

Web Process Intellectual Property (IP) Creation and Patenting Model Using Enterprise IP Capture and Knowledge Sharing.

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Abstract

Web Process IP Creation and Patenting Model using Enterprise IP Capture and knowledge Sharing is illustrated in this paper. There is an internal search to create and capture process intellectual property (or best practices for web based processes) which is stored in a repository and shared among the entire workforce of the company. Knowledge elicitation is done from the entire workforce group. The elicited knowledge is codified and stored in the IP knowledge repository after being verified, validated and graded by the peers. An inference engine is developed to sift through the IP knowledge repository in search of appropriate response for IP knowledge. An integration of the repository and inference engine forms the initial expert system that grows quarterly as knowledge elicitation peer review and knowledge repository update are done, leading to rapid growth of patentable IPs.

Keywords: Web, Business, Intellectual, Property, Creation, Patenting, Model, Enterprise, Capture, Knowledge, Sharing,

1. Introduction

An expert system or knowledge based system results when the knowledge of a domain expert is elicited and stored in a knowledge base and an Inference Engine (software) is developed to sift through the knowledge base in a manner that mimics the domain expert's thinking process when a problem requiring the domain experts knowledge occurs, James A. (2008). This enables the expert system to arrive at a solution to the problem comparable to that of the domain expert, Kelly R (2015).

A dynamic expert system as the name implies, refers to the situation where the initial expert system is dynamically kept up-to-date as more knowledge is gained in its field of expertise, Gia. S. (2009). This is a useful means of managing the intellectual property that drives an organization forward so that it can be enhanced as knowledge increases and edited to eliminate obsolete knowledge or techniques. The dynamic expert system is thus able to keep track of best practices at any point in time and grows like a living organism to enhance organizational performance as it grows richer with best practices.

In the context of a company, one is concerned with Intellectual Property (IP) vested in the individuals that work for the company, Cornelius T. (2001). An initial expert system in this regard would be made up of best practices at every level of the organization for performing the operations of the firm. If through collaboration and knowledge sharing within the company, new best practices are evolved and used to replace the older but now obsolete best practices, then the intellectual property of such a company will be dynamically upgraded and the company can keep pace with changing technology.

This paper is primarily concerned with web business processes and dynamic growth of the Intellectual Property (IP) used by the workforce to execute those processes. A typical web based business can be

broken down into the following processes: (a) the business strategy, (b) the marketing hype, (c) the payment system, (d) the quality of web pages and (e) the cyber security arrangement that ensures that the earnings of the company are not stolen by hackers. A new and improved IP can be developed for any of these processes to replace the earlier less satisfactory ones as time goes on. It is best to challenge all the workforce with the task of continuously evolving new and better ways of carrying out any of these processes. In such a scenario, the best improvement to a process might come from the least expected quarters. It depends on who gets the intuition first. In the context of this paper, web business workforce is roughly classified into the following categories:

- (a) Junior Knowledge Workers
- (b) Junior Administrative Staff
- (c) Senior Knowledge Workers (among these are the Operations Managers)
- (d) Senior Administrative Staff and
- (e) Top Management Staff (Cyber Security Expert, Deputy Director and Director)

All workers in each of these categories are required to be internet literate, cyber security conscious and able to work competently with computers in their day to day operations. Thus, all workers are constantly exposed to information technology.

