Function Point

Analysis

for

Digital Bus Automation System

Shubhi Jain :16ucs184
Vrinda Goel :16ucs216
Saloni Chauhan :16ucs165
Muskan Gupta :16ucc059

The LNM Institute of Information Technology

Data Stores:

Sr.	Data Stores	Complexity	Explanation
1.	Bus Details	Complex	This involves multiple tables regarding bus details, driver details, bus layout etc.
2.	Schedule Details	Average	This involves two tables regarding bus time table on weekdays and weekends/holidays.
3.	Booking Details	Complex	This involves multiple tables regarding different types of bookings by different categories of users.
4.	Payment Details	Complex	This involves multiple tables regarding payment details of various users.
5.	Public Notifications and FAQs	Average	This involves two tables regarding each: public notifications and FAQs
6.	Personal Notifications	Simple	This involves one table only.

Home page without login:

User Inputs:

Sr.	Activity	Complexity	Explanation
1.	Access bus reservation software	Simple	User only has to type one URL

2	User selects what to do next	Simple	User has to select only one option

System Outputs:

Sr.	Activity	Complexity	Explanation
1.	Software displays the homepage	Complex	The home page is made up of many different types of displays.

A1 for LNMIIT Residents:

User Inputs:

Sr.	Activity	Complexity	Explanation
1.	User enters login details	Average	Only 2-3 login details are there.
2.	User selects what to do next	Simple	User has to select only one option

System Outputs:

Sr.	Activity	Complexity	Explanation

1.	Display login credential fields	Average	Only 2-3 login credentials are required

A1 for BMC Staff:

User Inputs:

Sr.	Activity	Complexity	Explanation
1.	User enters login details	Average	Only 2-3 login details are there.
2.	User selects what to do next	Simple	User has to select only one option

Processing Inquiries:

Sr.	Activity	Complexity	Explanation
1.	Software validates the details	Average	Only one database to be checked i.e. User details

System Outputs:

Sr.	Activity	Complexity	Explanation
1.	Display login credential fields.	Average	Only 2-3 login credentials are required

A1 for BMC President:

User Inputs:

Sr.	Activity	Complexity	Explanation
1.	User enters login details	Average	Only 2-3 login details are there.
2.	User selects what to do next	Simple	User has to select only one option

Processing Inquiries:

Sr.	Activity	Complexity	Explanation
1.	Software validates the details	Average	Only one database to be checked i.e. User details

System Outputs:

Sr.	Activity	Complexity	Explanation
1.	Display login credential fields	Average	Only 2-3 login credentials are required

A2:

User Inputs:

Sr.	Activity	Complexity	Explanation
1.	User selects whether to view bus schedule orgo to homepage.	Simple	Only one selection is to be made.
2.	User selects whether to go to home page or to close the software	Simple	Only one selection is to be made.

Processing Inquiries:

Sr.	Activity	Complexity	Explanation
1.	Access schedule details	Simple	One database accessed

System Outputs:

Sr.	Activity	Complexity	Explanation
1.	Displays bus schedule	Complex	The database is accessed to display the current bus schedule.

2.	Home page is displayed by software	Complex	The home page is made up of many different types of displays.

A3:

User Inputs:

Sr.	Activity	Complexity	Explanation
1.	User selects whether to go to home page or to close the software	Simple	Only one selection is to be made
2.	User selects whether to view FAQs or notifications	Simple	Only one selection is to be made

System Outputs:

Sr.	Activity	Complexity	Explanation
1.	Displays FAQs and contact details	Complex	Many FAQs are displayed with different ways in which BMC can be contacted
2.	Home page is displayed	Complex	The home page is made up of many different types of displays.

A4:

User Inputs:

Sr.	Activity	Complexity	Explanation
1.	User selects whether to go to home page or to close the software.	Simple	Only one selection is to be made

System Outputs:

Sr.	Activity	Complexity	Explanation
1.	Notification board is displayed	Complex	It is a dynamic board with multiple notifications displayed at a time
2.	Home page is displayed	Complex	The home page is made up of many different types of displays.

