

**World's First and Largest 3D Screen (16'6") Video Simulator Ride having 20 Seats Built on 35' Truck Chassis with Expandable Auditorium On Wheels  
India's First Simulator Ride ON WHEELS Built on Multi-purpose Expandable Auditorium  
Designed and Developed by Dr. K. GOPALAKRISHNAN  
Russian Federation (Rospatent) International Patent No. 152801**



NDRF-IEI IPR Cell: The First International Patent from Russian Federation (Rospatent) has been presented to Dr. K. Gopalakrishnan, Chairman, R&D Committee and Dr. K. Ramachandra, Director, NDRF for the "World's First Expandable Mobile Auditorium On Wheels with 7D Simulator Built on 35' Chassis having Largest 3D Screen (16') and 20 Seats",

An official delegation including **The Institution of Engineers (India)** President has accompanied the Hon'ble President of India **Shri Pranab Mukherjee** during the state visit to Russia, from 07 - 11 May 2015 attended the 70<sup>th</sup> Victory Day Celebrations at Moscow to mark the **70<sup>th</sup> Anniversary of the Victory in Great Patriotic War (World War II)**



*IEI Delegation with Indian Foreign Secretary, Mr. S. Jaishankar and MHRD Secretary (Higher Education), Mr. Satyanarayan Mohanty*

*L to R: Dr. K. Gopalakrishnan, Chairman, R&D-IEI, Mr. S. S. Rathore, Past President, IEI, Mr. S. Jaishankar, Mr. Satyanarayan Mohanty, Dr. L. V. Muralikrishna Reddy, President, IEI, Mr. A. Basa, Immediate Past President, IEI*



Academic Delegation Visited Russia with Hon'ble President of India **Shri. Pranab Mukherjee**

*L to R Sitting:* **Shri. Manoj Sinha**, Minister of State, Railways, Hon'ble President of India **Shri. Pranab Mukherjee** and **Shri. P. S. Raghavan**, Ambassador of India to the Russian Federation

*L to R Standing:* Prof. Bimal K. Roy, Director, Indian Statistical Institute, Dr. K. Gopalakrishnan, Chairman, R&D-IEI, Mr. A. Basa, Immediate Past President, IEI, Mr. S. S. Rathore, Past President, IEI, Prof. R. K. Shevgaonkar, Director, IIT Delhi, Dr. L. V. Muralikrishna Reddy, President, IEI, Mr. Satyanarayan Mohanty, MHRD Secretary, Prof. Dinesh Singh, Vice Chancellor, University of Delhi, Dr. Jayant B. Udgaonkar, National Centre for Biological Sciences, Prof. Devang Khakhar, Director, IIT Bombay and Prof. Bhaskar Ramamurthi, Director, IIT Madras (*not seen*)

*Indo-Russian Academic Delegation led by Hon'ble President of India **Shri Pranab Kumar Mukherjee** during the state visit to Russia, from 07 - 11 May 2015 attended the 70<sup>th</sup> Victory Day Celebrations at Moscow to mark the 70<sup>th</sup> Anniversary of the Victory in Second World War.*

**Indian Side:**

IIT Bombay, IIT Madras, IIT Delhi, University of Delhi, the Institution of Engineers (India), the Indian Statistical Institute. So, we have three IITs, we have Delhi University, Institution of Engineers, and the Indian Statistical Institute.

**Russian Side:**

Tomsk State University, the Ural Federal University, the Tomsk Polytechnic University, the Skolkova Institute of Science and Technology, the Higher School of Economics of Moscow, the Lomonosov Moscow State University, and the Russian Union of Scientific and Engineering Associations.

## Experience the seventh dimension on wheels

A team of five worked on the project for six months and came up with a bus that could be converted into a 20-seater auditorium

Apurva Venkat  
bmfeedback@gmail.com

TWEETS @BangaloreMirror

It may look like any other bus on the road, but it's far more than that. In fact, it's an auditorium on the wheels. The National Design and Research Forum has received an international patent from Russia (Russian Federation-ROSPATENT) for its latest invention called the 'Multi-purpose Expandable Auditorium on Wheels'.

A team of five worked on the project for six months and came up with a bus that could be converted into a 20-seater auditorium.

K G Gopalkrishnan, the lead member of the team felt the need to take technology to rural areas. Gopalkrishnan, chairman, research and development cell, Institution of Engineers, said, "The idea occurred to me when I was watching a movie in a cinema. It was a 3D film and I wondered why only people in cities should be able to watch these films; why not in villages too. I also realised that building a whole cinema in every village was not possible. That's when I thought if rural folk can't reach technology, let's take technology to them."

The expandable theatre is built on 35-foot truck chassis with an expandable 16-foot screen. The chassis also has 20 seats. This seats and the screen is what has helped the team to bag the patent.



Murali Krishnan Reddy, All-India president of the Institution of Engineers and a team member, said, "There have been moving auditoriums before, however, they were all built on 80-ft chasses, with a much smaller screen. The maximum number of seats that could be accommodated was 12. Ours is different. The expandable unit is where the screen is located and this helps to create the correct distance between seats and screen."

The '7DPlus Simulator On Wheels' prototype and proof of concept (PoC) is built on an Ashok Leyland Multi-Axle chassis. The manufacturing of all components has been done

in Bengaluru itself. The bus was made by Hi-Tech Engineers at CV Raman Nagar and most of the components used were bought in Peenaya.

Taking the whole experience of entertainment a step further, the wheelless auditorium has a 3D screen along with a 7D simulator. This makes it a complete 7DPlus Video Simulator ride. It is also fitted with snow machines, bubble machines along with all other special effects. These features actually help experience a movie rather than just watch it.

K Ramachandra, director, National Design and Research Forum, said, "When you see a movie in this theatre you will feel all the effects too. If it is snowing in the movie the snow machine while create snow in the theatre as well, if a car turns left your seats will also tilt. This is a similar experience you would get in an amusement park."

While currently built as a theatre, it can also be converted into various other facilities like an Intensive Care Unit (ICU), rural hospital, computer/Internet centre, etc.

Gopalkrishnan added, "The prototype was built at a cost of Rs 1.2 crore which is low as most of the products were manufactured locally. We can now further reduce the cost to Rs 60-70 lakh as we plan to sell it commercially. Within three years, we want at least 15 to 25 such facilities to be used across the country."





