
Design, creation and implementation of a pilot training programme on Artificial Intelligence (AI), specifically tailored for the South African context	Project number/ cost centre: 19.2010.7-007.00
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1. List of abbreviations

AI	Artificial Intelligence
AVB	Local general terms and conditions 2017
BMZ	German Federal Ministry for Economic Cooperation and Development
DCDT	Department of Communications and Digital Technologies
DHET	Department of Higher Education & Training
DRM	Disaster Recovery Management
GDPR	General Data Protection Regulation 2016/679
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
IDD	Instructional Design Document
NEMISA	National Electronic Media Institute of South Africa
OER	Open Educational Resources
POPI	Protection of Personal Information (Act) 2013
SAQA	South African Qualifications Authority
SCORM	Shareable Content Object Reference Model (format)
SDG	Sustainable Development Goals
TORs	Terms of reference
TPF	Training Program Framework

2. Context

AI is a key technology driving the global digital revolution. It offers new opportunities to break down existing barriers to human and socio-economic development and social inclusion and helps to achieve the SDG's.

Acting on behalf of the BMZ, GIZ implements the project“ FAIR Forward – Artificial Intelligence for all”. FAIR Forward strives for an open, inclusive and sustainable approach to AI on an international level. Over a four-year project phase from 09/2019 to 11/2023, the project's objective is to augment the prerequisites necessary for local AI development in country across its six partner countries (South Africa, Rwanda, Uganda, Ghana, Kenya and India).

The FAIR Forward project pursues three main goals:

- a. Strengthen local technical know-how on AI – Capacity development in Africa and Asia. FAIR Forward supports digital learning and training for the development and use of AI and fosters cooperation with German and European research institutions and businesses.
- b. Remove entry barriers to AI – Access to training data and AI technologies for local innovation. FAIR Forward facilitates the provision of open, non-discriminatory and inclusive training data and open-source AI applications. Open access to African and Asian language data is a key priority to enable the development of AI-based voice interaction in local languages to empower marginalized groups.
- c. Develop policy frameworks ready for AI – Ethical AI, data protection and privacy. FAIR Forward advocates for value-based AI that is rooted in human rights, international norms such as accountability, transparency of decision-making and privacy, and draws on European experiences such as the EU General Data Protection Regulation (GDPR). Therefore, the project supports the development of effective political and regulatory frameworks in Africa and Asia.

As part of the area of action area (a) above (capacity development), in 2020 FAIR Forward has partnered with the Department of Communications and Digital Technologies (DCDT) and the National Electronic Media Institute of South Africa (NEMISA) to augment AI capacity building and subsequently give effect to the 'Digital and Future Skills 'Strategy developed by DCDT. This strategy envisages a society of digitally skilled South Africans.

FAIR Forward together with DCDT and NEMISA have commenced the development of an 'AI Skills Ecosystem' to support the Digital and Future Skills Strategy. The AI Ecosystem executes on Strategy element 2 (Digital futures and mastery – Building advanced digital skills) and Strategy Element 4 (Creating Society 4.0 and addressing the digital skills divide), and aligns with the vision of all South Africans benefitting from enhanced digital skills (e.g. AI).

The AI Ecosystem development is envisaged in a 4-step plan:

- (1) Collate existing work, training and educational material of AI experts in South Africa for the purpose of creating a central public repository of existing AI material and courses for use and access.
- (2) Analyse the skills gaps from the training material and a targeted survey, address the demand for complementary AI skills in South Africa

- (3) **Develop a localised AI training program in South Africa for South Africans based on identified skills gap (subject of these TORs)**
- (4) Create the AI Skills Ecosystem, which can be understood as a network of AI skills experts and stakeholders in South Africa

In implementing **phase 3 of the plan, the AI training program** is premised on:

- i. Developing a unique, stand-alone AI training program, that augments existing training content, and which addresses a clearly identified AI skills gap as well as provides balanced and contemporary AI skills development
- ii. The program featuring localised and contextual use of AI within a South African environment (accounting for domestic challenges), featuring local use cases and with an aim of using AI to find local solutions to African problems
- iii. Being developed in a blended learning format which includes in-person and virtual elements. In the event that COVID-19 restrictions apply, there should be an option to adapt it to a purely virtual format.
- iv. The training content and program being free of cost for participants and designed as Open Educational Resources (OER), enabling learners to continuously receive the benefit, without barriers to education to disadvantaged groups.

