Challenges in Human Resource Management: Project Oriented Software Product Development & Software Service Firms

Systematic Literature Review

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1. GROUP MEMBERS PARTICIPATION

The percentage of commitment for idea creation and report writing by the respective group members involved in writing literature review are given below.

|  |  |  |
| --- | --- | --- |
| Group | Idea | Report |
| Member | Creation | Writing |
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|  |  |  |
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|  |  |  |

***Abstract*—For any software firmHuman resource Management (HRM) is very important. The HRM helps in plan and organize resource for a project team. In this Paper, we present the Systematic literature review on the challenges of HRM in software firms. The selection criteria is based on pre published studies for reviewing and select the studies. 10 primary studies were identified ,reviewed and results are reported. Furthermore research can be done in this area to mitigate challenges and yield better software product and services by providing easy ways for practitioner to follow pre published standards**.

***Keywords— Project-oriented company, Managing of Projects, Managing by projects.***

1. INTRODUCTION

Context:

What is HRM?

For any Project it requires Project teams and corresponding team members but it’s certainly not sufficient it also required to be organized and managed which is done by HRM. The main purpose of the HRM for a project is to acquire , develop and manage them by providing reasonable resource on needy basis for better yield. HRM does the above functionality because the software project runs on man power. Their energy in developing quality product the HRM should take care that their energy contribution is not wasted in order to do so HRM employ various process and also methods during this process challenges occur.

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In software firms HRM take care not only on the merits but also challenges in particular field of knowledge see how a team member utilize mitigation strategy among team members. Which makes the review important as there are many challenges in Performing HRM of them need for identify certain important ones which are discussed in the Research questions which elucidates the certainly the importance of research Question.

Background:

Why is HRM important?

The software industry has team members at various level like management technology administration which are indeed concrete space where the HRM is necessarily involved in govern and organize team and they certainly do have some challenges. Now a days due to high technological era and segregations in the software firms evolved the one that develop software products and the one that provide Software services which have HRM and both of them have their own development life cycle ,market value and competition. So, Thus in both the firms HRM play a strategic role and they are bounded to the performance and innovation but to achieve them they need to outcome challenges faced through various factors. The software product and service firms need employee those satisfy the conditions like good experience in respective fields, quality they deploy, attitude of being professional at work better pushup in completion of project and satisfy the costumer requirement’s.

But in recent years the for employee to achieve and behave above conditions they face many new challenges complex and interlinked which need deeper insight to solve the riddles challenges that are to be looked into and compensated are occurred which justify there is a need for the review to be conducted.

Objectives:

We present the systematic literature review based on the challenges that are faced by HRM in maintaining the project. Our objective was mainly focused on finding how for the HRM are doing their prescribed work in reducing the challenges by help improve in better team with all spices from all field in it for better output. These challenges that we speak about can be reduced by must required standards that

Predefined followed. Check whether the elucidated standards that usually many professionals don’t follow while implementing the HRM for better software Firms is big calamity and the awareness about the actual standard to be followed is bought under notice for long run perfect no drawback Software firm. The questions addressed deal with the mitigation strategies and verify whether they are common to the one that are implemented in industrial practice for the respective few challenges listed if not implemented then bring awareness for the required change.

Methods:

We used IEEE and INSPEC total electronic databases that was useful in gathering the relevant information for our literature review. We followed the kitchen ham’s and charter’s guidelines for performing systematic literature review [1]. To have a complete thorough search for the primary studies and also in order to specify the review question based on the data that is extracted. We used for our literature review based on the (inclusion/exclusion) criteria for accurate search strings.

To filter them to match the papers we were looking for we used study selection criteria for our primary study synthesis.

Assessment of quality was made based on both qualitative and quantitative measure whether the paper reviewed are stating aim clearly. Their measurement out comes are good. Level of understandability cohesion with other articles.

We used Text editors and notepads for the reediting phase for collection of data and store them in order to asses evaluate and answer the research questions and to consist the relevant information from the articles.

**Results**:

We first identified based on our search string in Criteria is based on firstly used the search string and elevated the results to only English and papers between (1990 to 2015). Second step involved more elevation based on journal articles consideration only. Thirdly the elevation is based on study on abstract and internal subject to classify them for related review using excluding other fields than software firms. Fourthly we choose only papers that give clear vision on challenges and also the relevant papers to the review search string.