## World's First and Largest 3D Screen (16'6") Video Simulator Ride having 20 Seats Built on 35' Truck Chassis with Expandable Auditorium On Wheels

India's First Simulator Ride *ON WHEELS* Built on Multi-purpose Expandable Auditorium

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# ಹೈಟೆಕ್ ಬಸ್‌ನಲ್ಲಿ 7ಡಿ ಆಡಿಟೋರಿಯಂ

■ ಬೆಂಗಳೂರು ಸಂಸ್ಥೆಯ ಸಾಧನೆಗೆ ಸಿಕ್ಕಿತು ರಷ್ಯಾ ಪೇಟೆಂಟ್ ■ 20 ಆಸನ ವ್ಯವಸ್ಥೆ

**■ ರಮೇಶ ದೊಡ್ಡಪುರ**

**ಬೆಂಗಳೂರು:** ಅಮೆರಿಕದ ಡಿಸ್ಕಿ ಲ್ಯಾಂಡ್‌ನಲ್ಲಿ ಮಕ್ಕಳ ಮನರಂಜನೆ, ಶಿಕ್ಷಣಕ್ಕೆ ಲಭ್ಯವಿರುವ 7 ಡಿ ಸಿಮ್ಯುಲೇಟರ್ ನಂತಹ ಅನುಭವವನ್ನು ಭಾರತದಲ್ಲಿ ಪಡೆಯಬಹುದು. ಸಾಮಾನ್ಯ ಬಸ್‌ನಂತೆಯೇ ಗೋಚರಿಸುವ ವಾಹನದಲ್ಲಿ ಹೈಟೆಕ್ ಆಡಿಟೋರಿಯಂ, ಆಸ್ತತ್ಯ, ಅಪರೇಷನ್ ಥಿಯೇಟರ್ ಸೇರಿ ವಿವಿಧ ಕಾರ್ಯಕ್ಕೆ ಉಪಯೋಗಿಸಬಹುದಾದ ವಾಹನವನ್ನು ರೂಪಿಸಿರುವ ಬೆಂಗಳೂರಿನ ರಾಷ್ಟ್ರೀಯ ವಿನ್ಯಾಸ ಮತ್ತು ಸಂಶೋಧನಾ ಸಮೂಹದ (ಎನ್‌ಡಿಆರ್‌ಎಫ್) ಸಂಶೋಧನೆಗೆ ಪ್ರತಿಭಿತ್ತ ರಷ್ಯಾ ಪೇಟೆಂಟ್ (ರೋಸೆಪೇಟೆಂಟ್) ಲಭಿಸಿದೆ.

ಮೂಲಸೌಕರ್ಯಗಳು ಲಭ್ಯವಿಲ್ಲದ ಸ್ಥಳಗಳಲ್ಲಿ ಅತ್ಯಾಧುನಿಕ ಆಡಿಟೋರಿಯಂ, 3ಡಿ ಥಿಯೇಟರ್ ಸೇರಿ ಶಾಶ್ವತ ವ್ಯವಸ್ಥೆ ಕಲ್ಪಿಸಲು ಸಾಧ್ಯವಿಲ್ಲ. ಅಂತಹ ಕಡೆಗಳಲ್ಲಿ 20 ಜನ ಕುಳಿತು 3ಡಿ ಸ್ಕ್ರೀನ್ ಜತೆಗೆ ಸ್ಕ್ರೀನ್‌ನಲ್ಲಿನ ಚಿತ್ರಗಳಿಗೆ ಅನುಗುಣವಾಗಿ ನೈಜ ಅನುಭವ ನೀಡುವ 7ಡಿ ಸಿಮ್ಯುಲೇಟರ್ ವಾಹನವನ್ನು 5 ಜನರ ತಂಡ ರೂಪಿಸಿದೆ. ವಿಶ್ವರಿಸಬಹುದಾದ ವ್ಯವಸ್ಥೆ: ಅನೇಕ ದೇಶಗಳಲ್ಲಿ ಈಗಾಗಲೇ ಆಡಿಟೋರಿಯಂ ಆನ್ ಪ್ಲೀಲ್ಡ್ ತಂತ್ರಜ್ಞಾನ ಲಭ್ಯವಿದೆ. ಆಸ್ತತ್ಯಗಳು, ಕಾರ್ಪೋರೇಟ್ ಕಂಪನಿಗಳು, ಶಾಲೆ-ಕಾಲೇಜುಗಳು ವಿವಿಧ ಕಾರ್ಯಕ್ಕೆ ಇವನ್ನು ಬಳಸುತ್ತಿವೆ. 80 ಅಡಿ ಉದ್ದದ ಚಾಸಿ ಇರುವ ಬಸ್‌ನಲ್ಲಿ 8-9 ಜನರು ಕುಳಿತು ರೋಮಾಂಚಕ ಅನುಭವ ಪಡೆಯುವ ವ್ಯವಸ್ಥೆಯಿದೆ. ಆದರೆ, ಎನ್‌ಡಿಆರ್‌ಎಫ್ ರೂಪಿಸಿರುವ 'ಎಕ್ಸ್‌ಪ್ಲಾಂಡೆಬಲ್ ಆಡಿಟೋರಿಯಂ ಆನ್ ಪ್ಲೀಲ್ಡ್ ವಿತ್ 7ಡಿ ಪ್ಲಸ್ಟ್ ಸಿಮ್ಯುಲೇಟರ್' ಇವೆಲ್ಲಕ್ಕಿಂತ ವಿಶಿಷ್ಟವಾಗಿದೆ.

ಡಿ ಇನ್ಸ್ಟಿಟ್ಯೂಟ್ ಆಫ್ ಇಂಜಿನಿಯರ್ಸ್ ಸಂಸ್ಥೆಯ ಸಂಶೋಧನೆ ಮತ್ತು ಅಭಿವೃದ್ಧಿ ವಿಭಾಗದ ಮುಖ್ಯಸ್ಥ ಡಾ. ಕೆ. ಗೋಪಾಲಕೃಷ್ಣನ್ ನೇತೃತ್ವದ ತಂಡ 35 ಅಡಿ ಉದ್ದದ



7ಡಿ ಆಡಿಟೋರಿಯಂ ಹೊಂದಿರುವ ಅತ್ಯಾಧುನಿಕ ಬಸ್.

ಚಾಸಿಯಿರುವ ಸಾಮಾನ್ಯ ಬಸ್‌ನಲ್ಲಿ ಆಡಿಟೋರಿಯಂ ರೂಪಿಸಿದೆ. ಆದರೆ, ವಿದೇಶಿ ವಾಹನಗಳಿಗಿಂತಲೂ 3 ಪಟ್ಟು ಹೆಚ್ಚು ಜನರು ಕುಳಿತುಕೊಳ್ಳುವಂತೆ ವಿನ್ಯಾಸ ಮಾಡಲಾಗಿದೆ. ಒಂದು ಸ್ಥಳದಲ್ಲಿ ಬಸ್ ನಿಲ್ಲಿಸಿ, ಒಂದು ಭಾಗವನ್ನು ವಿಸ್ತರಿಸುವಂತೆ ರೂಪಿಸಲಾಗಿದೆ. ಈ ಮೂಲಕ ಸ್ಕ್ರೀನ್ ಅಳವಡಿಸಲು ಹೆಚ್ಚಿನ ಸ್ವಕಾವಕಾಶ ಲಭ್ಯವಾಗಿದೆ. ವಿದೇಶಿ ವಾಹನಗಳಲ್ಲಿ ಸಾಮಾನ್ಯವಾಗಿ 80 ಇಂಚ್ ಸ್ಕ್ರೀನ್ ಇದ್ದರೆ, ಈ ವಾಹನದಲ್ಲಿ 16 ಅಡಿಗಳ ಬೃಹತ್ ಸ್ಕ್ರೀನ್ ಲಭ್ಯವಿದೆ. ಈ ವಾಹನವನ್ನು 1.2 ಕೋಟಿ ರೂ. ವೆಚ್ಚದಲ್ಲಿ ಅಭಿವೃದ್ಧಿಪಡಿಸಲಾಗಿದೆ. ಸಂಶೋಧನೆ ನಡೆಸಿದ್ದರಿಂದ ಇಷ್ಟು ಹಣ ವೆಚ್ಚವಾಗಿದೆ. ಇದೀಗ ಅಭಿವೃದ್ಧಿಯಾಗಿರುವ ಕಾರಣ ಗ್ರಾಹಕರಿಗೆ 60-70 ಲಕ್ಷ ರೂ.ನಲ್ಲಿ ತಯಾರಿಸಿಕೊಡಬಹುದು ಎಂದು ಗೋಪಾಲಕೃಷ್ಣನ್ ಹೇಳುತ್ತಾರೆ.

