# Status Report

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# E-Governance in State Universities

**The Kerala State Higher Education Council**

**January -2022**

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# University of Kerala

## 1. University of Kerala

### E-Governance initiative: Administration

*Recruitment Portal*: There is an online registration portal for various posts called for by the University is and it was implemented in 2019, various recruitments are successfully conducted through this portal. Contract posts like, Lecturer posts in various departments, Non-teaching posts in the engineering wing are the main registrations done through this portal. Now it is a full-fledged portal for recruiting all posts at University of Kerala.

*Online Meetings:* almost all the University meetings are conducted through online mode. University meetings such as Senate, Syndicate, Academic Council, Dean's Meeting, etc., and Government meetings are also done online. G-suite for the academic plan is used for this purpose. Various university departments have used it to conduct classes in online mode.

The University has implemented Digital file flow systems throughout the University. All office files move through this DDFS with tracking facility.

There is a dedicated portal for teachers and staff – Ku-finance for all online service including salary and service benefits, IT statements, leave details, PF etc.

Separate IT Cells functions under the Computer Centre, office of Controller of Examinations and Finance wing.

A mobile application 'Aacharya' was adopted in 2019-20 fir teachers to track their publications and academic credentials.

As the part of IT Infrastructure development, we have a tier-3 Artificial Intelligence based Data Centre and its DR site implemented at Karivattom campus. We have implemented 10GBPS OFC connectivity throughout both campuses with a 1 GBPS Internet.

We have initiated theatre classrooms in all departments

### E-Governance initiative: Academic

### Revamping of Research Portal:

The University of Kerala is on the path to provide a state of the art, end to end solution for all the stakeholders associated with research activities.The portal will exclusively cater to the research scholars, research guides, and administrative staff of the University and be made available 24x7.The portal is envisaged to augment the research activities by minimizing all bureaucratic hassles utilizing a seamlessly integrated structured software

solution, beginning from registration to Provisional certificate award to the research scholar.

Digitization research activities would enhance the productivity of all the stakeholders. Further, the portal minimizes paperwork and would adhere to green protocol.

*Students Life Cycle Management:* The Aim of the Student Life Cycle Management is creating a comprehensive examination system in the University of Kerala and extents the solution to the other Universities. The projects cover IT enabled examination management that gives a single platform for the examinations. The services are useful to all stakeholders of the examination. the project is sharpening the IT enabled services into a single platform, and then optimizing it in the examination process that gives better service to the students. This reduces the time lag in the examination processes and faster result processing. Proper conduct of examinations and time declaration of bound results are major challenges faced by the Universities in Kerala. This can be eliminated by the use of IT enabled services in the examinations integrating software applications in a single platform. The stakeholders of other universities also beneficiary of this project. After completion of the project this can be customized for the interested Universities with a minimum cost. Now this project is under development at the University.

*Enhancement in Admission Process:* Ever since the admission to various affiliated colleges and departments was started in online mode, frequent changes were made in the software for making the admission process more transparent and student-friendly. During the academic year 2019-20, the following changes were made in UG/PG admissions software.

- Admissions to community quota through online mode only:

  Admission to the community quota in all Aided colleges was made completely through online mode. As one would expect, this involved considerable software changes. First and foremost, all candidates were given provision to give new college and course preferences wherein they wished to study under community quota. Based on these options, the community rank list was prepared and published on the website.

- Admissions to sports quota through online mode only:

  Like community quota, admissions to deserving sports-persons under sports quota in all the affiliated colleges were also made online. Consequently, the older software had to undergo a drastic revamp to facilitate this change. All applicants who had declared

themselves as sports-persons during the initial registration were given the provision to upload scanned copies of their sports-related certificates on the website.

- Online mode of payment:

  In our pursuit to go completely digital, candidates were permitted to pay registration and admission fees only through online means.

**Examination: Measures taken for modernization of examinations**

The Government of Kerala has issued Administrative Sanction for the implementation of the Specific Project "Student Life Cycle Management System" submitted by the Director, Computer Centre.

The project envisages in developing a comprehensive software solution for managing the "Life Cycle" of a student, right from the starting of the admission procedure, to the issuance of final certificates and the scope covers all the cycles, Viz., Student Registration, Admission, Student services like Matriculation and Migration, Eligibility and SDC, Exam Registration, Verification CA Mark, Attendance, Teachers Index card, Online Question papers, Hall tickets, QR coded false numbering, Online Examinations, Camp management, Online evaluation and QR code system, Tabulation, Results Publication, Revaluation, Consolidated mark list, issuing of Degree certificates and all other relevant Certificates.

'M/s. ITI Limited, Palakkad' was invited to conduct a detailed presentation (Demo) of the Functionalities of the Examination Management Software in connection with the  project "Student Life Cycle Management System" (prototype of one or two modules) before the Monitoring Committee and accordingly the firm conducted a detailed demonstration of the "Camp Management Module" of the proposed software (one of the urgent requirements of the University), before the Committee. After the Financial evaluation & subsequent negotiations, the Committee recommended to issue work order (Award of contract) to 'M/s ITI Ltd, Palakkad' for the project "Implementation of Examination Management Software Solution in the University (Student Life Cycle Management System) "

- Online examinations for B.Ed.
- Online question paper for all department exams
- Research portal for scholars.

# Mahatma Gandhi University

# 2. Mahatma Gandhi University

**E-Governance initiative: Administration**

E-payment –  payments can be done online via different payment gateways like Paytm, SBI epay, Atom and MGU Cash Counter.. E-payment portal - epay.mgu.ac.in .

- Online Certificates Portal - certificates.mgu.ac.in to download certificates.
- Eligibility - Equivalency certificate -apply online for the programmes conducted by all the institutions and certificates are usually issued on the same day.
- Migration certificate –  apply online with supporting documents and can normally download the certificates on the same day.
- Re-admission, Course certificate, Condonation and College Transfer– Students submit application online and they reach the college Principals' ID for verification and approval. On submission by the Principals, the application can be viewed at the university office. After proper approval students are informed the decision of the University as a digital Certificate.
- PhD WAT Exam Online application for Ph D Registration and related matters      .
- Admission Portal
- CAP (admission to UG and PG Programmes conducted in Arts and Science Colleges)
- Common Admission Portal (admission to UG and PG Programmes conducted in autonomous / B.Ed / MA / B.Arch / MBA / LLB / MCA Colleges).
- CAT-for admissions to PG Programmes conducted in the Universitydepartments.
- An online portal for admissions to MBA Programme.
- PhD-An online portal for admissions to PhD Programmes.
- Foreign Students Admission
- Hostel Management - data entry progressing - provides details of hostlers - application submission,  processing, allotment on the basis of prevailing rules, collection of fees and issuance of notice etc.
- Employees Portal: -to view personal and official details.
- NSS Portal :an online portal for the National service scheme which manages the activities in  different colleges. Certificates can also be generated for eligible candidates.

- Establishment Register- To manage the University employees service history.
- Budget Creation-Create new account head and subheads.Add each financial year account entry.
- Revaluation Software-Online software for studentsto apply for revaluation, viewingrevaluation results and downloading memo.
- Recruitment Portal - [Professor/Asst.Professor/Assoc.Professor/Registrar/FO/CE]
- Adalath-Online complaint registration portal for students, teachers, college principal and manager.
- JeevanPraman- a biometric enabled digital service for pensioners.
- DDFS-is for Documentation, Collaboration and Distribution of Files digitally at university.
- DASP-ALEMS: Automated Learning and Evaluation Management System of Directorate for Applied Short-term Programmes.
- Students Grievance Redressal Portal
- Refund Management-Online refund application accepted and proceed.
- Employees Portal –Live Application for Converting Temporary to NRA(Employees side)
- Asset Management
- Recruitment Portal
- Medisep employee and pensioners - data collection and forwarding
- P F Management

**E-Governance initiative: Academic**
- Common Admission Test (CAT)- Admission portal for Departments/Schools/ Centres reception of application, ranking, allotment, admission, and transferring data to Exam portal . Admission to 330 seats of the University teaching Departments is done through CAT
- Common Admission Programme (CAP) – Admission portal for Affiliated Colleges – for both U G and P G courses - application, ranking, allotment, admission, and transferring data to Exam portal. Admission to 50000 seats in the affiliated colleges is done through CAP

- PhD WAT Exam: Online application for Ph D Registration and related matters
- For recognizing courses of other Universities, relevant documents like syllabus are collected online to reduce usage of paper.
- Application for Eligibility certificate, - Equivalency certificate, Migration certificate, Re-admission, College transfer, Course certificate, Course Recognition etc were made online.
- Mahatma Gandhi University conducted Online Exams at the Directorate for Applied Short-term Programmes (DASP)- DASP has made a big leap in automated evaluation process by conducting fully online examinations to the students of its short-term programmes. The online examination system which is a part of its comprehensive Automated Learning and Evaluation Management System (DASP-ALEMS) provides students the option to write exams from home using digital devices. It also provides the option to write the exams in a designated online examination centre which will be helpful to students who are lacking access to digital devices.
- DASP-ALEMS provides flexibility and security to the examination process. Once all the questions are uploaded in the system, the system can shuffle and give questions in different orders to different students. In this online examination system, the exams can be conducted wherever the candidate is and the results can be generated instantly and accurately. The exam surveillance can be conducted with the help of a web camera and the method is called Remote Proctoring. Online Exam can be managed in auto surveillance mode where a web camera connected to the system would take snapshots of the student and can act as an invigilator/supervisor; which is again cost and time efficient. Security measures include photo verification of the candidate and auto switch off of the examination in case of a suspected malpractice. This would ensure foolproof student identity and the system is able to keep track of the students during the exam.
- When an online exam is conducted remotely, a large number of students can appear for the exam, without the need to spend on travel and accommodation. This also solves the problem of scheduling exams across various exam centers, hiring invigilators, providing security to these centers etc.

- Designing a question paper for a digital exam reduces the chances of paper leakage. Online exams give the flexibility to design customized question papers in different patterns for different students and evaluate and grade them instantly. The online exam can provide detailed subject or topic wise analysis helping the University in decision making and in various short-listing processes.

**Examination: Measures taken for modernization of examinations**

As the travel restrictions were in force due to Covid 19, examination centres were allotted to the students in their home district itselfand even in Lakshadweep Islands too.

- Permission was given to conduct practical and viva voce internally in the college (by waiving the mandatory requirement of external examiners) and to submit online the marks directly to the university portal. Students who couldn't attend viva voce in person were given the facility to attend it online. The students who couldn't attend examinations due to covid infection or quarantine are offered special examinations.

- The open Defence (Ph D Viva) has been remodeled to suit the online mode.

- A lot of students used to visit the university during the pre-Covid period to submit applications for various certificates and documents. Online application facility was introduced to help the students to avoid unwanted journey.

- To tide over the difficulty of arranging offline meetings during the pandemic situation, pre-valuation Board meetings, exam board meetings, and Principals meetings were conducted online.

- A new digital degree certificate generation system also has been launched. The processing of these degree certificates is being conducted at multiple levels using high security biometric systems.

- Almost all the PG and UG examinations are now conducted using question papers generated from the university's centralized question bank which is being constantly enriched with the help of academic experts. These question papers are transmitted through an online transmission software with security encryption. This system helps to save time, money, human labour and also ensures the confidentiality and the security of the examination process.

- The entire student support services in 90 percent of programmes offered by the University are being done by software developed in house.

- The University is facilitating online registration to examinations and online payment of fees.
- A massive online question bank is in place to facilitate diversity in examinations
- Successful implementation of digital delivery of Question Papers to its affiliated colleges
- CCTV enabled exam halls help to strengthen the examination system and reduce malpractice cases.
- The applications for migration and condonation certificates are received online and the certificates can be downloaded by the candidates.
- Revaluation/scrutiny of answer scripts – online submission of payment integrated application - after valuation, intimation shall be forwarded electronically to applicants and concerned tabulation section through API.

# Cochin University of Science and Technology

**3.** **Cochin University of Science and Technology**

**E-Governance initiative: Administration**

The University has effectively transformed various administrative processes, from the conventional file system to the ICT enabled processes, utilizing the funding under e-governance project of the State Government.

- **File flow Management System(FFMS)**

  File Flow Management System (FFMS) has been successfully implemented in CUSAT in 2017. Currently files are routed through FFMS (http://ffms.cusat.ac.in/ddfs/login.do), in administrative office as well as in departments. All administrative processes from File Creation to Approval are being done through FFMS. This technology enabled staff to work from home during lock down period and university could work without break during the Covid-19 Pandemic situation. All of the departments joined FFMS and all the inward /outward communications between departments are now through FFMS.

- **UniSPARK**

  This software is used for Salary processing. Service book updation is also done in this software. Facilities are enabled for employees to can take their salary slip, know the income tax deductions view their personal profile etc.

- **DEAS(Double Entry accounting System)**

  CUSAT is using Single entry accounting system currently. We have developed a new software DEAS for double entry accounting system with the help of NIC. The NIC support is stopped and in-house development is going on since August 2020 to develop further modules like payment gateway and Bill Processing system. Now Accounts, receipts at cash section and departments and taken through DEAS software

- **PF Management System**

  PF statements are taken through this software after importing data from Unispark schedules.

| Areas of e -governance | Year of implementation | Name of the Vendor with contact details | Link to relevant website/ document |
|---|---|---|---|
| Administration | | | |
| Maintenance of File flow Management System | 2018 | KELTRON, Keltron House, Vellayambalam Thiruvananthapuram 695033 | https://ffms.cusat.ac.in |
| Maintenance of Video Conferencing System | 2018 | KELTRON, Vellayambalam Thiruvananthapuram 695033 | |
| Finance and Accounts | | | |
| University Service and payroll system(UniSPARK) | 2020-21 | NIC, Kerala | http://training.spark.gov.in/unispark/ |
| Double entry accounting system | 2020-21 | NIC Kerala & E-Governance Cell, CUSAT | http://deas.cusat.ac.in |
| Miscellaneous Finance applications- PF, SLI, GIS, GST, TDS , Form16 | 2019 | E-Governance Cell, CUSAT | http://finance.cusat.ac.in |

**E-Governance initiative: Academic**

  **i. ADMISSION**

The Directorate of Admissions (DoA) of the University handles the entire admission process of the University. Through effective application of information and communication technology (ICT), (DoA) is fully equipped to deliver all the admission related Services of the University to the student community in a very convenient, efficient, and transparent manner. Exchange of information, communication transactions and integration of various stand-alone systems through e-Governance has made the University capable of delivering quality service to the society at par with world class Universities across the globe.

The complete admission process of the University is computerized since 2016. The various automated processes involved are:

1. Online Application Registration
2. Online Common Admission Test (CAT)
3. Email and SMS alerts
4. Online Option Registration.
5. Online admission and online payment
6. Candidate portal
7. Information exchange services

The Computer based Common Admission Test is conducted in 30 major cities across India and also at selected centres in the UAE for admission to the various academic programmes of the University every year. The response sheets of the candidate and answer keys are made available in the candidate's portal/email within 24 hours of completion of the test. The candidate feedback registering services are activated immediately and will be open for three days. The rank position of the candidate for each academic programme will be available in the candidate's home page within 10 days of completion of the CAT.

The allotment of candidates to various programmes is processed automatically based on the options registered by the candidates online. The details of allotments will be made available through candidate's home page and through sms within no time. The candidates have the facility to pay the course fee online and confirm their admission. The admitted students will be issued student identity card upon successful verification of their qualification certificates at centralized counseling venue.

Fully in-house developed software is used for the entire process like student registration, allotment, payment, counselling etc. Through the effective use of ICT, the University has successfully managed to reach the beneficiary and to ensure that their service needs are met.

## ii. STUDENT PORTAL

The student admission data is ported from Admissions software to Examination software. Payment Gateway is integrated with online. SMS gateway for Examination activities are also live.

### iii. SCHOLARSHIPS

Processing of scholarships and fellowships are online now through the National Scholarship Portal and e-grantz portal of State Government of Kerala.

### iv. TEACHING- LEARNING

- The use of internet based resources in teaching learning process is supported by online course management platforms such as Moodle, SWAYAM etc.
- Through this content management, attendance, online tests, grading can be done.
- The internet connection with high bandwidth has been provided to all the Departments/Schools in the University which act as a major factor in improving quality of teaching.
- The feedbacks from students are being collected and analysed online.

**Examination: Measures taken for modernization of examinations**

Cochin University of Science and Technology (CUSAT) initiated the automation process with the introduction of Credit based system of the examinations in Post Graduate Courses in 2000 -2001. The automation in the B.Tech courses started from the year 2003 -2004. Examination system is undergoing drastic reforms. Policies and procedural changes are happening with revision in each regulation which needs modifications in the computer program code to accommodate the changes.

CUSAT started the fully online examination automation activities with 2012 admission B.Tech students in ERP5 platform in Nov 2012. Now an in-house software was developed and has been successfully implemented. All the student related activities has been channeled through student dashboard facility.

The modernization activities include:

### i. *E-Governance initiatives in the Examination System*

- Student Portal with provisions for uploading photo, signature and Qualifying Certificate, Examination Registration, Hall Ticket Down load
- Results/Grade Cards are made available in the student dashboard. Students can login to their dashboards and can view the results.
- Forty two services provided by the Examinations Wing have been made online. And remittance of the fee for all examination related matters has been made online.
- Implementation of a payment gateway for remittance of the fee

- Providing the Examination updates to the students through SMS has been implemented and is working successfully.
- Implemented payment gateway for all the common forms making it available through the student dash board.
- Provisional Certificates Migration certificates are made available online.
- Fully automated Examination Software have been developed and is successfully working

**ii.** Syllabus Revisions – Regular revisions of syllabus is done in University incorporating the modules which facilitate the students to achieve outcome based education

**iii.** Online Examinations – University have successfully conducted the ONLINE Mode of Examinations/Ph.D Open Defence/Viva Voce using the scope of various online platforms such as MOODLE, Google Meet, Zoom etc.

