

DALBIR SINGH

System Analyst (Senior Scale), University Computer Centre
Coordinator, Online Exams and Computerization of Examination Branch
Co-Coordinator (Computer Operations), Centralized Admission Cell
Assistant Nodal Officer, iHRMS

1. Initiate and Manage development of Software for automation of various administrative functions in university environment (e.g., Examination, Admission, Finance & Establishment etc.)

- **EXAMINATION BRANCH, PUNJABI UNIVERSITY PATIALA**

<https://pupexamination.ac.in>

Concept Introduction, Development, Maintenance and Coordination of the In-House Online Examination System including Various Online Examination Forms along with SMS and Payment Gateways, Internal Assessment Portal, Table Marking Data Feeding Online Portal, Computerisation of Registration Branch, Computerisation of OSA2 Set for Examination fee Reconciliation, Examination Computer Lab and Various Sets of Examination, Student/ College/ Department/ Staff Dashboards etc.

This online examination system is helping the management understand functional areas, improving the coordination between different branches, improving the quality of services provided to the students by the examination branches, bringing transparency to the examination system, reducing dependence on manpower, and reducing the burden on the examination branch.

The complete online examination system maintains a proper log of all the activities performed by the various end-user and protecting the security and confidentiality of application and data by implementing three tier architecture:

- Presentation Tier
- Application Tier
- Data Tier

This ensures a secure online application and provides security against attacks like hacking, unauthorised access controls, SQL injection, cross-site scripting, de-phasing, data security, and other attacks.

1. Online Application, Examination Forms and Dashboards

1. Online Bilingual Application Form (English and Punjabi) and Examination Forms

- Regular Students
- Distance Students
- Private Students
- A. Additional
- Re-appear Students (Regular, Private, or Distance Education Students)
- Data import through template sheets for examination forms for regular students, distance education students, and college students
- Golden Chance Students
- Deficient Exam, Golden Chance, B.A. Additional, etc.

Tasks Associated with the Online Application Form

1. Requirement Analysis and Liaison with Various Examination Sets, the Accounts Branch, and the Meeting Section
 2. Regular students, distance education students, and college students Data import through template sheets for the Examination Form
 3. Designing and developing online application forms (registration and examination) and a student dashboard, along with
 - a. Data Structure and Database Design
 - b. Course Requirement Basic Data and Eligibility Criteria
 - c. Validations and checks
 - d. Multilingual Form (Punjabi and English)
 - e. Biometric data, etc.
 - f. **Single Sign-In Student Dashboard** (Regular, Private, Distance Education Students, Re-Appear, etc.)
 - i. Fill, edit, or print the application form.
 - ii. Fill or edit examination papers and validate them as per ordinances or course schemes.
 - iii. Track Application Status
 - iv. Online tracking and verification of fee status
- **Online Fee Payment with an Integrated Payment System to Pay Examination Fees through the Following**
 - Debit Card
 - Credit Card
 - Net Banking
 - UPI
 - Offline Bank Receipt (Generated Online)

- SMS gateway integration
- Admit card for the exam

Key Highlights: The student application form has all the registration register details through which they can track and get the latest and live status of their application, exam papers, discrepancies, etc.

2. College and Department Dashboards for Regular and Distance Education Students

- View/download the applicant's record
- Fee Confirmation
- Paper allocation by grouping and validation as per ordinances or course schemes
- Download Cut-Lists
- Approve or block a student for the semester examination.
- Download Examination RLR and RLE Reports
- Teacher and Staff Account Management for External Award Feeding
- Reports of Current and Previous Sessions: Internal, External, and Practical Awards

3. Online Staff Dashboard for Examination Staff Routine Activities

- Online fee reconciliation and verification of various examination fees
- Course Masters, Fee Masters, College Masters, and Various Corrections
- View or download the applicant's data and cut-lists.
- View application status and edit student details.
- Mark Objection Online

