

HCL Technologies Industrial Training

BPM Training Examination Group Team Exam 2– Due Date 22 February 2018

IBM BPM Group Work -BPM 8002

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Reading Time: 4 days

Writing Time: 96 Hours

Permitted Materials: Notes and any other material

*Answer **all** questions in this section using the answer booklet(s) provided. Answers are expected to be succinct but complete. Answers that are too long and irrelevant will be penalized. Please do the technical work in IBM BPM Cloud and also take screenshots in a word document. Groups of 2 or 3 , will be done and submission will come in as one's group for this.*

Question 1 BPM uses the following coach frameworks namely Sparks,Brazos among others.

1. Explain in your own words and not more than 10 lines the history of Coach Frameworks based on literature from the web.
2. Sparks is now the preferred coach partner by IBM for BPM 8.6 , what are the advantages of using Sparks. Sparks provides 80 coach views please list 15 of those coach views and explain what each of those coach views does?
3. Brazos is another major coach framework.Based on the literature from the internet please explain in not more than 10 lines the history of Brazos and its unique features
4. Please list any noticeable differences between Brazos and Sparks coach frameworks.

[15 marks]

Question 2a As an extension to Exam 2 , for buying a TV question please create another process called Pay A TV with one screen to capture the payment. In the process after the human service called CaptureTVPayment Human Service then put a message event that allows it to send a payment details to the original BuyTV process from Exam 2. The CaptureTVPayment Human Service should capture the same data eg Receipt Number, Payment Amount, Cashier,Date of Payment, Branch of Game. Run a couple of test and document screenshots. [15 marks]

Question 2b As an extension to Exam 2 , for buying a TV question please create another StandAlone Human service called Pay A TV with one screen to capture the payment. In the StandAlone human service then put a message event after the coach that allows it to send payment details to the original ByTV process. Run a couple of test and document screenshots. Please note in this case the message sending event is within the human service since there is no process in that case. The StandAlone Human Service should capture the same data eg Reciept Number, Payment Amount, Cashier,Date of PAYment, Branch of Game. The Human Service should be exposed as a Dashboard on Portal. Please run a couple of tests and document [15 marks]

Question 2c As an extension to Exam 2 , for the Consuming Java Question please implement the java program on your own in Eclipse and export the jar into BPM and repeat the same exercise.”<https://developer.twitter.com/en/docs>”

[15 marks]

Question 3 BPM Validations -Dialog Box

Please search for Kolban video "IBM BPM: Creating a Dialog with SPARK UI" on YouTube.

As an extension to Exam 2 , for the Home Loans Process question. Please add a dialog box when submitting the capture home loan using the dialog control and show the message "Are you sure you want to submit the home loan". There should be a submit or cancel button on the dialog box such that if i cancel the submission is not done. [15 marks]

Question 4 BPM Validations -Coach Views

Please go through this video by Kolban on Coach Views,"IBM BPM: Custom Coach Views"

<https://www.youtube.com/watch?v=j5bCvffQZbYt=2220s>. There is an Ampersand Character between Y and t on the URL. Please also go through this YouTube video "IBM BPM 8.5 Advanced - Coach Views"

1. [5 marks] In the Home Loans Process please create a Coach View called address with the following , suburb,town,street,Post Box,Country,Home number.
2. [5 marks] Then add two controls in your capture home Loan and approve home loan Human Services namely called, Residential Address as well as Postal Address using the same Coach View created above.
3. [6 marks] The second step will show the same addresses above in read only mode. Please make use of the coach views as well.
4. [6 marks] Also please why we need coach views in 5 lines from your own words please.

Question 5 ..

BPM and Brazos Coaches toolkit

Please check on the web for documentation pertaining to the Brazos Coaches framework.

1. [5 marks] Please list 10 coach views provided by Sparks or Default Coach Frameworks that you have used or intend to use.
2. [5 marks] Download the Brazos Coaches toolkit from the internet and save on your machine. Create a process App called, DemonstrateBrazos-Username. Import the Brazos toolkit into your process app. Create a process called DemonstrateBrazos-Username-Process. The process has 2 Human Steps. Call the first Step BrazosHS1 and have fields, name , surname and address as well as gender in a select drop down where one selects male or female. To create this fields please only select Brazos coaches controls only not the default Sparks Controls. Please put validations to make sure name,surname and gender are mandatory as well.