# University of Calicut

## 4. University of Calicut

**E-Governance initiative: Administration**

The Calicut University Computer Centre is the central hub for ICT-related services for the University. With the implementation of various Free and Open Source Software (FOSS) based e-Governance initiatives, the center serves the University for all its ICT needs. It aims at empowering the students, academicians, and staff to access the services of the University anywhere and anytime at their fingertips by transforming the University into an inclusive digital and paperless institution thus contributing to the overall development of society. The following are the e-governance initiative launched for augmenting the effectiveness of the administration of the University.

- Centralised College Portal
- Department Portal for University Teaching & Research Departments
- New responsive university website in uoc domain
- Unified Web Portal for all teaching departments, Pareeksha Bhavan, School of Distance Education, etc.
- New e-Payment system 6. SDE online – New software for School of Distance Education
- A complaint lodging portal exclusively for SC/ST students
- Hyper-Converged Server Infrastructure and private cloud facility (The Technical Committee approved the specification of the facility and the tender formalities are underway).
- A Complete Student Portal, Alumni Portal, Placement Portal, and also a module for gathering all the data related to the activities of the University

**E-Governance initiative: Academic**

A platform for uploading e-learning content was setup and extensive training was given to selected staff members of various teaching departments. Multimedia content that can be used for e-learning can be created, categorized, and uploaded using Moodle platform. This gives a chance for the teachers to get updated with e-learning technology and convey the same to the students. Students can remotely access e-learning content just by having an

internet connection and a device. They can watch videos as many times as they wish. Students have access to the e-classes of the best teachers.

**Examination: Measures taken for modernization of examinations**

The following web-based e-Governance initiatives were introduced keeping in mind the prime stakeholders of this Higher Educational Institution.

Online issue of Certificates - Migration Certificate.

New Portal for processing and issuing original degree certificates to the Autonomous colleges.

A software system for Managing Syllabus, Curricula, Exam timetable, and Notifications.

Online processing and issuing of Original Degree Certificates with the digital signature of the Vice-Chancellor

Digital students service center

E-Governance Initiatives underway

Automatic storage and retrieval system (ASRS)

Online Question paper delivery system: Completed requirement gathering.

# Kannur University

## 5. Kannur University

**E-Governance initiative: Administration**

- **Digital Document Filing System (DDFS)**

  As part of the implementation of e-governance in Kannur University, Digital Document Filing System (DDFS) is being utlised for file movement. This is having high relevance for Kannur University with a multi campus system. DDFS enhanced the pace of file movement and there is better transparency in administration.

- **University Websites**

  Kannur University maintains a comprehensive website with separate portals for Examination, Finance, Internal Quality Assurance Cell, International Academics, Student Portal etc. The websites also provides links to various other academic institutions and government offices and it acts as a single point for various services of the University.

- **Single window Admission System**

  Admission to all the Under Graduate and Post Graduate programmes of Kannur University are completely online. There is a Single Window Admission system based on a Software module developed by the IT team of Kannur University. This online single window admission system offers a smooth functioning of admission system for the aspiring students.

- **Intra Campus Network (LAN)**

  Intra campus networking exists for Administrative Headquaters at Thavakkara, Dr. Janaki Ammal Campus at Palayad and Dr. P. K. Rajan Memorial Campus at Nileswaram. Networking of rest of the campuses are in progress.

- **Inter campus connectivity**

  Administrative Campus at Thavakkara is equipped with a stable National Knowledge Network (NKN) connection of 1 gbps bandwidth and all the other campuses are connected via OFC.

- **Mobile Apps (m Governance)**

  An Android App was developed for the use of UG admission for providing the details of affiliated colleges, details of courses offered and allotment details etc. In addition to that, an

App for School of Distance Education with details of courses, fee structure and contact classes with provision for push messages is also introduced.

- **E Payment facility**

Facility for making payment via online has been implemented through SBI Collect. All fees related to examination registration, fee for various certificates, fees related to Distance Education and Research are being collected through e payment system.

**E-Governance initiative: Academic**

- **Online services**

Kannur University has a full fledged e governance system to support the academic activities. This was widely used to reach the students online during the COVID 19 pandemic and subsequent lockdown. The University is having premium online platforms including Google meet, Google classroom, Zoom and Webex. In addition to this University is having its own customised Learning Management System based on Moodle. All the faculty members were trained to use the learning management system and online classes are shifted to this on a phase by phase manner.

Kannur University offers six online services to the students. This includes submitting application for Equivalence certificate, Migration certificate, College transfer, Re-admission, Medium of instruction certificate, Attendance condonation etc. Ph.D. open defense examination of research scholars are also conducted online. Recruitment of faculty and staff are also conducted online. Most of the regular meetings of the academic bodies are also now shifted to online platform.

- **Project Monitoring System**

For management and monitoring of various projects of Kannur University, an Open source software was developed and installed. This is helping the University for effective management of projects.

- **Asset Management System**

Developed and implemented software for keeping track of the assets of the University.

- **WiFi Campus**

Installed WiFi devices in four campuses, Administrative Campus at Thavakkara (Head Quarters), Dr. Janaki Ammal Campus at Palayad, Mangattuparamba Campus and Dharmasala Campus, as a part of IT Mission project.

- **Smart Classrooms**

  37 Class rooms in various teaching departments have been upgraded into smart classrooms. The smart classrooms comprises of a smart board, Electronic Podium and LCD Projector.

- **Video Conferencing Facility**

  High end Video Conferencing facility integrated with Cisco WebEx conferencing solution is available in the University head quarters. This can accommodate 1000 participants at a time. Kannur University with its multi campus system was greatly benefitted from the video conferencing facility. Compared to previous days faculties, staff and students of various campuses of Kannur University makes use of the Video conferencing facility for attending official meetings and conferences. Thus saving resources and time for effective governance.

## Examination: Measures taken for modernization of examinations

- **Software for automation of UG Courses -2019**

  Design, development and implementation of new software in tune with the revised syllabus is completed. Tabulation of marks of Under graduate and Post Graduate programmes of the University from 2019 Admission onwards is completed successfully using this software.

- **Uploaded Academic Awards into National Academic Depository (NAD) portal**

  As per the direction from Ministry of Human Resources Development, Kannur University executed an Agreement with CDSL and NSDL for uploading of all Academic Awards into the National Academic Depository AD portal. After completing the primary configurations, University had commenced uploading of Awards into NAD. Recently Kannur University also started uploading Academic Awards into Digilocker system. These initiatives were well accepted by the student community.

- **Automation of Online Migration Certificate**

  An online portal for automating all activities from Application to issuance of Migration Certificate is implemented from February 2020 and Two thousand plus applications have

already been processed through this portal. This is helping students residing outside the state and country for pursuing higher studies.

- **Automation of tabulation works of courses.**

All tabulation activities like Registration for Examination, Issuance of Hall tickets, Mark lists, Tabulation works including online capturing of Internal, External and Practical marks, Issuance of Provisional Degree certificate and generation of various reports have been automated from 2019 Admission onwards.

- **Other services**

Almost all examination related services of Kannur University are now offered through Online. This includes submitting application, remitting fees, tracking the status of application and receipt of the required documents.

- **Automated Question Paper Generator**

For the first time in a University, a team of experts from Kannur University designed and developed a software for Automated generation of Question Papers. This is being utilized on a trial run basis for various internal and model examinations of Kannur University. A solid question bank based on Revised Blooms Taxonomy is prepared and stored as a data base and required question papers are generated by giving key words. This system offers efficiency, speed and confidentiality and is cost effective.

- **Online delivery of Question Papers**

Question paper delivery to various examination centres of University Departments are now online. Password protected question papers are sent to Chief Superintendents with a definite time gap before the starting of examination. This also increased the efficiency of examination system of Kannur University.

# Thunchath Ezhuthachan
# Malayalam University

# 6. Thunchath Ezhuthachan Malayalam University

**E-Governance initiative: Administration**

In the administration section, most of the works including payments, announcements, notifications etc are made online. Moreover, e-payment methods (including e- tenders) are established for payment and every other financial transaction. Inter department communication happens exclusively through the online platform as well as through the official e-mail address of the staff.

**E-Governance initiative: Academic**

The Academic communication is mostly made through dedicated - email system, though in backup hard copies are also maintained.

Examination: Measures taken for modernization of examinations (a brief one page note to be submitted)

All semester examinations under this University are conducted as per the guidelines issued by the UGC and Govt of Kerala. The medium of instruction of all programmes are in Malayalam. Measures are also taken to conduct examinations in online and other modes-During the crises of COVID pandemic Third Semester PG internal exams conducted in online mode. External (theory) exams not yet to conduct. Improving the infrastructure facilities will definitely help in the conduct of examination system.

# Sree Sankaracharya University of Sanskrit

## 7. Sree Sankaracharya University of Sanskrit

### E-Governance initiative: Administration

The University made available on-line services pertaining to admission, examinations & its other allied activities. The e-Governance initiatives in all administrative sections ensuring the transmission of data through e-based mechanism on University Wide Area Network. The Data Centre of the University serve as e-services delivery centre for all stake holders of the University. The entire e-Governance solutions are designed & developed in house through a highly competent, committed & capable group of software and hardware experts. The revenue is generated through different sources including IT service charges, consultancy & trainings.

### E-Governance of Admission System

- Ensures online submission of Applications forms for entrance tests.
- Auto Filled Academic Details
- Auto-Eligibility Check
- Campus Preferences
- Auto Roll No Allocation
- Exam Centre Allocation
- Auto generation of e-Admit Cards
- Form Printout & Fee Receipt
- Pay using online methods
- Submit Hardcopy to University
- Auto Generation of Merit List
- Selection List and Waiting List

The University is in a stage of switching towards digital data. All admissions, examinations and financial related works are digitised. Communication through paper is discouraged and email mode is insisted on, as much as possible. Official email ID has been provided to all regular teaching and non –teaching staff in the official domain of the University.

### E-Governance initiative: Academic

During 2019,Learning Management System (LMS) has been put into operation in the University as part of the implementation of OBTLE in PG programmes. The system enabled

to integrate components of teaching, learning and evaluation effectively. Prior to the introduction of LMS platform, the faculty members were given preliminary offline training of 5 days duration during March 2019 and vigorous training of 12 days duration during May 2019. During the pandemic situation, this platform paved way for regular online classes without much distraction. The University's Moodle based LMS (Learning Management System) portal lms.ssus.ac.in, which allows every teacher to manage their courses and let students to easily access the learning materials. It enabled teachers to upload all documents and videos, and share materials and events between courses or learning paths.

The University implemented guidelines for the conduct of Seminars /Workshops/ Guest Lecturers/ Extension Lectures/ Sastrasadas in online mode organized by the Faculty Members/ Academic Departments/ Regional Campuses of the University which was strictly adhered to by the academic sector. The Webinars and Workshops/ Guest Lecturers/ Extension Lectures/ Sastrasadas etc in online mode was hosted in any appropriate platform (Google Meet,Moodle, Bluebutton etc.), preferably using the official email id of the co-ordinator of the webinar which will necessitate recording of the whole procedures. Webinars and Workshops/ Guest Lecturers/ Extension Lectures/ Sastrasadas etc in online mode was streamed using the official YouTube channel of the University.

Guidelines for Online Teaching was issued in the face of the Novel Coronavirus pandemic that has kept educational institutions shut and made the usual class room teaching/ learning impossible. In the face of the fact that the students should not lose out in the learning process, educational institutions world over have resorted to online teaching. Though not a substitute for classroom - centred pedagogical practices, guidelines to set measures for a continued academic dialogue, involving teaching and assessment, between students and teachers is being brought. LMS giving ample space to conduct assessment in a flexible way.

The University has a high quality acoustic Recording Studio functioning in Kalady campus. It is equipped with a fully comprehensive suite ideal for pre-production, production, mixing, tracking and mastering. The 3000 sq. ft sized studio offers audio bank, audio books and also facilitates the development of e-content.

**Examination: Measures taken for modernization of examinations**

Positive impact of reforms on the examination procedures and processes including IT integration and continuous internal assessment on the examination management system.

- Android Mobile Application for all examination related services.
- Online payment of fees
- Monthly statement of the attendance is uploaded in the student portal.
- Internal grades are uploaded in the portal. The University makes use of the sheets of internal grades in calculating the final grades of the students.
- The eligibility of attending final semester examinations are determined by the percentage of the minimum attendance required.
- In the beginning of each semester, the Course Registration of the students is done with all details of Courses- whether Core/Elective, Name of Course, Course Code, Credits assigned, etc. which is registered online. Only those students who have registered thus can appear for semester exams.
- Application for registration of semester examination and remittance of examination fee is notified around two months before the commencement of examination, for each semester, with provisions to remit fee without fine, with fine and with super fine for the benefit of students.
- Hall tickets are issued online to eligible students, on verification of the applications and supporting documents submitted, within one week before commencement of examination.
- Feedback submission through online
- After the conduct of examination, answer scripts are coded with false numbers and evaluation process completed through centralized valuation.
- Results are announced and Grade Sheets with SGPA are issued to students within one month after conduct of examination.
- Continuous Internal Assessment including seminars, mid semester examinations and assignments are done in each Department and the Grade Sheets forwarded to the Examination branch only after redressal of grievances.

- There is no practice of online evaluation of students in their end semester examination. However, under pandemic conditions assignments and presentations were successfully completed in online mode on LMS platform.

- Internal components are evaluated by two teachers (T1 & T2)

- End semester examination answer scripts are valued by internal experts and external experts.

- The results of the students are published within 30 days.

- Grievances redressal mechanism through University portal

- Examination procedure is fully integrated with IT facilities such as for Course registration, exam registration, online fee remittance, online hall ticket download, online attendance updating, online internal mark entry, etc. and the software for publishing results and issuing mark lists is in place.

KERALA STATE IT MISSION
Department of Information Technology
Government of Kerala

# Security Audit Report of
# Kerala Technological University – eGov System

## Security Audit Report No: KSITM/CERT-K/VAPT/268/2016 - IV

**Computer Emergency Response Team-Kerala**
**07/02/2017**

**Table of Contents**

1.  Executive Summary

2.  Summary of Vulnerabilities

3.  Detailed Vulnerability Descriptions

4.  Conclusion

| 1.0 | | **Client Details** |
|---|---|---|
| 1.1 | Name of client | Kerala Technological University |
| 1.2 | Address of client | Kerala Technological University, CET Campus, Thiruvananthapuram - 695016 |
| 2.0 | | **Details of Application** |
| 2.1 | Product nomenclature | Kerala Technological University - eGov System |
| 2.2 | Version No: | -NA- |
| 2.3 | Date of release | -NA- |
| 2.4 | Application description | - NA- |
| 2.5 | Developing organization& Point of contact | Sujith G S, Sr.System AnalystOspyn Technologies Pvt Ltd M:+91 963 315 5517 P:+91 471 654 0402 |
| 2.6 | Test environment URL | *https://10.5.32.45/login.jsp* |
| 2.7 | Date of receipt for audit | First audit - 05.08.2016 Second audit – 23.11.2016Third audit – 09.01.2017 Fourth audit – 27.01.2017 |
| 3.0 | | **Audit description** |
| 3.1 | Name and Address of auditing agency | CERT-K, Kerala State IT MissionICT Campus, Vellayambalam, Thiruvananthapuram Kerala - 695 033 |
| 3.2 | Scope of work | The scope of audit is limited to above mentioned web application. This security assessment is carried out to gauge the security posture of **Kerala Technological University - eGov System**. The result of the assessment is then analyzed for vulnerabilities. The vulnerabilities are assigned a risk rating based on threat, vulnerability and impact. |
| 3.3 | Audit standard | The application is audited based on OWASP Top 10 vulnerabilities. |
| 3.4 | Audit report version | 4.0 |
| 3.4 | Audit start date | **27.01.2017** |
| 3.5 | Audit completion date | **06.02.2017** |
| 3.6 | Tools used | Acunetix 11 Web Vulnerability Scanner HP Web Inspect 16.20 |

# 1. Executive Summary

This document provides the result of the Phase-IV Vulnerability Assessment performed by CERT-K against the domain: *https://10.5.32.45/login.jsp* hosted temporarily at the staging server in SDC-2. The information contained within this document is considered extremely confidential and intended only for private use of Kerala Technological University, Government of Kerala.

# 2. Summary of Vulnerabilities

The vulnerabilities are classified based on OWASP Top 10 vulnerabilities. The Open Web Application Security Project is an online community dedicated to web application Security. The Community releases its list of Top 10 vulnerabilities every three years and the below table shows the vulnerabilities according to OWASP Top 10-2013.

| # | OWASP Top 10 Vulnerabilities | Risk Severity | Phase 1 | Phase 2 | Phase 3 | Phase 4 |
|---|---|---|---|---|---|---|
| 1 | Injection | -NA- | 1 | 1 | 0 | 0 |
| 2 | Broken Authentication and Session Management | -NA- | 0 | 0 | 0 | 0 |
| 3 | Cross Site Scripting | -NA- | 1 | 1 | 1 | 0 |
| 4 | Insecure Direct Object References | -NA- | 0 | 0 | 0 | 0 |
| 5 | Security Misconfiguration | Low | 3 | 4 | 2 | 1 |
| 6 | Sensitive Data Exposure | Low | 3 | 2 | 2 | 1 |
| 7 | Missing Function Level Access Control | -NA- | 0 | 0 | 0 | 0 |
| 8 | Cross Site Request Forgery | -NA- | 0 | 0 | 0 | 0 |
| 9 | Using Components with Known Vulnerabilities | -NA- | 0 | 0 | 0 | 0 |
| 10 | Unvalidated Redirects and Forwards | -NA- | 0 | 0 | 0 | 0 |

## 2.1 Vulnerability Severity Definition

*High*: - A vulnerability, which, if exploited would allow malicious native-code to execute, potentially without a user being aware. **Medium**: - A vulnerability that is limited to a significant degree by factors such as default configuration, auditing, or is difficult to exploit. **Low**: -A vulnerability that has minimal impact and is extremely difficult to exploit.

