

## The Application of Informatics Systems in Restaurants

**Marcin Kurek<sup>1\*</sup>**

<sup>1</sup>*Division of Engineering in Nutrition, Faculty of Human Nutrition and Consumer Sciences, Warsaw University of Life Sciences, Poland.*

### **Author's contribution**

*The sole author designed, analyzed and interpreted and prepared the manuscript.*

### **Article Information**

DOI: 10.9734/BJAST/2016/22564

#### Editor(s):

(1) Hamid El Bilali, Mediterranean Agronomic Institute of Bari (CIHEAM/IAMB), Sustainable Agriculture, Food & Rural Development department, Via Ceglie 9, 70010 Valenzano (Bari), Italy.

#### Reviewers:

(1) Leela Dhar Mangi, Sher-e-Kashmir University of Agricultural Sciences & Technology, India.

(2) Anonymous, University of Macedonia, Greece.

(3) M. Bhanu Sridhar, GVP College of Engineering for Women, India.

(4) Preeya Puangsomlee Wangsomnuk, Khon Kaen University, Thailand.

Complete Peer review History: <http://sciencedomain.org/review-history/12485>

**Review Article**

**Received 10<sup>th</sup> October 2015**  
**Accepted 14<sup>th</sup> November 2015**  
**Published 30<sup>th</sup> November 2015**

### **ABSTRACT**

Informatics systems help in the running of organizations such as restaurants. There are several informatics systems that business organizations can use to improve the efficiency and effectiveness of their operations. The informatics system include transaction processing systems, management information systems, decision support systems, executive support systems, and customer relationship management systems. These systems play different roles in restaurants; however, they all help to ensure that the decisions adopted by the management are those that benefit the business. In addition, they help to ensure that the customers of a business are given a high quality of service, to ensure they keep coming back. There are some of the functions that these systems play in restaurant businesses. The article is a review of currently used informatics systems in restaurant. The content of this paper will help to systemize the contemporary knowledge about these systems.

*Keywords: Informatics; systems; restaurants.*

\*Corresponding author: E-mail: [marcin\\_kurek@sggw.pl](mailto:marcin_kurek@sggw.pl)

## 1. INTRODUCTION

It is clear that business organizations, such as restaurants, deal with huge amounts of data. Data refers to facts or values that are usually organized in a database by the organizations to come up with future business strategies. When data is arranged and organized in a suitable matter, it results in information that can then be used to determine the direction of a business. An informatics system refers to the software that can help in the organization and analysis of such data. In particular, the main purpose of an informatics system is to convert raw data into information that can be used to make decisions. There are two types of information systems: general purpose and specialized information systems. An example of a general purpose information system is the Database Management System (DBMS). This system is a combination of data and software that allows for the organization and analysis of data. However, DBMS software is not designed to be used within a specific organization or to perform an analysis of a specific type. Another example of a general purpose information system is the electronic spreadsheet. It is usually used to carry out basic data analysis using formulas that help to identify relationships and trends in the data. On the other hand, specialized information systems are designed to perform specific functions or tasks within an organization. Examples of specialized

information systems include: Enterprise Resource Planning (ERP), Geographic Information Systems (GIS), and Expert Systems, among others. ERP helps in the management of both internal and external information in an organization. GIS is information system that is usually used in the management and analysis of geographical data of all types. Expert Systems help in solving complex problems by imitating the way an expert would reason. Therefore, all these informatics systems have a crucial role to play in business organizations like restaurants. This paper will analyze the application of informatics systems in restaurants.

## 2. TYPES OF INFORMATICS SYSTEMS IN RESTAURANTS

Informatics systems are very important in the running and management of restaurants. They help to make it possible for restaurants to streamline their operations without any issues. It is vital to ensure that they can effectively manage their operations if they are to survive the competition. Transaction processing systems, management information systems, decision support systems, and executive support systems are some of the informatics systems that can be used by restaurants. These systems help with the management of the restaurants, to make good decisions can be quickly formed to help propel the business forward.

