Kathmandu University

ISMS (Information System Management Section)

Annual Report 2021/2022   *Prepared on: May 2022*

Introduction

ISMS (Information System Management Section) is located in Central Administration Kathmandu University, Dhulikhel. This section is dedicated to:

- Development and Implementation of evolutionary University ICT Strategic Plans; Policies; Standards; Operational Plans; & Budgets; sensitive to emerging technologies and responding to changing needs and practices.
- Acquisition and Development of University ICT Network Infrastructure and Services
- Acquisition and Development of University Management Information Systems and Services
- Acquisition and Development of expanded Corporate Internet Services; especially Browsing (Research, Journals etc.) and E-mail (staffs & students)
- Aggressive and Continued Training on Basic and Intermediary ICT Skills for all Students and Staff
- Improve the use of technology to support teaching and learning.
- Improve access to information.
- Improve infrastructure and increase connectivity.
- Maximize benefits of investments in technology.
- Develop and integrate Information Management systems
- Design ISMS structure, develop specific TOR to assist on hiring Staffs
- Improve effectiveness of KU Information Technology operations.
- Promote use of open-source and genuine software and services

Activities of ISMS

System and Services Administration/Management

- Installation and Maintenance of Systems/Servers (Web, Mail, VOIP Telephone, Learning Management Systems, DNS, Storage/Backup, Database, HRMS, Monitoring)
- Administration of installed Systems/Servers
- Upgradation of Systems and Servers

- Development of Content Management System (CMS) for websites (Central, Schools and Departments)
- Administration of Web/Mobile Application Software for websites
- Install, configure and manage Software and their functions according to specifications
- Ensure system/server security and run timely security audits
- Maintain proper technical (Installation, administration) documentations and user manuals
- Facilitate online journals and journal publications

Network Administration/Management
- Network Design and Setup
    - VLAN design
    - Video conference network design
    - Wireless hotspot network setup
    - Network equipment (Switch, router and Firewall) installation and maintenance
    - Bandwidth monitoring and management
    - Network monitoring and maintenance
    - Network setup and support to different schools, projects and others
- Network authentication
- Server Networking
- KUCAT CBT Network management
- CCTV Networking
- Attendance/Biometric Networking
- Security Access control, Automatic Door Locks and RFID Registration
- Point-To-Point Optical Fiber Installation and Maintenance (building to building)
- Ensure Network security and run timely security audits

Support, Maintenance and Upgrade services
- Organize and schedule upgrades and maintenance without interfering work of others
- Perform troubleshooting to diagnose and resolve problems in a timely manner
- Upgrade the entire system to enable compatible software on all computers
- Perform tests and evaluation on new software and hardware
- Maintain records/logs or repairs and fixes
- E-Mail support and services (Central, SoE, SoS, SoA, SoL, SoEd)
- Video conference support and maintenance
- Training and training resources preparation for Staff, Faculty and Students
- e-Learning (Moodle) LMS support for faculty, staff, students and administrators of all Schools
- KUCAT CBT System administration and support
- Accounting, Inventory, HRIS software support
- Library software support (OPAC, SOUL)
- Departmental Computer lab support (School of Engineering, School of Science, School of Law)

- Assist in developing and maintaining local networks
- Online Admission for School of Science and School of Engineering
- Web hosting service to schools, departments, projects, clubs and others
- Assist in setting up workstations with computers and necessary peripheral devices
- News and notice, contents update in university webpages
- Operating System and software licensing
- PABX/VOIP support and maintenance
- Assist the users on how to operate software and computer equipment
- Provide and support dedicated internet services to faculty/staff and students (Central Administration, SoE, SoS, SoL, faculty/staff residence, students' hostels, guest houses)
- Provide and support wireless internet services inside KU premises Dhulikhel and SoL
- Networking and internet service/support for various events including Convocation, Welcome/Farewell, Tranings/Seminars/Conferences
- Provide remote support for internet and networking in Panchkhal premises, KUSoL, KUSoM Exam

Facts & Figures

1. **Current Internet Connection**: Through Fiber optics link from **WorldLink Communications P. Ltd.**, Jawalakhel, Lalitpur, Nepal
2. **Intranet Connection:** Nepal Research & Education Network (NREN) and its member/s (100 Mbps local connection with Educational Network); Canteen (5 Mbps from Dhulikhel to Balkumari and Hattiban)
3. **Current Internet Bandwidth**: **250 Mbps** Symmetric

