly on the team's innovation development (Widmann, et al., 2016).

The dependence of organizations is high on the employees' efforts to innovate. But the recognition of employees' efforts for innovation affected by the relationship between employees and their manager. Employees having high leader-member exchange relationships receive favorable ratings of their performance by their engagement in innovative work behavior (Schuh, et al., 2018). If the task is difficult and challenging, employees have to come up with a simple and innovative solution to fulfill that task. The more challenging the task is, the more are chances for the employees' innovative work behavior (Battistelli, et al., 2019).

Innovative work behavior is the variable not yet explored to the extent of its importance. Furthermore, the bibliometric analysis of IWB will give a more clear understanding of the concept and what area or topic should the researcher choose to explore this field of study further. In keywords co-occurrence analysis, the occurrence of keywords in all published papers, and their strength gets calculated in statistical analysis. This further helps future researchers to choose the area, or a keyword less explored in connection with IWB. This will strengthen the overall research base and the field of IWB. The impact of top Journals, areas of research, country-wise research data, keywords co-occurrence, top-cited papers, and the yearly research data in the field of IWB will be analyzed and the bibliometric analysis is the most relevant tool to do so.

### **Significance of the Study**

This study has designed to give an overview of all the research work done on innovative work behavior. The bibliometric analyses give insight into the research on IWB. The data shows a gradual increase in the annual studies on IWB. The data from 2005-2020 in **Figure 1** indicates that the research on IWB has increased with time. Bibliometric analysis of IWB will demonstrate the importance of this field. It will attract more researchers.

The study will also make it easy to understand the impact of articles on IWB in the research domain. Top cited papers, paper producing countries, journals, areas of study, yearly data, and keywords analysis will help to understand the overall development of the field with time. In the time of conducting future research on IWB, the areas less explored and already explored will be easy to extract from the bibliometric analysis. It will make future research in the field to be a more specific, rightly directed, and a significant addition in the literature.

Following is the arrangement of the paper. Methods and the materials are described in Section 0. Analysis results are introduced in Section 0, including source journals, the network of keywords co-occurrence, publications per year, the top 10 cited papers, influential productive countries, and research areas. The discussion of results is in Section 0. Section **Error! Reference source not found.** includes a meaningful conclusion.

### **Research Methodology**

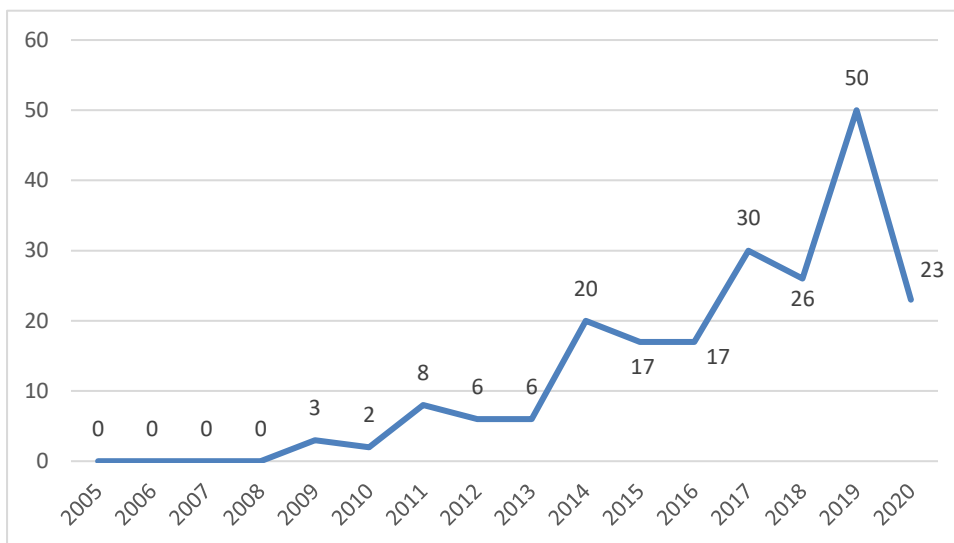
The bibliometric analysis was conducted to understand the knowledge domain of Innovative work behaviour. The Web of Science (WoS) was searched with "innovative Work Behaviour\*" OR "innovative Work Behavior\*" using wild card character to know all related terms. The word spelling of behavior had American and British spelling, therefore both terms were searched with the option of "OR" to have maximum publications in WoS. The search was done with topics, ranging from 2005 till 2020 customizing the years resulted in 209 publications. The articles with the English language were included resulting in final 208 documents for analysis, only one

publication in the Dutch language was excluded. The data was retrieved and exported on 20 May 2020.

## Results and Discussion

### Scientific Activity Evolution: Prior Analysis

The trend of the research in IWB can be followed and analyzed by the papers researched during a particular period. The evolution in research with the time adds diverse knowledge of the variable and indicates the overtime change in the subject knowledge. The clarification of the research trend and future development in the subject can be taken from the yearly statistical analysis of WOS. Trends in IWB from 2005-2020 are shown below in **Figure 1**.