3. [6 marks] The second step will show the same fields above in read only mode.
4. [6 marks] Based on the above. Explain the advantages of using Brazos or disadvantages of using Brazos as opposed to using Sparks.
5. [6 marks] Implement a Coach using a header and footer coach views to view a document you just uploaded

Question 6 .. BPM and Twitter

Please read this video <https://www.youtube.com/watch?v=LooL6chvN4>(Please put underscore between 6 and c in the url) for REST API concepts. Please read about <http://www.apigee.com/>. Please check on the web for documentation pertaining to a Twitter API you can call.

1. [6 marks] Define the following , Endpoint,the S in the word HTTPS,based on the video above. Differentiate YAML Vs JSON
2. [5 marks] Please download a Twitter API and use Soapui to send messages to Twitter using SoapUi
3. [6 marks] Generate a YAML for the Twitter Services
4. [6 marks] Create a BPM Process called DemonstrateTwitterWithAPI with 2 step , one step called captureTwitterComments where one capture the twitter comments. Then followed by an intergration Service implmenting a Service Flow that consumes the Twitter YAML. Please go through this youtube video as well. "IBM BPM Technical Tutorials: Using External Services with REST" by Kolban.
5. [6 marks] Please run some tests on the above and show the documentation.

<https://www.youtube.com/watch?v=TvGLm7BijJY>

Question 7 .. BPM and SOAP Web Services

Please read this vedio, "REST Vs SOAP - What is the difference? — Tech Primers". Explain what SOAP means?

1. [6 marks] A Soap Web Service has its own advantages, Explain
2. [5 marks] A soap Web Service has cons. Explains those
3. [6 marks] Compare Soap and REST explaining the advantages and disadvantages in your own words.
4. [6 marks] Soap uses XML and WSDLs. Please explain in 10 lines maximum the meaning of the 2 above.

Question 8 ..

BPM Servers

BPM in a MultiCluster has AppTarget Cluster,Support Cluster and Messaging Clusters. For Company Miriro Enterprises with MultiCluster setup 2 Nodes in Production, 2 Nodes for Disaster Recovery, each node having an HTTP Server, running DB2 Databases,Windows Active Directory and also BP 8.6.

1. [6 marks] Please explain AppTarget Cluster and its functions
2. [5 marks] Please explain Support Cluster and its functions
3. [6 marks] Please explain a Messaging Cluster and its functions
4. [6 marks] Please explain a HTTP Server and its functions
5. [6 marks] Please explain meaning of a cluster,node and application server giving examples of the above company. How many application servers are in Miriro Enterprises.
6. [30 marks] Please draw an infrastructure diagram for Company Miriro Enterprises.

Question 9 ..

BPM Programming Fundamentals I

1. [6 marks] What is shared object?Please create a process with one step and show how to use a Shared Object. What are the advantages.
2. [5 marks] In production one instance has been failed due to some business object has bad data or null values, How will you inject data on runtime in production?Please using process above to demonstrate this by the use of tokens and REST API. Hint setBusinessDate on the REST API.
3. [6 marks] How will you handle exception in BPM? implement error handling on the process created above and demonstrate how to catch error in BPM.
4. [6 marks] What is durable and consume in UCA?
5. [6 marks] Difference between Sub Process and Linked Process?

Question 10 ..

