Strategic Plan (2019-2024)

I. Developing a system for industry interaction through MOUs, internships, trainings and programs.

1. To collaborate with at least five industries in each program through MOUs
2. Induction of industry oriented problems and applications as projects of the students.
3. To facilitate the conduction of internships of students at premiere industries.
4. Development of consultancy by all the departments.
5. Conduction of regular invited talk by experts from industry and facilitating interaction between experts, faculty and students.
6. To develop a KMEA Innovation council comprising IIC,incubation centre , IEDC ARIIA KDAC & KMEA innovation cell to foster innovation and creativity among students and thereby to apply for IIC ranking conducted by MHRD.
7. To Start techno lab for incubating start-up of kmeans
8. To conduct idea fest
9. To conduct entrepreneurship meet.

II. Enhancing the continuing education cell to cater to the needs of neighbouring community.

1. All departments offering UG program should start PMKVY programs to enhance the skill development of neighbouring people.
2. All departments should start ASAP programs in association with government of Kerala.
3. Collaborating with state resource council for providing value added courses to graduated students of all programs.
4. To start B.Voc courses in all departments

III. Faculty and Student empowerment programs

1. To encourage associations of all departments to conduct various programs so as to improve organizing capacity and leadership qualities of students.
2. To conduct invited talk by experts from premiere academic institutes to enhance advancements in their subject domain.
3. To conduct workshops and seminars for the students at regular intervals.
4. To conduct techno managerial cultural fests for students at intra college level and inter college level.
5. To promote the participation of students in competitions, seminars, workshops, conferences and tech fests, outside the campus.
6. To conduct induction program for the faculties at the beginning of each semester.
7. To conduct regular faculty training and empowerment programs.
8. To conduct FDP at regular intervals.
9. To encourage faculties to attend at least two FDPs in an academic year.

IV. Encourage activity based learning to develop disciplinary minds, creative minds and innovative minds

1. To develop program based academic plan.
2. Implement activity based course plan.
3. Developing manuals for implementation.

V. Development of start-ups and promotion of entrepreneurship.

KMEA ENGINEERING COLLEGE ★ KUZHUVELIPADY ★ EDATHALA PIN: 683561

1. To develop ten start ups within next five years.
2. To conduct invited talks by experts from KSUM and other allied organizations to students.
3. Encourage the activities of IEDC cell such as conduction of idea contests, seminars and workshops on entrepreneurships and start-ups.
4. To provide incubation space in campus for the registered start-ups of our students.
5. **To participate in IIC ranking conducted by MHRD innovation council to rate the colleges based on their performance in innovation and entreprenur ship related activities.**

VI. Membership of Professional bodies

1. All departments should get membership of at least two professional bodies in their domain.
2. The chapter of the professional body in the college should chart out its road map for five years in consultation with its parent body.
3. The various activities charted should be implemented as per the schedule.
4. Regular visit and interaction of the expert or elder from the professional body should be conducted.

VII. Streamlining of Career Guidance and Placement unit.

1. Conduction of invited talk of experts from each program to create awareness about the opportunities in each program.
2. To start training programs for various competitive exams like GATE, CAT, GRE, GMAT, IAS etc.
3. To set a target of 60% placement for the eligible students.
4. To conduct semester wise training program for making the student place able.
5. To attract core companies to campus for recruitment.

VIII. Development of Research Cell

1. To produce ten research papers for each program of which at least two should be SCI indexed journals.
2. To encourage the students of the department to produce research papers at the end of their project.
3. To provide motivational monitory benefits to students and faculties for producing SCI indexed journal papers.
4. To conduct FDPs in Research Methodology and expert talk in other research areas.
5. To develop a research culture in the college.
6. To encourage existing faculties to enrol for Ph.D. programs.
7. To set a target of at least one Ph. D holder in every department after five years.
8. To conduct national and international conferences regularly.
9. To introduce new research lab for facilitating research.

IX. Preparation of institute development plan for academic enhancement

1. To develop the academic interventions required to move from mission to vision.
2. To identify the sources for mobilizing the resources.
3. To develop an academic monitoring committee for proper guidance and monitor its functions.
4. To set a target of 60 % pass in the semester end examination.