2. Online Portal for the Collection of Internal Assessment Awards

Tasks Associated

1. Requirement Analysis, Designing, and Development of an Internal Assessment Portal
2. Single sign-in portal for various departments, neighbourhood campuses, constituents, and affiliated colleges of Punjabi University Patiala
3. Mapping of Student Data and the Master Database (Papers)
4. Validation of **Students** and Their Examination Papers
5. Facility to Fill, Edit, Print Preview, Lock, and Final Print Marks of Internal Assessment of Theory and Practical Awards
6. Facility to View or Download Current and Previous Session(s) Internal Award Lists

7. Single Sign-in Dashboard to Manage, View, and Print Current and Previous Sessions Awards

- a. Verification of Student Records
- b. Validation of Awards through an Online Intelligent System
- c. Check marks obtained by the candidate should be less than the maximum marks and as per the ordinance.
- d. Marks cannot be entered for blocked or unapproved candidates.
- e. Awards can be entered only for the subject that was selected by the candidate while filling out the examination form.
- f. Alert or check the department or college dashboard if the subject of the candidate changed after award feeding.
- g. Log book to maintain a record of each and every award.
- h. Prevent changing awards after the award has been locked.

Key Highlights: Smart Algorithms automatically detect the students for various kinds of discrepancies and improve the result efficiency.

- a. If the paper(s) of a student change during award feeding, then the system will automatically detect it and report it to the department.
- b. Before locking awards, the system automatically identifies if awards for all students have been entered or not.

3. Online Portal for the Collection of External Awards

Tasks Associated

1. Requirement Analysis, Designing, and Development of an External Awards Portal
2. Mapping of Papers with the Master Database (**Lal Kitab**)
3. Single sign-in portal for various departments, neighbourhood campuses, constituents, and affiliated colleges of Punjabi University Patiala to facilitate
 - a. User Management for Award Feeding
 - b. Verification of Award Masters
 - c. Fill/Edit/ Print Marks of External Awards
 - d. View or download current and previous session external award lists.
4. Routine Inquiry Associated with Award Feeding in Various Departments and Colleges

4. Online Portal for the Fee Reconciliation and Reports (Accounts Branch OSA-2)

1. Online Live Portal for Various Fee-Related Reports for the Following Categories

- a. Registration Type (Regular, Private, Distance, Additional, and Reappear) Wise Reports
- b. College-Wise Reports
- c. Class and semester-wise reports
- d. Session-Wide Reports
- e. Even Odd Session-Wise Reports

Proposal Under Progress: Live RLF Reports to reduce RLF in result and improve the result efficiency.

5. Online Registration Branch Portal (Centralised Student Repository)

Tasks Associated

1. Requirement Analysis, Designing, and Development of Portals
2. Mapping of Students with Various Sets (Role-Based Implementation)
3. View or download student records (only authorized)
4. Student Verification
5. Edit Student Record
6. Mark, View, or Process RLR Objection

Key Highlights: Now students and departments can get RLR objection details before the result declaration. Departments and colleges can get live RLR reports and mark their corrections before the result processing.

- *Online Management System for Examination Duty and Panel Management*
- *Online Content Management System for Examination Results, Gazettes, Datasheets, Cultists, Notifications, News, Important Notices, etc.*

6. Additional Regular Jobs and Responsibilities in Examination

1. Team Leader of Technical Team
2. Capacity Building, and Staff Training
3. Routine Application Modifications, Troubleshooting and Reengineering of various Application Software
4. Server, Database, and Application Design, Development, Management, and Administration
5. Liaison with Various Sets and Branches of Examination Branch, Accounts Branch, Meeting Section, Bank, Department, Colleges, etc.
6. Dedicated technical support to various Colleges, Departments, Cells, and Branches associated with Examination-related tasks through the Mobile Helpline, email, and Manual mode.
7. Student Grievances, Enquiries, and Support
8. Miscellaneous Reports to various Branches and Cells of the Examination Branch and Other Departments and Cells of Punjabi University, Patiala
9. Allotment of Examination Roll Nos., Admit Card, and Prepare Cut-Lists
10. Fee Reconciliation and Technical Coordination with the Bank for various Payment Gateway and Fee-Related Issues
11. Technical Support for the Distribution of Examination Question Papers Through the Online Portal and Email

▪ CENTRALISED ADMISSION CELL, PUNJABI UNIVERSITY PATIALA

<https://pupadmissions.ac.in>

Introduced, developed, and maintained the complete in-house online admission portal, integrating it with the payment gateway and SMS gateway for the various courses running at the Punjabi University main campus, neighbourhood campuses, regional campuses, and its constituent colleges for the last 10+ years.

