Gujarat Technological University

Report

Plenary meeting of the Research Project on

DESIGNING ORGANIZATIONAL STRUCTURE OF TECHNOLOGICAL UNIVERSITIES (DSTU)

24th November, 2012

The meeting on DSTU was organized by Gujarat Technological University at GTU, Gandhinagar Campus, E/4, Sector – 26, GIDC, Gandhinagar, Gujarat. More than 45 Directors and Principals of Management and Engineering colleges, senior faculty members and GTU officials participated in the meeting of this research project.

Inaugural Session:

On behalf of the Core Committee of DSTU, Prof. P. G. K. Murthy, Master of Ceremony, welcomed Dr. K. L. Chopra (Padmashri), Former Professor, IITD & Former Director, Indian Institute of Technology, Kharagpur, Dr. Akshai Aggarval, Honorable Vice Chancellor of Gujarat Technological University, Dr. D. S. Chauhan, Vice Chancellor, Uttarakhand University, Dehradun, Dr. Premlatha Rajan, Director, Academic Courses, Anna University, Chennai, Dr. H. P. Khincha, Former Vice Chancellor of Vishwasaraya Technological University, the Technological University of Karnataka and Dr. Gitesh Joshi, Registrar of Gujarat Technological University, Principals and other invited guests and core committee members, Dr. Satyendrakumar of CKSVIM, Baroda, Dr. Rajesh Khajuria, Director, CKSVIM, Baroda, Dr. Ajitsinh Rana, Former Registrar of Saurastra University and Assistant Professor, R. B. Sagar College of Pharmacy, Dr. T. D. Tiwari, Director General of PEC campus, Bakrol, Dr. Trupti Almoula, Incharge Director of Narmada College Bharuch and Prof. Dr. K. N. Sheth. Director of Faculty of Engineering and Faculty of Management, Shree Saraswati Education Sansthan, Rajpur, Kadi.

After the "*Deep pragatyam*" and felicitation of the Dignitaries by fortune plant, Dr. Gitesh Joshi, Registrar of Gujarat Technological University gave warm welcome address and threw light on the present status of GTU and gave a brief account of the four DSTU meetings held this year. He stated that the objective of the DSTU project is to develop a system of governance by which GTU is able to integrate education training and research in the disciplines of Engineering, Management, Computer Application and

Pharmacy at the level of Diploma, Degree, Post Graduation and Research and identify the organizational components to pursue the objective of putting up the best efforts in making GTU a world class University.

The key note address was delivered by Dr. Akshai Aggarwal, Honourable Vice Chancellor of Gujarat Technological University. At the outset Dr. Aggarwal expressed his happiness to see the distinguished people participating in the DSTU meeting. He said that this is a project where GTU is not making an effort to follow the models of IIT or any Technological University of the world. DSTU is designed to develop a model for affiliating type of Technological University. Dr. Akshai Aggarwal, then, very clearly mentioned the vision of the University as under:

- To make GTU a hub of research, technology and entrepreneurship
- Gujarat is Number 1in growth rate. It has become well-known for excellent governance. However it needs to develop innovative and revolutionary ways to emulate similar success in education, to make GTU a world class university.
- GTU to be a Leader in Learning Outcomes through use of technology, Faculty Development Programs and through collaborative models.

He defined a World class University by quoting from a document from the *Center for World-Class Universities at Shanghai Jiao Tong University*:

- Attracting scholars who are global leaders in their fields.
- Internationalization of faculty and students
- Leader in academic research and teaching
- Creating an eco system for *innovation* - leveraging academic and industrial research
- Fostering entrepreneurship through management education
- One-stop hub for continuing learning programs through regular as well as distance education

While giving a brief account of today's environment Dr. Aggarwal stated that after 2000, India has started being counted along with China as the upcoming countries. He said," Our industries are able to compete with the world at least within India very successfully now." In Gujarat, during the last decade, the number of seats for technology education have been increased eightfold. But our technology teachers have no practical experience and not ready to be evaluated by their peers for research or by students for their teaching skills. Most of them

(including even those with doctorate degrees) have not done any research for years and are outdated. In Technology labs, SFIs have minimal facilities. In Government colleges, facilities are better but they are rarely used and many times need repairs. Similarly, when we compare with China, Indian industry has a lower quality at higher cost (Share of world's exports: China 10.4%; India 1.4%). Indian industry has not satisfactorily collaborated with any University/IITs/IIMs.

Dr. Akshai Aggarwal raised the question, "whether the vision of GTU to be a hub of research, technology and entrepreneurship and of GTU becoming a Leader in Learning Outcomes can be realized." After a pause he said that it is a difficult but not impossible job. He quoted Philip G. Altbach "If India cannot improve the quality of the mainstream universities and the ….. colleges affiliated to them, the overall quality of the system cannot rise. This has been the key challenge for decades -- and it remains the key factor" and he also quoted Mr. S. Gopalakrishnan, CEO, Infosys Ltd. "I'm terribly worried about education in India. …….there is a significant opportunity for India to continue to grow at 9-10 per cent. But what will hold us back is education and lack of manpower." According to Dr. Akshai Aggarwal, those without knowledge will be as helpless in the twenty-first century as those without arms were from 12th to 20th century.

Dr. Akshai Aggarwal further stated that in 1985 Indian and Chinese Universities were nearly at the same low level but China coined the word 'World-class University' and established a University Department for full-fledged study of World-class Universities at *Shanghai Jiao Tong University (SJTU)*. The characteristic of World class University could be following:

- a high concentration of talent,
- abundance of resources and *autonomy in academic investment*
- autonomous governance in recruitment of *students and faculty*, in learning systems and in assessment systems
- carries out education and research in a wide range of disciplines and
- makes great efforts to serve both national needs and international public good

Dr. Aggarwal gave the report on Research output on China and India as follows:

S.No.	Area of Research	Share of world research output in %age in 2010	
		India	China
1	Mathematics	2	17
2	Materials Sciences	6.4	26
3	Physics	4.6	19
4	**Computer**	**2.4**	**15** (Korea 6.3% and Taiwan 5.7%.)

While discussing about the top engineering and technological universities in the world, Dr. Aggarwal stated that among the first 10, 7 are from USA, 1 from Switzerland and 2 from UK but none from Asia. However, among the first 50, Asia has 10 - 1 from Singapore, 2 from HongKong, 4 from China, 1 from Japan, 1 from Korea, 1 from Taiwan but none from India.

According to M. K. Hada, AICTE Advisor, "In a surprise inspection conducted by AICTE in 400 colleges, as many as 350 were found not fulfilling basic norms stipulated by the council."

Creating Joint Networking Systems Among Colleges : Dr. Akshai Aggarwal said that GTU is state University which leads from the front. We are creating networks of Students, Researchers, Faculty members and not creating legal entities. Dr. Akshai Aggarwal stated that we jointly perform Quality assurance in studies, teaching and research. Dr. Akshai Aggarwal briefly stated the measures taken in creating joint networking systems among Colleges.

1. For jointly improving the quality of Learning Processes GTU has established ALCE (Active Learning and Creating Excitement in classes, laboratories and workshops)
2. ALVCOM (Active Learning Video lecture Communication) – a telecast program started with technical support from BISAG
3. Preparing Courseware through joint efforts through the competition among the students.
4. Joint research project on Kotler's Incubator on Ayurvedic medicines
5. Two research projects with German University – DHBW
6. Joint Analytical Lab for Pharmaceutical Sciences
7. GTU Board for Mobile Computing and Wireless Technologies.
8. GTU Board for Environment and Green Technologies
9. GTU Innovation Council
10. Udisha (Universal Development of Integrated Skills through Higher Education) Innovation Clubs have been set up to bring the culture of innovation to both the Industry and Academia.

Dr. Aggarwal stated that the Sectoral Innovation Councils bring together Researchers and Developers, Faculty members from all over Gujarat, Professionals from the industry – associated with IDPs and Mentors from the entire world and to work jointly to successfully develop

innovative products and processes – (for the Final Year Projects) and to identify new but relevant research problems for post-graduate students.

11. Three Skills Councils

The three skills councils set up by the University include

- GTU Council for Financial Services with 12 Sectoral Panels
- GTU Council for Marketing with 7 Sectoral Panels
- GTU Council for HR & Organizational Structures with 8 Sectoral Panels

Each Sectoral Panel is co-chaired by a Director of an MBA College and a leading industry professional. A Secoral Panel: works to define the skills and certifications required by a professional in its area of interest; to help GTU develop a close and continuing inter-action with professionals; to help students of Business Studies in obtaining placements for immersion studies.

To promote collaborative working through networking, we need inbuilt structures or matrix structures which permit joint/ multiple ways of working as needed. The regulations for the affiliated colleges should include service conditions for the teaching and non-teaching staff: to be enforced by University and Performance-based increments and other incentives/ dis-incentives - to be permitted to colleges with an over-arching supervision by the University for fairness and transparency. Traditionally the Universities have rights for allocating examination and other academic duties like sending them on Local Inquiry Committees. Additionally the Universities should acquire the rights for deputing them for FDPs, research and academic work

Similarly, traditionally the Universities have charged (i) enrolment fees (ii) examination fees (iii) affiliation fee per student. He proposed that for SFIs, the Technological Universities should get about 10% of the fees charged by Colleges for creating common research facilities and for encouraging the appointment of world-class professors in colleges.

What is required is Autonomy. Dr. Akshai Aggarwal said that a college has multiple stake-holders: Trustees, local politicians, faculty, students and parents. These stake-holders have priorities like (i) cost-effectiveness and profits, (ii) receipt of parchment, without any hiccups and with a first class etc.

It is the University, which brings the ideas of (i) quality education and (ii) investments for research to the forefront.