2. The Model

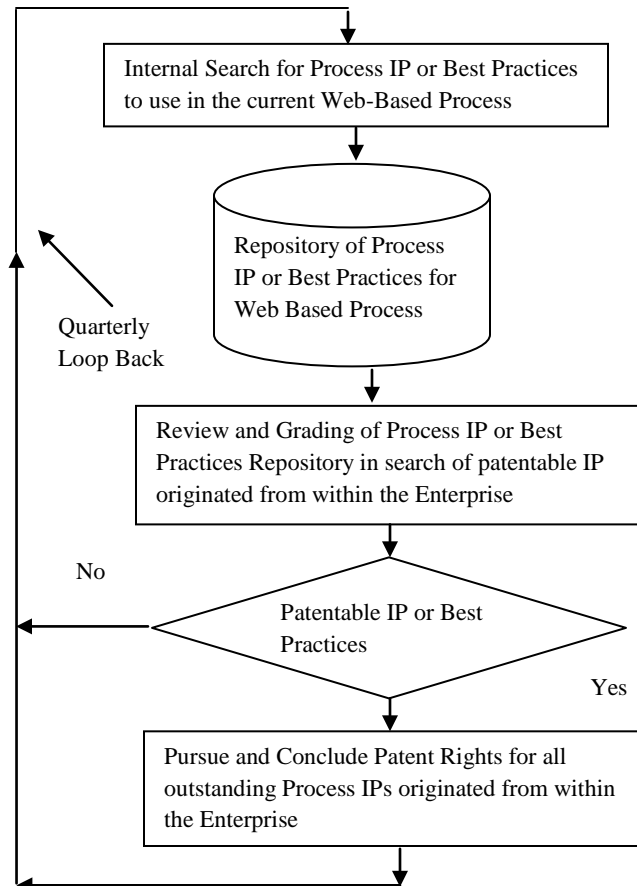


Fig 1: Process IP creation and Patenting using Enterprise IP capture and Knowledge sharing technique.

Fig 1 shows the proposed web process IP creation and patenting model using Enterprise IP capture and Knowledge sharing technique. There is an internal search for the process best practices used in the current web based process, these are stored in the process IP repository. The new IP are renewed and graded by web masters, a new patentable best practice may be found, and patent rights pursued. If found, there is a quarterly loop back every quart to search for new IP.

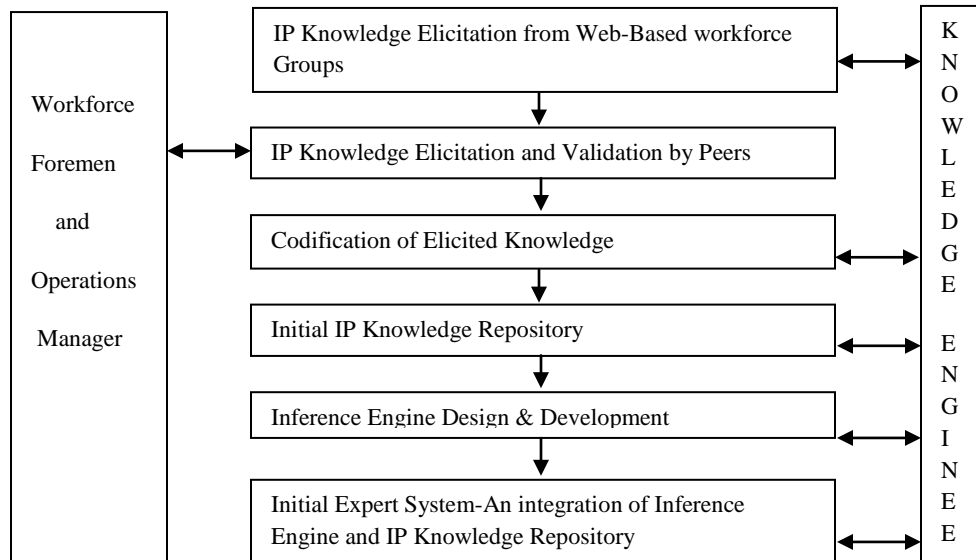


Fig 2: Steps in the Development of Initial Expert System using Elicited Knowledge from web-based work groups.

IP Knowledge of the workforce in form of implicit knowledge is elicited by the knowledge Engineer who is able to convert them from implicit to explicit knowledge usable by all. The elicited knowledge is verified and validated by peers (Web Masters or Operations Managers). The approved ones among the elicited knowledge are then codified by the knowledge engineer who also stores them in the knowledge repository for future use. The first IP knowledge elicitation done leads to the initial IP knowledge repository (Fig 2). An inference engine that serves to provide a response to the workforce when then they need expert guidance or best practices on any aspect of the web processes is designed by the knowledge engineer. The knowledge engineer integrates the inference engine with the IP knowledge repository to realize the initial expert system.