- This application collects admission-related data from aspiring candidates interested in seeking admission to various courses at the university. This includes contact details, qualifications, demographics, and other information.
- Applicants have the complete ease of filling out the forms online at any time. Features also include editing, the download facility of application forms and admit cards, and the online payment of the processing fee.
- The privacy of this collected data is also kept remarkably high. It is done by implementing a three-tier architecture and by Server-side and Form validation etc.

This ensures a secure online application and provides **security against attacks like hacking, unauthorized access controls, SQL injection, cross-site scripting, de-phasing, data security, and other attacks.**

- Four payment modes have been integrated into this application:
 - **Online:** net banking and payment through debit or credit card
 - **Offline:** Pay-in-slip of State Bank of Patiala and Punjabi University Cashier Fee Receipt (Patiala Campus only).

In these processes, I worked as an expert technical member during the selection of the payment gateway and implemented the finalised payment gateway with the online admission portal to facilitate candidates' payment of admission fees in optional online mode with a 99.99% success rate.

- An integrated SMS gateway facilitates student fee confirmation responses, admission/entrance test/result alerts, and recovering their passwords.
- Entrance Test Activities
 - Generation and avail an online admit card along with a photograph and signature.
 - Preparation of cut lists and attendance sheets with biometric data.
 - On-Spot Registration and Form Filling Portal and Assign Roll No.
- The online submission of admission application forms was intended for
 - 52+ university departments

- All regional centres and neighbourhood campuses of Punjabi University Patiala

Other Important Involved Activities:

- Technical Expert Member in Selection of Domain Name Registration, SMS Gateway, Payment Gateway, and Web Server
- Registered a secure and safe web domain name on ERNET India.
- Development of various on-demand portals for administrative and help desk teams like password recovery, latest fee status, on-spot fee, form filling, etc.
- Train the technical team for testing and implementation of the online admission system and update the portal as per testing results and requirements.
- Set up the web server as per application requirements.
- Monitoring the database on an hourly basis for any kind of discrepancy or error.
- Daily backup of the database
- Daily or hourly update of the online portal and database regarding online available information, application forms, candidate fee status, blocking or unblocking candidates application forms, etc.
- Weekly or daily update of application form fees in the master database
- Provide registration data to the technical team for various activities like fee reconciliation of offline and online fees paid, admission alerts through SMS or email, sitting plan preparation, etc.
- Generation of on-demand reports for various analyses:
 - Identify duplicate registered candidates before the entrance test.
 - Randomly ordered admit cards, cut lists, and attendance sheets
 - Identify a list of candidates who had registered and filled out an application form but had not paid their application fee.
 - Identify candidates who paid their application fee but did not fill out their application form.
 - Identify any kind of discrepancy or error related to candidate information like contact information, biometric information, etc. that is required for the admission process.
- Consistent modernization of the online admissions portal with enriched features during successive years for attaining new requirements, better performance, and security.

- **RE-ENGINEERING OF ONLINE APPLICATIONS AT THE CENTRALISED ADMISSION CELL, PUNJABI UNIVERSITY PATIALA**

Every year, the online admission software is upgraded to achieve sustainable automation while keeping in view the latest challenges, vulnerabilities, and security aspects by lowering manual interventions.

