Terms of reference (ToRs) for the procurement of services below the EU threshold

Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

Creation of Virtual Reality Experiences to demonstrate the Non-Motorised Transport facilities in Coimbatore	**Project number/ cost centre:** **2015.2197.0**

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0. List of abbreviations

AVB	General Terms and Conditions of Contract (AVB) for supplying services and work 2018
ToRs	Terms of reference

1. Context

Deutsche Gesellschaft fuer Internationale Zusammenarbeit (GIZ) GmbH and Ministry of Housing and Urban Affairs (MoHUA) are jointly implementing the "Integrated Sustainable Urban Transport Systems for Smart Cities (SMART-SUT)" project to improve the planning and implementation of sustainable urban transport in selected Indian cities. The implementation focuses on the pilot cities of Bhubaneswar, Coimbatore, and Kochi, which were selected by the German Government for special support on their way to becoming a Smart City.

The project combines transport-oriented and methodological advisory services and training of the political partner and the implementing organisations (meso-level) with selected demonstration measures for sustainable urban transport at the micro level (multi-level and multi-actor approach). The project has four components namely: (i) planning and implementing sustainable urban transport projects; (ii) institutional performance and coordination; (iii) learning and exchange formats, (iv) state-level capacity building

Background

As per Census 2011, more than 3.7 million people in the urban areas of Tamil Nadu either walk or use bicycle daily to reach their workplace. Out of them, women's share is nearly 26 per cent (about one million). Further, about 2.4 million use bus transport, and most often walk to and from the bus stops. Coimbatore city has more than 100,000 bicycles but only about 30,000 people use it as a mode of transportation to reach their workplaces (Census 2011). It is evident that there is a huge demand for dedicated space for walking and cycling facilities in the cities.

Under the Smart City proposal, Coimbatore is designing over 30 km of complete streets under the eco-mobility project and implementing pilots such as Public Bicycle Sharing (PBS) and Model streets. GIZ has been supporting CCMC to integrate these NMT interventions and prepare a city-wide non-motorised transport (NMT) network plan. GIZ's implementation partner GFA-WRI India-Wuppertal Institute consortium is preparing the city wide NMT network plan with the support of national and international experts. As part of the activity, the project intends to support the city in implementing tactical events on NMT related measures to involve the public in planning and implementation.

In this context, the project intends to create immersive virtual experiences to showcase the existing infrastructure for NMT commuters & the conceptualized changes, and its subsequent visualizations for the stakeholders to experience using a head mounted display (HMD) unit for the local citizens and city officials.

Objective

The objective of this project is to create immersive virtual experiences using a combination of 360 Virtual Reality (VR) shoot and VR Computer Generated Imagery (CGI) covering the present and the conceptualized changes in the infrastructure facilities available/designed for non-motorized commuters at Townhall and Cross Cut Roads in the city of Coimbatore.

Intended outcomes

- To make the stakeholders, virtually experience the benefits achievable by implementing tactical measures for NMT users and to collect inputs and suggestions.
- The stakeholders should be able to experience these immersive VR experiences using standalone HMD units and should be able to navigate 360 Degrees within the VR environment.

- The immersive VR experiences should be able to be played/controlled on the HMD by an orchestrator or an emcee; for this, a separate application for mobile or a tab with synchronized guided experience feature to be created.

The users of this VR experiences are local citizens, city and state government officials, citizen groups, business groups, etc.

2. Tasks to be performed by the contractor

The contractor is responsible for providing the following services:

- A total of two individual VR experiences (virtual walkthroughs), each with a duration of a minimum of 3 minutes, showcasing both the existing conditions prevailing for NMT commuters and conceptual visualization of the infrastructure for NMT commuter's post-implementation for selected roads.

Functional Deliverable:

- A fully functional standalone HMD based 360 VR content/experience/virtual walkthrough that when played on an HMD, the viewer shall experience the current physical state & conditions post-implementation of tactical improvement measures for NMT commuters in 360 VR mode, this shall also include synchronized guided experience feature for guided tours of the VR environment.

