

Intellectual Capital Management Increase in Offshoring

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Abstract. Offshoring is a method for companies from automotive software development industry to have access to a larger pool of talents or to reduce the development costs. In order to have success, the management must be prepared for knowledge transfer process that will be different while compared to training a new employee at the headquarters. Many companies fail when this step is made and instead of reducing the costs, the loss can drag down the business even to the bankruptcy. In this paper, it is presented a solution for a systematic knowhow increase for the new offshore team, applicable to the processes of knowledge transfer. Complex trainings and various methods of solving the orders are not recommended immediately after the offshore branch was opened; rather the foundations must be very clear for every employee. The conclusions of this study are encouraging, supporting the companies in investing in the employee's development and by increasing gradually the knowledge, the result will be solid and the offshoring can become a big success in the company's development.

1 Introduction

In the automotive industry, the competition is very aggressive. Every advantage offered to the customer can help the company to gain more percentages of the market. For a company to be able to give discounts, extended warranty or other kind of promotions, the cost production must be reduced or obtained technological or else competitive advantage over the competitors. In 2020, more than 62 million of vehicles were sold and it is expected this number to increase as soon as the pandemic is over [1]. In India, a software developer's base yearly income is \$15.000, this representing 25% of the wage of an Irish developer who earns 50% when compared to a developer from United States [2]. These numbers can help the companies if they are moving parts of their processes or software development in a country, which will allow saving costs. Also in other countries like China and India, the number of software developers who are launched on the market from the universities is around hundreds of thousands every year so they have a larger pool of talents to choose from [2]. Like this they will be able to gather more experts for their projects and the quality and innovation have a big change to be outstanding. This strategy is called offshoring.

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Fig. 1. Offshoring advantages [3]

Offshoring is the procedure of relocating processes from production or software development to a different country where the labour or resources are more available and cheaper [4, 5].

In early 1908s, the foreign direct investment had a value of \$55 billion while in the 2000 the number grew significantly to \$1271 billion [6]. The amount of money and the number of companies offshore is in continuous growth.

A great advantage in relocation is that the business can value the capabilities and expertise of the country selected for transfer; these things can help the parent company to have a higher performance and a better creation of in-depth knowledge which is called reverse technology transfer, RKT [7, 8].

Another benefit is that moving low-skilled activities and operations can have positive effects on complex complementary activities in the country of origin [9]. Simpson demonstrates that an analogous result for plants occurs in low-skilled industries [10]. Becker shows that relocation to German multinational companies' leads to a greater dependence on highly qualified employees and the opportunity of having less implicit routine responsibilities [11].

All these facts show that expanding research and development is a solution worth considering, and other companies use it to increase their knowledge, to grow their business and to reduce costs. Offshoring can be very attractive but if it is not managed wisely, it can drag the company down. In the next chapter the relevant problems will be presented and an overview over the status of offshoring

2 Issues in offshoring

According to Moe, a future research direction is focusing on software processes improvement in companies, which are involved in offshore insourcing and observe the behaviour at the offshoring branches [12]. Companies that activates within the domain automotive software industry have a smaller logistic issue to care about when offshoring in comparison to companies that are manufacturing parts of the car, but that does not mean that offshoring it will be automatically a success.

Especially in the first period of the offshoring when the orders are given to the new offshore-created team the difficulties are various and many aspects must be explained. In the next cases, it will be observed that offshoring is not a stress-free process.

These number can be considered as a warning for every company which intends to offshore without a careful planning: 50% of offshore outsourcing contract signed by North American businesses failed to meet their anticipations; 30% to 50% of the companies involved in offshore outsourcing had annulled their agreements and 20% of outsourcing contracts are cancelled in the first year. The main causes for ending outsourcing contracts are unmet expectations of cost savings and the need to defend intellectual property [12].

In offshoring, several dispersed teams work on a project and because of the distance and lack of face-to-face interaction, the communication and coordination are not straightforward, simple and comprehensible [13, 14]. Insufficient team communication often creates challenges like:

- Lack of trust for the new offshore team;
 - Bad relationship between the teams causes their efficiency to be severely affected [15]
- Knowledge transfer is a critical aspect when offshoring [4]. In offshoring, this process is not direct and clear from one country to another due to:
- Lack of experience of the offshore team: the knowledge transfer does not take in consideration the decreased level of the newly formed offshore team;
 - Cultural differences like the greetings or how the problem should be presented so the other one is not offended;
 - English is not the primary language for the employees [16];
 - Weak management [6];
 - Lack of communication routines, the knowledge transferred is too wide instead of comprising the most important aspects [17].