1. In INSPEC database total of 13 search results for our synthesis out of which 4 served as the evidences for our study based on the Study criteria which is elaborated in further notes and after we completely read the papers only few of them were relevant that mainly focus on the challenges faced in Software Firms only which are used for Primary studies.
2. In IEEE database total of 11 results were found for our and study criteria used 5 served as the evidences to our search area for primary studies and the evaluation was purely based on the challenges we were interested in discussing.

For any case issue every challenge is interlinked like consider When a new project suddenly given to the HRM within threshold time to complete there are many challenges that are faced by the HRM to organize the team also indeed effect on newly formed team for these cases can be avoided if they follow the principles at right time right place for right reason to finish and in faster way. For reduction in challenges these are many issue that we review in the literature review which we bought under light in the reviewed papers.

Our finding emphasizes on verifying the guidelines that are standard for software product outcome are implemented or not.

We also summarize on the type of possible debris that occur if the correct mitigation guideline not followed.

Conclusions:

Our overview reminds and helps software practitioners in order to correct themselves irrespective of level at which they work for coordinating and mitigating the gap for coordination in software firm development and also the challenges faced if not implemented the guidelines.

The quantitative effect of HRM in software product and service firms during run time of project is not reported.

1. REVIEW QUESTIONS

RQ1) What are the challenges faced by HRM in Project oriented Software product development and software services firms?

**Motivation:** Our motivation is that in unusual challenges various test strategies criteria techniques new discoveries and performance analysis are needed to bring into appliance but in normal strategies which are not complex simple mitigation guidelines can cure them. In such normal challenge if you behave and perform what is benefit to organization these are already manifested in the standards but never read or followed thus motivate us to bring awareness that there are real life considerable challenges.

Our motivation is that the people need to be given aware of how vulnerable if proper decision is not made and challenges are neglected then there will be a serious effect on the projects.

Our motivation is that the challenges that we discuss should be clearly explained to the practitioner such that the quality that he is not trying to put into the software development by just neglecting what is necessarily had to be done.

**Explanation:** We found that due to normal challenges in HRM doesn’t seem important but it effect in either small scale or large scale are firms effect for implementing the wrong guidelines which effect the quality. We also emphasized on whether the challenge if normal by following the standards predefined what to do at that instinct is known to the employee his rate of impact will be dramatically under correct awareness increases. We also take into account on compensation of the current challenge occur using correct mitigation strategy then the new challenge that arise what is the scope and influence of that new challenge either high or low if high whether the strategy to be compromised.

RQ2) What are the Mitigation strategies for cultural and behavioral challenges that are handled by HRM?

**Motivation:** Our motivation is that different people across various positions have different abilities and posses some peculiar skills thus when there is a need the firm must bind strict rules for good relation with other

Global cultures. There is a significance concern to look into the Team members certainly with respect to culture affects are effected in one way or the other. The behavioral barriers are also need to be compensated as they impose inferiority complex and reduce the communication the behavioral barriers sometime even lead to complete ignorance on an employee.

Explanation: We found Challenges faced based on poor communication, inconsistency and ambiguity. We reviewed how culture effect the organizational team work. We also reviewed that no cultural imbalance reside and if so should be wiped off by following various measure and advices and to build cohesiveness. We reviewed on the cultural sensitivity can be improvised by mitigation strategies , these challenges both the cultural and behavioral challenges to be completely removed otherwise the implications that arise and they can clearly impact on the quality , reputation and interest of working with such firms.

RQ3) Challenges faced by software industry and also HRM when employee voluntary turnover and also in work distribution strategy failure?

Motivation: Our motivation for the concentration in employee turnover rate increase it effects the company. No company wants to loss a good employee. Our motivation focus on choice that can be made in the Work distribution between the team members done. The criteria of solving the employee leaving the company must be reduced in large extent it can’t be neglected. Our motivation is that if the firms should have some key guidelines for making employee comfortable.

Explanation: We observed that the employee need to be given certain protection rights and help him to settle inside the organization. We reviewed that if the proper real time implementation of work distribution done improperly then it has serious effect on the turnover rate of the employee. We reviewed the effect of employee turnover rates if very high it effects the firms project development process due to lack of skilled workers.

