

Lab Companion : A software for laboratory management

M.Grover*, V.K. Sharma and S.Marla

**Author for correspondence*

National Bureau of Plant Genetic Resources, Pusa Campus, New Delhi-110012

Abstract

The complete sequencing of various plant and animal genomes (<http://www.ncbi.nlm.nih.gov/genomeprj>) and the advances in transcriptomics, proteomics and metabolomics have resulted in a virtual explosion in biotechnology and molecular biological studies. These studies involve large scale and complex experimentation. Keeping this in view we have developed a tool Lab Companion which serves to automate the maintenance of molecular biology and biotechnology laboratories. A relational database Lab Companion software was constructed. The backend was created using Microsoft SQL server 2005 and front end was created using Microsoft visual studio 2005 framework 2.0. The developed tool will serve to automate the management of stock inventory of the biotechnology and molecular biology laboratories.

Keywords : Software, SQL, Biotechnology

Introduction

Recent increase in the number of molecular biological and biotechnological studies have necessitated the development of a software tool to manage the laboratories. Lab companion is a software system proposed to be used in laboratories for the integration of all instruments, chemicals and other laboratory functions. The software is meant for biotechnology and molecular biology laboratories, however its use is not limited to these. A laboratory involves several functions such as management of chemicals, equipments, glassware, plastic ware and Software. The Lab companion serves to automate all these features. Several relational data management models have been developed to serve varied applications. [Gibbon (1996), Sapio Sciences] . The proposed " Lab companion" is designed to serve the requirements of a biotechnology laboratory".

Materials and Methods

A relational database management system was constructed for the Lab companion software (Fig.1). The backend was created using Microsoft SQL server 2005 and front end was created using Microsoft visual studio 2005 framework 2.0.

Results and Discussion

A comprehensive Lab management tool, Lab companion was created using RDBMS. A relational database management system (RDBMS) is a database management system (DBMS) that is based on the relational model as proposed by E. F. Codd.[Codd,(1970)]

Most common commercial and open source databases currently in use are based on the relational database model. The first systems that were relatively faithful implementations of the relational model were from the University of Michigan; Micro DBMS (1969) and from IBM UK Scientific Centre at Peterlee; IS1 (1970–72) and its follow on PRTV (1973–79)

The software developed has appropriate security features as a log in id and password is required to login to the system.(Fig.2) There is also a provision for retrieval of password if the password is forgotten. The front page menu (Fig.3) consists of the description of the software and a Menu which lists links to Accessories, chemicals, Equipments, Glassware, Plasticware, Search and Contact information. In the accessories page the user can input information on, Product code, Accessories Id, Name, Status, Description, Supplier Name, No. of Items, Supplier Date, Price,Packing etc. In the chemicals page the user can input information on Name of Indenter:, Date of Indent:, Office Order No., Chemical Id, Date of Order, Make:, Date of Manufacture ,status, name of chemical etc.. In equipments page the user can input information on Name:, Quantity:, Date of Supply, lab Location etc. . In glassware page the user can input information on product Id ,Name ,Status ,Name of indenter, supplier date, ,model, location, Equipment Id ,make, supplier name, date of indent, price, Quantity, office order no. etc. In plasticware page the user can input information on product Id, plasticware ID, Manufacturer name ,packing, Price/pack, Location ,Date of indent, plasticware, name, status ,capacity, Balance, total cost etc. In Glass ware page the user can input the information on Glassware Id, Product Id, Name of Indenter, Contact Persons, Office Order No, Manufacturer Name, Packing, Price/pack, Glassware Name, Date of Indent, Quantity, Date of supply, Status, Capacity etc. All the above mentioned pages contain search

functions for further retrieval of data from these pages. A separate search page serves to search the database for relevant items.

