Object Oriented Systems Analysis and Design

A Case Study: System Analysis of 'Simon's Kennels' Business Structure

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Abstract

The report intends to draft a strategy for the development of a structured system to handle the on-call kennel booking process followed by the organization. The report conducts a soft system design to explore, and define the existing set-up prevalent in the organization. The manual system of record keeping and booking is flawed because of several reasons. There are problems related to overbooking, loss of critical booking data and outdated medical records. These factors together create a faulty system which needs an improvisation. A soft systems methodology is adopted to focus on improvements to the problems. The important elements of the problem situation are drawn together. The root definitions are analyzed to understand the primary tasks and structures. Finally, methods are identified for implementing recommendations and strategies (Dearden, 2012). 'Simon's kennel' is a business house which takes care of those pets, whose owners go out-of-station for vacation or other reasons. Currently, pets taken care of are primarily cats and dogs. Clients book the kennels by making phone calls. The staff members of the company receive the calls and record the necessary details from the clients. These details include the address of the clients, the number of pets, the date of booking, the medical record of the pets and dietary requirements. Recently the company has been facing a lot of issues with respect to over-booking. The records are all manual in nature and hence are prone to errors. There is no proper mechanism to update the medical records of the pets and hence it results in complications like allergies and vet dissatisfaction. The organization is in search of a proper system to cater to their business needs, so that operations are smoother in nature.

AMERICAN INTERNATIONAL UNIVERSITY -BANGLADESH

Bachelor of Business Administration

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Assignment Title: Analyzing individual personality types available in Standard Chartered Bank (Gulshan-2Branch) using MBTI and their work relevance.

Assignment Number: 01 **Due Date:** __April, 2014 **Semester:** Spring 12-13

Subject Code: _____ **Subject Name:** Introduction to Behavioral Science **Section:** C

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Systems Analysis

Simon's Kennels – System Analysis

AN OVERVIEW

Contents

Terms of Reference

The report intends to draft a strategy for the development of a structured system to handle the on-call kennel booking process followed by the organization. The report conducts a soft system design to explore, and define the existing set-up prevalent in the organization. The manual system of record keeping and booking is flawed because of several reasons. There are problems related to overbooking, loss of critical booking data and outdated medical records. These factors together create a faulty system which needs an improvisation. A soft systems methodology is adopted to focus on improvements to the problems. The important elements of the problem situation are drawn together. The root definitions are analyzed to understand the primary tasks and structures. Finally, methods are identified for implementing recommendations and strategies (Dearden, 2012).

Commented [A1]: The content of report is nicely brought out

Summary

There are several functions that this report performs to optimize the overall process.

- It identifies the strengths and weaknesses in the existing system
- It creates a preliminary mental model of the underlying processes
- It creates a structured root definition to identify what, how and why things are being done.
- It identifies the actors, external factors and internal factors that impact the system at hand.
- It gathers all the relevant design requirements for the system
- It identifies the useful data and functions that need to be implemented.
- It gives an accurate picture of the exact sequence of steps that need to be followed

Background:

'Simon's kennel' is a business house which takes care of those pets, whose owners go out-of-station for vacation or other reasons. Currently, pets taken care of are primarily cats and dogs. Clients book the kennels by making phone calls. The staff members of the company receive the calls and record the necessary details from the clients. These details include the address of the clients, the number of pets, the date of booking, the medical record of the pets and dietary requirements. Recently the company has been facing a lot of issues with respect to over-booking. The records are all manual in nature and hence are prone to errors. There is no proper mechanism to update the medical records of the pets and hence it results in complications like allergies and vet dissatisfaction. The organization is in search of a proper system to cater to their business needs, so that operations are smoother in nature.

Commented [A2]: Introducing the topic and bringing out the gap areas as the reasons for choice of discussion is a good practice in academic assignmnets.