X. Activation of IQAC for acquiring NAAC & NBA accreditation

1. To develop system and processes benchmarking for NAAC & NBA.
2. To set the internal mechanism & HR practices to address accreditation processes.

3. To set up quality assurance network.
4. Train staffs & students regarding the benchmarking in the accreditation processes.
5. form criteria committees and criteria co ordinators to prepare the documents related to concerned criteria.
6. To conduct and evaluate presentations of the criteria co ordinators .
7. To suggest modifications and to monitor the implementation of the same.
8. Prepare institutional information for quality assessment
9. prepare basic information , extended profile and self study report
10. Ensuring the timely implementation of the same in the portal.
11. To ensure proper reply for any query after the DVV processs
12. To facilitate the visit of accereditation team.

XI. Enhancement of Alumni Association Activities

1. All departments should form Alumni associations.
2. To conduct annual alumni association meeting.
3. To encourage the contribution of alumni for department upgradation.
4. Motivating Alumni to act as a mentor for their juniors thereby providing an insight regarding career opportunities and placements.

XII. Physical Education Facilities

1. The objective is to become the best Engineering College in Physical Education facilities.
2. To construct excellent gymnasium for the students.
3. To conduct intercollege tournaments in various games
4. To modify existing grounds and shuttle court

INNOVATION CELL ACTIVITY

As an example of innovation cell activity we would like to demonstrate our project done by students of Mechanical Engineering department named as " **EXTRICATOR**". The goal of our project is to serve the society in a natural disaster. In recent days we faced a natural disaster, there were many emergency requirements for rescue and medical assistance the ordinary vehicles cannot meet the same. So we derived a new design from the combination of both sand rails and swamp buggies.

- The vehicle will be attatched with a detatchable part to make the vehicle compatable to float on water at the same time to provide motion to the vehicle using specially designed alloys.
- By equipping a GPS system the vehicle could function for locating and tracking activities during rescue operation in floods and natural calamities.
- For light weight transportation for medical assistance and food distribution at times of flood.

Concept of the project: Buggy is generally refer to any light weight automobile with off road capabilities and sparse body work. The vehicle is a combination of a sand rail and swamp buggy to overcome all type of hard terrains. The vehicle comes with an engine specification under 200cc with manual gear shift. The body is built from a tubular space frame chassis that incorporates an integrated roll cage. The vehicle is capable of carrying one person. The vehicle is capable of safe operation over rough land terrain including obstructions such as rocks, sand jumps, logs, steep inclines, mud and water in any or all combination and in any type of whether.

Recognitions: We have recieved recognition for the project named as "EXTRICATOR".

- Won third prize in the TEKON 2K19 held at GEC Thrissur.

Another open source project titled "SMART PHONE APPLICATION FOR DISASTER MANAGEMENT" which is an open source project done by students of CSE department. The aim of the project is, during a disaster strike, common problem observed as spreading of fake news duplication of already processed help requests, failure of communication facilities, ineffective coordination of rescue opoerations. A dedicated mobile application is proposed to avoid the disadvantage of existing system by establishing communication proving help for victims, implimenting a unified platform for rescue operation, sharing updated news from the authorities.

Concept of the project: The application will be prebuild with an offline data base consisting of precautions to be taken under any given scenario. It uses mesh technology to establish communication when all else fails. Through the unified platform, a person can register as a victim or volunteer. The rescue operation are monitored and coordinated by the respective authority and officials with the help of a control room where all victims request as well as the volunteer details are recorded. The application is designed to be very light weight, energy efficient and easy to use.

Recognitions: We have recieved recognition for the project named as "SMART PHONE APPLICATION FOR DISASTER MANAGEMENT".

- Won first prize in the TEKON 2K19 held at GEC Thrissur.

Student project titled "Extricator" to help the flood affected people developed in Garage by Ashim T Ashraf, Badusha bin Abdullah, Fathima KA, Mohammed Shafi, Salman Basheer won the 3rd prize in TEKON 2019, State level contest for innovative engineering projects for students of all engineering colleges in Kerala jointly organized by KTU & KSCSTE on 17th of February 2019 at Government Engineering College, Thrissur.

