

Challenges in Human Resouce Management: Project Oriented Software Product Development & Software Services Firms

Systematic Literature Review

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I. 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 Member	Idea Creation	Report Writing
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Abstract— Human resource Management (HRM) is the process of managing and organizing of project teams or project staff. In this Paper, we present the Systematic literature review on the challenges of HRM in product development in software industry. The selection criteria is based on pre published studies for reviewing and select the studies with precious information. 10 primary studies were identified reviewed and results are reported. Furthermore research can be done in this area to improvise the level of interaction and expertise coordination between project staff in project planning and decision making for better product line development and software services.

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

II. INTRODUCTION

Context:

What is HRM?

“Project HRM Includes the processes of organizing and managing IT Project Teams”[1]. In project oriented software development HRM includes the process who involve in project. The major process involved in HRM are: 1) Human resource planning 2) Acquire Project team 3) Develop Project team 4) manage project team [1].HRM deals with techniques and inputs for the team development for better HRM practices

in software Industry.IT is project oriented and mainly depends on man power and knowledge[2].The project team management is subset for project team its core or leadership team.

Background:

Why is HRM important?

In the technological era company which develop products and also the one which develop software and provide it services for business automation and gain huge market values. In these company development is project oriented as its technical involves different types of team members at various Technical, Management and administrative level who are responsible for whole project until its completion. The HRM has strategic and crucial role in the technological industry for great success.HR slack have relationship with innovation and performance industry[2]. The criteria depends on more professionalism, more quality, more experience in respective field, more training[3]. These attributes reinforce in chance to complete project and get costumer appreciation lead to great value in market. If the team members lack the attributes then re staffing must be implemented so HR pool has immense advantage for software development as it takes advantages of opportunity which realm outside the existing business[4].

But in recent years there is degrade in the significance of HRM worldwide. This results in issue and many challenges hence there is a great demand on insight about challenges being faced by HRM during project oriented development in both service oriented and product development firms.

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 success of the project depends upon the structure of the IT project team [5].The challenges that occur based on the level of connection between the success and the project team structure in Software development for both product The challenges also include a series of must require measurements

that must be met for efficient IT project team. It also elucidates the effects for not implementing the drawbacks in the HRM influence over IT project team management in a long run time over maintenance of the Software Industry.

Methods:

We used Scopus and IEEE and INSPEC total three, 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. The need for systematic literature review 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. More over 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 and their measurement outcomes 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 assess 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 18 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 culture and team work and management the area which are used for Primary studies.

2) In IEEE and SCOPUS database total of 11 results and 10 results were found for our and study criteria used for which 5 and 2 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.

We found the challenges of HRM as they have temporary and dynamic nature of work environment. The challenges in temporary nature of work like an new project is started the company HR configuration will change impact is because as it needs searching appropriate personal who fits for the new project [3]. In dynamism of project oriented also leave challenges like roles are conflicting from one to another which affects the performance as leader in one team and member in

another team. Other challenges like communication challenges over cross culture[6], lack of training,[3] IT labor shortage,[7] lack of professional skills[8] these are many issue that we review in the literature review which we brought under light in the reviewed papers.

Our finding emphasizes on providing the guidelines that are standard for software product outcome. We also summarize on the type of possible debris that occur if the management is not done correctly.

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 product and service development as business goals count not the organization size matters 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.

III. REVIEW QUESTIONS

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

Motivation: For proper managing of IT Professionals in organization which is managerial specific issue and is essentially manifested in HRM.[8]The HRM play a vital role in software industry unlike other sector of technology it is completely user centered design that help the software growth steady.[2] So, the organization must be aware of the level of importance that is given in HRM such that if not given the desirable importance the company might fall into vulnerability flaws and which is disadvantage for any it industry which motivates the research in this study.

Explanation: we found that commonly HRM face many challenges primarily balancing work and personal life, manage changes, restructuring organization ,globalization , stress and conflict and also manage low attrition rate[5].We also emphasized on how the company size is not important but the business goals that can be achieved by proper HRM.

RQ2)Challenges faced due to cultural and behavioral barriers that are to be handled by the HRM?