The graphical representations of the vulnerabilities are detailed as below.
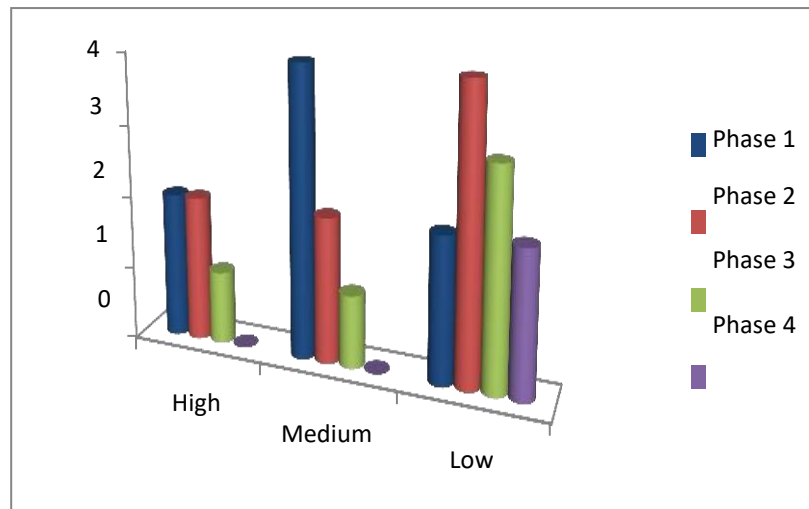


## 1.1 Methodology

### 1.1.1 Planning
During planning, we gather information from the server in which the web application is installed. Next, we detect the path information and identifiable software and determine the running versions.

### 1.1.2 Exploitation
Utilizing the information gathered in planning, we try to find any vulnerability in the software and services identified and try to exploit it.

### 2.1.1 Reporting
Based on the results from the first two steps, we analyze the results and document the reports.

# 3. Detailed Vulnerability Descriptions

### 3.1 Security Misconfiguration

### 3.1.1 Login page password-guessing attack

| Sl No. | Affected URL |
|---|---|
| 1 | https://10.5.32.45/login.jsp |

## Description

A common threat web developers face is a password-guessing attack known as a brute force attack. A brute-force attack is an attempt to discover a password by systematically trying every possible combination of letters, numbers, and symbols until you discover the one correct combination that works.

This login page doesn't have any protection against password-guessing attacks (brute force attacks). It's recommended to implement some type of account lockout after a defined number of incorrect password attempts.

## Impact

An attacker can attempt to discover a weak password by systematically trying every possible combination of letters, numbers, and symbols until it discovers the one correct combination that works.

## Recommendation

It's recommended to implement some type of *account lockout* after a defined number of incorrect password attempts and *Captcha Settings*. While creating credentials for your websites, use strong credentials; always use various combinations of characters with minimum 8 characters which should be difficult to guess. An example of strong password is E@^M!$<9@k.

## 3.2 Sensitive Data Exposure

### 3.2.1 Error message on page

| # | Affected URLs |
|---|---|
| 1 | https://10.5.32.45/eu/com/universityAdmin.htm |
| 2 | https://10.5.32.45/eu/com/universityAdmin.htm |
| 3 | https://10.5.32.45/eu/pub/autoCompleteData.htm?pageAction=getInstitutions&query= |
| 4 | https://10.5.32.45:443/eu/afn/institutionContactDetails.htm?pageAction=getDesignation&query=' |
| 5 | https://10.5.32.45:443/eu/afn/currentRunningProgram.htm?pageAction=loadProgram&query='&programType=&categoryId=&degreeId= |

**Description**

This page contains an error/warning message that may disclose sensitive information. The message can also contain the location of the file that produced the unhandled exception.

**Impact**

The error messages may disclose sensitive information. This information can be used to launch further attacks.

**Recommendation**

Review the source code for this script.

**Conclusion**

It is observed that the application has a few low severity vulnerabilities which we recommend you to fix. However, you may proceed with production server hosting.

# SYSTEM ARCHITECTURE OVERVIEW

## APJAKTU E-Governance

**APJ Abdul Kalam Technological University
College of Engineering MBA Block,
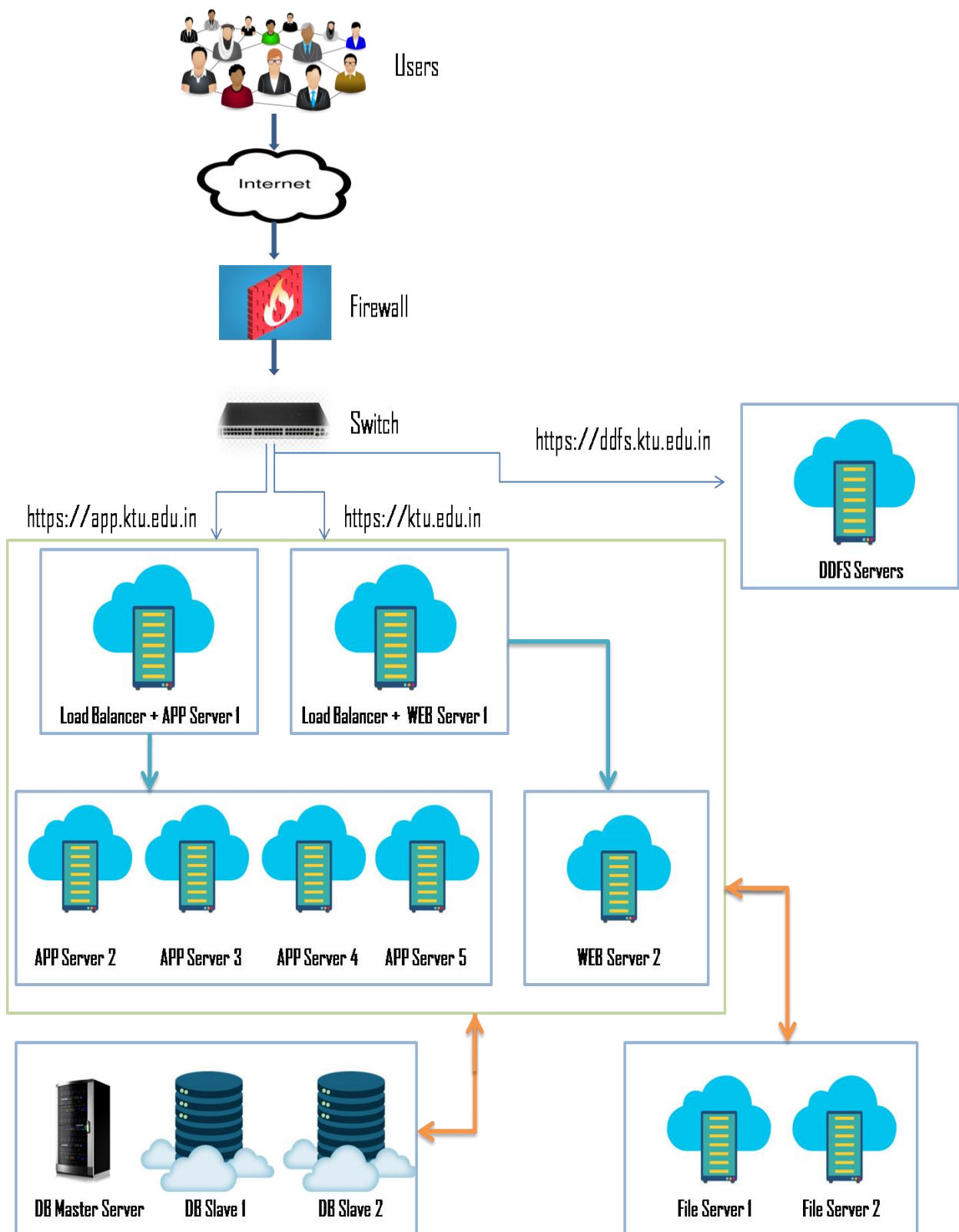Thiruvananthapuram**

# 1 INTRODUCTION

This documentation refers to serve the purpose of giving an overview of the system level architecture of E-Governance application and Website projects of APJ Abdul Kalam Technological University.

E-Governance application and website projects of APJ Abdul Kalam Technological University runs on Ubuntu machines with tomcat application server. The Live applications/ websites hosted on a total of 12 Ubuntu servers which includes both Blade and Cloud servers. The entire live servers are hosted on Kerala State Data center-2 at Technopark, Trivandrum managed by Kerala State IT Mission.

# 2 GLOSSARY

- **APP Server** refers to the servers on which the KTU E-Governance application software isinstalled
- **WEB Server** refers to the servers on which the KTU website is hosted.
- **DB server** refers to the server on which the database is installed
- **File Server** refers to the server from which the File System of the application is Served.
- **DB slave server** refers to the replica of live DB server
- **LB server** refers to the Load Balancer server used for application load balancing

# 3. SYSTEM ARCHITECTURE

Users

Internet

Firewall

Switch

https://ddfs.ktu.edu.in

DDFS Servers

https://app.ktu.edu.in

https://ktu.edu.in

Load Balancer + APP Server 1

Load Balancer + WEB Server 1

APP Server 2

APP Server 3

APP Server 4

APP Server 5

WEB Server 2

DB Master Server

DB Slave 1

DB Slave 2

File Server 1

File Server 2

## 3.1 System Specifications

| Sl No | Server | Server Type | No of Core | Ram | HDD | Operating System |
|---|---|---|---|---|---|---|
| 1 | LB + APP Server 1 | Cloud | 4 | 32 | 200 | Ubuntu 14.04 LTS 64 bit Server |
| 2 | APP Server 2 | Cloud | 4 | 32 | 200 | Ubuntu 14.04 LTS 64 bit Server |
| 3 | APP Server 3 | Cloud | 4 | 32 | 200 | Ubuntu 14.04 LTS 64 bit Server |
| 4 | APP Server 4 | Cloud | 4 | 32 | 200 | Ubuntu 14.04 LTS 64 bit Server |
| 5 | APP Server 5 | Cloud | 4 | 32 | 200 | Ubuntu 14.04 LTS 64 bit Server |
| 6 | LB+ Web Server 1 | Cloud | 4 | 32 | 200 | Ubuntu 14.04 LTS 64 bit Server |
| 7 | Web Server 2 | Cloud | 4 | 32 | 200 | Ubuntu 14.04 LTS 64 bit Server |
| 8 | File server-1 | Cloud | 4 | 32 | 1.6 T | Ubuntu 14.04 LTS 64 bit Server |
| 9 | File server-2 | Cloud | 4 | 32 | 1.6 T | Ubuntu 14.04 LTS 64 bit Server |
| 10 | DB Master | Blade | 32 | 64 | 600 | Ubuntu 14.04 LTS 64 bit Server |
| 11 | DB Slave1 | Cloud | 32 | 64 | 500 | Ubuntu 14.04 LTS 64 bit Server |
| 12 | DB Slave2 | Cloud | 32 | 64 | 500 | Ubuntu 14.04 LTS 64 bit Server |

### 3.1.1  APP Server 1 + LB

This server consists of a Haproxy load balancer and an Apache Tomcat 9 application server. The Haproxy load balancer runs on port 80 and 443 which acts as a front end server and responsible fordistributing the server load among 5 application servers.

The Tomcat9 installed on the server runs on Port 8443 and the application is deployed on/opt/tomcat9/webapps/ROOT.

### 3.1.2    APP Server 2, APP Server 3, APP Server 4 & APP Server 5

Tomcat9 is installed on these servers and it listens on port 8443 locally. These servers are  the other four members of the load balancing Server farm.

### 3.1.3   WEB Server 1 + LB

This server consists of the following

a)    Load balancer for the website

b)    Website

This Load balancer server is used for load balancing the website, both deployed on two servers- WEBServer 1 and WEB Server 2.

The tomcat9 installed on this server listens on port 8080 and it is consisting of the WAR file ofWebsite. The website file is deployed on location /opt/tomcat9/webapps/ROOT.

### 3.1.4 WEB Server 2

This is the second application server for website. Apache tomcat9 is installed on this server.

### 3.1.5  DB Master Server ( Master database server)

This is the master database server on which every database write operation is performed.  The database engine used on this server is MySQL 5.5.46. Mysql engine on this server is tuned for the maximum performance of the application. All the applications use this server as its database server.

### 3.1.6   DB Slave 1 and DB Slave 2

DB Slave1 and DB Slave 2 servers act as the slave servers for Mysql master. These servers are configured using MySQL master-slave replication method where any query executed on the master

server will replicate on the slave servers. As a result, we are maintaining the database replica on 2 servers which can be used, if something went wrong.

Also, by the use of certain application parameters, we can configure the application to read the database entries from the slave servers, which will reduce the master server load thus improves the application performance.

### 3.1.7 File Server 1 and File Server 2

These servers act as the file servers for the applications. The file server runs on a tomcat7 server which listens on the port 8080.

## 4. UAT TEST ENVIRONMENT
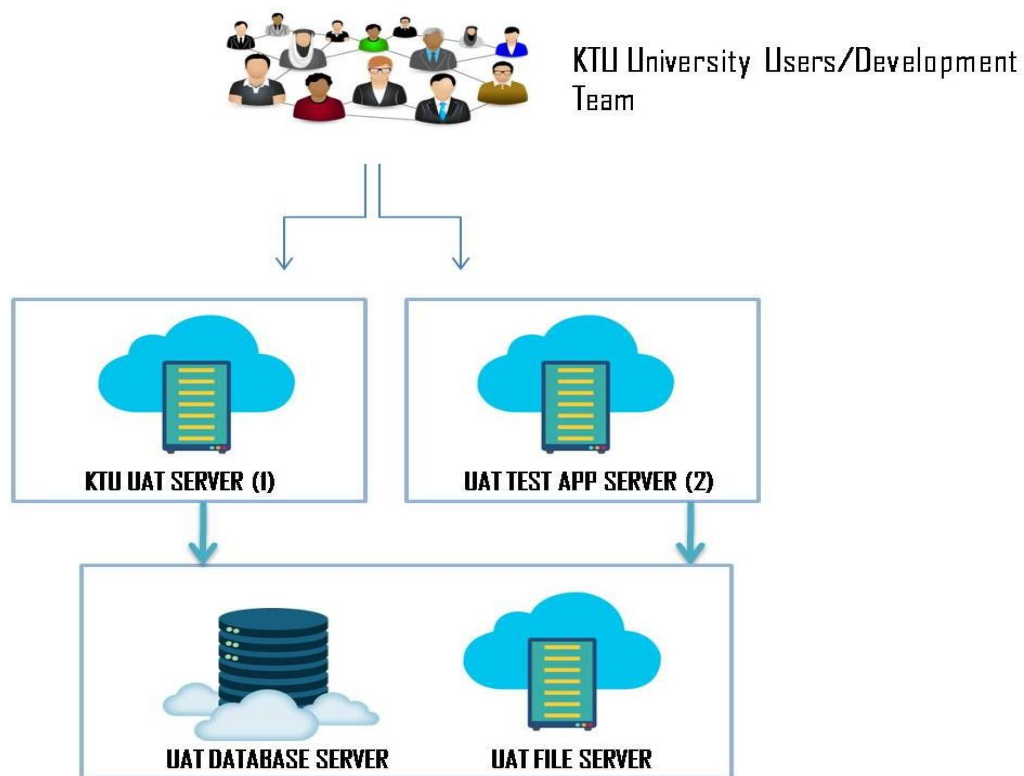


UAT (User Acceptance Test) server for university runs on Ubuntu machines with tomcat application server. The UAT applications hosted on a total of 4 Ubuntu servers which includes Cloud  servers. The entire UAT servers are hosted on Kerala State Data center-2 on Techno Park, Trivandrum managed by Kerala State IT Mission.

## 4.1 UAT Server Specifications

| Sl No | Server | Server Type | No of Core | Ram | HDD | Operating System |
|---|---|---|---|---|---|---|
| 1 | UAT TEST | Cloud | 4 | 32 | 200 | Ubuntu 14.04 LTS 64 bit |
| 2 | UAT APP | Cloud | 4 | 32 | 200 | Ubuntu 14.04 LTS 64 bit |
| 3 | UAT DB | Cloud | 4 | 32 | 500 | Ubuntu 14.04 LTS 64 bit |
| 4 | UAT FILE | Cloud | 4 | 32 | 500 | Ubuntu 14.04 LTS 64 bit |

**BACKUP POLICY**

The database backups are taken using scripts residing on the DB server and it is executed using cron jobs. The key database named university is backuped at intervals of 11AM, 3PM, 6PM, 8PM and all other database's backup were taken on 23:55PM. The backups taken were copied to other servers (10.5.32.233:/data/Backup/) using 'rsync' for better redundancy.