7ಡಿ ಪ್ಲಸ್ಟ್ ಅನುಭವ: ತಲಾ 5 ಸೀಟುಗಳ ಸರಣಿಯ ನಾಲ್ಕು ಸಾಲನ್ನು ಅಳವಡಿಸಲಾಗಿದೆ. ಸ್ಕ್ರೀನ್ ಮೇಲೆ ಮಳೆಯ ವಾತಾವರಣವಿದ್ದರೆ, ಪ್ರೇಕ್ಷಕರ ಮೇಲೆ ತುಂತುರು ನೀರು ಸಿಂಚಡಿಸಿದ ಅನುಭವವಾಗುತ್ತದೆ. ವಿಮಾನ ಟೇಕಾಫ್ ಆದರೆ ಸೀಟುಗಳೂ ವಾಲುತ್ತಾ ಆದರೆ ಅನುಭವ ನೀಡುತ್ತದೆ. ಚಿತ್ರದಲ್ಲಿ ಇಲಿಗಳು

**6 ಬೆಂಗಳೂರು,** ಮಂಗಳೂರಿನಂತಹ ಕೆಲವೇ ಸ್ಥಳಗಳಲ್ಲಿ 3ಡಿ ಥಿಯೇಟರ್ ಲಭ್ಯ. ಇತರೆ ಸಣ್ಣ ನಗರಗಳು ಹಾಗೂ ಗ್ರಾಮೀಣ ಜನರಿಗೆ ಇವು ಮರೀಚಿಕೆ. ಗ್ರಾಮೀಣ ಪ್ರದೇಶದಲ್ಲಿ ಹೈಟೆಕ್ ಆಸ್ತತ್ಯ, ಹೆರಿಗೆ ಕೇಂದ್ರ ಸೇರಿ ಹಲವು ಸೌಲಭ್ಯಗಳನ್ನು ಈ ವಾಹನದ ಮೂಲಕ ಕೊಂಡೊ ಯುಬಹುದು. ದೇಶದಲ್ಲೇ ಇದು ಮೊದಲ ಪ್ರಯತ್ನ.

**1 ಡಾ. ಕೆ. ಗೋಪಾಲಕೃಷ್ಣನ್**  
ಹೈಟೆಕ್ ವಾಹನ ರೂಪಿಸಿದ ತಂಡದ ಮುಖ್ಯಸ್ಥ

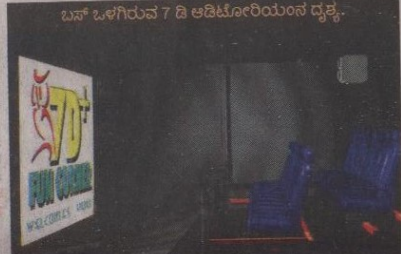
ಓಡಾಡಿದರೆ, ಕಾಲ ಕೆಳಗೆ ಅಳವಡಿಸಿರುವ ನ್ಯೂಮ್ಯಾಟಿಕ್ ಉಪಕರಣಗಳ ಮೂಲಕ ಕಾಲಿಗೆ ಅದೇ ರೀತಿಯ ಅನುಭವ ನೀಡುತ್ತವೆ. ವಿವಿಧ ತಿನಿಸುಗಳ ವಾಸನೆಯನ್ನೂ ಸೃಷ್ಟಿಸುವ ಸಾಮರ್ಥ್ಯವುಳ್ಳ ಸಿಮ್ಯುಲೇಟರ್‌ಗಳನ್ನು ಅಳವಡಿಸಲಾಗಿದೆ. ಚಿತ್ರವನ್ನು ವೀಕ್ಷಿಸುವಾಗ ಅದೇ ವಾತಾವರಣಕ್ಕೆ ಕೊಂಡೊಯ್ಯುತ್ತದೆ.

**ಹಲವು ಉಪಯೋಗ**

ಪೀಠಿಕೆಯಲ್ಲಿರುವ ಹೈಟೆಕ್ ಕೋಚ್ ಬುಲ್ಡಿಂಗ್ ಸಂಸ್ಥೆ ಮೂಲಕವೇ ಇದನ್ನು ಅಭಿವೃದ್ಧಿಗೊಳಿಸಲಾಗಿದೆ. ಮನರಂಜನೆಯಷ್ಟೇ ಅಲ್ಲದೆ ವಿವಿಧ ಉಪಯೋಗಕ್ಕೆ ತಕ್ಕಂತೆ ಬದಲಾಯಿಸಿಕೊಳ್ಳುವ ಸಾಮರ್ಥ್ಯವನ್ನು ವಿನ್ಯಾಸಗೊಳಿಸಲಾಗಿದೆ. ಆಸ್ತತ್ಯಗಳ ತುರ್ತು ನಿಗಾ ಘಟಕ (ಐಸಿಯು), ಗ್ರಾಮೀಣ ಆಸ್ತತ್ಯ, ಇಂಟರ್‌ನೆಟ್ ಸೆಂಟರ್, ಸಂಚಾರ ಪ್ರಯೋಗಾಲಯ, ಸಂಚಾರ ಡಿಜಿಟಲ್ ಗ್ರಂಥಾಲಯ, ಸೇರಪ್ರಸಾರಕ್ಕಾಗಿ ಸಾಂಡ್‌ಪ್ರೊಫ್ ಸ್ಟುಡಿಯೋ ಒಗೆ ಅನೇಕ ಕಾರ್ಯಗಳ ಅವಶ್ಯಕತೆಗೆ ತಕ್ಕಂತೆ ವಿನ್ಯಾಸಗೊಳಿಸಬಹುದು.

**ತ್ರಿಪುರಂ ಗೋಲ್ಡನ್ ಟೆಂಪಲ್‌ನಲ್ಲಿ ಬಳಕೆಯಾಗುತ್ತಿರುವ ವಾಹನ**

ವಿವಿಧವನ್ನು ವಿನ್ಯಾಸದ ವೇಳೆಯಲ್ಲೇ ಗಮನಿಸಿದ್ದ ತಮಿಳುನಾಡಿನ ತ್ರಿಪುರಂನಲ್ಲಿರುವ ಗೋಲ್ಡನ್ ಟೆಂಪಲ್ ಅಧಿಕಾರಿಗಳು ಆಗಲೇ ಆರ್ಡರ್ ಮಾಡಿದ್ದರು. ಎನ್‌ಡಿಆರ್ ಎಫ್ ನಿರ್ಮಿಸಿದ ಮೊದಲ ವಾಹನ, ಕರ್ನಾಟಕದಲ್ಲಿ ನೋಂದಣಿ ಯಾಗಿರುವ ಆಡಿಟೋರಿಯಂ ಬಸ್ ಇದೀಗ ಗೋಲ್ಡನ್ ಟೆಂಪಲ್ ಬಳಿ ಸಾರ್ವಜನಿಕರಿಗೆ ಧಾರ್ಮಿಕ ಶಿಕ್ಷಣ ನೀಡಲು ಬಳಕೆಯಾಗುತ್ತಿದೆ.



ಬಸ್ ಒಳಗಿರುವ 7 ಡಿ ಆಡಿಟೋರಿಯಂನ ದೃಶ್ಯ.