There are 374 Deemed Universities and Autonomous Colleges and they should work towards bringing world-class education to niche areas. Dr. Akshai Aggarwal suggested that Deemed Universities and Autonomous Colleges should not attempt to become comprehensive universities as none is even on the way to be able to compete with Universities even in Malaysia/ Thailand

and none is able to attract scholars (research students or teachers) from outside India – except one, which has lower costs in India as its USP for attracting foreign students.

Organizational Structure of the University: Dr. Aggarwal summarized the important aspects brought by Prof. Satyendrakumar, member of the Core Committee as under:

- Growth through geographical dispersion brings the need for a departmental structure and headquarters to administer several local field units.
- When expansion is aimed at through addition of new types of function, we require a Central Office and a multi departmental structure.
- The growth which is attained through new lines of products or through continued growth on a national or international scale requires a multidivisional structure with a general office to administer the different divisions.
- An organization, which has experienced growth through expansion, needs to add an administrative office to handle one function in every local area.

Dr. Aggarwal further briefed other issues to be considered in designing the structure which includes

1. For Strengthening VC's Office, he needs 3 Associate Professors on deputation at least for 2-years and staff to run the office full time.
2. The Organizational structure of the University should not have more than five direct reports. Dr. A. K. Malik, Registrar of South Asia University had suggested that preferably there should be two levels but not more than three levels for a decision.
3. The structural Principles brought out by Prof. Dr. K. N. Sheth in his study of IIT Kanpur

Dr. Akshai Aggarwal apprised that one of the Core Committee members – Prof. Dr. K. N. Sheth, Director of Faculty of Management and Faculty of Engineering of Saraswati studied the Organizational structure of IIT Kanpur in context with five elements:

- Work Specialization (how activities are subdivided into separate jobs)
- Departmentalization(how jobs are grouped together)
- Chain of command (line of authority)
- Centralization (decision making concentrated at a single point)
- Formalization (rules to direct employees)
- Span of control(no. of subordinates to be supervised) Not studied

Dr. Aggarwal stated that the conclusions arrived by Dr. Sheth in his studies include the following:

- This organizational structure shows centralized control and existence of separate functional areas. Thus it can be considered as multi-functional structure (centralized functionally departmentalized structure).

- The structure of IIT Kanpur very clearly shows the lines of authority and accountability. The structure is heavily centralized.
- The authority for decision making in the institute is centralized and it rests with the Director.
- The structure has horizontal differentiation as the institute is divided into specialism.
- But the different levels in the hierarchy are coordinated i.e there exists vertical integration
- But coordination does not occur across the functional areas i.e. there is no horizontal integration
- The structure shows standardization i.e. rules and standards for operational procedures exist.
- The rules and regulations for the employees are very specific. Therefore formalization exists. Organizational structure is designed in consonance with the mission statement.
- Chain of command is very clear. There is no ambiguity is division of work.
- Span of control is not explored in the present study

At last, Dr. Aggarwal stated, "we can attain our objectives provided the teachers, students and others at GTU take the initiatives jointly and plan for Inter constituent collaboration – for example between MBA and Engineering students, Inter constituent competition, Rating of constituents and SWOT analysis. Dr. Akshai Aggarwal emphasized on preparation of a Matrix of Faculty Skills which may include list of University Degrees, professional accreditations, certifications, number of graduates supervised and preparation of a Matrix of constituents infrastructure which may include laboratories, infrastructural facilities, buildings, number of students, programs, Degrees offered.

Prof. K. L. Chopra (Padmashri), Former Professor, IITD & Former Director, Indian Institute of Technology, Kharagpur gave an address on Technical Education in knowledge era. In the beginning he appreciated the efforts made by GTU for the Joint Network programs already established up by the University. He then stated that the educational models go on changing as rightly stated by Dr. Aggarwal. Guru-Shishya Parampara is augmented with Data and Skill-based, Information-based (Broadcast Teaching Model) and Knowledge-based (Outcome –based) models. This is the era where Knowledge & Mind Power-based Active Learning Model work. These encompass Interactive, Asynchonous, Multitasked, Collaborative, Holistic, Integrative, Translational, Transformational and Ethical systems. Peter Drucker has said that Conventional Universities are "dead" or "Dying Relics." Today Education is deemed to be a knowledge process of nurturing Human Capital as an agent of growth of social good for a Knowledge Society. Knowledge based Active Learning is Transformational, Translational and

Integrational learning. UNESCO defines Educational Process as, "Learning to Know, Learning to do, Learning to live together and Learning to be useful, adaptable and employable."

Dr. Chopra redefined the knowledge and stated that Knowledge is traditionally judiciously distilled information extracted from observation/analysis of nature/natural phenomena, concepts, beliefs, perceptions, judgments etc. and he further said that Knowledge is power to innovate usable and exploitable information to provide new and viable ethical solutions for human needs based on the integration of multidimensional Sciences, e.g.; Natural and Social Sciences, Engineering, Technologies Manufacturing, Marketing, Business/Management Sciences (Science of Practice), etc. He said that Knowledge Power is Creativity through Human Resources, Innovation through Research and Development, Capital through Intellectual Property Rights (IPR), Inclusive Development (Economic and Societal) and Prosperity (E) of a Nation is determined by the no. of creative and innovative workers, empirically as $E= m C^2$ (C is creativity and m is the no of creative/innovative workers). He further discussed about the Academia-Innovation Chain which includes

- Society pays for education in public institutions, Education empowers Individuals
- Individuals leverage the power of education
- The power of education creates knowledge power
- Knowledge power fosters innovations
- Innovations create entrepreneurs
- Entrepreneurs translate and transform innovations
- Transformation process creates wealth and economic growth
- Economic growth creates spirals of inspiration and aspiration
- Inspired societies invest in education and S&T to create knowledge and innovations

Dr. Chopra stated that Knowledge-based innovative development is the magic bullet to eradicate poverty in the world as stated by Bill Gates, GDP of many rich nations (US, Japan, Germany, S. Korea, Taiwan, Israel, etc) is primarily due to creation, diffusion and utilization of innovative knowledge and Knowledge power contributes over 30% to the GDP of India Knowledge has created most of the recent Indian and global billionaire. According to Dr. Chopra Knowledge is wealth that means "Saraswati" or "Laxmi" or both. He said that Conventional University generates new knowledge (Public good), Enterprise creation of wealth (Private goods) and new university balances new knowledge generation and wealth creation (Public and Private good).

While explaining Role of Knowledge Institutions, Dr. Chopra said that Growth of global economies and life styles of civilized societies are being increasingly determined by knowledge and innovation created and nurtured by knowledge institutions. Close interaction of such institutions with entrepreneurs, communities and industry has, therefore, to be mandated as a SOCIAL CONTRACT with the society. According to him, Academic Institutions: Mission & Vision include:

- Knowledge Creation and Dissemination
- Seat of Learning & Learning to Learn
- Manpower development & Training
- Curiosity driven research
- Innovative R & D
- Sponsored & Mission oriented R & D
- Industrial consultancy
- Science & Technology Parks
- Foster entrepreneurship
- Nurtures 3D Matrix (Learning, R & D, and Social Interaction)
- Think Tank

He narrated the major issues in Technical Education as under:

- Lack of Qualified and Motivated Faculty
- Inadequate Infrastructure
- Questionable Quality of Inflexible Curriculum
- Outdated Teaching-Learning process
- Negligible Research and Development
- Little Entrepreneurship Activity
- Rigid and Opaque Governance & Management
- Lack of Autonomy and Accountability
- Stifling Affiliation and Government Policies
- Ignorance of Ethical Values
- Lack OF Globally acceptable Accreditation & Mobility
- Affiliation/Constituent College System: A Master-Slave Relationship

While discussing on Affiliated & Constituent Institutions he highlighted following aspects:

- Master-Slave relationship with affiliating university
- Little efforts to upgrade slave to "self-master"
- Minimum quality standards with maximum no of students
- Homogenization of strong and weak institutions & students
- Pre-set, unwieldy and inflexible curricula
- Broadcast Teaching and Rote Learning (of information and data)
- Lack of academic and administrative autonomy and accountability
- Lack of any program for development of faculty, pedagogical practices, innovative projects, research activities, Industry interaction.

Dr. Akshai Aggarwal said that it is not Master-Slave relationship with affiliating university but it is partnership with affiliating institutions. According to Dr. Chopra, Faculty development challenges include following:

- Lifelong Learning through participation in short term courses, conferences, Sabbatical leave, industrial interaction
- Multidisciplinary Competence
- Team Spirit
- R & D activities
- Consultancy
- E – Learning & Multimedia Techniques
- Training for Teaching & Communication Skills
- Self-assessment
- Peer Review
- Student Assessment
- Regular Seminars
- Liberal Student Interaction
- Participation in some Management activities

Dr. Chopra said that we need reforms in teaching-learning process: According to him there should be active learning as well as active teaching. Active learning invites students to "practice the art of enquiry" through dynamic interaction with what they are learning. Thinking skills lead to analysis critique and synthesis "Problem Based Learning" (PBL) is an approach to active learning. In problem based learning, learner engages with real-life complex problems. They are self directed and open ended problems with well defined context. He stated that Research is creation of knowledge. He further said that to create, innovate or discover something hitherto unknown which will enhance our knowledge of nature in its various manifestations, and/or which will benefit the society in some ways "Any innovation or creativity of knowledge is good research, neither low or high, nor basic or applied".

