

# The Information Technologies Outcome on Total Quality Management as the Most Important Study

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**Abstract** — Both of Total Quality Management (TQM) and Information Technology (IT) have considerably impacted on most organizations and each one has been generally researched. on the other hand, there is little well-founded practical research on the relationship between the two, particularly on the way in which TQM is influenced by IT. There is little doubt that applications of IT influence all parts and functions of a company, therefore, it is argued that IT also must affect Total Quality Management (TQM). This paper propose a study of such relationships through an analysis of industrial companies based in Libya. The data will be got will show that the most concentrated users of IT identify a bigger impact on their TQM scope.

**Keywords**—Industrial companies; Information Technology; Organizations; Practical research

## I. INTRODUCTION

It is continually said that IT is a very essential part in increasing productivity and reducing costs [1, 2, 3, 4, 5], even if some studies explain opposing results [6, 7, 8]. facts of positive and important income from investment of IT can be established in Brynjolfsson and Hitt [9], Dewan and Min [10] and Kelley [11] at the same time as Loveman [12], Powell and Dent-Micalef [13] and Strassmann [14] found that IT had no important outcome on efficiency or competitive improvement. Dewan and Kraemer [15] found that IT investments have a positive and important outcome on GDP productivity in developed countries but not in developing ones, by using country-level data.

Companies and service sources looking for incessant developments in business performance apply different resources to improve quality, reduce costs and increase output. These consist of Total Quality Management (TQM), Total Productive Maintenance (TPM), Business Process Reengineering (BPR), Manufacturing Resources Planning (MRP), Just-in-Time (JIT), etc. Weston [5] says that each and every one of these interventions depend on IT, in view of the fact that they perform as a feedback method to users who are ardent to determine output and, additionally, they as well give

out as the resources to search out fast and more precise information, improve communication relations, and make possible the achievement of superior tools, systems and modeling techniques. In this paper the method in which TQM is controlled by IT and the character of IT in TQM interventions will be scrutinized.

It is essential to describe what is meant by the term TQM before considering the influence of IT on TQM. In this study, to identify the key of TQM dimensions; the TQM dimensions identified by Ahire et al. [16], Flynn et al. [17] and Saraph et al. [18] will be used (see Table 1). for that reason, eight keys TQM dimensions will be identified: they are top management support, workforce management, employees attitudes and behavior, customer relationship, supplier relationship, product design process and process flow management. Figure 1 show a concise explanation about each TQM dimension.

In current years, concentration to quality issues and helped to clarify the meaning and the key elements of quality management [21, 22] has been got by quality award programs, for examples the European Quality Award [19] and the Malcolm Baldrige Award (MBNQA) [20]. The key elements included in this paper's TQM definition with the building blocks of the EFQM and MBNQA frameworks (see Table 1), that can be concluded, as a complete, the TQM explanation will be used in this study will be compared with EFQM and MBNQA frameworks.

a lot has been written regarding how IT can be used to improve TQM, such as: Ayers [23], Zadrozny and Ferrazzi [24], Berkley and Gupta [25] and Cortada [26]. Sobkowiak and LeBleu [27] and Pearson and Hagmann [28] give emphasis to the key roles that information and IT take part in TQM. Exact IT applications in different feature of TQM have been explained by: Miller [29], Aiken et al. [30], Goodman and Darr [31], Khalil [32], Kaplan [33], Kock and McQueen [34] and Counsell [35].

A number of studies have thought-about however it's associated with structure performance

measures.. For instance Byrd and Marshall [36] used causative model analysis to communicate IT investment to organizational performance whilst Rogers et al. [37] examined the link between employment of IT and company performance within the warehouse trade. Although Rogers et al. [37] presented experiential proof of the significance of IT in quality performance, the position of IT in TQM environments was not examined. Torkezadeh and Doll [38] developed and applied a construct to determine the supposed impact of IT on work (i.e. only one of the eight TQM dimensions).

The main thought given to how IT impacts TQM is the reference display created by Forza [39] to connect TQM rehearses, data frameworks and quality execution through exact research. In any case, utilizing his own model and related measures, Forza [40] did not prevail in observationally building up a connection between TQM practices and IT and just the utilization of IT in the quality confirmation part of TQM was investigated. Forza [40] recommended that the commitment of IT ought to be additionally researched by creating satisfactory measures particularly with reference to its utilization. All the more as of late, Dewhurst et al. [41], have recommended that IT bolster TQM by enhancing costumer and provider relationship, expanding process control, encouraging cooperation, encouraging entomb departmental data stream, enhancing configuration process and aptitudes and applying preventive support.

To build up an estimation develop it is important to express the theories to be tried and this requires a hidden hypothetical system. The structure appeared in Figure 2 was created by the creators after a contextual analysis investigation on fourteen organizations [41].