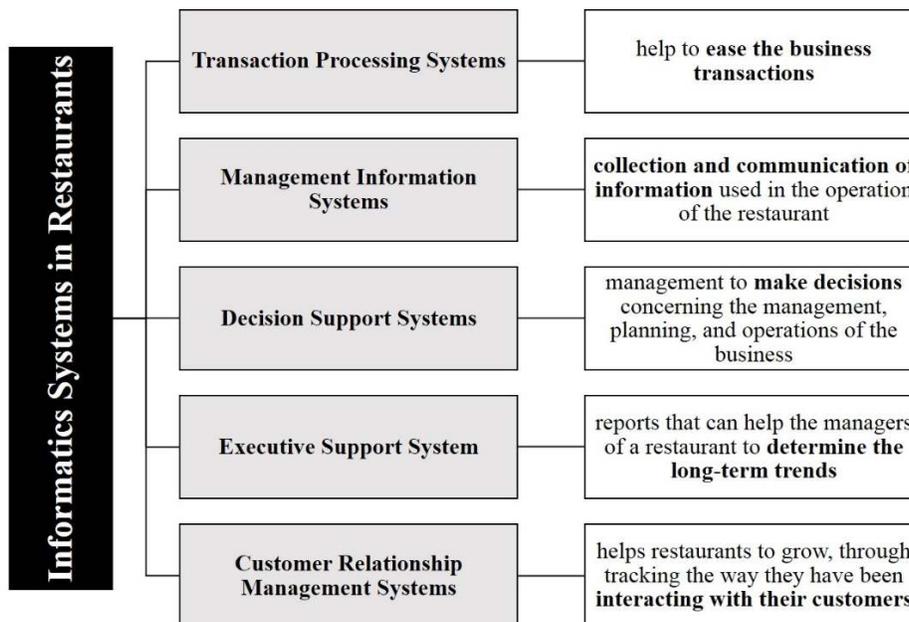


Fig. 1. The main roles of most important informatics systems used in restaurants

## **2.1 Transaction Processing Systems**

Transaction processing systems help to ease the business transactions that take place in a restaurant [1]. Customers visit restaurants and order their meals before paying for them. Each customer orders a meal that he or she likes, and it is here that the transaction processing systems come into play. The payment of the meals is just one of the transactions that take place in a restaurant. A transaction system is usually required to keep track of these processes [2]. A Transaction Processing System captures and processes detailed information needed to update data on fundamental operations of the restaurants [3]. A transaction refers to a single event that takes place in a business organization that then changes something. The different transactions that take place in restaurants include; customer orders, invoices, receipts, and payments, among others [4]. The processing of the transactions taking place in the restaurants includes: the collection, manipulation, storage, and editing of data. The main purpose of processing a transaction is to ensure that the records of the restaurant continue to stay updated. Updating the records on a regular basis helps to ensure that the management has knowledge of the direction that the restaurant is taking. In addition, it is good practice to update the records because it provides a reflection of the new conditions during the last processed transaction. For example, a customer may order pizza and pay for it at the counter with cash. The event will be recorded as a sale transaction, and it will result in other transactions [5]. First, the level of cash available at the counter will go up. Second, the inventory of pizza at the restaurant will go down by one. These transactions are linked because they take place at the same time, and they involve only one item. Linking the two transactions helps to guarantee consistency in the data because they cannot exist on their own. The amount of cash present at the counter cannot increase unless the transaction system makes it happen. The different transaction systems that may be found in a restaurant include: inventory control, payroll, accounts payable, and order entry, among others. The transaction processing systems help to produce valuable inputs into the other systems that are used in restaurants [6]. There will also be increased efficiency and maintenance of records which is an important thing. These are systems such as decision support systems and management information systems. Therefore, transaction processing systems help to

streamline the operations of restaurants when it comes to events that deal with transactions.

## **2.2 Management Information Systems (MIS)**

Management Information Systems refer to systems that use information technology for the collection and communication of information used in the operation of the restaurant [7]. There are several types of MIS that can be used by restaurants, which help in providing an organized approach to the information of the restaurant to allow the management to make tactical, strategic, and operational decisions [8]. The main purpose of the MIS is to design, as well as, implement processes, routines, and procedures that will provide detailed reports in an accurate manner [9]. Modern computerized systems, found in a management information system, gather relevant data within and outside the business. The data that has been obtained undergoes processing and integration before being stored in a centralized database. The management of the restaurants can access the data any time they want, so they are able to decide the strategy to adopt. There are several management information systems that the restaurants can use in a bid to guarantee effectiveness and efficiency in their operations. The restaurants can use a management reporting system to keep track of its finances and operations. In particular, the management reporting will be used to come up with reports that compare past and present financial performance [10]. The system is beneficial because it will allow the restaurants to speedily retrieve information regarding its ongoing financial performance, which is always of paramount importance for any business. Furthermore, the management of the restaurants will be able to determine whether its operations are efficient depending on whether they achieve their goals or not. Additionally, the sales and marketing system is an important management information system that the restaurants can use. Specifically, it will assist the management to execute and track the effectiveness of the functions that are related to sales and marketing [11]. The sales and marketing system will help the management to know which food items to introduce in the menu. Furthermore, the system will allow the sales and marketing team to make a forecast of the sales. The team will use the data in the system to ascertain whether the sales of a particular food item will rise or fall [12]. Additionally, the team will be able to compile and