- Now, the online admission software is fully automated, responsive, and has various automated modules, such as:
 - a. A completely automated and managed single registration portal for registration of various undergraduate, postgraduate, diploma, certificate, state-level courses, M. Phil., Ph.D. courses, courses with or without entrance tests, engineering courses, etc.
 - b. Role-based administrative portal for the front/help desk team to execute the following tasks:
 1. Create a new form.
 2. Add a new field or modify an existing running form.
 3. Add or modify new categories, courses, notices, fees, or other information using our in-house developed online responsive content management solution.
 4. Assign roll numbers and can generate cultists.
 5. On-the-spot registration of candidates
 6. Allow or block candidates for the next process.
 7. Automatic Confirmation of Online Fee Mode and Portal for Manual Confirmation of Fee for Offline Mode
 8. Start or stop various activities like enabling late fees, registration, form filling, printing admit cards, etc.
 9. Capable to auto-design Online Portal for State Level Counselling's.
 10. Single Sign on Online Dashboard of students for various activities like Fill/ Edit Online Application Form within stipulated date, Print Admit card and to check their completed/ pending processes, Pay Application Processing Fee, Fill Choices etc.

- **ONLINE COUNSELLING'S SOFTWARE, PUNJABI UNIVERSITY PATIALA**

Developed and successfully executed an in-house online solution for counselling of various courses at Punjabi University and its neighbourhood campuses like M. Tech., MCA, M. Ed., LAW (Point 3), etc.

The Complete Counselling Software includes:

online web-based module to authenticate, authorise, and capture the candidate preferences regarding the colleges, departments, and courses for first, second, and successive counselling.

Local server database algorithm module for allocation of seats to candidates on the basis of their merit position, online captured preferences, and policy framed by Punjabi University, Patiala

- Various summary reports after the allocation of seats:
 - Automatically updated seat matrix
 - Candidate-wise Allocation Report
 - Category-wise Allocation Report
 - Department-Wide Allocation Report
 - College-wise allocation report
 - Cut-off Minimum and Maximum Course and Category-Wide
 - Various run-time on-demand reports for successive second, third, and manual counselling

Developed and successfully implemented a complete in-house online admission and counselling software solution for MBA Two-year regular course admission for Punjabi University, its neighbourhood campuses, and affiliated colleges for academic sessions 2013–14 and 2014–16

- This helped the admissions and counselling committee accomplish admission and counselling activities in a transparent manner.
- The complete package includes the following modules:
 - Setup of a web server and domain name registration
 - web-based software application module for capturing admissions data related to contact information, qualifications, demographic information, and other information relevant to admissions of the aspiring candidates who are interested in seeking admissions to MBA-two-year regular courses at the university, its neighbourhood campuses, and affiliated colleges.
 - The applicant can get complete online information regarding the course and seat availability from time to time.
 - Applicants can fill out, edit, and download their application forms and admit cards completely online.
 - Various SMS and email alerts regarding entrance exams, results, counselling schedules, etc.
- Web Based Well-Executed Software module for allocation of seat along with automatic update of seat matrix.
- Various real time and on demand basic Reporting queries to get various kind of summaries like total filled/ vacant seats in various colleges/ categories, Reallocated/ re-vacated seats.

