



FLogbook: From Concept to Realization

B. S. K. Srivastava*, R. K. Agrawal, K. G. Barpande,
P. Fatnani & C. P. Navathe

Raja Ramanna Centre for Advanced Technology
(RRCAT), Indore, India

*E-mail: bsks@rrcat.gov.in

Introduction

Indus-1 and Indus-2, the Synchrotron Radiation Source (SRS) facilities at RRCAT Indore are national facilities and being operated on round the clock basis to provide synchrotron radiations to users as well as carrying out machine studies. Both of these accelerators are widely distributed systems and employ many sub systems for their operation. These sub systems are also made up of heterogeneous type of hardware and software modules. Indus-2 Control System is presently controlling approximately 10,000 input/output parameters for its operation. To keep the whole system up and running the faults & failures encountered during machine operations are attended at site and all observations and rectifications information are to be recorded electronically by the crewmembers. Fault Log Book (FLogbook) has been conceived & developed to meet such needs. This web based software operates in the intranet environment over three tier software architecture. It mainly uses JavaServer Pages (JSP), JavaBeans and SQL databases for designing its building blocks. Using relational database features have been provided in the package for logging, emailing, searching & commenting the faults of various sub systems.

FLogbook Architecture

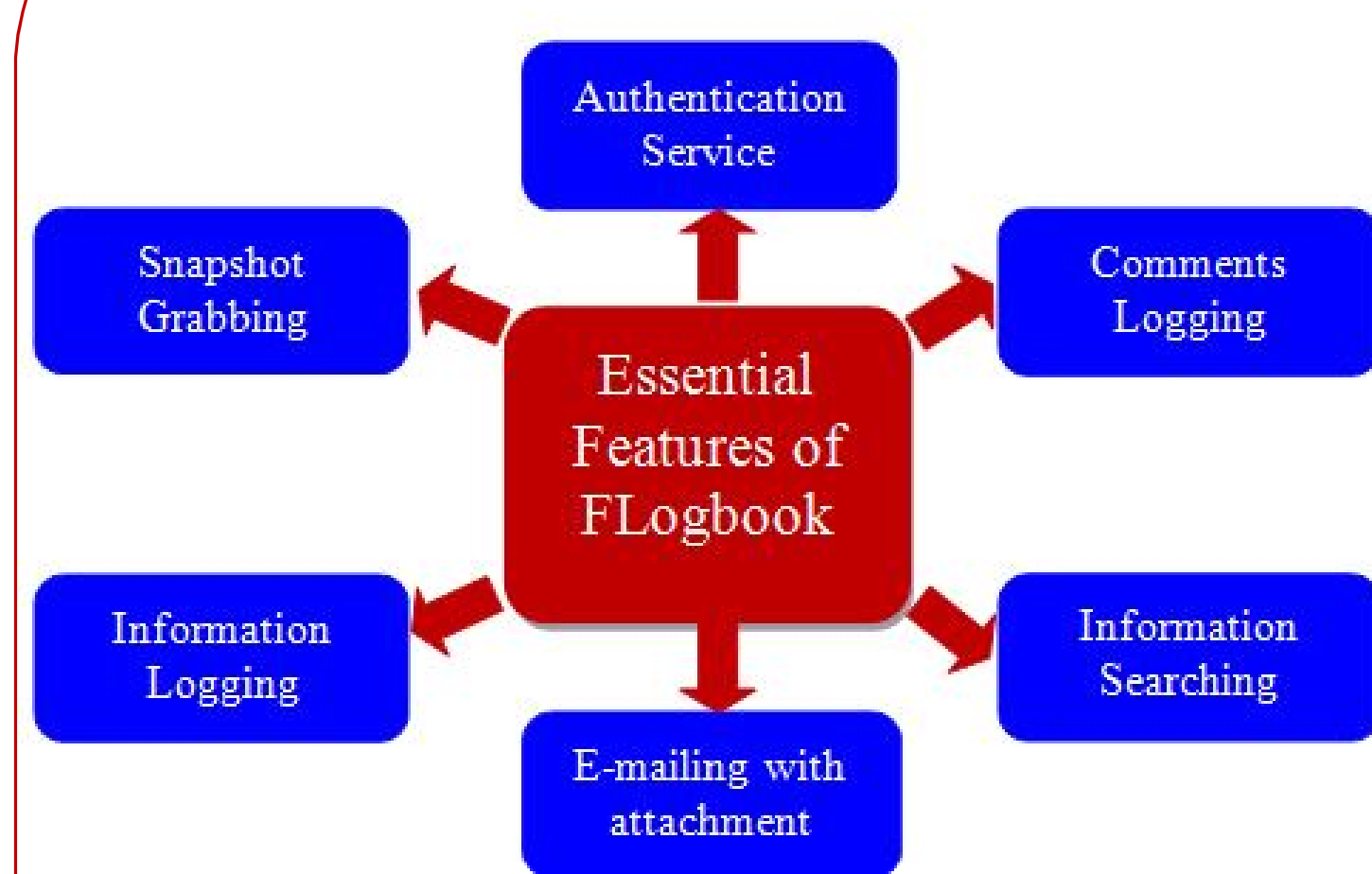