**ಹೈಟೆಕ್ ವಾಹನ ರೂಪಾಂತರಗಳು**

- 1 ಡಾ. ಕೆ. ಗೋಪಾಲಕೃಷ್ಣನ್
- 2 ಡಾ. ಎಲ್.ವಿ. ಮುರಳಿಕೃಷ್ಣ ರೆಡ್ಡಿ, ದಿ ಇನ್ಸ್ಟಿಟ್ಯೂಟ್ ಆಫ್ ಇಂಜಿನಿಯರ್ಸ್ ಅಧ್ಯಕ್ಷ
- 3 ರಾಜಾ, ಹೈಟೆಕ್ ಕೋಚ್ ಕಂಪನಿ
- 4 ಸರವಣಾ, ಹೈಟೆಕ್ ಕೋಚ್ ಕಂಪನಿ
- 5 ಡಾ. ಕೆ. ರಾಮಚಂದ್ರ, ಎನ್‌ಡಿಆರ್‌ಎಫ್ ನಿರ್ದೇಶಕ

# THE HINDU

MADURAI, July 4, 2012

## A VISUAL AND AURAL TREAT

T. SARAVANAN



*The Hindu*: HOUSEFULL: The 7D experience Photo: G. Moorthy



*The Hindu*: ENTERTAINING: The 7D experience. Photo: G. Moorthy

### ***The newly opened 7D+ Fun Corner has caught attention with its special effects***

Instead of just sitting in your theatre seat watching pictures, how about flying in a war plane? Bullets whiz past you as the fighter pilot flips the aircraft upside down and twirls around to escape his opponent. Water sprays on to your face as the jet travels past a cascade. Though it all feels real, it is a virtual creation, part of the exhilarating experience at the newly opened 7D theatre in the city.

“Please call it as 7D+ Video Ride Simulator,” clarifies K. Gopalakrishnan, advisor, 7D+ Fun Corner. “It is an innovative edufotainment venture for the entertainment-starved people of Temple City.”

Films with three-dimensional effects are already popular, but 7D is a giant leap in the technology. It brings together an immersive experience on-screen and sensational seat simulation coupled with special effects that are bound to transport the audience to a different world. The simulator combines sophisticated audio-visual equipment including extreme performance control systems and high-end simulation.

The simulator is at the Vishaal de Mal. It has a 24-seater auditorium, control room and power room. The complete 7D+ system consists of motion seats and special effects (SFX), projection or video equipment, audio equipment, motion controllers and drivers, and hardware and software to co-ordinate the synchronisations.

“The entire visual pleasure is built on Stereoscopic 3D Technology or S3D,” says Gopalakrishnan. “The technique of enriching the illusion of depth in an image or a video footage by presenting two offset images or video footages separately to the left and right eye of the viewer is called 'stereoscopy' (also called stereoscopic vision or 3D imaging or stereo 3D or S3D),” he explains.

When seated in the motion seat, the guest moves in synchronisation with the events on-screen. “These motion seats are indigenously developed in order to simulate real life sequences that appear on-screen and are powered by pneumatic actuators that makeup the motion base,” says Gopalakrishnan.

Each motion base moves in three different axes -- the seats move up and down, forward and backward, and sideways. They also come with flexible air tubes that tickle your ankles, water spray, a butt tickler thrusting upward from the bottom seat cushion, a back poker thrusting forward from the back seat cushion, a seat vibrator, and a powerful jet of air on the back of your neck.

“Cinema theatres screening 3D content can adopt this technology,” says Gopalakrishnan. “If not for the whole theatre at least a section can be provided with the facility. We have developed 45 animated contents exclusively for screening in our fun corner,” he adds.

With indigenously developed technology, the company aims to provide stereoscopic 3D visualization, animation, intelligent imaging solutions, image enhancement, stereo 3D, 4D, 5D, 6D movies and special effects, stereo 3D learning resources, stereo 3D studios, virtual reality simulators, designing and running games and demonstration of visual or immersive projection technologies.

Gopalakrishnan, who is an alumnus of Thiagarajar College of Engineering, says 7D+ Fun Corner also wishes to help interested researchers in engineering colleges and technical universities in setting up stereo 3D studios or intelligent imaging centres with equipment and training. “We are also interested to nurture and mentor new ventures at various cities including Tier II cities,” he says.

The video ride simulator is not recommended for pregnant women and persons with neck or back pain and heart patients. However, all age group in general and kids in particular will enjoy this ride.

The Fun Corner is open from 11 a.m. to 9.30 p.m. on weekdays and from 10 a.m. to 10 p.m. during weekends. Each show is 15 minutes long and a ticket costs Rs.150 on weekends and Rs.130 on weekdays. “For bulk booking and for school students we offer discounts,” says P. Sugumaran, another advisor, 7D+ Fun Corner.

At a time when cinema theatres are witnessing a sudden drop in the number of visitors, this technology may bring movie goers back.



**Successful Startups of New Horizon College of Engineering**  
**World's First and Largest 3D Screen (16'6") Video Simulator Ride having 20 Seats Built on**  
**35' Truck Chassis with Expandable Auditorium On Wheels**  
**India's First Simulator Ride ON WHEELS Built on Multi-purpose Expandable Auditorium**

**Startup Success Stories at New Horizon College of Engineering:**

The Startup with an idea of developing indigenous Simulators for Edufotainment sector has been incubated at New Horizon College of Engineering (NHCE), Bangalore during January 2012 and successfully commercialized the idea with an establishment of Partnership Firm "7D+ Fun Corner" lead by Dr. K. Gopalakrishnan, the n Adjunct Professor of NHCE as its Managing Partner. The firm has started its commercial operations at Vishaal de Mall, 4<sup>th</sup> Floor, Madurai, Tamil Nadu since June 2012. The said firm could able to mobilize Rs.2.2 Crores including the Collateral free Term Loan of Rs. 45 Lakhs from Bank of India, Madurai in April 2012 for the period of 6 Years, under Credit Guarantee Fund Trust for Micro and Small Enterprises (CGTMSE) Scheme. However, the company could pay back the entire loan in 30 months (2.5 years) instead of 72 months. Similarly, another Startup by the same team incubated at NHCE during October 2013 with an idea of "Expandable Auditorium on Wheels with 7D+ Simulator" or in other words "7D Theatre On Wheels" for the first time in the World and has filled their patent at Russia. The patent has been awarded and been commercialized. The startup also has resulted in successful venture "7DPlus Technology Network Company" at Chennai having Dr. K. Gopalakrishnan as its Managing Partner with an investment of Rs.1.2 Crores and has commercialized the product which has running their business at Sri Narayani Golden Temple, Sripuram, Vellore, Tamil Nadu since, June 2014. This project also got the financial support of Central Bank of India, Chennai to the tune of Rs.42 Lakhs as term loan for the period of 5 years (60 months). The company has already repaid the 60% of the term loan successfully. They are also in the process of pre-close the loan at the earliest with their surplus earned.