These circumstances lead to hostile and harsh work environment and can lead to total break between the involved employees.

The outcome of these issues are:

- Fail to accomplished deadlines;
- Teams under high pressure;
- Low quality of the software products;
- Slow or inexistent development of the team;
- High employees' fluctuations.

3 Solution presentation

A healthy growth mentality for the offshore team is learning and taking small steps in the direction of teaching and learning by transferring small and low complexity projects at the beginning [17]. In the launch of the project, the best method for knowledge transfer is to train the team in one or two approaches when working on the project's orders. Therefore, the knowledge transfer process is simplified and teaches the most important points of the working procedure:

In the **first stage** will be basic processes knowledge transfer:

- Software tools used in all the projects will be presented: short examples of how to use them and short and easy tasks to understand how they are designed;
 - Trainings for all employees according to the level of low complexity orders, which will be assigned;
 - The set of orders will be orders with low complexity and low or medium priority.
- In the **second stage** will be more complex trainings for orders with medium complexity:

- The set of orders will be orders with medium complexity and low or medium priority.

In the **third stage** the high complexity trainings with tools and orders which require high skills and expertise will be presented:

- The set of orders will have high complexity and low or medium priority.

The variation will be narrow at every stage, but the knowledge depth within the working process will increase. A practical example would be from the part of the testing the software. If testing the behaviour of the software the check expressions are limited to two or one, anyone from the team can understand and correct any dysfunctionalities within their colleagues work. If a teammate has impediments, the colleagues will not waste time trying to understand how the check condition works and what is compared within; the time is saved and the problem is fixed more easily and the overall knowledge of the squad will increase in an easier manner. These check expressions can vary a lot but if the number of them is limited, the team will be more robust when facing any challenges.

In the next figure, the two strategies are presented under the form of square and a circle for underlining the advantage of limited working options methodology. The method's concept it will be illustrated in comparison with the more methods used for knowledge transfer for a better understanding for the new colleagues when the offshore branch has been opened.

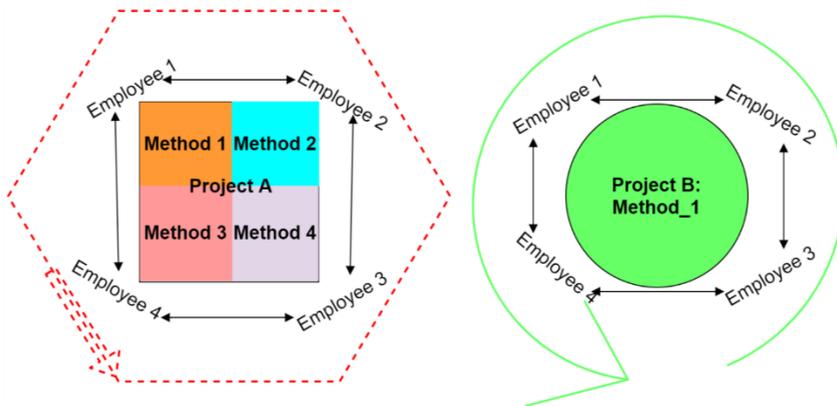


Fig. 2. Concept of limited working approaches method

The advantages of applying a method with limited working approaches are:

- In depth knowledge transfer of the process;
- Less quantity of information that must be transferred;
- The greater the impact of the trainings, the faster and more visible the results will be and the changes of making mistakes are more limited;
- Quicker transfer of orders from one colleague to another, without a long period for a detailed explanation;
- Faster and easier for the reviewers when checking the work, with a more narrow path of creating or testing the software.

The disadvantages of limited working methods are:

- The employees are not acquainted from beginning with all the possibilities of solving an order;
- For the moment, they cannot innovate because they are not familiar how can the problems be solved in other ways.