Figure 1: FLogbook features

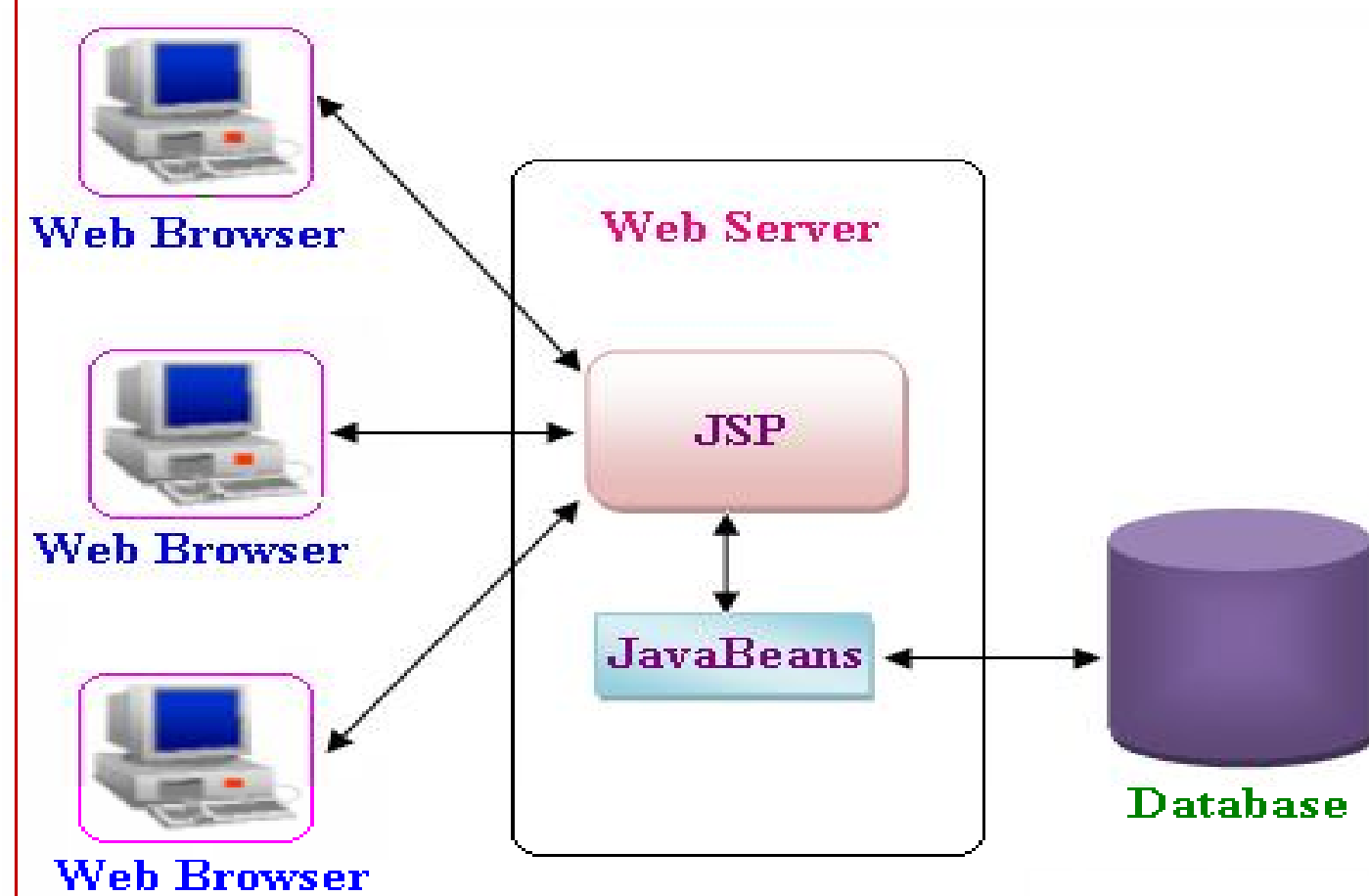


Figure 2: FLogbook Modules

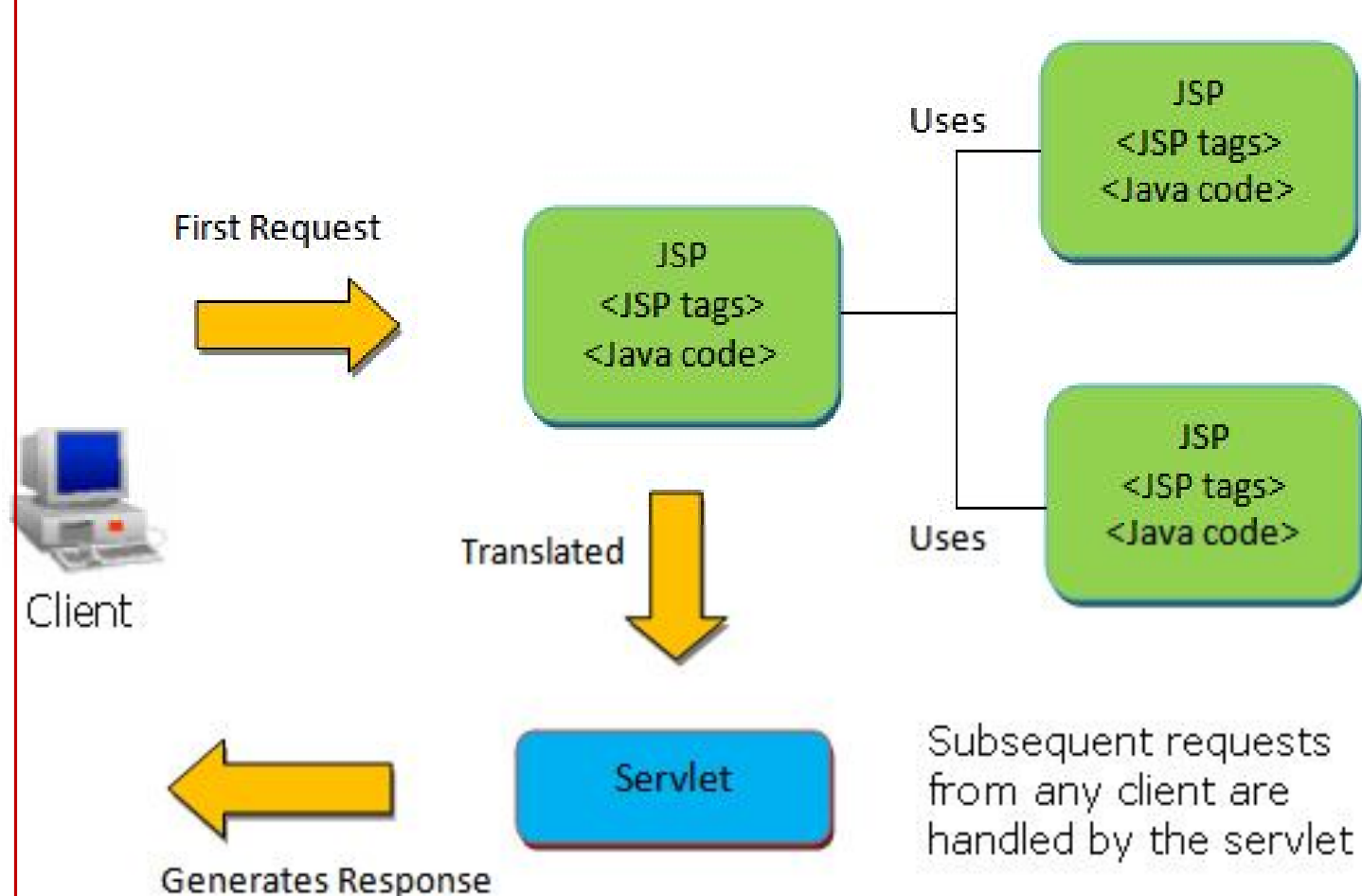


Figure 3: Execution of a JSP

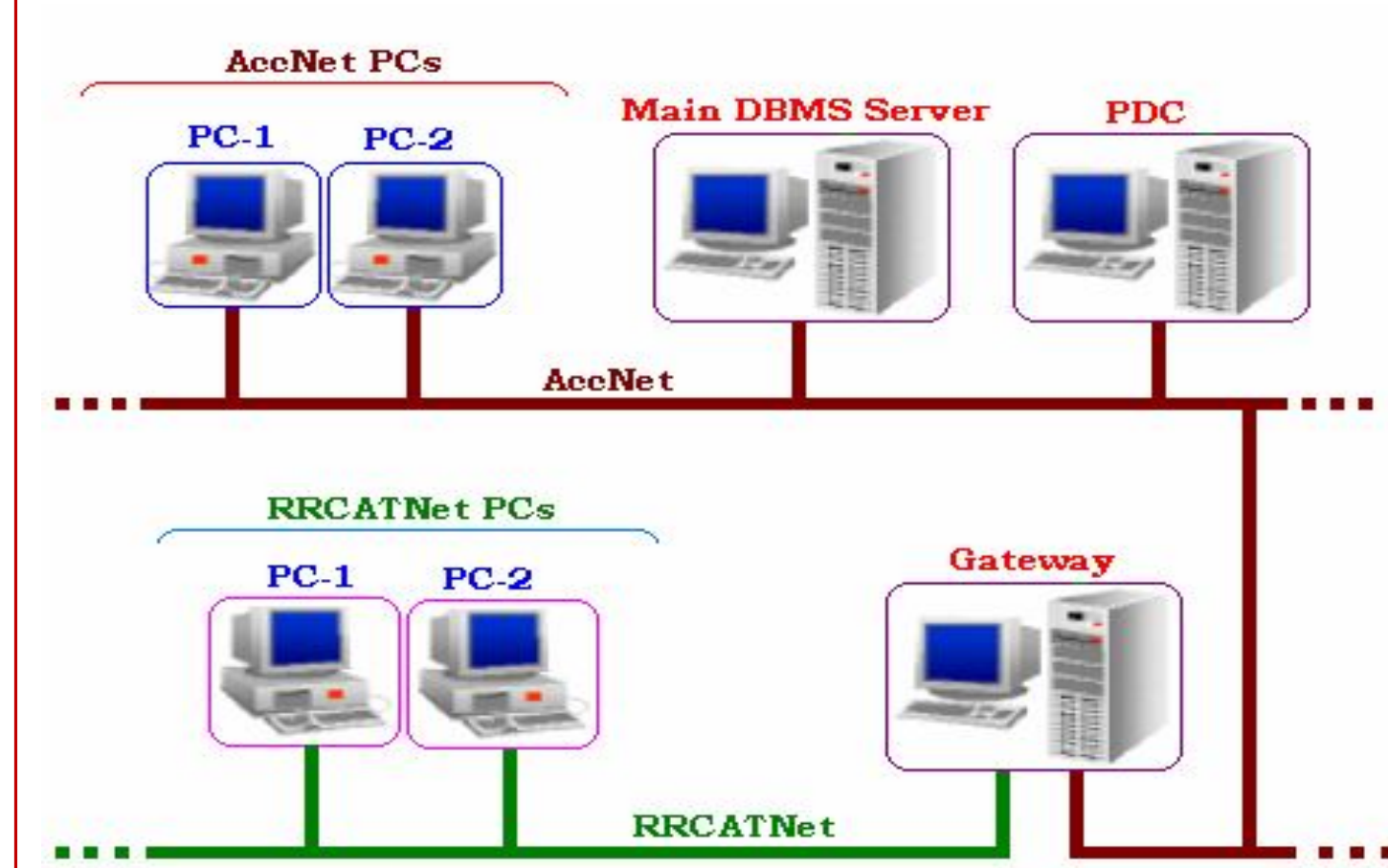
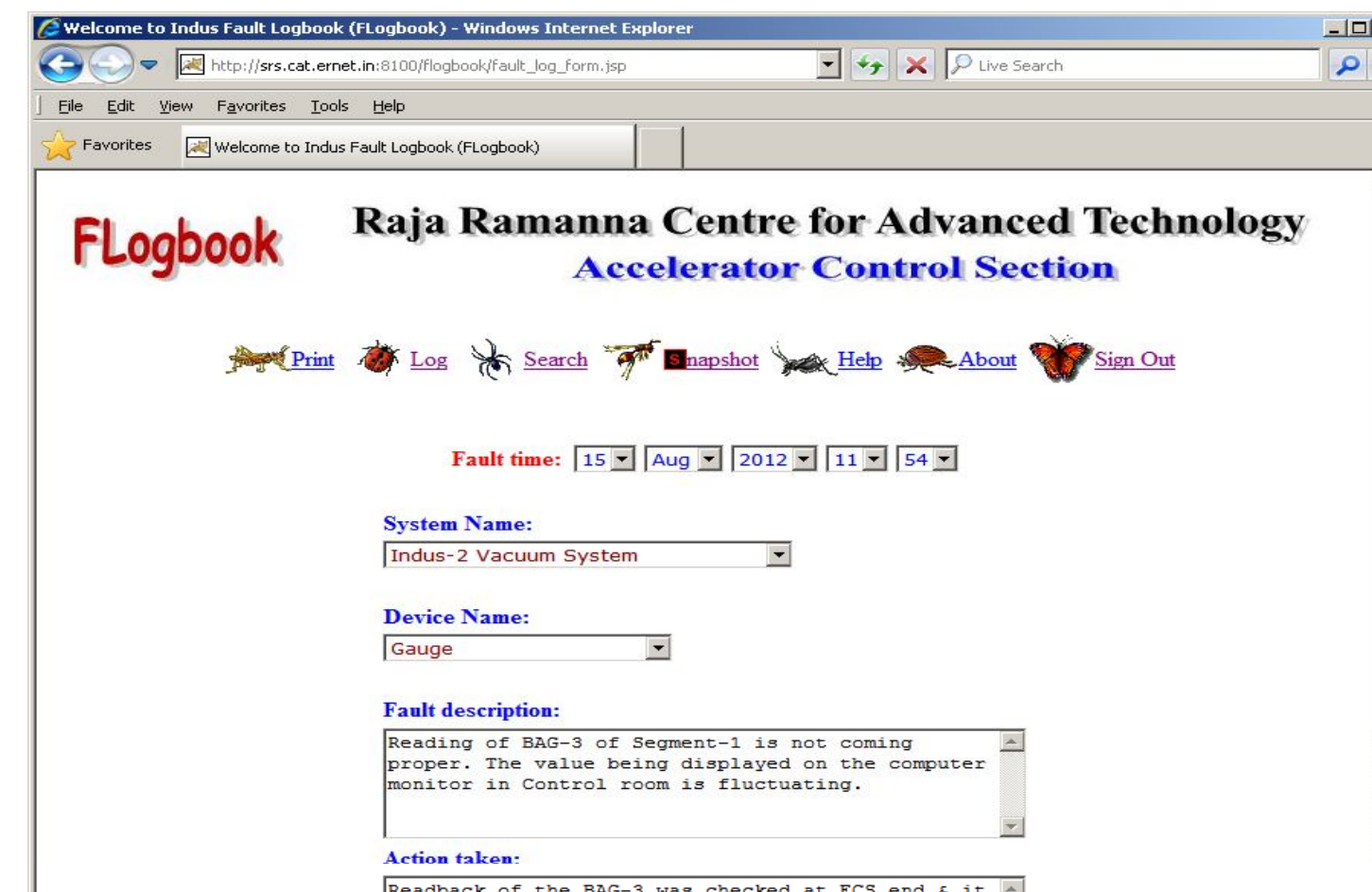
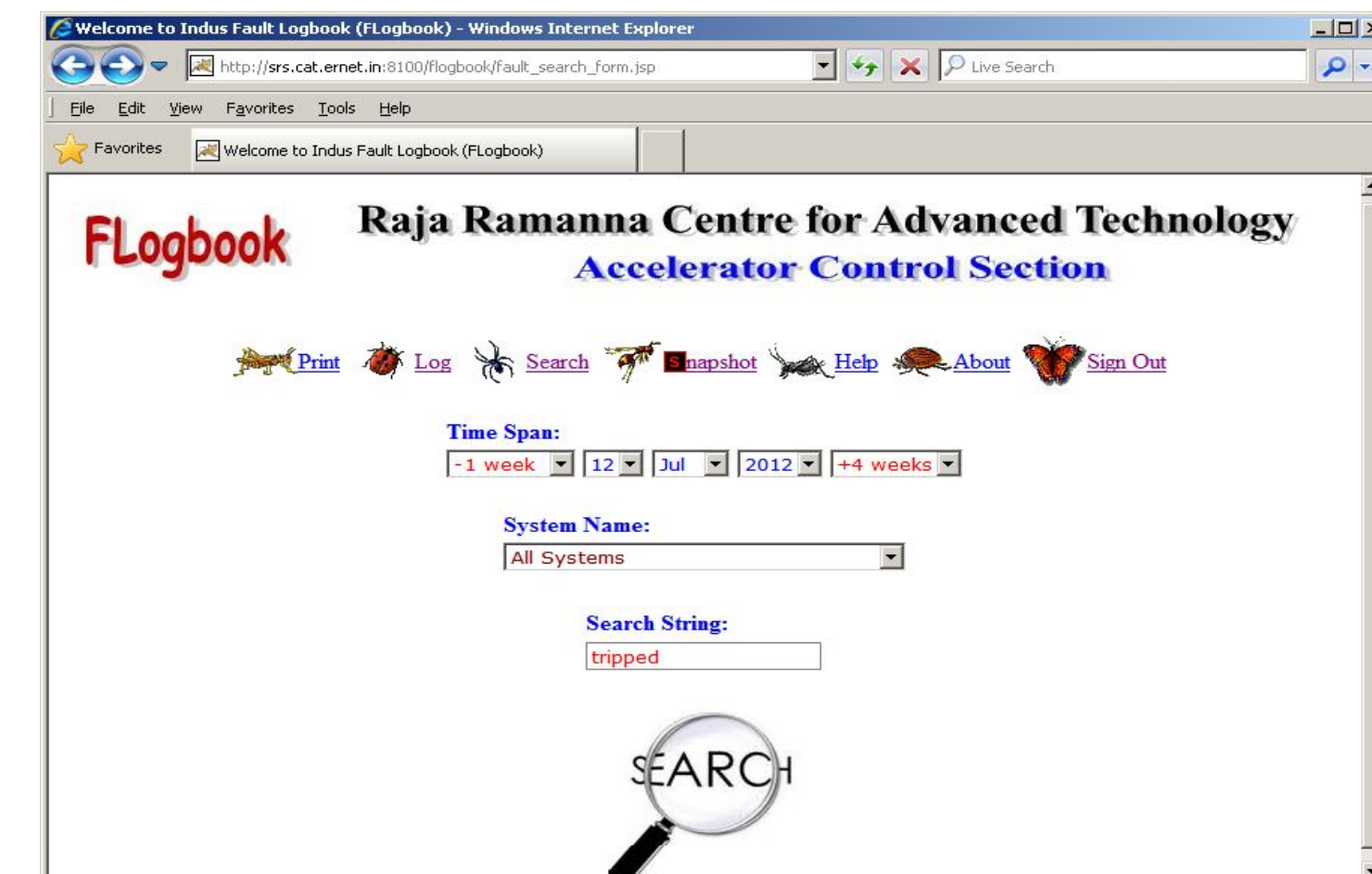


