# Evaluation Metrics for Big Data Project Management

Munir Ahmad Saeed and Mohiuddin Ahmed(✉)

Canberra Institute of Technology, Canberra, Australia
saeed.munir@cit.edu.au, m.ahmed.au@ieee.org

**Abstract.** In this paper, we investigated the current scenario of big data project management followed by success criteria. Our research found that, the evaluation metrics are generic and no universal metric available for the big data projects. Therefore, we have proposed few evaluation metrics suitable for big data projects.

**Keywords:** Big data · Project management · Evaluation metrics

## 1 Introduction

Though project management started in late 1950 but project success started attracting the imagination of researchers as project management matured in to an independent discipline since 1980s. Success is a subjective in nature and it may mean different to different people. However, project management professionals and researchers commonly identified project success evaluation metrics as completing a project within triple constraints such as at cost, time and within specifications. With the passage of time various other metrics were added to the wish list and most recently projects benefits realization has been included as key evaluation metrics for project success. Big data projects are inherently software projects and according to Standish Report 2017, the project success in software development is abysmally low. Big data projects are struggling to convince top managements of large organizations for the value of resources spent on such projects. Therefore it is pertinent to identify evaluation metrics for big data projects success. This paper discusses the current state of big data projects and challenges faced with regard to success and how to measure success of big data projects. It also identifies metrics for the evaluation of the success of big data projects.

The rest of the paper is organized as follows. Section 2 discusses big data project management. Section 3 defines success in big data projects and Sect. 4 outlines the evaluation criteria for such projects followed by the proposed metrics. Section 5 concludes the paper.


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## 2 Big Data Project Management

The CHAOS report 2017 by the Standish Group points out that nearly $250 Billion were invested on IT applications projects in the US alone but the success rate has been far less than desirable and only 28% of software projects at small size companies were completed on time and cost. Which means rest of the projects were either cancelled (31%) or massively (53%)will be over budget by one hundred-ninety times. The report further states that in the US medium size organizations fared well with 16% project success rate, whereas larger corporations had an abysmal 9% project success rate. However, the report did not explain whether the organization size has role to play in project success. Big data projects being inherently software applications project are expected to suffer from similar challenges experienced by mainstream IT applications projects. As according to Informatica (a reputed software development company), even the data analytics proof of concepts, being small projects, fail to complete on time and budget and subsequently these projects were unsuccessful in meeting top management expectations. Big data projects need to convince the top management of the utility of projects and currently in companies, where such projects are being implemented only 27% executives consider their data projects are successful because there are only 13% companies where big data projects are in full scale production. It is found that for project success and subsequent organizational change, top management support (TSM) is one of the most important critical success factors. Young and Poon [1] argue that TMS is more critical for project success than other traditional success factors.

Though the mainstream project management is yet to give due attention to big data projects. Since big data projects are less known, therefore there is a need for research to identify the factors behind the success/failure. However, Informatica has identified some of the factors that contribute to the failure of big data proof of concepts such as projects failing to align with the strategic objectives of sponsoring executives, lack of planning and design, scope creep and ignoring data management. According to Informatica, if projects align to top management's strategic plans, it guarantees whole hearted support of organization executives. In order for projects to ensure executives' support, the projects must align to the organization strategic objectives by creating value to the organization.

## 3 Success in Project Management

Traditional project management literature identifies the triple constraint or the Iron Triangle of cost, time and specifications as project success criteria [2]. However, as the project management became more popular tool for achieving organizational strategic tool, the success criteria also added various other variables. It is argued that trade literature identifies schedule, budget and customer satisfaction, as the measures of project success. Time and budget are already known components of iron triangle of project success; however, the customer satisfaction has been identified equally important project success measure later on [3].

Pinto and Slevin [4] identified 10 project success factors such as project mission, top management support, project schedule plan, client consultation, personnel matters such as human resources and training, technical tasks - adequate technology to support project, client acceptance, monitoring and feedback, communication and troubleshooting. Though the research on project success was in rudimentary form when these success factors were identified by Pinto and Slevin [4], however, these factors echo in the current research as well. The recent research puts emphasis on client satisfaction in addition to traditional success factors such as time, cost and specifications. Similarly, Freeman and Beale [5] identified seven main elements of project success criteria and state that first five have been more frequently mentioned:

- Technical performance
- Efficiency of execution
- Managerial and organizational implications (mainly customer satisfaction)
- Personal growth
- Manufacturability and business performance
- Technical innovation

## 4 Big Data Projects Evaluation Criteria

On the basis of the above brief discussion on project success following variables can be employed as the basis of the evaluation of the project success.

- Alignment to organizational strategic objectives
- A strong business case leading to approval of projects proof of concept on merit
- Project benefits realization
- Completion of project on time, cost and specifications
- Quantifiable objectives based on SMART methodology
- Technical performance of the big data application
- Technical innovation
- Top management support (ownership)
- Employment of project management methodology along with software development life cycle processes
- Continuous interest of top management through governance and political support
- Stability of organizational strategic objectives to ensure continuous support to ongoing projects

### 4.1 Proposed Metrics for Application Specific Big Data Projects

Based on the above discussion, we are encouraged to propose a number of evaluation metrics for big data projects as below:

- The efficiency of the application to achieve its objectives such as change in business processes and effective decision making

- Appropriate technology
- Completion on time, cost and required scope of functions and features
- Effective scope definition and scope change management as Big Data Projects fail 30% more than IT Project, due to poorly defined scope and uncontrolled scope changes
- Effective Risk and quality management against poor decision making and quality
- Organizational learning and changes as a result of big data applications
- Contributing towards the achievement of strategic objectives through benefits realization
- Effective change management of processes as a result of big data application

## 5 Conclusions

Project success is an old and continuous debate in the mainstream project management literature. Initially the success criteria was based on the iron triangles of on time, on cost and as per specifications, but later various other variables such as customer satisfaction, technical performance and quite recently the realization of promised business benefits have been added to the project success criteria. Big data projects, though different from IT applications, suffer from similar challenges, such as poorly defined scope, scope creep, lack of clarity on project objectives leading to failure to provide business value. In addition to the application a suitable project management methodology thus ensuring properly defined scope, effective scope change management, big data projects need to give due attention to benefits realization, which means giving more attention to project outcomes rather than outputs. For this to happen big data projects should be managed through Project Management Office (PMO) so that once the project is complete, it must ensure that promised organizational learning and value are harvested to the optimum levels.

## References

1. Raymond, Y., Simon, P.: Top management support-almost always necessary and sometimes sufficient for success: findings from a fuzzy set analysis. Int. J. Proj. Manage. **31**(7), 943–957 (2013)
2. Atkinson, R.: Project management: cost, time and quality, two best guesses and a phenomenon, its time to accept other success criteria. Int. J. Proj. Manage. **17**(6), 337–342 (1999)
3. Dragon, M., Peerasit, P.: Standardized project management may increase development projects success. Int. J. Proj. Manage. **23**(3), 181–192 (2005)
4. Pinto, J.K., Slevin, D.P.: Critical success factors across the project life cycle: definitions and measurement techniques. Proj. Manage. J. **19**(3), 67–75 (1988)
5. Freeman, M., Beale, P.: Measuring project success. Proj. Manage. J. **23**(1), 8–17 (1992)