Method of Investigation

The study of this system involves a five stage investigation

Stage 1: Predict: In this stage, we engage in discussions on the probable processes that we may expect to find out during the actual investigation. This stage will test our pre-notions regarding the industry involved. The industry at-hand is similar to any online booking service. Although the business needs and framework are unique for 'Simon's kennels', yet a background study of related industries would help us to understand the industry trends. A background study would ensure that our predictions are more tuned and accurate.

Stage 2: Plan: In this stage, we plan on the best methods that we can employ, to make sure that we get accurate observations. We also prepare a list of questions that would be used to gather the necessary details. Our aim would be to make the whole process very systematic. Every step should be planned, and probable outcomes should be evaluated. A well prepared plan ensures that the implementation is carried out in a systematic manner, with minimum number of glitches. We make sure that all the necessary stakeholders are kept informed about the whole process of planning. There are certain important guidelines which need to be followed while framing the actual plan. Firstly, the plan should be realistic in nature. Secondly, the actual needs of the projects should be addressed. It is important to make a clear distinction between the 'good-to-have' and 'must-have' features. These precautions would ensure that the plan is relevant and well-formed.

Stage 3: Data collection: This stage involves data collection from different sources. The staff could be involved in group discussions or personal interviews. The staff should be educated regarding the positive outcomes of the research. It is important to extract the tacit knowledge of the workers. It is known that, in any organization, not all the information is available in documented form. Most of the information is in non-documented form, with the employees of the organization. Proper questionnaire would be used to see that all the relevant details are captured. The staff would be encouraged to share their experiences and feedback. It is important to evaluate the inputs obtained from the staff, because that would reflect the actual needs of the organization. They are the most important stakeholders, as far as the proposed system is concerned and so their involvement is of utmost importance.

Commented [A3]: If a point of recommendation is provided, it is backed with suitable reasons for the same

Stage 4: Analysis: This stage would involve a thorough analysis of the data collected, to understand the strengths and weaknesses in the existing system. Data is analyzed to find patterns,

or uncover anything which we missed to notice during our interaction. At this stage, we might also like to go back to the staff involved in the data collection. They are the most important stakeholders, as far as this project is concerned. Thus, it is important to ensure that they are always involved in the analysis. They can be involved to get some necessary insights and confirmations regarding our conclusions. Their feedback can make our analysis better toned.

Stage 5: Reformulate: This is a critical stage, in which we apply our findings and conclusions, to formulate a better design for the existing system. At this stage, we are quite clear about the strengths and weaknesses of the underlying system. We have done a thorough study of the actual business needs and the existing loopholes. The strengths and capabilities have been identified and understood. It is the correct time for implementation and re-engineering. The findings of this stage would form the basis for the further steps that would be adopted.

Commented [A4]: Mentioning the criticality factor at the beginning of the paragraph makes the reader attentive when going through the section

Outline of the existing system

The Figure 1 below illustrates the "Rich-picture" for the existing system. The purpose of constructing a rich-picture is to encapsulate the actual situations, cartoon representation (Stevens, 2014). The picture below shows all the relationships, connections and cause-and-effects. The picture below also shows the basic 'problem themes' that the existing system has:

'Problem theme 1': The problem of mismanagement related to over-booking, unavailable reservations and problems of manual records

'Problem theme 2': The problem of outdated records. The organization fails to have all the necessary updates pertaining to pets.