IV. REVIEW METHODOLOGY

The following research protocol had been used. It defines the pilot study, at sources and the search strategy and the approach to the search selection. Study quality assessment, data extraction and data synthesis.

Pilot study:

We developed our research protocol based on three different pilot studies which helped us in,

* Review and refine and rephrase or research question.
* Increase the search terms to help obtain more relevant articles for the primary studies.
* Confine the review to specific research scope topic

Refining the research question and research string:

The research question we formulated contain the following keywords:

IN IEEE: challenges, Human resource management, software industry.

The research question that we used for primary study is “(challenges of Human Resource management in Software Industry)”

In INSPEC: A research question is constructed based on the keyword s that were used in formulation.

((human resource management)WIN ALL)OR((IT team work) WIN ALL))OR((challenges OR limit OR drawback\* OR effects) in product and service development)WIN ALL) ).

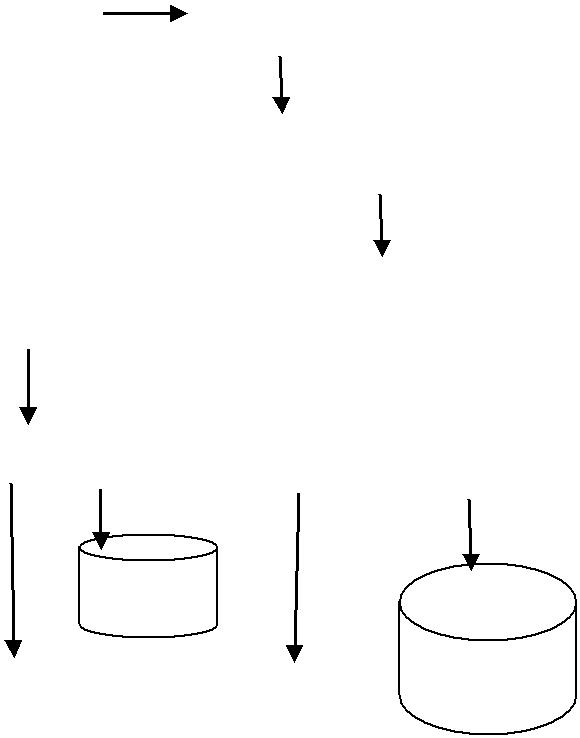
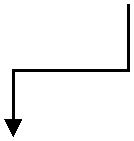
We used the Boolean operators for our search we use the above set of key words for refinement in the research question.

Search strategy:

Initial search for primary studies was carried out in IEEE In which based on the search string we found ten results out of which only 5 are related to the literature review we want to do.

Later the search is conducted in INSPEC and out of 13 papers we took 4 papers that we very much related to the review topic.

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| AREA OF | | |  |  |  |  |  |  |  |
| RESEARCH | | |  |  |  |  | QUESTION | | | | |  |  |  |
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|  |  | CONDUCT SEARCH | | | | | | |  |  |
|  |  |  |  |  |  |  |  |
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Include/exclude criteria:

Include studies criteria is based on:

* Studies that are made in between 1990 and 2015
* Studies that are made in English
* Studies that have the full text access eligibility

Studies that are related to team work, resource management, product management.

* Studies that are related to journal articles and related to IEEE papers.
* Studies that are directly related to work
* Studies at one stage were made on only challenges of HRM(IEEE)

Exclude studies criteria is based on:

* We did not focus on the area of software and enterprise business side.
* We did not focus on the health systems, other government systems, private industries ir related other than software sectors were not considered.
* We did not focus on the articles that don’t deal with software industry and Information technology.
* Studies that don’t focus on project team management and focus on some other issues in the software industry.

Quality assessment Criteria:

Quality based on quantitative criteria:

QSC1 Whether the aim of the article is clearly stated?

QSC2 The measurement outcomes were unbiased?

QSC3 Whether the survey and analysis of data for research clear?

Quality based on Qualitative criteria:

QSC4 For minimum quality requirement basis how well was the data collection process done?

QSC5 Is the level of clarity and coherence and consistency maintained in report?

QSC6 How well is the documentation done using the research process?