"EXTRICATOR"

The Ambient Buggy

Table of Contents

KMEAENGINEERING COLLEGE

EXECUTIVE SUMMARY

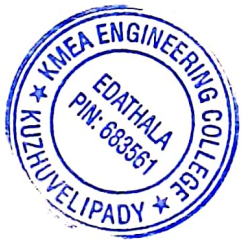
- Automobiles have paved a smart and easier way to move on human activities. They also put a huge impact on entertainment and lead to the whole world behind motor sports and racing. Motor sport is a global term used to encompass the group of competitive sporting events which primarily involve the use of motorized vehicles, whether for racing or non-racing competition. The terminology can also be used to describe forms of competition of two-wheeled motorized vehicles under the banner of motorcycle racing, and includes off-road racing such as motocross. They include racing like Formula one, off-road racing, Sports car racings etc. Buggy Racing is one among this.

- Buggy is generally used to refer to any lightweight automobile with off road capabilities and sparse bodywork. We intended to build a 4 wheel drive buggy car including Solid Axle Coil Spring Suspension. The vehicle is a combination of a sand rail and swamp buggy to overcome all type of hard terrains. The vehicle comes with an engine specification under 200cc with manual gear shift. The body is built from a tubular space frame chassis that incorporates an integrated roll cage. The vehicle is capable of carrying one person. The vehicle is capable of safe operation over rough land terrain including obstructions such as rocks, sand jumps, logs, steep inclines, mud and water in any or all combinations and in any type of weather.

GOAL OF THE PROJECT

- In recent days we faced a natural disaster, there were many emergency requirements for rescue and medical assistance. The ordinary vehicles cannot meet the same.so we designed an automobile which is capable for these emergency. So we derived a new design from the combination of both sand rails and swamp buggies. The vehicle will be attached with a detachable part to make the vehicle compatible to float on water at the same time to provide motion to the vehicle using specially designed alloys. Also by equipping a GPS system the vehicle could function for locating and tracking activities during rescue operations in floods and natural calamities. Also for lightweight transportation for medical assistance and food distribution at times of flood.

- Since it is detachable in nature, any add on modifications can be incorporated to this. We believe that, we can make this happen, and we wish to extend it as a commercial model with further add on.



Detailed Description

1:BODY STYLE

- When it comes to serious sand dunes, most off-road vehicles including those with four wheel drive are relatively top heavy and can only safely climb or descend steep hills with a mostly perpendicular approach to inclines or downhills. In the case of driving up a steep sand dune, many would simply "dig-in" and get stuck. Sandrails are ultra lightweight vehicles often weighing in at 800 and 1500 pounds (≈363 and ≈680 kg). They typically use high flotation smooth or farm implement front tires and special rear paddle tires, allowing it to skim over the surface of the sand without getting stuck. A sandrail has a low center of gravity, permitting it to make tight turns even on the face of a sand dune.

- Sandrail frames are built from a tubular space frame chassis that incorporates an integrated roll cage. The distinction between a sandrail and dune buggy or sand car is that the sandrail will rarely have windows, doors, fenders, or full body panels. The sandrail will also be a lighter weight vehicle compared to the sandcar. On most sand rails, the engine is typically at the rear. Some sandrails also use a mid-engine configuration. This design offers favorable weight distribution and traction, which is very desirable for dune "hill-climbing".

2: ENGINE AND TRANSMISSION

- Displacement : 199.5 cc
- Cylinders : 1
- Max Power : 23.2 bhp @ 9,500 rpm
- Maximum Torque : 18.3 Nm @ 8,000 rpm
- Bore : 72 mm
- Stroke : 49 mm
- Valves Per Cylinder : 4
- Fuel Delivery System :Carburettor
- Fuel Type : Petrol
- Ignition : Independent spark control through ECU
- Spark Plugs : 3 Per Cylinder
- Cooling System : Liquid Cooled
- Gearbox Type : Manual
- No. of Gears : 6
- Transmission Type : Chain Drive
- Clutch : Wet Multi-Disc