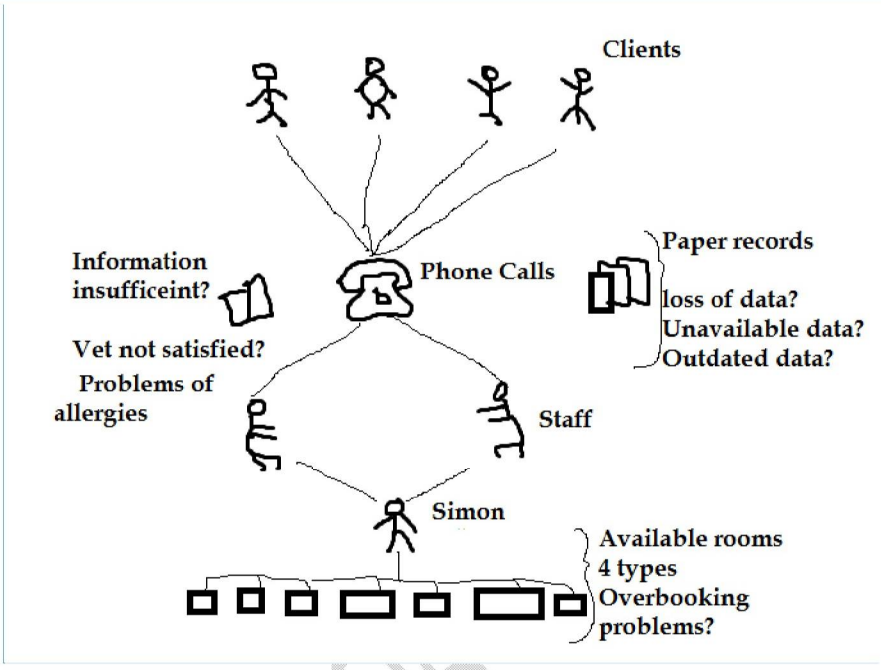

Figure 1: Rich-picture of the existing system

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A structured root definition for the existing system is described below.

The root definition addresses three major aspects of the problem.

1. What is being done?
2. How is it done?
3. Why is it being done?

"Simon's Kennel has an on-call booking system for use by its prospective clients. The clients can book kennels for their pets, either cats or dogs, while they themselves go out on vacation.

Currently the entire system has a lot of flaws because it is paper-based in nature.The purpose of maintaining the records is to keep track of the kennel allotment and availability, and also to update the relevant information about the health and food requirements of the pets."

The CATWOE test is meant to identify the following elements of the system (Nayab, 2013).

C = Customers (The ones who are at the receiving end)

A = Actors (Those who carry out the activities)

T = Transformation (Input to output)

W =Weltanschauung or world view (The consequence of the overall system)

O = Owners (The person who is the owner of the system)

E = Environmental constraints (It includes the ethical, financial or resource limitations)

Basing upon the above parameters, we can redefine the system as:

A System, which is owned by **O,** to do **W** by employing **A,** in the process of **T,** in order to achieve certain objectives for **C** (Nayab, 2013).

" The system under study is owned by Simon, for on-call kennel booking by employing the staff, by means of recording information received via phone call, in order to achieve efficiency in handling of 'pet caretaking services' for the customers."

Commented [A6]: Well explaind, defined and referenced

Requirements

The requirements for the improved system have been illustrated in the Figure 2 below. A Use-Case diagram serves certain important functions in the system design process (silva, 2012).

1. It gathers the design requirements for building the system
2. It gives an outside view of the system (Ryo Kawabata, 2007).
3. It illustrates the external and internal factors which influence the system (Bell, 2003).
4. It identifies the actors involved in the system