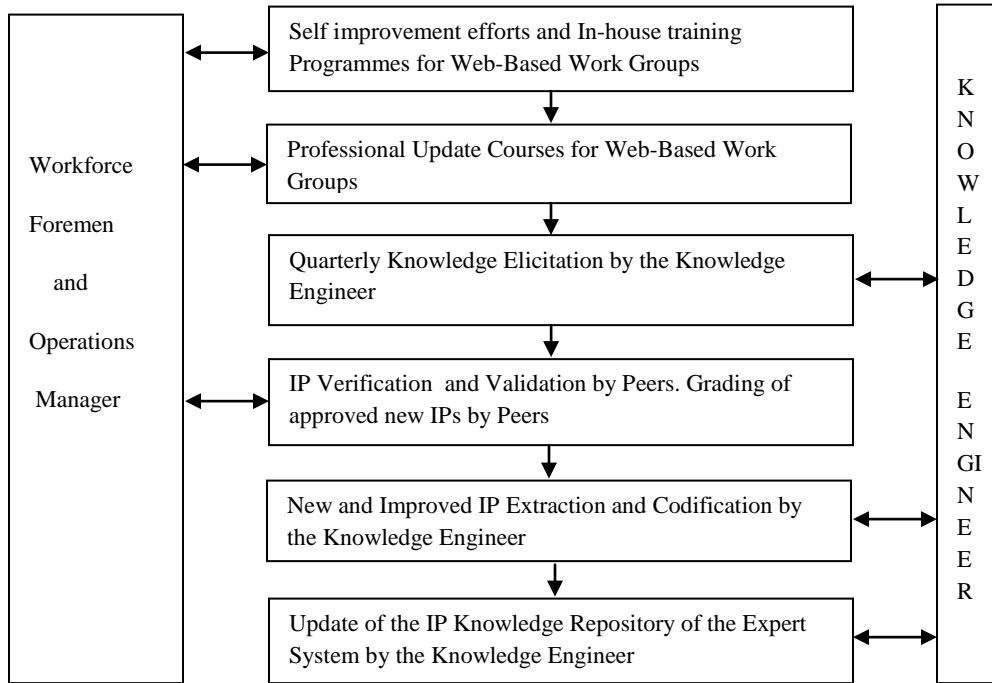


Fig 3: Quarterly Knowledge Elicitation and Knowledge Repository Update Process

Fig 3 shows an enterprise-wide in-house arrangement for IP growth. In this, a web-based business is identified by peers followed by an internal search for enhanced process IPs or best practices to use for each of the processes that constitute the web business (Fig 3). This involves IP Knowledge elicitation from workforce groups by the knowledge engineer; IP knowledge elicitation from workforce groups by the knowledge engineer; Elicited knowledge verification and validation by peers; Codification by the knowledge engineer of elicited knowledge approved by peers after peer review; and update of IP Knowledge Repository. These steps are further illustrated in Fig 3 which also shows the principal actors at each step in the process, namely the knowledge engineer, the peers made up of senior knowledge workers (Operations Manager or Web Manager), and the Top Management Staff (Chief Cyber Security Officer, Deputy Director and Director).