The key cornerstones of the AI training programme have been derived from an AI skills ecosystem survey and gap analysis, as well as from input gained during multi-stakeholder workshops held in June 2020 and June 2021. The results include the following key pillars for the training program, i.e. target group, format/structure and content:

Target Group:

Feedback suggests that the program be designed for the key user group:

- 18 – 35-year-old, either seeking to upskill or reskill, or acquire AI skills for improved chances of employment
- Applicants to the program should have completed pure math, science and have acquired basic digital literacy skills. Ideally, participants should have an introductory level knowledge of coding / programming

Format and Structure:

The format of the course should be on average **6 months**, depending on activities and group projects envisaged (e.g. participation in a public-private-sector working initiative, gaining on the job work experience through a private sector entity, programme internship / work projects) this can be extended to 9 months.

This would include a blended learning structure, i.e. offline (in-person) as well as online elements, as some participants might not have stable internet access from their homes. The offline elements of the training (in-person) will be held at venues procured by FAIR Forward / GIZ for training purposes.

The **physical training** shall be provided **in blocs of 2 weeks every 2 months (6 weeks in total)**. **Virtual training** and follow-ups would take place in the **remaining weeks of the programme**. Training shall take place either week-day evenings and/or Saturdays as

determined by the availability of the lecturers and trainers. This teaching mode enables employed individuals the ability to participate without compromising existing income opportunities.

The structure would further include group activities and individual projects to maximise peer knowledge transfer and adaptability of skills acquisition. The course structure will include time for mentoring and engagement with external experts for situational learning (e.g. identifying and examining live use cases in deployment).

Content:

The structure of the program should include a combination of core modules and electives. Envisaged core modules outlined in the program must be premised on an African context (preferably South Africa), employing local and regional use cases and examples, and would be at a minimum:

Core Courses	Course elective (options)
• Introduction to Data Science	• Interactive design thinking
• Data Analytics	• General Project management
• Statistical programming	• Entrepreneurship / start-up management
• Machine Learning	• Digital soft skills
• Programming Algorithms	• AI Ethics (including gender bias in data collection and dataset development)
• Natural Language Processing (NLP)	

The core modules of the training shall cover the following topics:

- 1) **Introduction to Artificial Intelligence:** Defining AI in an African context and connecting its potential to socio-economic development and the Sustainable Development (SDGs) agenda with a focus on (South) African use cases.
- 2) **Introduction to Data Science:** Understanding data in Africa (accounting for historical data inequality including the effects of poverty, race and gender inequity on data distribution), and how to use it, extract useful information from the data, conduct an analysis, make findings and apply this in solving problems.
- 3) **Data Analytics:** A follow on to data science introduction, data analytics involve inspecting, cleansing, transforming, and modelling data accounting for historical biases and limitations, with the goal of discovering useful information, informing conclusions, and supporting decision-making.
- 4) **Statistical Programming:** Learning basic computational techniques that help in data analysis, including techniques to explore large data sets and make graphical displays of it for better and quick understanding.
- 5) **Machine Learning:** Understanding computer algorithms and how they can improve automatically through experience and using data.
- 6) **Programming Algorithms:** Learning how to configure an algorithm using different languages (programming and non-programming languages).

- 7) **Natural Language Processing:** Understanding what natural language is and how it is processed by software, and its localised application in machine learning in SA.

Pilot program:

In a first step, FAIR Forward together with NEMISA intends to implement a pilot of the training program to assess whether the program fulfils its objectives.

The pilot program would be implemented in **3 provinces in South Africa** and include a **maximum of 20 participants per province**, and those will be selected in an application process to participate in the programme. The training will be **simultaneously implemented in the 3 provinces**; however it is possible to conduct physical training blocs in one province while virtual training blocs are conducted in another province, based on the availability of the trainers.

