WORLDSKILLS SINGAPORE QUALIFYING ROUND TEST PROJECT (TEMASEK POLYTECHNIC)

IT SOFTWARE SOLUTIONS FOR BUSINESS

SESSION 5
WSS2020_QR_TP_S5

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CONTENTS

Session 5 of this Test Project consists of the following additional files:

1. WSS2020_QR_TP_S5.pdf   (Session 5 instructions)
2. WSS2020_QR_TP_S5_MSSQL.sql   (SQL Script to create tables with data for MSSQL)

INTRODUCTION

In this session, you will continue developing the ASEAN Skills 2020 application. Due to the complexity and unique characteristics of hosting this event in Singapore, the WorldSkills Singapore Council has decided to hire you to develop an in-house customized system to support their various business processes during the preparation for the event and the actual event. The designer has provided you with some system documentation so that you can build it according to the client's needs. Take some time to carefully look through what has been provided and what is required. Prepare your own test data to help you to test the application. Document your test data, assumptions and any other key information in a Readme.txt file and save it with the other files that you are submitting.
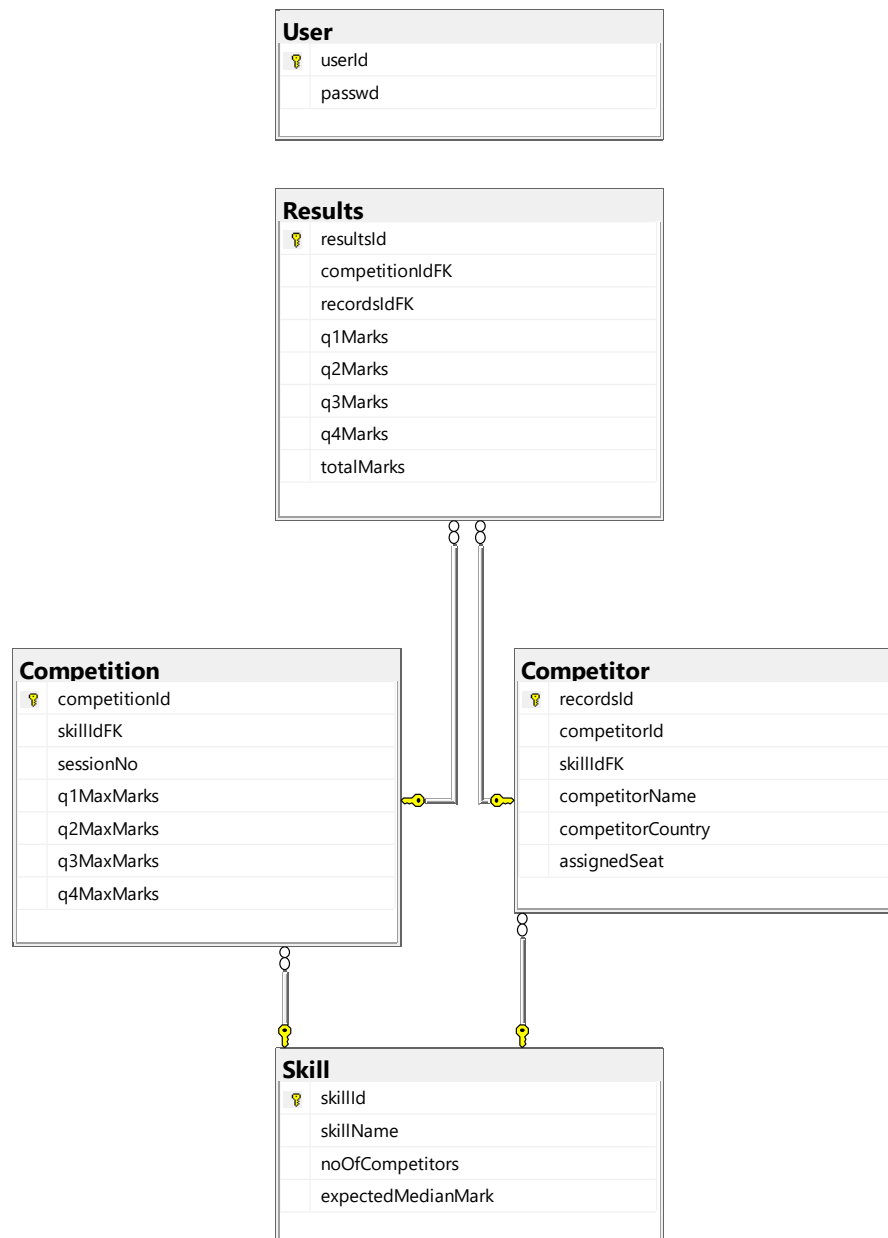
INSTRUCTIONS FOR THE COMPETITOR