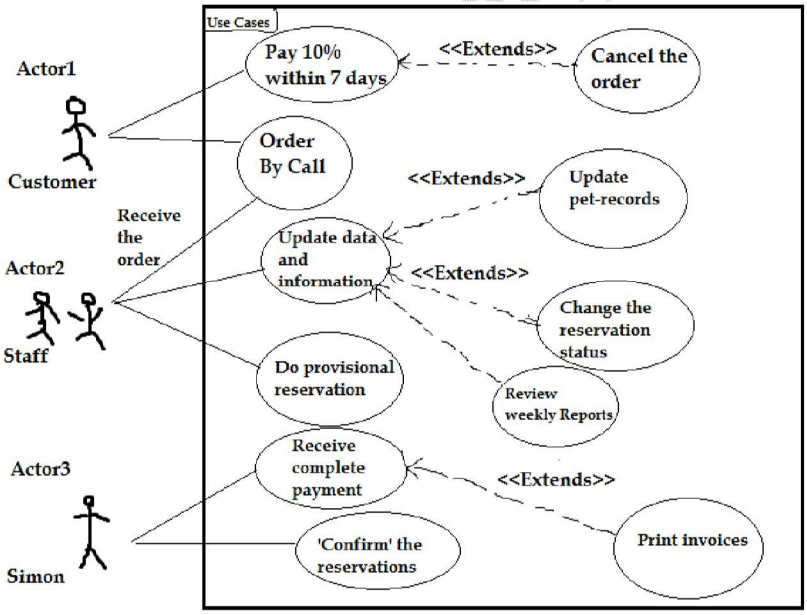

Figure 2: Use-case diagram for the system (silva, 2012)

Overview

- The customer pays 10% of the bill amount within 7 days .This use-case is extended to include the provision to cancel the order up to 7 days before the actual stay date.
- The second use-case describes that the customer can make phone calls to make an 'order'. The staff of 'Simon's kennels' would receive these calls and make the bookings.
- The third use-case describes that the staff receive orders. If the client is a regular customer, they inquire only the recent medical updates. If the client is a new customer, then the staff members take down complete details about the pet, the owner, medical records, dietary needs, and allergies.
- The fourth use-case describes that the staff can update the data and records, as and when required. This use-case is extended to include features to update pet records, change the reservation status and review the weekly reports. These reports would indicate the expected entry and arrivals for the week ahead. It is important to understand that even though the staff can update reservation status, they can never make the status as 'confirmed' because that privilege would be provided only to Simon.
- The fifth use case describes the authority of the staff to make 'provisional reservation'. These reservations will be 'confirmed' by Simon, only after the client deposits10% of the fee amount. Moreover, they need to deposit this amount within seven days of booking.
- The sixth use-case describes the role of Simon to accept the fee payments. This use-case is extended to include authority to print the necessary invoices. These invoices would be

delivered to the client and would also be retained with the organization, for future reference.

- The seventh use-case describes the authority of Simon to confirm the reservation status after receiving 10% of the fee amount from the client, within seven days of booking.

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Options for solutions and recommendations

There can be various kinds of solutions catering to the required needs and simplifying the business process. The solution can be either an industry specific package or a customized solution.

Package versus Bespoke solution

A package is generally based on the generic requirements of the specific industry. A package is easy to install and requires less initial outlay. Besides ease of use, users find it easy to adapt as these packages are available in standardized form (Jenner, 2014). Going for a package based solution might cater to all the common industry needs of the organization. However, a package based solution also has certain demerits. The users might find themselves being dictated. There is always a limitation in the functionalities which can restrict growth and business potential. A purchased product might also face compatibility issues in the future.

In comparison to a package, a bespoke solution is much tailor made to the actual needs of the organization. It better integrates and suits the business objectives of the firm. Besides these advantages, a bespoke solution is also scalable as per company's requirements.

Recommendation

Based on comparative advantages and disadvantages, I would recommend the organization to go for a customized solution. The greatest advantage with such a solution would be that, it would best replicate the business needs of the organization. Although the initial investment would be a bit higher as compared to a package, the company would own all intellectual property rights for its in-house software. This will have its own beneficial effects in the long run because it can be further packaged and sold to similar business houses, to create more revenue streams (Davidson, 2006).

A package would not be a better option because of its rigid nature. Sometimes, it is not feasible for a package to cater to the intrinsic business needs of an organization. Simon's business needs are quite unique and specific, and it would be difficult to find a perfectly compatible package for the needs.

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Class diagram

The Figure 3 below shows the classes and the relationship between them.

As can be seen, there are three classes, namely

- Customer class
- Administrator class

- Staff Class

The customer class is further subdivided into two subclasses named 'new Customer' and 'regular customer'. The new customer comprises of those clients who would avail the services of 'Simon's kennels' for the first time. The staff has to deal differently with these customers. As these clients would not have any existing data in the system, a complete set of all the relevant data pertaining to both the client as well as the pet, would be obtained from them. They will also be asked details regarding the medical history of the pets and their dietary needs. These details would not be required for a regular customer. A regular customer class would store data only regarding any recent medical updates. Both the regular and new customer classes have the 'functions' to confirm the orders, cancel the orders as well as make payments.