**Figure 1. Distribution of published articles on IWB, 2005-2020**

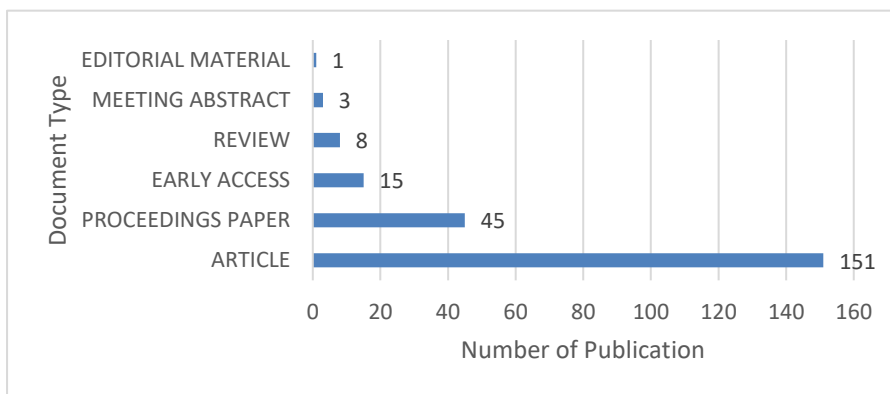
As can be seen in **Figure 1**, the trend in the study of innovative work behavior kept changing with time, slightly up and down as the Innovative behavior also depends on the political trends in the society. From the years 2005 till 2009 there was no publication on IWB in WoS. The research in 2009 started with 3 publications, before 2014 only a handful of 25 publications can be seen. With the several ups and downs every year, the constant growth in the study of the IWB can be witnesses after every 3 years. In 2011, total publications were 8, in 2014 it went up to 20 with three times increase. Then with the 42.8% fall in 2015, it went up again to 30 publications in 2017. And then from the very next year, the research domain of IWB started to grow. The peak of the IWB study came in 2019 with 50 publications. The area is developing with time. In the first quarter of the year 2020, as data was saved in May 2020, a good amount of 23 papers were published, which reflects a growing research trend. The more relevant research in Innovative Work Behavior can keep the businesses growing and innovating.

A total of 208 research papers have been published since 2005. The annual publication percentage shows clearly that out of a total of 208 publications, 24% are in the year

2019. And the growth of publications can be seen in 2020, only the first quarter contributes 11 % in the total research on IWB. The field of study in growing and gaining the interest of researchers as Individual employees' Innovative Work Behavior (IWB) has a very important role in organizational success. In the growing field of innovative work behaviour, even researchers (Bibi & Afsar, 2020) are analyzing the behavioral and gender aspects of innovative work behaviour for organizational success.

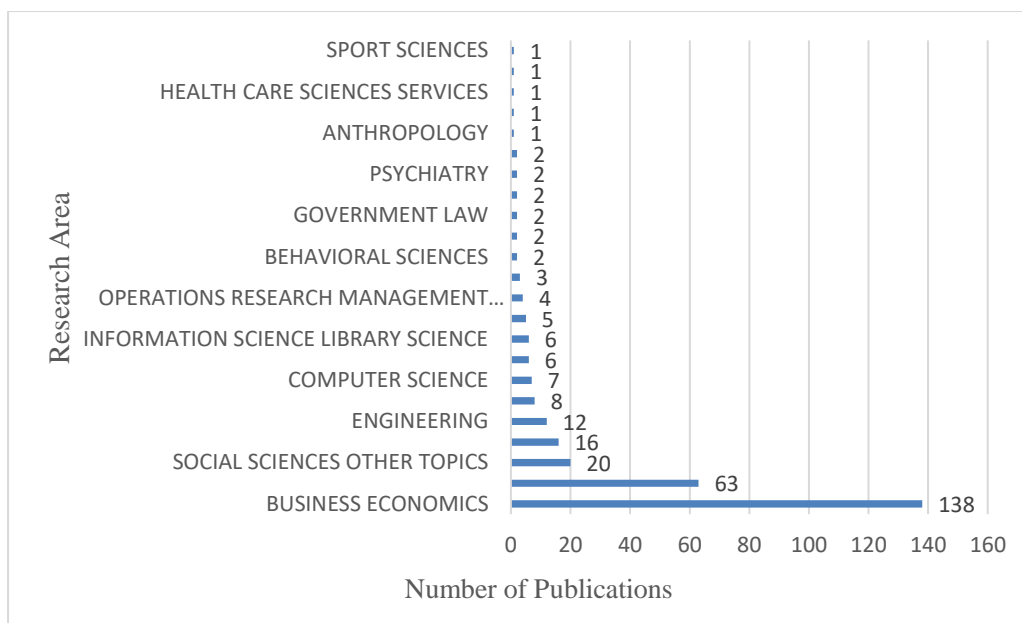
**Publication Types and Research Area Analysis:**

The 208 documents of WoS were analyzed resulted in six different types of documents, illustrated in **Figure 3** i.e., articles, proceedings paper, early access, review papers, meeting abstracts, and editorial material. The 151 papers are articles, which is 73 % of 208 total papers. Proceedings papers are 45 in number. Followed by early access article 15 in number. The review articles account for 3 % of total publication i.e 8 in number. In the last, 3 meeting abstracts i.e., 1 % and one editorial material. The result shows that more than 2/3<sup>rd</sup> of them are articles on IWB. The same data is represented in the graph in **Figure** , shows the longer bar for articles and shorter for the meeting abstracts and editorial.