Afternoon Session:

Dr. D. S. Chauhan, Vice Chancellor, Uttarakhand University, Dehradun, said that Dr. Chopra presented input on favorable Governance. When the universities are funded by the Government, it becomes very difficult to design the structure. Dr. D. S. Chauhan said that when he joined as Vice Chancellor, no single person was Ph.D but more than 730 teachers were B.Tech in 19 colleges. It was difficult in the beginning for him to understand the

ordinance of UP Technological University. But it was through the various Directors' meetings of the IIT, Technological University could grow. The UP Technological University started M.Tech and there are 1100 persons who passed M.Tech in five years. Slowly and gradually, Ph.D qualification is made compulsory. It is essential that the teaching faculty members should go for publication in the foreign journals. Now the UP Technological University, Dehradun has many Ph.Ds because university has given a practical platform. However, NASA has said that commitment is required in research. All world class universities are in America but 9.8% of the population is not employed in USA. As such this is all psychology on unemployability-employability. Even in NASA or America, genius from India is there. The only problem is that the system does not exist in India. Indians have genius, so what is required is to improve our teachers.

Dr. Chauhan said that AICTE has gone down by permitting students who have secured 45% in HSC exam because AICTE wants the seats of the private colleges should be filled up. He as such emphasized on qualitative aspect and stated that the university system is very complex and autonomy is not available.

Dr. Premlatha Rajan, Director, Academic Courses, Anna University, Chennai, started addressing the session by introducing the Anna University which includes:

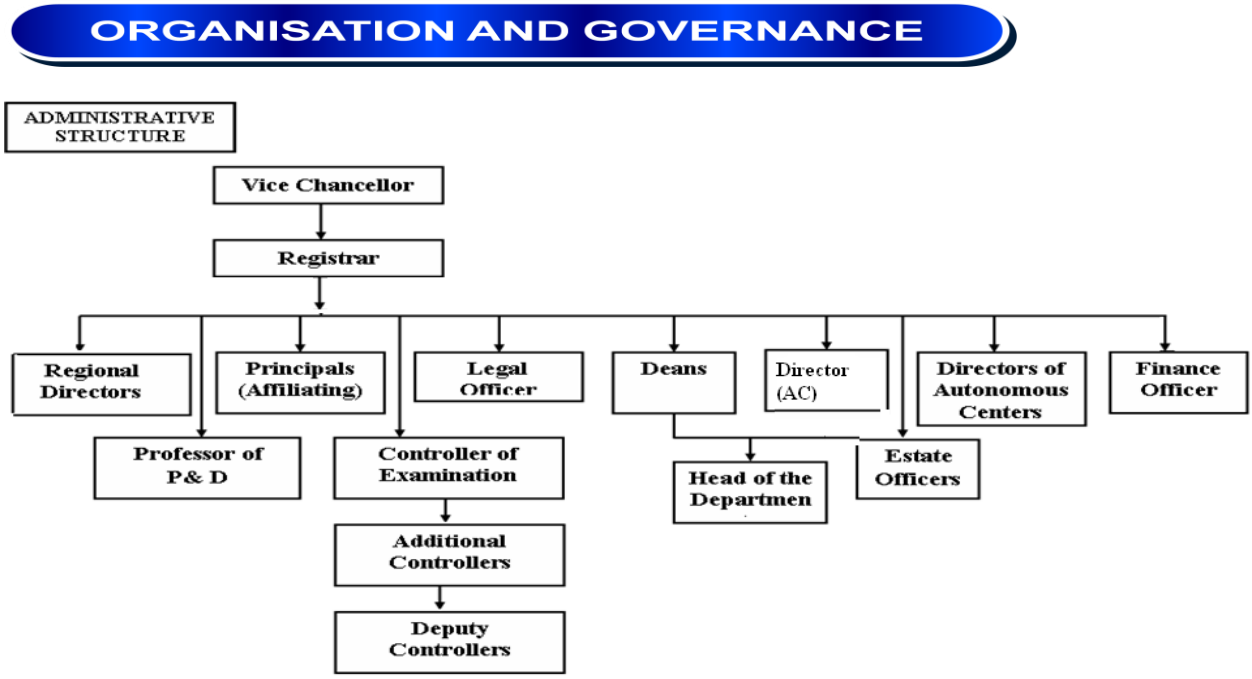
- Established on 4th September 1978 as a unitary type of University for Engineering, Technology and Applied Sciences.
- Currently there are 8 Faculties, 30 Departments and 46 Centres on the campus.
- Over 550 engineering colleges in Tamil Nadu State are affiliated to Anna University making it the largest technological University.

She said that the University has lakhs of Alumini one of them is his Excellency Dr. Abdul Kalam, the former President of India.

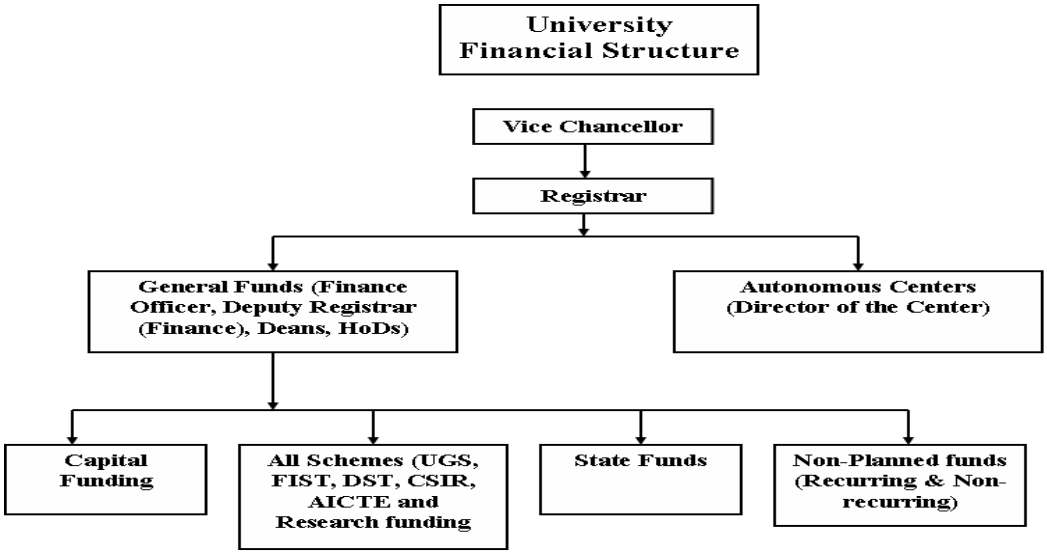
Dr. Akshai Aggarval and Dr. Khincha stated that this is the oldest University and the Director of Anna University has multi tasking responsibilities.

She further discussed that the total number of students are 13989 including UG, PG and research. The NRI/CIWGC and FN are 808 including UG, PG and Ph.D. Dr. Premlatha madam further informed that the total staff in the University departments is 1418 (934 – Academic and 1418 – Administrative).

She presented on the Organizational Structure of Anna University and she very systematically explained the structure:

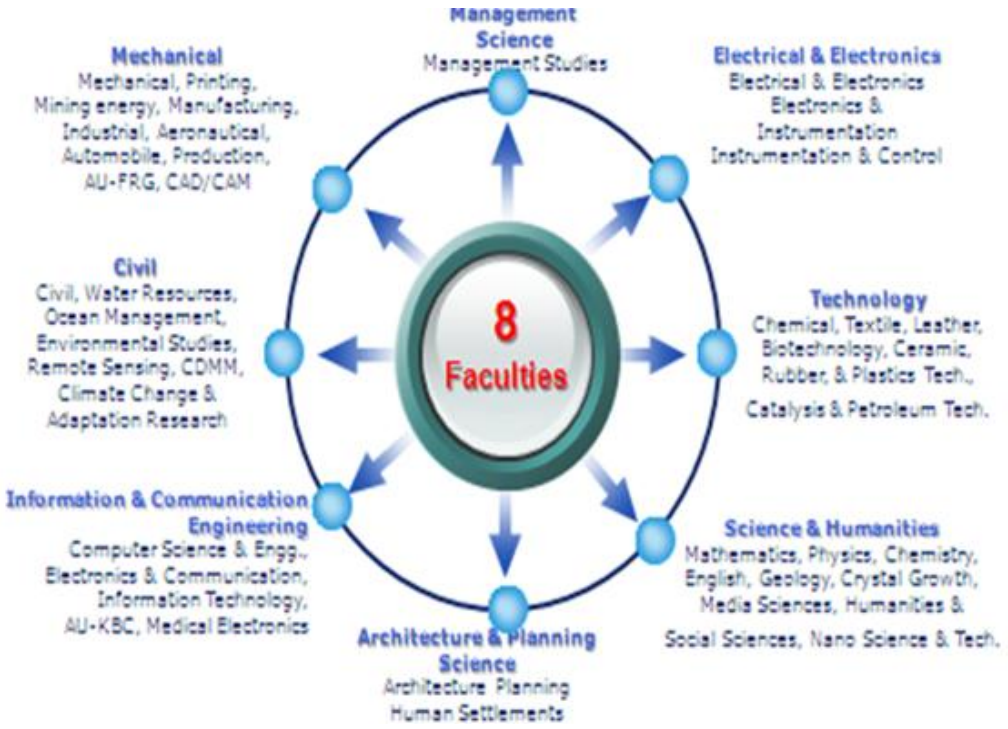


The core committee members of Gujarat Technological University expressed their views on their Organizational Structure. Prof. Dr. K. N. Sheth raised the question as to whether the Principals and the Directors, Professors normally do not work under Registrar. Dr. Rajesh Khajuria stated that Acdemic matters are directly reported to the Vice Chancellor whereas no-acdemic matter should be discussed to the Registrar. Dr. Premlatha Madam very cleary explained they in Anna Iniversity, Registrar is responsible both for Academic as well as Administrative matters and all the matters are routed through Registrar. Similar is a structure for University Finance.