Detailed Description

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3 : Buoyancy

Buoyancy or **upthrust**, is an upward force exerted by a fluid that opposes the weight of an immersed object. In a column of fluid, pressure increases with depth as a result of the weight of the overlying fluid. Thus the pressure at the bottom of a column of fluid is greater than at the top of the column. Similarly, the pressure at the bottom of an object submerged in a fluid is greater than at the top of the object. This pressure difference results in a net upwards force on the object. The magnitude of that force exerted is proportional to that pressure difference, and (as explained by Archimedes' principle) is equivalent to the weight of the fluid that would otherwise occupy the volume of the object, i.e. the displaced fluid

Estimated Weight of the buggy : 300

Buoyancy force Fb = Vs * D * g

Where : Vs (Submerged Volume) = Length * Width *Height

D (Density of Water) = 1000 kg/m^3

g (Gravity) = 9.8 m/s

Approximate Calculation :

Vs = 3*1.5*1 = 4.5

Fb = 4.5*1000*9.8 = 44145N = 44.145 KN

Fb = 44.145 KN

To achieve this buoyant force the use of air balloon made of PVC polymer.

The material specification is **0.9mm PVC 1000 Denier Polyster weight 1100 g/m**

4 : ACCESSORIES

- Early sandrails often consisted of little more than a steering wheel, brakes and accelerator. However, today an entire industry is built around all kinds of accessories such as HID and LED headlamps, radios, passenger communications headsets and GPS navigation devices.

5 : SAFETY

- Accidents most often occur in collisions with other off-road vehicles, and are frequently the result of not being seen. In many dune areas, all sand vehicles (motorcycles, quads, sandrails, UTVs and sandcars) are required to use an eight-foot antenna whip and flag. This is critical to being seen by other vehicles as a driver traverses from one dune to the next.Most sandrails employ a variety of safety features for the driver and passengers. The most common is the use of a three-point safety belt system. Many sand rails also utilize roll bar padding and fire extinguishers. More advanced safety features sometimes include: arm and wrist restraints, netting for large frame openings, automatic fuel cut-off switches and horns. Additionally, the use of eye protection (goggles and ballistic-grade glasses) is considered a necessity. Finally, the use of helmets while "duning" is increasing due to the advances in performance. Sand associations along with state and federal land management agencies work to provide dune safety information through pamphlets, online and in classes.

6 : OTHER APPLICATIONS

Some states in the USA, such as Arizona and Utah, allow the registration of sandrails and other primarily off-road vehicles for "on-road" use. In these states, sandrails registered for on-road use usually must meet the minimum insurance coverage required by normal vehicles.Additionally, they may require modifications to be road worthy this typically includes a wind shield, turning signals and license plate. These requirements may vary by state.

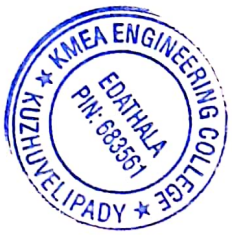
Sandrails have been employed by US state authorities, the United States Border Patrol and even the military. They are still in use today by the Navy SEALs. The military design of these vehicles is based on the Chenowth Advanced Light Strike Vehicle model and have been modified for a third seat above the engine to control a .50 caliber machine gun and other armaments. State authorities, such as rangers at sand dune parks sometimes employ sandrails removing the passenger seat to convert the sandrail into a makeshift ambulance with a stretcher.

Although sandrails are primarily designed for the sand, they have been successfully used on "soft pack" dirt, mud and even snow. Some of these types of applications usually require the use of off-road type tires vs. "sand" tires. They are typically not well suited for rocky terrain due to their mostly limited suspension and lighter duty frames.

7: FUTURE, INDUSTRY AND ASSOCIATIONS

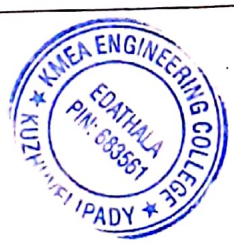
Due to its economical cost to build and maintain, access to new parts and good balance between weight and power, the sandrail continues to be used by many enthusiasts today.[9] However, the heavier and typically more powerful sandcar now represents another style for duners.[1] This style often employs mammoth cars weighing several thousand pounds and using highly advanced suspension systems and transmissions coupled with large performance V8 engines such as the latest GM LS engine series, Ford Coyote engine series or Range Rover engine series.