**Figure 2. Document Types on IWB (2005-2020)**

The research on IWB has been conducted in different research areas, as shown in **Figure 3**. Most of the research on IWB is in the area of business economics. A total of 138 paper contributions are from the area of business economics. This shows that economics is the most important area of study especially concerning IWB. Economics is considered as the backbone of every country as well as every business. Almost everything revolves around economic gain. Social sciences and engineering have also contributed well to the study of IWB. Whereas, more work is required to be done in the area of Behavioral Sciences and Government Law on IWB. The sports sciences, health care science services, and Anthropology are quite less explored and immature research areas in the IWB domain.



**Figure 3. Research Area Domain: IWB(2005-2020)**

Out of the top 10 areas of research in the field of Innovative work behavior, Business economics and psychology contribute 66 % and 31 % respectively. After the analysis of the data, many areas of research are yet to be explored concerning the IWB study. More of the study in different areas of research will increase the diversity of Innovative Work Behavior studies.

### Quantitative Analysis of Productive Countries

The bibliographic coupling of countries was conducted in the VOSviewer using fractional counting method. The threshold value was computed 5 documents per country. Out of 54 countries, only 23 countries meet the criteria, the total link strength of bibliographic coupling link with other countries was calculated. The list of countries along with documents produced with total link strengths is depicted in Table 1. The countries bibliographic coupling is listed in terms of total link strength means how research work has been co-authored and co-cited by researchers from different countries linked together. The search result of IWB shows that all 208 papers came from 54 countries or territories worldwide.

In terms of the highest number among documents link with other countries, on the top, 28 papers have been produced in Pakistan since 2005 around the world. Pakistan accounts for 28 papers with 102 citations having total link strength 25085. This indicates that the interest in developing Innovative Work Behavior is more in Pakistan as compare to other countries in the world. Pakistan is putting its efforts into developing this field of study. This is a good sign for the developing country to work more than any developed country on Innovative work behavior. The second in line is England, Netherlands, Peoples R China has 26 publications links with other countries. Germany is fifth in a row with 23 documents links, followed by Italy (18), USA (17),

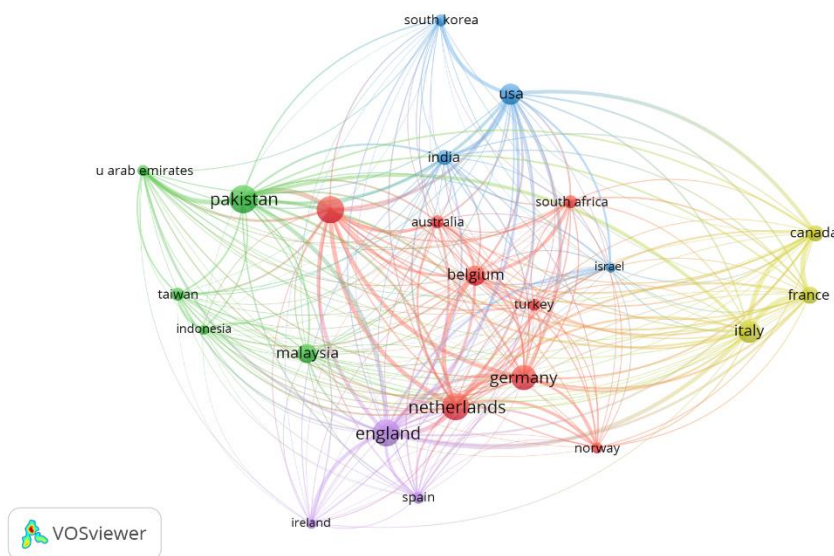
Belgium (16) Malaysia (15), and France having 12 documents links with other countries. Among other countries Canada (11) India (10), Australia, South Africa, and Taiwan have 8 documents links. Spain Turkey and South Korea having 7 documents linked with other countries. The U. Arab Emirates and Norway with 6 documents and Israel Ireland and Indonesia with 5 documents links.

Table 1.

Bibliographic Coupling of Countries Documents 2005-2020				
Rank	Country	Documents	Citations	TLC
1	England	26	473	27992
2	Pakistan	28	102	25085
3	Netherlands	26	603	24095
4	Peoples R China	26	229	22485
5	Germany	23	210	22155
6	Italy	18	181	20557
7	France	12	141	16850
8	USA	17	453	16564
9	Belgium	16	165	16431
10	Canada	11	88	14762
11	India	10	248	10122
12	Australia	8	78	9526
13	South Africa	8	118	9084
14	U. Arab Emirates	6	26	9002
15	Malaysia	15	25	8168
16	Spain	7	104	7543
17	Norway	6	78	6817
18	Turkey	7	62	6035
19	South Korea	7	60	5969
20	Taiwan	8	56	5441
21	Israel	5	189	4882
22	Ireland	5	125	4315

In terms of the highest number of citations of bibliographic coupling of countries' documents (Table 1), Netherland has the highest number of citations (603) of documents followed by England having 473 citations of documents. The third in line USA (453) followed by India (248) Peoples R. China (229), Germany (210). It is interesting to note that seventh in the rank country in terms of citations, Israel with 5 documents has 189 citations. Italy having 181 citations, Belgium (165), France (141), Ireland having 5 documents with 125 citations. South Africa (118), Spain (104), Pakistan (102), and Canada with 88 citations. The sixteen in rank among 23 countries in terms of citations of bibliographic coupling of countries, Australia and Norway have 78 citations followed by Turkey (72), South Korea (60), and Taiwan's publication with 56 citations. The last three countries in terms of citation are United Arab Emirates (26), Malaysia (25), and Indonesia with only 2 citations for 5 publications. The other 31 countries out of 54 have produced less than 5 documents on Innovative work Behavior.