The administrator class (Simon himself) would have the built-in functions to confirm the reservations, decide discounts and print invoices.

The staff class which would comprise of the working staff of 'Simon's kennels' would have inbuilt functions to book the orders for the clients, update the reservation status, update the records of pets.

The administrator and staff have a simple 'association' relationship between them. Similarly, both of these classes have a simple association with the 'customer class.' The sub-classes 'new-customer' and 'regular-customer' are inherited from the parent class 'customer'.

Commented [A9]: Segregating the classes and then explaining them individually is a great effort to organize and simply the work done

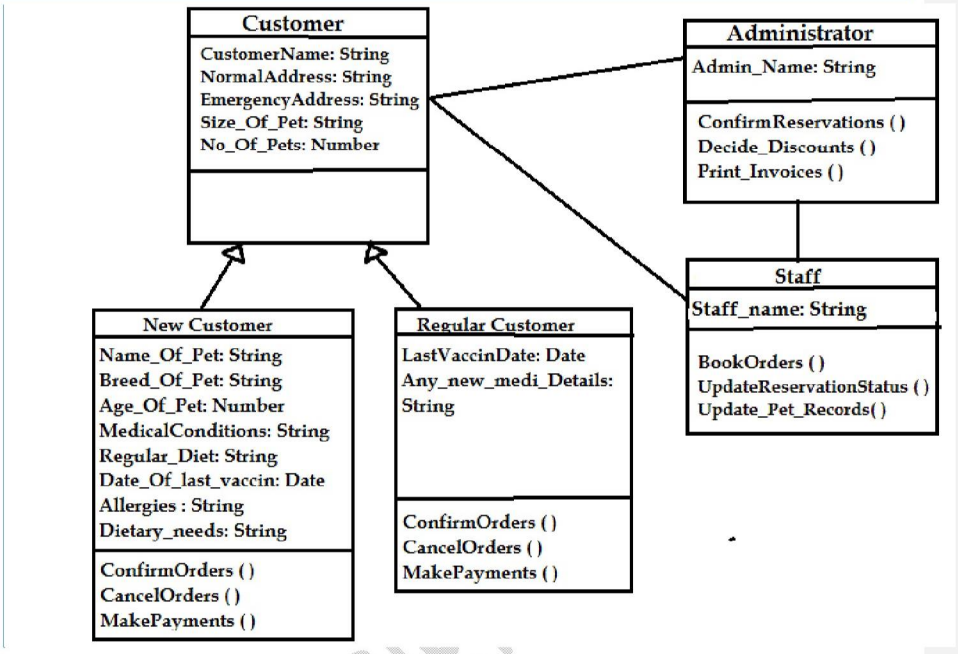

Figure 3: Class Diagram, with the relationships(silva, The Complete Guide to UML Diagram Types with Examples, 2012)

Commented [A10]: Figure needs to always be properly referenced as done

Sequence diagram using UML notation

The Figure 4 below illustrates the sequence diagram for the process 'Create reservation' using the standard UML notations (Bell, UML basics: The sequence diagram, 2004). As described below, the process starts with the customer calling up the 'Simon's kennel' office to

book a kennel. The second stage involves the staff, to ask necessary details from the client. After taking down the necessary details the staff can decide on the type of room and the fee amount. In the next stage, the staff books the room for the client. The reservation status is now 'provisional'.

In the next stage, either the client makes the payment within seven days, or he might choose not to pay.

If the client deposits 10% of the fee, Simon changes reservation status to 'confirmed'. In case the payment is not done, the next stage involves the cancellation of the booking. Thus, the entire process of 'create reservation' is carried out.