**Introduction to "Expandable Auditorium On Wheels with 7DPlus Simulator"**

Normally the 4D/5D/6D Theaters or 3D Simulator Rides/Video Rides are the best examples to showcase/promote the interplay of various Science & Technology to create Virtual Reality/Immersive Experience and make the audience to understand complex theories, basics and principles with the help of stereoscopic 3D images (also called "intelligent imaging system") along with simulation of seat movements in virtual environment and also to educate them in an interesting way with their proactive involvement. It is a *New Age Edufotainment (Education, Information & Entertainment)* initiative and contemporary way of cultivating interest for learning science & technology among school kids in a lucid way. These kinds of theatres are available at Disneyland (Parris, Hong Kong, Los Angeles etc), Sentosa Island (Singapore), Various World-class Science Centres/Museums/Exploriums, few Amusement Parks and Malls in India. The **7DPlus Video Simulator Rides (Theatres) or Stereoscopic 3D or 7D+ Simulator Rides** integrated by us, which can be installed either on Permanent/semi-Permanent Model or On Wheels at Science Centres/Museums, Schools/Academic Institutions/Professional Institutions or "**On Wheels**" has been the superior integrated system than all these experiences in India and Abroad and also designed/integrated by us in such way to provide better experience, feeling, sense of satisfaction and higher value for money to every stake holder. It is ideal solutions for various cities including Tier II or Tier III cities where Science Centres/Museums are yet to come, and provide cost effective solutions.

The 7D Attraction typically is situated in a mall or a theme park in a fully enclosed location measuring at least 600 to 1200 sq ft for 16-24 Seats. The site will house the auditorium, the control room and pre-show waiting area for visitors. The complete 7D Attraction system consists of (i) Motion seats and Special Effects (SFX), (ii) Projection or Video equipment, (iii) Audio equipment, (iv) Motion controllers and drivers, (v) Hardware/Software

to co-ordinate the synchronizations. The entire visual pleasure is built on “**Stereoscopic 3D Technology**” or **S3D**. The same system has been integrated in such a way at lowest possible cost because of its innovative state of the art technological superiority “**On Wheels**” which has been patented (International Patent Filed at Russian Federation-ROSPATENT) by us. National Design and Research Foundation, The Institution of Engineers (India) (IEI) is constantly encouraging such inter-disciplinary researches and supported the International Patent filing process. New Horizon College of Engineering, Bangalore is the Institutional Member of IEI and has signed MoU with National Design and Research Foundation for collaborative research projects on interdisciplinary and multi-disciplinary areas.

The technique of creating or enhancing or enriching the illusion of depth in an image or a video footage by presenting two offset images or video footages separately to the left and right eye of the viewer is called “**stereoscopy**” (also called stereoscopic vision or 3D imaging or stereo 3D or S3D). The set of these 2D (*x & y axis*) offset images/visuals are then combined or processed in the brain instantly to give the perception of 3D depth or *z axis*. This can be accomplished in the following three ways:

1. The viewers wear eyeglasses to combine separate images from two offset sources
2. The viewers wear eyeglasses to filter offset images from a single source separated to each eye
3. The light source split the images directionally into the viewer's eyes (no glasses required to view which is also known as Auto stereoscopy)

#### **Concept:**

To showcase/promote the interplay of various Science & Technology (also to understand the need for interdisciplinary or multi-disciplinary approach) to create Virtual Reality/Immersive Experience and inculcate the interest for Science, we wish to establish Network of **4D** or **5D** or **7DPlus** Theatres/Fun Corners at Science Centres, Museums, Schools/Tourist Places/Academic Institutions and/or **On Wheels** either with the support of Government or Public-Private Partnerships or Sponsorship from Corporate world as CSR initiative. Within 3 Years, we can explore the opportunities by establishing at least 15-25 such facilities across the country to benefit the School Children either on Permanent/semi-Permanent or On Wheels at Science Centres, Museums, Schools/Tourist Places/Academic Institutions etc.

#### **Major Components of a 7DPlus Video Simulator Rides (Theatres) or Stereoscopic 3D or 7D+ Simulator Rides**

The 7D Attraction brings together an immersive real life experience on-screen and sensational seat simulation coupled with special effects that are bound to enthrall our visitors. Historically, 7D Attractions have been thought of as a fringe benefit added to numerous other entertainment options in a Science Centres/Museums or mall or a theme park, but this idea is rapidly changing and making way for a truly world class learning centre or edufotainment experience to educate science/technology to contemporary school kids in a lucid way.

The technology that goes into the making of a 7D Attraction is truly world class as it combines the best in the business of audio-visual equipment including extreme performance control systems and high-end simulation. The 7D Attraction adds a layer of immersive fun for our visitors by treating them to experience the world of not only audio-visual but also other sensory effects such as Touch (Ticklers), Smell (Aroma), Movement of Seats, Combination of Rain, Wind, Snow, Bubble, and Lightening Effects. All the seat effects and theater effects are built-on either Permanent/semi-Permanent Model or as Mobile Auditorium/Theater on Wheels.

#### **7DPlus Video Simulator Rides (Theatres) or Stereoscopic 3D or 7D+ Simulator Rides ON WHEELS**

7DPlus Technology Network Company is aiming to provide NewAge Edufotainment (Education, Information & Entertainment) Solutions. It has designed indigenous 7XDPlus Video Simulator Ride Auditorium/Theater into a traveling road show or in other words **7D+ Theater On Wheels** or on the move wherever required, it can be

parked and provide amusements, education and entertainment to the viewers. These mobile attractions are completely turnkey and ideal for temporary or semi-permanent (quasi-permanent) exhibits at science centres, museums, zoos, fairs, carnivals, religious festivals, Special parties, Celebrations, special events etc and a host of other venues. Each 7XDPlus On Wheels attraction can be customized for every event with branding and theming inside and out — as well as custom 3D contents. Our standard 3DoF/6 DOF Pneumatic/Hydraulic/servo motion EFX seats are a perfect fit for this advancing technology.

The following pictures are self explanatory to provide the features of **7DPlus Simulator ON WHEELS** built by us as a prototype and proof of concept (PoC) to demonstrate the capability of interdisciplinary research out come and built its kind first time in India with the help of Hi-Tech Engineers, Bangalore which has their Design Studio and Product Development Centre at New Horizon College of Engineering. It is built on Ashok Leyland Multi-Axle Chassis. Hi-Tech Engineers are specialized in Special Purpose Vehicles (SPV) such as 1000 KVA Genset with Sound Proof On Wheels, Outside Broadcasting (OB) Vans, Hospital On Wheels (Mobile Dental Clinics), Kitchen On Wheels (Restaurant On Wheels) etc. They have also built Cluster of Bio-Toilets On Wheels for First International Air Show held at Bangalore. They regularly do projects related to design and development of SPVs for Indian Space Research Organisation (ISRO), Gas Turbine Research Establishment (GTRE), Defence Research and Development Organisation (DRDO), Aeronautical Research and Development Board (AR&DB), Bharat Earth Movers Ltd (BEML), National Aerospace Laboratories (NAL) and Hindustan Aeronautics Ltd (HAL) etc. They always strive for innovative and cost effective contemporary solutions for their projects. Recently, they have developed dental clinic kit for door to door service as “D2H” for M/s Mobident as "World Class Dental Care: Affordable & Accessible at your Door step".

**7DPlus Simulator ON WHEELS, houses World’s First and Largest 3D Screen (16’6”) Video Simulator Ride having 20 Seats Built on 35’ Truck Chassis with Expandable Auditorium On Wheels. 9 International Patents have been filled at Russian Federation under Utility Model Application No.2014115371.**

It is a self contained Air-Conditioned Auditorium has very good state of the art acoustics insulation with In-built Generator with On-line UPS etc. It has also fitted with Snow Machines, Bubble Machines along with all other Special Effects as mentioned above. The entire indigenous design process of **7DPlus Simulator ON WHEELS** with the help of National Design and Research Forum, The Institution of Engineers (India) and Dr.Saurabh Kwatra, Head, International Innovations, New Delhi has resulted in nearly 12 more International Patents which has been filled recently.