The quality assurance for the primary study assessment is assessed as follows:

|  |  |
| --- | --- |
| Quality | Response score |
| assessment |  |
| criteria |  |
| QSC1 | Yes/No |
|  |  |
| QSC2 | Yes/No |
|  |  |
| QSC3 | Yes/No |
|  |  |
| QSC4 | Strong(s)Weak(w) |
|  |  |
| QSC5 | Strong(s)Week(w) |
|  |  |
| QSC6 | Strong(s Week(w) |
|  |  |
|  |  |

The above table helps in assessment of quality score for each study in primary study:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Primary | QSC | QSC | QSC | QSC | QSC | QSC |
| Study | 1 | 2 | 3 | 4 | 5 | 6 |
|  |  |  |  |  |  |  |
| Ref[2] | YES | NO | YES | S | S | S |
|  |  |  |  |  |  |  |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Ref[7] | YES | YES | YES | S | W | S |
|  |  |  |  |  |  |  |
| Ref[6] | YES | YES | NO | W | W | S |
|  |  |  |  |  |  |  |
| Ref[8] | YES | YES | YES | S | S | S |
|  |  |  |  |  |  |  |
| Ref[5] | YES | YES | YES | S | W | S |
|  |  |  |  |  |  |  |
| Ref[4] | YES | YES | YES | S | S | S |
|  |  |  |  |  |  |  |
| Ref[1] | YES | YES | YES | S | S | S |
|  |  |  |  |  |  |  |
| Ref[9] | NO | YES | YES | S | S | S |
|  |  |  |  |  |  |  |

We applied the quality assessment criteria for interpretation purposes and utilize them for the research studies by strengthening the interfaces where they are applicable.

Validation of Protocol:

The whole search strategy used the same recorded document is used for quality assessment criteria .Then the final results were done on the Microsoft word document on Macintosh System for our literature review. The results we obtained are trust worthy as they say about challenge of HRM. Out of total 24 papers 7 papers are trustworthy, that should be included in the literature review are handpicked conference publications certainly used in our final evaluation results.They are genuine once to look into for challenges in HRM in software industry.

Data Extraction Process:

The below table explains what type of data that is challenge type that is being extracted from different selected papers that were obtained in the primary study:

|  |  |  |
| --- | --- | --- |
| Papers that are selected to do the research | Impact of the data from paper in the review High (H);Low(L) | We were interested in challenges that are found in each paper to extract data. |
| REF[2] | L | IS there a need for Human workforce in large scale software development |
| REF[3] | H | IS Training not that important with relevance to performance in industry |
| REF[7] | H | Does Labor shortage has no effect in development |
| REF[10] | H | Is there any impact if Challenge faced due to cultural insensitivity. |
| REF[8] | L | Good for company and if not Challenges of usage of tools and its impact positive or negative in firms. |
| REF[9] | H | Does Improper work distribution has effect on the employees. |
| REF[4] | L | No necessary of task coordination for completion of project |
| REF[5] | H | Unstructured IT teams are advantages. |

We used the Macintosh PAGES and KEYNOTE and for diagrams and Tables NUMBERS in order to conveniently store and use the data for our research question and also the form we used for quality assessment is also written in pages. The appended 7 papers from which the following key result are extracted from the following papers and word documentation is done.

INCLUDED AND EXCLUDED STUDIES:

After appending all here databases results by the

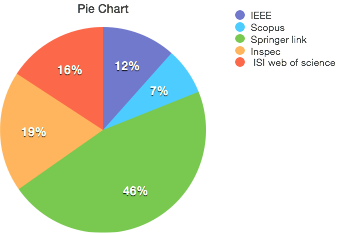
inclusion /exclusion criteria in order to get the relevant

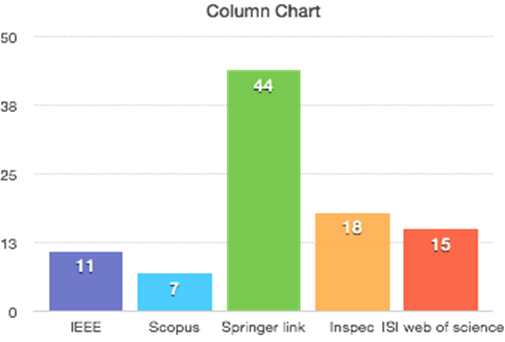
information that by consolidating three electronic data bases to

get 7 papers related for the literature review. These standard useful in cross check of all the papers that were included are trust worthy as these 11 papers are relevant so believe our results.