Bandwidth Upgrade history   *(1024 Kbps = 1 Mbps)*

Year	Service Provider	Connection	Month	Bandwidth (Kbps)	
				Downlink	Uplink
2001	BTN Access, Singapore	VSAT	November	256	128
2003	BTN Access, Singapore	VSAT	June	512	160
2004	SinGTel, Singapore (Mercantile)	VSAT	May	1024	384
2005	SinGTel, Singapore (Mercantile)	VSAT	May	1152	384
2006	SinGTel, Singapore (Mercantile)	VSAT	October	1536	512
2007	SinGTel, Singapore (Mercantile)	VSAT	May	1536	512
2008	SinGTel, Singapore (Mercantile)	VSAT	May	1920	640
2008	Websurfer, Naxal	Fiber	October	3072	3072
2009	Websurfer, Naxal	Fiber	July	3584	3584
2010	Websurfer, Naxal	Fiber	July	4096	4096
2010	Websurfer, Naxal	Fiber	August	6144	6144
2011	Websurfer+Mercantile*	Fiber	July	11264	11264
2012	Websurfer+Mercantile*	Fiber	June	13312	13312
2012	Websurfer+Mercantile*	Fiber	July	17408	17408
2012	Websurfer+Mercantile*	Fiber	July	17408	17408
2013	Websurfer+Mercantile*	Fiber	April	19456	19456
2013	Websurfer+Mercantile*	Fiber	July	25600	25600
2014	Websurfer+Mercantile*	Fiber	August	35840	35840
2015	Websurfer+Mercantile*	Fiber	August	38912	38912
2017	Websurfer+Mercantile*	Fiber	June	51200	51200
2017	Worldlink	Fiber	October	102400	102400
2020	Worldlink	Fiber	March	153600	153600
2022	**Worldlink**	**Fiber**	**April**	**256000**	**256000**

From Mercantile (5Mbps free)

4. **Bandwidth utilization:** 24 hours

5. **Fiber connection in KU:** Building to Building in Dhulikhel premises, P2P connection to KUSMS and School of Law

6. **Network Topologies: Star & Extended Star**

7. **Number of computers/internet devices connected to wired Network**: 1970+

8. **Average number of internet users per day**: 2500+ (Wired+Wireless)

9. **Intranet bandwidth**: Local (1 Gbps & 100Mbps) inside KU premises, Canteen (5 Mbps) KU Dhulikhel to Kathmandu (Balkumari, Hattiban)

10. **Annual Internet Bandwidth Consumption** (Daily Average: May 2021 – May 2022)
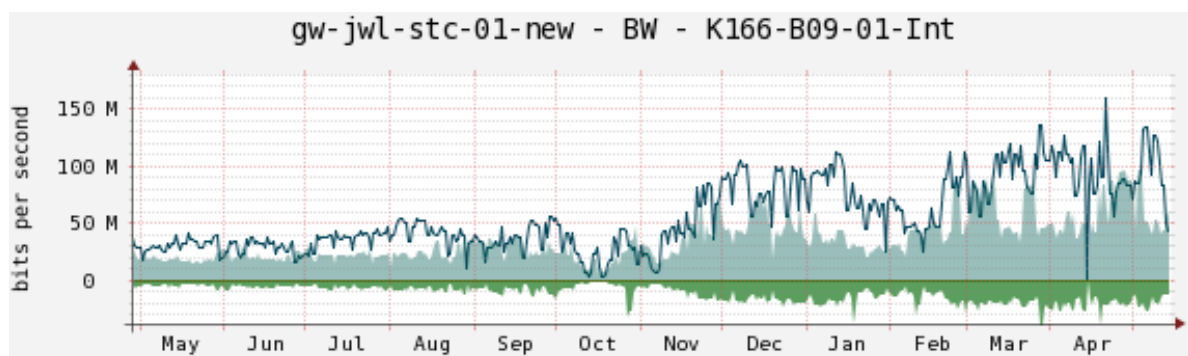
11. **KU Website upgrade history (major releases):**

    Web 1. 2002 November
    Web 2. 2003 July
    Web 3. 2006 January
    Web 4. 2009 April
    Web 5. 2012 October
    Web 6. 2019 June (Current)

12. **Annual KU Homepage Website Visitors** (Daily Average: May 2021 – May 2022)