## II. METHODOLOGY

A postal survey will be used based on a preceding many case study. The people included manufacturing companies with factories placed in Libya. Manufacturing companies will be chosen for the reason that the troubles faced in the management of quality by service companies are dissimilar [44, 45]. The aim respondents of the questionnaire will be quality managers. At what time the name of the quality manager will be unidentified, the questionnaire will be addressed to quality leader and the first question will be asked for the location of the respondent in the company.

The questionnaire answer rate will be determined for a number of companies, and this will be comparable to those of Operations Management researches by Frohlich and Dixon [46], Mehra and Inman [47], Small and Yasin [48] and Vickery et al. [49].

The common of the questionnaires will be answered by quality managers whilst extra major respondents will be quality department representatives and stand directors. Additionally, respondents will be asked to show if they are using TQM or not. Using the scores from this sub-sample of companies, a set of analyses of variance will be performed on all objects including TQM, IT impact on TQM, quality significance to contend and prepared and quality performance to charge the impact of the respondent's place in the company on the

answers. The results will be showed that respondent's observations between various groups.

Orlikowski and Gash [50] defined IT as "any form of computer-based information system, including mainframe as well as microcomputer applications". Based on previous literature reviews [51, 52, 53, 54, 55], information technologies were in that case categorized into six large classes concerning to their reason of use: administrative IT, communications-related IT, decision support IT, production planning IT, product design IT, and production control IT. For example, the administrative IT (ITADMN) build relates to IT used to aid the more administrative and authoritative errands, for example, report association, information association and capacity, information examination, and so forth. This develop incorporates IT applications, for example, invoicing frameworks, stock control frameworks, finance frameworks, databases and cost bookkeeping frameworks. The communication related IT develop (ITCOMM) alludes to IT that is straightforwardly identified with the transmission of data. This build incorporates the accompanying IT applications: promoting by an organization site page, coordinate deals by an organization website page, electronic data exchange (EDI), Intranet, and intercompany systems and gathering working with electronic data trade.

The TQM accomplishment construct will be measured using a seven-item scale. Moreover, eight constructs will be developed to measure the impact of IT on TQM. Every last one of these develops identifies with the effect of IT on every single one of the eight TQM measurements appeared in Figure 1: they are: effect of IT on top administration bolster, effect of IT on workforce administration, effect of IT on representatives demeanors and conduct, effect of IT on client relationship, effect of IT on provider relationship, effect of IT on item configuration process, effect of IT on process stream administration and effect of IT on quality information and announcing.

Four indicators of company performance will be used:

- *Operational* - different aspects of operational efficiency will be subjectively measured by the respondents in relation to their industry.
- *Quality* - different aspects of quality will be subjectively measured by the respondents in relation to their competitors.
- *Profitability on sales turnover (PST)* - obtained from the Fomento de la Producción database.
- *Profitability per employee (PE)* - obtained from the Fomento de la Producción database.

Every one of the things estimating TQM, IT, IT affect on TQM, readied and quality execution develops will be estimated on a 1 to 5 scale where a score of 1 "no utilization by any means" and 5 spoke to "serious utilize". The scores in each develop will be arrived at the midpoint of to get a composite measure for the build. Dependability for the all the examination's builds will be estimated utilizing the inner

consistency technique, as portrayed by Bohrnstedt [57]. Normally, unwavering quality coefficients will be considered

## Results

The results will explain that company dimension is related with IT implementation that called company characteristics and IT implementation. The use of IT for administrative work can be considered as less complex and more common. The results will confirm that the size of IT completion depends on company size and the reason can be found in the fact that bigger companies have more qualified workers, which are necessary for the successful application of IT.

What's more, this study will clarify that company dimension is related with company characteristics and TQM implementation, IT and TQM implementation, IT and IT impact on TQM, TQM and company performance, IT and company performance and IT impact on TQM and company performance.

All the scales measuring IT impact on TQM will be examined and significantly correlated with quality and operational performance.

## Conclusions

Information technology (IT) is escalating in significance for companies and its property on universal trading are becoming generally felt. There is tiny uncertainty that applications of IT influence all parts and functions of a company, for that reason, it is disagreed that IT in addition must influence Total Quality Management (TQM). This paper examines the relationship between Information Technologies (IT) and Total Quality Management such relationships through an analysis of industrial companies based in Libya.. The inspection will be made in opposition to a number of dimensions of TQM including customer and supplier relationships, workforce management, process flow management and quality data and reporting. Furthermore, the point will be made that the impact of IT on the TQM involvement depends on the category of IT application in terms of its use as a representative to the work development or as an enabling mechanism. The impact of IT on process design and control and what quality professionals need to do to confirm quality will also be argued and suggestions made

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