In-network visualization of countries' bibliography (Figure 4), the size of the circle represents the proportion of the country. The countries like Pakistan lead in documents and Netherlands in citations. The bigger the circle the bigger contribution in terms of documents linked between countries. The bibliography coupling of the country generated 5 clusters having red, blue, green, purple, and yellow themes colors.



**Figure 4. Network Visualization: Bibliographic Coupling Of Countries (2005-2020)**

The cluster 1 with Red color theme has Australia Belgium, Germany, Netherlands; Norway, Peoples r China, South Africa, and Turkey. In cluster 2 with green color have



countries like Indonesia, Malaysia, Pakistan, Taiwan, and the United Arab Emirates. Cluster 3 with a blue color theme depicts countries like India, Israel, South Korea, and the USA. Cluster 4 with a yellow theme reflects Canada, France, and Italy. Finally, cluster 5 having purple theme color Depicts England, Spain, and Ireland. The grouping in these clusters reflects that author from these countries has co-authored publications and co-cited each other's work.

### Most impactful Papers and Main Journals

This field of study is emerging and paper publishing per year is growing. The analysis was done on WoS analyzing bar. So far 208 total papers have been published in the field since 2009 in 133 journals which means the diversity of publications is high. A higher list of journals explains that the field is still in its growth stage. Still, a lot of work can be done on IWB and it can be studied with the combination of other dependent or independent variables.

**Table 2**  
**Top 10 Journals by No. of Publications, 2005-2020**

Rank	Journal	Records	% of 208
1	European Journal of Innovation Management	11	5.641
2	Personnel Review	8	4.103
3	International Journal of Human Resource Management	7	3.59
4	Creativity and Innovation Management	6	3.077
5	European Journal of Work and Organizational Psychology	6	3.077
6	Advanced Science Letters	5	2.564
7	Procedia Social and Behavioral Sciences	5	2.564
8	Frontiers in Psychology	4	2.051
9	Journal of Occupational and Organizational Psychology	4	2.051

Most of the papers on IWB are published in the European Journal of Innovation Management. A total of 11 papers have been published in 2009-2020. This journal holds the highest 5.641% of total published papers. From 1998-2020, a total of 23 volumes of European Journal of Innovation Management have been published. Journal named Personnel Review is at the second with 8 publications and holds 4.103% of total publications. Both of these journals are for Europe, which indicates that European scholars are more interested in this field of study. European countries are no doubt well-developed nations. They invest more in innovation, encourage people to innovate and implement their ideas to give a boost to the industries. Error! Reference source not found. below shows the top 10 journals in the field of IWB ranked based on total publications:

After the top 10 journals, here is an overview of top-cited research papers written on Innovative Work Behavior (IWB). The citation report was generated in WoS, the H-Index report 32 which means 32 documents are cited 32 times in research. The value of H-Index above 30 is considered as good (Hirsch, 2010). **Table 1** shows the data which indicates that the research paper, titled Measuring Innovative Work Behavior by (de Jong & den Hartog, 2010) is the top-cited paper on IWB with 236 citations. Although the Journal, in which it has been published, ranked 4<sup>th</sup> in the top-ranked Journals on IWB publications (Error! Reference source not found.). In the top-cited paper, the author studied the IWB in 4 dimensions namely; exploration, generating ideas, championing the idea, and implementation of the idea. De Jong and Den Hartog (2010) found the IWB is one-dimensional because of the weak distinctiveness amongst the four dimensions. However, no paper from the 10 top-cited papers is from the 'European Journal of Innovation Management' which is a top-ranked journal by no. of publications.

Discussing the other papers shown in **Table 1**, individual innovative work behavior shows a positive relationship with group ethical leadership and individual ethical leadership perception (Xinxin & Yidong, 2013). In an article "Linking LMX, innovative work behavior and turnover intentions: The mediating role of work engagement", Agarwal, Datta, Blake-Beard, and Bhargava (2012) found out in their research that work engagement is related positively to the innovative work behavior and also mediates its relationship to LMX. Furthermore, another research (Ma Prieto & Pilar Perez-Santana, 2014) found results that the opportunity-enhancing and ability-enhancing practices of Human resources are related positively to IWB with the mediation of coworkers and management support. Innovative Work Behavior, included idea generation and idea implementation, is also influenced positively by transformational leadership (Afsar, et al., 2014). Therefore, the top-cited research papers show that IWB has a positive relationship with most of the variables studied and

highlighted in keyword co-occurrence. This trend of a positive influence of IWB also indicates the importance of its implications in the organization.