She further informed that Administration of the University is with the Dean, Heads of the department, Director of the centres and the Controller of Examination. In academic matters, Chairman of the faculty, HOD help in academic planning and monitoring is conducted by the Academic Council, Board of Studies and Faculty members. The Academic council through the Board of studies takes care of revision of the Syllabus. Syllabus committee normally revises the syllabi within four years. She said that there is lot of transparency and the students evaluate the performance of the teachers by using 5 point scale. If a staff member gets low rating, then that staff member will be called and counseled by the HOD and Registrar and if the rating is very low then he counseling is made by the Vice Chancellor himself. The best example of transparency is the single window admission for lakhs of students purely on merit and ranking. There is a state level placement system for all the students of affiliating institutes.

Dr. Premlatha madam very brilliantly explained the Eight faculties as under:



Each of the faculties are headed by respective chairpersons. To coordinate these eight faculties, the University has autonomous centre. The total courses offered in the University are 45 UG and 113 PG in different eight faculties. Madam gave detailed list of the Undergraduate program and Post Graduate program conducted by the University.

Faculty of Mechanical Engineering (13)

- Aeronautical Engineering
- Automobile Engineering
- Industrial Engineering
- Manufacturing Engineering
- Mechanical Engineering
- Mining Engineering
- Printing Engineering
- Production Engineering
- Material Science and Engineering
- Marine Engineering
- Mechatronics Engineering
- Mechanical and Automation Engineering
- Industrial Engineering Management

Faculty of Civil Engineering (4)

- Civil Engineering
- Geo Informatics
- Agriculture & Irrigation Engineering

- Environmental Engineering

Faculty of Electrical Engineering (3)

- Electrical & Electronics Engineering (EEE)
- Electronics & Instrumentation Engineering (E&I)
- Instrumentation and Control Engineering

Faculty of Information & Communication (5)

- Computer Science & Engineering (Both in CEG & MIT Campus)
- Electronics & Communication Engg.(Both in CEG & MIT Campuses)
- Information Tech. (Both in CEG & MIT Campuses)
- Bio Medical Engineering
- Medical Electronics

Faculty of Technology (10)

- Chemical Engineering
- Textile Technology
- Leather Technology
- Industrial Bio –Technology
- Ceramic Technology
- Food Technology
- Rubber & Plastic Technology
- Pharmaceutical Technology
- Apparel Technology
- Chemical & Electro-Chemical Engineering
- Bio-Technology

Faculty of Architecture & Planning

- B.Arch.
- B. Arch. (ID)

Faculty of Technology

- Polymer
- Plastic
- Textile Technology (Fashion Tech)
- Petroleum
- Textile Chemistry
- Petro Chemical Technology
- Petro Chemical Engineering

Faculty of Mechanical Engineering

- Internal Combustion Engineering
- Energy Engineering
- Computer Integrated Manufacturing
- Refrigeration and Air-Conditioning Engineering
- Engineering Design
- Aeronautical Engineering
- Automobile Engineering
- Industrial Engineering
- Manufacturing Engineering
- Mechatronics
- Manufacturing System Management
- Printing and Packaging Technology
- AeroSpace Technology
- Solar Energy

Faculty of Civil Engineering

- Structural Engineering
- Irrigation Water Management
- Hydrology & Water Resources Engineering
- Environmental Management
- Transportation Engineering

- Soil Mechanics and Foundation Engg.
- Construction Engg. and Management
- Environmental Engineering
- Geo Informatics
- Coastal Management
- Remote Sensing
- Integrated Water Resource Management
- Environmental Science and Engineering

Faculty of Mechanical Engineering

- Quality Engineering Management
- Product Design and Development
- Computer Aided Design
- CAD / CAM
- Thermal Engineering
- Production Engineering
- Industrial Safety Engineering
- Cryogenic

Gujarat Technological University

Faculty of Electrical Engineering

- Power Systems Engineering
- Power Electronics and Devices
- Embedded System Tech.
- High Voltage Engineering
- Control and Instrumentation Engineering
- Instrumentation Engineering
- Electrical Drives and Embedded Control
- Power Management
- Embedded System

Faculty of Information Engineering

- Computer Science and Engineering
- Software Engineering
- Communication Systems
- VLSI Design
- Medical Electronics
- Multimedia Technology
- Bio-Medical Engineering
- Communication and Networking
- Avionics
- Applied Electronics
- Information Technology
- Laser and Electro-Optical Engineering
- Mater of Computer Application
- Optical Communication
- Computer and Communication
- Mobile and Pervasive
- Main Frame Technology

Faculty of Information Engineering

- Digital Communication and Networking
- Computer Networking Engineering
- Network and Internet Engineering

Faculty of Technology

- Chemical Engineering
- Textile Technology
- Leather Technology
- Bio –Technology
- Ceramic Technology
- Food Technology

- Plastic Technology
- Bio Pharmaceutical Technology
- Rubber Technology
- Sugar Engineering
- Nanoscience and Technology
- Foodwear Science and Management

Faculty of Science & Humanities

- Mathematics (2years)
- Medical Physics (2years)
- Applied Chemistry (2years)
- Applied Geology (2years)
- Material Science (2years)
- Computer Science (2years)
- Environmental Science (2years)
- Electronic Media (2years)
- Economics (2years)
- Financial Economics (2years)
- Applied Mathematics (2years)
- Theoretical Physics (2years)
- Theoretical Computer Science (2years)
- Science and Technology Communication
- Nano Science & Technology
- Electronics Media(5 Years)
- Computational Biology

Faculty of Technology

- Petroleum Refining and Petro Chemical
- Polymer Technology
- Environmental Science and Technology
- Textile Technology (Chemical)
- Nano Technology

Faculty of Science & Humanities

- Applied Mathematics (2years)
- Medical Physics (2years)
- Applied Chemistry (2years)
- Applied Geology (2years)
- Material Science (2years)
- Environmental Science (2years)

- Electronic Media (2years)

- Science and Technology Communication
- Computational Biology
- Visual Communication
- Electronic Software
- Bio Technology
- Computer Technology
- Information Technology

Faculty of Management Sciences

- Master of Business Administration
- Hospitality Management

Faculty of Architecture & Planning

- Landscape Architecture
- Digital Architecture
- Master of Planning
- Master of Architecture

The Anna University has established Research Board and the Research Board comprises of 8 Chairpersons, 5 HODs and 10 faculty members. The research degrees awarded are Ph.D, M.S. (by research) and M. Phil. The exam is conducted twice in a year. Dr. Premlatha Rajan stated that they have many research sponsors right from UGC to Government of Tamilnadu. Total grant received in the current year is Rs. 150 millions. The curricula of each program in UG contain syllabi consisting of theory and practical courses. The curricula of each program contains syllabi consisting of theory and practical courses. The curriculum is framed with 20% of Science and Humanities, 45% of core subjects pertaining to respective branch of study, 30% elective subjects and 5% for allied engineering subjects. Curricula is designed in such a way as to promote creative thinking, analytical thinking, lateral thinking and problem solving skills. There are 4 credits for core subjects and 3 credits for elective subjects wherein 6 weeks of Industry Training is required.
Dr. Premlatha gave a brief account of broad research areas covered by Anna University, Tamilnadu. She also gave details of centers promoting the research in the University.

1. Centre for Water Resources
2. Centre for Environmental Studies
3. Centre for Human Settlements
4. AU-FRG Institute for CAD/CAM
5. Institute of Remote Sensing
6. Institute for Ocean Management
7. Institute of Energy Studies

8. Centre for Aerospace Research
9. AU-KBC Centre for Internet and Telecom Technologies
10. Centre for Biotechnology
11. Crystal Growth Centre
12. Centre for Nanoscience and Technology
13. Centre for Intellectual Property Rights
14. Knowledge Data Centre
15. Information and Communication Tech. Park
16. AU-Microsoft.net Centre for Excellence
17. Centre for Climate Change and Adaptation Research

She also gave brief details about the MOUs signed by the University National as well as International. There are 152 (55 and 98 respectively) MOUs and each student exchange program is included. She also gave brief account about the Centre of Distance Education set up in the year 2007 and courses offered are MBA, MCA and M.Sc. At the end, she thanked Vice Chancellor, Registrar and DSTU core committee for giving Anna University an opportunity to give detailed presentation of their structure.

Dr. H. P. Khincha, Former Vice Chancellor of Vishwasaraya Technological University, Technological University of Karnataka State, said that there are two critical points for consideration – the Vision of the University and the Mission of the University. He started saying that let us look at the Vision and Mission of the Harvard University. It states that

"The advancement of all good literature, arts, and sciences; the advancement and education of youth in all manner of good literature, arts, and sciences; and all other necessary provisions that may conduce to the education of the … youth of this country…." In brief: Harvard strives to create knowledge, to open the minds of students to that knowledge, and to enable students to take best advantage of their educational opportunities. to pursue excellence in a spirit of productive cooperation; and to assume responsibility for the consequences of personal actions. Harvard seeks to identify and to remove restraints on students' full participation, so that individuals may explore their capabilities and interests and may develop their full intellectual and human potential. Education at Harvard should liberate students to explore, to create, to challenge, and to lead. The support the College provides to students is a foundation upon which self-reliance and habits of lifelong learning are built: Harvard expects that the scholarship and collegiality it fosters in its students will lead them in their later lives to advance knowledge, to promote understanding, and to serve society. Whereas the Vision of the Harvard University is, "We educate the leaders who make difference in the world".

He said that the University should have the vision which is unachievable but the mission should be achievable. Through the consultative process mission can be accomplished. The Vision and mission statements can always lead the World class university. The current Times journal has stated that University system is huge body of people, passion and perseverance. University system has many complex problems and Technological University having more than 500 affiliated colleges may find it difficult to bring the changes providing standards of performance for the examination, evaluation of the performance and so on and designing incentive (disincentive system) are difficult jobs. It requires intense communication for designing a system and getting support of the stake holders from all the institutions is difficult. Dr. Khincha said that it is substantial fact that the University has to play different role at different times. Therefore, the Administrative structure of the University must be designed to support the purpose of the establishment of the University and the system of working through the structure has to be simple and the ordinary person having normal prudence should be in position to work.