#### **Various Potential Applications of Expandable Auditorium On Wheels:**

The proposed Multi-purpose Expandable Auditorium can be used for variety of other applications and can house Intensive Care Unit (ICU), Rural Hospital, Computer/Internet Centre, Mobile Labs, Mobile Digital Library, Live Telecast Sound Proof Studio, Dormitory, Caravan, Mobile Home etc. For Further Details regarding the commercialization of the product can be heard from Managing Partner, 7DPlus Technology Network Company [*New Age Edufotainment (Education, Information & Entertainment) Solutions Company*], having its Registered Office at Sakthi Body Works Campus, 46, Poonamallee Bye-Pass Road, (Opp to MTC Bus Depot.), Poonamallee, Chennai 600 056, Tamil Nadu, Mobile: 09566776675 Email: [tmsrri@yahoo.co.in](mailto:tmsrri@yahoo.co.in). Currently the Mobile Auditorium On Wheels is in commercial operation at Sripuram Golden Temple, Near Vellore, Tamil Nadu, since June 2013 onwards.



**Prototype of 7DPlus Video Simulator Ride “On Wheels”**

*9 International Patents have been filled at Russian Federation under Utility Model Application No.2014115371  
Russian Federation (Rospatent) International Patent No. 152801*



**7DPlus Video Simulator Ride “On Wheels” : Screen Portion after Expansion**

*9 International Patents have been filled at Russian Federation under Utility Model Application No.2014115371  
Russian Federation (Rospatent) International Patent No. 152801*



**Conceptual Model of 7DPlus Video Simulator Ride “On Wheels”:** *Inside View of the Auditorium after Expansion*  
*9 International Patents have been filed at Russian Federation under Utility Model Application No.2014115371*  
*Russian Federation (Rospatent) International Patent No. 152801*



**Russian Federation (Rospatent) International Patent No. 152801**



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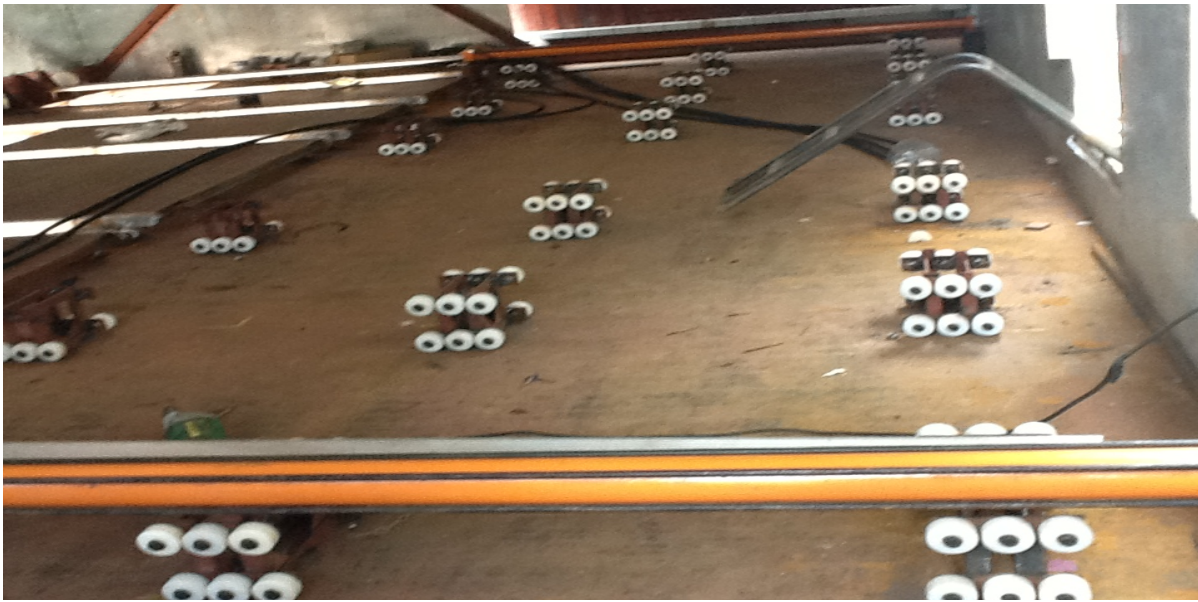
*9 International Patents have been filled at Russian Federation under Utility Model Application No.2014115371  
Russian Federation (Rospatent) International Patent No. 152801*

**Methodology/Construction of the means which providing telescoping of elements of the transport vehicle**  
**Expanding Mechanism/Sliding Mechanism**

**Conceptual Design:**

I have designed a Truck/Bus built on a conventional truck chassis available at market which will be expanding either on both sides or on one side (plane) parallel to its side (lengthwise) based on our requirement and also will move the ceiling (roof-top) upward to provide more floor area in all directions (length x width x height) inside the Truck/Bus to accommodate the Large Size Projection Screen (16'x9' or more). This will provide 3 times or more than the original floor area of the Truck/Bus including the saloon area or even still more floor area and volume by having telescopic expansion of the sides on all three or four directions, i.e., left, right, upward and backward" based on our needs.

**Expanding Mechanism/Sliding Mechanism:**



**Figure 1 Hydraulic Cylinders along with array of Teflon Wheels**



**Figure 1a. Hydraulic Cylinders with Power Pack (Left) and Piston Mounting to Push Expanding Portion along with array of Teflon Wheels up & down to hold the bottom platform intack during sliding in/out (Right)**

The first functional Prototype has been fabricated on 35' Standard Truck Chassis with an Expanding Area (25'x8') using 2 Hydraulic Cylinders as shown in above figure 1 & 1a in Signal Red Colour. These cylinders push the



Expandable Portion of the Mobile Auditorium towards the left (away from the main floor) and duly supported by five landing wheels which were assembled/attached to the outside body before the expansion at sprit level as shown in figure 2 & 2a. The entire expandable portion gently slides and gets guided on array of 244-272 numbers of Teflon Wheels having 50 mm diameter (allowing the stainless steel plate covered bottom floor) which ensures the 2000-2500 kg load of expandable portion smoothly with reduced friction. Fully Expanded Auditorium on Five landing wheels is shown in figure 3. Major Guiding Wheels (6 numbers on each side, total 12 wheels having 150 mm diameter) which are mounted at the inner end of "X" beam fixed on either sides which provide additional support to expanding portion also sliding between rigid stainless steel plate guides mounted at the major stationary portion of truck are partly seen at Top & Bottom in figure 3 & 3a.



**Figure 2 Five landing wheels which were assembled/attached to the outside body of expandable portion before the expansion**



**Figure 2a Five landing wheels which were assembled/attached to the outside body of expandable portion before the expansion is moving outward during expansion**



**Figure 3 Fully Expanded Auditorium on Five landing wheels  
(Major Guiding Wheels are partly seen at Top & Bottom)**



**Figure 3a Major Guiding Wheels are partly seen at Top & Bottom (Left) and "X" Beams Fixed on eitherside (Right)**

The above "Expandable Multipurpose Auditorium" which could be used as regular Theater/4D-7D Theater/Seminar Hall/Class Room/Laboratory/Library etc. based on the needs/applications by overcoming the limitations imposed by Motor Vehicle Rules & regulations of various countries and will achieve "Portability, Expandability & Compactability in design" through Innovation and will result in many fold increase in floor area and/or volume inside the truck/bus while it is in stationary.

