

# **Case Study: Implementation of Business Process Management System in Technical Inspection CRM of National Iranian Gas Company.**

**Ali Massaeli**

Department of Technical Inspection,  
National Iranian Gas Company,  
Tehran, I. R. of IRAN  
[massaeli@nigc.ir](mailto:massaeli@nigc.ir)

## **Abstract**

In recent century, the rapid and dynamic changes in business environment leads the organizations to the re-engineering of the business processes toward service-oriented ones; this phenomena requires agility. For this aim Subject-oriented Business Process Management (S-BPM) is utilized for assisting of communication between process owners and the experts and formed the new way of cooperative business processes. Meanwhile all essential infrastructures for supporting resources (such as selective info, know-hows, mental and professional skills, input and outputs, desired quality level and limitations, assessments and control) are taken into account for using the operational experiences (as an added-value knowledge) that perform inside the predefined business environment. This act leads to renovating the business model by selecting proper business services and demonstrates the basis for quickly capable “real-time” service-oriented BPM. In this paper the case study has been performed for using BPMS in internal processes of National Iranian Gas Company technical inspection and control organization in CRM area in order to clarify the processes and effective work-flow as a managerial experience.

## **Keywords**

Business Process Management System, BPMS, Customer Relationship Management, CRM, Workflow, Process Optimization, Change Management, Organizational structure, Project management

## **Introduction**

In recent century, the rapid and dynamic changes in business environment leads the organizations to the re-engineering of the business processes toward service-oriented ones; this phenomena requires agility. For this aim Subject-oriented Business Process Management (S-BPM) is utilized for assisting of communication between process owners and the experts and formed the new way of cooperative business processes. Meanwhile all essential infrastructures for supporting resources (such as selective info, know-hows, mental and professional skills, input and outputs, desired quality level and limitations, assessments and control) are taken into account for using the operational experiences (as an added-value knowledge) that perform inside the predefined business environment [1].

This is the basic preface of the paper: To explore about utilizing organizational tools supplied by proven management conceptions that helped us manage available resources.

Our co-works believed that this approach could provide an effective structure by which our work would advance and grow up as well as promptly adapt to the business environmental changes at our affairs.

An effective inherent organizational structure would supply the support for developing applied systems, technologies, and proper tools. This approach would help us to manage the limited resources (e.g. HR and the time) and everyday operations more effectively. Meanwhile doing this job in a systematic and strategic way was essential for both head-quarter management and customers. We understand and reviewed the management studies to help organize our everyday workflows in CRM related jobs.

BPM is used for enhancement and development of processes within systems.

As per APQC open source standard recommendation and for starting BPMS we've taken into account process classification and divergent processes by creating new forms, and in simpler procedures, possibly even smaller ones. Meanwhile all of these were so achievable that we were able to see what we were doing at all times and improve them time to time.

An application, BPM for CRM is very useful by guiding to effective organizational changes meanwhile taking into account the organizational environment. Environmental review is the critical step for improving CRM at a major foundation.

## **Problem Statement**

As this project try to optimize the business process of National Iranian Gas Company (NIGC) Technical Inspection department, let's introduce the business first, This department is a part of NIGC headquarter of with 21 staffs, which includes middle managers in multi-disciplines for coordinating of Technical Inspectors over the unique Iranian gas supply chain, which contains 52 sub-companies in the fields of natural gas processing, transmission, underground-gas storage, distribution, export, engineering and development.

Regarding to this huge scope of works, technical inspection affair of NIGC headquarter constitution which has been approved by NIGC board and became a requirement by law, one of the mission statement which has been approved for this department is certifying the 3<sup>rd</sup> party technical inspection companies (our external customers and a part of our CRM) in various inspection field of works (such as material inspection, coating tests, mechanical inspection, leakage finding, elevator testing, Non-Destructive Examinations (NDE) fields (VT, UT, MT, PT) and etc.) then update the technical inspection Approved Vendor-List (AVL) and the related Data-Base, meanwhile the technical inspection affairs of sub-companies for out-sourcing the technical inspection careers in different fields(as per stated previously) must use this AVL simultaneously [2].

As per statistical analysis over 6 period of time (monthly basis) more than 50% of telephone calls, post packages or courier deliveries and organizational traffic (specially 1<sup>st</sup> half of year) are due to the 3<sup>rd</sup> party companies certifications and our colleagues in sub-companies technical inspection departments asking for updating AVL based on their request; meanwhile only 3 staffs are working in this area [3].

The CEOs think about how to manage this huge traffic with very limited resources (HR, auditing process, complaints review, updating the lists and...).

