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INFORMATION TECHNOLOGY IN A GLOBAL SOCIETY
CASE STUDY: THEATRE BOOKING SYSTEM

For use in May and November 2012.

INSTRUCTIONS TO CANDIDATES

- Case study booklet required for higher level paper 3 information technology in a global society examinations.

Foreword

The ITGS case study, *Theatre Booking System*, is the stimulus material for the research investigation required for May and November 2012 higher level paper 3. All of the work related to the case study should reflect the integrated approach explained on pages 15–17 of the ITGS guide.

Candidates should consider *Theatre Booking System* with respect to:
- relevant IT systems in a social context
- both local and global areas of impact
- social and ethical impacts on individuals and societies
- current challenges and solutions
- future developments.

Candidates are expected to use online booking systems to investigate the capabilities of various booking (and other) systems that are available in more than one language, to research real-life situations similar to *Theatre Booking System* and relate their findings to first-hand experiences wherever possible. Information may be collected through a range of activities: secondary and primary research, field trips, guest speakers, personal interviews and e-mail correspondence.

Responses to examination questions **must** reflect the synthesis of knowledge and experiences that the candidates have gained from their investigations. In some instances, additional information may be provided in examination questions to allow candidates to generate new ideas.

Introduction

The Piedmonte canton of Switzerland lies in an area where four official languages (French, German, Romansh and Italian) are spoken. Within the canton there is a capital city and a number of smaller towns. There are also a number of theatres which provide high quality performances, both professional and amateur. Two theatres have realized that there will be benefits of working together to provide an efficient ticket booking system and have begun to investigate how this may be done, creating the Piedmonte Theatre Consortium (PTC).

Interviews were carried out with managers at the two theatres to elicit the problems with the current IT systems.

Cœur Théâtral – Small company

Overview

The Cœur Théâtral (CT) is a small theatre company situated on the outskirts of the capital city. It has a full time manager and an administrative assistant, but most of the work is carried out by a group of amateur theatre enthusiasts who act as producers, directors, actors, set designers, and administrators. It is dedicated to quality productions and only presents five plays per year,
5   from late February to early December. Each play runs for twelve performances over three weeks. When purchasing tickets for a performance, customers are encouraged to become a member of the "Friends of Cœur Théâtral".

Current IT system

- The details of all members are kept on a flat file database. Mail merge letters are sometimes sent from the database which contain special deals, details of special events and other such
10   information. The same database is also used to print mailing labels for those members who have the "Retroscena" newsletter posted to them, and for the tickets and membership cards when they need to be posted. Members receive preference over other customers and they can book early before booking is open to the public.
- The details of all telephone bookings are recorded in a spreadsheet – there is one page for each
15   performance. Each page of the spreadsheet contains a seating plan for a performance with the name of the person and telephone number recorded in each seating location.
- Only payment by credit card is available for telephone bookings. After processing, a receipt is produced and sent with the tickets when posted or collected from the box office. All bookings are recorded for legal and financial purposes.
20 - Cash sales at the door do not get a receipt and are recorded in a special folder. Facilities for credit and debit card sales are not available at the theatre.
- Details of all ticket purchases are sent to the accountant in order to check that the amount deposited in the bank matches the tickets purchased. Credit card purchases are automatically recorded in the bank account and cash sales are deposited separately. At the end of the year
25   an analysis report for the ticket sales is produced – most of the analysis is done manually. The report contains the number of seats sold for each performance divided into categories, *e.g.* member sales, door sales, concession sales, *etc*. The report also contains an analysis based on the various days of the three weeks for each performance. Various percentage occupancy rates are also calculated, however it is very time consuming. Detailed financial analysis of
30   types of tickets, as well as member and cash sales are not available.

The following problems were highlighted
The problems with the current system are:
- Most of the ticket and membership information is manually processed.
- The lack of integration of the various ways of recording and processing the data which is
35   currently performed using a mixture of spreadsheet, database, desktop publishing and word processing software.
- Double-booking issues.
- Payment problems with the processing of credit cards and cash, providing receipts.
- The lack of detailed analysis of the ticket sales and income.