Technical Deliverable:

- A bespoke 360 VR player that is compatible for standalone HMD's with a feature to navigate through the Virtual environment.
- Content of three VR experiences/walkthroughs, each with a maximum duration of 3 minutes.
- A Mobile/Tab application to connect to the HMD/HMD's for a synchronized guided experience.

Issues to be considered:

- To showcase the existing facilities available for NMT commuters, the contractor can capture the same using 360 Degree VR shoot using 360 Cameras and Rigs.
- The 360 VR shoot should be of a minimum of 4K resolution and should be portable & scalable onto multiple VR systems.
- The VR Shoot should cover the entire length and width of the selected roads (total combined length is around 2000 mts).
- The VR experience should also feature a virtual walkthrough of post-implementation of tactical measures; this content can be made using CGI or a mix of 360 VR Film & CGI, the CGI content has to replicate the exact location post tactical measures.
- A detailed storyboard on the entire flow of each VR experience shall be submitted by the contractor and has to be approved by the GIZ team.
- The entire VR Experience/Virtual walkthroughs to be made within the limitations of motion sickness needs due to the addition of camera motion. Viewer perspective within a stationary frame of reference ex: Viewer perspective is from inside of a car, also known as cockpit effect is proven to be less disorienting & hence may be considered while choosing viewer perspectives and camera motion.

- When choosing viewer perspective for the 360 VR shoot, consider the fact that subjects close to the camera will appear larger than expected and a minimum of four feet (4') distance between the camera and the subject should be considered.
- Technical alterations or to introduce newer techniques within VR technology that can enhance the overall experience and are cost-effective than existing practices will be considered for the project, subject to the successful demonstration of proof of concept to GIZ team & their subsequent approval.
- While creating the VR experience content, the contractor should ensure that only licensed software's are used and GIZ is not responsible for any misdemeanour by the contractor.
- The contractor shall take necessary precautions and permissions for conducting surveys, shooting videos, photography etc. on site.

Support/Service:

- The contractor shall provide online support (Call/Chat) 9 am - 5 pm (Mon-Fri) for six months from project handover date to troubleshoot any issues while playing the content over HMD.
- If no resolution is attained despite online troubleshooting by the tech support team, the contractor is obligated to send a technician to the location to troubleshoot, and this will be in effect for six months from the date of project handover.
- For any troubleshooting at GIZ locations, the contractor shall not be paid for the service during the first six months after project handover; however, the GIZ team will extend travel and accommodation expenses for the support engineer as per GIZ travel guidelines.

Certain milestones, as laid out in the table below, are to be achieved by certain dates during the contract term, and at particular locations:

Phase	**Task**	**Deliverable**	**Deadline**
Initiation	1) Ideation & Story Boarding 2) Recce, Scouting & Scenario Planning	1) A GIZ approved Storyboard for each of the two experiences to be delivered as per defined technical & functional specifications 2) Production Plan for the VR shoot	Dec 2019
360 VR Shoot	1) Direction 2) Shoot	1) A Raw 360 footage of the existing infrastructure at the selected locations. 2) 3ds Max sketches/Walkthroughs of the pre-selected streets post-implementation of tactical measures, these are to be sourced by the GIZ team and handed over to the project manager.	Jan 2020

Post Production	1)User Experience (UX) / User Interface (UI) Designing 2) 3D Modelling 3) Animations, Graphic effects 4) Visual effects, motion designing, stitching, colour grading, rendering 5) Background Music/Voiceover Integration	1) 360 VR Content made as per agreed storyboard. 2) A total of 3 VR Experiences each with a duration of 3-4 minutes with all the necessary background music and voice-over scripts incorporated into the content.	Feb 2020
Application Development	1) Designing 2) Coding 3) Testing	1) A Bespoke application with 360 VR Player for standalone HMD units. 2) A Mobile /Tab application for a synchronized guided experience	Mar 2020

Period of assignment: Expected to start from November 2019 (Duration - 5 months)

3. Concept

In the bid, the bidder is required to show how the objectives defined in Chapter 1 are to be achieved, if applicable under consideration of further specific method-related requirements (technical-methodological concept). In addition, the bidder must describe the project management system for service provision.