A5:

User Inputs:

Sr.	Activity	Complexity	Explanation
1.	User selects whether to view bookings or make a booking	Simple	Only one selection is to be made
2.	User selects date of	Average	Date, Month and Year to be selected

	booking		
3.	User selects bus trip	Simple	One checkbox for concerned bus trip to be checked
4.	User selects seats	Average	One or more seats to be selected
5.	User selects whether to go to home page or close the software	Simple	Only one selection is to be made

Processing Inquiries:

Sr.	Activity	Complexity	Explanation
1.	Software checks if the details are valid	Complex	Date, time and seat validation needs multiple databases to be checked

Processing Updates:

Sr.	Activity	Complexity	Explanation
1.	New booking made	Complex	Multiple tables of multiple databases updated

System Outputs:

Sr.	Activity	Complexity	Explanation
1.	System displays booking details	Complex	Many details are to be displayed corresponding to each booking
2.	System displays calendar	Complex	Month Wise calendar to be displayed
3.	System displays bus schedule	Complex	The schedule is long and complex
4.	System displays bus layout and occupancy details	Complex	Bus layout is complex with different colour coding
5.	System displays confirmation message	Simple	One sentence to be displayed
6.	Home page is displayed	Complex	The home page is made up of many different types of displays.
7.	Displays Booking Details	Simple	3-4 fields are displayed

External Interfaces:

Sr.	Interfaces	Complexity	Explanation
1.	Payment API	Complex	Accesses bank accounts, paytm wallets, etc

A6:

User Inputs:

Sr	Activity	Complexity	Explanation

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1.	User selects whether to add money or go to home page	Simple	Only one selection to be made

Processing Updates:

Sr.	Activity	Complexity	Explanation
1.	Money added	Average	One database updated: Payment details

System Outputs:

Sr.	Activity	Complexity	Explanation
1.	Display current balance	Average	Has to access payment details database
2.	Displays homepage	Complex	The home page is made up of many different types of displays.
3.	Displays different payment gateways	Simple	No database access and only 2-3 options to be displayed
4.	Display confirmation that money has been added	Simple	Only one sentence to be displayed

External Interfaces:

Sr.	Interfaces	Complexity	Explanation
1.	Payment API	Complex	Accesses bank accounts, paytm wallets, etc

A7:

User Inputs:

Sr.	Activity	Complexity	Explanation
1.	User selects booking to be cancelled	Simple	Only one selection to be made
2.	User confirms that they want to cancel	Simple	Only yes or no to be selected
3.	User selects whether to delete booking or go to home page	Simple	Only one selection to be made

Processing Inquiries:

Sr.	Activity	Complexity	Explanation
1.	Validation based on cancellation policy	Complex	Rules for cancellation are complex

Processing Updates:

Sr.	Activity	Complexity	Explanation
1.	Release seats	Complex	Changes made in booking details and bus details

System Outputs:

Sr.	Activity	Complexity	Explanation
1.	Display existing bookings	Average	Display only bookings that can be cancelled
2.	Display cancellation policy	Average	Display all data stored as cancellation policy
3.	Display confirmation message “Are you sure?”	Simple	Only one sentence to be displayed
4.	Display “Cancellation complete” message	Simple	Only one sentence to be displayed

External Interfaces:

Sr.	Interfaces	Complexity	Explanation
1.	Payment API	Complex	Accesses bank accounts, paytm wallets, etc

A8:

User Inputs:

Sr.	Activity	Complexity	Explanation
1.	User Selects whether to go to homepage or to close the software	Simple	Only one selection to be made
2.	Uploads Schedule	Complex	Have to upload file
3.	Enters Time and Date	Average	Have to input many values
4.	Select whether sure or not	Simple	Select yes or no only

Processing Inquiries:

Sr.	Activity	Complexity	Explanation
1	Software validates the entered details.	Average	Only one database need to be checked
2.	Send to BMC for approval	Complex	External API used

Processing Updates:

Sr.	Activity	Complexity	Explanation
1.	User edits the details.	Complex	One database access is required but many

			credentials are required.

System Outputs:

Sr.	Activity	Complexity	Explanation
1.	Displays schedule	Complex	It is a complex format
2.	Display confirmation message	Simple	One line displayed
3.	Display homepage	Complex	The home page is made up of many different types of displays.

A9:

User Inputs:

Sr.	Activity	Complexity	Explanation
1	BMC selects whether to remove bus, add bus or return to home page.	Simple	Only one selection is to be made.
2.	BMC selects bus to delete	Simple	Only one selection is to be made.
2	BMC enters deactivation time.	Simple	Only time has to be entered.
3	BMC enters activation time.	Simple	Only time has to be entered.

4	BMC selects whether to go to home screen or to close the software.	Simple.	Only one selection is to be made.
5.	BMC selects whether to confirm deletion of bus	Simple	Only one selection is to be made.