Ideally, the pilot will be run in cooperation with institutions interested to take up the course in their regular course offers if it proves successful (i.e. NEMISA). One of the aims of the programme is to enable participants to translate learnings into tangible outcomes, e.g. using data science to contribute to chatbot development.

Having established the relevance of AI, its role in digital evolution and the need for AI capacity development in South Africa, a service provider is required to fulfil the tasks of creating, designing and implementing a blended pilot AI training program, as detailed herein this TORs.

3. Tasks to be performed by the contractor

The successful bidder (service provider) must deliver the following services, in the timeframe stated and within the budget allocated.

The service provider is responsible for the **design, creation, planning, organization and implementation of the pilot AI training program and the associated logistics required in delivering the program successfully, as well as knowledge capturing and transfer**, as defined in these TOR's and all annexes hereto.

This project is divided into three work packages, broadly defined, being:

A: Scoping and Creating the curriculum content

- Scoping
- Kick-off workshop
- Designing the training program framework
- Developing didactics including methodology and teaching format
- Design learning platform
- Process Flow

B: Implementing the curriculum and facilitating course roll out

- Course Design and Specifications
 - Engagement with experts for course development
- Application and Selection Process

- Calls for Application
- Selection Process
- Participant preparation
- Course Logistics, Implementation and Disaster Recovery Management
 - Training Implementation
 - Program logistics and DRM
 - Communication and collaboration with participants and partners

C: Post training evaluation, certification, knowledge transfer and reporting

- Post training review
- Reporting
- Certification, Media and Accreditation
- Implementing a knowledge transfer strategy including thorough documentation of methodology and teaching format through appropriate means e.g. a replication-kit and teachers-guidelines, teachers material etc.

Further details of each work package follow:

Work Package A: Scoping and Creating the curriculum content

• **Scoping:**

In a first step, the service provider is required to conduct scoping activities to gain further insights for the design and implementation of the AI skills programme. These scoping activities would include, but not be limited to:

- conducting end-user surveys and focus group discussions to ensure the planned training programme is fruitful to end users (approximately 5 expert days). Focus groups and user surveys must encompass (i) equal number of women and men; and (ii) marginalised communities / previously disadvantaged persons, to the highest extent possible.
- conducting research on existing programs and their applicability in the economic sector, optimal study/training times and collaboration options for gaining practical work experience by participants, i.e. applying acquired skills in live environment (approximately 5 expert days).

• **Kick-off workshop:**

The service provider will prepare and conduct a kick-off workshop with FAIR Forward, NEMISA, DCDT and stakeholders to launch the development process of the course based on the results of the scoping stage that was conducted by the service provider and any preliminary course concepts.

• **Training Program Framework (TPF):**

Develop a TPF (which includes the Instructional Design Document (IDD), detailed below) in close coordination with FAIR Forward team. The TPF should include at minimum:

- Details of any scoping activities and the results thereof conducted by the service provider to give effect to this project.
- Detailed definition of the target group and their needs for training. This shall be based on target group identified jointly by DCDT, NEMISA and FAIR Forward.
- Define three (3) target provinces for pilot training program together with FAIR Forward and NEMISA based on objective selection criteria to be determined by FAIR Forward and NEMISA, together with service provider.
- Define training objectives
- Define formats of the training and each session
- Full curriculum including the training content that will be taught
- The timeline of the curriculum spread, from start to finish for the duration of the program
- Design of training materials and exercises
- Timeline of the training as well as the curriculum spread over this period (being 6 months)
- Marketing strategy, including call for applications in South Africa

- **Didactics:**

The service provider shall develop a written strategy on how knowledge building of participants would be most effectively achieved. This strategy should consider the concepts outlined in the 'establishment of an effective teaching format' requirement below, and should include at a minimum:

- Methodology for conducting the training, including format, presentation, interaction, collaboration and communication styles
- Tools (online and offline) utilised for implementing knowledge transfer (training)
- Method for measuring the effectiveness of the training and certifications

The teaching format should encompass **blended learning**, the four learning design principles founded on the educational theory of constructivism and the principles of connectivism for learning in a digital age. These are:

Constructivism

- Focussing on the outcomes for learners
- Getting learners to own the learning process
- Maintaining motivation and engagement
- Encouraging collaboration and social learning

Connectivism

- Learning and knowledge rests in diversity of opinions.
- Learning is a process of connecting specialized nodes or information sources.
- Learning may reside in non-human appliances.