Motivation: ("With today's business environments no longer confined to national borders, much work is undertaken in global virtual teams. Such teams consist of members located in different countries that communicate via technology media to complete a project task. Much of the research in this area has been focused on the technological aspects of such environments; there is, however, a lack of research into the behavioral aspects and the issue of cultural differences in particular. It has been acknowledged that when

cultural diversity is neither recognized nor acted upon, significant challenges can arise for the team”)[6].The text is taken from journal that helped us to narrow that there is a significance concern to look into as the Team members certainly with respect to culture affects are effected in one way or the other[6]. With respect to project progress and also shared understanding of how different cultures have different problem solving abilities and analytical skills that help in understanding system requirements.

Explanation: We reviewed the usual challenges that are faced based on poor communication, inconsistency and ambiguity. We also reviewed how does culture effect the organizational team work structure due to poor leadership [6] cultural affect on team employees while they are coordination work across geographical boundaries, knowledge management, lack of training for employees, lack of building team cohesiveness and poor professional skills so it is better to create a list of examples to explain the list which makes team members comfortable are also reviewed by us and presented.

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

Motivation: By investigating in the area of employee voluntary turnover it is understandable that when a long term employee leave the organization he takes along some vital information which is irreplaceable [4][2]and also difficult task to manage different generations at work. Absolute choice should be made In work distribution criteria between the team members so that it uniformly improvise the quality of work life ,participation ,performance upraise [1].

Explanation: We reviewed that The voluntary employee turnover leads to labor shortage[7] in particular area is due to disrupts between HRM and employee which can be resolved by using open two way communication between employee and the senior management. The work distribution[9] should be made based on the employee capabilities sand listen to the valued employees new technological ideas instead of risking in considerable cost investment in a competitive business environment which effect the long run of the company[4].

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.

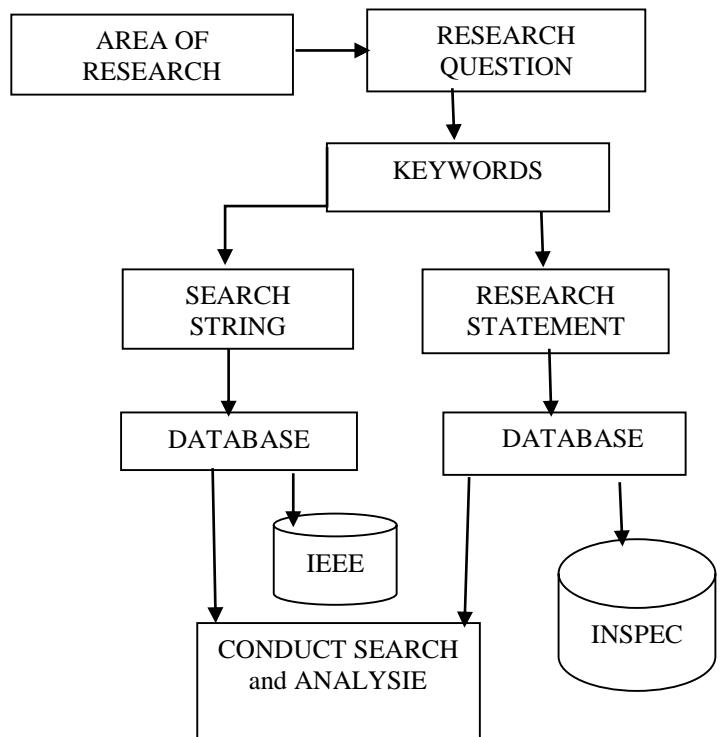
((human resource management)WIN ALL)OR((IT team work)WIN ALL))OR((challenges OR limit OR drawback* OR effects) in product and service development)WIN ALL)).

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 6 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. Even a book “”is also used for our literature review.



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 in software industry(in 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:

- ❖ Whether the aim of the article is clearly stated?
- ❖ The measurement outcomes were unbiased?
- ❖ Whether the survey and analysis of data for research clear?