Dr. D. S. Chauhan, VC of UTU, Dehradun said that University is a complex system but Dr. Chauhan responded that what he said was that we should design the structure for the abnormal circumstances, however, your suggestion to have the University system simple is well taken. Dr. Khincha said that there is a difference between IIT system and a University system. The credibility of the Exam system of the University depends on the Vice Chancellor. 25 lakhs answer sheets are required to be checked in a semester in Technological University and University has to take care of the legal system because media is always around Vice Chancellor, this is not the case in IITs. Dr. K. L. Chopra also agreed that University system is vulnerable to many such problems.

Dr. Khincha said that University must ensure that the books are available to the students exactly as per the syllabus. There should be four different volumes – first is book exactly as per the syllabus, second is core book, third is text book and forth is reference book. University should insist on CBS learning. NASSCOM report says that there is unemployment say for e.g., in IT sector but it is an economic game as such no IT person is found unemployed. According to Dr. Khincha University should not think in narrower perspective, because the job of the University is

to impart knowledge as explained by Dr. K. L. Chopra. Autonomy should be given to affiliating University. So far as the process of affiliation is concerned, University should give permanent affiliation as such we have made the process very complex. University possesses autonomy. The politicians, society may feel that University system is not proper whereas the IIT system is good but this is the "perception". Dr. Khincha said that, "I believe in branding". According to him branding must be done excellently by the Vice Chancellor of the University and it should include many idea of innovation implemented by GTU and VTU like Research Centres, Innovation Councils, etc. Actually to create the branding in India, University has failed. Though the Universities are governed by the statute and the regulations, University still can create a space through the said regulations for academic autonomy. He gave example that VTU has also established Karnataka Innovation Council, Social Entrepreneurship which has resulted into research project in the 5th and 7th semester of B.E. students. GTU can also go for innovation from the ideation to the maturity and finally penetrate the product or the process into the market. Dr. Chopra suggested that Technological University should create the brand and the branding has to be done by the Vice Chancellor through the alumini of the students. Vice Chancellor should be generous in handing over branding to the Alumini.

Dr. Murthy said creating branding takes time and he gave the example of the IIM Ahmedabad. IIM Ahmedabad was started in the library of Dr. Vikram Sarabhai and four professors worked very hard. They had gone personally to the industry requesting the industry personnel for joining IIM and within 15 years they could create excellent branding. Dr. Khincha said that this is the era of Post Graduation and higher education. We should go for Global networking.

Session 3: Presentation by core committee

On behalf of DSTU Core Committee, the presentation was made by Dr. Rajesh Khajuria. On account of shortage of time, Dr. Khajuria made efforts to be as brief as possible. He stated that DSTU research team members include:

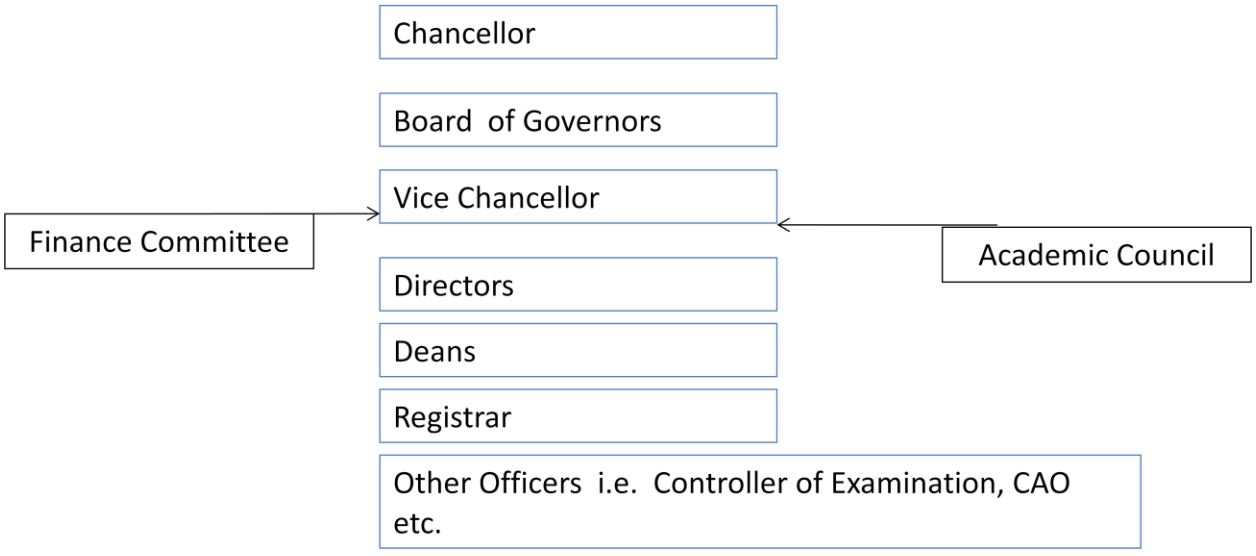
- Dr. Akshai Aggarwal
- Dr. Gitesh Joshi
- Dr. Ajitsinh Rana
- Dr. Satendra Kumar
- Dr. K N Sheth
- Dr. Rajesh Khajuria
- Dr. PGK Murthy
- Dr. T D Tiwari

- Dr. Ashish Joshi
- Dr. Trupti Almoula

He stated that following are the objectives of DSTU research project:

- To develop a system of governance by which GTU is able to integrate education, training and research in its four disciplines namely :
    - Engineering
    - Pharmacy
    - Management and
    - Computer Application
- At the level of Diploma, Degree, PG and Research Programs
- To identify those **organizational components** which are needed to pursue the objectives of GTU, and to monitor its activity related to admission, education, training, research, industry interface, inter-institute and international collaborations, more effectively and efficiently.
- To **sensitize** the members in all the institution at all the level and to encourage them to put in their best efforts in making GTU a World Class Technological Institution.

Dr. Khajuria said that the GTU was founded in the year 2007 by an Act of Gujarat State and the prevailing structure of GTU as per Act is as follows :\



The DSTU team reviewed the structure of different Technological and other Universities / Institutions under the following five groups of experts:

1. Selected Technological Universities of India
    - **Dr Rajesh Khajuria**
2. IIT – Kanpur
    - **Dr K N Sheth**
3. Selected Asian Universities
    - **Dr PGK Murthy**
4. Selected Global Universities
    - **Dr Trupti Almoula**
5. Ancient Universities of India
    - **Dr Rajesh Khajuria**

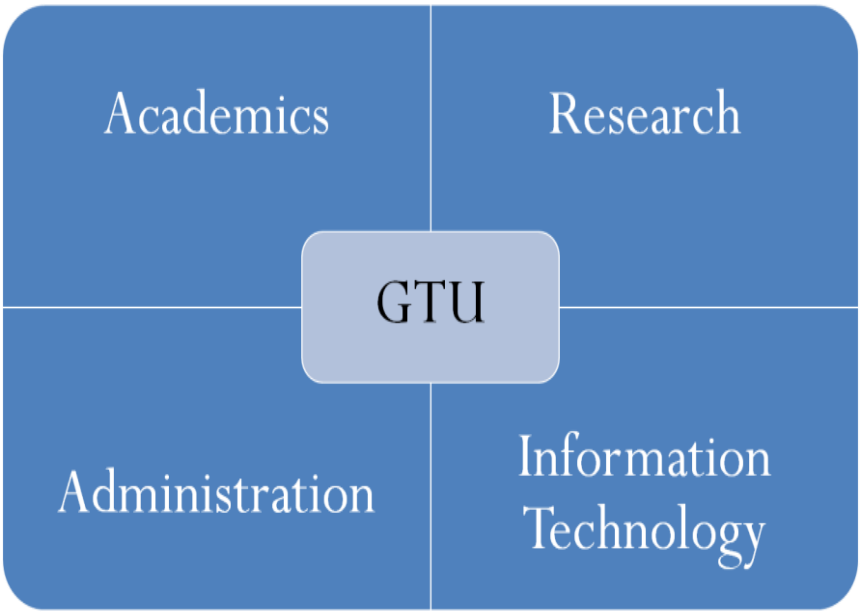
Dr. Khajuria stated that GTU is the Largest University in Gujarat.

- For the smooth functioning of a vast University like **GTU**, which caters to the entire field of Engineering, Pharmacy, MBA Programs and Computer Applications (MCA), a well-designed organizational structure is not only **essential**, but **absolutely imperative**.
- **GTU** has about **4,00,000 students**, a large number of Bachelors and Master's programs, and robust doctoral programs. It has about **500 colleges affiliated from all nooks and corners of Gujarat**.
- Hence, for such a large University it is quite essential that the (proposed) organizational structure is developed considering successful functioning of India's, Asia's and World's some of the best Universities and educational institutions mentioned in the review.