# 5. PERFORMANCE MONITORING

The performance of the virtual machines/ servers are monitored using the DARPAN NMS, which is a policy based autonomic network and cloud management suite of

solutions for heterogeneous multi-vendor IP networks and developed is based on ITU - T recommended FCAPS Model. The following figures show the performance of the live servers:
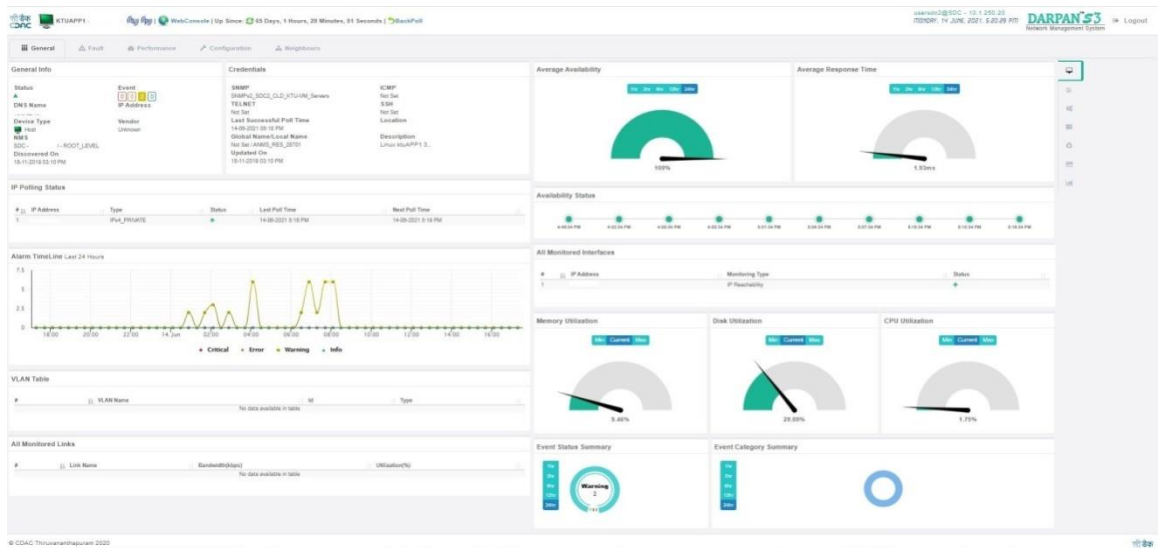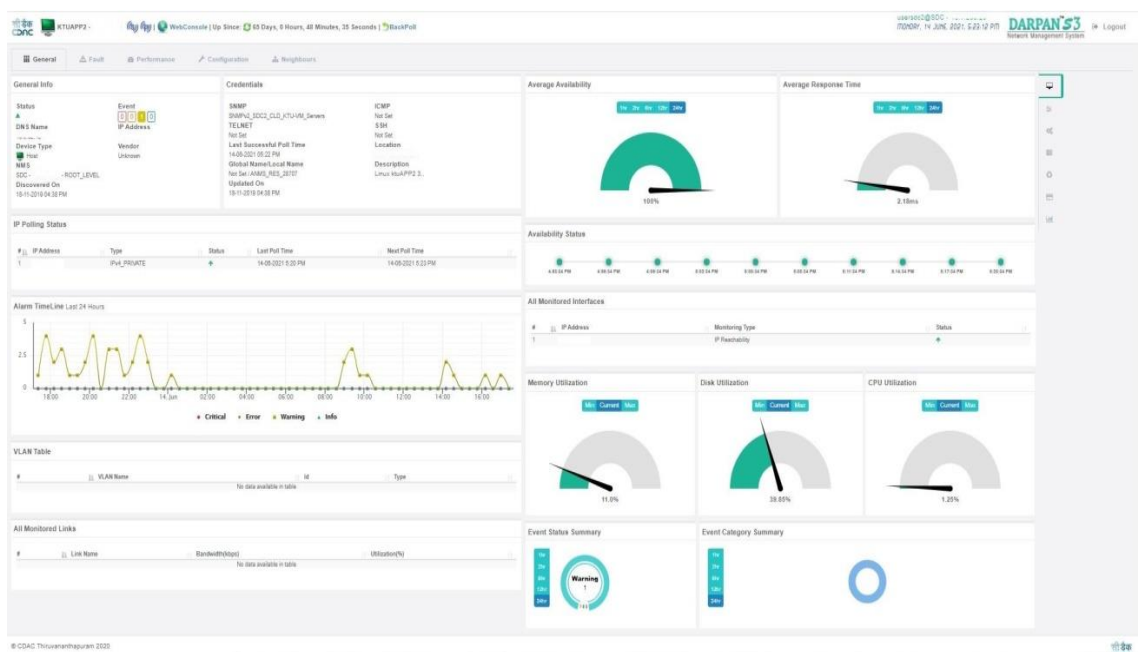


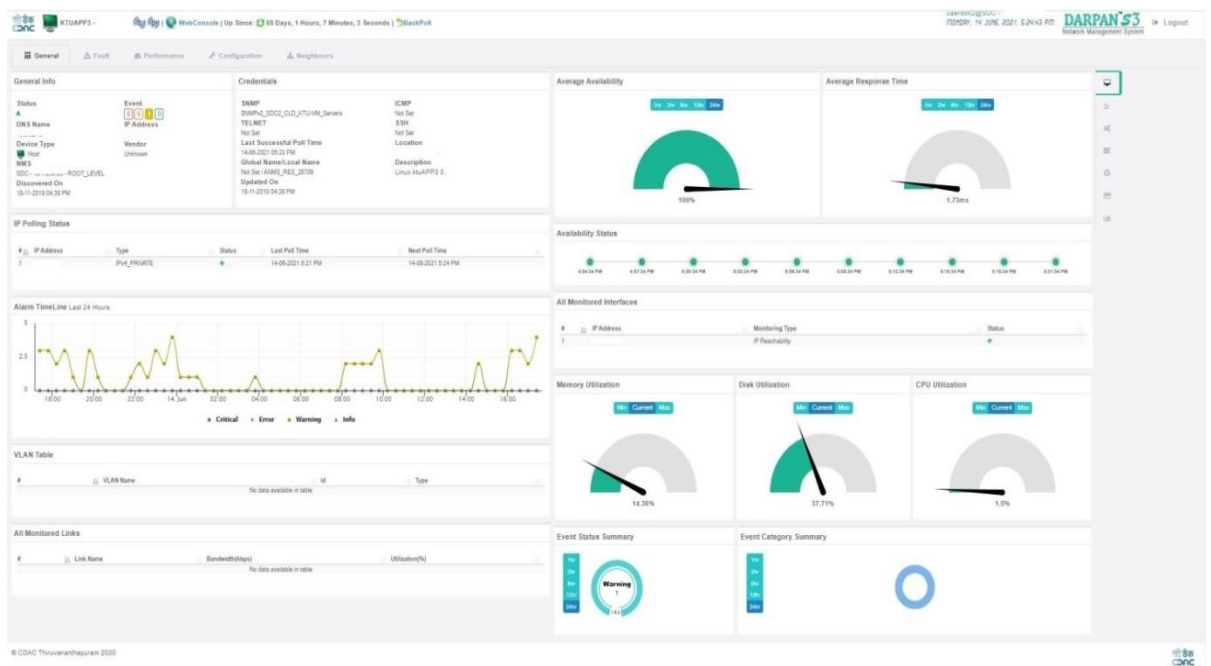*Figure  APP Server 1 Performance report*



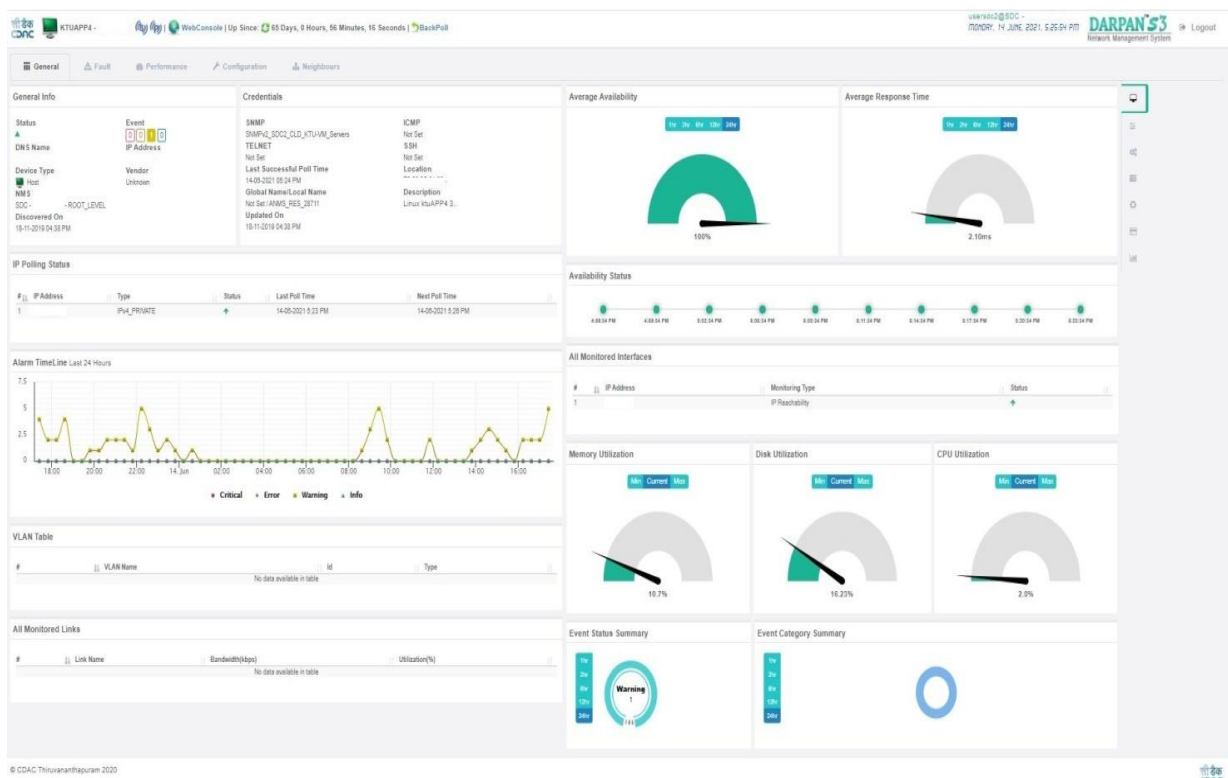*Figure  APP Server 2 performance*
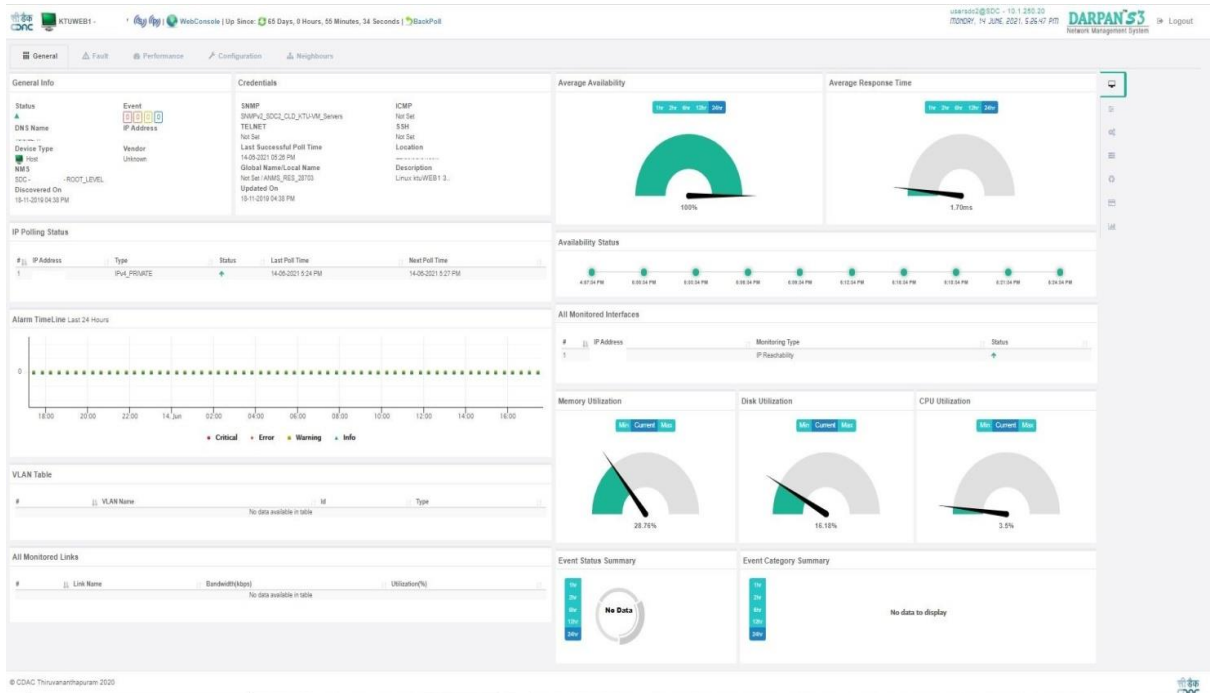
*Figure App Server 3*



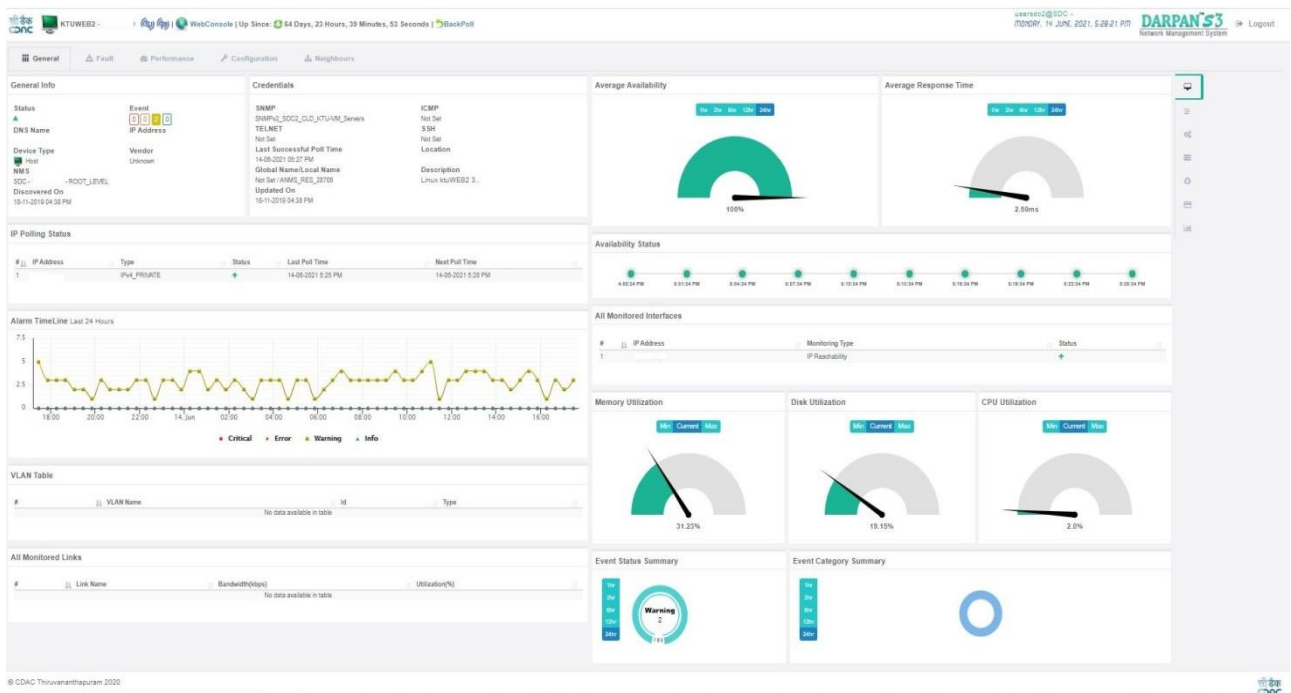*Figure App Server 4*

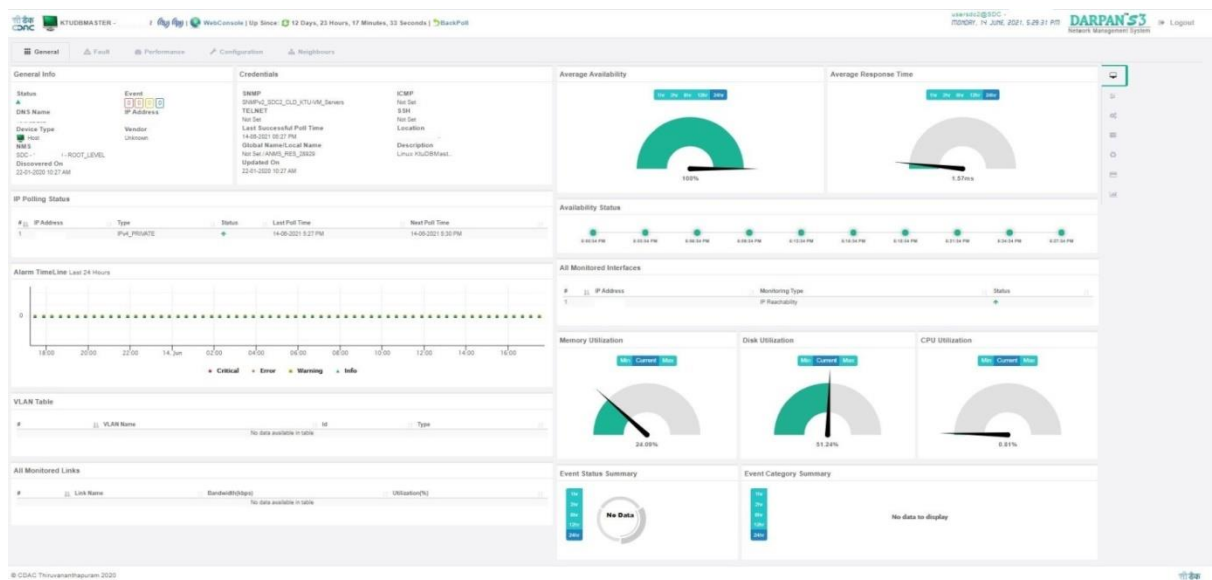*Figure Web Server 1*



*Figure Web Server 2*

*Figure DB Server Performance(Master)*

## 6. ACTIVE USERS AND EXPECTEDARCHITECTURALCHANGES

The active users using the APJA KTU E-Governance application and website is growing every year. Currently the APJA KTU application has a total of 2,77,644 active user accounts including 2,23,800 student accounts,16,007 faculty accounts, ~150 college admin accounts etc. The changes in server architecture is required to handle the expected growth of users interacting with the system.

Based on the sever load and performance analysis , the surge in users requesting services concurrently will be during the period of result publishing, exam/course registration etc. On analysis, during the peaktime, approximately 25% of the students of each batch interact with the system concurrently, ie around 25% of ~40000 students = 10000 requests.