**Table 1.**  
**Top 10 Cited Papers, 2005-2020**

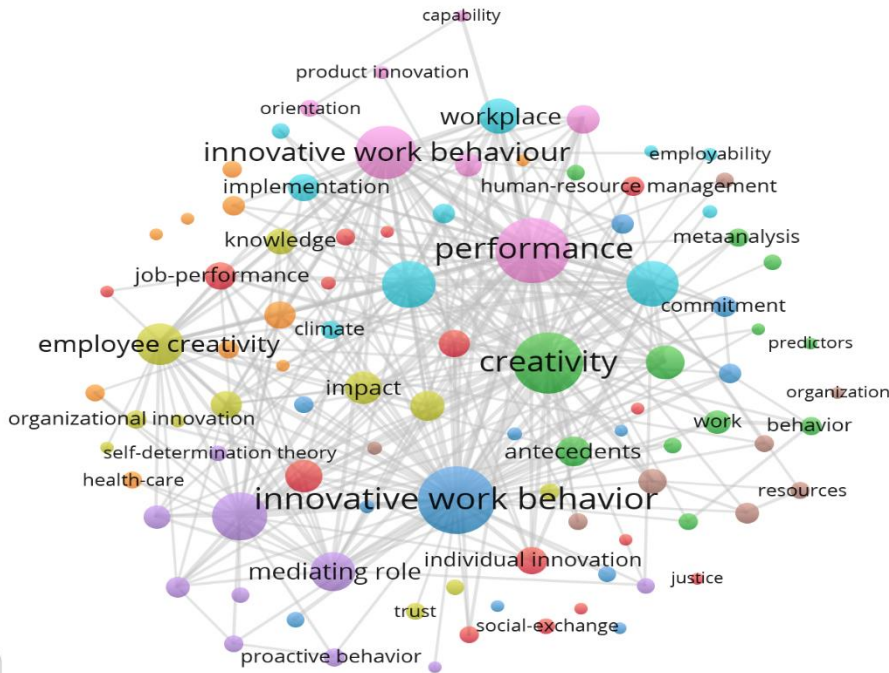
<b>Rank</b>	<b>Article</b>	<b>Journal</b>	<b>Year</b>	<b>Citations</b>
1	Measuring Innovative Work Behavior	Creativity and Innovation Management	2010	236
2	How Ethical Leadership Influence Employees' Innovative Work Behavior: A Perspective of Intrinsic Motivation	Journal of Business Ethics	2013	118
3	Linking LMX, innovative work behavior and turnover intentions The mediating role of work engagement	Career Development International	2012	116
4	The relationship between Line Manager Behavior, Perceived HRM Practices, and Individual Performance: Examining the mediating role of Engagement.	Human Resource Management	2013	101
5	Linking justice, trust and innovative work behavior to work engagement	Personnel Review	2014	79
6	Managing innovative work behavior: the role of human resource practices	Personnel Review	2014	68
7	The role of weekly high-activated positive mood, context, and personality in innovative work behavior: A multilevel and interactional model	Journal of Organizational Behavior	2014	64

8	On the Relation of Job Insecurity, Job Autonomy, Innovative Work Behavior and the Mediating Effect of Work Engagement	Creativity and Innovation Management	2014	51
9	Organizational climate for innovation and organizational performance: The mediating effect of innovative work behavior	Journal of Vocational Behavior	2017	50
10	Transformational leadership and innovative work behavior	Industrial Management & Data Systems	2014	50

### Keywords Analysis:

The most important part of any research paper is keywords that hold information, the important one, regarding the paper. The differences in research and development trends in any specific field of research are understandable by the analysis of keywords in a systematic way in the field. Links strength within keywords, that are different-in a greater number of documents, are often analyzed through keywords co-occurrence analysis. To gain extraordinary knowledge in a particular discipline first and foremost is to understand the structure and internal formation relationship in an academic domain which can be done by the analyses of the co-occurrence relationship of the keywords. As a result, the analysis of the co-occurrence keywords relationship has now become a common method of research in Scientometrics (Shi, et al., 2019).

Identified in the VOSviewer and shown in the network of co-occurrence, a total of 938 words have come into sight in all the collective literature on Innovative Work Behavior. A set selection condition in VOSviewer helps in understanding the relationship between the documents, which means, the software will only recognize the keywords with the rate of occurrence more than  $\geq 5$ . In the screening result, a total of 95 keywords meet the threshold as recognized by the software. Thus, we have the keywords co-occurrence network with 1343 links on Innovative Work Behavior, as visible in **Figure 2**. Furthermore, a keyword is represented by each node, two connected nodes make up a link which constitutes the association between two keywords, and keyword's number of occurrences are indicated by the size of the node.



**Figure 2. Network Visualization: Keywords co-occurrence.**

As it is evident in **Figure 2** that the research theme of innovative work behavior has formed 9 clusters. Each cluster has a noteworthy correlation in between the keywords. The analysis of the 9 clusters of innovative work behavior is as follows.

- Cluster 1 (red): In Error! Reference source not found.<sup>4</sup>, given is the list of keywords fall in cluster 1. As evident from the list, the “moderating role” has more appearances than any other keyword in the list with 25 occurrences. Leader-member exchange, individual innovation, job performance, and human resource management are on numbers 2,3,4 and 5 with the occurrence of 19,18,18 and 11, respectively.