General knowledge transfer steps:

1. Identify the definition of done of the knowledge transfer.
2. Split the definition of done in smaller phases. These phases should be parts of the process on which the trainees will work in the future.
3. Make clear what will be transferred in every step.
4. At every major step, the knowledge transfer must be measured and evaluated for assuring that the trainees have assimilated the knowhow.

Definition of done represents all the objectives of the knowledge transfer so the team can work independently fulfilling all the standards.

4 CASE STUDY

This solution was applied on a small offshore team from Romania, with three members and with the headquarters in Germany involved in knowledge transfer. Because the results were not satisfying (see Figure 1), an improvement had to be done, in order to correct this situation. The outcomes of the team have been recorded for a comparison with the results after the new approach is implemented to verify if the method comes with improvements or not.

In the next figure, it can be observed that the deadlines and the quality of work have not been respected and it was clear that this is not the right direction for developing the offshore branch:

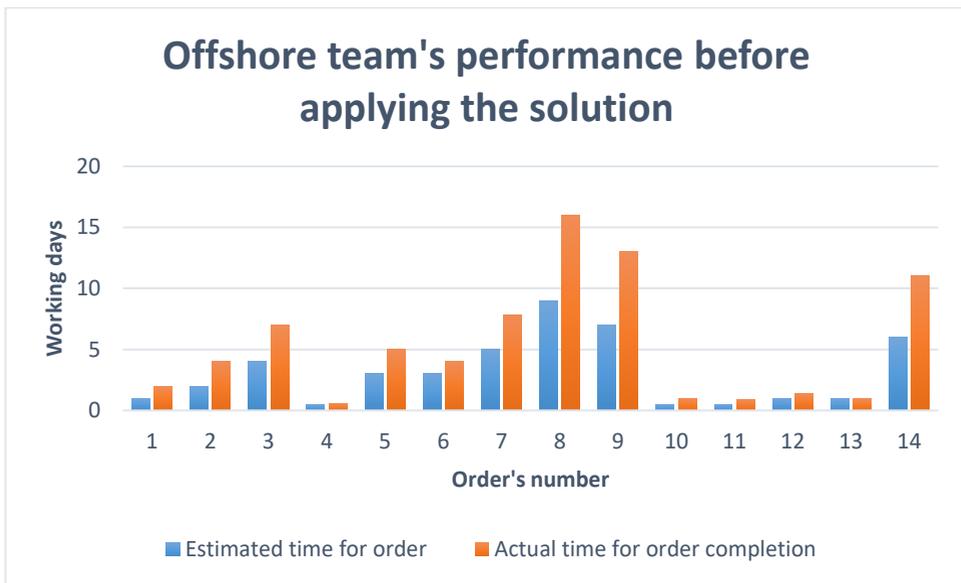


Fig. 3. Performance before implementing the solution

From figure 3, it can be observed that for completing an order was necessary more needed time than estimated. This was because the trainings were very complex and the experience of the team was low. For a total number of estimated days of work of 43,5 were needed 74,7 working days for finalize the customer's orders. Here are included all the reviews and the necessary explanations for correcting mistakes and increasing the quality of work.

In the next figure, the proposed technique was implemented. The number of possible methods in which the work could be completed has been reduced to two standard methods. These methods have been presented in a meeting with the team from the Head Quarters and the team from the new offshore branch. These methods have been discussed and presented all the details needed for the methods and all the questions have been clarified. The monitoring took place after the meeting and all the details have been clarified, starting with the first order from the client. The complexity of the orders was increased systematically, and the training and knowledge transfer methods were reduced so the essentials have a strong fundament:

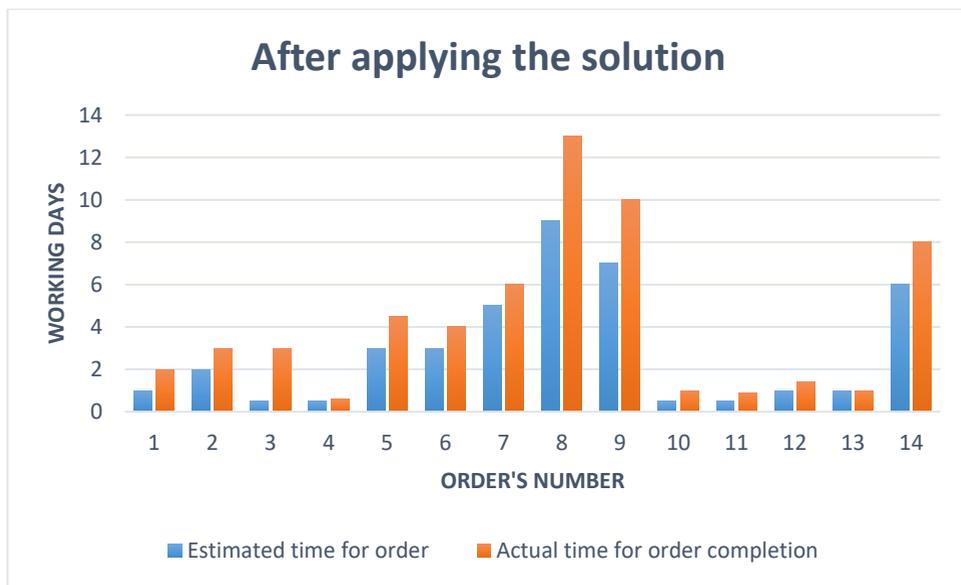


Fig. 4. Performance after implementing the solution

It is observable that the solution starts to produce effects and the correction is gradually increased in the order's reworks.

After the solution was applied and the number of working methods have been reduced, the employees could focus on a limited number of techniques to finalize the orders and learn very well those methods. For an estimation of 40 days of working on the orders the total number of days needed to finalize the work was 58,4 a decrease by more than 15 working days.

5 Conclusions

In this article, it is presented an effective method, which should be implemented from the beginning of offshoring. The people must be trained effectively, by including them in the projects. The orders assigned to the offshore branch should be simple and easy to accomplish until the new employees have a higher knowledge. Afterwards, the complexity of the orders can increase gradually rather than teaching a lot of new information, which is hard to assimilate and implement it in the daily orders. The companies should take in consideration

that the offshoring is not an easy step and it takes time until the new branch is capable in taking responsibility over the designated projects.

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References

1. I. Wagner, <https://www.statista.com/topics/1487/automotive-industry/> Retrieved 17.01.2020
2. E.Ó. Conchúir, P.J. Ågerfalk, H.H. Olsson, B. Fitzgerald, *Commun. ACM.* **52** **8**, 127-131 (2009)
3. <https://www.wallstreetmojo.com/offshoring/> accessed on 17.01.2020
4. Z. Mansoor, M. Shahin, M.A. Babar, *Int J Inform Manage* **36**, 995-1019 (2016)
5. C. Erran, P. Tjia, *Offshoring information technology: sourcing and outsourcing to a global workforce* (Cambridge University Press 2005)
6. J. Mansour, G.K. Stahl, F. Brodbeck, C.P.M. Wilderom, *Acad Manage Exec* **19**, 59-76 (2005)
7. C.E. Electron, *J. Inf. Syst. Dev. Ctries.* **13**, 1–12 (2003)
8. G. Yilmaz, A. Bengston, A. Hadjikhani, *Procedia Soc Behav Sci.* **195**, 982-992 (2015)
9. H. Simpson, *UK. World Econ* **35**, 243-272 (2012a)
10. H. Simpson, *Can J Economics* **45**, 698-731 (2012b)
11. S.O. Becker, K. Ekholm, M.A. Muendler, *J Int Econ* **90**, 91–106 (2013)
12. N.B. Moe, D. Šmite, G.K. Hanssen, H. Barney, *Empir Software Eng* **19**, 1225–1258 (2014)
13. A. Y. Ibrahim, A.Q. Gill, A. Al-Ani, *Inform Manage* **53**, 22-37 (2016)
14. S. Sundeep, B. Nicholson, S. Krishna, *Global IT outsourcing: software development across borders* (Cambridge University Press 2003)
15. L. Filippo, F. Calefato, C. Ebert. *Group Awareness in Global Software Engineering.* *IEEE Softw.* **30**, 18-23 (2013)
16. B.L. Kedia, S. M. Lahiri, *J Int Manag*, **13**, 22–37 (2007)
17. M. Mihalache, O.R. Mihalache, *Manag Int Rev* **60**, 37–67 (2020)