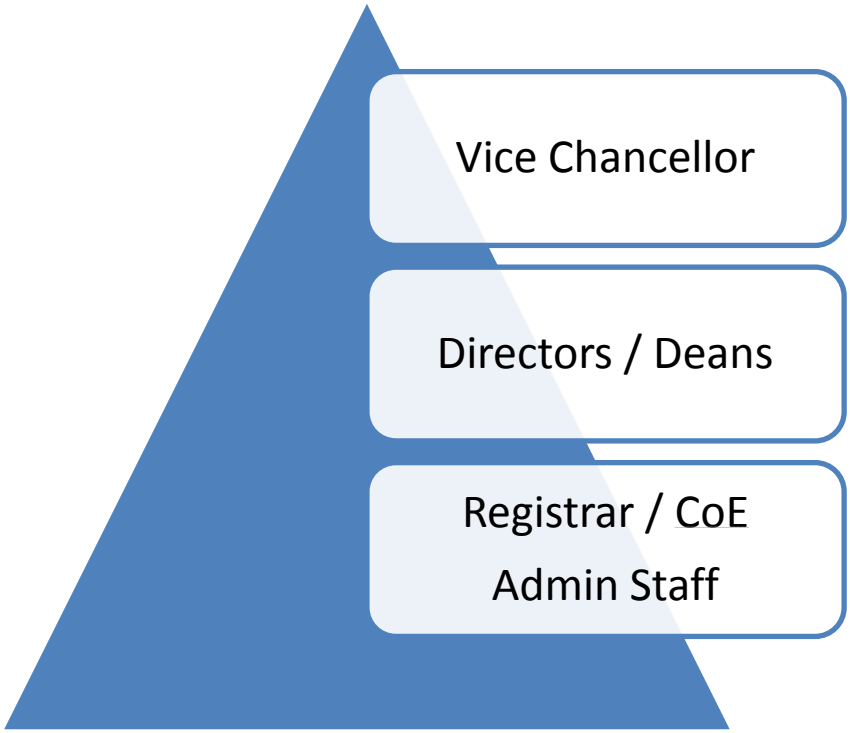
The tasks before the committee are as under:

- Overall Structure
- Academic Structure (for Schools and Centers)
- Administrative Structure (Head Office / Wings / Centers and Schools)
- The suggested Organization Structure for GTU in the following slides is for **easy understanding**, and a **consensus** is being developed by GTU's stakeholders – DSTU Research Team, VC & Registrar, and Government of Gujarat.

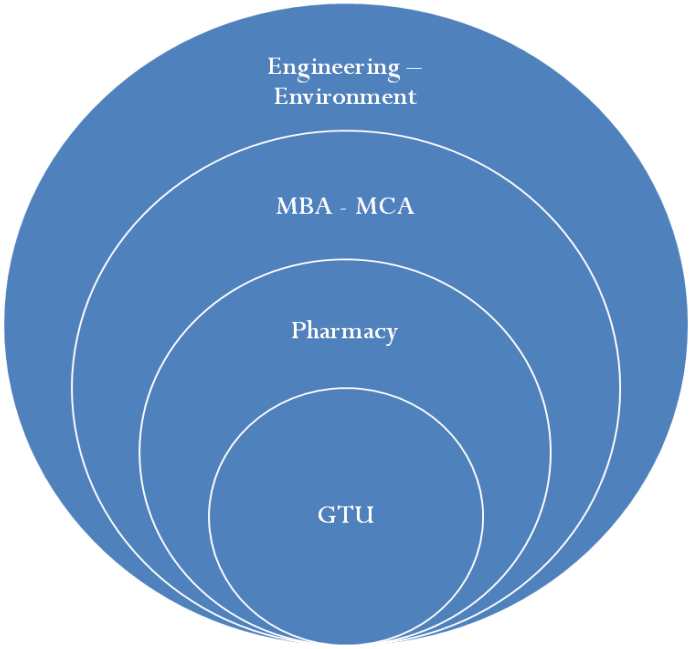
The Matrix of Major Functions at GTU is as shown below:



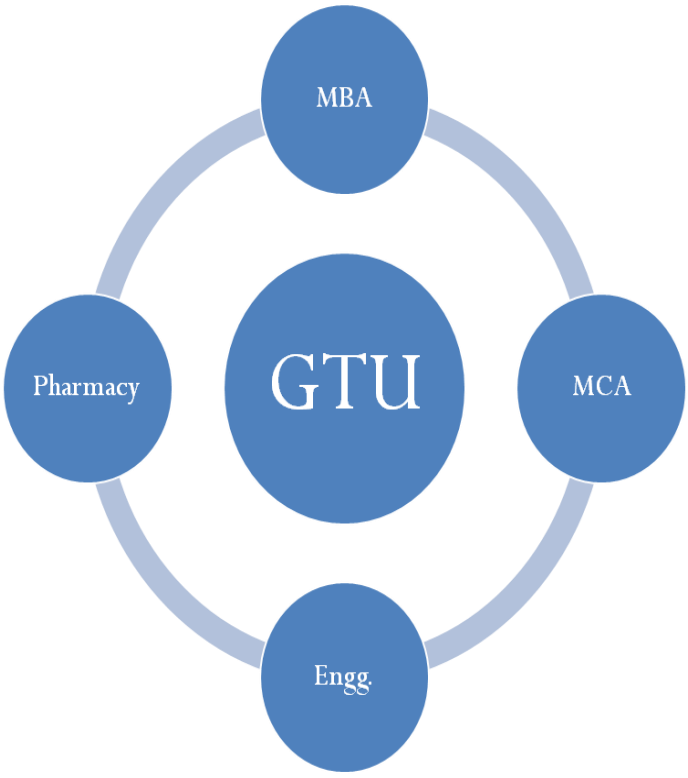
The Pyramid Structure for GTU is shown as under:



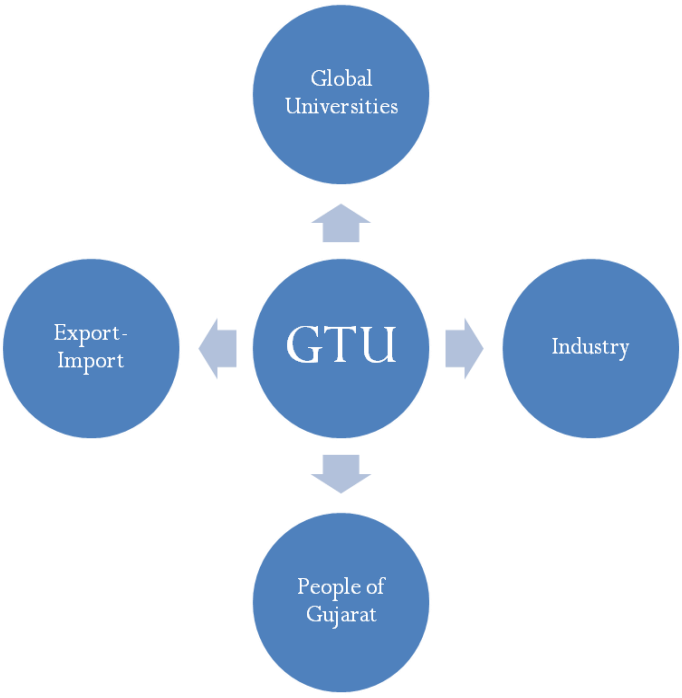
GTU and Academic Programs



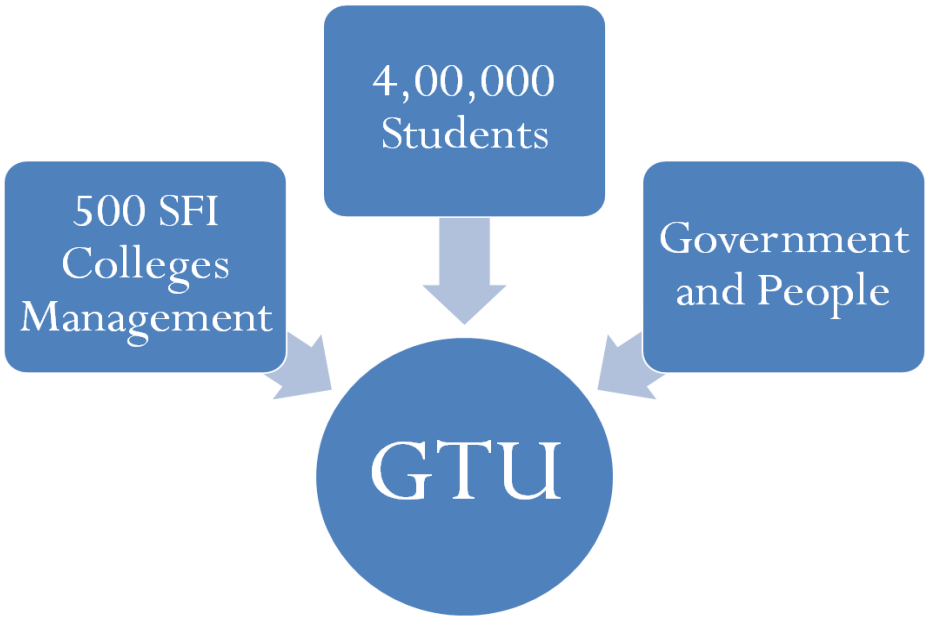
Challenge is to establish inter-relationships among GTU's Programs