Associations such as ASA hold events throughout the year in some parts of the country for sand racing and hill climbing. Additionally, these associations provide representation for enthusiasts with legislators and land management officials.



8 : Cost Estimation

round tube – 45m	8700
tyre – 4	7200
tyre hub – 4	10000
tyre drum – 4	3000
disc brake – 4	8000
shock absober – 8	3000
differential – 1	3000
steering wheel – 1	2000
pedel – 3	1500
gear lever – 1	1500
engine – 1	3000
chain sprocket – 1	2000
air filter – 1	1200
carburetor – 1	750
fuel tank – 1	1500
wishbone upper – 4	4000
wishbone lower – 4	4000
head light – 4	2000
wiring kit – 1	1000
self motor – 1	1500
battery – 1	2000
bucket seat – 1	2500
wheel bearing – 4	1400



shaft – 2	2000
universal joint – 2	3000
air baloon – 1	20000
aluminium cheker sheet(6*4) - 2	2000
handbrake lever – 1	1500
exhaust – 1	2000
bent pipe – 1	350
paint job	6000
air pump	2600
Total Cost	114200

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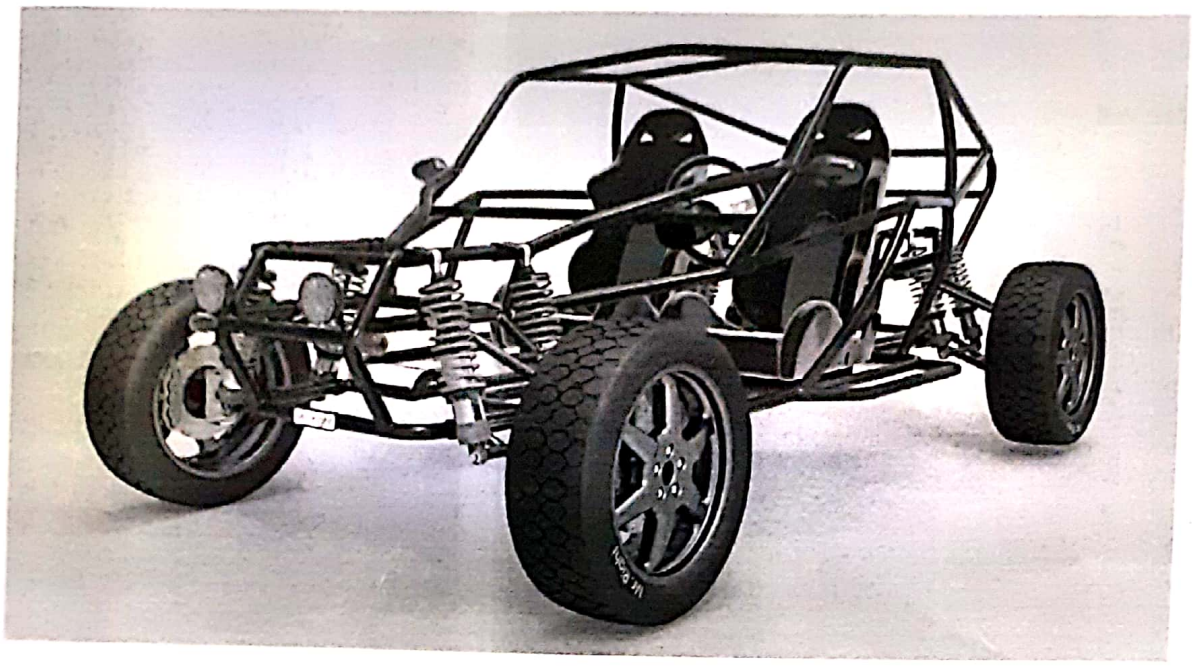
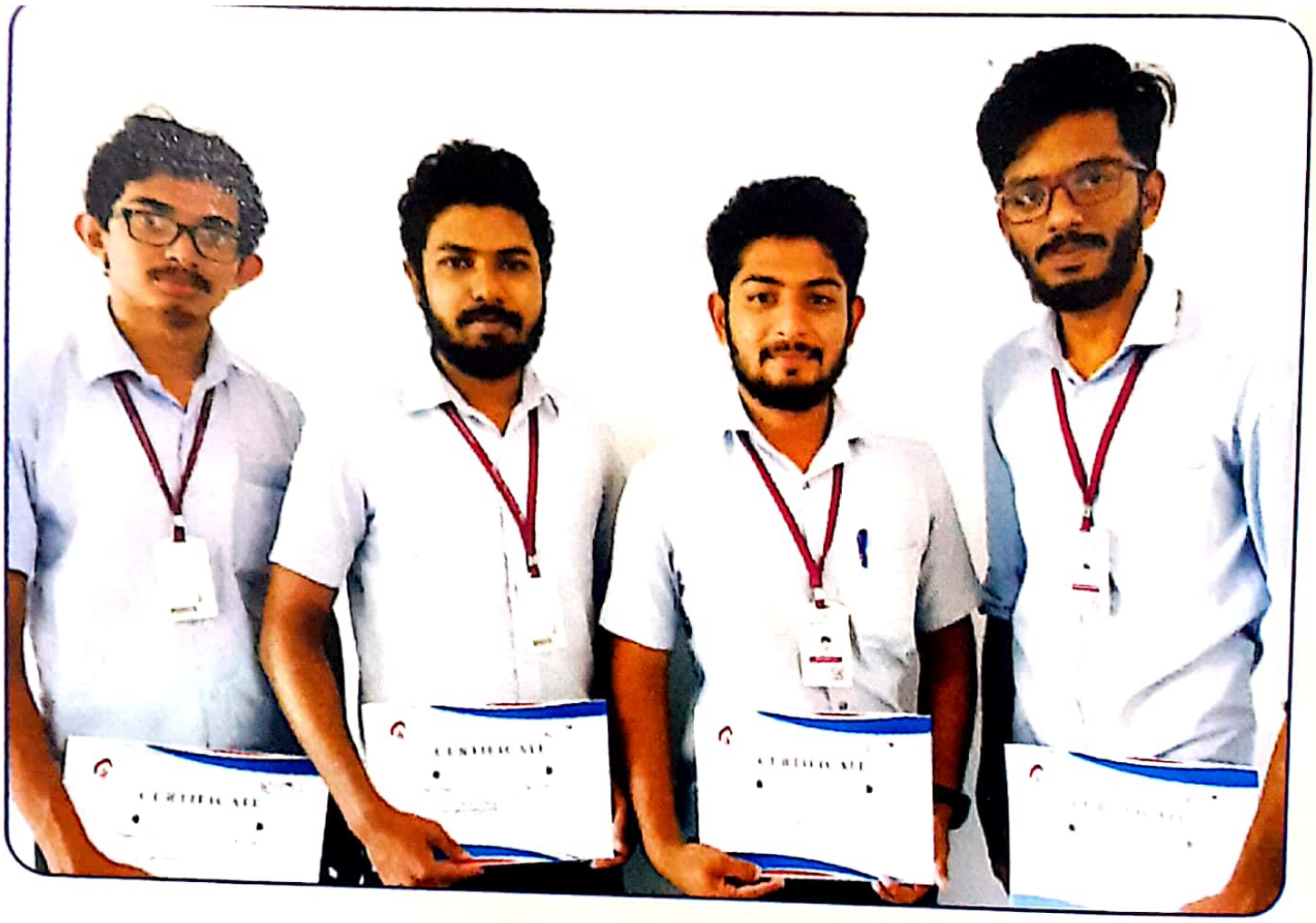
Attachments





Student project of CS Department titled "Disaster Management" bagged Best Open Source Award in TEKON 2019, State Level Contest for innovative Engineering projects for students of all Engineering Colleges in Kerala.-jointly organized by KTU & KSCSTE on 17th of February 2019 at Government Engineering College, Thrissur. The Team Members were Azarudeen P.N, Ameen Ahmed, Mohammed Aslam, Mirsha Ashfakh Shan T.