track the advertising schedules and outlets to determine if they are effective or not. The team will also find it easy to monitor the distribution channels, as well as pricing, promotions, and discounts [13]. Last but not least, the sales and marketing team of the restaurants will be able to implement effective sales and advertising promotions. Therefore, management information systems will help the restaurants collect relevant data that will help them position themselves well in the market.

### **2.3 Decision Support System**

The other informatics system that restaurants can use is the Decision Support System (DSS). A DSS is an application is a computer-based system that helps in the collection, organization, and analysis of business data [14]. The system helps the management to make decisions concerning the management, planning, and operations of the business [15]. A DSS system that is well designed is vital in aiding the decision-makers of the restaurants to compile data from various sources [16]. These sources include: documents, raw data, personal knowledge from executives, business models, management, and employees. The system will help the restaurants to identify, as well as solve problems in addition to making decisions [17]. DSS is also defined as an interactive computer-based system, which the restaurants can use to solve unstructured, semi-structured or ill-structured problems. These problems would have been much more difficult for the management to solve if they did not have the DSS. The decision support system helps the leaders of the restaurants carry out their analysis without doing much programming [18]. There are several uses of the DSS within the restaurants such as retrieving, searching, and analyzing data that is relevant to the decision-making process [19]. In particular, the system will allow management to summarize the main points that will then determine the kind of decision they will take. The users of the system may search for correlations that exist between data without having to rewrite the underlying software or MIS application. Another valuable use of DSS to the restaurants is that it allows for the use of graphs; making it an important tool for the executives. The executives are thus able to analyze trends and report on the way that the business is doing in the market. Additionally, the managers are able to map-out conjoint analysis, and answer any relevant questions related to the running or operations of the restaurant. Consequently, the

system helps to support the strategic and tactical decisions that the managers will employ. Sometimes, the managers of the restaurants may fail to make decisions because they seem difficult. They may go ahead and request more information without trying to comprehend t that which is already at their disposal. These managers tend to believe that additional information will guide them in the decision-making process. However, if they fail to understand the information at their disposal, it will stop them coming up with new ideas. Once they come up with their ideas, they will be able to know how to make the decisions that at first looked difficult to them. Therefore, the decision support system helps the managers of the restaurants to make often vital decisions.

### **2.4 Executive Support System**

The Executive Support System (ESS) contains reports that can help the managers of a restaurant to determine the long-term trends [20]. It serves a purpose that is close to that of the decision support system. The determination of the long-term trends helps to support non-routine decision-making, as well as strategic planning [21]. The users of the system will be required to click any icon that appears on the screen of the system then enter the report criteria. They will be able to see the individual predefined graphs and reports that are based on the data of the organization [22]. The sources of the data include: scheduling, cost accounting, and sales, among others. The reports from the ESS will help the managers have a better understanding of the important issues affecting the restaurants [23]. These are issues such as buyer preferences and market trends. Furthermore, the system provides tools that the managers can use to calculate statistics, predict outcomes, and assess performance on the basis of existing data. The main difference that exists between ESS and DSS is that ESS focuses on the end-user requirements of user-friendliness and maximum interactivity [24]. In particular, it is an interactive, fully-customized, and friendly system that helps policymakers to get updated assessment on key questions [25]. The ESS emphasizes on the executive and interactive assessment tools, especially those that the end-users can use without any help. The only thing that the management will need is the experts who will help to filter the knowledge and information into meaningful tools and indicators. Besides, the ESS design and implementation tends to integrate its future users. It is because it is a

reality that the system will help to better their working processes. When the working processes of the users are improved, the restaurants are likely to benefit by posting impressive financial performances. One thing that restaurants need to understand is that the ESS cannot induce organizational changes, unless they are desired from the beginning. The ESS model needs to be interactive, and its results should be linked to indicators that are relevant to the policy. Purpose and goals must be added to knowledge so as to come up with policy actions. Furthermore, ESS helps the employees of the restaurants to have quick access to relevant data that is important to the operations of the restaurant [26]. The management also benefits from the system because they can quickly access the data before reaching their decision. Therefore, ESS is one of the systems that are used in restaurants.