***Please open the separately attached Video Files to see the actual movement of Expandable Portion of Auditorium for your reference.***



**Final Stage of Fabrication of Expandable Auditorium on Wheels built on Truck Chassis**



**Various Stages of Fabrication of Expandable Auditorium on Wheels built on Truck Chassis**



**Various Stages of Fabrication of Expandable Auditorium on Wheels built on Truck Chassis**



Various Stages of Fabrication of Expandable Auditorium on Wheels built on Truck Chassis

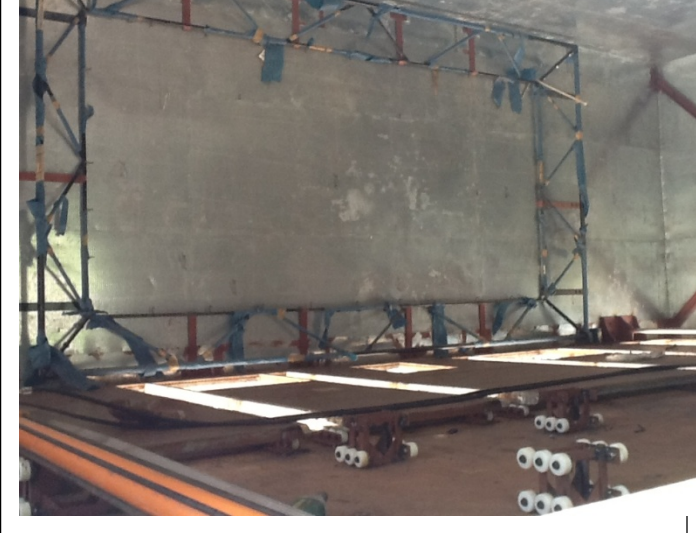


**Various Stages of Fabrication of Expandable Auditorium on Wheels built on Truck Chassis**



**Various Stages of Fabrication of Expandable Auditorium on Wheels built on Truck Chassis**





**Various Stages of Fabrication of Expandable Auditorium on Wheels built on Truck Chassis**



Various Stages of Fabrication of Expandable Auditorium on Wheels built on Truck Chassis