Currently, the KTU E-Governance application hosted on a total of five cloud servers. Each server can handle ~800-1000 requests concurrently. The load balancer that sits between the client devices and backend servers, is distributing the incoming requests to any available server capable of fulfilling the request. To handle the user request during the peak time, we need to host the application on a total of 10 servers, eachcan handle ~1000 requests concurrently.

### 7.1 Estimated  Server resource requirement

Based on the user request during the peak time surge in users interaction, the following sever side resource shortage is estimated.

| Sl No | Server | Server Type | No of Core | Ram | HDD | Operating System |
|---|---|---|---|---|---|---|
| 1 | APP Server 6 | Cloud | 16 | 32 | 200 | Ubuntu 20.04 LTS 64 bit Server |
| 2 | APP Server 7 | Cloud | 16 | 32 | 200 | Ubuntu 20.04 LTS 64 bit Server |
| 3 | APP Server 8 | Cloud | 16 | 32 | 200 | Ubuntu 20.04 LTS 64 bit Server |
| 4 | APP Server 9 | Cloud | 16 | 32 | 200 | Ubuntu 20.04 LTS 64 bit Server |
| 5 | APP Server 10 | Cloud | 16 | 32 | 200 | Ubuntu 20.04 LTS 64 bit Server |
| 6 | DB Slave3 | Cloud | 32 | 64 | 500 | Ubuntu 20.04 LTS 64 bit Server |
| 7 | DB Slave4 | Cloud | 32 | 64 | 500 | Ubuntu 20.04 LTS 64 bit Server |

To deploy the application support for the equivalency certificate module a single sign on interface based subdomain is also under the development. Based security constraints, this module needs to be separated from the core application and designed as a subdomain with following compute resource requirement.

| Sl No | Server | Server Type | No of Core | Ram | HDD | Operating System |
|---|---|---|---|---|---|---|
| 1 | APP Server11 | Cloud | 16 | 32 | 200 | Ubuntu 20.04 LTS 64 bit Server |
| 2 | APP Server 12 | Cloud | 16 | 32 | 200 | Ubuntu 20.04 LTS 64 bit Server |
| 3 | DB Slave4 | Cloud | 32 | 64 | 500 | Ubuntu 20.04 LTS 64 bit Server |

## 7. USER LEVEL SECURITY POLICY

All system logins for each system allow a user to perform specific tasks. A unique login ensures that the authorized and named individual has the correct level of access, allowing them to perform their designated role(s)

Each user is identified by a unique user ID so that users can be linked to and made responsible for their actions. Each user will be given a copy of their new user form to provide a written statement

of their access rights. The user signs the form indicating that they understand the conditions of access. Compliance with this procedure is mandatory and section heads shall ensure continuous compliance monitoring within their departments. Compliance with the statements of this procedure is a matter of periodic review. Username and password combinations provide privileged access to

computer based information systems at APJAKTU. Each person provided access has a responsibility to protect those systems and the data and information they contain. As such, passwords are an important aspect of computer security. They are the front line of protection for user accounts.

- All system-level passwords (e.g., root, , application administration accounts, etc.) must be changed on at least a quarterly basis.

- All accounts with administrative privileges or those with the ability to escalate privileges should also be documented regarding their roles and privileges

- ll user-level passwords (e.g., email, web, desktop computer, etc.) must be changed at least every six months. More frequent changes although not mandatory, are recommended

- Usernames must never be used by more than one person .ie users must not share their username and password.

- Passwords must not be revealed to any other persons.

- Users must never write down their username and password in an unsecure place.

- Users must never save their passwords to the internet browsers of unsecured computers, i.e. computers that do not require a unique login on start-up.

- If a user suspects that their password has been compromised in anyway, they must immediately reset their password and should contact system administration team to verify the login history.

- Users must log out whenever they have finished their session.

- As a matter of security constraint for the APJAKTU e-Governance applications ,every User account will be automatically disabled after 5 consecutive wrong credentials based login attempts

- All passwords will be expired after 90 days to ensure password security

This procedure applies to the e Transactions and communication of all staff member of APJAKTU, its affiliated institution or official partners including data processing and process control systems, that are in possession of or using information and/or facilities owned by APJAKTU.

This procedure applies to all staff/ users that are directly or indirectly employed by APJAKTU or any

entity conducting work on behalf of APJAKTU that involves the use of information assets owned by APJAKTU.

This procedure applies to all teaching and non teaching staff / that are directly or indirectly affiliated to APJAKTU or any entity managing / conducting / attending academic activities in association with APJAKTU that involves the use of information assets owned by APJAKTU.

This procedure applies to all students admitted full time / part time to the academic programme offered by APJAKTU that involves the use of information assets owned by APJAKTU.

APJ Abdul Kalam Technological University

# "Apoorva Touch"
## e-Governance Platform
## with Integrated Grievance
## Redressal System
# "Sutharyam"

APJ Abdul Kalam Technological University, CET Campus, Thiruvananthapuram
Kerala -695 016
Phone: 0471-2593120, 2593128
www.ktu.edu.in

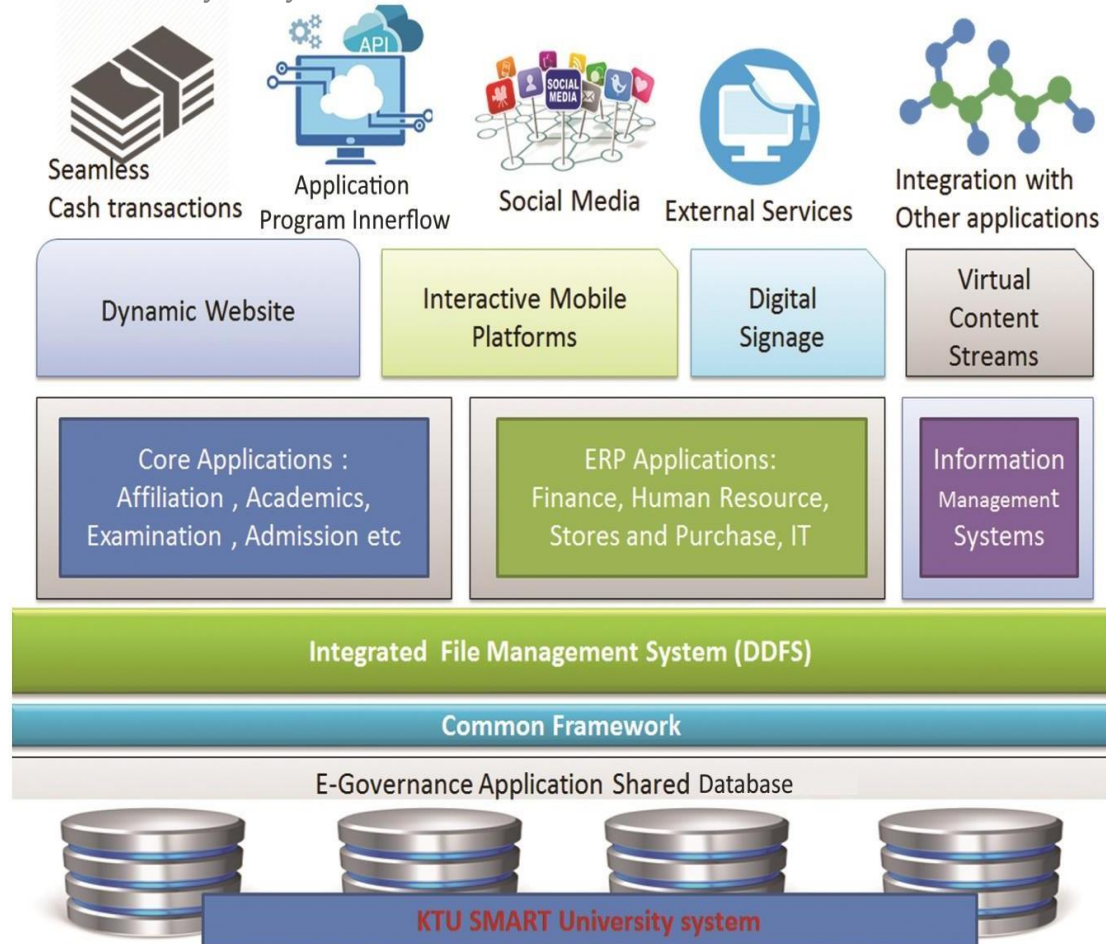# APJ Abdul Kalam Technological University

Introduction

A P J Abdul Kalam Technological University which was constituted in 2015 has consciously decided to ensure that e-Governance backed by innovation and application of technology will constitute the basis of enabling the functioning of the University. University at that time couldn't find a suitable or similar IT environment in other Universities to emulate and end up venturing into its own path of establishing such a system. University has decided to ensure that the solution will be in open source, custom built, integrated, intelligent and owned by University.

The goals established for the system was to ensure the speed of service delivery, ease of use, transparency and best use of technology. The solution was envisioned with core characteristics like data integration and consistency, scalability and end to end digital data. University was aware that such a system can only evolve through years hence took an approach of building and enhancing the systemon a step by step basis.

University could establish portion of e-Governance system from day one of University operation and was able to conduct all student registrations, examinations, affiliations and all other core activities through the system. The system has been under addition and enhancements since then. This system has helped the University apart from bringing accountability and transparency, some unique achievements with respect to publishing of examination results. For example, first semester results was published within 31 days of completion of examination which was a record among Universities in Kerala.

**KTU SMART University ecosystem**

Seamless Cash transactions | Application Program Innerflow | Social Media | External Services | Integration with Other applications

| Dynamic Website | Interactive Mobile Platforms | Digital Signage | Virtual Content Streams |

| Core Applications : Affiliation , Academics, Examination , Admission etc | ERP Applications: Finance, Human Resource, Stores and Purchase, IT | Information Management Systems |

**Integrated File Management System (DDFS)**

**Common Framework**

E-Governance Application Shared Database

**KTU SMART University system**

University is in process of establishing an integrated and intelligent next generation e-Governance ecosystem. Above picture shows the planned environment which is currently under various stages of lifecycle.

All the core applications and integrated file management systems are already in production. ERP application, development of common framework are in development and/or implementation phases.

The complete ecosystem is planned on open source platform and mostly custom built. The University adopted continuous e-governance development approach to ensure the activities are not hindered while waiting for full system to be in place.

# APJ Abdul Kalam Technological University

**e-Governance System : Highlights**

Automated file flow system

Zero cash flow office with internet banking

Integrated platform for stakeholders

Automated exam/ valuation management

KTU e-governance platform

Flexible e-Governance platform

Open source platform

Continuous upgrade facility

Academic auditing mechanism

Completely online affiliation process

Information based decision making capability

KTU e-governance platform provides unique set of capabilities and features which helps the University immensely. Some of the major benefits include :

- ✓ *Improve and effective services to all stakeholders, including students, faculty and management.*
- ✓ *Transparency and accountability in University functions and decision making .*
- ✓ *Rule based information for error free and consistent decisions.*
- ✓ *Digital transformation in cash transactions, exam result processing, course handling, and student life cycle*
- ✓ *End to end service maturity resulting in capture and storage of digital data, which could be used for future decision making and policy formations.*

At KTU, e-governance is its core foundation and forms the platform for all its activities and isrecognized as one of its major strengths.

# APJ Abdul Kalam Technological University

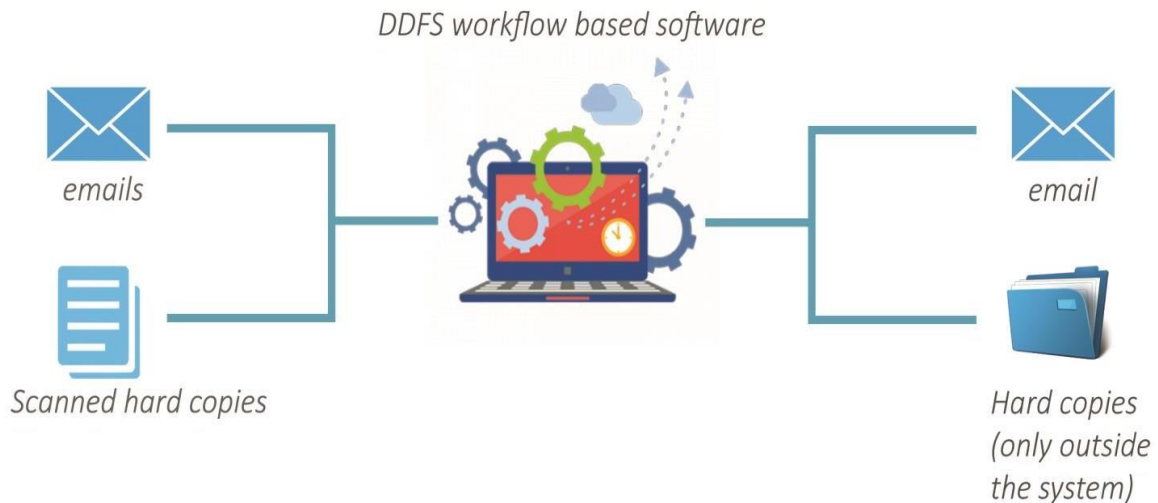**Overview : e-Governance ecosystem**
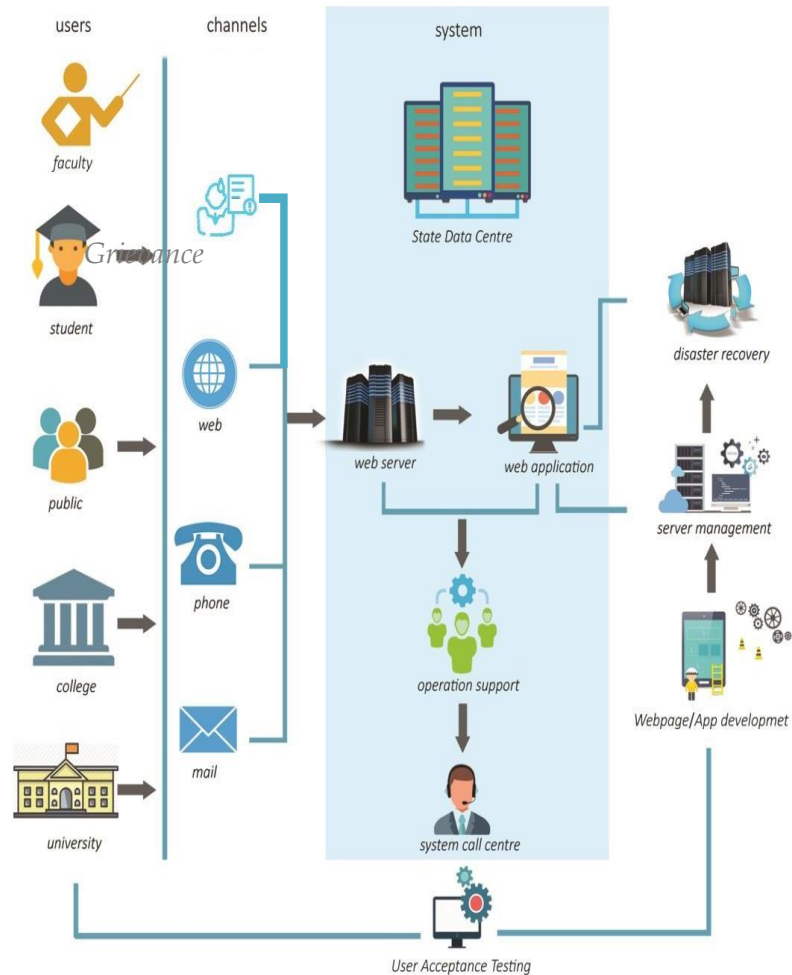


Each University stakeholders have their own unique secure access. System can be accessed through the web portal, call center or email.

System call center provides key interface for stakeholders to address system related issues on a timely fashion.

University has established separate production and user acceptance testing environment. This has helped to segregate development ecosystem from production which has in turn helped to ensure confidentiality of production environment and its information.

Close working of operation support, software development and system management groups ensure time bound software enhancement mechanism. This forms the base for maintaining the vitality of the system on continuous fashion.

**Automated File flow system**

*DDFS workflow based software*

emails

Scanned hard copies

email

Hard copies
(only outside
the system)

*Correspondance with the stakeholders including students, faculty members and college authorities are only through official emails.*

Automated file flow system helps to establish a paperless office in all file handling activities. University has established automated  file flow system from its initial days of operation itself so that all files in University remains digital.

The file flow system hosted in State Data Centre is accessible over internet and is available for all University officials. All correspondences will be scanned and uploaded to the system. Routing of files are done automatically.
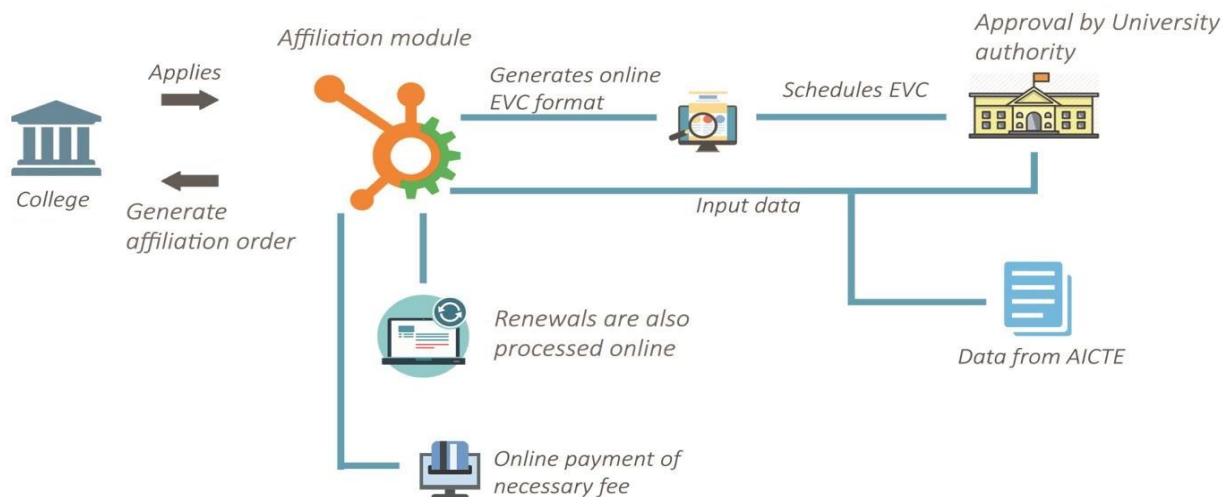
System has helped to ensure faster decision making, accountability of any document uploaded to the system and faster internal circulation within the system . This helps to ensure that all the files are trackable with relative easiness. All file activities are recorded through the log facility and this can be audited.