Therefore, the main focus of this paper is on the recent development of BPM for optimizing the processes and data processing. And it is obvious that providing the Information System and Telecommunication Infrastructure as supportive processes for the main tasks is vital and the ICT and Knowledge Management play a key-role in this respect.

## **Initiatives and Innovations of this research**

Regarding to the re-engineered technical inspection affairs of NIGC head-quarter authorities, the duty of certifying the 3<sup>rd</sup> party technical inspection companies and updating the technical inspection AVL has been placed in this organization to perform this task. For the first time, the BPM system has been suggested and developed to facilitate this duty for Technical Inspection and Control affairs of NIGC head-quarter.

## **APQC Standard and Process Classification Framework® [4]**

APQC open source standard and APQC's Process Classification Framework® (PCF) is an approved list of processes that any process-oriented organizations can use to redesign and redefine work processes plenary and avoid redundancies. Farther providing just a list, the PCF provides a tool to help benchmarking, managing content, and carry out other important process management operations.

APQC's PCF is the most widely applied process framework in the world moreover by 300K downloads since 2010 as per declare in APQC foundation web-site.

As it was mentioned previously the companies and any organizations such as us utilize the PCF to:

- designate and prioritize continues improvement efforts based on ISO 9000 series,
- redefine and communicate responsibility for business processes that need to be improved,
- benchmark internally and with the best-practice organizations,
- equalizing IT initiatives and updates for the same processes along the organization,
- provide a framework for performance monitoring and measurement,
- finding affiliations and inter-connections along/between processes, and
- Integrate enterprise intent and knowledge management.



Figure 1. Process Identification

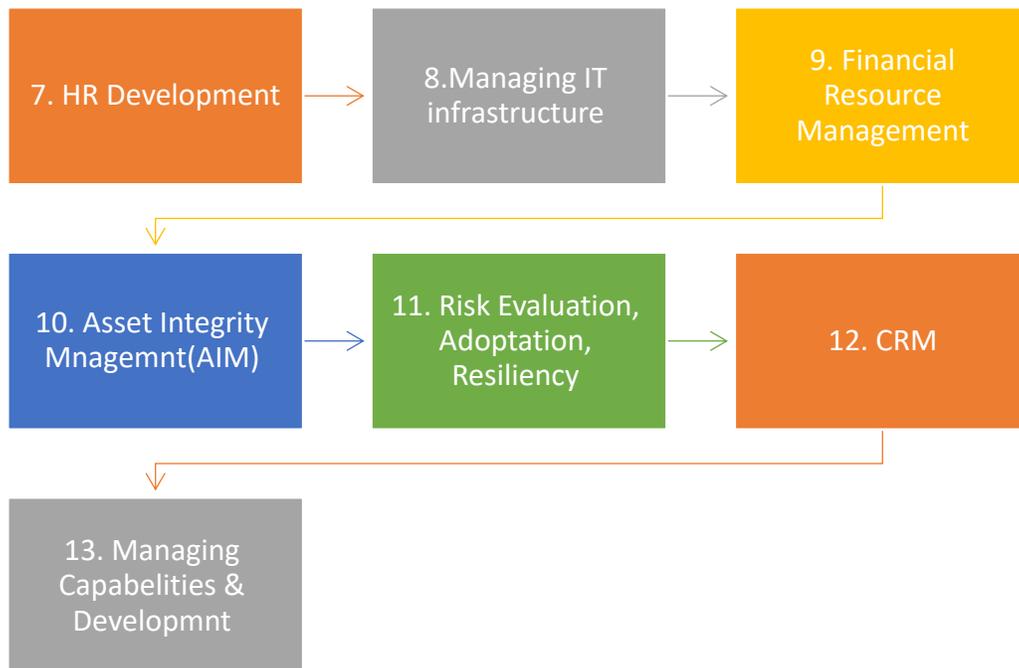


Figure 2. Supportive Services and Management

### What is customer relationship management? —Basic definitions and overview

As per pre-defined terms based on our new mission in technical inspection and control department the CRM is dealing with how to facilitate the customers willing toward our organization rapidly. One of the best clarifying solutions for facilitating such these processes which already used in several cases is the BPM.

Previous methods which was launched based on the asking several printed-copied supporting documents such as insurance documents, in-due personnel list, evidence of the related works and so many extra items in an specific field of technical inspection are needed for evaluating the capability of the 3<sup>rd</sup> party inspection companies working in the inspection outsourcing projects to certify them for a period of time (usually 2 years). This process sometimes takes time for more than 6 months due to missing documents!

