school of computing, informatics, & decision systems engineering

ASU Ira A. Fulton Schools of Engineering Arizona State University

CSE 460: Software Analysis and Design

BMI Calculator SOC Application

Purpose:

This project, with opportunities for both creativity and practical application, is designed to provide students with a suitable environment for applying practical concepts covered in the unit. Students will draw inspiration from real-world scenarios and identify a service-oriented application of their choosing. Using Visual Studio, an industry-standard IDE, they will develop SOAP and REST web services, as well as the website client application that will use them. By developing these web services and applications, students get hands-on practice with web-service development, service invocation, and application building.

Objectives:

Students will be able to:

- Envision and write the specification for a service-oriented application
- Develop C# WCF REST web services in Visual Studio
- Develop C# WCF SOAP web services in Visual Studio
- Develop ASP .Net website application that uses REST and SOAP web service

Technology Requirements:

- Visual Studio, 2017 or 2019

Project Overview:

Phase I [25 Pts]: Develop a specification for your service-oriented application.

Phase II [50 Pts]: Develop REST and SOAP web services and a website client to use them.

Project Description:

Brainstorm an idea for a service-oriented application, then develop a specification for the service-oriented application. Afterwards, develop REST and SOAP web services, followed by a website client application that uses those REST and SOAP web services.

Submission Directions for Project Deliverables

Phase I: Please create **single** PDF titled “Last Name_FirstName SOC Application Project_Phase I_Submission” and Submit Online

Phase II: Use Visual Studio to complete all of Phase II and submit as a **single** solution in a compressed (zip) file.

Phase I - Directions:

Brainstorming a SOC Application Scenario

1. Write a description of a service-oriented computing system you may develop. You may use publicly-available web services and your own web services that you may need to develop in order to implement this application. Consider a real-world application scenario. Taking an idea found on the internet or from others is **not** acceptable. You may wish to refer to Programmable Web (https://www.programmableweb.com/) to help you develop an idea for a potential SOC application.

   Note: You are **not** programming this application--only developing an idea for a potential SOC application

2. Draw a diagram showing the overall system design, its layers, components, and the connections among the services. The focus of this assignment is to brainstorm SOA applications and identify available web services and web services you may develop to implement your app idea. A sample diagram is given in Figure 1.
   Note: This is only an example. You must provide a similar diagram for your application.) You must come up with your own system.

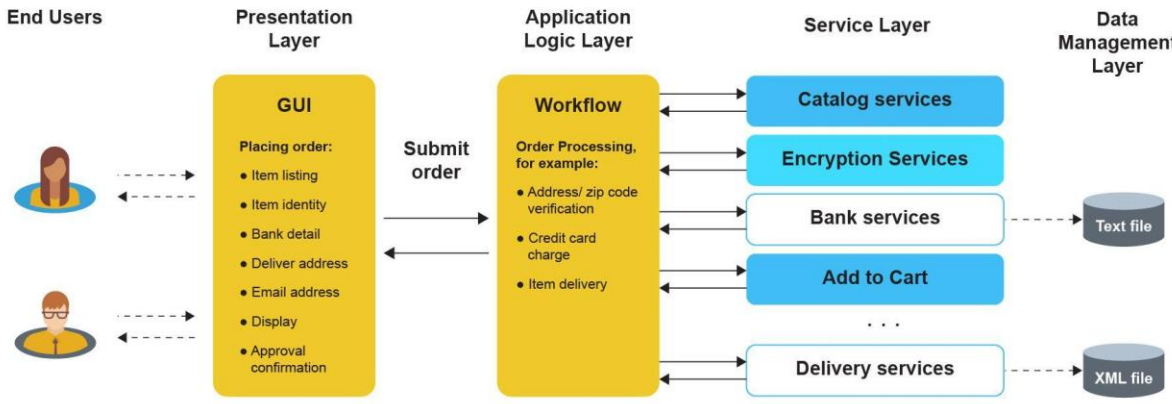

Figure 1 - A sample of a four-tier service-oriented computing system

Phase II - Directions:

Web Service and SOC Application Development

For this phase, use C# and Visual Studio 2017 or above. Develop both web services and the ASP .Net client application in the **same** Visual Studio solution.

