

Information & Communication Technology Vision document for AIIMS Mangalagiri

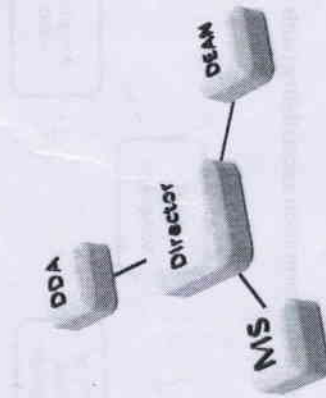
Salient Features

1. Comprehensive;
2. Interconnected;
3. Research Friendly - Storage; backup and Retrieval; accessible from universe;
4. Unique identifier- IRLA (Individual Running Ledger Account); IRCH (IR Case History); GP- S;
5. AppABLE- Mobile friendly; wearable device friendly; Wearable Interactive GPRS enabled Device
6. Scalable to meet future needs

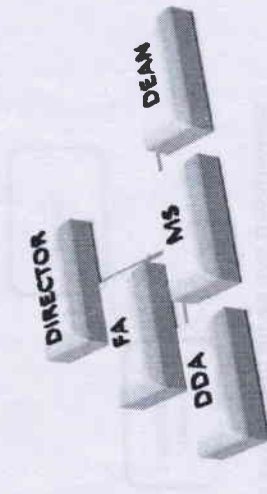
A. Comprehensive:

1. **Single platform for all matters of DDA (All matters of General Administration); MS (All matters of Hospital administration); Dean (All matters of Academics, Research and Exams)**

(When the intervention of Financial Advisor is required- Only matters which involve expense from Grant in aid and ancillary/operational receipts of AIIMS, either immediately or in future, will flow through FA)



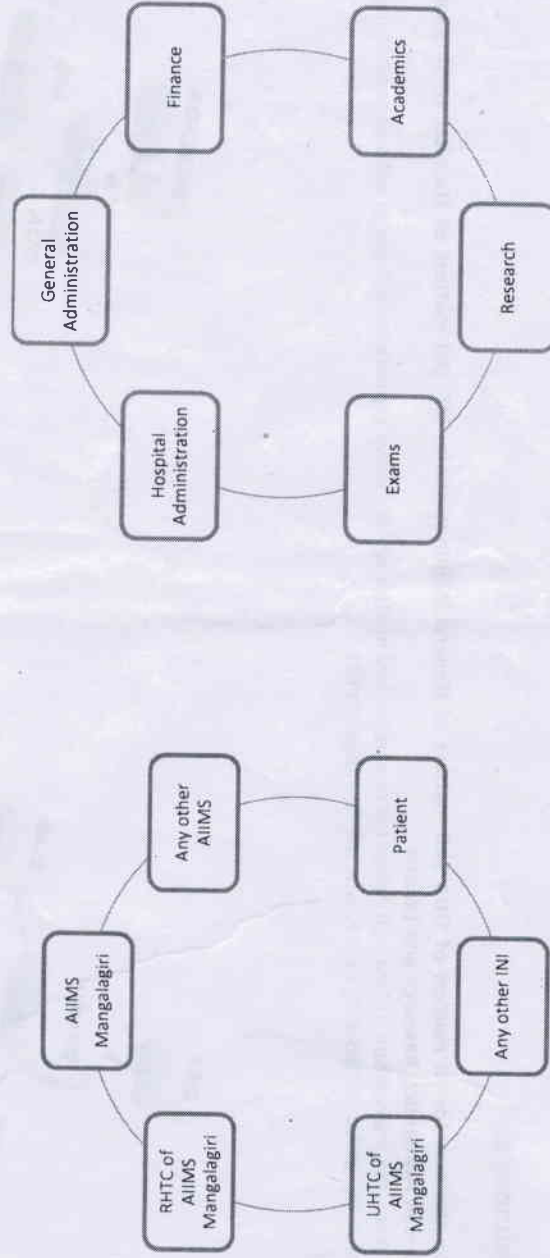
Institute MATTERS not involving finance
**General administration; Hospital administration;
Academics, exams & Research**