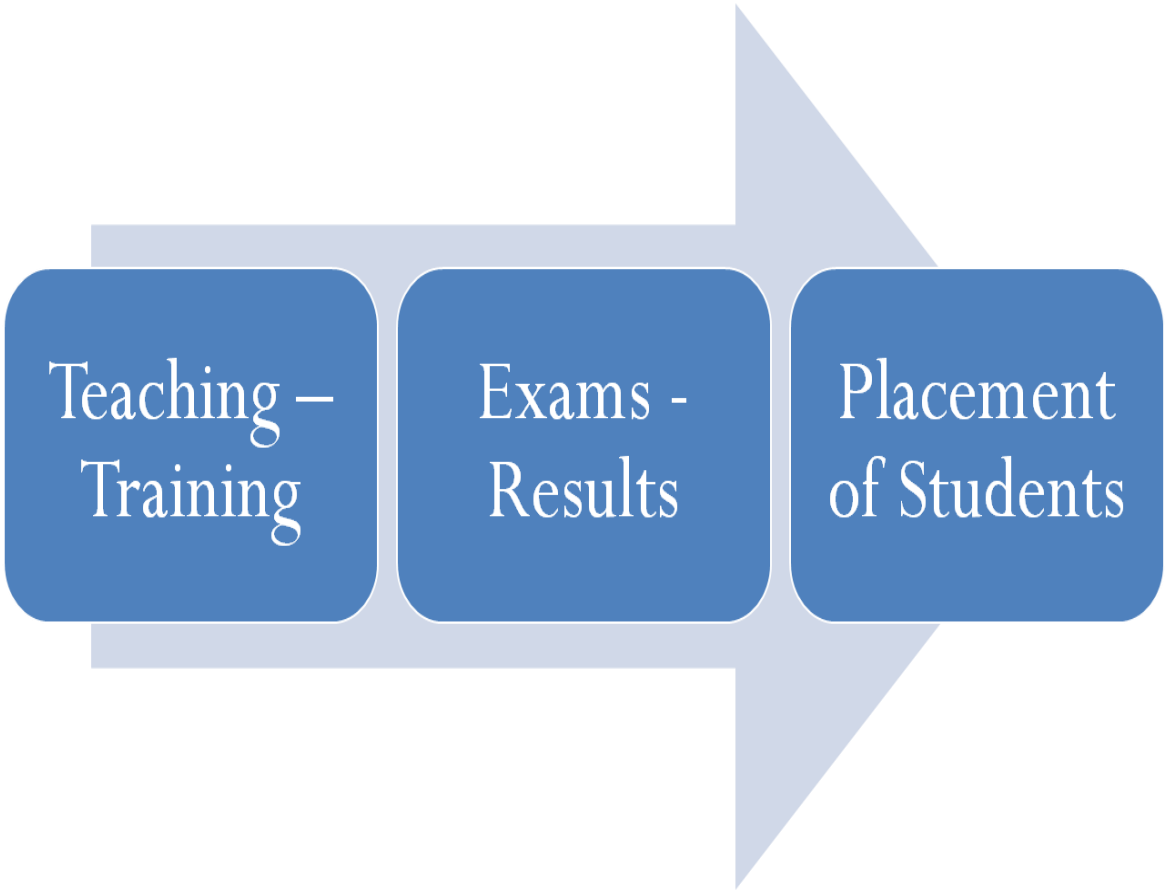
Second Challenge is to establish Linkages with Industries and Global Universities



Third Challenge is to manage various Pressure Groups



Forth Challenge is to Manage Processes of Teaching – Learning…

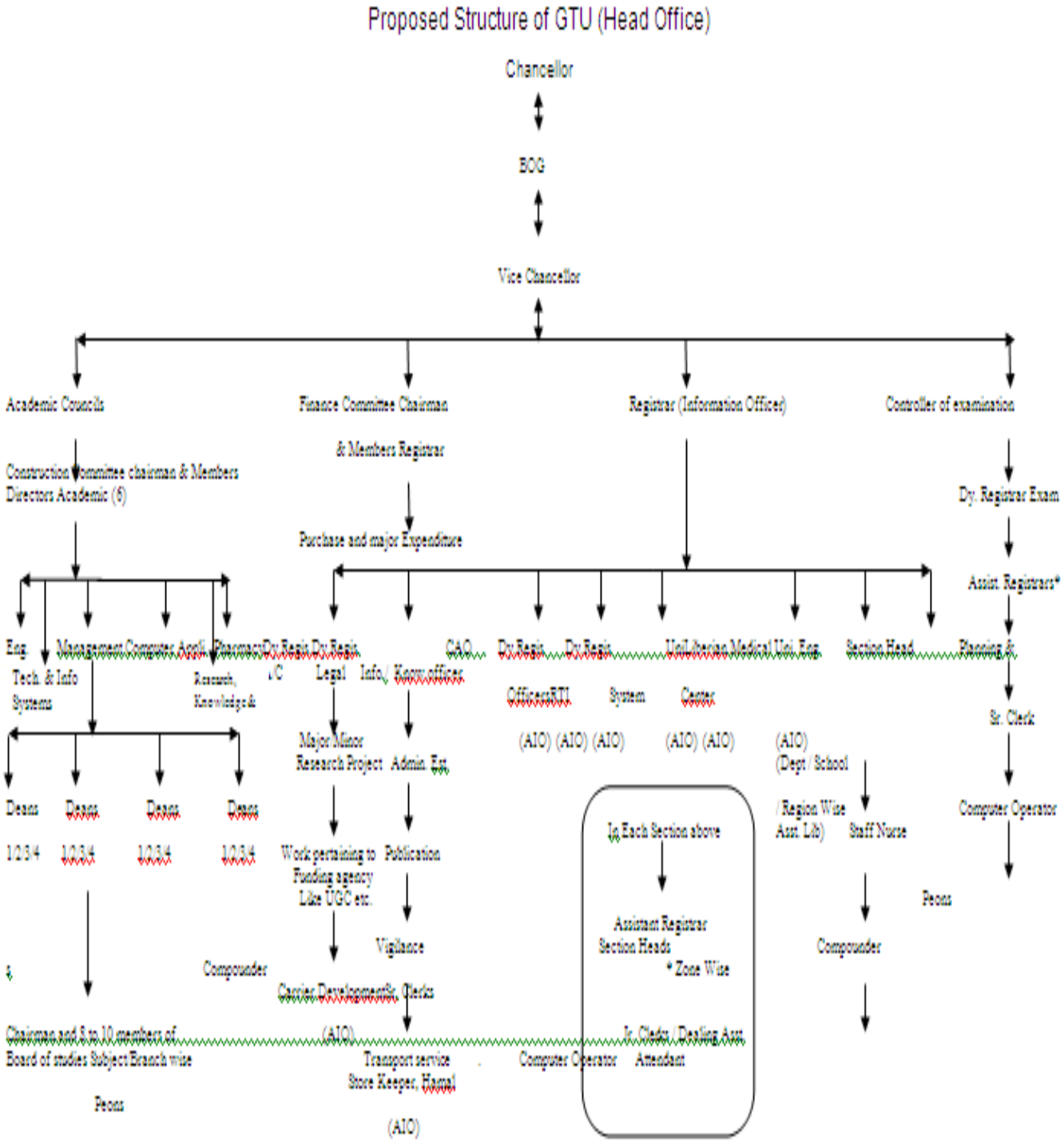


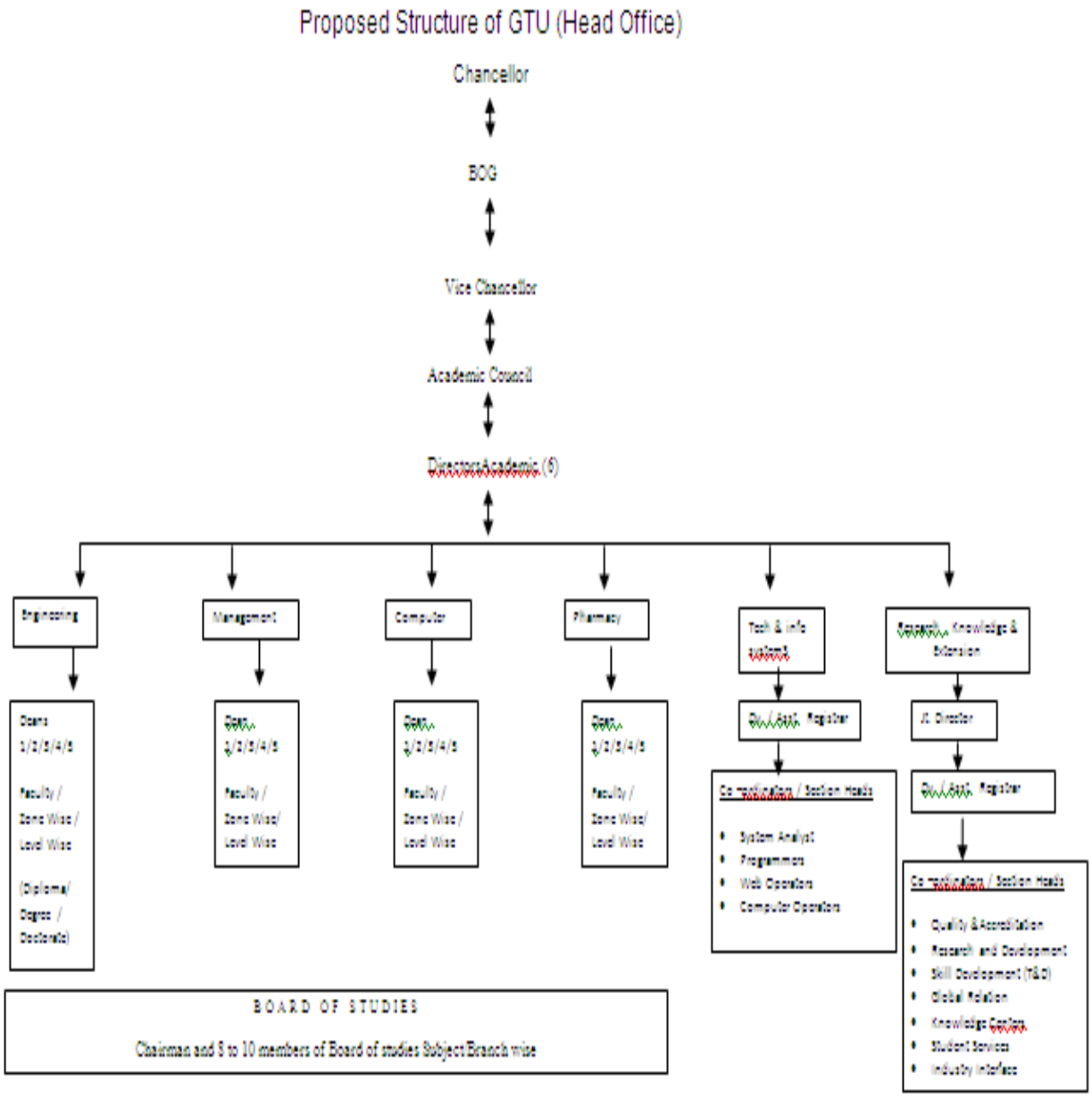
He therefore said that the suggested or proposed Organization Structure for GTU must address Issues:

1. All four major challenges on one hand, and
2. Take GTU to become a world class university to
3. Satisfy the educational and employment or business needs of our young population in the 21st Century.