BPM Java Programming and Automated Testing using Selenium

BPM start process can be triggered using REST from different languages like Java and the following program shows a good example where the url string is an HTTPS an using port 9443 after the ip address of one's BPM server. For start process is always a POST

as usual and a base64 encoder is used by downloading the Base64Encoder jar from the Internet. Basic Authorization which is basically using username and password are used in this scenario as opposed to a token framework where one gets a Token to authenticate to a service.

```
1  public static void main(String[] args) {
2  // trigger process
3  // get a response which is a process ID using java
4  HttpURLConnection connection = null;
5
6  // your own machine ip address 9.111.117.235:
7  try {
8  // Start Process REST URL
9  String uriString = "https://9.111.117.235:9443/rest/bpm/wle/v1/
    process?action=start&bpdId=25.c71cb22f-a8b1-4177-bce1-6
    c4e1e71690a&snapshotId=2064.ba58586e-04ec-4365-bb78-
    c1c5401200fb&branchId=2063.beff197b-35b7-4711-817c-5fcb0ab053fc
    &processAppId=2066.f6b0696f-116c-4764-aa51-fdc2db8141b2&parts=
    all";
10
11 // Saved Search REST url
12
13 URL url = new URL(uriString);
14 connection = (HttpURLConnection) url.openConnection();
15 connection.setRequestMethod("POST");
16
17 BASE64Encoder encoder = new BASE64Encoder(); // import the base64
    jar from the internet
18 String username = "admin";
19 String password = "admin";
20 String encodedCredential = encoder.encode((username + ":" +
    password).getBytes());
21 connection.setRequestProperty("Authorization", "Basic " +
    encodedCredential);
22 // Basic Authorization      username and password
23 // BPM connection has been achieved
24 connection.connect(); // triggers the rest call
25 BufferedReader reader = new BufferedReader(new InputStreamReader(
    connection.getInputStream())); // Response
26 // comes
27 // back as
28 // JSON
29 // Buffered Reader is a java class which stores data
30 int responseCode = connection.getResponseCode(); // 200 or
    401/403/404 /500
31 if (responseCode == HttpURLConnection.HTTP_OK) // HTTP OK==200
    Successful response
32 {
33 StringBuffer stringBuffer = new StringBuffer();
```



```

34 String line = "";
35 while ((line = reader.readLine()) != null) {
36     stringBuffer.append(line);
37 }
38 String content = stringBuffer.toString();
39 System.out.println(content); // Print the whole JSON response
40 }
41 } catch (Exception e) {
42     e.printStackTrace();
43 } finally {
44     if (connection != null) {
45         connection.disconnect();
46     }
47 }
48 }
49
50 }

```

1. [5 marks] Please explain KPIs in IBM BPM. Please implement and show advantages.
2. [6 marks] Using any process you have done with a tracking group. Please write a standalone coach that queries the data from the Tracking Group and shows it on the standalone coach in Portal. Expose the Standalone coach as a Dashboard. Expose it to only yourself please.
3. [6 marks] IBM BPM allows for process simulation. Please explain what it is for and advantages for simulation.
4. [30 marks] Please write another java program that triggers a BPM process from eclipse and finishes the first task.
5. [30 marks] Selenium is a java framework for automation testing. Write a standalone java program in Eclipse that triggers a BPM process using Selenium Framework and the REST API.
6. [30 marks] Please schedule the above program in a jenkins Server and schedule the program to run every 30 minutes.

Question 11 ..

BPM KPIs and Process Simulation

1. [5 marks] Please explain KPIs in IBM BPM. Please implement and show advantages.
2. [6 marks] Using any process you have done with a tracking group. Please write a standalone coach that queries the data from the Tracking Group and shows it

on the standalone coach in Portal. Expose the Standalone coach as a Dashboard. Expose it to only yourself please.

3. [6 marks] IBM BPM allows for process simulation. Please explain what it is for and advantages for simulation.

Question 13 ..

BPM Localisation

Nyaradzai Clothing Wares need to sell clothing merchandise to global customers who have different languages, tastes as well use different currency. The process will involve one going to a website and display clothes to wear and one has to select the type of clothing he wants by selecting several dropdowns namely, size of clothing, price of clothing based on the currency of his nationality, colour of clothing brand, type of clothing in a drop down and credit card number and bank code. Address of the shipment is also captured as well. Upon submitting this data, this will be routed create a backend clothing sales consultant who looks at your order, and approves the order or rejects the order and confirms payment. Upon approval the shipment of the order begins to the customer hence shipment is another activity. The customer will get an sms once shipment starts. The Shipment once it arrives, the customer needs to sign the document and the delivery person will update on the system the delivery date of the shipment.