Technical-methodological concept

Strategy: The bidder is required to consider the tasks to be performed with reference to the objectives of the services put out to tender (see Chapter 1). Following this, the bidder presents and justifies the strategy with which it intends to provide the services for which it is responsible (see Chapter 2).

The bidder is required to present the actors relevant for the services for which it is responsible and describe the **cooperation** with them.

The bidder is required to describe the key **processes** for the services for which it is responsible and create a schedule that describes how the services according to Chapter 2 are to be provided. In particular, the bidder is required to describe the necessary work steps and, if applicable, take account of the milestones and contributions of other actors in accordance with Chapter 2.

Other specific requirements

N.A.

Project management of the contractor

N.A.

4. Personnel concept

Eligibility requirements of the firm *(Refer worksheet: Assessing the eligibility of consulting firms)*

- Please provide the legal status of your firm
- Average annual turnover for the last three financial years: at least 100.000 EUR.
- The number of employees as at 31.12. of the previous year: at least 10 persons
- Please provide 2 reference projects in the field of Virtual/Augmented/Mixed Reality (Any Sector) with a minimum commission value of 30.000 EUR.

Technical Experience *(Refer worksheet: Assessing the eligibility of consulting firms)*

- Experience of two projects in 360 VR Shoot, CGI content creation for VR Platform and Application development for VR platform
- Experience of developing different VR experiences/content of more than two minutes duration
- Experience of one project in virtual reality application for urban infrastructure projects

The bidder is required to provide personnel who are suited to filling the positions described, on the basis of their CVs (see Chapter 7), the range of tasks involved and the required qualifications.

The below specified qualifications represent the requirements to reach the maximum number of points.

Team leader

<u>Tasks of the team leader</u>

- Overall responsibility for the advisory packages of the contractor (quality and deadlines)
- Coordinating and ensuring communication with GIZ, partners and others involved in the project
- Personnel management, in particular identifying the need for short-term assignments within the available budget, as well as planning and steering assignments
- Regular reporting in accordance with deadlines

<u>Qualifications of the team leader</u>

- Education/training (2.1.1): Degree in Engineering or MCA/MBA or Equivalent
- Language (2.1.2): Proficient in English
- General professional experience (2.1.3): 12 years of professional experience
- Specific professional experience (2.1.4): 2 years in Start-ups or leading a team that has worked on VR projects

- Leadership/management experience (2.1.5): 5 years of management/leadership experience as project team leader or manager in a company
- Regional experience (2.1.6): working experience on relevant projects in South India
- Development Cooperation (DC) experience (2.1.7): NA
- Other (2.1.8): NA

Expert 1 – Director of Photography

Tasks of expert 1
- Visualize the Project
- Story Boarding
- Recce the Shoot Locations
- Shoot Scenario Planning
- Finalizing Viewer Perspectives for the shoot
- Guide/Monitor/Lead the camera crew

Qualifications of expert 1
- Education/training (2.2.1): Degree in Broadcast or Film Production or equivalent
- Language (2.2.2): Proficient in English
- General professional experience (2.2.3): 10 years experience in story boarding, filming and outdoor shoots
- Specific professional experience (2.2.4): Experience of working on 360-degree VR shoots
- Leadership/management experience (2.2.5): NA
- Regional experience (2.2.6): NA
- Development Cooperation (DC) experience (2.2.7):
- Other (2.2.8): NA

Expert 2 – Software Engineer

Tasks of expert 2
- Build 360 VR Experiences using Unity or relevant engine
- Collaborate with UI,3D&VFX artists
- Employ Software development skills
- Build & Derive user training
- Support the client for any software (SW) and hardware (HW) issues