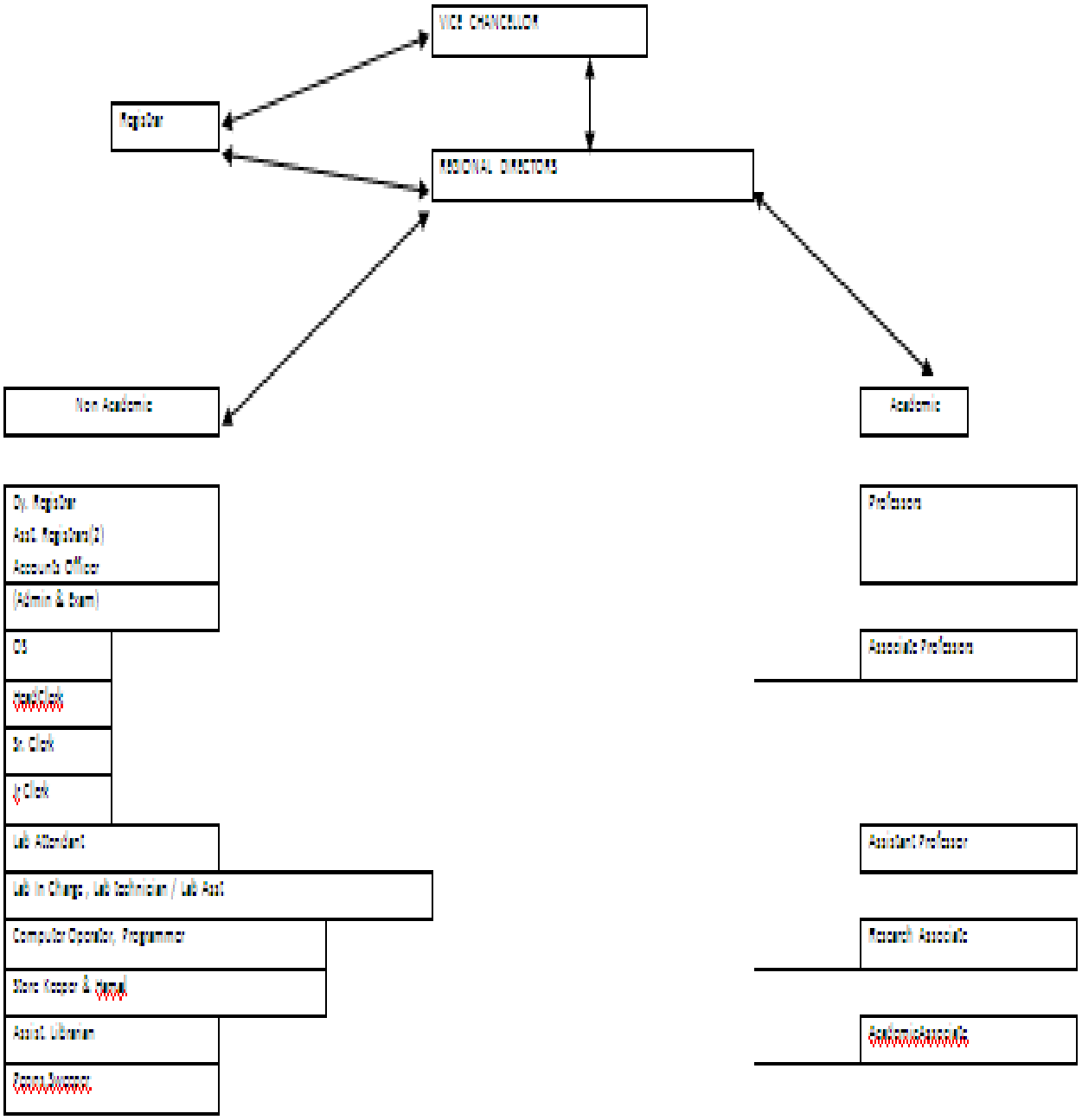
The suggested structures are as under:

Gujarat Technological University




Proposed Structure of GTU (Head Office)
Chancellor
BOG
Vice Chancellor
Academic Council
DirectorsAcademic (6)
Engineering
Management
Computer
Pharmacy
Tech & info
Research, Knowledge & Extension
Dy./Asst. Registar
Jt. Director
Dy./Asst. Registar
Co ordinators / Section Heads
System Analyst
Programmer
Web Operators
Computer Operators
Co ordinators / Section Heads
Quality &Accreditation
Research and Development
Skill Development (T&P)
Global Relation
Knowledge Center
Student Services
Industry Interface
BOARD OF STUDIES
Chairman and 8 to 10 members of Board of studies Subject/Branch wise

Proposed Structure of GTU Regional Centers

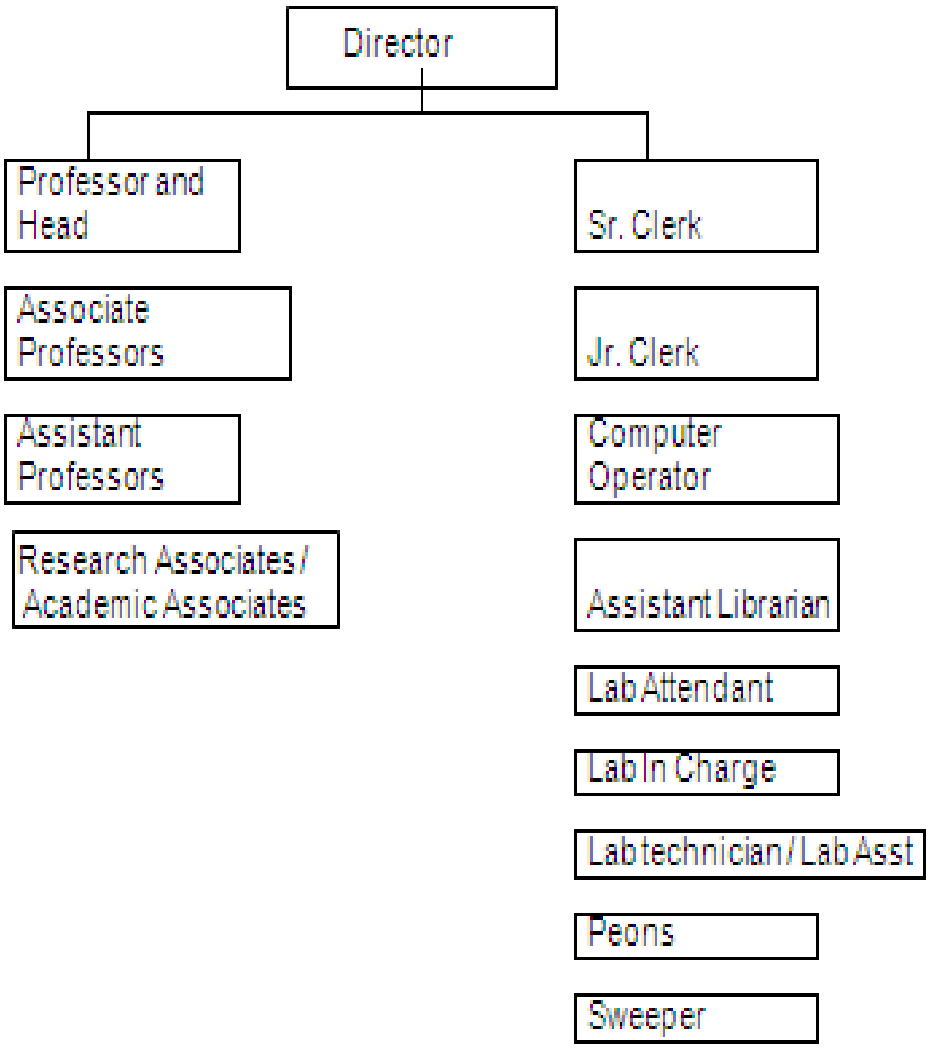


Note: Director / Regional Director , if working at GTU Head Quarter will be designated as Director

, otherwise they will be designated Regional Director. And both the posts will be transferable

The Post of Steward, Signal, Security Guard, Driver etc. will be outsourced

Proposed Structure of GTU Schools / Centers



Note: Director / Regional Director , if working at GTU Head Quarter will be designated as Director
, otherwise they will be designated Regional Director. And Both the posts will be transferable.
The Post of Sweeper, Hamal, Security Guard, Drivers etc. will be out sourced

Proposed Structure of GTU Wings

VICE CHANCELLOR

Registrar

GTU WINGS
Coordinator & Committee members

Computer Operator

Legal	Sports	Grievance	Anti Ragging	Women Dev	Youth &Cult	NCC/NSS	Alumni	Global Study
empanelment of Advocates	Sport Officer coaches	Coordinator & Committee members	Coordinator & Committee members	Coordinator & Committee members	Youth welfare Officer, Committee . Members	Coordinators	Coordinator & Committee members	Coordinator & Committee members

The Coordinator will directly report to the registrar , registrar will report to the vice Chancellor
The Vice Chancellor will be the Chairman of the all Committees more over he/she will nominate the Chairman/Coordinator as well as the members of the committees. The Registrar will be the Member Secretary of the Committee.

The proposed structure thus takes care of the various functions of the university; there is academic autonomy as well as it in consonant with the GTU Act. During the presentation the invited speakers appreciated the suggested structures.

At the end Dr. Trupti Almoula gave vote of thanks. The workshop started at 10 am and ended at 5.30pm. All the sessions remained very interactive. The meeting ended with the feelings of gratitude to the Chair, i.e. Dr. Akshai Aggarval, Vice Chancellor, GTU.