— **FINANCIAL MATTERS (File will be routed through FA)**

2. Students- UG, PG, Nursing, Allied, Researchers, Exchange students, special course students
3. Visitors- Patients, Guests
4. Security
5. Maintenance, Laundry, CSSD, etc.
6. Vendors- Pharmacy, Diagnostics, Banks, All third party vendors of AIIMS, Mangalagiri
7. Ministry, PMSSY, PMO
8. Other AIIMS correspondences

B. Interconnected: Information accessibility (with built in levels and safeguards) within AIIMS and among AIIMS and Departments



Among Institutes and Patient

Within AIIMS Mangalagiri

C. Research Friendly - Storage; backup and Retrieval; accessible from universe with adequate permissions

Cloud based as well as local server based; periodic backups;
 Adequate storage capability; backup capabilities
 Unique identifier based data mining; retrieval and mining supported by other details linked through Unique identifier, for eg. Gender, age, PAN, mobile number, AADHAR, state, biometrics, etc.

A Tabulation for general guidance purposes is as follows (This may not be treated as an exhaustive list)

<p>Administration</p>	<p>The Ministry, PMSSY, Director AIIMS Mangalagiri and Administration can be able to see and generate relevant statistical data for monitoring as well as submission to Government and Parliament, etc.</p> <p>A comprehensive, integrated, multifunctional website for the institute which shall comprise of clinical services along with educational services and outreach capability for years to come.</p> <p><i>Multifunctionality covers the academic management along with the personnel management and the information thus gathered shall be utilised for the administration of the institute while providing the clients with quality care with access to information on the website.</i></p> <p>The various modules of the system would work together within one environment so as to provide all round data collection potential to make it available to the administration and the faculty with necessary information at times need with regard to the patients as well as the student population.</p> <p>Statistical Interface: The everyday data can be populated into pre-formatted statistical sheets to generate ready to find relevant statistical data for monitoring and appraisal.</p>
<p>Finance and Accounting</p>	<p><i>The website will be the front end of the database that is clinical and cost oriented so much so the admin and the faculty must be able to access the information on any device with no restriction on the software functionality.</i></p> <p>Payment and accounting modules are inevitable part of any software and the money management per client shall be available for the project managers. There shall also be separate accounting system for extramural research funds. Intramural research shall be part of the accounting function of students.</p>
<p>Academic interface, including examination</p>	<p>The student admission/registration and continued follow up of progress of students with the ability to call back academic data at any time in future without depending excessively on hard copies.</p> <p><i>The admission and registration details of the students are data which has to be secured and stored forever. The data must be captured at the level of the students and must be accessible at the time of verification of the documents.</i></p> <p>The day-to-day requirements of a department shall be done online with data archiving facility so that even the schedule of classes and related attendance details of the students are available online for the designated person.</p>

Universal accessibility (from any place in the world) with adequate permissions.

D. Unique identifier- IRLA (Individual Running Ledger Account); IRCH (IR Case History); GPRS

1. Generation of a unique identifier – Internal identifier for AIIMS, Mangalagiri purposes, but based on either of the following:

- a. AADHAR, wherever, such number is available
- b. Where AADHAR is not immediately available, a number generated by associating with-
 - a. PAN
 - b. Voter ID Card Number
 - c. Biometrics
 - d. Date of Birth with parent's unique id in cases of newborn

This Unique ID should have the capability to be populated with AADHAR in future as and when the same is generated.

2. IRLA based on unique identifier

Every patient will have an **Individual Running Ledger Account (IRLA)** from the day of Registration. All financial transaction of the patient shall be maintained in it, including expenses borne by government, if any.

3. IRCH based on unique identifier

Every patient will have an **Individual Running Case History (IRCH)** from the day of Registration. This will include details from IPD, Diagnostics, OPD, Research, etc.

E. AppABLE- Mobile friendly; wearable device friendly

App: AIIMS will have a mobile as well as Computer based app.

Wearable device: A patient UID based **wearable device**, with a small touchscreen; GPS tracker; limited to AIIMS App operability; limited audio and video recording capability; RFID-Bar code and wifi capability is proposed. Each patient will wear his/her device when he or she visits AIIMS either as OPD patient or InPatient. This device will be a single window to access patient data, mark his/her attendance, utilize his/her data for research while in the hospital or away from the hospital, limited communication SMS support for patient to take action upon hospital and/or research query, etc.