All order or documents generated by the system contains unique order number as well as 2D bar IQR code. This helps the faster recovery of documents.

The system also has meeting management module which helps to organize meeting at University level and record minutes which remains accessible forever.

## Affiliation Module



*The affiliation process and its renewals are done through the online affiliation module. The documents are uploaded with the application. A hard copy of the bond executed should be sent through post. The affiliation approval gives the information as the courses and intake which forms the vital informtaion for the remaining modules.*

**Affiliation Module** automates the full affiliation process of colleges with University.

Affiliation application : Interested colleges, can submit completed affiliation application along with all required documents through e-Governance portal which is accessible over internet. Colleges have provision to submit necessary fees through this portal.

Expert visiting Committee(EVC) management : System automatically generate report as required by EVC based on documents and information submitted by Colleges through online application.

Schedules EVC visit and results will be uploaded to the system. This along with AICTE informationand other required information forms basis for University to make decision on affiliation application.Once decision is made, the result will be available on e-Governance portal under concerned college login for their access.

Affiliation renewal process also forms part of affiliation module and works completely automated.

## Student Module

College transfer

Course registration

Course cancellation

Branch Transfer

Student

Migration certificate generation

Rejoining / Readmission

Report generation

Student activity points
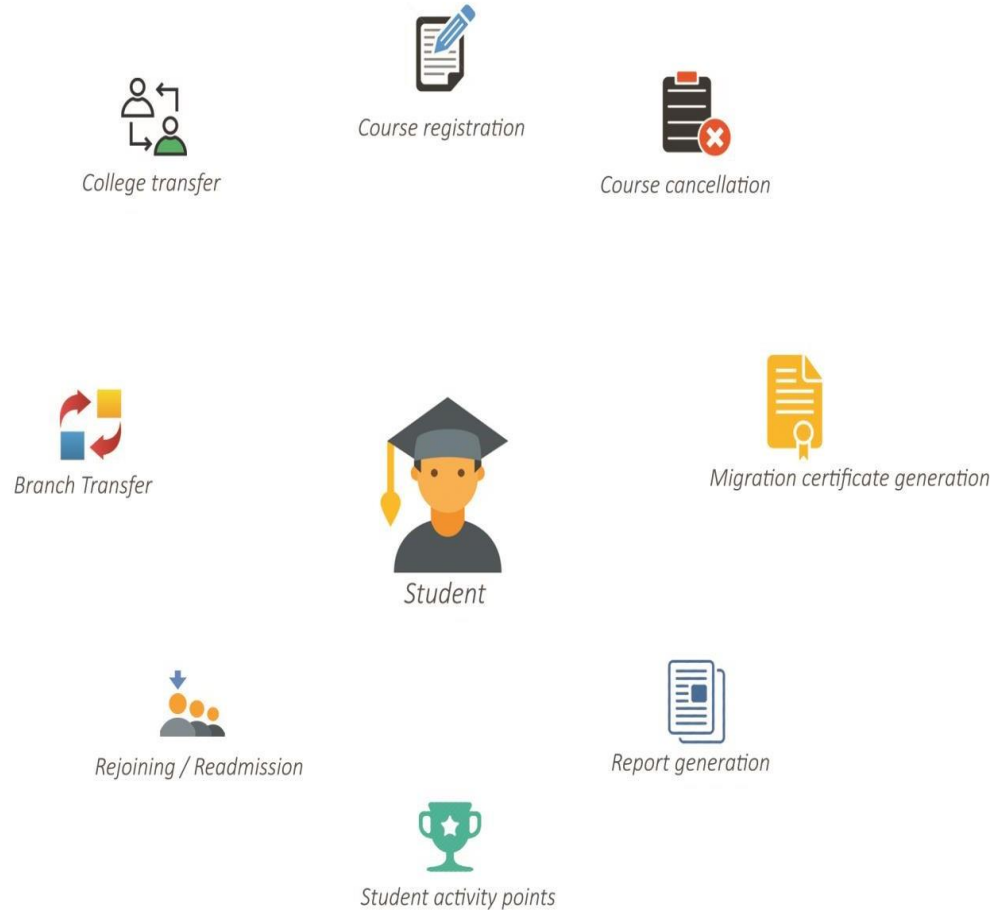
⚙ In each semester, a student registers for the courses and semester examination, from their unique portal login. Faculty/Advisor/Principal approves the registration through the system.

⚙ All student information entered by students through online, are verified by Faculty/ Advisor/ Principal.

⚙ Each student is linked with his unique Aadhar number.

Student registration external agency

Approval by Admission Supervision Committe of Govt of Kerala

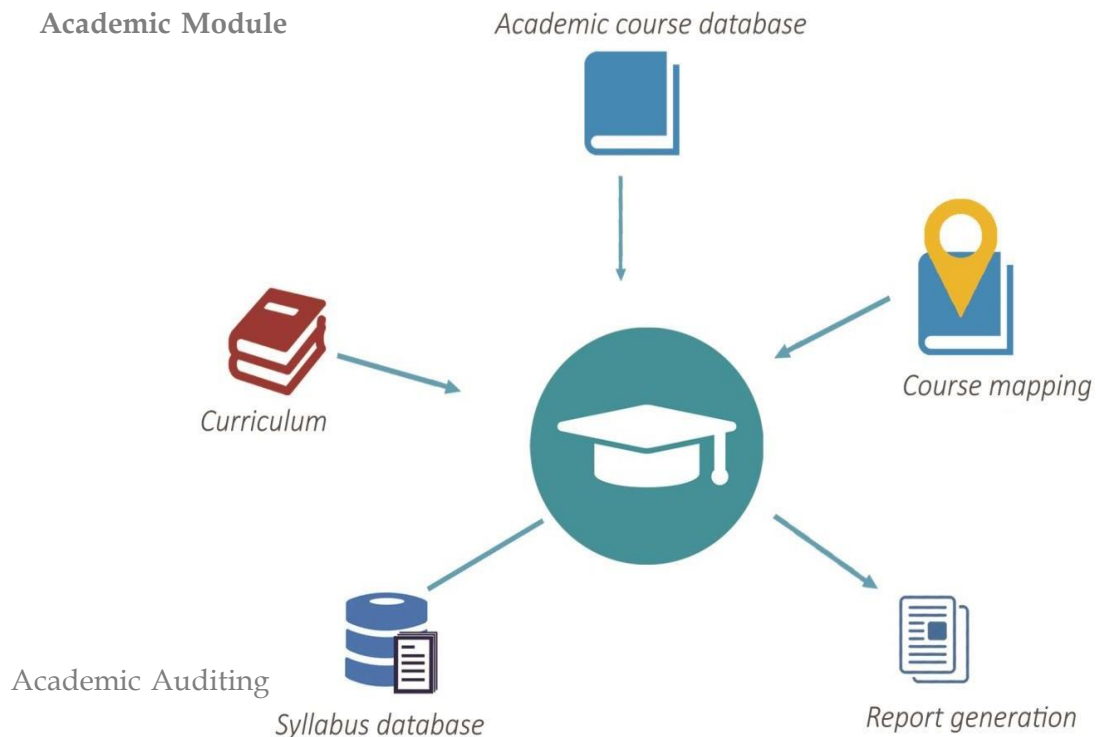⚙ A link is provided for external agency like ASC for obtaining the information regarding the student admission.
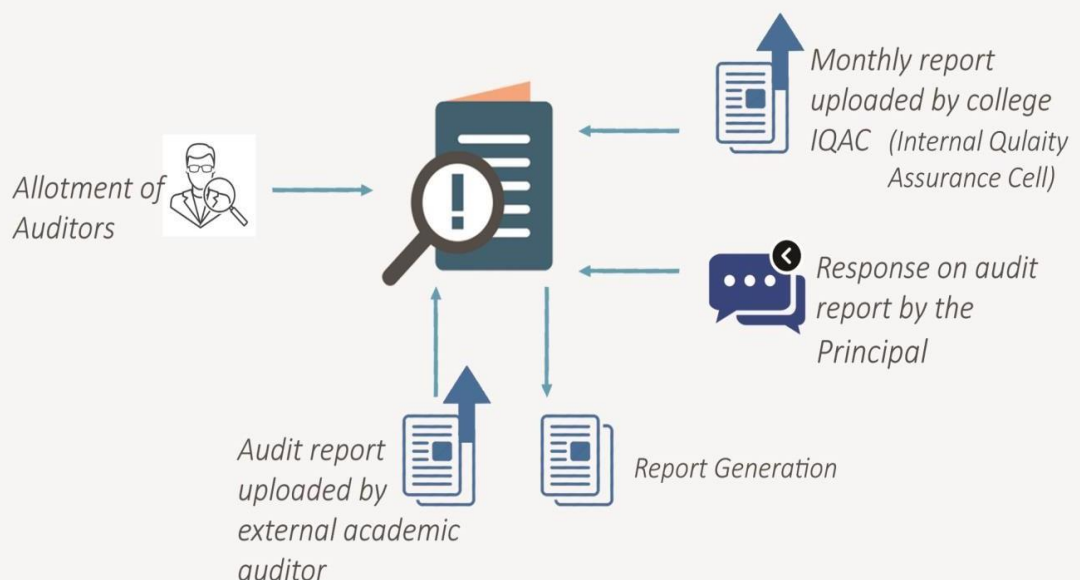
⚙ The students can download their marklist and certificates from their login.

⚙ All certificates are secured in the Digilocker and Academic Registry. Digilocker is the national digital locker system launched by Govt. of India for security storing resident documents and certificates.

**Academic Module**

Academic course database

Course mapping

*Curriculum*

Academic Auditing

*Syllabus database*

*Report generation*

⚙ Mapping facility with course offered to facilitate assessment of students.

⚙ Course and curriculum database for easy retainance.

Monthly report uploaded by college IQAC (Internal Qulaity Assurance Cell)

*Allotment of Auditors*

Response on audit report by the Principal

*Audit report uploaded by external academic auditor*

Report Generation

KTU empanelled academic auditors monitor the teaching learning process in the 150+ affiliated colleges by visiting the colleges twice in a semester.

⚙ Provision to assign colleges.

⚙ Uploading of monthly report by colleges and audit report by auditors.

⚙ Grading of Institutions based on academic auditing

# APJ Abdul Kalam Technological University

## Examination Module

Random selection by COE on the day of exam

Upload question paper

Question paper module

encryption

Downloading at 150+ colleges

Printing and distribution to exam halls
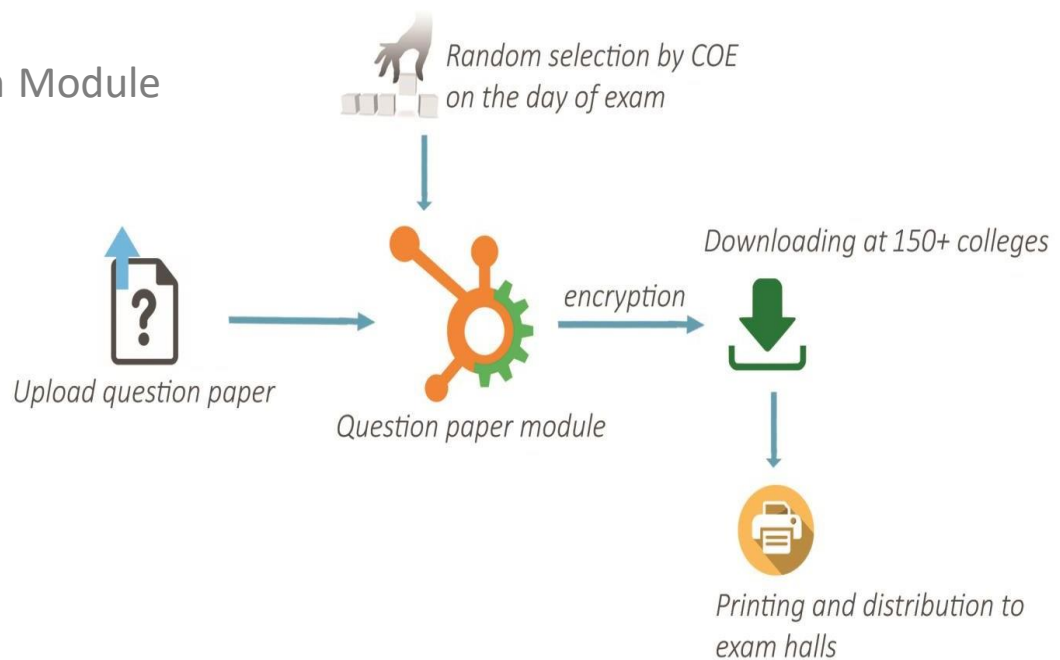
⚙ Transmission through a highly secured system of OTP, login credential and encryption.

**Re-engineered Exam conduct module**

⚙ One answer booklet containing 36 pages.

⚙ Bar coding for maintaining the secrecy & identity of students.

⚙ Design of answer booklet to facilitate double valuation.

⚙ Transmission of answer papers through postal services.

⚙ To blend with e-Governance application.

**Highlights :**

✓ Time tested, secure and effective online question paper module.
✓ Examination conduct module handles conducting of exam and distribution of answersheets to valuation camps in effective manner.
✓ Fully automated result processing module which ensures faster and reliable results

# APJ Abdul Kalam Technological University
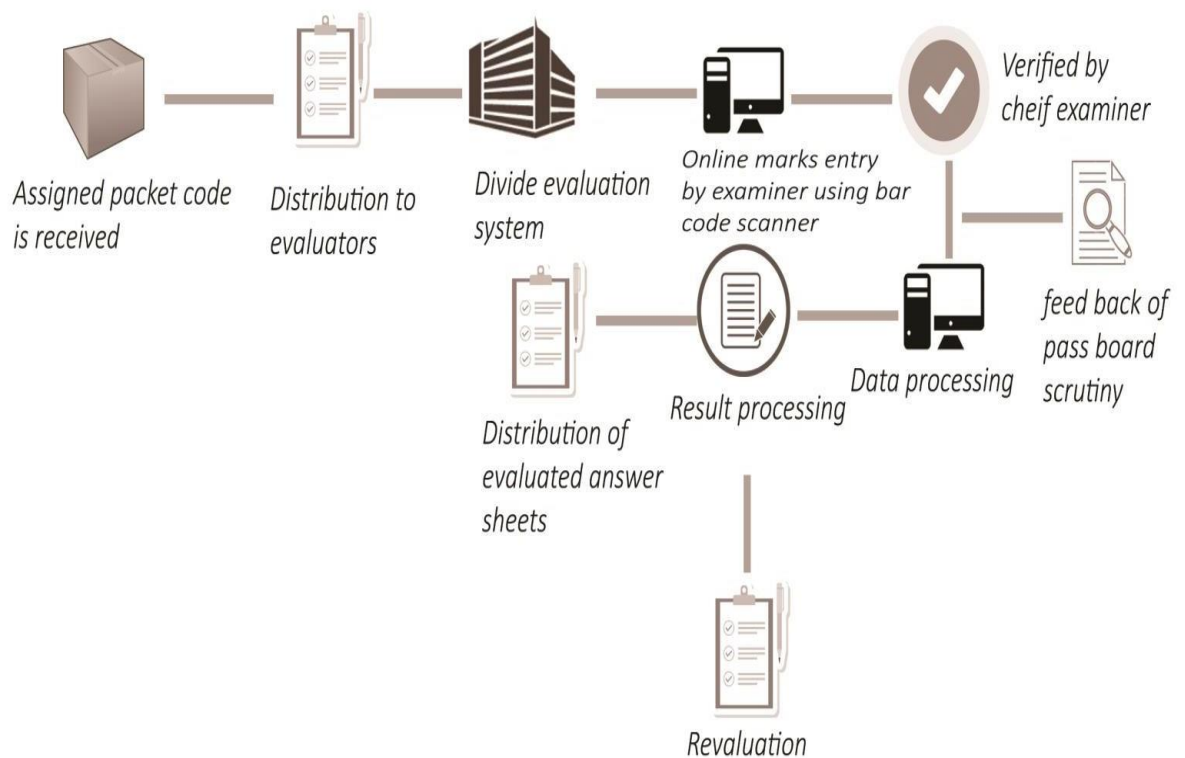
Examination Module

1



Student — Course registration — Exam registration — Payment of fees — Hallticket generation

2

*college*



college — Course mapping — Question paper setting — Question paper committe evaluation — 5 sets of question paper



Exam controller randomly selects on number on date of exam — Digital question paper to college — Exam cell fast printing Question paper printing before 2 hours

3



Despatch to college through postal dept.