Regarding to the lack of qualified persons (only 1 senior staff and 1 junior and a head working on this section) any documents shortage may cause a delay in whole process as well.

The head of this section always complains about document shortage and the limited time they have wasting for obtaining documents shortage.

He asked for a solution to manage the limited resources (e.g. limited staffs, limited time and information shortage).

### **What is a “Business Process”?**

The term “Business Process” was concisely be defined by Davenport & Short as “Logically related tasks performed to achieve a defined business outcome” [5].

Business processes are dealing with coordination procedures between more than one staffs happens in organizations. Meanwhile prerequisite of implementing the BPM is systems thinking and it is critical success factor for understanding business processes. BPM could be analyzed over time to make sure that the individual processes performed more effective and thus decrease the time and cost of achieving the outcome. In this way BPM may be involved in exploring and listing the processes affected in an activity so that having adequate knowledge of a broader system at the organizational level and to control it. Business process improvement reviewed and improved the processes themselves to make them more efficient and more effective. There are a large array of management terms, such as process reengineering, continuous improvement, business process redesigning, that all relate to this approach of improving effectiveness and quality of processes by analyzing and reviewing business processes. [6]

### **Why Business Process Automation?**

Business process automation addresses some business opportunities as below. Even some limited organization (such as us) or small businesses empowered from a process automation capabilities:

- Reliability: Such these automation provides clear aspect of who, what, when, and how role-players must execute their assigned roles so that fulfill a process goal.
- Integration ability: Processes define how organization capabilities provide and how they integrate networking to meet organization objectives.
- Sharing: Processes can use shared capability services as sub-processes to obtain the results. Sharing yields optimizes of scale from usage of limited resources and accomplish of improvements.
- Control: Processes can certainly control for efficiency, to reach at least minimum requirements in conformity with policies and regulations, and to mitigate the overall risks.
- Resource Management: The processes that consume the same resources and manage the same business capabilities can be combined for optimizing of scale and tasks load management.
- Visibility: IT tools usage can magnificently improve process visibility.
- Optimization. Repeatable view of business processes can be monitored, and the affection of particular tasks can be recognized to determine if any type of improvements are needed (or not) and to evaluate progress in execution of changes.
- Advanced Technology Development: In recent years, mobile computing, such as smart phones and tablets, has enabled the organizations to engage their staffs in a process as it happens from anywhere, at any time, and required information can be accessed over the Internet.
- Modeling: Modeling enables consideration of process design development based on operational requirements together with many other elements and attributes such as authorization, benchmarking, best practices, risks, answerability, sharing ability, and optimization.
- Customer Services and Satisfaction: Business processes can be motivated to succeed by customer queries, orders, or order status requisitions over the internet for prompt response to a global market.

- Agility: Business process modeling enables determining and adaptation of processes in order to quick development, and process automation supports prompt extension with minimum need for training of staffs and resistance of the transition state.[7]

## **The Development of Business Process Management**

Two articles published in 1990 performed the beginning of BPM as an identifiable regulation. So while not new, the early 1990s noticed a focus on business processes in themselves illuminate as an essential approach toward challenging with new business pressures and trends toward outsourcing, customer-orienting demand, and competition from appearing markets. [8]

As it was addressed before, Michael Hammer's (1990) article described the issue of companies automating their business processes but understand that simply automating existing processes was not producing added value for organization nor increasing effectiveness or efficiencies. As per Hammer stated, the need of organization is to use technology solutions in the reviewing and redesigning of business processes in order to become more effective: "We should 'reengineer' our businesses: use the power of modern information technology to radically redesign our business processes in order to achieve dramatic improvements in their performance"

As we can see in this statement, Hammer's view of reengineering was based on that it required a powerful, continuous, and wide-range reconfiguration of organization processes in order to break free of old-fashion business processes. In this paper he addressed several essential principles for business process reengineering based on his experience, including:

- Focus on outcomes, not the tasks
- The staffs who use the output of the process perform the process
- Classify information-processing task into the real work that produces the information
- Decentralize the dispersed resources as they were centralized
- Utilize parallel activities rather than integrating their results
- Arrange the decision point where the task is performed, and set the control into the process
- Acquisition of the information once and at the adequate points
- And most primary: think systematic and big [9]

In a later article, Hammer realized that business process reengineering of studied organizations was considered as temporary task, periodic process that organizations would essay, instead of an continuous and systematic process itself, and that it lacked the focus on metrics that an continues improvement which management system should have. Anyhow, by these changes the concept addressed to BPM, especially by distinctly defining what establish a process ("end-to-end task across the enterprise that generates customer added value"), and in focus on process-oriented design instead of simply execution and performance. [10]

Davenport & Short, suggested five steps for redesigning business processes utilizing information technology solution and infrastructure, in order to advancing the business vision and processes objectives, reviewing current processes to be reengineering, measuring the performance of existing processes, addressing new approaches to the processes, and intending and prototyping the new processes. The business processes management principle in this matter is cost and time reduction, quality improvement, and developed work and life quality through empowering of those performing the work. [11]

As it was illustrated in this paper, business processes conduct organizational configuration and management, and BPM provides continues improvement skills and abilities of employees, including process-oriented thinking, for continuous, current process improvement as IT develops and market changes.