Processing Inquiries:

Sr.	Activity	Complexity	Explanation
1	Software validates the deactivation time details	Average	Date and time conditions need to be checked
2	Software validates the activation time details	Average	Date and time conditions need to be checked

Processing Updates:

Sr.	Activity	Complexity	Explanation
1	Remove Bus	Average	Need to access “Bus Details” data store.
2	Add Bus	Complex	Need to access “Bus Details” data store and bus details need to be updated again.

System Outputs:

Sr.	Activity	Complexity	Explanation
1	Display Existing Buses and their Details.	Average	Need to access “Bus Details” data store.
2	Displays Message	Simple	Only single line output to be displayed.
3	Home page is displayed by software	Complex	The home page is made up of many different types of displays.

A10:

User Inputs:

Sr.	Activity	Complexity	Explanation
1.	User selects whether add, delete, edit driver details or go back to home page.	Simple	User has to select only one option

System Outputs:

Sr.	Activity	Complexity	Explanation
1.	Software displays list of Bus Driver details.	Average	Only one database need to be accessed i.e. Bus Details

A11:

User Inputs:

Sr.	Activity	Complexity	Explanation
1.	User selects whether to go to home page or to close the software	Simple	Only one selection is to be made
2.	Enters Details of driver	Average	Many fields

Processing Inquiries:

Sr.	Activity	Complexity	Explanation
1	Software validates the entered details.	Average	Only one database need to be checked i.e. User Details
2.	Approval request sent	Complex	External API used

Processing Updates:

Sr.	Activity	Complexity	Explanation
1.	User edits the details.	Complex	One database access is required but many credentials are required.

System Outputs:

Sr.	Activity	Complexity	Explanation
1	Software displays driver details.	Complex	.Many credentials are required.
2	Successful Updation Message	Simple	One line message needs to be displayed.

A12:

User Inputs:

Sr.	Activity	Complexity	Explanation
1.	User selects whether to delete bus driver details or return to home page	Simple	Only one selection to be made
1.	Select a driver	Simple	Only one selection to be made
2.	Confirm deletion	Simple	Choose only yes or no

Processing Inquiries:

Sr.	Activity	Complexity	Explanation

1.	Send approval request to President	Complex	Have to send notification to president

Processing Updates:

Sr.	Activity	Complexity	Explanation
1.	Delete driver details	Simple	Deletion in only one database

System Outputs:

Sr.	Activity	Complexity	Explanation
1.	Software displays list of drivers	Average	Only one database required
2.	Display deletion complete message	Simple	Only one sentence to be displayed

A13:

User Inputs:

Sr.	Activity	Complexity	Explanation
1.	User selects whether to	Simple	Only one selection to be made

	edit bus driver details or return to home page		
2.	Select a driver whose details are to be edited.	Simple	Only one selection to be made
3.	Edit details of driver	Complex	Many fields are present
4.	User selects whether to edit bus driver details or return to home page	Simple	Only one selection to be made

Processing Inquiries:

Sr.	Activity	Complexity	Explanation
1.	Software validates the details	Average	Validation of only a few fields with few constraints
1.	Send approval request to President	Complex	Have to send notification to president

Processing Updates:

Sr.	Activity	Complexity	Explanation
1.	Updating driver details	Average	Only one database to be updated

System Outputs:

Sr.	Activity	Complexity	Explanation
1.	Software displays list of drivers	Average	Only one database required
3.	Display updation complete message	Simple	Only one sentence to be displayed

A14:

User Inputs:

Sr.	Activity	Complexity	Explanation
1.	BMC selects whether to make a booking for VIP seats or go to home page.	Simple	The user simply selects a link to make bookings.
2.	BMC selects start and end date on the calendar to make VIP bookings.	Average	The input is interactive and also not just simple as it will only display valid dates.
3.	BMC selects simply a particular bus from the schedule list.	Simple	A simple click on a bus from the schedule.
4.	Select seats of a bus.	Simple	A simple click to highlight the seats to booked..
5.	Enter the list of students who can book a seat in this pre-booked section.	Average	A list of students with their roll numbers is to be entered.
6.	Reason for pre-booking.	Simple	A reason for pre-booking is to be entered by the BMC.

7.	Final confirmation of booking is to be entered(Y/N)	Simple	A simple yes/no is to be selected.
8.	BMC selects to proceed to the home screen or stop.	Simple	A simple click for further processing.

Processing Inquiries:

Sr.	Activity	Complexity	Explanation
1.	Bus details display.	Complex	The database is accessed to fetch information about the existing bookings in a bus, its layout, its bus number, bus type, bus driver associated etc.