## **2.5 Customer Relationship Management Systems (CRM)**

The CRM system is crucial in ensuring that the restaurants are successful. The customers are the ones who decide whether to visit a particular restaurant or not. If they are not well managed, the customers may decide to shift to another restaurant where they feel appreciated [27]. Tracking the customers will help the restaurants know the areas that they need to improve [28]. The CRM system helps restaurants to grow, through tracking the way they have been interacting with their customers [29]. The calls made, meetings held, emails sent or the presentation delivered need to be tracked to determine whether the customers were convinced or not. Restaurants need their customer relationship data to be automatically updated if they are to run smoothly [30]. The employees have to be able to access the data instantly, so as to know the right actions to take. The CRM system provides a platform for every restaurant to store every customer contact, every service request, and every lead, among other things [31]. It also allows the restaurants to maintain a personal relationship with their customers hence; assisting in building trust between the two [32]. Once the customers and the restaurants build trust between each other, then it makes it easy for them to do business. The marketers of the respective restaurants can use the CRM system to understand the market better making sales forecasting to be simple and accurate [33,34]. They will be able to have a clear path, beginning from inquiry, to sale; allowing them to make good and accurate

decisions. A restaurant that has an active sales team is likely to generate a flood of data. The sales people will interact with the customers and come up with valuable information [34]. However, it becomes tricky when this information is stored in laptops, handwritten notes or the heads of the salespeople. The details might get lost and affect the operations of the restaurants. The meetings that had taken place may not be followed up on, and the restaurants might prioritize the customers through guesswork, rather than facts. Furthermore, the problem may be compounded when an important salesperson moves to another company. The CRM system helps to eradicate these problems by storing important data that relate to the management of the customers of the restaurants.

## **3. CONCLUSION**

It is clear that informatics systems play a crucial role in the running and management of restaurants and other businesses. There are two types of information systems: general purpose and specialized information systems. Transaction processing systems, management information systems, decision support systems, and executive support systems are some of the informatics systems that can be used by restaurants. The transaction processing systems help to combine all the transactions that take place in the restaurant. It makes it easy for the restaurants to manage their transactions and monitor their performance levels. The management information systems are vital for the collection and communication of relevant information in the restaurants. It will help to ensure that the management can come up with strategic decisions that will help propel the business forward in the future. Therefore, management information systems will help the restaurants collect relevant data that will help them position themselves well in the market. The ESS and DSS play quite similar roles because they help the managers make decisions concerning the running of the restaurants. However, the difference is that the ESS puts much emphasis on the end-user requirements. Finally, the CRM system helps the restaurants to stay in close contact with their customers. It helps to ensure that the issues raised by the customers are addressed quickly and efficiently, at all times.

## **COMPETING INTERESTS**

Author has declared that no competing interests exist.