Turn over

Mälzerei Theatergruppe – Large company

Overview

40   The Mälzerei Theatergruppe (MTG) runs a multi-theatre venue in the centre of the capital city, with an all year programme. There are three theatres within the complex, which are used for their own productions and by other professional theatre companies. They have their own customized IT ticketing system accessible through their own web site.

Current IT system

The IT system they have at the moment is old and was developed in-house. There are two
45   sub-systems; an office network connected to the Internet and a stand-alone local network box office system. The office network has its own server and connection to the Internet, but is based on old technology and is starting to develop problems. This system is used for customer relations, finance and analysis, production management, business communications and development of advertising and web site material.

50   The box office network has a separate server that is based on *Microsoft* Small Business Server 2003 and a *Microsoft* SQL database. The separate server is used to keep credit card information and customer details secure. Both servers back-up to the same place but there is no transfer of data between the two systems. Since there is no electronic connection to the office network, all sales and customer data is transferred to the office network using a USB memory stick.

55   The M-ticket web site which was developed for the MTG a few years ago is run on the web site of an Internet service provider (ISP); but the MTG is not happy with the user-interface and the features of the web site. Customers are complaining, since they often go to the web site for information about productions, but find it easier to telephone the box office to make bookings as they can make special requests for seats, get more personal attention and discuss various options. The reporting facility of
60   the web site is adequate but new needs for customer relations, requiring more complex data analysis, are arising.

The following problems were highlighted
The problems with the current system are:
- The MTG does not have an in-house IT department and the two staff members who have been
65   responsible for most of the IT maintenance and development are planning to leave soon.
- The office and box office hardware and software need upgrading and integrating where possible.
- The web site has been in operation for many years but is basically still the same as when it was first developed, providing information but lacking interactivity and multimedia features, especially an interactive seat-selection interface.
70   - The quality of the reports produced needs improving. They take a long time to produce, are poorly presented (often as numbers without any visual representation of the data through the use of graphs), and often do not contain detailed analysis that would be useful for making decisions and assessing past performances. The accuracy of the analysis and financial reports has sometimes been challenged and requires a significant amount of time and effort to fix.
75   - Keeping in contact with customers via e-mail has been a major strength and has developed a strong community support for the MTG. Now the management wants to make use of new technologies such as smartphones, *Twitter*, and social web sites to build even stronger relationships and have multiple means of contacting people and advertising.