Users	New Users	Sessions
235,263	230,443	644,016

Number of Sessions per User	Pageviews	Pages / Session
2.74	1,691,045	2.63

Avg. Session Duration	Bounce Rate
00:02:33	54.71%

Returning Visitor 23.8%
New Visitor 76.2%
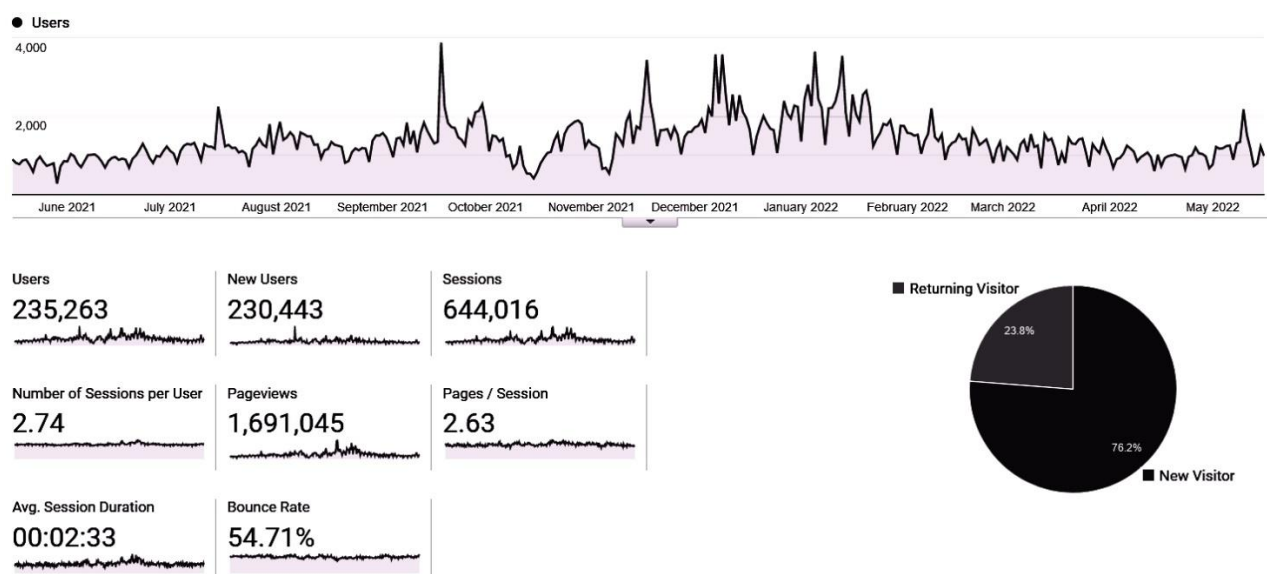
13. **KU Website Infrastructure Management System (Centrally Managed CMS)**

    Start Date: 30 June 2019; **Total Websites: 25**

    Status of Web Infrastructure Management System

S.No.	Website Name	Remarks
1	Kathmandu University (https://ku.edu.np)	Deployed
2	School of Engineering (http://soe.ku.edu.np)	Deployed
3	School of Science (http://sos.ku.edu.np)	Deployed
4	School of Law (http://sol.ku.edu.np)	Deployed
5	School of Education (https://soed.ku.edu.np)	Deployed
6	School of Engineering (All six departments)	Deployed
7	School of Science (All six departments)	Deployed
8	School of Education (All four departments)	Under Development
9	School of Arts (https://web.ku.edu.np/kusoa)	Under Development
10	School of Management (https://web.ku.edu.np/kusom)	Under Development
11	School of Management (Department of Management Informatics and Communication)	Deployed
12	Office of the Controller of Examinations (https://web.ku.edu.np/departexam)	Under Development

14. Other Websites (Units/Sections/Projects/Clubs/Programs/Events/Miscellaneous):

    Total other websites: 78

15. **Total number of public websites directly maintained by ISMS: 103**

16. Total Server Resources in KU

S. No.	Server Location	No of Physical Servers	No of Virtual Servers	Total Servers	Total Memory	Total Storage
1	ISMS	31	40	71	898 GB	62.09 TB
2	EXAM	5	0	5	128 GB	9.35 TB
3	KUSOM	2	0	2	14 GB	1 TB
4	KUSOED	3	0	3	56 GB	5 TB
	Total	**42**	**40**	**81**	**~1096 GB**	**~77.44 TB**