Figure 4: FLogbook Deployment

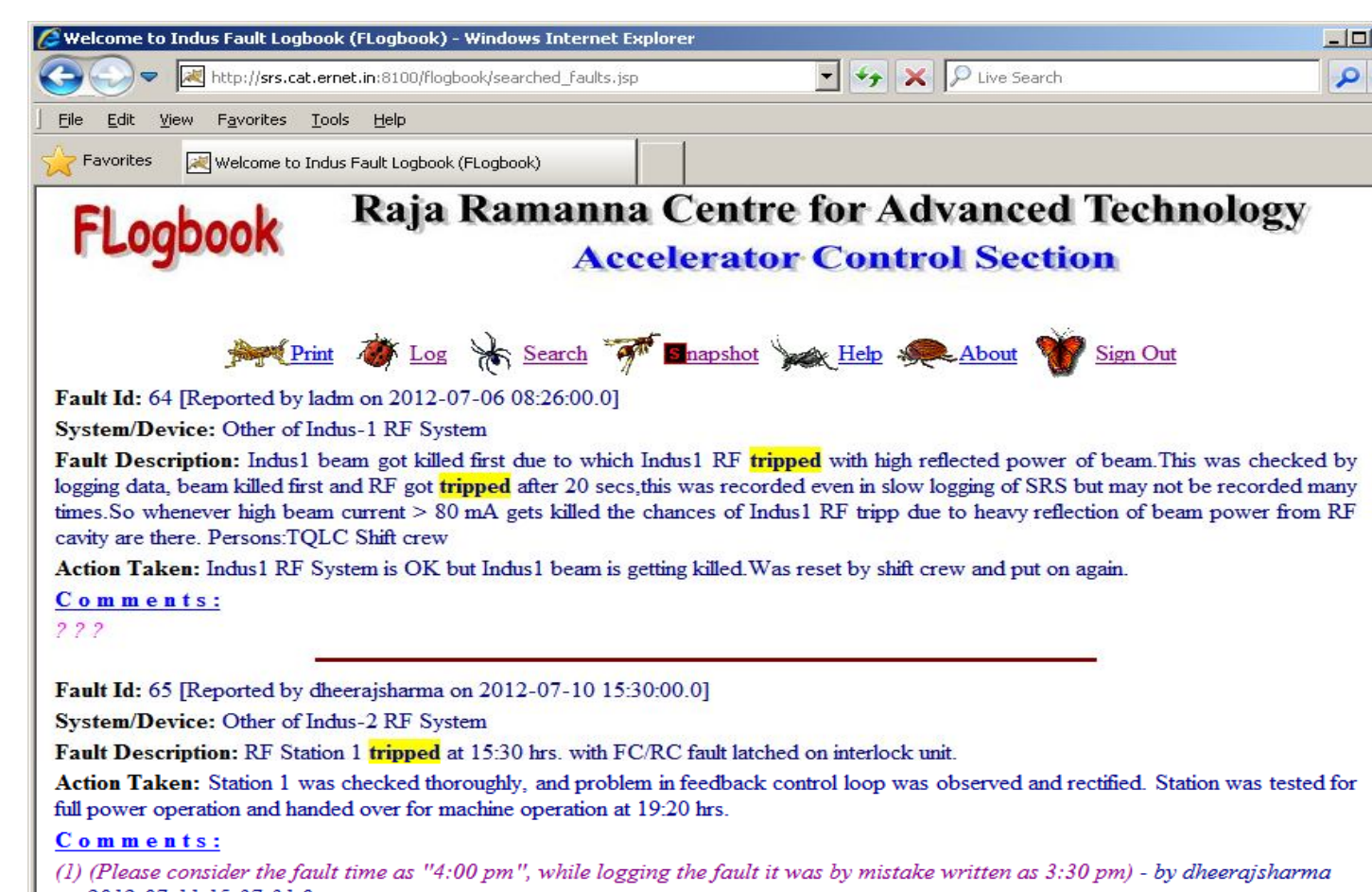
FLogbook in Action



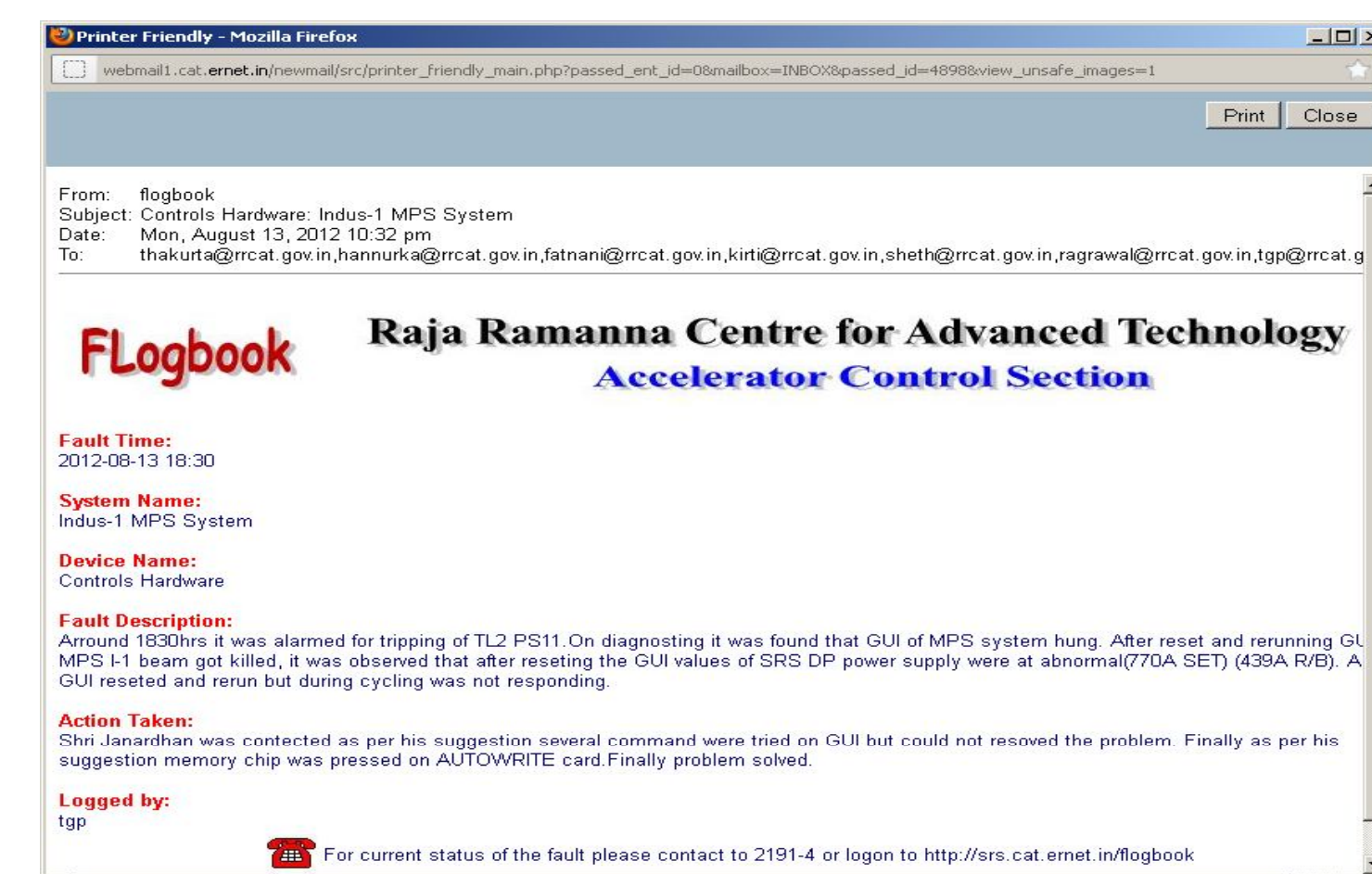
Snapshot-1: Information Logging Page



Snapshot-2: Information Query Page



Snapshot-3: Query Result Page



Snapshot-4: Email Sent by FLogbook

Description

FLogbook follows the three-tier software architecture for designing & executing its building blocks. Here Web Browser resides on client machine and works as **first or client tier**. JavaServer Pages (JSP) & JavaBeans components have been developed for designing the presentation/view and business/application logic (**middle tier**) of FLogbook.

JSP technology separates the user interface (content presentation) from content generation, enabling designers to change the overall page layout without altering the underlying dynamic content. Tags for content access and presentation reside in the webpage. Logic and programming code for content generation reside in reusable components. After receiving the client request, the JavaServer Page requests information from a JavaBean. The JavaBean can in turn request information from a database. Once the JavaBean generates content, the JavaServer Pages can query and display the Bean's content. JavaBeans components (beans) are reusable software programs that we can develop and assemble easily to create sophisticated applications. FLogbook uses JDBC (Java Database Connectivity) inside JavaBeans components for accessing the FLogbook database for inserting & retrieving the information.

For grabbing the screenshots of client's machines a software module developed in java and packaged in an executable jar file has been linked with the FLogbook.

FLogbook uses JavaMail API for sending the e-mails composed of the information logged by the operation crewmembers into FLogbook database. The JavaMail API provides a platform-independent and protocol-independent framework to build mail and messaging applications.

Microsoft SQL Server based relational database was designed to implement the **data tier** of FLogbook, which stores the complete information in related tables. Subsystem names of both the accelerators (Indus-1 & Indus-2) and concerned persons details are stored in the database so that logged fault information could be mailed electronically.

Deployment

Apache Tomcat is being used for executing & serving web components of FLogbook. Apache Tomcat has been configured on Gateway machine. This computer as shown in **Figure 4** is connected with accelerators' technical network (AccNet) as well as campus network (RRCATNet). The URL of the application has been mapped in DNS of both the networks so that it could be accessed uniformly from the machines of both networks.

Conclusion

The first version of FLogbook has been deployed in the field and being used by the operation crew members of both accelerators (Indus-1 & Indus-2). The system is very useful for not only the accelerators operation crewmembers but also for machine/subsystem experts for tracking the faults and improving the overall machine performance.