- Printing Module linked with previous online Captured database for printing of On-Spot of Admit Cards, Attendance Sheets and Allotment letters with candidate photograph and signatures.
 - Online website Update of Daily Summary report/ Seat Matrix for various departments and students to get the daily updated report regarding the total filled/ vacant seats in various departments and Categories.
 - Daily Backup and update of database and website.
 - Control panel administration, FTP account management, Database management and website security.
- **DEVELOPED AN IN-HOUSE ONLINE ADMISSION PORTAL FOR ADMISSION IN VARIOUS COURSES OF THE CORRESPONDENCE DEPARTMENT OF PUNJABI UNIVERSITY, PATIALA.**
 - **DESIGNED, DEVELOPED, AND SUCCESSFULLY IMPLEMENTED A COMPLETE IN-HOUSE ONLINE ADMISSION PORTAL FOR VARIOUS UNDERGRADUATE COURSES AT THE ENTRY LEVEL RUNNING AT DIFFERENT COLLEGES OF PUNJABI UNIVERSITY FOR THE ACADEMIC SESSIONS 2017–18 AND 2018–19.**
 - This application has the capability to authenticate candidate registration data from different boards like the Punjab School Education Board, ICSE, CBSE, etc.
 - This application collects data related to contact information, qualifications, demographic information, and other information relevant to the admissions of aspiring candidates who are interested in seeking admission to various courses at the university.
 - Student Dashboard: Applicants can fill out, edit, and download their application forms using the Student Portal.
 - **College Administrative Portal:** Various colleges can view and download successfully registered candidates' data. They can approve and admit their candidates. This data will be further utilised for different student-centric activities like examinations, identity cards, and student alumni.
 - Implemented a three-tier architecture (server-side validation, form validation, secure passwords, etc.) for securing online applications to provide security against hacking, unauthorised access control, SQL injection, cross-site scripting, de-phasing, data security, and other strictures.
 - Integrated SMS gateway facilities student admission/ result alerts and to recover their passwords.

▪ **PUNJABI UNIVERSITY PATIALA OFFICIAL WEBSITE**

<http://www.punjabiversity.ac.in>

A website is an essential tool to represent an institute in today's digital era. It is also a major source of information for the outside world. To achieve this, conceptualised and re-engineered the official website of Punjabi University, Patiala, from a static system to a complete dynamic.

The CMS-based official website has the following features:

- **In-house** complete website content management system for various kinds of day-to-day-based activities like faculty and employee data and **profile management, administration profile management, neighbourhood campuses and constituent colleges, various departmental content and webpage management, syllabus management, online procurement, tendering, notices, and event management systems, course management systems, student and employee alumni management, noticeboards** etc.
- **Uniform structuration** of various webpages like About University, About Patiala City, Photo Gallery, University Functionary, About **Centralised Facilities, Faculty and Departments**, Neighbourhood Campuses, Regional Centres, Ph.D. and Research, Accounts Branch, Health Centre, **Library, IQAC, RTI, Download Centre, Download Syllabus, Vacancies, Tenders, Recruitment Advertisements**, Important UGC/University Notifications, Admissions **Notices, Alumni Association, Director Sports Noticeboard** etc.
- Configure the **subdomains** of all departments, neighbourhood campuses, important branches, cells, and centres of Punjabi University Patiala in a uniform manner.
- Secure department CMS login portal for regular upkeep of their webpages.
- **Bilingual Webpages**
- Integrated SMS facility
- **Responsive Layout**

2. Teaching and Research Support to Teaching, Technical Staff, and Other Duties

- Providing **technical support** to the team members of various core technical teams for software development, web site development, database handling and management, web hosting, and setup
- **Providing support and consultancies** to various departments like the Centralised Admission Cell, Computer Science, Punjabi Pedia, Examination, Accounts Branch, Botany, and the Centre for Advance Media Studies, etc.
- Specifically involved in technical parameters for the proposal and setup of the **ETD Lab** with a UGC grant of Rs. 19.65 lakhs under the Shodhganga project for digitization and the ETD Lab
- Involved as an **expert member in purchases** of IT equipment and IT-related services like:
 - Bandwidth, web space, and domain name
 - Website development and maintenance
 - Software/ ERPs.
 - Firewall, and Wi-Fi access points.
 - Equipment like workstations, servers, desktops, laptops, photostat machines, fax machines, printers, projectors, UPS, etc. for the university where the University Computer Centre participates as a member in the centralised purchase committee for
- Provide assistance in **formulating policy** and provide consulting to various departments at the university level to implement e-waste policy.
- Implementation of Microsoft licences at Punjabi University Patiala's main campus, its neighbourhood campuses, and regional centres
- Setup of a **Smart Class Room Solution** and Training Programme
- Nominee for Director Computer Centre/Expert Member of Computers in College Inspections
- Setup and Evaluation of University **Exam Papers**
- Centre superintendent for PGDCA examinations for the last two years
- Perform various **UGC exam duties**.
- Managing the official **email services** of Punjabi University, Patiala These services are being made available to faculty, administrative staff, and research scholars.
- PGDCA Coordinator and subject expert in ASP.Net, SQL Server, HTML, Scripting Language, and Computer System Architecture
- **Taught** MCA and BPT students. I am currently taking PGDCA classes.
- Performed duties as an **assistant coordinator in the MBA** Two-year regular online admission and counselling
- Performed duties as **In-Charge Computer Operation and Co-Coordinator in the Centralised Admission Cell** from 2012 until now.