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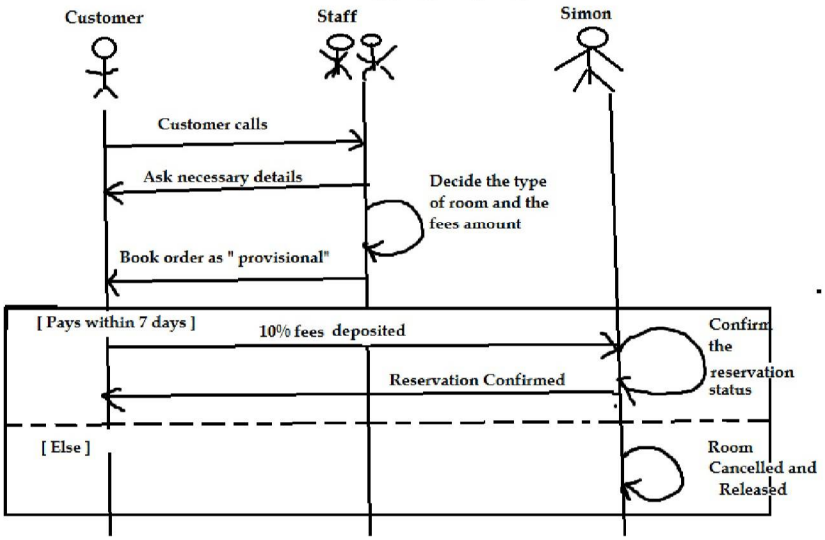

Figure 4: Sequence diagram (Inghelbrecht, 2008)

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Criterion	Levels of achievement		
	Exemplary	Good	Poor
Writing style and presentation are clear			
• Title	Title is concise and informative so readers can anticipate the contents of the contribution and interested people look forward to reading it.	The title gives a general indication of the material covered in the contribution, but have to read the document to fully appreciate what is covered. Some potential readers may be lost because they can't clearly anticipate the material covered by reading the title.	The linkage between the title and the text is not clear. Reader may skip the contribution because they don't appreciate its relevance.
• Introduction	Introductory statement clearly indicates the main purpose of the contribution and suggests the plan of organization, so the reader can anticipate the text that will follow.	Introductory statement indicates the main purpose of the contribution in general terms, so the reader has some idea of what will follow.	The introduction does not give an overview of the contribution so the readers are not sure what to expect as they read the text.
• Main Body	Main body of contribution makes connected points that clearly build the argument so the text flows from introduction to conclusion in a logical manner, thereby helping the reader to follow the thinking behind the text.	The main body presents a number of points that allow the reader to understand the argument, but lapses in the writing may force the reader to make some connections between the parts.	The text is not well structured so the reader must stop reading at times to try to makes sense of the text.
• Conclusion	The main point of the contribution is clearly indicated and reinforced so the reader can clearly remember it.	The main point of the contribution is indicated, but may be stated in an unconvincing manner.	The concluding section does not reinforce or revisit the main point so the reader is unsure about it and likely to misinterpret or forget it.
• Written expression	Sentences and paragraphs are well structured and clear so the reader can focus on what is written. Each paragraph has a topic sentence that indicates the subject matter.	Minor lapses in sentence structure, such as run-on sentences and unnecessarily complex sentence structures, force the reader to pause and reflect on the meaning of the text. Paragraphs present a complete argument, but may not flow so well.	Many sentences are poorly structured so the reader must stop often to reflect on the meaning of the text. Many paragraphs lack topic sentences or have poor flow so the main points and linkages among explanatory text are not clear.
• Grammar, punctuation and spelling	Grammar, spelling and punctuation are flawless, which	Some minor errors in grammar, spelling and/or punctuation detract from the	Many errors in grammar, spelling and/or punctuation make reading