F. Scalability provisions: for future requirements

	<p>As a student has to finish a checklist the minimum number of conditions he or she has to observe during the curriculum, the medical record system would allot provisional ICD numbers to all admitted patients at least and MBBS students will have a system of permissions to observe such cases for the purpose of their study.</p> <p>Online examination and evaluation interface: Examinations of the online type could be considered or even the written papers could be scanned in for online paper valuation within or outside the department.</p> <p><i>On the futuristic side, the data service of the website will generate content at each interaction, be it patients, students, parents or relatives of patients in addition to the faculty and administrative staff. The access of medical information at the appropriate level shall be made available to the pre and para clinical department faculty also with UID based logins with accountability.</i></p> <p>Authorization will have to be provided to the clinical database through logins which are secured using passwords for faculty (including pre/para clinical), admin (hierarchical), patients and students (PG/UG).</p> <p><i>The students need to interact with the patients routinely and the systems can be planned such that waiting periods are made use of for history taking and brief examinations by the students for the purpose of their study.</i></p>
<p>Clinical Academic Integration</p>	<p>The classes and classwork of the students shall be the subject of eLearning platform with logbooks and such progress cards shall be made available on the said platform. Student perusal of the uploaded material and timely submission of assignments shall be also subject of this domain.</p> <p><i>Education has changed in the hybrid models that most of the learning of student takes place on the web itself and activities which the students undertake online are monitored and timestamped. It is valuable to have such a system where the logs of the individual students are used for grading the students.</i></p>
<p>Central Research software with ICMR</p>	<p>The students shall have access to timely information of the availability of lecture classes, demonstration classes and even access to the video stream of the same.</p> <p>The data captured in the system will conform to the local accreditation standards as well as international standards acceding research compliance and quality maintenance without additional manpower. Research component shall procure systems complying with 21CFR11 or contemporary systems.</p> <p><i>ICMR is part of our vision for growth and co-operating with ICMR starts with establishment of a cancer registry. This is possible only if our software is in consonance with their software.</i></p> <p>Oncology could develop a database of cancer with pathology department and could work towards a state cancer registry with ICMR.</p>

	<p>How a wearable interactive gadget will help in Research: The wearable interactive gadget will have GPRS, WiFi, messaging and limited audio and video recording facilities. It will have a rechargeable battery. It will be useful when a patient visits AIIMS OPD, IPD, Diagnostics and other facilities and will serve as a marker, permissions document, etc.. It will thereafter be useful when a patient has returned to his place..Some examples are as follows:</p> <ol style="list-style-type: none"> 1. GPRS can help track outbreak of Malaria, Dengue, etc. from a particular area. 2. Research can be undertaken in cases of Diabetes, AIDS, Cancer patients, etc. by regulated but regular wellness query from AIIMS, Mangalagiri. 3. GPRS can track prevalence of cases of teeth bone deformity, renal failure due to high salt levels, etc. and similar patterns from various areas. 4. Maternity and NeoNatal care, vaccination, pulse polio, etc. registry and advice: The gadget can be useful during the entire term. This will boost Infant and Mother Health and wellness in the long term. 5. Chronic disease care: Cancer and chemotherapy care; Kidney CKD care and follow up. <p>These are some of the illustrations. The cost of the equipment will be offset by the Medical research/ data and wellness benefits which it will provide. Patient registry will simultaneously be possible without additional cost and efforts.</p>
<p>Community</p>	<p>The population surveillance of Mangalagiri is a major project of the CFM department and UID based population database shall form the basis of a long term cohort study of Mangalagiri or the capital region.</p> <p><i>The above vision expands to the image of a population based registry wherein we are in contact with the patients. Efforts will also be made to connect to all the CHCs in the state to tap into a common database which is mostly AADHAR linked instead of depending on multiple data points to correlate patient data.</i></p> <p>The access would not be limited to the institute but also to the remote locations where the patients can move without break in data and service continuity, with adequate security permissions.</p>
<p>Student Records; health card and Research database</p>	<p><i>Education has changed in the hybrid models that most of the learning of student takes place on the web itself and activities which the students undertake online are monitored and timestamped. It is valuable to have such a system where the logs of the individual students are used for grading the students.</i></p> <p>All students of AIIMS will be initially treated like an OPD patient and health records will be maintained for them. They will be immunized for Hepatitis B and other possible infections. This database will be maintained at AIIMS. The students who pass out may be tracked for research purposes and wellness.</p>