Processing Updates:

Sr.	Activity	Complexity	Explanation
1.	Seat selection by BMC.	Average	The database is updated as these seats cannot be selected by the other users for booking.
2.	Reason for pre-booking.	Simple	A column is to be updated simply by entering the reason for a particular VIP pre-booking.

System Outputs:

Sr.	Activity	Complexity	Explanation
1.	The software displays the calendar.	Average	The calendar displayed is month-wise. We need to select dates on it making a little more than simple.
2.	Software displays the current bus schedule.	Complex	The schedule is long and complex having parameters like bus number, bus route, bus departure venue and time, etc.
3.	Bus layout display	Complex	The database is accessed to display the bus type, its layout, its associated details like bus driver details, its path etc.
4.	Display message of pre-booking.	Simple	A pop-up window comes with a message whether the pre-booking is successful or not.

A15:

User Inputs:

Sr.	Activity	Complexity	Explanation
1.	Selects whether to delete public notifications, FAQ's or go back to home page.	Simple	Only one selection to be made.
2.	Selects whether to confirm changes	Simple	Only one selection to be made.
3.	BMC selects public notification to delete.	Simple	Only one field to be filled.
4.	BMC selects public	Simple	Only one field to be filled.

	FAQ to delete.		

System Outputs:

Sr.	Activity	Complexity	Explanation
1.	Software displays list of public notifications and FAQ's.	Average	Only one database required
2.	Displays confirmation message.	Simple	Only one sentence to be displayed

A16:

User Inputs:

Sr.	Activity	Complexity	Explanation
1.	Selects whether to add public notifications, FAQ's or go back to home page.	Simple	Only one selection to be made.
2.	Selects whether to confirm changes	Simple	Only one selection to be made.
3.	BMC enters public notification.	Simple	Only one field to be filled.
4.	BMC enters public FAQ.	Simple	Only one field to be filled.

System Outputs:

Sr.	Activity	Complexity	Explanation
1.	Software displays list of public notifications and FAQ's.	Average	Only one database required
2.	Displays confirmation message.	Simple	Only one sentence to be displayed

A17:

User Inputs:

Sr.	Activity	Complexity	Explanation
1.	Selects whether to view approval requests or go back to home page.	Simple	Only one selection to be made
2.	Selects Approval to be considered	Simple	Only one selection to be made
3.	Selects whether to view more approval requests	Simple	Only one selection to be made
4.	Selects whether to view approval requests or go back to home page.	Simple	Only one selection to be made

Processing Updates:

Sr	Activity	Complexity	Explanation

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1.	Updating approvals.	Average	Only one database to be updated

System Outputs:

Sr.	Activity	Complexity	Explanation
1.	Software displays list of approval requests	Average	Only one database required
2.	Display confirmation message	Simple	Only one sentence to be displayed

Given Weights :

	Simple	**Average**	**Complex**
User Input	2	4	6
System Output	3	5	7

Data Stores	5	10	15
Processing Inquiries	2	4	8
Processing Updates	4	8	12
External Interfaces	4	6	8

Counts:

	Simple	**Average**	**Complex**
User Input	50	9	2
System Output	15	16	19

Data Stores	1	2	3
Processing Inquiries	1	7	7
Processing Updates	2	4	5
External Interfaces	0	0	3

Weight x Count :

	Simple	Average	Complex
User Input	100	36	12
System Output	45	80	133

Data Stores	5	20	45
Processing Inquiries	2	28	56
Processing Updates	8	32	60
External Interfaces	0	0	24

Unadjusted Function Points (Unadjusted FP) = ∑ (Weights x count) = 686

AI range = 0 (0*5) to 70(5*14)

Adjustment Factors :
(Range 0-5 where 0 means No influence and 5 means Essential)

1. The software to be run as a web-based apps: 5
2. High performance critical: 3
3. The software to be used in multiple sites: 1
4. The code designed to be reusable: 3
5. Data communications: 2
6. Distributed data processing: 3
7. Heavily used configuration : 4
8. Transaction rate: 5
9. Online data entry: 4
10. End-user efficiency: 3
11. Online update: 2
12. Complex processing: 2

13. Facilitate change: 3
14. Operational ease: 4

AI = ∑ Factor Weight = 44

CAF (Complexity Adjustment Factor) = 0.65 + 0.01 x AI = 1.09

Adjusted FP = Unadj FP x CAF = 686 * 1.09 = 747.74(approximately)