## REFERENCES

1. Ochodek M, Alchimowicz B, Jurkiewicz J, Nawrocki J. Improving the reliability of transaction identification in use cases. *Information & Software Technology*. 2011; 53(8):885-897.
2. Okamura H, Dohi T. Dynamic software rejuvenation policies in a transaction-based system under Markovian arrival processes. *Performance Evaluation*. 2013; 70(3):197-211.
3. Shang P, Serish S, Wang J. TRAIID: Exploiting temporal redundancy and spatial redundancy to boost transaction processing systems performance. *IEEE Transactions on Computers*. 2012;61(4): 517-529.
4. Kim YG, Jaejoo L. A POS system based on the remote client-server model in the small business environment. *Management Research Review*. 2011;34(12):1334-1350.
5. Laker S. Get ready for a paperless process. *Mortgage Strategy*. 2015;1(1):18.
6. Allal-Chérif O, Babai M, Bidan M. Special issue AIM 2012: Information systems and supply chain management. *Supply Chain Forum: International Journal*. 2012;13(3): 2-3.
7. Ogiela L, Ogiela MR. Cognitive systems for intelligent business information management in cognitive economy. *International Journal of Information Management*. 2014;34(6):751-760.
8. Järveläin J. IT incidents and business impacts: Validating a framework for continuity management in information systems. *International Journal of Information Management*. 2013;33(3):583-590.
9. González-Gallego N, Molina-Castilo F, Soto-Acosta P, Varajao J, Trigo A. Using integrated information systems in supply chain. *Enterprise Information Systems*. 2015;9(2):10-232.
10. Williams J. Types of management information systems; 2015. Available:[http://www.ehow.com/about\\_519\\_4585\\_types-management-information-systems.html](http://www.ehow.com/about_519_4585_types-management-information-systems.html)
11. Toyasaki F, Wakolbinger T, Kettinger WJ. The value of information systems for product recovery management. *International Journal of Production Research*. 2013;51(4):1214-1235.
12. Iowa State University. Management information systems; 2015. Available:<http://www.business.iastate.edu/undergraduate/prospective-students/choosing-your-major/management-information-systems/>
13. San José State University. Management information systems; 2015. Available:<http://www.sjsu.edu/isystems/>
14. Heikkilä T. A decision support system to evaluate the business impacts of machine-to machine system. *Benchmarking: An International Journal*. 2015;22(2):201-221.
15. Wang F, Mora M, Raisinghani MS. Web-based decision support for e-Business strategies: A balanced scorecard approach. *International Journal of Information Technology & Decision Making*. 2015;14(3):455-479.
16. Gómez-López MT, Gasca RM, Pérez-Alvarez JM. Decision-making support for the correctness of input data at runtime in business processes. *International Journal of Cooperative Information Systems*. 2014; 23(4):1-29.
17. Kaushik T, Bhardwaj M. Contribution of decision support system in enhancing productivity and profitability of the firm. *Journal of Technology Management for Growing Economies*. 2013;4(2):85-96.
18. Zandbergen P. Decision support systems: How managers analyze internal and external data with DSS; 2015. Available:<http://study.com/academy/lesson/decision-support-systems-analyze-internal-and-external-data-with-dss.html>
19. Tutorials Point. MIS-decision support system; 2015. Available:<http://www.tutorialspoint.com/management-information-system/decision-support-system.htm>
20. Tutorials Point. MIS-executive support system; 2015. Available:<http://www.tutorialspoint.com/management-information-system/executive-support-system.htm>
21. Mcrit. What's an executive support system?; 2015. Available:[http://www.mcrit.com/ASSEMBLING/ASSEMB\\_CENTRAL/WhatESS.htm](http://www.mcrit.com/ASSEMBLING/ASSEMB_CENTRAL/WhatESS.htm)
22. Zandbergen P. Executive information systems (EIS): Upper management decision making tools; 2015. Available:<http://study.com/academy/lesson/executive-information-systems-eis-upper-management-decision-making-tools.html>
23. Skool MBA. Executive support system ESS; 2011.

- Available:<http://www.mbaskool.com/business-concepts/it-and-systems/7251-executive-support-system-ess.html>
24. University of Missouri. Decision support and executive information systems; 2015. Available:<http://www.umsl.edu/~joshik/msis480/chapt10.htm>
25. Singh KJ. What is executive information system? explain its characteristics, capabilities and benefits; 2015. Available:<http://www.mbaofficial.com/mba-courses/information-technology/what-is-executive-information-system-explain-its-characteristics-capabilities-and-benefits/>
26. Barnat R. Executive support systems (ess); 2014. Available:<http://www.strategic-control.24xls.com/en317>
27. Kevany K. Connecting the dots with CRM. NZ Business. 2015;29(6):34-38.
28. Sales Force. What is CRM?; 2015. Available:<http://www.salesforce.com/uk/crm/what-is-crm.jsp>
29. Pearson. Electronic customer relationship management (e-CRM); 2012. Available:[http://wps.pearsoned.co.uk/engage\\_turban\\_elec\\_comm\\_2012/217/55592/14231614.cw/content/index.html](http://wps.pearsoned.co.uk/engage_turban_elec_comm_2012/217/55592/14231614.cw/content/index.html)
30. Hathi N. CRM: An untapped engine for growth. Investment Advisor. 2011;31(8): 44-48.
31. IT Knowledge Portal. Customer relationship management; 2015. Available:<http://www.itinfo.am/eng/customer-relationship-management/>
32. Karazijiene Z, Saboniene A. Customer relationship management systems' prevalence in Lithuanian business. Economics & Management. 2013;18(1): 49-57.
33. Edwards CSS. (Functional integration and systems implementation of customer relationship management in hotel industry: A multilevel analysis. International Journal of Information Technology & Decision Making. 2014;13(1):175-196.
34. Vickers M. Is your CRM system social media friendly? CRM Magazine. 2015; 19(6):7.

© 2016 Kurek; This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

*Peer-review history:*  
*The peer review history for this paper can be accessed here:*  
<http://sciencedomain.org/review-history/12485>