	allows the reader to focus on the message.	quality of the text, but do not impair the communication.	the text difficult and communication is impaired.
Concepts and arguments are well developed			
• Accuracy	All information is accurately reported using appropriate terminology so the information is reliable.	The information is largely accurate but imprecise language could lead a reader to misinterpret aspects of the text.	Although the gist of the information is correct, there are problems with the interpretation of it. A reader can be misled by the text.
• Relevance	Connections between the contribution and the main topic of the discussion are clearly indicated.	Connections between the contribution and the main topic of the discussion are indicated or implied, but the reader needs to pause to clarify those connections.	Although the text is relevant, this is not clearly indicated, so the reader must guess how the text relates to the main topic.
• Significance	The reason why the contribution is important to the overall discussion is clearly described and discussed so the reader takes the contribution seriously.	The reason why the contribution is important is touched on but not elucidated, so the reader must make some interpretations about the author's view of the contribution's significance.	The contribution may include significant material but this is not indicated, so the reader must guess it.
• Clarity	The main points and new technical terms are clearly described and/or explained so the reader is left with no ambiguity about what was written.	Although the text is clear to informed audiences, unexplained points may leave room for alternative interpretations of the text.	Key points and new technical terms are not explained so the reader is confused.
• Independence	The contribution is completely self-contained so the reader does not have to read other contributions or published materials to understand what was written about.	The text is sufficiently clear that the reader can understand the main point without further reading, but some parts of the text are not clear without consulting earlier contributions or other sources of information.	The text is written in a manner that presumes considerable prior knowledge, so the reader must have a thorough knowledge of what has been written about the subject in order to understand the main point of the contribution.
Contribution is responsive to another contribution	The writer links ideas submitted by others to their own contribution in a manner that substantially strengthens the group's efforts to resolve the main problem. This linkage can include elaboration of what was previously written, a critique or questioning of it, demonstration of linkages among	The writer makes references to earlier works that are a starting point for new ideas but, apart from the reference to the earlier work, not much information is incorporated	The text mentions other contributions but neither explains the reference nor substantially adds to it, so there is no clear benefit to the resolution of the main problem from citing the earlier contribution.

	two or more earlier contributions, and/or utilization of an earlier contribution as a foundation to build your own.		
Text is supported by references			
• Sources indicated	All information and ideas that are not commonly know are supported with references to sources, so the reader has confidence that the information is not based on hearsay or the writer's opinion or assumptions alone.	Most sources are indicated, but in only a few cases the sources are not given or are ambiguous, so the reader has to check some of the sources.	Sources are cited for some specific parts of the contribution, but no references are supplied for information and ideas that are clearly not the author's, so the reader has no idea of the validity and authority of the information.
• Relevant references	Information, concepts and opinions are supported with references to published literature, especially primary (original) sources of information, rather than review articles or textbooks. This allows the reader to independently review the cited sources. More than one reference is cited to support key points, which adds strength and authority to the argument.	One or a few references are used to support the text. Thus the contribution is supported but this may be an idiosyncratic source. Some general references to textbooks are made that could have been replaced by primary references which are more thorough and authoritative.	Information comes from Web sites or other sources that have no recognized authority, so the validity or strength of the source is unknown.
• Citation style	References cited appropriately in the text, and the correct format is used in the text when citing information, so the reader clearly knows which information is attributable to which source.	Minor lapses in citation format do not prevent the reader from finding the sources in the reference list at the end of the contribution.	Citation format incorrect or poorly placed in the text, so citations distract from reading.
• Bibliographic information	The reference list contains complete bibliographic information (author's name(s), publication date, title, source, date web page accessed), so a reader can easily find the references for their own research. The authority of sources can be evaluated by checking them.	Bibliographic information largely complete, but some information missing so the reader may have difficulty finding some references. Most sources can still be easily checked.	Not all references are listed, information in the reference list is incorrect, or important information is missing from the reference list, so the reader is unable to find the same sources of information and the authority of sources is almost entirely unknown.

Comments: The work can be considered a little less than perfect. The topic has been well exemplified and the processes nicely explained. Little more efforts put into structuring sentences and proper punctuations would have helped it call a perfect piece of academic assignment.