3. The Inference Engine Design and Usage

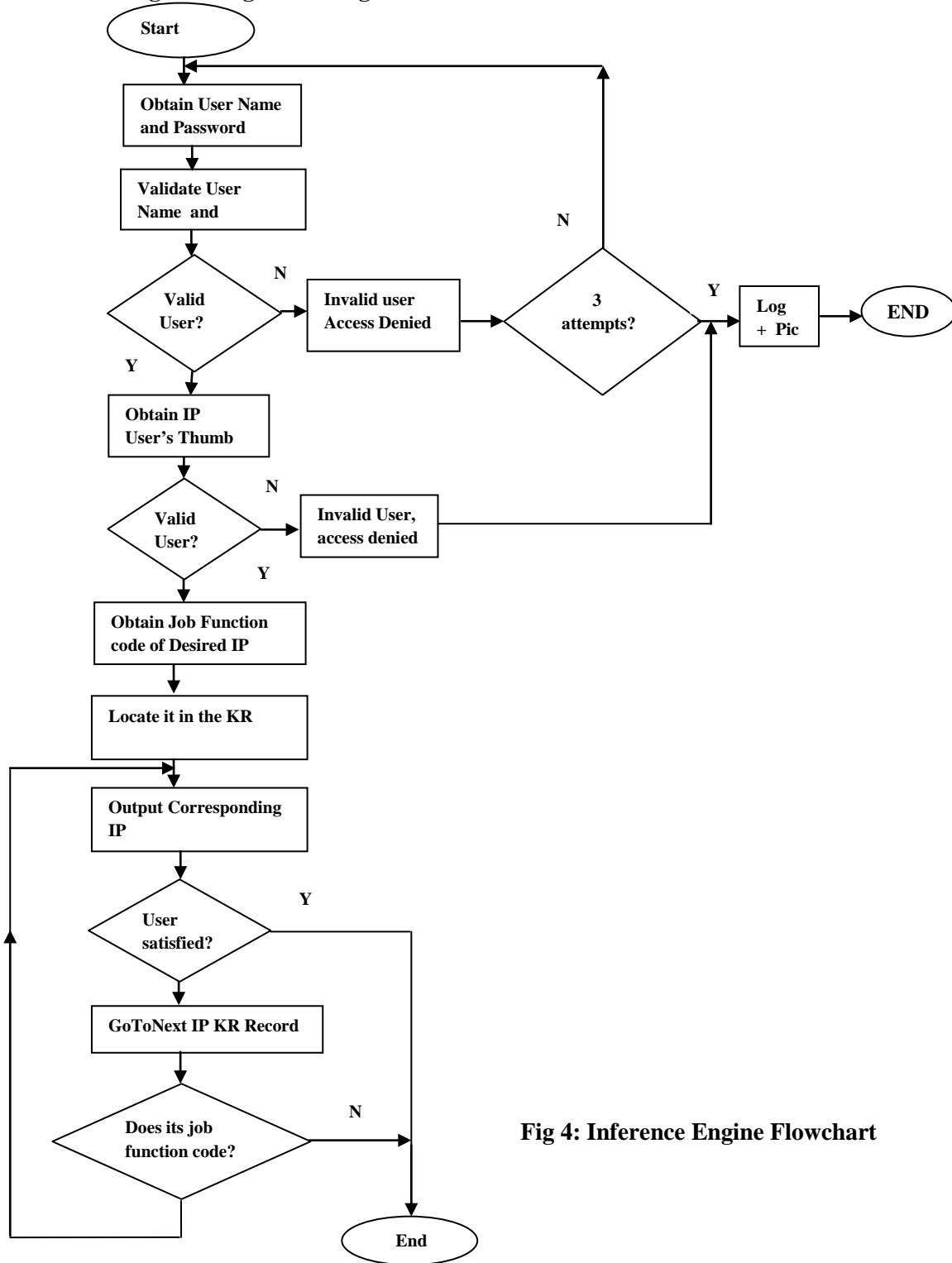


Fig 4: Inference Engine Flowchart

Fig 4 is the flowchart of the inference engine. It involves user authentication section involving user name, password and thumbprint based user authentication. The double authentication first by user name and password and then by finger print is necessary to forestall the stealing of the intellectual property in the knowledge repository (KR) by hackers. If the intending user fails authentication by user-name and password three times in a row, he or she is denied further access and this attempt by an unauthorized user is logged for further investigation. If the intending user scales through user-name and password based authentication, then the user’s thumb print is captured for further authentication. If the user fails to supply a valid thumbprint, he or she is denied further access to the inference engine and the attempt is logged for further investigation (Fig 4). After a successful user authentication, the user inputs the job function code for which the best practice is desired. It is the practice that each job function best practice is stored against the job function code in the knowledge repository. The inference engine (Fig 4) then locates in the knowledge repository the best practice stored against the job function code for which IP information is desired. If the user is not satisfied, the inference engine continues outputting IP records one after the other for as long as the job function code is appropriate. The search stops either because the user indicated satisfaction or because there are no further entries in the repository with the desired job function code. The valid job function codes and their meanings are as shown in Table 1.