Answer booklet — Collected by college exam cell



Exam Registration — False number generation — Bar code is generated for each students for each course using the assigned false number — 4 sets of Bar codes despatched to colleges for each registered students — Collected by the college — 3 Bard codes pasted at three parts of Answer Book & 1 on attendance sheet

4



Answer paper — College — Student — College — Valuation camp — Shredding centre — Retention for 6 months

# APJ Abdul Kalam Technological University

## Examination Module(Continues....)

6

Answer sheets from students
Packed in 25 numbers
Despatched to valuation camp
Packet code is assigned

7

Assigned packet code is received
Distribution to evaluators
Divide evaluation system
Online marks entry by examiner using bar code scanner
Verified by cheif examiner

Distribution of evaluated answer sheets
Result processing
Data processing
feed back of pass board scrutiny

Revaluation

**Malpractice Reporting**



college

Examination squad

Revaluation centre

Reporting of Malpractice through online

Results of concerned students are automatically withheld

Examination manual

college

Internal enquiry by Disciplinary Action Committe(DAC)

Report of DAC statement of student/ invigilator

Punishment of student

Revaluation centre

External Regional enquiry committe appointed by University

Report

Punishment of student/ college

Selection of Scholars

Place of Research

Conducting course
work exams

Constitutes of DC

University Research

Degree of Award

**Research Module**

**Thesis Evaluation for PG courses and Ph.D.**

Monitoring progress

Supervisors

Thesis Evaluation

KTU research

CERD Funding
portal

Research portal
(under construction)

# APJ Abdul Kalam Technological University



An online system for appointment of thesis examiners, thesis evaluation, appointment of viva-voce examiners and result publishing reduces the time gap between the processes, thus completes the academic process on time.

# APJ Abdul Kalam Technological University

**Server Handling View**
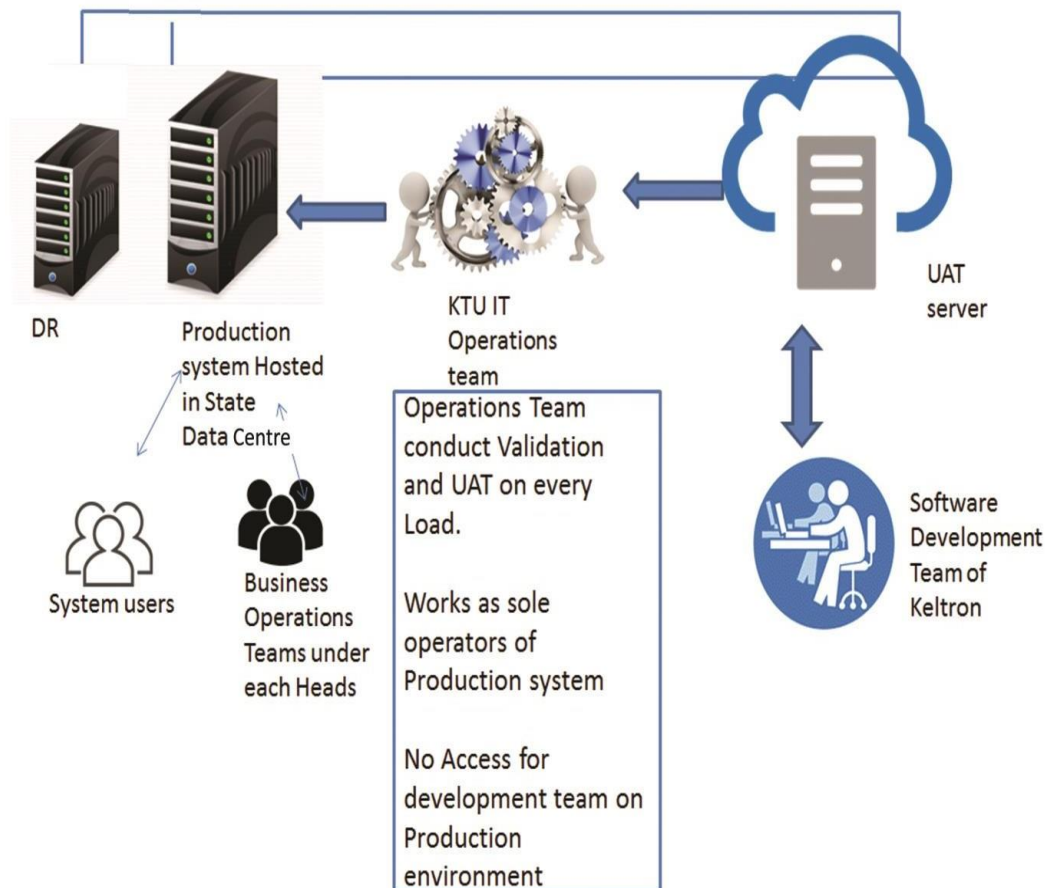


University's server management had clearly separated access of development team from production environment. Production access is limited only to the University officials.

All the production servers including e-governance application, file flow application, web servers and UAT Servers are hosted in State Data Centre(SDC) of Kerala IT mission. All server requirements are met through state data center cloud server services. This helps the University to provide a highly secured and protected server environment.

University doesn't posses any physical server in its premises. This provides huge cost saving by avoiding procurement of server hardware, running cost and its maintenance.

The Disaster Recovery (DR) server ensures zero downtime during any unforeseen disaster situations. Disaster Recovery (DR) environment of the University is at NIC Data Centre under the Department of IT, Government of India.

IT Operations Environment
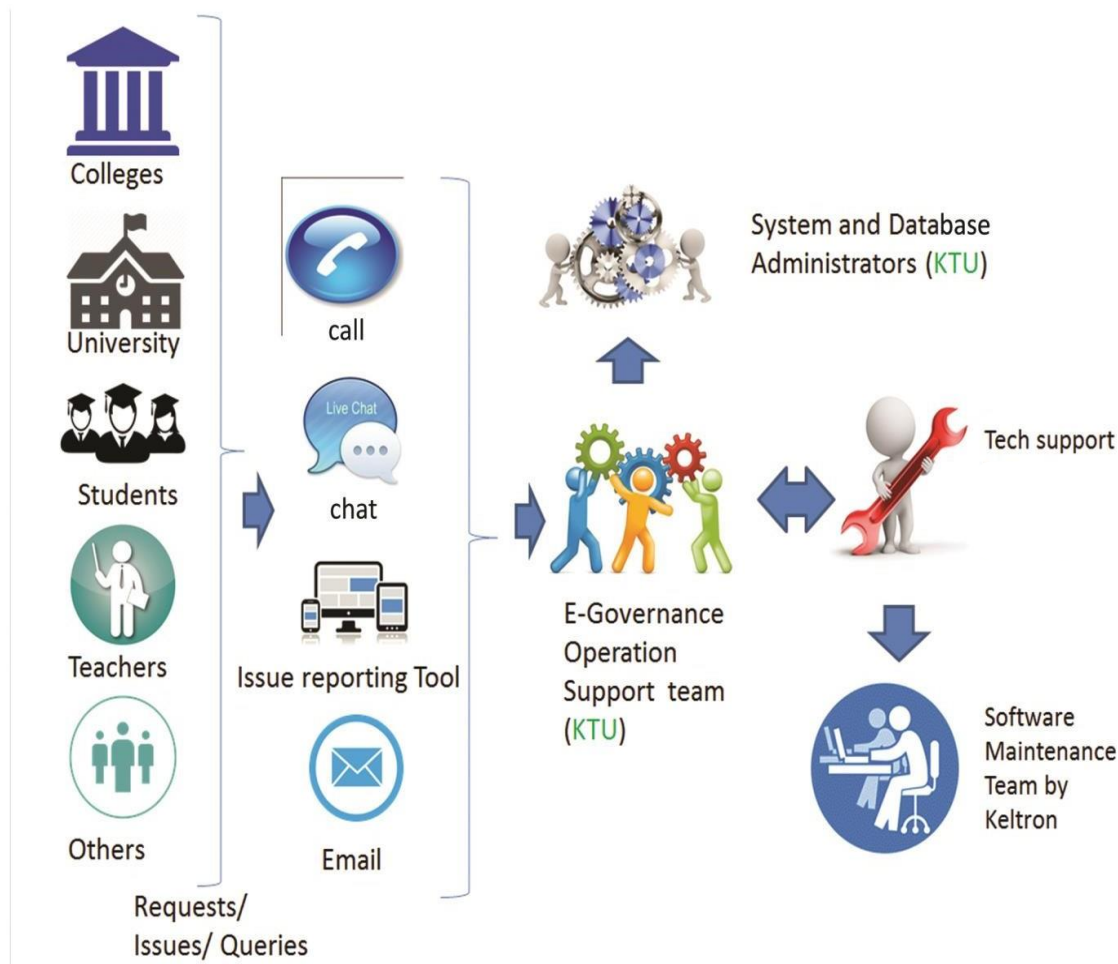


IT support and operational teams form core pillars for sustaining the functional flow and addressing various grievances of stakeholders. The team operated from University premise is accessible through various channels by stakeholders. Once a problem is reported, the team does initial assessment and assign the issue either to the concerned University department official or to the technical support team for technical investigation. After analysis, its is ensured that the concerned stakeholder is properly updated with status or outcome of the issue/concern.

University is in the process of implementing advanced Interactive Voice Response(IVR) technology supported with automated issue tracking system enabling the stakeholders to reach out to the University IT support team. Both these technologies enable University to record and track the concerns of stakeholders. This will ensure timely updates and leads to accurate resolution of the issues raised by the stakeholders. This also helps the University to analyze the issues more accurately . Any trends and larger issues which can be understood by analyzing the reports will help University to address them more systematically.

# Kerala Agricultural University

# 8. Kerala Agricultural University

i. **E-Governance initiative: Administration**

   *Administration Management System*

   Basic Administration support

   *University Suite :* Online file flow system at University headquarters with the functionalities like Tapal, File, Document, Dispatch & Record room

   *E-Hajar :* Biometric attendance recording, Monitoring and Leave recording system

   *HR & Payroll:* Employee enrollment, Salary processing, QR code embedded employee ID card generation and online provision for validating ID authenticity.

   *Recruitment:* Module for score card calculation of applicants and prepare rank list

ii. *Research Management*

   (ORMIS)Online Research Management Information System: For the monitoring and management of research projects.

iii. **Extension Management**

   **Sales and Service Portal:** For showcasing and selling of university products and services. The system is currently in the development stage.

   **USAIM (University Sales Administration and Information Management):** Stand alone application to verify the daily stock with advance billing, cash and invoice billing options.

   MISTT Management Information System for Transfer of Technology

iv. *Infrastructure Management*

   DPP Work Advance Accounting Module: For accounting the infrastructure works.

v. Planning Management

   Project Management Module : Monitors the progress of KAU projects

vi. **Finance Management**

   - UFAST (University Functional Accountability System): To track flow of funds from government grants/funding agency till the actual expenditure.
   - UPAST (University Pension Administration System): To automate all pensioner benefit calculations including tracking pension details, life certificate submission, IT anticipation, issue of Form 16.
   - Internal Funds (Provident Fund Management System): To record monthly PF subscription and also publish yearly credit cards.

vii. **APPS**

KAU has developed three separate mobile apps catering to diverse stakeholder groups of the university named the farming community, public, students, staff, pensioners etc.

KAU Live: KAU Live is an authentic notification and communication platform which generates automated and customized notifications to various target groups like farmers, students, and trainees, business institutions collaborating with KAU etc with authentic and timely notifications of the updates from KAU. Along with these KAU Live also facilitates geolocation based search facility for KAU's products & services for general public and farmers regarding product/service availability and critical contacts in this regard.

KAU ESS: KAU ESS is a specialized application intended for the employees of KAU. The primary aim of the application is to reduce the usage of paper by making all information that used to be communicated to the employees through printed papers available on the fingertips. These details include salary, pf, income tax etc.

KAU UPAST: KAU UPAST will serve the pensioners of the university by making all the information available at finger tips. The interlocution of the app greatly reduced the amount of printed communication to and from the pensioners to the university.

**E-Governance initiative: Academic**

The benefits of e-governance in educational programmes include improved efficiency, increase in transparency and accountability. It serves to achieve dual objectives of convenient and faster access to services, and lower administrative costs for these services to students. Moreover, technology advancement has created great opportunities and challenges in the knowledge ecosystem management through virtual classrooms and e-learning platforms which are supported by the e-governance internet facility. The Kerala Agricultural University is open to e-governance initiatives in education and has taken following initiatives to adopt itself to the e-governance mechanism.

Academic & Exam Management System of the University has an admission web portal that enable online student admissions. This has helped the University to complete all the admissions procedures during the strict COVID 19 pandemic regimes without much hassle.

The web portal for Academic management supports the students from registration of a course till the publication of the final results.

The university also has an Academic Convocation Management web portal that helps online registration for the annual convocations.

Students Portal is involved with the complete management of student activities including provisions for complaint registration and its resolution.

Certificate generation will be an added utility for generating Photo and QR code embedded academic certificates.

ID Card generating utility is used to generate QR code embedded student ID with online provision to validate the authenticity of the card

KAU main campus is connected to National Knowledge Network (NKN) grid with one Giga Bit Internet backbone connectivity. One Giga Bit internet is shared between all constituent colleges, Central Library, student hostels, faculty residences in the main campus. The students can make use of internet through the Wifi access points attached to the corresponding colleges, Central Library and student hostels.

Implementation of online fee portal which is underway enable students of the university to make online fee payment using the various payment gate ways viz., net banking, UPI, Credit / Debit cards etc. The new application development in collaboration with the payment gateway of SBI is in the final stage. Currently the application has completed the testing phase and the process of third-party audit is progressing. On completion of the audit, the facility will be made available to the students. On the second phase of this project, KAU plans to extend the facility for all the payments made by the public to KAU also. This will pave way for making cashless digital payments a reality at the university.

**Examination: Measures taken for modernization of examinations**

Modernization of exam

Kerala Agricultural University has reformed the conduct of examinations and evaluation of answer sheets by including online examination (OMR based) for 25 marks and online centralized evaluation of descriptive part (for 25 marks).

The process of online system involves:

Bar coding of answer scripts for quick and accurate processing

Introduction of OMR techniques for final examinations

Web based announcement of results for transparency and publicity

Internal marks is being uploaded online by the faculty. KAU has also implemented the Academic Management System (AMS) introduced by ICAR which is a web enabled system for management of all the various academic activities of the university. The system caters to the needs of different users, namely Dean, Registrar, Professor, Head, Guide, Faculty, Teacher, Student, Administrators and Officials for performing their assigned tasks. A system has been designed in a modular approach with in-built work flows. System ensures that the individuals responsible for the next task are notified and receive the data they need to execute at their stage of process. At present five modules have been envisaged viz., Student Management, Faculty Management, Course Management, Administration Management and E-Learning.

The question papers for final exams are sent via email from the university one hour before the commencement of exam (ue@kau.in). The password is sent thirty minutes before the commencement of exam to the respective deans by mail.

# Kerala Veterinary and
# Animal Sciences University

# 9. Kerala Veterinary and Animal Sciences University

**E-Governance initiative: Administration**

Integrated University Management System (IUMS)

- IUMS is an enterprise-wide web enabled ERP application that takes care of almost all the University's operations.
- It is an initiative to replace University's administrative and Academic systems with a new Integrated System in a secure and stable environment.
- IUMS not only helps in daily operations of the university, but also provides the foundation to foster research and develop academic e-learning methodologies.
- The modules have been indicated below and they have subcomponents for each

**Administration Modules**

Financial Accounting, Budgeting, Establishment, HRMS & Payroll, Pension, Recruitment, Tax Management, Leave Management, Employee Portal, VC & Administration Offices, File Movement System[DDC], Letter Movement System, Hostel & Mess Management, Pig Farm Management, Sheep And Goat Farm And Buffalo Farm Management, Dairy Plant Management, Meat Plant Management, Poultry Farm Management, e-Vet Connect

**E-Governance initiative: Academic**

Academic Modules

*Integrated University Management System [Iums]*

IUMS is an enterprise-wide web enabled ERP application that takes care of almost all the University's operations.It is an initiative to replace University's Academic systems with a new Integrated System in a secure and stable environment. It is being used for BVSc and AH (2015 and Earlier admission), MVSc, MTech, MSc and PhD programmes.IUMS not only helps in daily operations of the university, but also provides the foundation to foster research and develop academic e-learning methodologies.

- The modules have been indicated below and they have subcomponents for each
  Admission & Academics
  Student Attendance Management
  Examination &Result declaration
  Student Fee Management
  Student Portal

*Academic Management System (AMS)*

AMS has been customized by the NAHEP Component of ICAR for the implementation at various Agricultural Universities. It is a web enabled system for management of all the various academic activities of the university. The system caters to the needs of different users: Dean, Registrar, Professor, Head, Guide, Faculty, Teacher, Student, Administrators and Officials for performing their assigned tasks

Features/ Modules

Student Management

Faculty Management

Course Management

Administration Management

E-Learning

**Examination: Measures taken for modernization of examinations**

Measures taken for modernization of examinations

Kerala Veterinary and Animal Sciences University has web based software, Integrated University Management System (IUMS) to successfully handle all the challenges of managing an educational institution. It is an initiative to replace University's administrative and Academic  systems with a new Integrated System in a secure and stable environment. It provides real time information processing and knowledge management. It is an integrated solution that facilitates the processing and maintenance of large volumes of information - including student and Employees.

IUMS-Phase 1 modules includes Admission & Academics, Student Attendance, Management, Examination & Result, Student Fee Management, Student Portal, Financial Accounting of 2015 and earlier BVSc & Ah, MVSc, MTech and PhD students. Students can access the portal with individual account. The IUMS has supported the publication of results without delay. BVSc & AH students from 2016 follow MSVE pattern and KVASU academic portal is used for managing examination including attendance, registration of examination, hall ticket generation, result declaration and certificate generation can be carried out efficiently with this system. This has improved the efficiency of handling examination from registration to distribution of certificates.

In order to improve the transparency in conducting examination CCTV has been established in all the examination halls which can be monitored by the Dean and Controller examination.

# Kerala University of Fisheries and Ocean Studies

## 10. Kerala University of Fisheries and Ocean Studies

**E-Governance initiative: Administration**

- In administration as part of E-Governance, all files are accessed through the campus suite which facilitates faster file movement. The faculty activities can be regularly monitored through this suite. Punching is compulsory in KUFOS for teachers and non-teaching staff. Files related to purchasing and receipts as part of the finance section are monitored online. E-tendering is strictly followed in the purchase of instruments.