Column and bar graph compare values in a side category, such as number of available records.

|  |  |
| --- | --- |
| Publications | No of Records |
| IEEE | 11 |
| Scopus | 7 |
| Springer Link | 47 |
| INSPEC | 13 |
| ISI web of Science | 15 |





THE INCLUSION EXCLUSION CRITERIA:

The following table represents the criteria for exclusion and the number of excluded criteria and also the reason or rationale behind the exclusion of the articles.

|  |  |
| --- | --- |
| Total number of Exclusion criteria for Inspec database | Reason or Rational of Criteria |
| 344 | Papers that include all the topics and sub divisions |
| 18 | Inclusion based on full text and also exclude the language other than English. |
| 4 | The relevance of HRM to the product and team working perspective challenges in software firm |

For better representation purposes the following flow diagram is used in order to understand how the refinement search criteria is made for our search process.

INSPEC &IEEE

SEARCH ITEMS

Papers from only journal articles

Based on problem statement

Inclusion based on text and relevance

Exclusion criteria based on no full text and irrelevant to our study and other than English

Final Trust Worthy papers related to the topic for review from all three databases consolidated.

RESULTS:

|  |  |
| --- | --- |
| Primary Study | Challenges or Drawbacks that are observed and deduced. |
| REF[2] | Human factors are not that important , lack of vision in who is responsible for what is unaware. |
| REF[3] | No necessary in use of the Skilled trainers in development or training process. |
| REF[7] | There is lack of labor effect to complete work in time , projects pending due to employee for specific work are not available in market. |
| REF[10] | Teams that are culturally insensitive necessary effect which should be mitigated. |
| REF[8] | The tools are necessary for any work along with Human workforce but challenges are faced in small scale firms where budget constraints. |
| REF[9] | Work distribution criteria always considered but due to micromanagement the employee either equal distribution or work overload. |
| REF[5] | Unstructured IT team lead to no proper managing and HRM is unable to properly plan for cases like new projects. |

Research Questions:

RQ1) what are the challenges faced by HRM in project Oriented software Product development and software services Firms?

DISCUSSION: The HRM is one of the important entity in software product and service firms. The HRM face challenges at different levels of development life cycle and these challenges that HRM face mainly project oriented. TO support my synthesis of data that there are challenges at various level in HRM the following different angles in challenges faced which is observed to be true as the synthesis of information from various papers support that there are challenges in HRM.

In [2], The workforce is very essential in software firms but even if there is immense workforce and no proper utilization as who is responsible for what work is unpredictable and sometimes the decisions are entirely based on product Managers who are key persons in taking decisions irrespective of others viewpoints. In [3], The challenges faced if there is improper training and no skilled employee is established for training which effects the performance and vision of the employee towards development. In [5], The challenges are faced for new projects due to shuffle of IT team members which effect in two ways one it effects their own team and also the new team due to both face the unstructured IT team and improper management occur and deadlines are not met in time.

IN [6], The challenges faced of cultural imbalance in IT teams which comprise of different people from different countries and improper behavior and disrespectful towards other culture and supremacy over them lead to challenges. In [7], The occurrence of challenges due to shortage in employee and even if the employee is available they are not given the desired work they can be capable of rather some other work distribution and is hard to complete by the employee and good employee are not easily available in the outside market which is having impact on recruitment of labor.

RQ2) What are the Mitigation strategies for cultural and behavioral challenges that are handled by HRM?

DISCUSSION: The cultural challenges are usually thought between those who are from various countries. There are challenges faced inside the organization for being disrespectful and it is true that there are really cultural and behavioral challenges.

In [5], For any software firm development if there are cultural differences not resolved the coordination in tasks resources and plan and manage disrupt.

IN [6],Team members for example when they are in a conference with other country delegates they must understand what or whom they are facing how to nurture with them what to speak and what not to that effect the cultural harmony how to behave and what are the barriers in behaving over the other cultural.

In [10], Someone must take responsibility like leader should take responsibility in reduce of miscommunication and obey the other culture view , belief over understanding a problem statement their ability to solve them and the way they understand the problems which we don’t have solutions help in reducing the ineffective task environment.

If these are not followed all the journal have same similarity that is dropout due to no proper values in firm, no proper global scale best IT practices communication.