Quality based on Qualitative criteria:

- ❖ For minimum quality requirement basis how well was the data collection process done?
- ❖ Is the level of clarity and coherence and consistency maintained in report?
- ❖ How well is the documentation done using the research process?

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

Quality assessment criteria	Response score
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 Study	QSC 1	QSC 2	QSC 3	QSC 4	QSC 5	QSC 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. We used reference management tool for the referencing .The results we obtained are trust worthy as they say about challenge of HRM. Out of total 35 papers 11 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:

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 11 papers from which the following key result are extracted from the following papers and word documentation is done.

Papers that were selected to do research based on which particular data is extracted.	Impact of paper data extracted on review. High(H) Use, low use (L).	We were interested in doing challenges in HRM in Software industry so extracted the Specific part of data for the required results for research.
REF[2]	H	Centralized vs decentralized user Design.
REF[3]	L	Role of training in Software industry.
REF[7]	L	IT labour shortage reflections.
REF[10]	H	Effects of culture on team management.
REF[8]	H	Develop personality by scheduling and staffing properly
REF[9]	H	Work distribution strategies for better success

REF[4]	H	Desperation and process complexity challenges
REF[5]	H	Project team structure un stability issues.

V. INCLUDED AND EXCLUDED STUDIES:

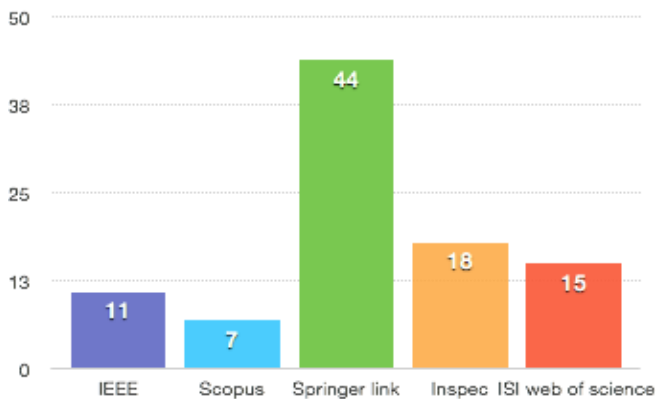
After appending all here databases results by the inclusion /exclusion criteria in order to get the relevant information that by consolidating three electronic data bases to get 11 papers related for the literature review. These standard useful in cross check of all the papers that were included are 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

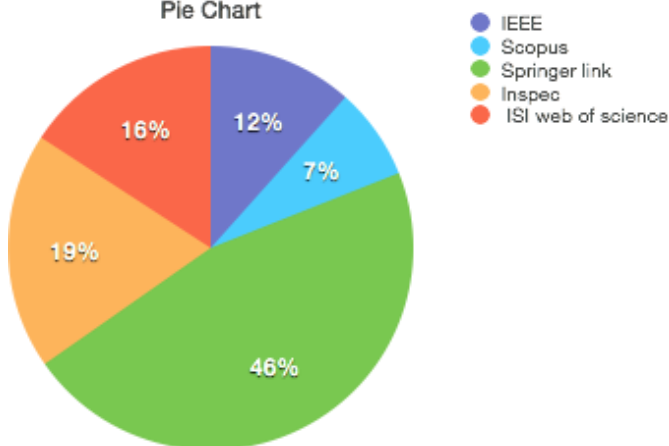
Records

Publications	Records
IEEE	11
Scopus	7
Springer link	44
Inspec	18
ISI web of science	15