Example of a web-based booking system

Turn over
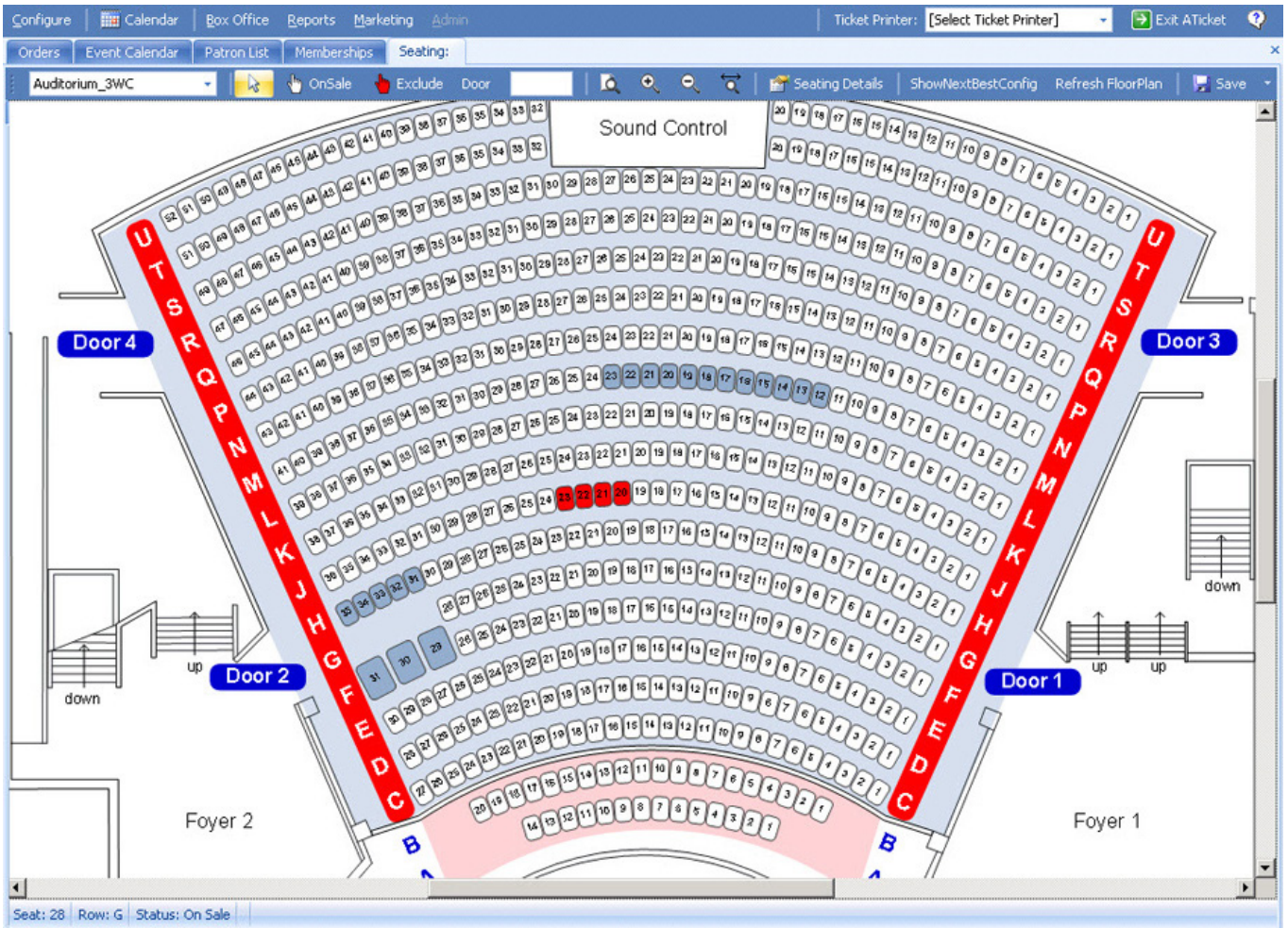
Solution Requirements

Project management issues

80 After a series of discussions, the PTC has accepted that they will need to purchase an IT system from a supplier to resolve many of the problems that currently exist.

They have set the following objectives of the development strategy:
- The web site ticketing system should be a single unified ticketing system for purchasing tickets and seat-selection for the PTC.
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- Tickets can be collected from the box office with suitable identification, or printed by the customer after they are sent as a PDF document in a confirmation e-mail.
- Users must be able to easily input data, obtain information and carry out analyses as required.
- The web site must be intuitive and function in five languages (the four official languages plus English), and be able to include non-Latin alphabet languages later, such as Russian and Arabic.
90
- The IT system must be handed over on 1 March 2014.

As a result of the developments, the PTC hopes to encourage other theatre companies in the canton to join the scheme, creating a comprehensive theatre web site that would hopefully facilitate more ticket sales to tourists and the local population.

However, the theatres have a limited budget and are aware that the solution may require compromises
95 to be made. They need to decide what will be the key features and also plan for future expansion.

The solution will need to include as many of the following features as possible.

Data management issues
Data migration
Data will need to be migrated from the existing systems and integrated into the new data structures
100 in the most time and cost effective manner.

An efficient data management system – performances and customer relations
Each theatre company needs to be able to manage its part of the consortium web site; specifically inputting details of performances and setting prices at least a year in advance for all performances through a content management system (CMS), possibly web-based.

105 Also, details of customers who purchase tickets need to be accessed and used to send them specific information on special deals and newsletters, using a customer relationship management (CRM) system.