<p>Patient registry and services</p>	<p><i>The piloting of the academic and health monitoring of the student data shall be checked for clarity and accessibility in addition to the ease of data entry by minimally trained individuals. The success in this activity shall be a pre-requisite for scaling up the initial software to the next functional level.</i></p> <p>The electronic health record system which is envisaged must be initiated once the patient logs in to register for OP services. In case of referred patients they shall also be able to upload the referral letter and some ancillary information, through APP.</p> <p>In addition to dedicated gadget, there shall be cross-browser /platform allowing web access through mobile devices as well as desktops of tele-medicine potential. The clinical faculty must be able to handle emergency data access at times of need using any of such devices.</p> <p>The emergency department should be state of the art in order to make available access to the patient information at the point of presence without needing much effort on the side of the clinician. A procedure might be beamed into the learning environment which could be watched by the students wherever they are.</p> <p>The quality of captured material of the above said material shall become the decision making tool of the HMIS module. The security aspect of the database and possibility of corrupted data shall be thoroughly tested.</p> <p>Emergency medicine and critical care medicine are areas where clashes happen between bystanders and hospital staff. The entry of people is restricted in those areas. Kiosks or monitors to show the relatives what they might want to see at spaced intervals could reduce the communication gaps by using the interfaces efficiently.</p> <p>Laboratory and investigational services modules will fit into the landscape of the same website.</p> <p>Campus wide Wifi is the enabler for constant access to information. Systems to generate announcements and alerts to keep the clients in the loop for routine actions. This will be possible through wearable gadget, as proposed.</p> <p>Referral network building with the CHCs would even ensure to have the population database for reaching out to the population for additional fact finding missions as mentioned earlier.</p>
<p>Hospital Management</p>	<p>Each aspect of Hospital Management system shall be covered. There will be a statistical interface, wherein operational data is captured and displayed for MS and his office. This data pool would simultaneously enrich the historical and current data with general administration. A medical director might want to feel the pulse of various areas of the hospital through CCTV cameras but also through score-cards or just summaries of day to day activities. The software shall be automated to have timely information and forecasting abilities for activities to planned ahead.</p>

	<p>The dynamic interactive website shall serve as a content management service as well as remote data capture technology with multimedia capabilities including accessibility options for disabled.</p> <p>Various data sharing programmes, which are unique to any health and medical education establishment, must be adhered to while programming.</p> <p><i>A hospital and its associated services are subject to audit of various kinds and the software must be able to calculate and display the matrices for monitoring in an automated fashion.</i></p>
<p>Maintenance of highest level of Medical standards; audit and accreditation friendly environment</p>	<p>m-Learning</p> <p><i>As per pre-decided access policy- The data of patients can be made available to students in a summarized codified form which will enable the student to ask for permission in the concerned section to have contact with the patient in real time.</i></p> <p><i>The accessibility to information must be 24x7, the interfaces have to be mLearning friendly without breaching patient privacy.</i></p> <p><i>Why the access to paraclinical departments is a must is because there are activities which are beyond the capacity of the hospital staff such as pharmacovigilance, hemovigilance, infection control measures, infectious disease reporting etc which have to be entrusted to the departments in the medical college.</i></p>
<p>Integration amongst all departments of medical college</p>	<p>The WiFi network of the AIIMS shall be mLearning friendly and this shall be made use of by the faculty to give access to students in restricted areas to give training on laboratory, operative and other sensitive procedures.</p> <p><i>The access of the patient information even before they come to hospital could complete the natural history of disease if the field units can beam the information of pre-pathogenic existence of the individuals before they fall mortally ill. The telemedicine capability could be amplified to provide multi-site real time classes by the field staff to complete such storylines.</i></p>
<p>Medical Records</p>	<p>Hospital statistics and other incident statistics and compliance data should be generated without much human intervention on a daily basis.</p> <p>Data mining to generate summarized case list which is regularly updated.</p>
<p>Medico Social</p>	<p><i>It is often seen that the parents of students and relatives of patients feel left out of the system in terms of progress notes. The system must be facile enough to provide timely information to authorized relatives/parents to access the progress charts. Emergency medicine and critical care medicine are two areas where access has to be limited for physical entry. In future, as a part of predetermined policy, Such areas may have bystander friendly web access to</i></p>