In [6], Behavioral aspects also have some common challenges in the HRM like if a person behaves improperly and removed the valuable information might leak also if he not following good and right IT practices and not obey others viewpoints and suppress them to surpass illegally also the challenges that are to be mitigated.

RQ3) what are the challenges faced by software industry and also HRM when employee turnover and also in work distribution strategy failure?

DISCUSSION: The employee dropout of company due to when he understands his contribution to the development is nil.

In [4],The pressure on the employee in problem and task solving is increasing due to external competitive world impact thus leads to employee quit the jobs due to no proper retention strategies to improve better work distribution. Firstly respect to individual work and recognition if its good and uniform distribution over all the employee including leader he must be ready to face any challenge when team does anything wrong and take the mistake on himself and give the awards and credits to the members when they succeed by giving them credit helps every team structure to be strong and respect their environment.

VII. DISCUSSION

From the summary of results we found that there are challenges at various levels which are imbalanced by HRM due to not following the required strategy to compensate it. Our study is based on new knowledge in challenges of HRM every software firm try to act as if they follow the mitigation strategies in compensating the challenges by following their own methodology instead of what actually to be implemented. Our finding mainly focus on whether there are challenges in the HRM are all of them addressed were really witnessed in real life industrial practices if so witnessed what are the mitigation strategies they are using in order to compensate the challenge. The mitigation strategy used is same as then one proposed by the researchers in the papers to highly and effectively reduce the challenge or they are following some other protocol.

As observed from the literature review it is proved that there are challenges that do exist in the real life HRM and concrete mitigation strategies are also proposed to reduce them. The review help reader for alternate controlled fine solutions as collected data is unbiased and also the data we came across from the trustworthy papers.

Strength: The research based mitigation strategies to the concerned challenge is best way that should be practiced in the industry.

Weakness: Bias To belief in the HRM industrial practitioners that the way they look at the challenge solver techniques.

Opportunity: It helps to find what all the challenges there in real world and new once that are coming into picture.

Threats: How to solve the new once that evolve and what steps to be taken if the proposed strategy has no effect in quality and no difference in results.

The magnitude of importance and the direction in which if HRM given more importance the overall development of the company is bind with and the effects like low market value, decrease in trust over company performance degradation, loss of valuable staff are the risks to be faced. But the treatment for not occurrence is better to follow the best way to completely depend on the proposed strategy as they provide better results to maximum extent in any kind of small or large projects.

VIII. LIMITATIONS

As no review is perfect chance to prone to internal validity due to 1 or 2 unpublished articles. Limitations occur as the data provided on what we saw so there will be certain incompleteness of data. Sometimes Interpretation on what is happening will go wrong in qualitative research it’s necessary to be ready to explain by which route the interpretation and justify the steps followed. Dependent variable: success rate of product quality; Independent variable: Violation of Human resources.

To reduce threats we can use reflexivity like limitations in potential role conflicts, lack of neutrality. Anything new or surprising in our data collection will be limitation to rectify so for qualitative research the case studies and survey can help. We can use Triangulation to reduce its effect.

The standards are all predefined for every challenge there is a mitigation strategy but not in practice as the employee believe he knows what has to be done and believe it’s the same in academic practice but it is different from what they think.

There is no governing body that survey on whether all the firm members at any level are following their own paper work or the standard that had to be followed for that instinct to avoid the challenge occurrence that effect the coordination harmony with other employee is not looked into keenly.

The academic researched HRM is predefined standard after doing a lot of keen research over particular field which must be the same procedure implemented generally to open lock to challenges in firms but it is not the same in real life industrial practitioners perspective they have their own challenge solvers strategies that are merely useful to some extent but highly hard to solve entire challenge riddle convincing them need some qualitative data.

IX. CONCLUSION

The main finding of the review is focused on recruitment, training, discrimination employee values are the very important must need concentration area by HRM for proper resource management and best outcomes can be achieved if all the above criteria are met.

Our findings show that the software development under HRM versus administration affects the productivity and low quality.

Our finding focus on what are all the challenges faced by the HRM and corresponding mitigation strategies whether they are implemented by industrial practitioners. There is chance for improving alternate solutions in looking into mitigation strategies for refinement which is upcoming scope for continuing research in this area. The quantitative effect of HRM in case of following the standards predefined is not answered in the review.

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