1. [5 marks] Please explain Localisation. Explain advantages of localization.
2. [6 marks] How will you implement localization?
3. [6 marks] Please design the process above with 3 steps , capture by the customer, approval by the sales consultant and shipment by a shipment consultant.
4. [6 marks] Please implement localisation on the screens to say if one is a French then show French screen and if one is English it shows English language. but the backend should still be English. The currency should also mirror the country as well.

Question 12 ..

BPM Exception Handling

Please create a process where you call the Weather Services API with 2 steps as in Exam 2 with the following model namely Step 1 ; Service Flow Step 2. Please put a Error Handler on the service Flow , as intermediate event , which routes to another Human Task which is called , Error Handling as is assigned to a BPM Exception Handling Team with 2 people in the team. Hence create a swimlane for error handling and in there a human task above . The Service flow can be made to fail by putting a wrong url endpoint , when it fails instead of going to step 2, it goes to the production support task.

1. [10 marks] Explain different components used for Error Handling in BPM 8.6 and show screenshots of which tools

2. [6 marks] How will you handle exception in BPM? implement error handling on the process created above and demonstrate how to catch error. Please run a positive test and a negative test and demonstrate.
3. [10 marks] BPM uses Responsive client Side coaches, please explain the impact of using client side coaches on error handling?
4. [30 marks] Based on the same principle in a process of your choice please show how you can implement client side error handling.
5. [15 marks] Compensation in Error Handling is crucial. Please why it is crucial and in what way.

Question 13 ..

BPM Performance Testing using Java and Jmeter

Workflow Systems have been known to have issues with running a load or batch process historically. Performance is caused by either inefficient code in BPM as well as infrastructure issues as well eg Network, Storage, databases.

1. [10 marks] Explain the reasons why this belief is true. and why its not true as well.
2. [10 marks] Explain which tools can be used for BPM performance monitoring for application, databases and storage as well.
3. [10 marks] Explain reasons why code is deemed inefficient in BPM and show 10 samples of inefficient code in IBM BPM. How is each one mitigated ?
4. [30 marks] Write a standalone java program in Eclipse that triggers 30 process instances in a loop. Trigger this Service flow from REST API This is some kind of mimicking a BPM Batch process. Please explain the issues one can get from running a batch?
5. [30 marks] Performance Testing in BPM has been always a challenge. What challenges does one get in BPM as far this is concerned?
6. [6 marks] JMeter is used for Performance testing . Please explain what Jmeter is and what are the advantages of using it.
7. [10 marks] Please use the Home Loan Application process to record the events using Jmeter and run some tests.
8. [30 marks] Give examples of causes of slow Responses in a workflow application.
9. [15 marks] In a situation where slow responses are being experienced in a BPM workflow, please explain how one can use java tuning tools to find a sample bottle-necks.

10. [15 marks] Design a sample IBM BPM tuning methodology in not more than one page, 'http://nividous.com/ibm-bpm-performance-tuning-strategy-part-iv/'.
11. [15 marks] BPM Sizing is a critical component. Please explain BPM sizing. Please design a BPM sizing document in one pager and explain.
12. [15 marks] Review the applications in BPM is called code review. Please explain key activities one would follow in doing a code review.

Question 14 ..

BPM Design Patterns

Workflow Systems have patterns that guide development same way programming languages like java have their own design patterns

1. [10 marks] Explain 5 Design patterns in BPM
2. [10 marks] Explain and give sample examples for using the Claim Check Pattern in IBM BPM
3. [10 marks] Explain reasons why code is deemed inefficient in BPM and show 10 samples of inefficient code in IBM BPM. How is each one mitigated ?
4. [30 marks] Please explain 10 activities to be done in an IBM BPM production systems that makes that it remains in a healthy state and list these checklist items.

Question 15 ..