- All activities including Tapal Entry, Processing of files, and issue of a final order can be fastened through this system. Purchase of equipment is fully automated. The examination wing is also fully automated.

**E-Governance initiative: Academic**

All activities including Tapal Entry, Processing of files, Student Registration, declaration of results, and generation of mark lists are done using the software KUFOS SUITE, with safety protocols. The pre-examination part and post-examination part are digitalized by using NIC Software(KUFOS SUITE).

**Examination: Measures taken for modernization of examinations**

All activities including Tapal Entry, Processing of files, Student Registration, declaration of results and generation of mark lists are done using the software KUFOS SUITE, with safety protocols. The pre-examination part and post-examination part are digitalized by using NIC Software(KUFOS SUITE)

- The exams are being conducted with strict confidentiality under the supervision of the Controller of Exams, within the campus.

- All examination halls are well equipped with adequate CCTV cameras and all the proceedings during the examinations are recorded and filed immediately after the examination for future verifications.

- A squad consists of Controller of Examination and two Governing council members functioning in the University to visit the examination halls for inspection during the examinations.

- The squad will invariably inspect the examination process and report malpractice, if any, to the Vice Chancellor.

- The Provisional Degree Certificates are issued immediately after the publication of final results. The Original Degree certificates are issued only through Convocation Ceremony which is conducted every year in a befitting manner.

# Kerala University of Health Sciences

## 11. Kerala University of Health Sciences

**E-Governance initiative: Administration**

Taking a leaf out of the Government of Kerala's initiative for implementing the concept of Electronic Governance or e-governance, the Kerala University of Health Sciences too decided to switch over to the electronic mode of managing the filing system.

Though the salary disbursal to the staff and other payments for the teachers/evaluators were being done through the digital mode for quite a long time, it has been decided that by the middle of August 2019 the normal file process system in the Administration and Academic branches shall be through the university's own 'SUITE' system of e-governance and it has been successfully implemented and now, all the files are through the same, leaving the physical files to a finger few. Of late, 'work-from-home' facility is also successfully implemented in our office and all the staff members are capable of attending their routine office work from a remote device, of course, using the necessary credentials issued by the I T branch.

Even as an advanced stage of implementing the 'paperless office concept' an online-payment gateway has been introduced to help the students and the general public to do their payment with the university, by which they can remit the necessary fees/remittances through their bank accounts without visiting any banks or the university office.

As far as the Examinations branch is concerned starting from introducing digital evaluation for certain courses to providing various services to the student community is already there, as a result of implementing the e-governance.

**E-Governance initiative: Academic**

The Academic E governance is implemented under four areas:

- *Student Enrolment:* Provision for student enrolment through university portal is provided.

- *Examination:* All students are enrolled and ID cards issued. A single ID is used for the entire program of the student. Hall tickets are electronically dispatched to the individual students who may download it. Question papers are transmitted electronically, downloaded and printed 30 minutes before the commencement of examination. Digital evaluation is being piloted so that the entire examination process will be brought under E governance.

- *Electronic Monitoring of Academic Activities of Institutions (Academic Monitoring Cell(AMC):* All institutions have an institutional academic committee which monitors its own academic activity. Its reports are filed to the KUHS through an electronic dashboard which is monitored by the university under the leadership of the Vice Chancellor.

- *Faculty Enrolment*: Entire 14,000 faculty members of the affiliated colleges of the university are assigned unique ID's after verifying their credentials. This data is the basis for the selection of examiners, quality enhancement training, Inspections and awards.

- **Examination: Measures taken for modernization of examinations**

- Introduced digital evaluation method for evaluation of Theory Answer Books: University initiated digital evaluation on pilot basis during the period under assessment. Successfully evaluated 11,528 answer books of 7 examinations. The total number of valuations (First, Second and third) for the above number of Answer Books were 24,576. Currently, the 8th digital evaluation camp is being conducted for B Sc MLT course.

- Network Attached Storage(NAS): NAS is the basic infrastructural necessity for providing storage space for large amounts of data for the required period when large scale digital evaluation is undertaken. The NAS with a capacity to store data (scanned images) of 1,75,000 Answer Books of 52 pages at the same time, is about to be procured, after completing all the formalities. University has taken steps to procure this facility to equip itself for large scale digital evaluation.

- Surveillance in examination hall: In order monitor the procedure of conduct of theory examinations in the affiliated Institutions, University is planning to introduce high definition/resolution surveillance camera with higher level functionality. One of the main benefits is that it will be difficult to predict its next movement, that is where the camera is pointing at the next instant. So the attempt for malpractices can be reduced. Moreover, University is planning to explore the possibility of live streaming the surveillance cameras mentioned above, to the Office of Controller of Examinations.

- Online certificate verification: University has started online verification certificates for those who are going for overseas job or for prospective employers within India.

- Online evaluation of thesis: In order to avoid time lag and ease of access of the thesis to the Evaluators, online evaluation of Theses was introduced.

- University has introduced, during the period under assessment, disabled- candidates-friendly approaches for helping them in the practical examinations and viva. For visually disabled, magnifying images for practical and viva are shown. For hearing impaired candidates, projection of questions in viva and practical examinations are provided, depending up on the gravity of impairments. All these are done with the concurrence of the Apex Regulatory bodies like MCI.

# Status Report

## *on*

# E-Governance in Kerala State Higher Education Council

# DIGICOL: Digital Enablement in Higher Education Institutions

## Executive Summary

The Digital Enablement of Higher Education Institutions is an initiative of the KSHEC in response to the call of the Government to Go Digital in teaching/learning activities in higher education. Under this plan, effective implementation of MOODLE, a Opensource Learning Management System (LMS) with excellent features used for blended learning, distance education, flipped classroom and other e-learning projects in schools, universities, workplaces and other sectors is envisaged.

As part of the Let's Go Digital campaign, the Department of Higher Education, Government of Kerala entrusted the Kerala State Higher Education Council to provide training for the faculty members of state universities and colleges and to provide centralized server space provided by State Data Centre (SDC) or with the Digital University of Kerala (DUK).

The project involves a central management and system administration by KSHEC with the backend infrastructure developed, maintained with technical support by Digital University of Kerala for implementing the software.

## Outcome

1. KSHEC has trained 3600+ teachers mostly through online mode especially hands-on-training done by experts. Faculty of institutions are getting equipped to implement LMS in their institutions.

2. Server space and MOODLE-LMS are provided to the trained institutions and is preparing to expand this facility to 50 colleges during the academic year 2021-22 and to extend the facility to 500 institutions in the next phase.

3. This scheme has facilitated the efficacious use of blended learning in our higher education institutions for the present and the future course of action.

# Online Digital Repository of course materials

## Executive Summary

Kerala State Higher Education Council provides a dedicated portal for students to access online study materials on various courses in UG/PG programmes in different subject disciplines of the state universities in its website www.kshec.kerala.gov.in under the title 'Online Study Materials' this repository has been developed in association with faculty members of government, affiliated colleges and universities in the state. A wide range of study materials for B.Sc./B.A./B.Com./B.B.A. and M.Sc./M.A./M.Com. programmes, are available. Students can easily choose it according to their interest and demand as the website provides user-friendly windows for search, view and downloading. The material is supplied in the form of pdf documents, power point presentation and videos formats. The council does the preliminary screening of the learning material received from the faculty members

A portal facility to host e-contents of courses of UG/PG programmes developed by the faculty members of government, affiliated colleges and universities similar to SWAYAM/NPTEL

## Outcome

1. The portal facility hosts 3000+ e-contents on various subjects of Undergraduate and Post Graduate programmes and provides access to teachers and students.
2. Large number of students are regular viewers of the e-contents. Active participation from the faculty members of various colleges is ensured.
3. Enhancing the quality of e- contents and expanding the resources using advanced technology of digital pedagogy.
4. Academic credit to e-content developers /resource persons single window access to e-contents/resources and access to courses of UG/PG levels for faculty and students in colleges.
5. Building State Level Knowledge Asset for research leading to the development of knowledge economy

# KALNET
## Kerala Academic Library Network
### Executive Summary

It provides the shared platform for academic resources. Kerala Academic Libraries Network (KALNET) brings on a common platform the collections of all the libraries of the HEIs of the State which would be accessible to all researchers. The system developed in consultation with Vice Chancellors/ Librarians of state universities. KALNET portal has been created in KSHEC website. Data hosted on State Data Centre. KALNET links Library data from various university libraries. At present 11 universities, 147 libraries and 15 lakh titles of books and journals are brought under a single search interface. The open source-based search interface offers various features like spelling suggestions and auto completion of queries. In the second phase the Higher Education Council of Kerala plans to provide live status of the availability of the library materials.

### Outcome
1. KALNET links Library data from various university libraries
2. It presently has the participation of 14 universities-networking of 140 libraries.
3. Data of more than 15 lakh collection is available on the portal.
4. A single, unified catalogue to search for items across the collections of different academic libraries in Kerala

## State Assessment and Accreditation Centre (SAAC)
### Executive Summary

The primary objective of the SAAC is to assess and assign state level accreditation and grades to all higher education institutions in the state including universities, government and aided colleges, autonomous colleges and self-financing institutions/colleges. The Council conducted several district wise programmes for colleges pertaining to various aspects of SAAC.

It envisages to stimulate and promote the horizontal and sustainable development of all higher education institutions of Kerala by employing transparent and methodical measuring means having global, national, state level, regional and local bearing, with prime focus on quality, excellence, competency, adaptability, inclusiveness and social/ development linkage.

Apart from the seven criteria for assessment proposed by NAAC, three state specific core values of SAAC have been adopted through measurable criteria-framed metrics. They are: (1) Ensuring Social Inclusiveness, (2) Striving for Equity & Excellence, and (3) Fostering Scientific Temper and Secular Outlook.

### Outcome

1. The SAAC portal is developed and maintained by the council, which facilitates all round process right from the beginning of SSR preparation to the grading.
2. All activities like data validation, scrutiny, assessment and final grading are being conducted online except the onsite visit of peer-team members.
3. The centre has accredited two institutions during this period and is receiving applications and self-study reports from various institutions for accreditations

# Kerala Institutional Ranking Framework (KIRF)
## Executive Summary

The council envisages the creation of a Kerala-specific ranking index, which will be termed as Kerala Institutional Ranking Framework (KIRF) for universities and colleges on the lines of the National Institutional Ranking Framework in the state of Kerala. This will enable holistic and comprehensive ranking of the 1500+ higher education institutions in the state. This will be a pioneering step in the country that a state level agency perform the ranking for the academic institutions in the state. The entire process of KIRF would be operated through online mode.

## Outcome

1. This would be completely online mechanism for comparative ranking of higher education institutions in the state.
2. This will be done through the existing portal facility and on the basis of the details obtained through the survey of All India Higher Education Survey (AISHE) and All Kerala Higher Education Survey (AKHES) in addition to the specially formulated ranking metrics with state specific aspects.
3. This would ne the first in the country that a state level public agency is engaged in institutional ranking of its institutions of higher learning, which incorporates specific areas of state specific aspects not covered under other ranking frameworks.

# All Kerala Higher Education Survey

## Executive Summary

KSHEC conducts All Kerala Higher Education Survey (AKHES) which contains useful information on various aspects of Higher Education sector in Kerala. It covers details of teaching and non-teaching staff, programmes conducted under various faculties, student enrolment, scholarships, examination, accreditation and infrastructural facilities in Higher Education Institutions and provides data for evidence-based decision making and planning. The information collected online through the KSHEC portal wherein most of the institutions of higher learning in the state have registered themselves and uploaded information in the Data Capture Format. The research team of the KSHEC also collected data directly on a number of parameters.

## Outcome

1. The entire process of data collection is held through online mode. The survey report for the year 2020-21 has been published.
2. Institutions once attempted/prepared the datasets for uploading the required information can update the information through the portal for the consecutive years.
3. First in the state that a comprehensive database of all higher education institutions in the state are collected through online mode.

# Brain Gain: Database of Keralite-Academic diaspora around the Globe

## Executive Summary

KSHEC is building up a database with details of the Keralite academic diaspora envisaged for their greater participation for enhancing the quality of higher education in the state. As part of building up the database, KSHEC maintains a registration portal open to scholars for providing their details through online mode.

The main objectives of the scheme is:

- attract, share, involve, integrate and incorporate Keralite-Academics in advanced fields of science, technology, and social sciences for the quality enhancement in higher education institutions in Kerala
- effectively implement the Erudite-Scholar in Residence cum Brain Gain programme
- bringing the experts as short-term teachers, part-time collaborators, and co-supervisors in researches in the universities
- locate experts in science-tech hybrid fields relevant to the transformation of higher education to knowledge economy and enhancement of the states' intellectual property contributions
- • identify experts in high-tech industries and invite them for generating ideas for the reconstitution of the curricula of the higher education institutions by establish communication directly with the experts who possess the expertise
- provide advisory support to the government by using the above database in relevant matters of expertise

**Outcome**

1. The council built a database of 200+ scholars from different field of knowledge areas from among the diasporic communities across the globe.
2. As part of it, these experts are asked to provide an academic plan of their choice so that the council coordinate the possible activities in association with the respective universities in the state.
3. It will further link with the erudite scholars in residence programme, arranging visits of scholars to state universities/colleges, creation and maintenance of database with help of software, sharing the details of scholars to universities and colleges, arranging online lectures/courses by NRK scholars are some of the salient outcomes expected from this scheme.

# E - Journal Consortium: e-journal access to all the state universities

## Executive Summary

The Governing Body of KSHEC resolved to establish a consortium of e journals in the State to cater to the needs of the academic community in wake of the rising costs of subscription to e journals and the paucity of funds faced by the universities. The KSHEC acts as the nodal agency of the consortium for which the state government as earmarked Rs.10 crores in the state budget for 2021-22.

## Outcome

1. This will provide single window access to Universities / colleges and other institutions for the required number of e-journals & academic database for the academic community.
2. Increased research output/productivity of faculty/universities will increase ranking state institutions globally.

# All India Higher Education Survey (AISHE)

## Executive Summary

KSHEC has been designated as the nodal agency for All India Higher Education Survey (AISHE) by the Ministry of Human Resources Development. The council oversees the collection of data related to all HEIs in the state based on the DCF developed by the MHRD. As per the latest survey of AISHE 2019-20, the Gross Enrolment Ratio (GER) in Kerala is estimated at 38.8% compared to the All-India Average of 27.1%. The survey covers programme-wise, programme enrolment, gender, social group, minority and Persons with disabilities (PWD) and foreign students distribution.

**Outcome**

- **Provide database for planning at the state level**
- **Provide data for NAAC/ NBA/ NSP/ NIRF**

# Higher Education Scholarship Scheme

## Executive Summary

Higher Education Scholarship Scheme, which is being implemented by the Kerala State Higher Education Council, with the financial support of the State Government is one of the most acclaimed and popular initiatives in higher education sector. It is an imaginative scheme formulated in line with the declared objectives of the Higher Education Council to promote equity, access and excellence in higher education. The main objective of the Scheme is to attract and retain talented students in non-professional academic schemes like sciences, humanities, social sciences etc. and about 3000scholarships are given every academic year at the UG level to pursue non-professional courses and about 1200 scholarships are given at the PG level. Physically handicapped students are given 25% additional amount.

## Outcome

1. The scheme of scholarship is done online mode in technical collaboration with NIC.
2. Transparence in the award of Scholarships.
3. From submission of Application to final disbursal of money directly to the student bank account.

# Chancellor's Award

**Executive Summary**

The Chancellor's Award was instituted by the Honorable Governor and Chancellor of Universities of Kerala in 2015 to nurture the spirit of healthy competition among the State Universities in Kerala so that they will evolve as vibrant centers of learning.

The selection is based on achievements of Universities in areas such as academics, pedagogy, research and social inclusiveness.

The selection process is entirely done through online mode, where universities upload data. The system generated assessment is made for quantitative metrics and committee members will verify the qualitative metrics through the access control provided to them. The entire set of process is highly transparent and effective for the time bound completion of the selection process.

**Outcome**

1. The council has completed the selection process of the award for the last three years fully under online mode.
2. The universities participating in the process are provided the general guidelines and format which enables them to prepare the dataset for final uploading.
3. Details of academic / administrative performance of participating universities create database in University education in the state.
4. Promotes healthy inter University competition and annual academic stock taking helpful for National and International accreditation/ ranking.

# Kairali Research Awards

## Executive Summary

The Government of Kerala have announced Kairali Research Awards to those candidates who excel in a particular subject with an aim to encourage the most eminent research scholars and research pedagogues of the state. This award is given under four categories of scholars viz. Kairali Gaveshaka Puraskaram, Kairali Gaveshana Puraskaram, Kairali Lifetime Achievement and Kairali Global Lifetime Achievement Award. From the first level of uploading applications or applying online mode to the final declaration of the awards are handled through online mode. The subject experts & selection committee are provided with access credentials for document verification of applicants.

**Outcome**

1. The entire award selection process is done through online mode
2. Promotes quality research in Higher Education in the state.
3. Encouragement to Faculty/ Scholars at the University/ College level for professional excellence.

# Chief Minister's Nava Kerala Post-Doctoral Fellowship

## Executive Summary

The Government of Kerala have introduced the prestigious Chief Minister's Nava Kerala Post-Doctoral Fellowships scheme for meeting innovation and development needs of the state through promoting quality research spanning the sectors like social, economic, agriculture, development and industry. The scheme envisages 500 individual Post Doctoral fellowships and each one carries an amount ranging from 50,000/- to 1,00000/-per month. The whole process is expected to be completed online mode only.

**Outcome**

1.   Helpful for promotion of research in socially relevant emerging areas of Knowledge.

2.   Provide inputs for faster economic developments as prominence is given to areas related to

 Rebuild Kerala theme.

3.   Enhance the academic ranking and research output of state universities.