Table 4.

List of Co-Occurrence keywords:Cluster 1

Keywords	Occurrence	Total Link Strength
Moderating Role	25	25
Leader-Member Exchange	19	19
Individual Innovation	18	18
Job-Performance	18	18
Human-Resource Management	11	11
Perceived Organizational Support	9	9

Outcomes	9	9
Social-Exchange	7	7
Empowerment	6	6
Organizational Support	5	5
Justice	5	5
Organizational Citizenship Behavior	5	5
Quantitative	5	5
Social-Exchange Theory	5	5
Structural Equation Models	5	5

In many of the researches, innovative work behavior and its impacts have been studied with the moderating role of different variables like moderating role of trust in the leader is being used to examine the relationship between innovative work behavior and leader-member exchange, which is also second in Error! Reference source not found.4 as per occurrences (Tastan & Davoudi, 2015). And in various researches, IWB had a moderating role (Battistelli, et al., 2014). Organizational Environment plays an important role to stimulate the individual innovation and creativity (Picci & Battistelli, 2009). Innovative work behavior can be used as an indicator of job performance (Chughtai, 2019). All these keywords like “individual innovation”, “perceived organizational support”, “outcomes”, “leader-member exchange”, “empowerment”, and “justice” are closely linked with one another. The perceived organizational support has a mediating effect on innovative work behavior (Clarke & Higgs, 2019). In the various researches, structural equation models, which have minimum occurrence in cluster 1, have been used in testing the hypothesis (De Spiegelaere, et al., 2014; Afsar, et al., 2014).

- Cluster 2 (green): The most used keyword in Error! Reference source not found.5 is “creativity” with 70 occurrences. It has the third-highest occurrences in the list of all the keywords used in the 208 research papers on innovative work behavior. “Innovation”, “antecedents”, “work”, and “behavior” are 2<sup>nd</sup>, 3<sup>rd</sup>, 4<sup>th</sup>, and 5<sup>th</sup> in the list.

Table 5.

List of Keywords Co-Occurrence: Cluster 2		
Keywords	Occurrence	Total Link Strength
Creativity	70	70

Innovation	26	25
Antecedents	21	21
Work	14	14
Behavior	10	10
Meta-analysis	10	10
Self-Efficacy	9	9
Consequences	7	7
Motivation	7	7
Personality	7	7
Environment	5	5
Predictors	5	5

Employee creativity from theoretical perspectives, develop potentially useful and original ideas by focusing on an individual's abilities and putting those ideas into practice is included in the definition of innovation (Birdi, et al., 2016). For the development of innovation, the employee innovative work behavior needed to be triggered (Messmann & Mulder, 2011). The lifeblood of the firms that compete is innovation and after its recognition, multiple antecedents of innovative work behavior of employees have been studied by researchers (Stock, 2015). Many studies on innovative work behavior have been concluded through metanalysis. Other keywords like, "work", behavior", "motivation", "personality", and "environment" are also linked with one another, and they have a significant impact on innovative work behavior, together or individually. For example, the environment at work has a significant impact on employees' innovative work behavior (Awang, et al., 2014).

- Cluster 3 (sky blue): Cluster 3 includes a total of 12 keywords, as shown below in **Table 6**. The top of all the keywords is "innovative work behavior", the variable which is the base of this study.

Table 6.

List of Co-Occurrence Keywords:Cluster 3

Keywords	Occurrence	Total Link Strength
Innovative Work Behavior	82	79
Commitment	12	12

Organizational Commitment	11	11
Satisfaction	11	11
Firm Performance	8	8
Employees	7	7
Knowledge Management	7	6
Context	6	6
Support	6	6
Hrm	5	5
Systems	5	5
Work Behavior	5	5

It has 82 occurrences in total and the highest link strength of 79 among all the keywords used in 208 articles of IWB. It falls here in cluster 3 with “commitment”, “organizational commitment”, “satisfaction”, “firm performance” and “employees” at numbers 2,3,4,5, and 6 respectively.

The key organizational competence is innovative work behavior(Korzilius, et al., 2017). Commitment and organizational commitment are second and third in the list. Organizational commitment has a significant relationship with innovative work behavior(Abdullah, et al., 2015). Employees’ creative work behavior is associated with their working lives through job satisfaction (Raykov, 2014). The possibility could be that the high vs low-performance firms have different impacts on the organizational environment where the employees’ are working (Stoffers, et al., 2014). Therefore, in low-performance firms, job loss threat impair the employee’s innovativeness with decreased concentration and increased irritation (Van Hootegem, et al., 2019). Social context (e.g., leadership, organizational support, working climate) significantly have an impact on employees’ proactive behavior at work (Cai, et al., 2019).

- Cluster 4 (yellow): Error! Reference source not found.7 above, contains the list of keywords in cluster 4. The keyword with most occurrences is “employee creativity” with 37 occurrences, whereas “impact” and “leadership” are on second and third respectively.

Table 7.