In this session, you will be developing a desktop/web application (you decide which is more appropriate to meet the client's needs for this session). While developing this application, please ensure that you confirm to the following basic instructions:

- You should consistently follow the provided style guide throughout the application.
- Time management is critical to the success of any project so by the end of this session, you should submit the deliverables listed in next section so that the ASEAN Skills 2020 application will be finished on time. Any deliverables that are not submitted on time will not be evaluated.
- Make sure that you follow the provided style guide throughout all parts of the system.
- Make sure that you follow the general layout and flow of the screens as outlined in this document and the storyboard.
- Make sure that you provide appropriate validation and error messages throughout all parts of the system.
- Make sure that all relevant buttons/links are working at the end of the session.
- Make sure that you use appropriate naming conventions for all parts of the system as needed.
- Where applicable, include comments in your code so that it is easier for evaluators and the client to understand your code.
- Do note that you are building the entire system progressively so some functions may only be added in subsequent sessions.

WORKING WITH THE DATABASE

Create a database by the name of "Session5". This will be the only database that you use in this session. Save this database in your main project folder. An SQL Script is provided for you. This script consists of the database structure and data required to complete the tasks in this session. As instructed by the designers, the database structure for this session cannot be altered (i.e. no adding or removal of tables, fields in the tables or data types). To help you understand the database structure, the database designers provided an Entity-Relationship Diagram (ERD), which explains the conceptual and representational model of the data used in this database.

User
- userId
- passwd

Results
- resultsId
- competitionIdFK
- recordsIdFK
- q1Marks
- q2Marks
- q3Marks
- q4Marks
- totalMarks

Competition
- competitionId
- skillIdFK
- sessionNo
- q1MaxMarks
- q2MaxMarks
- q3MaxMarks
- q4MaxMarks

Competitor
- recordsId
- competitorId
- skillIdFK
- competitorName
- competitorCountry
- assignedSeat

Skill
- skillId
- skillName
- noOfCompetitors
- expectedMedianMark

DELIVERABLES

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5.1 Create "1. Login"

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Create the screen for login to the application, as outlined in "1. Login" in the wireframe.

This screen can be accessed by all users. Only administrators can successfully login via this screen. Include appropriate error checks and messages for data entry and unsuccessful login attempts. When a user successfully logs in, they will be automatically re-directed to the admin main menu.

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5.2 Create "2. Admin main menu"

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Create the screen for the main menu items for administrators to access, as outlined in "2. Admin main menu" in the wireframe.

This screen is only for use by the administrator to manage the seating and results for the competition.

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5.3 Create "3. Assign seating"

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Create the screen for administrators to assign the seating for competitors at the competition venue, as outlined in "3. Assign seating" in the wireframe.

The user must first choose the skill that they want to focus on, from the drop-down list. The system currently only supports two skills – Software Solutions and Web Tech. Once a skill is chosen, the screen shows the total number of competitors for that skill who have already been assigned seats and the number still without seats. Both values cannot be manually changed but they will be updated accordingly every time the allocation of seats on the screen changes. The layout of the venue is shown on the left of the screen and it is generated dynamically based on the total number of competitors for the skill (i.e. if there are 6 competitors in the skill, then a layout with six seats is generated). The seat numbering runs from left to right and top to bottom, starting with seat number 1 at the top left corner (refer to the wireframe for a sample seating plan for six competitors). Each seat will show the seat number. If a seat is allocated, the seat will also show the competitor ID and the background will change to blue. When the user mouseovers the seat, there will be a box that appears that shows the competitor's name and country. On the right of the screen will be a list of all the competitors (i.e. competitor's name and their country) who have not been assigned to any seats yet. To help the user, the system has an option to randomly assign the seats. Each time that this button is clicked, the system will automatically randomly assign the competitors to a seat. The only constraint is that two competitors from the same country cannot be seated in front or behind one another (e.g. with reference to the wireframe, if the competitor from Malaysia is sitting at seat number 3, then the other competitor from Malaysia cannot sit in seat number 1 or 5. The user may also wish to manually assign seats to a competitor. So, when the user clicks on a seat and clicks on the name of a competitor from the "Unassigned" list and clicks on