	<p>enable relatives to interact with certain categories of patients, in a manner that other patients and hospital services are not disturbed.</p> <p><i>The wearable gadget will provide access of the patient information even before they come to hospital ; the information could complete the natural history of disease if the field units can beam the information of pre-pathogenic existence of the individuals before they fall mortally ill.</i></p>
Networking	<p>Remote video conferencing shall be used not only for tele-medicine but also to teach the students from the rural centres and off-sites directly. The system could make use of multiple teams working simultaneously from the house/workplace and other relevant spots to beam the information to a single classroom.</p> <p><i>Dynamic nature of the site should make it possible for data to appear on the website without further manual processing from the primary data entered at service points. The summary data thus provided must be useful for generating performance indicators and appraisal matrices.</i></p>
IT	<p>Queue management and other optimization routines have to be enabled by time place analysis of the patient movement. The big data analytic capabilities by data mining must be there in place to see whether the flow is optimised. Patient feedbacks can be taken using kiosks and timely action triggered by floor managers to avoid congestion and drop in quality.</p>
Patient Care	<p><i>In fact it is better to keep the patients in the health care loop with additional mails and SMS services to make them continue to maintain the cured state in which they are sent out of the medical college.</i></p>
Procurement, asset management and Warehouse	<p>Procurement modules: Readily available records of items procured, issued to various departments, New Indents and demands for procurement; Consumable utilization; condemnation of assets; asset register, etc.</p> <p>In addition to simple procurement solutions, the stores and pharmacy could be tapped by the departments of pharmacology and infection control to identify pharmaco-vigilance and epidemic triggers.</p> <p>Central Warehousing and asset management interface: for reuse of seasonal and occasionally used assets; storage of depreciated assets till their auction as per GFR.</p>
Data Security and RTI	<p>The system shall allow UID based logins and safety features to prevent data thefts and similar misdemeanours at the same time allowing access at different levels at suitable summary data (students) or detailed data (faculty).</p> <p><i>The access to data being so seamless it is imperative that the encryption and the privacy aspect of the data is taken care of with regard to health related data rules.</i></p> <p>The access to such data shall be limited to the designated employees. This ensures the generation of transcripts at any time in the future when such a record becomes essential.</p>

	<p>In addition to Cloud based storage, local server based storages may also be adopted. Regular backup shall be practised.</p> <p>RTI Policy, Public domain, Private domain: Data pertaining to patient cannot be disclosed under RTI as it ordinarily falls under 3rd party information. However, the patient may demand such data. In the scheme of things, the wearable gadget will provide access to all relevant data to the patient. This data has to be kept separate from the statistical and other administrative data which can be provided under RTI, being data under public domain.</p>
<p>Technical Services</p>	<p>Again, laboratory and investigational services will be part of our patient management/student education system. The modules have to fit into the landscape of the same website which we have been expanding on.</p> <p><i>The laboratory, and invasive procedure areas could also be arenas of learning. Anatomy department can also tap the imaging department for teaching applied anatomy. Forensic medicine could supplant teaching in anatomy and pathology.</i></p> <p>Similarly pathology department could generate blood bank related surveillance triggers (haemovigilance). Community medicine department along with infection control units can report of infectious diseases to government.</p> <p>Remote video conferencing shall be used not only for tele-medicine but also to teach the students from the rural centres and off-sites directly. The system could make use of multiple teams working simultaneously from the house/workplace and other relevant spots to beam the information to a single classroom.</p> <p>The website functionality must be top class and trendy to allow information flow even to the parents of students as well as relatives of the patients (if so desired by patient) and as per pre-decided policy. The updates shall ensure visibility and clarity wrt RTI and other legal requirements.</p> <p>The EHR must be friendly to insurance programmes and also the faculty CGHS so that the data can be used to make the forms for the purpose easily printable. Referral network building with the CHCs would even ensure to have the population database for reaching out to the population for additional fact finding missions.</p> <p><i>The access shall be so much so even the on-site and off-site back up systems shall not be allowed to be corrupted in terms of patient or student related data by the users. The back up should be adequate and auditable.</i></p>
<p>Telemedicine</p>	
<p>Staff and Student Welfare</p>	
<p>Central Records</p>	