This integration of the structural definition of business processes, the concept of reengineering and management for continuous improvement, and improving quality issue and metrics-oriented affecting of Six Sigma, lean production, TQM, and have guide to the development of BPM discipline and to the robust finding of the critical need for alternative management of organizational processes.[12]

## **Our CRM Elements in Technical Inspection Department**

In order to review our sample business processes in certifying technical inspection 3<sup>rd</sup> party companies, we categorized the main elements of CRM as in-due staffs, systems, and tools (Figure 4).

As it may considered in the reviewer of this paper, this is a very basic approach toward CRM; but initial findings proved that as the first steps of such these processes this is a good initiative to launch our work toward processes

reviewing in our organization. When running through this process, we thought about new ideas on how to manage that we had formerly not came up with.

The current process maybe successful now, but as per the environmental rapid changes, the need of ability to be agile enough to adapt to such these changes on the horizon is vital for the organization.

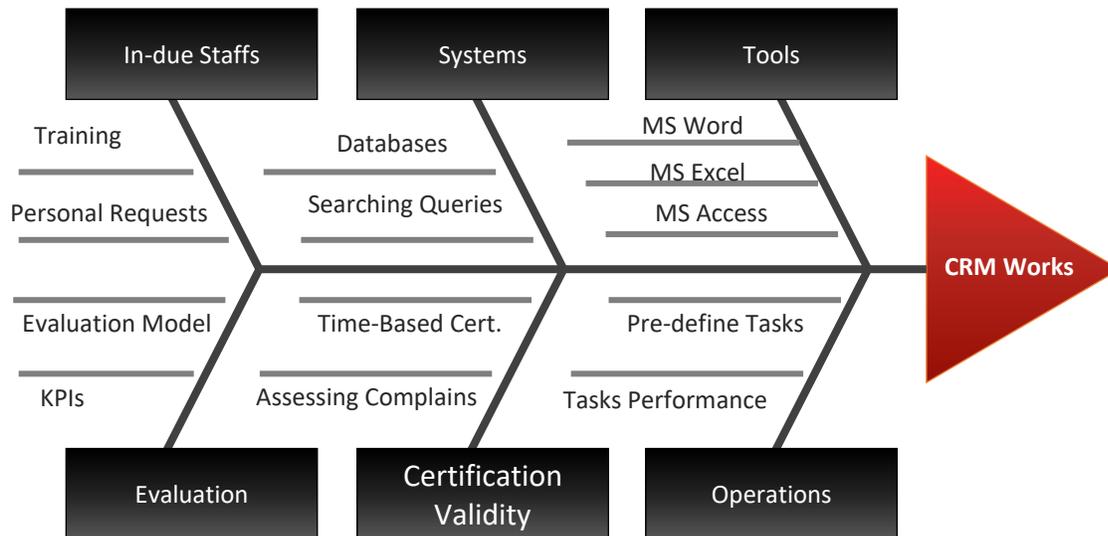


Figure 3. Customer Relationship Management (CRM) Elements at NIGC Technical Inspection department

## Decision making about utilizing the BPMS

As per it was described in problem statement the goal was defined to provide the possible way to have the ultimate access for our internal and external customers to the valid information of the processes. And while studying management solution for this purpose, it was founded that such these solutions could be applied in any similar processes with similar workflows (e.g. any AVL certifications process). Finally we choose BPM principal for managing AVL certification. This principal (BPM) offers process optimization for the typical organizations of CRM workflows.

With such a small staffs (only 2 full-time staffs and one manager) the strategic focus on CRM workflow is vital. As an application, BPM for CRM is very useful by leading to adequate organizational changes in reach the context of the organizational surroundings. Environmental overlooking is the demanding 1<sup>st</sup> step for developing CRM at a large-scale businesses.

In order to implement such these systems to current processes the adaptability is needed; But adaptability takes some time and planning. BPM grants such these changes to organization by providing the framework in a way to make the changes regarding to the organization's environment.