1. Develop a WCF SOAP Web service that takes height in inches and weight pounds and calculate the BMI. The service contains two operations:

   string healthIndicator(int weight, int height);

   This method calculates the BMI and returns one of the following indicators based on the BMI

You are underweight	BMI < 18
Your weight is normal	25 > BMI >= 18
You are pre-obese	30> BMI >= 25
You are obese	BMI > 30

   double BMI(int weight, int height); // calculate BMI

   use the following equation to calculate BMI

   BMI = (weight in pounds/(height in inches)* (height in inches))*703

2. Develop a WCF RESTful Web service that takes height in inches and weight pounds and calculate the BMI. The service contains two operations:

   string healthIndicator(int weight, int height);

   This method calculates the BMI and returns one of the following indicators based on the BMI

You are underweight	BMI < 18
Your weight is normal	25 > BMI >= 18
You are pre-obese	30> BMI >= 25
You are obese	BMI > 30

   double BMI(int weight, int height); // calculate BMI

   use the following equation to calculate BMI

   BMI = (weight in pounds/(height in inches)* (height in inches))*703

3. Develop an ASP. Net website application to use the BMI and healthIndicator web APIs. Your website application's user interface should look similar to Figure 2.

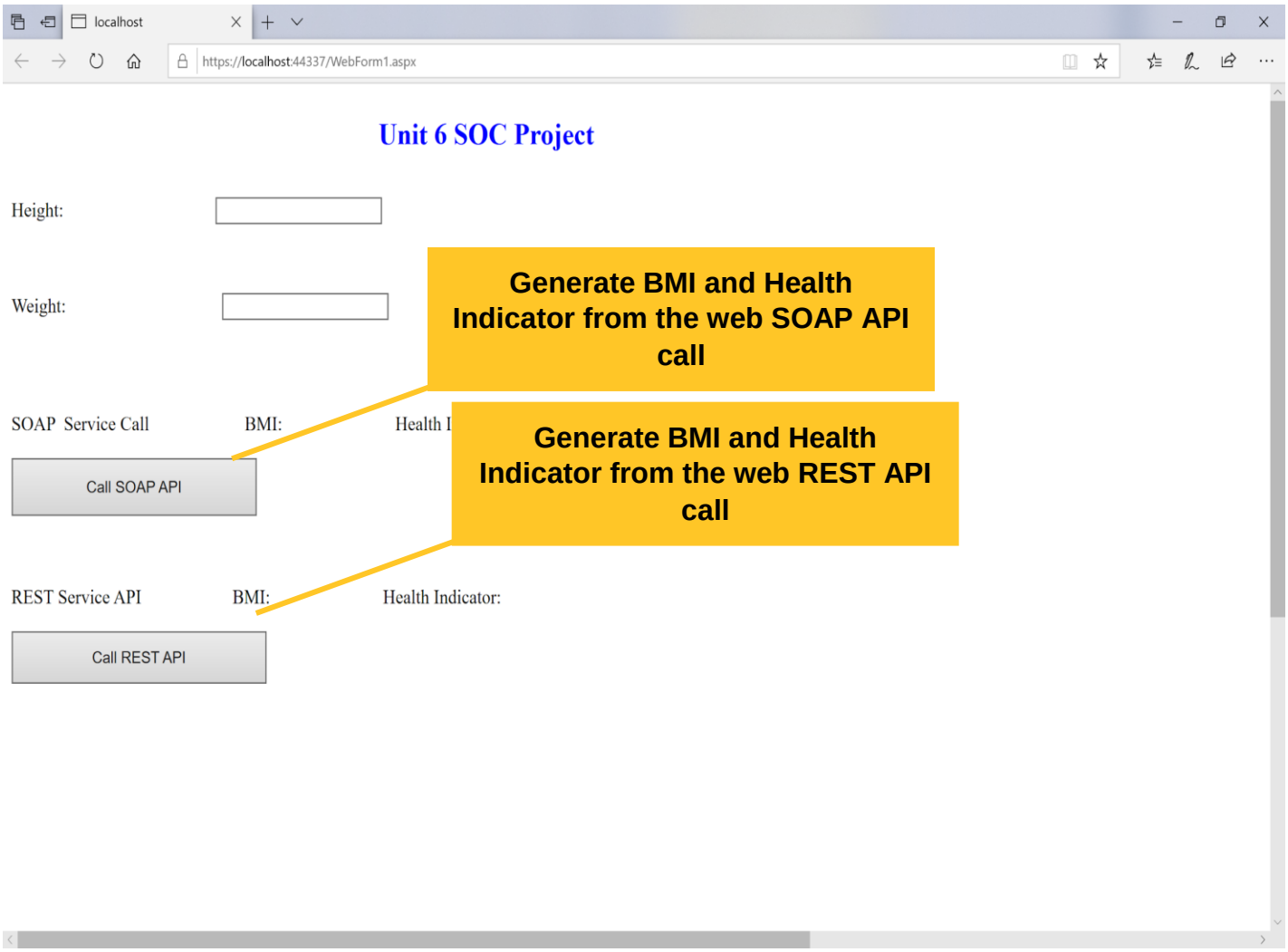

Figure 2 - Sample UI for the Website Application