Column Chart



Pie Chart

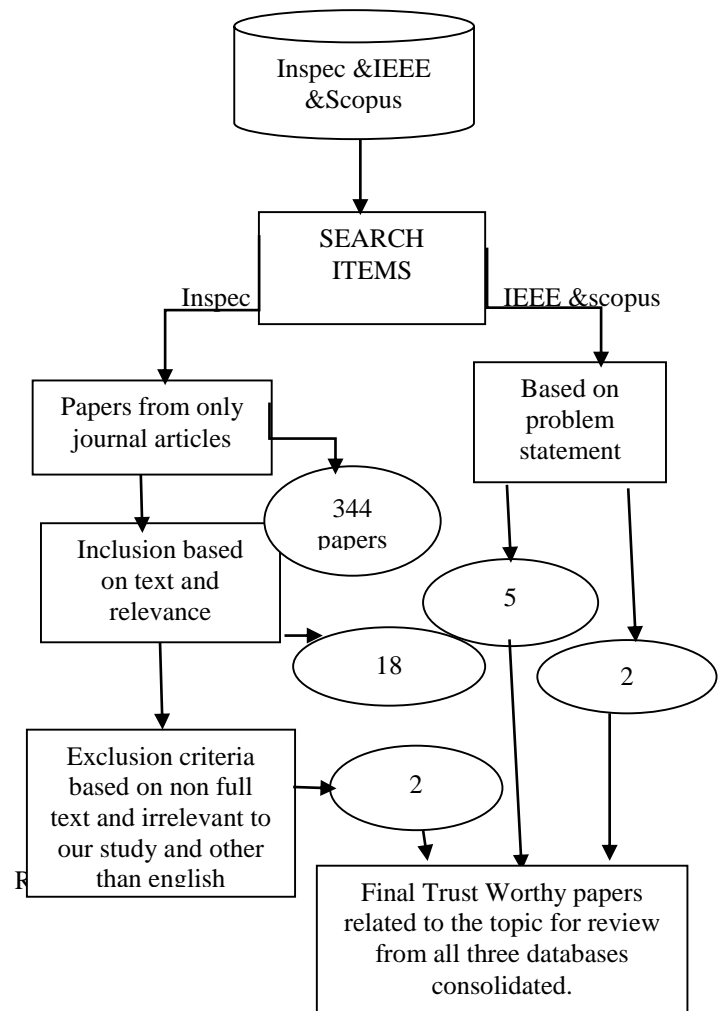


THE INCLUSION EXCLUSION CRITERIA:

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

Total number of exclusion criteria	Reason or rational of criteria
344	Papers that include all the topic and sub divisions
18	Inclusion based on full text and also exclude other than English
4	and relevance to product and team working perspective

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.



VI. RESULTS:

Primary study	Drawbacks or challenges
REF[2]	The issue with decentralized human factors who is responsible for human factors work compared to centralized version where manager are champions for human factor work.
REF[3]	Drawback in providing knowledgeable and skilled mentors during training to keep up with industry is only done by few MNC's not all software institutions
REF[6]	Challenges are faced during awareness inside the team for adopting to culturally sensitive is not always possible.
REF[8]	The intelliSPM is very useful for project team members as its quite easy but cannot be invested in small company so it and also cannot help in drag and drop on resource charts to reduce work load.
REF[5]	The team structure should be always standard but challenges occur when the structure becomes redundant due to changes in internal structure.
REF[1]	The best practices are easily believed and excitable but for IT HRM best practices challenges evolve at various stages.
REF[7]	Communication challenges among team lead to loss of valuable information due to dropout lead in Shortage of labor for an expertise approach and desirable productivity the highest priority must be given to labor shortage in information technology so it has to be overcome.

Research Questions:

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

DISCUSSION: Based on the vulnerability to the software industry the challenges are user centered Design in absences of organizational structure and staff.[2] Human work beyond documentation design and training are to be governed and someone should be responsible for the human work to be done.[8].IT professionals need ethics and values for long run sustainability of organization which help in best HRM practices [4]rather than only meant to configuration level rather than implementation[8]

Working hours and work life should be sync with personal life for employee which can be taken care by SR managers and project team leaders in Work distribution[9]and reduce the stress and conflict level management before as it helps in less Employee voluntary turnover scenario.[4] .

The principle Finding is that outside it is high class inside its full of loopholes to be sorted out like micromanagement for example.

RQ2)Challenges faced due to the cultural and behavioral barriers that are to be handled by the HRM?