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the "Manually Assign" button, the system will check for the same seating constraint stated above. If there is no constraint, then this competitor is assigned to this seat, and the layout is updated accordingly to show who is sitting in that seat and the competitor's name is removed from the "Unassigned" list. If the seat was previously occupied by another competitor, then this competitor's name is added to the "Unassigned" list. Alternatively, the user may want to swap the seats of two competitors. In such cases, they can click on two seats and the "Swap Seats" button to make the swap. Finally, all these seat allocations are only temporary. So, if the user leaves the screen at any point, all these seat allocations are lost. The user needs to click the "Confirm" button to save the seat allocations to the database.

5.4 Create "4. Enter marks"

Create the screen for administrators to award marks to competitors during the competition, as outlined in "4. Enter marks" in the wireframe.

The user must first choose the skill that they want to focus on, from the drop-down list. The system currently only supports two skills – Software Solutions and Web Tech. Once the user selects a skill, the number of available sessions in the drop-down list is updated based on the skill selected (i.e. each skill could have a different number of sessions). Once the user selects a skill, the names of all the competitors in that skill are added to the drop-down list for competitors' names. When the user selects a session, the table is automatically updated to show one row for each question in that session. As shown in the database, each session can have a maximum of four questions. But if the max marks for a question is 0 then that question does not exist (e.g. if for session 2, the max marks for question 1 is 10, question 2 is 20, question 3 is 30 and question 4 is 0, then this means that there are only 3 questions for session 2 so the table should only show questions 1, 2 and 3). For each question, the user can award a grade of Good, Average or Poor only. If the competitor is Good, then they get 100% of the max marks for that question. If the competitor is Average, then they 65% of the marks for that question. If the competitor is Poor, then they get 20% of the marks for that question. All marks should be stored to the nearest one decimal place. The screen also automatically refreshes and shows the total marks that the competitor receives for this session. If the user clicks on the Clear Form button, then only the data keyed into the table is cleared. The data selected for the Skill, Session and Competitor Name are not affected. Finally, the user can click on the Submit button to save these marks to the database.

5.5 Create "5. View results"

Create the screen for administrators to track the results of the competition, as outlined in "5. View results" in the wireframe.

The user must first choose the skill that they want to focus on, from the drop-down list. The system currently only supports two skills – Software Solutions and Web Tech. Once a

skill is chosen, the screen shows the total number of available sessions for this skill, and the number of completed sessions. Both values cannot be manually changed. A session is considered to have been "completed" if all the competitors for the skill have been awarded marks for that session. The table on the left shows all the competitors that are participating in this competition, together with their country and total marks. The table is sorted by the total marks (descending marks) and then name of the competitor. On the right, the tentative winners are shown, based on the current marks. A competitor is represented in this display by their country flag. The country flags are provided. You can change the size of the flags to fix your screen, but they should maintain a 200px by 130px aspect ratio. A competitor qualifies for Gold if they get more than 80% of the total max marks for that skill. If multiple competitors qualify for Gold, then the one with the highest score gets the Gold. If the next highest competitor has the same score or their score is less than or equal to 2 marks below the Gold score, then this competitor gets the Gold too. E.g. Competitor A gets 85%, B gets 83% and C gets 81%. All three qualify for Gold because they are above 80%. A is the highest so he gets Gold. B's score is only 2 marks less than A, so B gets Gold too (i.e. two Gold medallists). C's score is more than 2 marks less than A, so C does not qualify for Gold. After the Gold medal is awarded, the next highest competitor gets the Silver. To qualify for Silver, they need to get more than 75% of the total max marks for that skill. Again, if the next highest competitor has the same score or their score is less than or equal to 2 marks below the Silver score, then this competitor gets the Silver too. Finally, once the Silver medal is awarded, the next highest competitor gets the Bronze. To qualify for Bronze, they need to get more than 71% of the total mark marks for that skill. Again, if the next highest competitor has the same score or their score is less than or equal to 2 marks below the Bronze score, then this competitor gets the Bronze too. There is no limit to the number of competitors who can get Gold, Silver or Bronze. If no competitors meet the criteria stated above, then it's possible that nobody gets the Gold, Silver or Bronze.