Table 1: Job Function codes and their Meaning

CODE	Meaning
BZS	Business Strategy
MHY	Market Hype
PMS	Payment System
QWP	Quality of Web Pages
CSA	Cyber Security Arrangement

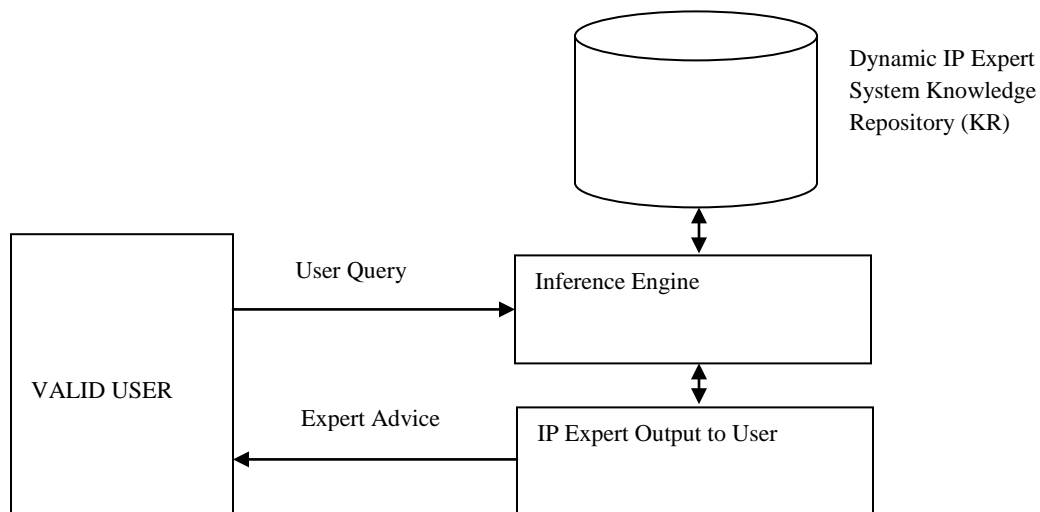


Fig 5: The Inference Engine Usage

Fig 5 shows how the inference engine is used by a valid user. The valid user in search of IP information forwards his query to the inference engine. The inference engine uses the query as a search key in the knowledge repository and retrieves the record that satisfies the user query. This IP (Best Practices) record is output to the user. The inference engine may output another record that satisfies the job function code if the user feedback (Yes or No) indicates that the user is not yet satisfied with the IP information output. It

has been shown that everything in an IP knowledge repository is marketable through patents, direct sales to other businesses, and through e-books. The issue of patenting has been a problem in web-based SMEs.

This paper shows how many more patents can be made to emanate from these SMEs through the quarterly review loop introduced in this paper, that makes the system dynamic, followed by incentives to the workforce in the form of adequate remunerations accruable to them for each new IP discovered for doing web based processes.

