Abstract

In any organization, information is a key resource, not only for decision making, but also for in-depth knowledge of the status and outcome of processes, which allows for continuous improvement actions that promote excellence. Therefore, for higher education institutions, well-defined methods for efficient information management are relevant for maintaining the quality standards demanded by the increasingly competitive educational market. Based on this idea, the purpose of this document is to explore, from literature and teaching experience, the aspects related to information management and continuous improvement, especially in the universities of the Colombian Caribbean. To this end, a qualitative approach was used, applying a document review technique in academic databases of recent years, both in Spanish and English. It is concluded, after the presentation of the theoretical bases of the analyzed topic, that the management of the information implies coordinated actions in the institution for a correct implementation and use, that facilitates the processes of continuous improvement in function of the strategic objectives and the achievement of the excellence.
Keywords: quality, higher education, information management, technologies, competitiveness

1 Introduction

Data generated from the organization's own operations and procedures can be transformed through methods and techniques to generate information relevant to decision making. The advance of information and communication technologies (ICT) has allowed information systems to be more useful and agile in terms of ease of data processing. However, the coordination and purpose of information is a key element that must be aligned with the objectives, goals and strategic needs of each institution, in order to respond to the stakeholders that are integrated for specific purposes [1].

In this sense, processes become an important source of data and information for the organization and continuous improvement transforms them into a mechanism for achieving operational excellence [2]. This synergy between data, information and continuous improvement requires mechanisms for efficient administration to enable the achievement of strategic objectives and a more efficient and effective decision-making process [3]; therefore, this document explores information management as a factor for improvement and growth in higher education institutions in the Caribbean region and in the country in general. For the proposed purposes, it approaches the management of information, its advantages, components and general conceptualizations, as well as the role of ICT and the processes of continuous improvement in organizations with the aim of establishing a frame of reference that facilitates the determination of the relevance of the topic in the current context of global education.

2 Information and continuous improvement in organizations

Information as a fundamental input for decision-making in organizations has gained relevance in the universal context [3], where the data generated in the field of ICTs comes from different sources and formats, with the consequence that its collection, processing and analysis requires systems and structures specifically designed to take advantage of all the advantages that its exploitation represents [4]. For this reason, data by themselves do not add value to the organization, methods, techniques and tools are needed to convert them into useful information [2] and, in turn, to transform them into knowledge for effective decision-making, not only by senior management, but also by all personnel belonging to the different organizational levels [3]. In this sense, the management of information in knowledge-based organizations represents a key factor that makes it possible to advance towards the implementation of continuous improvement, understanding that this is nourished mainly by the feedback of the processes established in the institution [5].
In general terms, it is possible to say that information management is a process in which the aim is to organize, analyze, evaluate and present data under a specific context, monitoring that it complies with the characteristics and parameters of quality, truthfulness, timeliness and timeliness [4]. In addition, the objective of exploiting knowledge through information processing is to foster and open new possibilities for the organization to take advantage of opportunities, adapt to changes in the environment, overcome weaknesses and strengthen its strengths [5]. Based on this consideration, it is possible to identify that, because of its importance and relevance, its applicability can be broad and independent of the sector, including education [2]. The education system has been undergoing important structural changes in recent years, driven mainly by the evolution of ICT and the ease with which they offer to design innovative teaching platforms [1]. In addition, the transformation of the dynamics and interactions between the main actors in the education process, students, teachers and administrative staff, among others, has been generating, in addition to a large amount of information, different points of direct contact that allow data to be obtained from different sources with high potential to be used [4].

This data from both administrative and academic processes, whether from structured or unstructured sources [3], requires a precise methodology that fosters the growth and development of the institution; on the other hand, the incorporation of information systems and the use of ICT significantly enhances knowledge in terms of extraction, distribution and socialization [5]. In this regard, organizations seeking to implement information management systems should first consider their strategic objectives, organizational culture, the capacity to undertake investments in the development of technological infrastructure and, secondly, the willingness and commitment to adopt information management methods based on their strategic needs.

2.1 Essential components for information management

Generically, information management in organizations involves a series of interconnected sub-processes to extract valuable knowledge [4]; first of all, it must be determined based on institutional objectives, relevant and key information, which is required to identify the sources from which data will be collected and analyzed, specifically at this point multiple methods and techniques are used that serve this purpose, and then extracted, recorded and processed with the aim of disseminating it in information systems to support decision-making [6]. In other words, information management consists of using and exploiting the organization's data generation sources [5] to transform them into relevant information for decision making and thus create mechanisms to adapt to changes in the environment [7]. Figure 1 details the elements involved in information management that can be applied to higher education institutions.
As shown in the figure, information management is based on a formulation based on the needs of the organization, guided by its strategic objectives, as referred to by Wilkin and Cerpa [8], who point out the importance of planning information systems to achieve significant performance [7]. On the other hand, there are elements related to data analysis techniques, including data mining and traditional statistical methods [9], so that later the user, in this case the decision-maker, has useful and quality information.