**Final Stage of Fabrication of Expandable Auditorium on Wheels built on Truck Chassis**

**Conceptual Design of Expanding Upward and Both Sides of Truck to get More Spacious Auditorium**

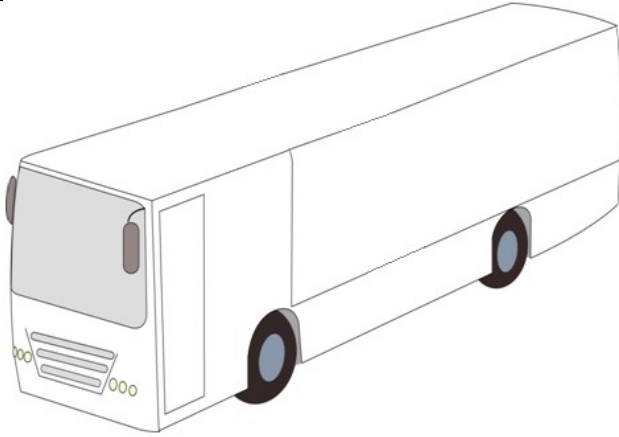


Fig 1

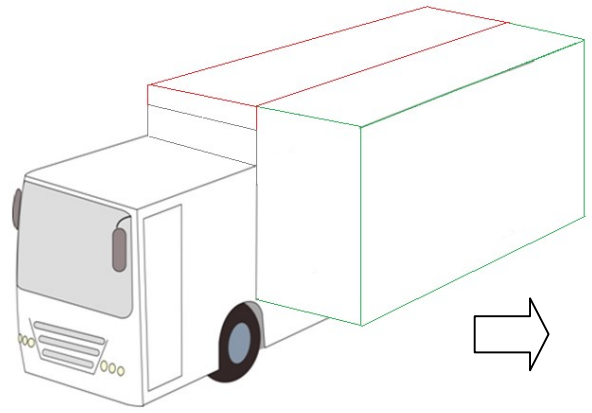


Fig 4

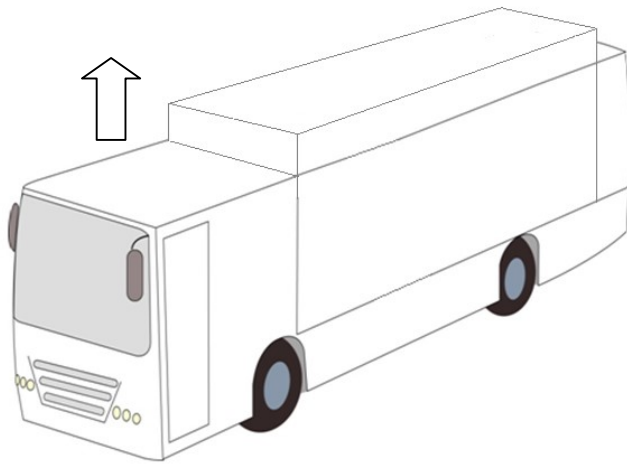


Fig 2

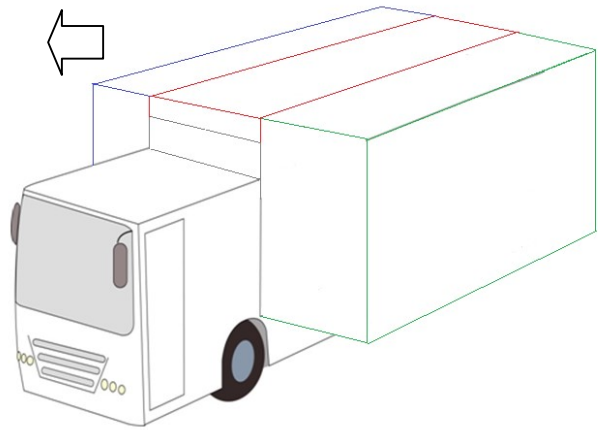


Fig 5

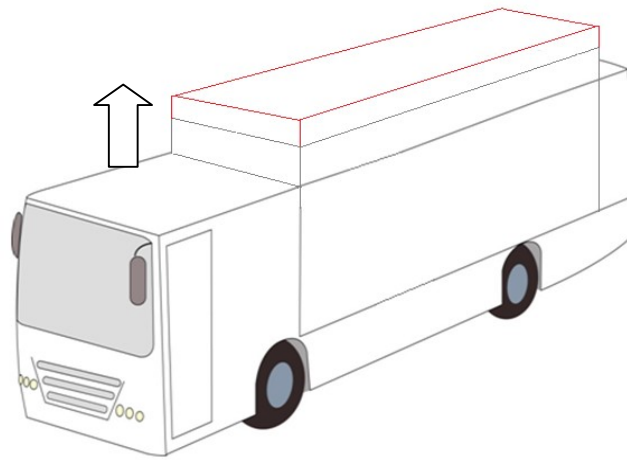


Fig 3

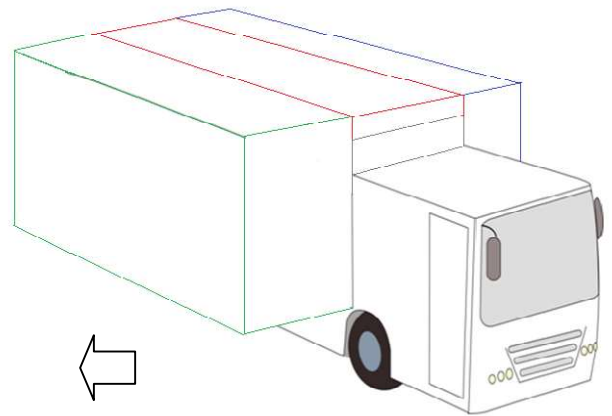


Fig 6

## Brief Career Profile of Dr. K. GOPALAKRISHNAN

Dean (R&D), New Horizon College of Engineering, Bangalore



**Dr. K. Gopalakrishnan, BE (Mechanical), ME (Industrial.), MBA, FIE, PhD**, is the Chartered Engineer and Member of Co-ordination Committee for Safety and Environment of Bureau of Indian Standards (BIS). He is a Fellow and National Council Member of The Institution of Engineers (India). He was the Chairman of The Institution of Engineers (India), Karnataka State Centre and Chairman of Marine Engineering Division Board of IEI. He received his Bachelor and Masters Degree in Industrial Engineering from Thiagarajar College of Engineering, Madurai and PhD from Anna University, Chennai, INDIA. He is the Founder Managing Partner of 7D+ Fun Corner (India's First 7D+ Video Simulator Ride got the ISO 9001:2008 Certification) and 7DPlus Technology Network Company. He was the Mentor and Chief Scientist at Global Institute of Stereo vision and Research, Chennai. He is also the Adviser of Paragon Info Systems UK Ltd, ENGLAND.

His current research interests and field of practice covers Design and Development of Expandable Auditorium On Wheels, Motion Simulators, Micro Air Vehicles (MICAVs), Intelligent Imaging System, Marine Corrosion & Bio-fouling, Ocean Observation System, Research Vessel Management, Marine Resources, Marine Safety & Environment and TQM.

He is having 26+ years of experience in Industry, Consultancy, Teaching, Training and Research. He published number of Research papers and won various Awards/Honors besides guided 7 Ph.D Scholars. He is the Secretary and Director General of Indian Institute of Safety and Environment.

As an Academician and Researcher, he had the opportunity to work closely with many Vice-Chancellors of Technical Universities including Anna University and Visvesvaraya Technical University, Ministry of Human Resource and Development, Government of India and contributed to the development of various Academic Research Process Models, teaching-learning process models, learning pedagogy and governance & management process models for Institutions for Higher Learning. He facilitated and played proactive roles for better Institute-Industry-Interaction and Sponsored/Funded Research initiatives in Universities/Engineering Colleges. He is instrumental for the introduction novel Academic Research Initiatives at Anna University, Coimbatore which resulted in the highest number of enrollment of PhD Research Scholars in India. His professional visits to many countries including China, Hong Kong, France, Germany, Switzerland, Singapore, Malaysia, Thailand and Sri Lanka resulted in better collaborations.

He was the Co-investigator of the proposal for National Research Initiative in Micro Air Vehicles (MICAVs) under the auspices of Defence Research & Development Organisation (DRDO) / Aeronautical Research & Development Board (AR&DB)/DST. The Hub centre will be located at National Aeronautics Laboratory (NAL), Bangalore and the Associate Centres will be at IIT-Kanpur, IIT-Bombay, IISc, Bangalore and NDRF (Consortium), Bangalore.

He is also a Fellow / Member of nearly 20 Professional Institutions / Societies. He is regularly publishing research / technical papers in International / National Journals & Conferences. He was the Organising Secretary of International Conference series "TEAM TECH 2004, 2006, 2007 & 2008" conducted at J.N. Tata Auditorium, Indian Institute of Science (IISc), Bangalore. He was also an Editor of the proceedings of these conferences.

He was the member of Board of Research, Anna University Coimbatore, and also the Academic Council & the Board of Studies on Research of Dr. MGR University, Chennai. He was nominated as a Member, Board of Governors & National Working Group Member of National Design & Research Forum (NDRF) of the Institution of Engineers (India) - IE(I). He is the Editor-in-Chief of "Engineering Design" – A Quarterly Journal published by NDRF and Editor-in-Chief of "Manufacturing Technology and Management" – A Quarterly Journal of Indian Institution of Production Engineers (IIPE).

He is also the Publisher of "World Safety and Environment" – A Quarterly Journal of IISE.

He is a Life Fellow Member of Indian Institution of Production Engineers (IIPE), Rapid Prototyping Society of India (RPSI), Engineering Design & Analysis Forum (EDAF), Biosensor Society of India (BSI), National Institution for Quality & Reliability (NIQR) etc. He served as Sponsored Research Coordinator of Anna University, Coimbatore. Presently he is serving as the Dean (R&D), New Horizon College of Engineering, Bangalore.

***Contact Information of the Inventor, Designer and Fabricator:***

**Dr. K. Gopalakrishnan, ME, MBA, PhD**

*Dean (R&D), New Horizon College of Engineering, Bangalore, INDIA*

*National Council Member, The Institution of Engineers (India), INDIA*

*Member, Board of Governors, National Design and Research Foundation, INDIA*

*Member, Board of Governors and Board of Management, Engineering Staff College of India, INDIA*

*Member, Board of Governors, Safety and Quality Forum, INDIA*

*President, Indian Institute of Safety and Environment, INDIA*

*Managing Partner, 7DPlus Technology Network Company, INDIA*

*Adviser, Paragon Info Systems UK Ltd, ENGLAND*

*Mobile: +91 98451 73730*

*Email: [profqoki@yahoo.com](mailto:profqoki@yahoo.com)*

**World's First and Largest 3D Screen (16'6") Video Simulator Ride having 20 Seats Built on 35' Truck Chassis with Expandable Auditorium On Wheels**  
**India's First Simulator Ride ON WHEELS Built on Multi-purpose Expandable Auditorium**  
**Designed and Developed by Dr. K. GOPALAKRISHNAN**  
***Russian Federation (Rospatent) International Patent No. 152801***



NDRF-IEI IPR Cell: The First International Patent from Russian Federation (Rospatent) has been presented to Dr. K. Gopalakrishnan, Chairman, R&D Committee and Dr. K. Ramachandra, Director, NDRF for the "World's First Expandable Mobile Auditorium On Wheels with 7D Simulator Built on 35' Chassis having Largest 3D Screen (16') and 20 Seats",

An official delegation including **The Institution of Engineers (India)** President has accompanied the Hon'ble President of India **Shri Pranab Mukherjee** during the state visit to Russia, from 07 - 11 May 2015 attended the 70<sup>th</sup> Victory Day Celebrations at Moscow to mark the **70<sup>th</sup> Anniversary of the Victory in Great Patriotic War (World War II)**



*IEI Delegation with Indian Foreign Secretary, Mr. S. Jaishankar and MHRD Secretary (Higher Education), Mr. Satyanarayan Mohanty*

*L to R: Dr. K. Gopalakrishnan, Chairman, R&D-IEI, Mr. S. S. Rathore, Past President, IEI, Mr. S. Jaishankar, Mr. Satyanarayan Mohanty, Dr. L. V. Muralikrishna Reddy, President, IEI, Mr. A. Basa, Immediate Past President, IEI*