4. Making the Expert System Model Dynamic

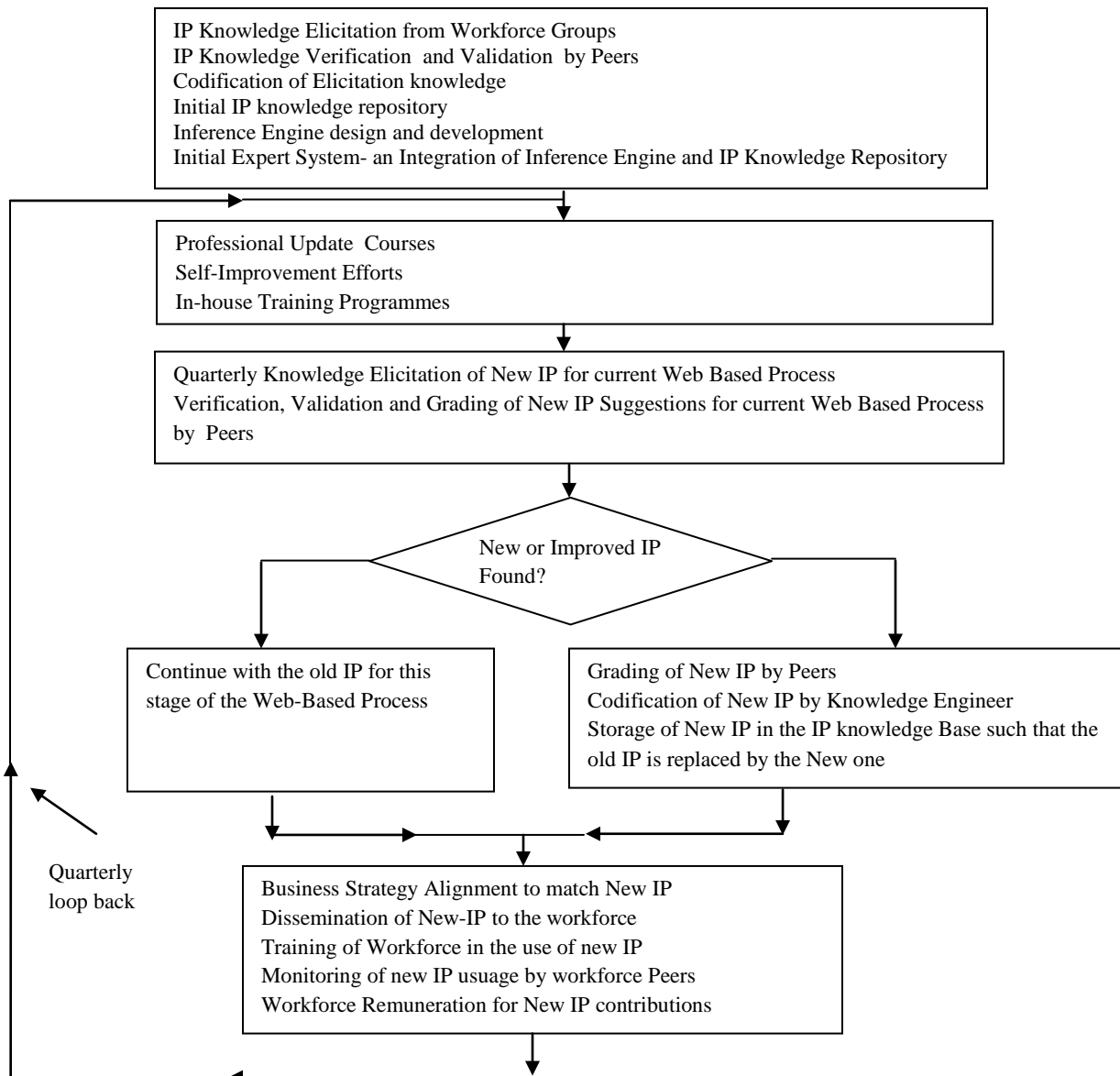


Fig 6: Quarterly Search for New IPs for Web-Process IP Updates

An expert system remains static if no provision is made to update the knowledge base or knowledge repository as technology improves and as more knowledge is gained. Fig 6 shows such a provision in some details. After the initial expert system is realized by integrating the inference engine with the initial knowledge repository, a quarterly update process is initiated (Fig 6). First, professional update courses and in-house training programme are organized for the workforce. The workforce are also encouraged to