Rapid adaption has the key-role for implementing BPM to our CRM; and we did not want to be out of track. Also, limitation of costs to manage our resources is an issue that we had to take into account of our processes, and BPM grants us brainstorm and implement all kind of cost-effective methods and measurements, in areas from licensing negotiations to operations. [13]

As we reviewed the daily operation and activities in our department, it was founded that, there are a hug traffic (more than 50%) of infrastructure transactions (e.g. e-mail, web-site visiting, telephone and faxes) are due to the technical inspection 3<sup>rd</sup> party companies' qualification department of our organization, and one of the management challenges is reducing these traffic at least by 20%.

Meanwhile the requesting companies and their representative always complain about the way of responding of our colleagues in that section on-time and clearly.

One of the best solution which maybe come into our mind at first, we thought about applying ERP.

The principal idea of the application of management theories seemed to fit logically and naturally with our workflows.

But at it was mentioned in several studies about applying ERP in the similar organizations, we found that there are several critical success factors interfere the success in this project which is not controllable by our organization so it seems to be difficult in implementation of the ERP in our processes.

Insufficiencies in processes are specified from a quantity of sources contains the following factors:

1. Benchmarking, which one recognizes the competition is operating at a higher level of efficiency.
2. Confirmation Audits, which there are either deficient processes or employees are not proceeding existing processes. Quality equivalent auditing (as per with ISO 9001) specifies if a documented special process is being carried out or not, and whether it requires to be improved or replaced.
3. Internal Audits, which a Risk-Based “Systems” orientation is taken into account, with a focus on the possibility of decays, and thereby potentially an opportunity for usage of computerized processes

Putting processes into computer systems can remove any objectively and reduce the potential for decays.

Business Process Management (BPM) has advanced from Business Process Mapping (See Fig.1) as per as APQC process classification open Standard, which a structured “Project Management” approach is used to make sure of practical usage and sustainability of the process improvement or modification. Change management is critical to the success of the implementation.

From a business process management (BPM) viewpoint, the excellent approach for managing limited resources is at first understanding and assessing the processes involved in this CRM life cycle.

Finding the underlying business processes of CRM, which is very much differed at each organizations, is a means for establishing more effective workflows which guides to more successful management of limited resources and greater organizational effectiveness overall.

We were about searching for the building blocks of CRM, concentrating on small projects in order to gain the noticeable results. Summarizing these processes is a suggested approach to get started on the review process. Also such the following questions may help the re-engineering of the processes inside any organizations (See Fig 3):

- What shall we do to utilize and optimize limited resources?
- Is there any streamlined workflows developed yet?
- How can we perform to organize the processes?

All of these viewpoints will help to a better and more flexibility to manage limited resources that maybe adjusted and utilized to different types of similar organizations and a wide range of different environments.

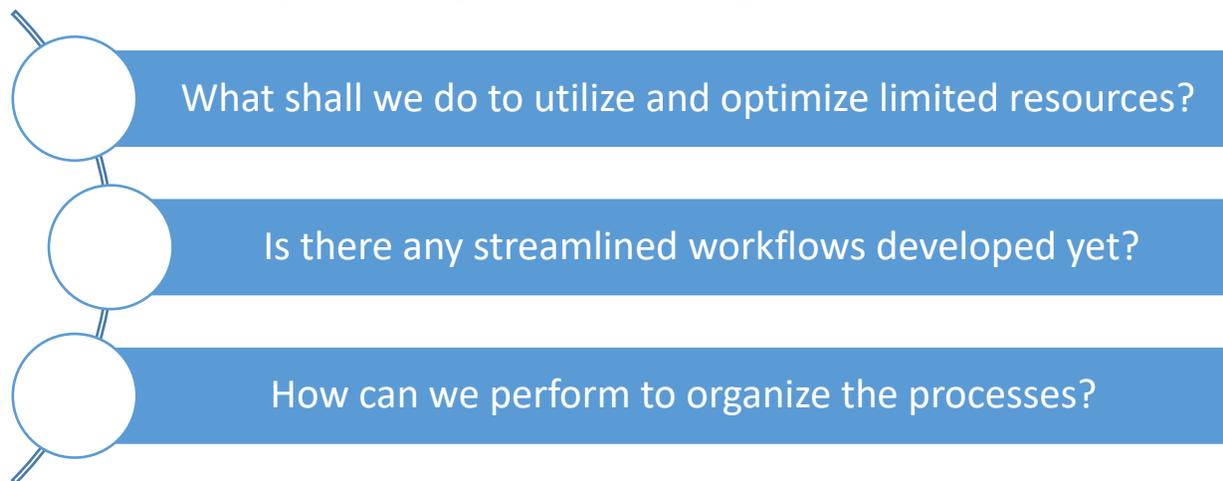


Figure 4. Process Review Basic Questions

## **Business Process Management Application in CRM of NIGC Technical Inspection Department: The case study**

As it was stated before about the challenges toward the certifying the 3rd party technical inspection companies and the issues of these companies toward our organization and after studying possible solutions in that situation that we

have as a governmental company, the safest way for rectifying the issues is implementation of BPMS in our department by outsourcing this project toward private consultant as a software development contract.