Total number of Servers directly maintained by ISMS: 76

17. **Total number of registered subdomains (*.ku.edu.np): 99**

18. Email System: Google Workspace/Suite **Free Educational License**

    i. *@ku.edu.np*: Total accounts: **1160**; Storage Used: **18.13 TB**

    ii. *@student.ku.edu.np*: Total accounts: **4714**; Storage Used: **31.13 TB**

Major activities of 2021/2022

- New Server/System setup and installation:
    - Four new eLearning/Moodle servers for all 7 Schools
    - One NTIC server
    - One Controller of Examination server
    - Primary Domain Name Server reinstallation after hardware failure
    - Various virtual servers for testing of different applications including KOHA eLibrary, Document Tracking, cPanel
    - Cacti MRTG Network Monitoring Server reinstallation after hardware failure
    - Old MIDAS Server re-setup for FINMAN Installation
- New Websites deployments:
    - Human Resources Division server and website
    - ISMS server and website
    - Community Engagement Division, Coordination and Communication Division, International Students Engagement, MCRC, Collaborations Portal Websites
    - Research and Project websites including Policy Lab, LUPIC, AEC, SURUNG, Nepal Hydrogen Initiative
    - KU CMS School/Department website deployed for School of Education, Department of Life Sciences
- Old websites upgrade and migration:
    - Global Engagement Division, Alumni Network, Crisis Response Resource Portal, Energize Nepal, Writing Unit, Forum for Interdisciplinary Discourse, Directorate of Research, Development and Innovation, NTIC
- Network upgrade and new installations:
    - Block 25 Hydraulics Lab new networking, vlan design and network equipment installation
    - Block 34 Shed new networking, vlan design and network equipment installation
    - SoS Faculty Research and Project Block new networking, vlan design, Backup system and network equipment installation
    - Block 14 Exam Server room Fiber P2P network upgrade
    - KU Girls Hostel Network maintenance and upgrade
    - KU Boys Hostel networking system redesign, upgrade and new network equipment installation
    - Panchkhal premises logical network design, vlan design, network equipment configuration and installation with remote support, IPSEC VPN connection with central campus for resources sharing
    - KUSOM Exam section logical network design, vlan design, network equipment configuration and installation, IPSEC VPN connection with central campus for resources sharing
- Trainings, skill development and knowledge sharing:
    - Moodle installation and administration training for IT Administrators of all 7 Schools through physical and virtual sessions

- o Resource Management System (RMS) orientation and training for IT Administrators and related personnel of all schools (excluding KUSMS)
  - o IT Administrator training, skill and manpower development for Panchkhal premises
  - o KU Web CMS School/Department websites design and administration training
- Research and testing of various system/applications:
  - o Moodle upgrade, issues troubleshooting and design testing
  - o WHM/cPanel, CyberPanel, Virtualmin testing for domain hosting and shared website control panel
  - o Linux automatic scripting for one-click site hosts and database creation for new websites, automatic scheduled backups
  - o Network boot, Virtual Desktop Infrastructure tests for hardware sharing
  - o Opensource hypervisors XCP-ng, Proxmox tests for Server resources sharing
  - o Ticketing Systems UVdesk, Zammad, OTRS, osTicket installation and testing
  - o Clickup system for task assignment, management and monitoring
  - o Gitlab source code management, version control, backup application for system/application backups and disaster recovery
  - o EDUROAM on-premises authentication system testing for educational roaming internet access
  - o Request, update and status monitoring system testing to support Plagiarism Checker process for staff/faculty, students and administrators
  - o NextCloud on-premises system for file hosting and sharing services
- System, Servers, Network, Internet monitoring and notification system redesigned, real-time IT status dashboard and internet bandwidth consumption made publicly accessible through ISMS website
- Resource Management System redesigned as per new requirements in collaboration with the developer
- KU Dhulikhel premises internet bandwidth upgraded from 150 Mbps to 250 Mbps International and 600 Mbps Local
- KUCAT CBT 2021 network design and system support
- KU 27th Convocation Phase I networking and internet support
- KU Web CMS bugfixes, redesigns, maintenance and feature addition as per new requirements in collaboration with the developer
- General service and support to all Staff/Faculty, Students, Guests, IT Administrators, Site Administrators
- Documentations of Systems, Servers, Networks, connection descriptions, setup and installation manuals, knowledge base and user manuals

Future Plan and Recommendations

- Deployment of New Website CMS to all Schools and Departments
- Underground of Currently Overhead Optical Fiber Cables
- Design and Implementation of IT Policies
- Implementation of User Authentication Services for application and wireless access
- Integration of all currently available database and Information Systems into **single gateway platform**
- The whole internal network needs to be upgraded into 1 Gbps by replacing all the older devices and equipment.
- The internet dependency needs to be distributed into at least **two ISPs** for consistency and reliability.
- Internet bandwidth (current 250 Mbps) should be increased gradually as per future requirement and demand of internet usage.
- Design ISMS structure, develop specific TOR and hire Staffs

Human Resource

Currently, we have **three** active people who are involved in different activities listed in the earlier section, but it is very difficult to carry all activities efficiently due to one person handling lots of activities, we require more people in order to efficiently handle the workload. Fulfillment of manpower can be done by hiring fulltime employees, work trainees, or student interns.