engage in self-improvement efforts to ensure their intellectual property (IP) appreciate in value with time. Then a quarterly IP knowledge elicitation is done for the workforce by the knowledge engineer. The elicited knowledge (new IP knowledge) is subjected to peer review. The successful new IPs are codified by the knowledge engineer who uses them to update the IP knowledge repository, replacing each old IP previously stored in the knowledge repository with the corresponding new IP found in this quarterly exercise. If a new IP is not found for any aspect of a web process, the old one remains in use in the repository until an improved best practice is discovered for that aspect later (Fig 6). Each new IP found is verified, validated and graded by the knowledge engineer. The grade awarded to each new IP reflects its quality and the corresponding incentive or remuneration to be paid to the person that discovered that best practice. An improved IP rated grade 1 would attract a remuneration of 8% of every extra profit deemed to have accrued to the web based business due to that improved process IP. The remuneration would be 6% and 4% for new IP processes rated grade 2 and grade 3 respectively. At the end of each quarter, the web based business strategy is aligned to match the new IP found (Fig 7). The current improved best practices are disseminated to the affected knowledge workers who are also given adequate training on how to apply them. The workforce peers monitor their use of approved best practices only and rewards those who are complaint with promotion as and when due (Fig 7). Because the use of approved best practices only is mandatory to all the workforce, those who are not complaint may have delayed promotion or lose their jobs entirely due to refusal to comply. Thus, the workforce is made to operate efficiently and effectively due to their use of best practices only, for every aspect of their web-based processes. The quarterly loop back(Fig 6) ensures that the IP knowledge repository is improved every quarter and that makes the expert system dynamic as it grows like a living organism, responding rapidly as appropriate, as technology changes.

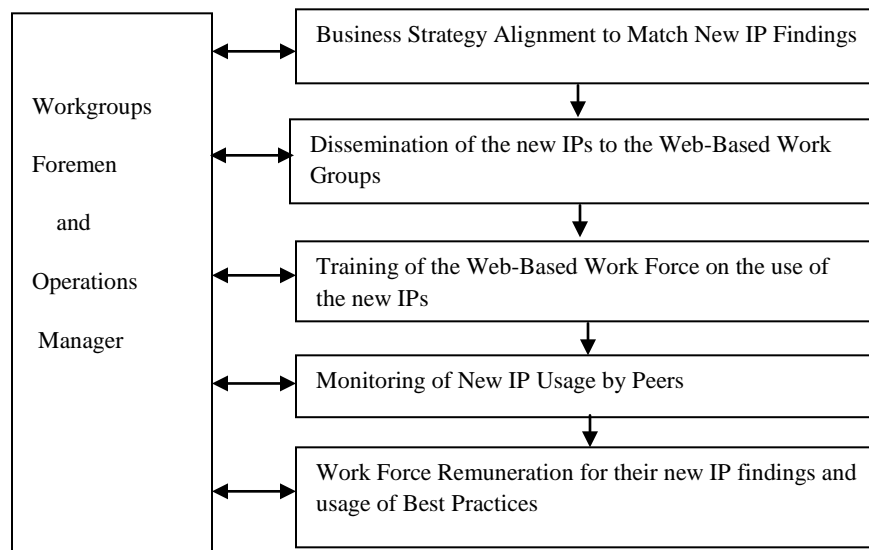


Fig 7: Business Strategy Alignment and Web-Based Workforce Remunerations

The business Strategy of the company is aligned to match the new IP findings(Fig 7). The work forces are trained on the use of the newly introduced IP. The foremen monitors the workforce on the use of the new IP, he makes sure the workers uses the new best practice for all their job in the company else they will not be qualified for normal increment. Those workers who contributed outstanding new intellectual property are remunerated (Fig 7).