This database can also be extended to include maintenance of repositories of different DNA (plasmid DNA, Genomic DNA, organellar DNA, vector DNA, clones), RNA (total RNA, mRNA), proteins, antibodies, genomic, cDNA, EST, BAC and YAC libraries, maintained in a molecular biology and biotechnology laboratory with regular updation facility. In conclusion a tool Lab companion has been developed which will serve as an efficient "companion" to molecular biology and biotechnology laboratory management.

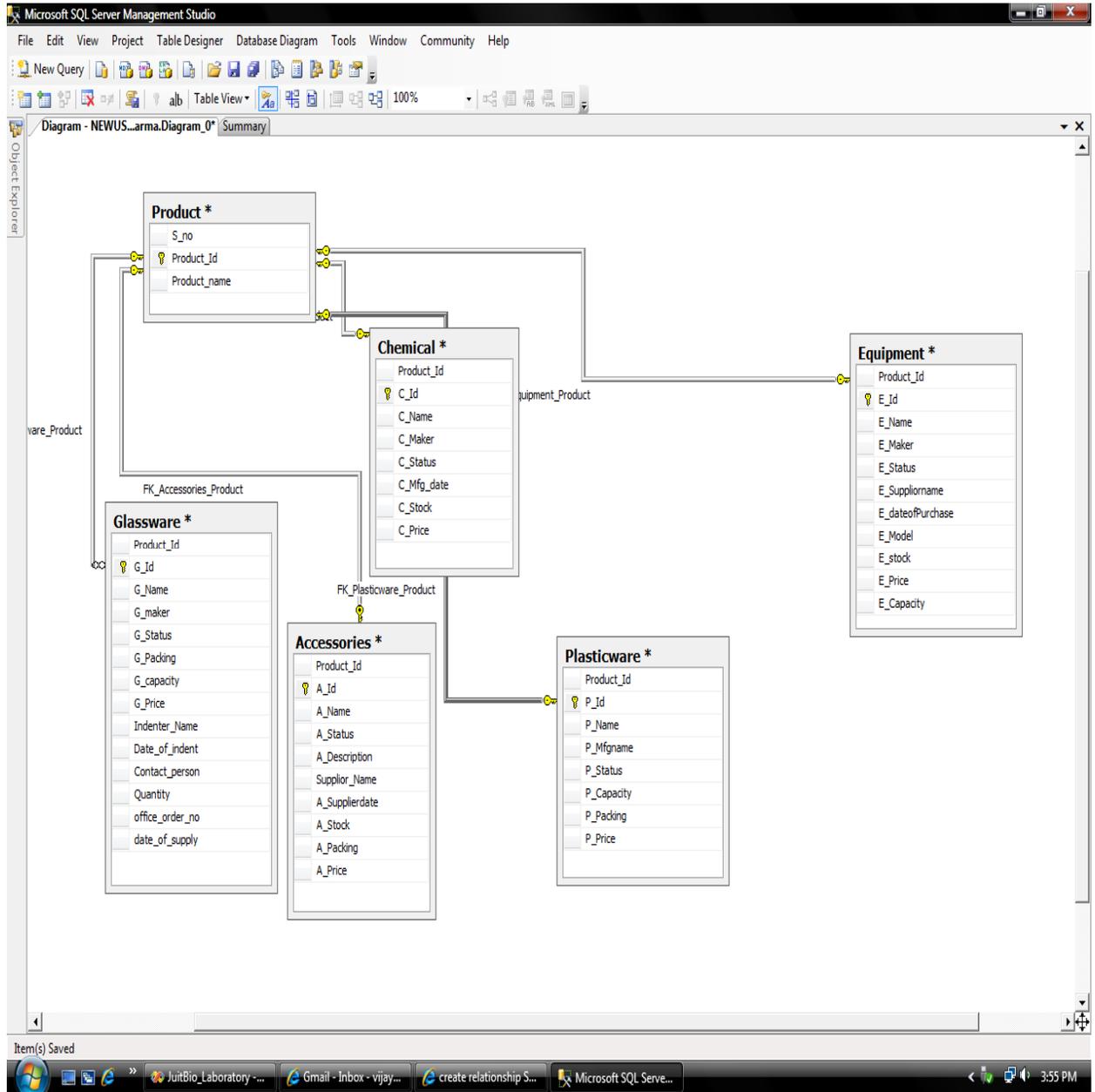


Fig.1 Schema for construction of Lab companion software

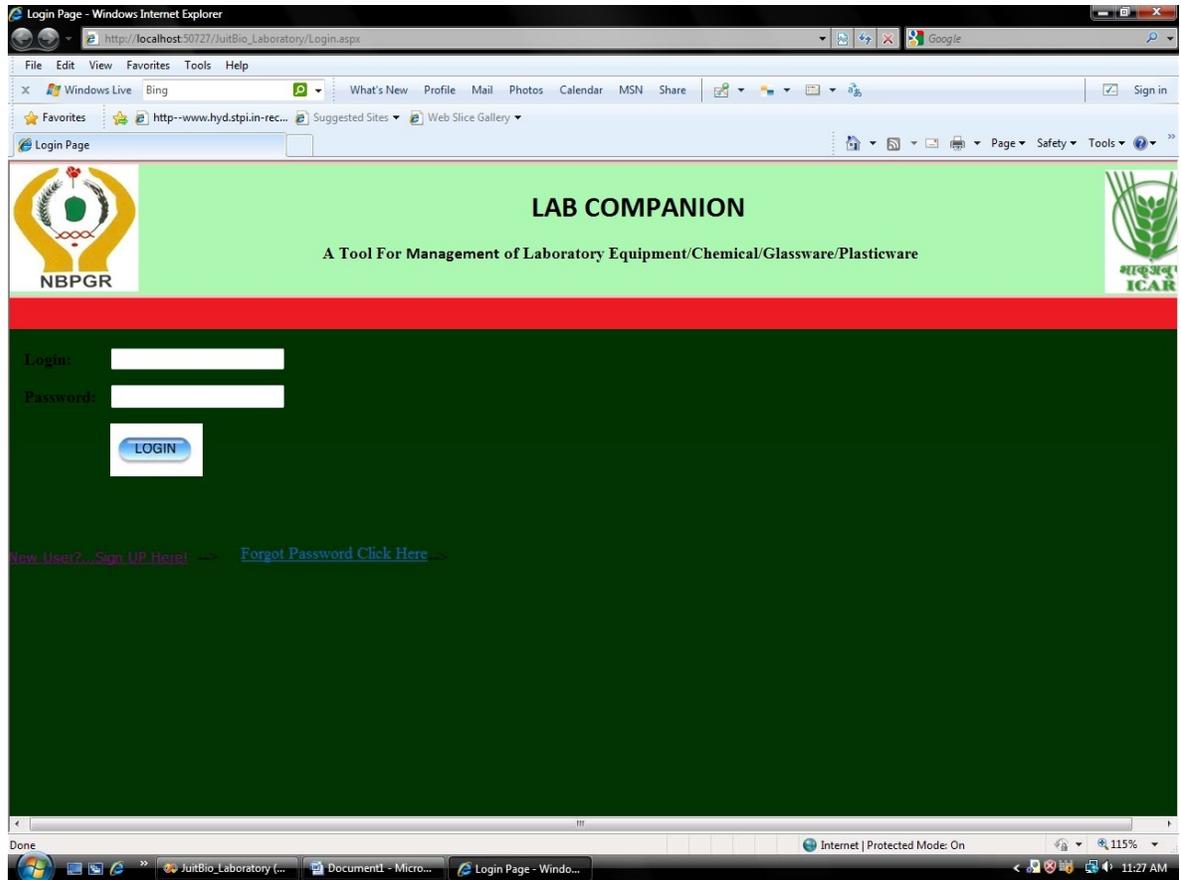


Fig. 2 : A screenshot of the Lab Companion Log in Page

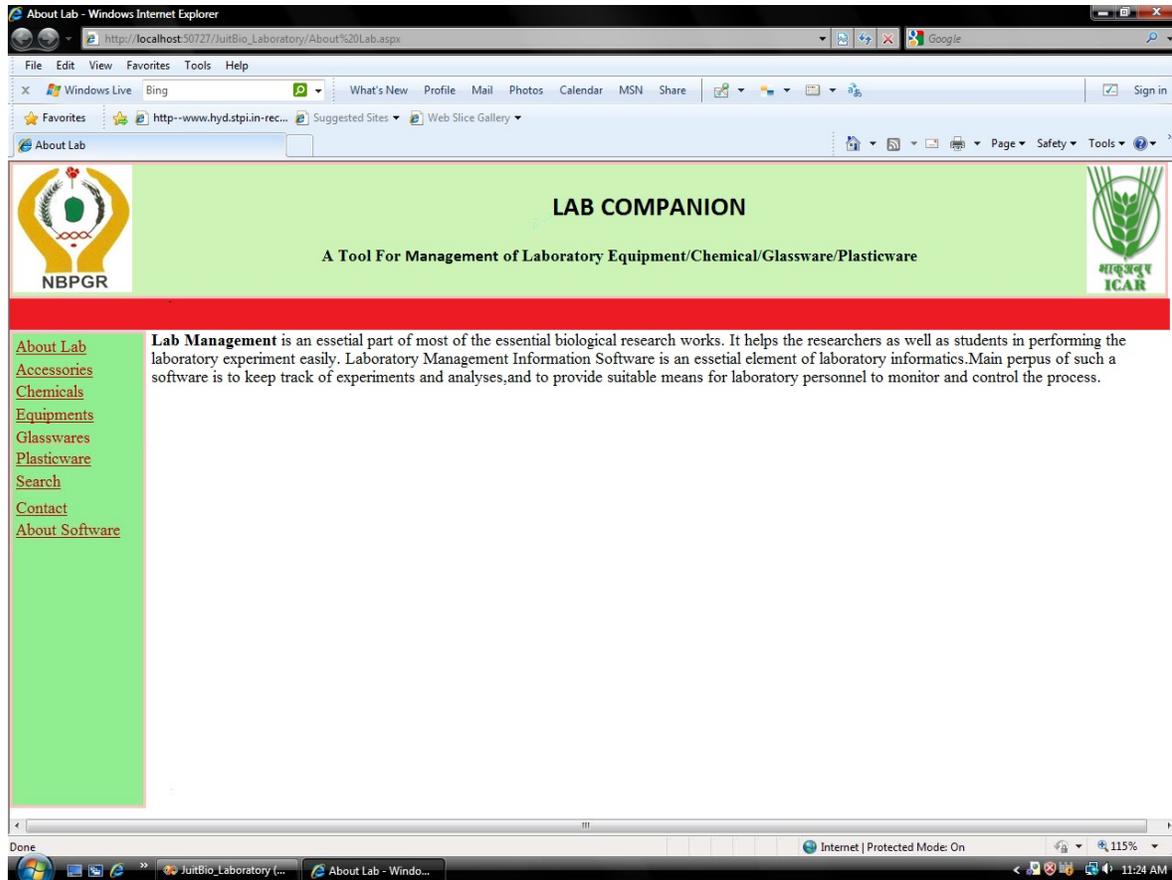


Fig. 3 : A screenshot of the Lab Companion Front Page

Acknowledgements: The authors thank Director NBPGR for supporting this work

References

- [1] Codd, E.F. (1970) . A Relational Model of Data for Large Shared Data Banks. Communications of the ACM 13: 377-387
- [2] Gibbon, G, A Brief History of LIMS. Laboratory Automation and Information Management **1996**, 32(1), 1-5
- [3] *Sapio Sciences* , Exemplar LIMS - A Complete Solution for Translational Medicine.