Another important element that intervenes in the process is document management, which has been transformed in recent years as a result of the evolution of ICT, providing new mechanisms for information capture and storage [10] and can be understood as the set of operations and techniques that allow the coordination and control of activities related to the creation, reception, location, access and storage of documents for their preservation over time [11].

The fundamental purpose of information management is decision-making, understanding this process as an optimal choice of a set of alternatives and depending on the objectives to be pursued [12]. According to Mishra, Kendhe and Bhalerao [13], the benefits of implementing information management systems in universities include those listed in Table 1.

### Table 1. Advantages of information management systems

<table>
<thead>
<tr>
<th>Item</th>
<th>Reference</th>
<th>Advantage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Relationships</td>
<td>Improves the coordination and therefore the relationships between the different departments of the organization</td>
</tr>
<tr>
<td>2</td>
<td>Documentation</td>
<td>By assigning codes to documents, information can be quickly retrieved and retrieved</td>
</tr>
<tr>
<td>3</td>
<td>Efficiency</td>
<td>Fewer resources are invested in information management, which generates profitability</td>
</tr>
<tr>
<td>4</td>
<td>Continuous improvement</td>
<td>Facilitates the monitoring and control of all processes</td>
</tr>
<tr>
<td>5</td>
<td>Quality</td>
<td>It generates a confidence scenario for the parties of interest which improves the perception of the users</td>
</tr>
</tbody>
</table>
Currently, there are various methodologies, procedures and tools available to manage information efficiently, effectively and efficiently [14]. Among these are emerging techniques such as Data Mining in Education, which allows relevant information to be obtained from data generated in the educational environment in order to improve teaching and learning processes, making the educational experience more personalized and complete for the student [15].

### 2.2 Continuous improvement

In every organization, even more so in those of higher education, the implementation of methods and procedures is required to promote the continuous improvement and innovation of processes as a tool to achieve growth, development and excellence, therefore, it implies having measurement systems that contribute to learning, based on a solid management philosophy and with the active participation of all its human capital [16]. These processes guarantee the quality of the products and services offered to the market, impacting on the perception and expectations that consumers or users have of the value proposition [14]. Therefore, it is important that organizations make an effort to articulate policies aimed at achieving excellence through continuous improvement, based on the guidelines established in strategic planning and other guidelines issued by senior management [3].

The literature sets out a variety of methodologies to stimulate continuous improvement in organizations, from the well-known set of ISO 9000 quality standards developed by the International Organization for Standardization (ISO)[17], through systems such as the Kaizen, which is based on the continuous implementation of small improvements that integrate and empower each of the actors in the process[18], to those based on the so-called Edward Deming cycle[19] whose components are Planning, Verifying, Doing and Acting (PHVA), widely used in the education sector[20]. Overall, the Deming cycle has the flexibility to be applied to information management systems as shown in Figure 2 below.

![Fig. 2: Deming cycle applied to information management systems](image-url)
According to Marín, Bautista y García [21], one of the fundamental pillars of the implementation of actions aimed at continuous improvement is innovation in the management of information and the measurement of indicators that allow us to know the performance of critical processes on a regular basis. In addition, according to the authors, it is necessary to develop information systems so that all members of the organization know the strategic guidelines and key inputs to achieve continuous improvement, all of which generate learning and feedback; in this way, data mining provides very dynamic alternatives. According to recent research, the best sources for extracting information and its applications [15] are those detailed in Table 2.

Table 2. Sources for information extraction at universities

<table>
<thead>
<tr>
<th>Technique</th>
<th>Benefits or Scope</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neuronal Networks</td>
<td>Describe and exploit preferences in data analysis</td>
</tr>
<tr>
<td>Evaluation by Score</td>
<td>Predicting trends and directions</td>
</tr>
<tr>
<td>Decision Rules</td>
<td>Identifying patterns for marketing and similar plans</td>
</tr>
<tr>
<td>Decision Trees</td>
<td>Perform classification of large data and division into segments or clusters</td>
</tr>
</tbody>
</table>

3 Conclusions

The evolution of ICT has created an impact on the management of information in organizations, through multiple technological tools it is possible to manage diverse sources of documents and data. The facilities to manage the high volumes of information generated from different sources, both internal and external to the organization, represent an opportunity to explore new knowledge about the processes and the market being served. Consequently, data becomes the fundamental resource to obtain information through the application of analytical techniques and tools and indicators, therefore, without a correct administration of these elements it is difficult to identify the opportunities for improvement that arise, truncating the possibility of implementing actions that lead to organizational excellence.

The management of the information generated in the organization is part of a more complex process: knowledge management. In this, information is exploited as a mechanism for active and collective learning, so that from this perspective the lessons learned and the knowledge obtained become an element of value for the institution. In the absence of adequate information management, the decision-making process may be ineffective and contravene the strategic objectives and needs of the organization, thus hampering the design of sound policies and guidelines, and methods to ensure information management are essential if excellence is to be achieved.
References


https://doi.org/10.3989/redc.2012.4.869


https://doi.org/10.1002/widm.1075


Received: September 3, 2018; Published: September 22, 2018