BPM Hardware and Infrastructure Knowledge

1. [30 marks] Please write a java program in Eclipse that queries a Saved Search and prints the results in the command line. Please use the BPM VMs for this not the Cloud.
2. [50 marks] In pairs please install BPM 8.5.7 on a fresh Windows 2012 VM. Then upgrade the BPM to 8.6.
3. [30 marks] Show how to start IBM BPM with screenshots on the local VM and how to stop it as well. Show the System Out log proof that you did start it successfully and stopped it successfully.
4. [30 marks] Please check on the internet for any Web Service which is freely exposed. Run it on SoapUi. Then implement it in IBM BPM in a 2 step process and the service being in between. Obvious you have to use a Service flow to consume.

Question 16a ..

BPM Team Services and Team Filter Services—Team Project Continued

Tendai Plumbing Consultants is an SA based group of plumbers in households. There have 2 juniors, 2 intermediate and 2 experts in each province Gauteng being the largest has 4 juniors, 4 intermediate plumbers and 2 experts. An expert has 5 years experience and works on a job with 5 000 rands and above. a Junior is a person with experience up to a year and works on a job up to 2000 Rands or is estimated to be up to 2 days only. The intermediate guy works on a job worth up to 5000 and also taking not more than 5 days. Experienced plumbers can work on jobs worth more than 5000 Rands or taking more than 5 days. When a customer goes online to book a plumber he or she specifies an address, province, town, type of job eg fixing a tap, time when the plumber can come to do the job and also payment method. On Clicking the customer gets a ticket number for tracking, the price quotation and confirmation as well as 3 times to choose from considering his or her preferred time if it was not available. The work takes into account the cost of the job, price and location. On acceptance of the quote. The customer job will be routed to the backoffice for routing automatically based on a load balancing mechanism. Only junior plumbers work on the weekends. Plumbers leave days are also considered in the design of the solution since if one is off or on sick leave then they can not work during the period they are on leave. If a work is scheduled for next week Friday, then the plumber should only see the work due in his or her basket on that day at midnight, not before.

1. [30 marks] Please explain Team Services and Team Filter Services. Please implement both in the process above and explain the use of the 2 and why from a business reasoning.
2. [50 marks] Please do a high level design of the process above.
3. [30 marks] Please implement the team service and team filter services.
4. [30 marks] Please setup the user for this with example plumbers configured.
5. [30 marks] Please explain how you ensure if someone is off duty the work can not get to him.
6. [30 marks] one should start get reminders of the work 3 days before its due. The email should indicate the location of the work, the type of work and suburb and estimated duration of the work.
7. [30 marks] If a consultant overruns his or her own schedule then all his new work that he hasnt started to come should be reassigned automatically as well at midnight usign the same round robin algorithm.
8. [30 marks] Please allow for one to reassign his or her bookings
9. [30 marks] Please allow for one to reassign his or her bookings
10. [30 marks] Please allow for one to take bookings on the phone and capture as well not from the customer.

Question 16b ..

BPM Team Services and Team Filter Services—Team Project Continued

Tendai Plumbing Consultants now wishes to expose it to private plumbers. The plumbers can register on a website and supply their province, contact details, skills level, hourly rates as well. The system now has to be modified to cater for a customer first choosing a preferred plumber first, otherwise a plumber from the pool will be allocated. Plumbers can register or deregister using another BPM process where it goes to an approver to approve a plumber's application. A plumber once he or she has done a job should be rated and the ratings for each job will be historically stored using the BPM workflow. The solution will allow for cases more than one plumber attends to a site as well in that case a separate task will be done for each plumber but the customer gets a single quote. Previous customers will get discount of 2 percent if they have booked for 5 times before for a certain household or for a certain individual's properties. A customer can book from a website or from an app on a mobile

1. [30 marks] Please design the process now including using a SQL database to store the data in this case.
2. [30 marks] Please design a website where one can do bookings
3. [30 marks] Please design a mobile using Android and iOS Apple for the customers to book
4. [30 marks] Please design a mobile using Android and iOS Apple for the consultants to do bookings.
5. [30 marks] Please allow for the plumbers to upload proof of work done using pictures when the job is done using an Alfresco ECM Repository.
6. [30 marks] Implement sample reports using Hadoop or ClickView for this solution by getting feeds from the PDW solution.

———— *End of Examination* ————