List of Co-Occurrence Keywords: Cluster 4



Keywords	Occurrence	Total Link Strength
Employee Creativity	37	37
Impact	24	24
Leadership	22	22
Psychological Empowerment	18	18
Knowledge	17	17
Organizational Innovation	10	10
Job	9	9
Trust	8	8
Transactional Leadership	7	7
Creative Self-Efficacy	6	6
Research-And-Development	5	5

In this cluster, the keywords like trust, job, knowledge, research, and development are linked as the role of these keywords is interlinked. A leader's proactive personality should match with the followers as it will foster employee creativity. Human resource management should consider this approach as it is critical from the recruitment perspective (Roopak, et al., 2019). The leadership does have an impact on employees' proactive behavior (Semenova & Esaulova, 2018). Psychological empowerment is affected positively by transformational leadership and it increases the knowledge sharing behavior of employees (Masood & Afsar, 2017).

- Cluster 5 (purple): In cluster 5, "transformational leadership" is at the top with 46 occurrences, and "mediating role" is on second with 33 occurrences. A total of 10 keywords are in cluster 5 as shown below in **Table 8**. Other keywords include "intrinsic motivation", "member exchange", "proactive behavior" "ethical leadership" etc. Transformational leadership has a positive impact on innovative work behavior when employees have a higher level of intrinsic motivation (Bin Saeed, et al., 2019). Individual and group ethical leadership in related positively to individual innovative work behavior and intrinsic motivation mediates this relationship. Group intrinsic motivation mediates the group innovative behavior and ethical leadership (Yidong & Xinxin, 2013).

Table 8.

List of Co-Occurrence Keywords:Cluster 5

Keywords	Occurrence	Total Link Strength
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Transformational Leadership	46	46
Mediating Role	33	33
Intrinsic Motivation	14	14
Member Exchange	12	12
Proactive Behavior	10	10
Ethical Leadership	9	9
Empowering Leadership	7	7
Organizational Performance	7	7
Self-Determination Theory	7	7
Multilevel	5	5

- Cluster 6 (turquoise blue): In cluster 6, there are 10 keywords as shown below in Error! Reference source not found.9. “model” is the keyword with the highest occurrence of 45 in cluster 6. Keyword “perceptions” is just below with 42 occurrences. Overall the trend of occurrence is better in this cluster among the keywords. Their link strength is good collectively. The structural equation model has been used in many of the researches for analysis (Vander Elst, et al., 2016)(Alfes, et al., 2013)(Afsar, et al., 2014).

Perceived human resource practices and their effect on innovative work behavior were studied with the role of innovative climate in this relationship (Bos-Nehles & Veenendaal, 2019). Organizational climate is relevant for the idea promotion (Hernaus, et al., 2016).

Table 9.

List of Co-Occurrence Keywords: Cluster 6

Keywords	Occurrence	Total Link Strength
Model	45	45
Perceptions	42	42
Workplace	27	27
Implementation	19	19
Job-Satisfaction	11	11
Climate	10	10

Psychological Climate	7	7
Employability	6	6
Fairness	6	6
Human-Resource Practices	5	5

- Cluster 7 (orange): In cluster 7, most of the keywords have minimum occurrences i.e., 5. The keywords “organizations” have the highest occurrence of 18 in cluster 7, as shown in Error! Reference source not found.0.

Table 10.

List of Co-Occurrence Keywords: Cluster 7

Keywords	Occurrence	Total Link Strength
Organizations	18	18
Perspective	11	11
Knowledge Sharing	10	10
Health-Care	9	9
Psychological Safety	9	9
Contextual Factors	8	8
Fairness Perceptions	5	5
Innovative Behavior	5	5
Models	5	5
Proactive Personality	5	5

The studies usually have been done within the organizations in different sectors. For example, some have been done in a health-care organization (Masood & Afsar, 2017), Indian organizations (Jada, Mukhopadhyay, & Titiyal, 2019), Canadian and US organizations (Montani, Vandenberghe, Khedhaouria, & Courcy, 2020), organizations in the Kingdom of Saudi-Arabia (Arain, Bhatti, Hameed, & Fang, 2019). Perspective is the keyword with the second-highest occurrence in cluster 7. Different perspectives of a study can make it more relevant. Investigated transformational leadership from different perspectives and found that it can stimulate the innovative behavior of followers through trust in leadership and work engagement in a Chinese context (Li, Sajjad, Wang, Ali, Khaqan, & Amina, 2019). Knowledge sharing is so important as the research found out that high-performance work systems and intrapreneurial behavior

have no direct relationship, it can only occur through knowledge sharing (Escriba-Carda, Revuelto-Taboada, Teresa Canet-Giner, & Balbastre-Benavent, 2020).

- Cluster 8 (gold): Below is the list of cluster 8 keywords in Error! Reference source not found.1. The comparative occurrence in this cluster is lower than the other clusters. It only has 8 keywords with the highest occurrence of 16 for “job demands”. The keyword “organization” has the lowest occurrence i.e., 5. Even research suggests that job demand can have a positive influence on innovative work behavior should be reconsidered as the theory of conservation of resources suggested alternate negative effects (Clarke & Higgs, 2019). (Tomislav, et al., 2019)found that age is the moderator between job demands and IWB. Younger employees’ in more complex situations perform better than older employees. The more work engagementemployees’ have, the more they possess innovative behavior at work (Waheed, et al., 2017).