- Performed duties in recruitment-related type tests, staff training courses, skill development programmes, state-level B. Ed. counselling, MBA two-year regular admission and counselling, university-level entrance exams, and UGC/NET exams.
- Performed duties as an **expert member of UGC's Human Resource Development Refresher Courses**.
- Technically trained to lead the team for conducting type tests and **recruitment tests** and perform computer lab in-charge duty during clerical recruitment at Punjabi University.
- Provided six months of **industrial training** to B.Tech. and MCA candidates of universities or other colleges on various projects like the online admission system, online shopping system, and online administrative portal for student-centered activities using the latest technologies and toolkits.
- Organised, managed, and conducted various **specialised training programmes**, lectures, and events to promote the latest trends in the IT sector.
- organised, participated in, or attended various technical workshops, seminars, and events. Participated in the various events organised by the University Computer Centre by providing participation in terms of online registration of participants, designing banners, invitation cards, and participation certificates for the participants, etc.
- **Technical expert member** for the selection of payment gateways and SMS gateways for the online admission portal.
- **Team leader of the technical team** for reengineering the Punjabi University, Patiala, official website and Examination.

3. Conducted various short-term computer courses and training programmes for the students, university or college teachers, staff, etc.

1. Organise and deliver **trainings** in various training programmes for various **examination online applications** to the OSA-2 (Account Branch), examination staff members like clerks, lab attendants, senior assistants, superintendents, assistant registrars, and Deputy registrars, department heads, college heads, principals, etc.
2. Given **industrial training** for six months to B. Tech. or MCA candidates of universities or other colleges on various projects like the online admission system, online shopping system, and online administrative portal for student-centered activities using the latest technologies and toolkits.
3. Organised, managed, and conducted various **specialised training programmes**, lectures, and events to promote the latest trends in the IT sector.
4. Acted as a resource person for UGC-Human Resource Development **Refresher Courses**
5. Officially deputed and trained to use anti-plagiarism software **Ouriginal (URKUND)**. Ouriginal (URKUND) is an automated system for handling plagiarism. Further, give assistance regarding this to the whole faculty and students of the university. Organised as well as delivered expert lectures on implementation and usage of URKUND to the various teachers and research scholars of various departments, neighbourhood campuses, and affiliated colleges of Punjabi University, Patiala.
6. Conducted training a number of times for data collection used by election commission software in the various departments.
7. Training to the accounts branch and establishment branch for the implementation of **iHRMS**.

4. Administration of Computing Facilities AI Supercomputer facilities and promote their use.

Manage and administer **high-end computational AI workstations, and GPU SuperServer:**

- for high-end computing facilities for the research students of various departments.
- Configured as a web server for hosting IQAC online data collection applications, research branch software, etc.

Xeon multi-core x86 Intel Blade-based technology processor servers on Linux and Windows platforms from IBM are being used to run various applications at UCC.

- Use as a testing server for set-up, testing, and configuration settings of various IT hardware and software like firewalls and their user management, Active Directory configurations, WAMP servers, LAMP servers, SQL servers, FTP servers, application servers, web servers, etc.
- These servers are configured as web servers for hosting and testing various in-house developed online applications like the Online Admission Portal, the University Official Website, IQAC Applications, and various student-centric activities, e.g., printing of admit cards, collection of student and staff data, etc.
- maintaining backups of various databases like previous year's admission databases, firewall user activity log backups, election commission data, etc.