Analysis of sales and other data
For the purpose of sales analysis, standard and customized reports need to be easily generated
110 and exported in a variety of formats, for example, sales figures for each play which can be analysed by day, ticket category or performance type. A basic business intelligence package to analyse sales, and to mine the customer and member data, would be desirable.

Web site development and management issues
Ticketing

115   The web site needs to provide interactive seat-selection from a theatre plan so that it avoids double-bookings, and also needs to provide a secure online payment facility. (The online payment system does not need to be researched in-depth.) The payment recording system must be able to handle online bookings, telephone bookings and those made from the booking offices in each theatre.

120   *Language provision*
In Switzerland there are four official languages. It is important that, for any system that is developed, the user will be able to select their preferred language. English will also be included. Information provided by the Swiss government has indicated that there will be a significant increase in tourism from countries such as Russia and Saudi Arabia, so the web site may need to
125   be developed in Russian and Arabic in the future.

    Web site interface
The interface must be user-friendly and intuitive. It needs to be able to easily switch from one language to another, and also be compatible with all browsers, preferably without needing additional software such as plug-ins. This might be problematic, especially for some smartphones
130   and tablet devices, as the inclusion of an interactive seat-selection feature may require the use of client-side software such as browser plug-ins, Java or *Adobe* Flash Player.

    The web site design also needs to give consideration to customers who may not be familiar with using online booking systems, who may not have a credit card, or may want to have the tickets physically sent to them rather than printing them themselves or picking them up at the venue.

Challenges faced

135   The development of a new system must take into account the following issues which may make the proposed solution too expensive or impractical.

Project management issues
    The PTC needs to create a development strategy in order to bring all of the PTC theatres into the new IT system. The solution needs to be delivered on time, within budget and meeting the
140   requirement specification as far as possible. Various methodologies will need to be considered in implementing the strategy, such as focusing on one theatre first and bringing the other online later; compared with bringing both theatres online together. A decision about implementing the system has yet to be reached, and may depend on other considerations.

    Suppliers
145   The theatre companies will need to investigate various suppliers of ticketing systems which could provide an existing system that can be customized, as well as companies that will build a completely new system.

    Due to maintenance and training issues, it is necessary to take all reasonable steps to ensure that the system purchased meets the needs of all the theatres as closely as possible, and within the
150   agreed budget. The PTC sees the correct choice of supplier as a key factor in the success of the development strategy.

Turn over

Data management issues

The new system could be based on one of the two options listed below:
- a distributed database system
155 - a centralized database system, in association with a Virtual Private Network (VPN).

Both choices need to meet the rigorous requirements of modern database systems, such as conforming to ACID (atomicity, consistency, isolation, durability) rules, and they need to manage concurrency of access and processing through record locking, to prevent multiple bookings and other problems.

160 *Data migration*

Both theatre companies have substantial amounts of data saved in various formats in their existing systems that should be copied across to the new system, such as customer and member details and records of previous performances for comparisons. This is potentially a major challenge for the PTC.

165 *Analysis of sales and other data*

The new database system needs to have the capability to produce detailed reports, in text and graphical format, with statistical analysis. This may require the purchase of a business intelligence add-on package for the database system.

Web site development and management issues

170 *Language provision*

The PTC is concerned about the additional costs and expertise required to develop and maintain the web site in five languages. They are aware that certain technical features, such as videos and animations, may be difficult to produce and maintain in multiple languages and that there could potentially be significant variations in quality between the different language versions.

175 *Web site interface*

The new web site must function in a range of browsers without the need to install client-side software; it must also accept and transmit the data inputted by the users and function correctly, whatever security settings the user has selected.

Specific Information Technology items, additional to those in the ITGS Guide, which are associated with the theatre booking system

ACID
Adobe Flash Player
Centralized and distributed databases
Client-side software
Concurrency
Customer relationship management (CRM) system
Plug-ins
Record locking
Smartphone
Tablet device

Any individuals named in this case study are fictitious and any similarities with actual entities are purely coincidental.