Based on the following flow-chart (See fig 5) the implementation stages is as below:

1. Finding the problem and taking CEOs challenges
2. Gathering environmental data about the challenges
3. Statistical analysis of collected data and stablishing the goals for decreasing the conciseness
4. Studying about possible solutions
5. Benchmarking with similar organizations about our challenges in this matter and consulting with their expert teams how they solved such these problems
6. Evaluating the solution based on the organizational environment and the collected information such as benchmarking results and etc.
7. Selecting the optimal solution which is called BPMS implementation as it was mentioned before.
8. Presenting the optimal solution for managing board and asking for their decision for implementation.
9. Credit negotiating for implementation BPMS
10. The RFQ has been developed by consulting with industrial BPMS developers and management representative brainstorming for the RFP selecting attributes and the features of the system which must be available and the technological solution and published by technical inspection department and asked for RFP form BPMS software developers who has the industrial engineering process analyzing section and has a good background in developing the BPMS project in similar organization.
11. The technical RFPs has been received and based on previous stage by selected attributes and minimum requirements and the features, the RFPs has been evaluated in the limited tender bid meanwhile the tender companies had some presentation meeting and elaborate more about their features for the CEOs and evaluating team based on the selecting attributes and factors of evaluation mentioned in RFQ.
12. The selected company was announced for signing contract.
13. After official bureaucracy for signing contract the project has been activated for 18 months, 3 months for finding out the process and developing in BPMS and 1<sup>st</sup> step initialization of BPMS in our organization and 3 months for developing the system and test-run and finally one year as a guarantee and trouble shouting (as we are in this stage).
14. Final Acceptance Test (FAT) based on the terms and attributes which has been agreed by the client and developers and signed in the contract.
15. The supportive contract will be signed after evaluating the 1<sup>st</sup> stage (as per decided in managing board the contract appointed to be signed as stage-gate contract) and if the needs of our organization satisfied by the 1<sup>st</sup> contract the second (supportive) contract would be signed and activated.
16. The executive team from the consultant company assigned for the project and announced to our organization (the client) officially.
17. The processes will be derivate based on APQC open source standard and IMS documentations (See Fig 5).
18. The stages for sending information toward customers (3<sup>rd</sup> part technical inspection companies) based on the processes will be notified.
19. The forms for collecting data will be stablished on form maker modules.
20. The process-map will be designed based on the process analyzing modules (you can see a sample in Fig 6).
21. The reports such as Approved Vendor List (AVL) report, statistical report, and etc. will be designed based on client CEOs needs
22. The managing dash-board will be developed based on CEOs requirements and providing access for authorized managers to manage the CRM.
23. The supportive processes (i.e. complain claiming process and ...) will be derivate and taking into account the above stages for these processes.