Qualifications of expert 2
- Education/training (2.3.1): Degree in Engineering or B.Sc./BCA/MCA or equivalent
- Language (2.3.2): Proficient in English
- General professional experience (2.3.3): 12 years of working experience as a software engineer/programmer
- Specific professional experience (2.3.4): Experience of working on VR projects for mobiles or HMDs, knowledge in using SDK's to import 3D models and 360 VR videos
- Leadership/management experience (2.3.5): NA
- Regional experience (2.3.6): NA
- Development Cooperation (DC) experience (2.3.7): NA
- Other (2.3.8): NA

Expert 3 – VFX specialist

Tasks of expert 3
- Create Motion graphics & animations

- Create stunning Visual effects
- Collaborate with software engineers & designers

Qualifications of expert 3
- Education/training (2.4.1): Degree/Diploma in 3D Animation/Multimedia or equivalent
- Language (2.4.2): Proficient in English
- General professional experience (2.4.3): 10 years of experience in animations, videos & background music
- Specific professional experience (2.4.4): Experience of working on 2 projects using VR tools like Sketch, 3D Max, Unity VR, Cinema 4D or Maya
- Leadership/management experience (2.4.5): NA
- Regional experience (2.4.6): NA
- Development Cooperation (DC) experience (2.4.7): NA
- Other (2.4.8): NA

Expert 4 – 3D designer

Tasks of expert 4
- 3D Modelling
- Sculpting, Lighting & Rendering 3D elements

Qualifications of expert 4
- Education/training (2.5.1): Degree/Diploma in 3D Animation or equivalent
- Language (2.5.2): Proficient in English
- General professional experience (2.5.3): 6 years experience in creating 3D models
- Specific professional experience (2.5.4): Experience of working on 1 project related to 3D sphere models & rendering engines suitable for VR
- Leadership/management experience (2.5.5): NA
- Regional experience (2.5.6): NA
- Development Cooperation (DC) experience (2.5.7): NA
- Other (2.5.8): NA

Expert 5 – UI designer

Tasks of expert 5
- Design the User Interface
- Ensure that the UI is navigation intuitive
- Design Visual Controls
- Define and Design Elements & Icons as required
- Ensure design elements are resolution specific

Qualifications of expert 5
- Education/training (2.6.1): Degree /Diploma in Multimedia or equivalent
- Language (2.6.2): NA
- General professional experience (2.6.3): 6 years experience in creating UI designs
- Specific professional experience (2.6.4): Experience of working on 2 projects related to creation of UI designs specifically for mobile apps and HMDs
- Regional experience (2.6.5): NA
- Development Cooperation (DC) experience (2.6.6): NA
- Other (2.6.7): NA

Note: Evaluation of expert 5 will be done as per assessment criteria mentioned under “short term expert pool 1” in Technical Assessment Grid

Expert 6 – Camera Crew

Tasks of expert 6
- Planning for the shoot
- Setting up the VR camera Rigs & settings
- Following DOP Instructions for the shoot
- creatively framing and capturing the action

Qualifications of expert 6
- Education/training (2.7.1): Degree in Film, Photography or equivalent
- Language (2.7.2):
- General professional experience (2.7.3): 9 Years
- Specific professional experience (2.7.4): Experience of working on two 360 VR shoots
- Regional experience (2.7.5): NA
- Development Cooperation (DC) experience (2.7.6): NA
- Other (2.7.7): NA

Note: Evaluation of expert 6 will be done as per assessment criteria mentioned under “short term expert pool 2” in Technical Assessment Grid

Soft skills of team members
In addition to their specialist qualifications, the following qualifications are required of team members:
- Team skills
- Initiative
- Communication skills
- Socio-cultural competence
- Efficient, partner- and client-focused working methods
- Interdisciplinary thinking

The bidder must provide a clear overview of all proposed experts and their individual qualifications.