Fig: Proposed Plan for Information System Management Section (ISMS) 2021

Registrar

IT Board
(Registrar, Deans, ISMS Manager, IT Experts, External IT Consultants, Alumni)
- Strategic Planning
- Policy Development
- Interinstitutional Collaboration
- Review
- Decision

Manager
[1 person]
(Professional expert in System, Network, Security or Development)

Manager duties:
- Office Administration
- Strategic Planning and Execution
- Policy Development, Implementation, and Correction
- Training, Collaborations
- Technology Design, Assessments, and Reporting
- Technical Consultation
- Projects Creation and Task Assignment
- System Integrations
- Meeting, Supervision, Decision
- HR Management and Performance evaluations

(Top duties list)
- Development and Implementation of evolutionary University ICT Strategic Plans; Policies; Standards; Operational Plans; & Budgets
- Acquisition and Development of University ICT Infrastructure and Services
- Improve the use and access to information and technology
- Technical Consultation and oversee during procurement of IT Resources (Workstations, printers, accessories, Servers and all related hardware/software)
- Record keeping of all IT resources in use with allocation and maintenance logs
- Training materials preparation, Aggressive and Continued Training for all Staff, Faculty, Students and others
- Computer Based Tests (CBT) Plan, Design and execution
- Trouble Ticketing, assignment and resolve
- University Information and Technology Quality monitoring and assurance
- Update and upgrade university's IT infrastructure and services to keep-up with technological advancements

Laboratories and General Support
[2 persons]
(Support Assistant)
- School/ Departmental computer laboratories monitoring, maintenance and support
- VOIP Intercom administration, installation of SIP hardware/software devices
- Hardware, Software installation and Onsite support
- General Hardware, Software, Network troubleshooting and Maintenance
- Biometric, CCTV and other devices/networks support
- Point-To-Point Optical Fiber Installation and Maintenance
- Maintain records/logs for support and maintenance

Design and Development
[2 persons]
(Technical Officer and Support Assistant)
- In-house Software, Database, Mobile Applications & Information Management Systems development
- Design and Integrate (single door system) different Systems and services like mail, storage, exam, account, library, eLearning for staff, faculty and students
- Install, configure and manage Software and their functions according to specifications
- Software Design/Acquisition for Exam, Account and others
- Collaboration/Supervision with external developers for outsourced developments
- Ensure Application security and run timely security audits
- Technical (Development, Installation, administration) documentations and user manuals

System and Network Administration
[2 persons]
(Technical Officer and Support Assistant)
- Installation and Maintenance of Systems/Servers (Web, Mail, VOIP Telephone, Moodle, DNS, Storage/ Backup, Database, HRMS, Monitoring, others)
- Systems/Servers/ Firewalls/ Network Devices Installation, Administration, Monitoring and Upgrade
- Network Design, Wireless Management, Authentications, Bandwidth monitoring and management
- Local networks (Laboratories, CBT) design
- Ensure System/Network security and run timely security audits
- Technical (Installation, Administration) documentations and user manuals

Multimedia and Web Administration
[2 persons]
(Technical Officer and Support Assistant)
- Deployment of websites (CMS or static) for all related schools, departments, units, projects, clubs and others
- LMS (Moodle) webpage installation, upgrade and support
- News & Notices Creation and Publication
- Email service and support
- Administration of Web/Mobile Application and user awareness
- Photograph Events, Graphics and banner Design
- Online journals and journal publications
- Ensure Website security and run timely security audits
- Technical (Installation, administration) documentations and user manuals

Editorial Board
(Editor-in-chief, Content writer/auditor, University Spokesperson, Information Officer, Writing Unit members)

Recording Studio
(Incharge and Video Editor Experts)
- Facilitate Studio or personal computer recording of Video Lectures
- Compile and Edit audio/video as per standard
- Quality monitoring and assurance
- Publish/ storage of final multimedia contents

All Schools (Arts, Education, Engineering, Law, Management, Medical Sciences and Science)