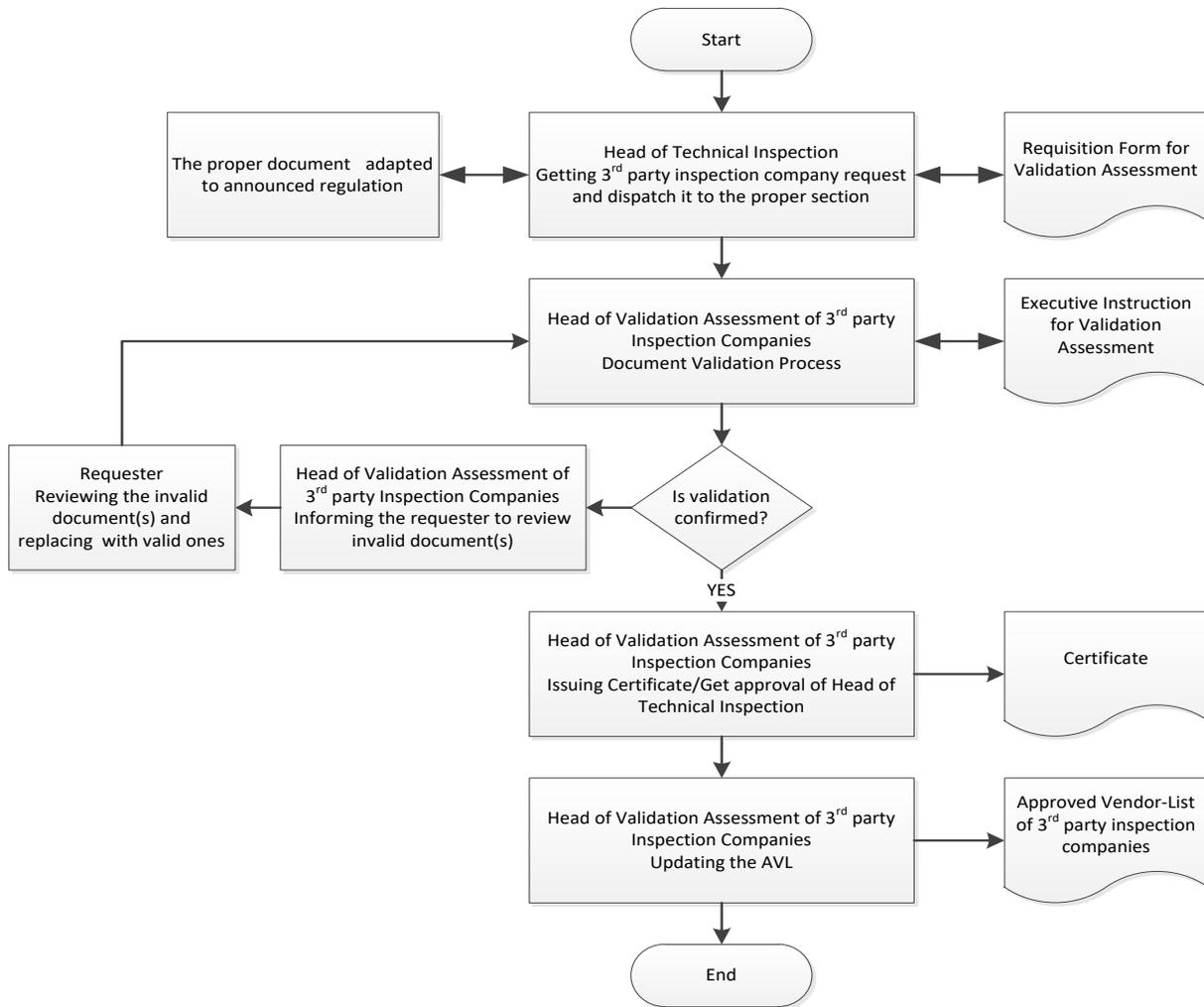


Figure 5. Validation Assessment Process of 3<sup>rd</sup> party technical inspection companies for AVL in NIGC