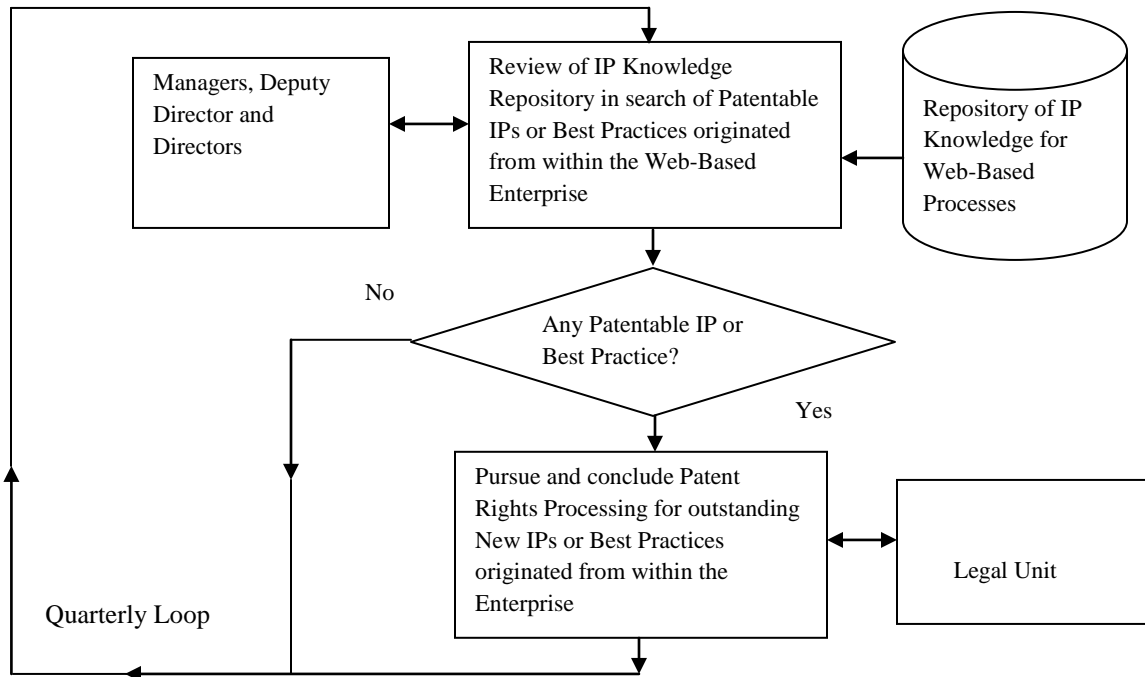


Fig 8: Quarterly Review of IP Knowledge Repository and Patenting of Outstanding IPs.

5. Marketing the IP Knowledge Repository

The Manager, Deputy Director and Director review the IP knowledge Repository in search of patentable IP or best practices originating within the web-based enterprise, if there is any, they pursue and conclude patent rights for processing the outstanding IP. This is done every quarter.

Fig 8 shows how the contents of the knowledge repository is reviewed quarterly leading to the selection of outstanding IP findings which are sent to the legal unit for patenting. Operations Managers or Web Masters who are part of Senior Knowledge Workers, Deputy Directors and Directors constitute the knowledge repository review panel. Patenting costs money and may lead to unnecessary litigation at extra costs if not handled well. That is why the Top Management Staff are involved in the IP knowledge repository review. They focus on those IP knowledge or best practices originated from within the web-based enterprise itself (Fig 8). That ensures that patenting enhances the worth of a company’s IP and gives it exclusive rights over its use. Besides, patenting need not be pursued for every new IP unless it is really outstanding. However, every new IP in the repository is marketable. Those not headed for patenting can still be sold off as a web-based process idea or they can be featured in e-books, as the company sees fit. The quarterly loop back (Fig 8) ensures that the process of patenting is an ongoing process and the legal unit is mandated to carry each patenting process through to its logical conclusion.

6. Conclusion

A web-based process IP creation and Patenting Model has been described in the foregoing. The method used involves web process IP elicitation and IP knowledge sharing among an enterprise’s workforce. Adequate training is giving on the use of each new IP but all members of the workforce are required to

use only best practices captured and stored in the Enterprise knowledge repository, in doing their work. The Enterprise workforce are encouraged to improve their IP knowledge through self improvement programmes and organized training programmes. New IP findings for doing the work of the company are adequately remunerated as an incentive to the workforce. A quarterly review keeps the repository refined and updated with best practices as technology improves. This makes IP growth dynamic in the Enterprise as a whole.

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