Table 11.

List of Co-Occurrence Keywords: Cluster 8

Keywords	Occurrence	Total Link Strength
job demands	16	16
work engagement	12	12
Engagement	9	9
Resources	9	9
method variance	8	8
Demands	7	7
self-determination	6	6
Organization	5	5

- Cluster 9 (pink): It is the smallest cluster in keywords count as it only contains 7 keywords in it. But it has a keyword with the second-highest occurrence in total keywords count of 208 papers on IWB i.e., “performance”. And on the second in cluster 9 is “innovative work behaviour” with 56 occurrences, as shown below in Error! Reference source not found.2.

Table 12.

List of Co-Occurrence Keywords: Cluster 9

Keywords	Occurrence	Total Link Strength
Performance	76	76
Innovative Work Behaviour	56	56

Determinants	20	20
Management	15	15
Orientation	9	9
Product Innovation	6	6
Capability	5	5

Performance can be enhanced by improving employees' learning culture. And that will eventually lead to innovative work behavior (Khan, 2012). In innovative work behaviour and innovative work behavior, there is a difference between British and American English language, respectively. In cluster 9 the keyword IWB is written in British English, which indicates that the researches using this keyword most likely has been written outside the US. As the most-cited paper on IWB has been published in the European journal, written by the authors in the Netherlands, they used British English. (de Jong & den Hartog, 2010). The keyword "determinants" is on the third in Error! Reference source not found., contextual and individual determinants of IWB have also being studied. (Francesco, et al., 2014). One of the determinants is the employees' IWB mediates the relationship between product innovation and human resource management (Sanz-Valle & Jimenez-Jimenez, 2018).

### Further Discussion and Findings

With time, innovative work behavior has gained the attention of the researchers as the number of researches in the field kept increasing. IWB has formed a diverse knowledge system. Its growth may have been caused by the acceptability of innovation trends in this globalized world. There has always been a need for innovation in every sector of life, because of this the growth of research on IWB never looks slowing down soon.

The research on IWB has published with different topics with time. Many researchers have used structural equation modeling for the analysis of data (Odoardi, et al., 2015; Stan, et al., 2016; Yean, et al., 2016). The mediation model had also been used in some researches (Kessel, et al., 2012; Hubert, et al., 2017). The studies on IWB are very limited in highly developed countries, like Switzerland, Japan, Russia, New Zealand, Austria, etc. It is maybe because they tend to adopt more rather than publishing the research on IWB. They should research on innovative work behavior in their organizations and publish so that developing nations can take benefit from it. The research published so far on IWB can be used by the under-developed or developing countries so that they can improve their working styles to innovate and establish organizations having a global reach. It must be studied more with performance, knowledge, organizational support, organizational justice, trust, motivation, etc.

Some of the research findings and key issues are,

1. The sports sciences, health care science services, and Anthropology are quite less explored and immature research areas in the IWB domain. Innovation is needed in these sectors
2. Pakistan has the highest number of document links but the citation is 13<sup>th</sup> in rank among 23 countries.
3. Yearly research data indicates that the research in this field so far shows the IWB got the researchers' attention and realization of its importance in the second decade of the 21<sup>st</sup> century. And with time the yearly graph of published papers on IWB kept increasing.
4. Many of the keywords are far less studied and less explored with IWB, as shown in the keywords analysis data. For example, capability, organization, fairness perception, human resource practices, organizational performance, research and development, environment, motivation, empowerment, etc.,. These keywords should be studied more as they can have a significant impact on IWB.

### **Conclusion and Limitations**

This paper includes the data of research on IWB from 2009-2020, to understand the literature trends in IWB quantitatively through the bibliometric analysis. The advantages of quantitative analysis, knowledge discovery and visualization have taken from Mapping Knowledge Domain (MKD). VOSviewer is used to carry the complementary and multi-angle analysis of IWB research.

The most top 3 countries in the research on IWB are Pakistan, Netherlands, and the People's Republic of China. This shows the global community is engaging in studying innovative work behavior rapidly. The authoritative journals in the field of IWB are the European Journal of Innovation Management, Personnel Review, and International Journal of Human Resource Management. They have published 26 papers on IWB from 2009-2020.

In the 9 different clusters of co-occurrence of keywords analysis, the areas are diverse and no keyword has repeated in two clusters. The total keywords in the paper are 95. This shows the diversity of the research field.

Our focus was on different research topics of IWB. We presented the topic distribution, knowledge base, and research trends through systematic analysis based on Mapping Knowledge Domain (MKD). For further research in the future, the other tools of bibliometric analysis e.g., Citespace can be considered. Besides, this research can become more meaningful with the emphasis on authors and source journals in future research.

Some limitations and future recommendations are,

1. In this research, data were extracted from WoS. Other sources of data can also be used for future research like Scopus, Ebshot, etc.

2. An in-depth analysis of the papers can be done in future. For example, Israel alone has 5 publications on IWB with 185 citations, whereas, Pakistan has 28 publications and just 102 citations.
3. It can further be explored with the separate analysis of Quantitative or Qualitative papers produced on IWB.
4. Furthermore, it can also be analyzed why some of the important keywords like organizational support, environment, capability, etc, are less studied with IWB.

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