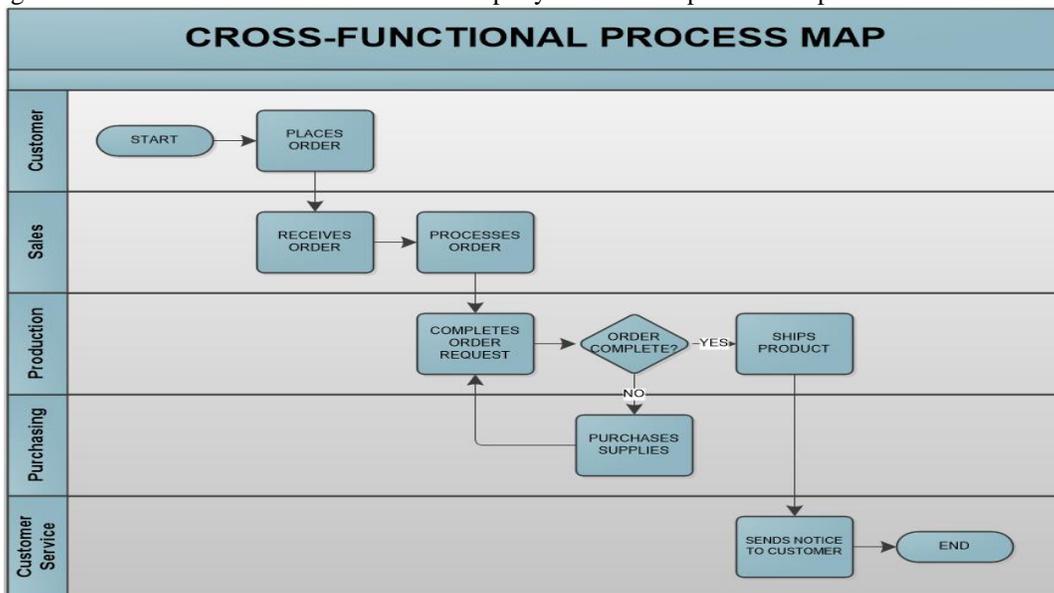


Figure 6. Sample of process-map

## Results and Findings

As it was mentioned before, the BPMS has several advantages for bulk and heavy work load, especially for repetitive processes when the resources are limited, and as per illustrated in the problem statement, based on the statistical data more than 50% traffic of transmission are due to the special process and it can be solved by applying BPMS and automation of the processes; We are at the mid-way of applying the system in our organization and it's a bit early to talk about how useful it is for our organization, but based on the studies, it can optimize our resource management and increase the customers satisfaction and clarify the validation of 3<sup>rd</sup> party technical inspection companies (our major external customers) which is one of the main goal of our CRM.

## **Conclusion**

BPM is a useful management techniques for assisting of communication between process owners and the experts and formed the new way of cooperative business processes. Based on studies of organizational environment and as per processes review in our organization, one of the new goal definitions was optimizing the process based on the customer satisfaction and better limited resource management. The BPMS provides the tools which can be utilize for the new goals of our organization.

This paper provides a framework for the similar processes and similar organization to utilize the BPMS and improve the overall productivity of heavy load- repetitive processes.

We are at the mid-way of applying BPMS and the final results and conclusion will be published after the test-run.

## **Acknowledgements**

The author wish to thank of the NIGC management system, specially Technical Inspection Department and supportive aid of Research and Technology Directorate for coordinating discussions with their key personnel and issuing the permission to gather the required data for developing performance monitoring system in this case study.

## **References**

1. Cummins, Fred, *Building the Agile Enterprise with Capabilities, Collaborations and Values*, 2nd Edition, Elsevier, 2016
2. <http://inspect.nigc.ir> NIGC technical inspection affairs constitution document
3. <http://inspect.nigc.ir> publication section
4. <https://www.apqc.org/>
5. Davenport, T. H., & Short, J. E., *The new industrial engineering: information technology and business process redesign*. Sloan Management Review, 31(4), 11– 27, 1990
6. Zellner, G., *A structured evaluation of business process improvement approaches*, Business Process Management Journal, 17(2), 203–237, 2011
7. Fred A. Cummins, *Cummins-Building the Agile Enterprise. With Capabilities, Collaborations and Values-*, Elsevier, 50 Hampshire Street, 5th Floor, Cambridge, MA 02139, United States, 2016
8. Smith, H., Fingar, P, *Business process management: The third wav*, Tampa, FL: Meghan-Kiffer Press., 2007
9. Hammer, M. , *Reengineering work: don't automate, obliterate*, Harvard Business Review, 68(4), 104–112, 1990
10. Hammer, M., *What is business process management?* In J. vom Broke, & M. Rosemann (Eds.), Handbook on business process management 1: Introduction, methods, and information systems. Heidelberg, Germany: Springer, 2010
11. Davenport, T. H., Short, J. E., *The new industrial engineering: information technology and business process redesign*, Sloan Management Review, 31(4), 11– 27, 1990
12. Beckford, J. L. W., *Quality: An introduction*, 3rd ed., New York, NY: Routledge, 2009
13. Anderson, M., *Scientific management*, In B. S. Kaliski (Ed.), Encyclopedia of business and finance, 2nd ed., pp. 564–656, Detroit, MI: Macmillan Reference USA, 2007
14. Duncan, E., & Ritter, R., *Next frontiers for lean*, McKinsey Quarterly, 2, 82–89, . 2014
15. Oppenheim, B. W. , *Lean for systems engineering with lean enablers for systems engineering*, Hoboken, NJ: John Wiley & Sons, 2011

## **Biographies**

**Ali Massaeli** is the Head of IT in Technical Inspection Department of National Iranian Gas Company, Tehran- I.R. of IRAN. He earned his B.Sc. in Chemical Engineering from Azad University of South Tehran and his M.Sc. in Industrial Engineering – System Management and Productivity from Azad University of Qazvin. He has several research activities such as publishing internal journal of IGU (International Gas Union) and international conference papers. He has several industrial training courses in Chem. and Industrial Engineering and co- authoring and the editor of process engineering in oil and gas industry. He was one of the senior experts in SCOE integrating executive committee of Petroleum Ministry of I.R. of IRAN. In the IEOM 2012(Istanbul-Turkey) he received outstanding industrial awards. He was one of the members Industrial Committee of IEOM since 2012 till now. Also he is member of jury team of International Management Conference since 2010 in managerial experience section.. He is member of IEOM Society.