5. Costing requirements

Assignment of personnel

Team leader: Assignment in country of assignment for **25** expert days

Expert 1: Assignment in country of assignment for **10** expert days

Expert 2: Assignment in country of assignment for **50** expert days

Expert 3: Assignment in country of assignment for **50** expert days

Expert 4: Assignment in country of assignment for **25** expert days

Expert 5: Assignment in country of assignment for **25** expert days

Expert 6: Assignment in country of assignment for **20** expert days

Procurement of HMD Units (5 nos.)

- The HMD units required to view the VR Experiences are to be sourced by the contractor based on mutual consultations. The cost for the same shall be reimbursed by GIZ against provision of original invoices (Refer to Annexure in section 9 for further details)
- All the licenses of application / system software / hardware / HMD units etc. procured for this project shall be procured in the name of GIZ

Travel

The bidder is required to calculate the travel by the specified experts and the experts it has proposed based on the places of performance stipulated in Chapter 2 and list the expenses separately by daily allowance, accommodation expenses, flight costs and other travel expenses.

A tentative schedule of 8 domestic round trips (inclusive of travel to Delhi, Chennai, and Coimbatore) along with 15 nights of accommodation and 20 days of per diem has been envisaged by the GIZ.

- Economy class Airline tickets shall be procured by the contractor and reimbursed by GIZ against provision of receipts, flight tickets, and boarding passes
- Accommodation will be arranged by contractor and shall be reimbursed by against provision of invoices

6. Inputs of GIZ or other actors

GIZ and/or other actors are expected to make the following available:

- The inputs/ designs for the conceptualized tactical measures will be provided by GIZ in 3ds Max or Google Sketchup format or any other format desirable & deliverable mutually agreed by both the contractor and GIZ team.
- GIZ team if required, will assist, to ensure smooth flow of the VR shoots on selected streets, by collaborating with the local authorities for required permissions.

7. Requirements on the format of the bid

The structure of the bid must correspond to the structure of the ToRs. In particular, the detailed structure of the concept (Chapter 3) is to be organised in accordance with the positively weighted criteria in the assessment grid (not with zero). It must be legible (font size 11 or larger) and clearly formulated. The bid is drawn up in English (language).

The complete bid shall not exceed 26 pages (excluding CVs).

The CVs of the personnel proposed in accordance with Chapter 4 of the ToRs must be submitted using the format specified in the terms and conditions for application. The CVs shall not exceed 4 pages. The CVs must clearly show the position and job the proposed person held in the reference project and for how long. The CVs can also be submitted in English (language).

If one of the maximum page lengths is exceeded, the content appearing after the cut-off point will not be included in the assessment.

8. Option

NA

9. Annexure

Available/Recommended Standalone VR HMD Units

The following are the most popular standalone VR HMD's in the market today:

Standalone VR headset	FOV*	DoF**	Made in Country	Release year
HTC VIVE Focus	110°	6DoF	Taiwan	2018
Lenovo Mirage Solo	110°	6DoF	China	2018
Oculus Quest	95°	6DoF	United States	2019
Pico Neo	-	6DoF	China	2018
DPVR M2 PRO	96°	3DoF	China	2016
GenBasic Quad HD	110°	3DoF	United States	2016
Oculus Go	-	3DoF	United States	2018
Pico Goblin	92°	3DoF	China	2017
Xiaomi MI VR	-	3DoF	China	2018

Note:

- The highlighted HMDs in the above table are the most recommended for the project.

*FOV: Field of View
**DOF: Degree of Freedom

Key elements to consider when buying an all-in-one VR HMD.

1) Battery life: a key factor as it will impact how long users can operate the device (and if portable battery packs are available).
2) DoF: currently, a limited number of untethered VR headsets have 6 DoF, and the ones that do are much less affordable.
3) Controllers: not all devices currently available have controllers, and again, there are limitations with 3 DoF.
4) FOV: Although standalone VR may not have as much processing power compared to tethered VR, the field of view is generally within a vast range; the higher the FOV, the more immersive the experience.