IT Officer
[1 person per School]
Website Administration, Email, Internet, LMS (Moodle), Video Conferencing Support

School/Department Computer Labs N
[N Labboys per additional N Labs]
(only if more than 1 Computer Labs)
Maintain Laboratory workstations and peripherals, Schedule Lab Classes, Support Faculty and students,

Support Assistant
[1 person per School]
(as Labboy as well if single Computer Lab)
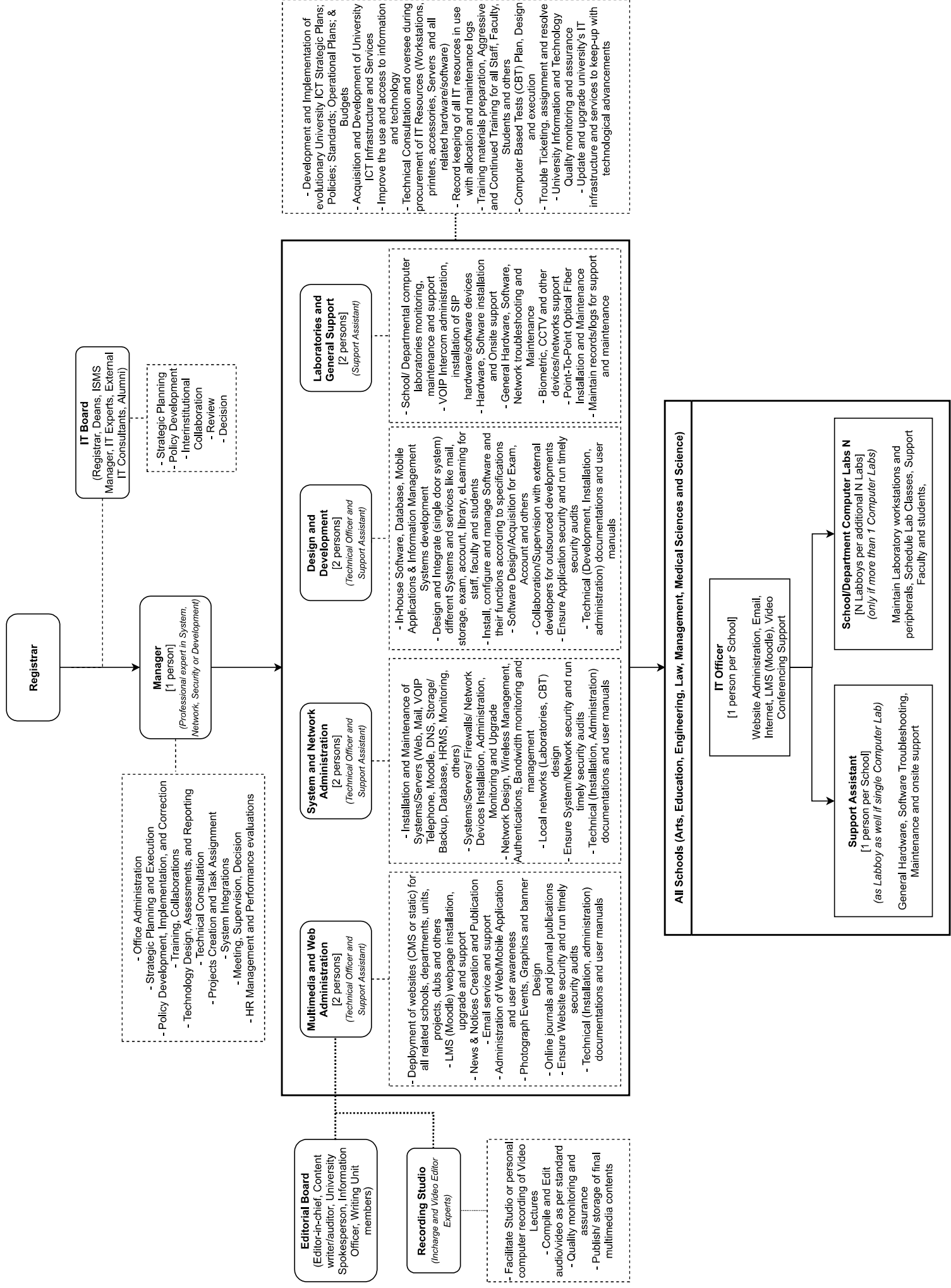General Hardware, Software Troubleshooting, Maintenance and onsite support

Fig: Proposed Plan for Information System Management Section (ISMS) 2021