DISCUSSION: Develop in software products and providing services require continuous desirable coordination among task resources and people.[5] The business environment is now no longer national wide [6]so adapt to normal work behavior that can help in less cultural differences[6].(" One factor that potentially has a significant impact on the development of a shared mental model in the distributed team is *cultural diversity*. Different cultures often have drastically different values, beliefs, and approaches to communication and problem-solving. In the context of a global software project these differences may lead to miscommunication. Developers from different cultures may also have disparate interpretations of requirements and ways to perform requirements engineering. As such, cultural diversity may hinder the team from forming a shared understanding of both the system requirements and other project-related issues") [6].As software development involve a lot of depended activities coordination is must important essence for the dependency if cultural differences are there the task environment coordination in software work ineffectively.[8].The principle Finding is that it's a bogged down behavior on the employee by administration irrespective to culture which affects the organization.

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

DISCUSSION: The pressure on project teams and its members is immense due to high attrition due to internal and external competition [4].Dilution of pressure by introducing retention strategies as it result in conflicts between the team members with respect to individual work done as per distribution assessment. leading to the employee quitting the jobs[4].and other factors Different generation that are at work. For a company it is a challenge to loss a good employee. The trust and loyalty must be improvised in organizations and challenges faced if the leadership changes are not made it can affect the structure of IT project teams. The principle finding is that uneven pay role, equality, loyalty and trust have no place in software industry.

VII. DISCUSSION

From the summary of results we found that there are challenges at various levels like cultural, training, retention of existing talent, Discrimination ,diversity ,payroll ,outsourcing factors are not well balanced by HRM[5].our study is based on new knowledge in challenges of HRM as software organizations try acting as if they are real good experts in doing things well and correctly but there are a lot of internal disturbances[4].The results and the discussion show that managers are under sheer pressure to manage the training section core essence of industry which is not carried away correctly[3].The review help reader depend on for alternate controlled fine solutions as collected data is unbiased and also the data we came across from the trustworthy papers one way to reduce internal threats is by ease of access of efficiently collected data to employees.

Continuous monitor on external environment to be done by scanning for the SWOT analysis for strategic changes to be made. Strengths: HRM strategy and functionality are internal strength factors. HRM strategy refers to employer of choice for long tier workforce goals. Functionality refers to operational side like open health insurance for employee. HRM staff and knowledge useful for tactical duties. Weakness: it is also internal factor that challenges HRM during his deal with budget constraints. He doesn't rely on revenue producing department but rely on fund investments for HRM activities. Low employee morale and high turn over HRM disrupts and it is to be controlled before dissatisfaction over workforce. Opportunities: Workforce growth, Demand of product's and services results in better wages, more staff, good surrounding. company's reputation depend on external factors like its ability to land highly successful in business development. Threats: External factors like when competitor gain market share. Businesses that offer better facilities affect the recruit of best qualified workers. HRM can't always insolate as some are imminent. Better way to tackle is by conducting routine assessments of compensation.

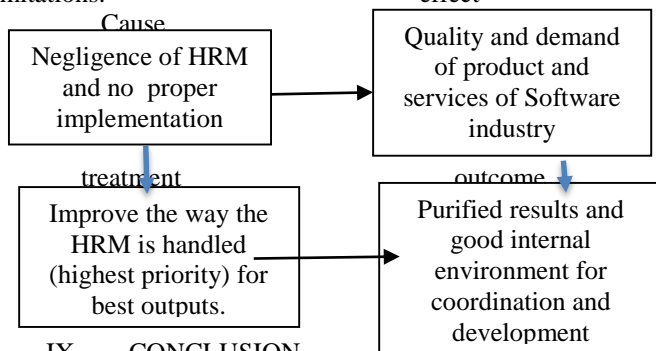
VIII. LIMITATIONS

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 once research is dependent on end product 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 and member checking also Audit trail to control

Obstructiveness and withholding information by senior managers and employee are not given access are also limitations.



IX. CONCLUSION

The main finding of the review is focused on retention, recruitment, training, discrimination and diversity, discipline

outsourcing payroll, 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 developers were bogged down by administrative bureaucracy affects the productivity and low quality with bugs in it. Emphasizes on micromanagement distract the seniors managers adequate time and energy on staff under control issues. There is chance for improving alternate solutions in issues for refinement which is upcoming scope for continuing research in this area. The quantitative effect of HRM in case of economic crisis is not answered in the review.

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