5.6 Create "6. Analyze results"

Create the screen for administrators to analyse the results of for a particular skill area, as outlined in "6. Analyze results" in the wireframe.

The user must first choose the skill that they want to focus on, from the drop-down list. The system currently only supports two skills – Software Solutions and Web Tech. The best performing country is the country that has the highest average score for all its competitors that are participating in that skill (e.g. if the country has two competitors in the skill and one gets 80 marks while the other gets 70 marks, then they average for the country for that skill is 75 marks). The flag for the best performing country will be shown beside the country's name. The country flags are provided. You can change the size of the flags to fix your screen, but they should maintain a 200px by 130px aspect ratio. The easiest session refers to the session with the highest total number of marks awarded to competitors. The screen should show the session number and the range of marks for this

session (e.g. if the best competitor scored 95 marks for this session and the worst scored 80 marks, then the screen should show "80 – 95 marks"). The toughest session refers to the session with the lowest total number of marks awarded to competitors. Again, the screen should show the session number and the range of marks for this session. The median mark refers to the middle number out of a range of marks (e.g. if you have a sorted list of numbers {4, 6, 9, 10, 25}, then the median is 9). If there are two middle numbers, then the median is the average of these two numbers. If the calculated median mark is equal to or higher than the expected median mark for that skill, then a green up arrow should be shown beside the median mark. If the calculated median mark is lower, then a red down arrow should be shown beside the median mark. Finally, a line graph is provided at the bottom to show the scores of each competitor across all the sessions for that skill area. The graph should show all the sessions, including those that have not been completed yet. The line for each competitor should be in a different colour so that it's easier to view the graph.

5.7 Create "7. Calculate bonus"

Create the screen for administrators to calculate the bonus awarded to each competitor, as outlined in "7. Calculate bonus" in the wireframe.

A generous sponsor has come forward to sponsor some money to reward competitors based on how much of the sessions that they are able to successfully complete. So, the organizers requested for this additional screen to be added to auto-calculate how much each competitor can get based on their results. The user must first choose the skill that they want to focus on, from the drop-down list. The system currently only supports two skills – Software Solutions and Web Tech. Once the user selects a skill, the names of all the competitors in that skill are added to the drop-down list for competitors' names. Once the competitor's name is selected, the data in the table is refreshed automatically. The sponsor has set aside $100 for each competitor for each session. This amount is divided among each question in the session based on its weightage compared to the overall session (e.g. If total marks for the session is 50 and question 1 is 20 marks, then question 1 is worth $40 (i.e. (20 / 50) * $100 = $40). The total amount set aside for all the questions in a session should equal to $100. The amount received by a competitor is equal to the marks they received relative to the total marks for that question (i.e. If question 1 is 20 marks and the competitor gets 15 marks and the question is worth $40, then the competitor gets $30 for that question (i.e. (15 / 20) * $40 = $30). Each competitor also receives a $5 bonus per session if they score more than 75% of the total marks for that session. Finally, each competitor also receives a $10 bonus if their total marks for the competition is above the median mark for their skill area. The table is split into up to a maximum of four sections based on the number of sessions in the skill area. In each section of the table, there is a row that shows the session number and total marks for that session. The section also contains one row for each question (i.e. if session 2 has two questions then its section will only have two rows for questions 1 and 2). For each

question, the table shows the marks that the competitor received for that section. It also shows the max possible marks for that section. Based on the calculation provided above, it will then show the amount that the competitor can receive for that question. The system should also calculate and display the total bonus awarded to the competitor based on the criteria above. Finally, the total amount that the competitor can receive is displayed.