- Learning is more critical than knowing.
- Maintaining and nurturing connections is needed to facilitate continuous learning. When the interaction time between the actors of a learning environment is not enough, the learning networks cannot be consolidated.
- Perceiving connections between fields, ideas and concepts is a core skill.
- Currency (accurate, up-to-date knowledge) is the intent of learning activities.
- Decision-making is itself a learning process. Choosing what to learn and the meaning of incoming information is seen through the lens of a shifting reality. While there is a right answer now, it may be wrong tomorrow due to alterations in the information climate affecting the decision

The teaching format should also consider the seven didactic principles for improving learning results, as required under the Quality Assurance matrix, in WP B:

- | | |
|-----------------------------------|---|
| ○ Ownership and self-organisation | ○ Multiple perspectives and switching of perspectives |
| ○ Learning support/advice | ○ Attitude of mutual regard and respectful comparison |
| ○ Spaces of experience | |
| ○ Reflection | |

The teaching format must adapt to learners' needs, be suitable to the participants and include a blended mode of learning, which includes (but shall not be limited to) a mixture of lectures, practical workshops, live cases, demonstrations, case studies, teamwork, project creation and tests to ensure maximum adoption of content and understanding by learners. These can be online and offline.

All modules shall be **highly practice oriented**. Each module shall include learning / knowledge transfer formats and practical activities as detailed in these TOR's as well as discussion and interaction among participants.

- **Design learning platform:**

NEMSIA will provide the **Microsoft Azure platform** as well as an optional digital skills platform (Moodle) as the base platform for the training. The service provider must design the course experience on these platforms in close coordination with NEMISA and FAIR Forward. This includes, among others:

- Designing course materials based on the requirements of the platform
- Designing course platform in a user-friendly manner
- Uploading all course materials and content to the platform to enable an optimal learner experience

- **Course Design and Specifications:**

- The service provider shall design and develop the course in accordance with the technical specifications detailed in the TOR as well as any annexes hereto.
- Technical specification is not negotiable and any instance in which the service provider cannot adhere to or comply with any requirement, for whatever reason, must be brought to the attention of GIZ. The service provider is directed to the 'Technical Specification and Data Privacy Requirements' document (Annex A) for further details.

- **Process flow:**

The provider is responsible for developing the course, including the following steps and in adherence to the timeline:

- Creating a high-level instructional design document (IDD) which forms part of the TPF. Revising the IDD by integrating feedback from GIZ, the partners and key stakeholders
- Creating a detailed storyboard for the course, then revising by integrating feedback from GIZ, the partners and key stakeholders
- Developing a prototype of for the course, then revising the prototype by integrating feedback from GIZ, the partners and key stakeholders
- Developing the course, including interactive and multimedia elements (except for sound), then integrating feedback from GIZ, the partners and key stakeholders

Work Package B: Implementing the curriculum and facilitating course roll out

- **Engagement with experts for course development and deployment**

- The service provider will procure all experts and trainers required to develop the curriculum, teach and/or transfer the knowledge to participants, as outlined in the approved curriculum (expert pool).
- The service provider will oversee, manage, and coordinate with all identified AI and other experts to ensure the training program runs smoothly. This management of experts will include remuneration for professional services rendered, work allocation, experts' days and replacement of experts / trainers due to any force majeure.
- The relationship management with experts will include (but is not limited to) reaching out to experts during the pre-scoping mission, coordinating for training program (curriculum) input, course roll out management (i.e., guest lecturing, etc.) and disaster recovery management (finding suitable alternatives where experts are unavailable).
- The service provider must ensure sufficient division of labour between subject experts who participate in the training process and to which degree subject matter experts should be involved in the training process, when designing and facilitating the training.

- **Marketing campaign**

- The service provider shall conduct a marketing campaign for not longer than 2 (two) weeks, based on the marketing strategy developed in work package A. All activities of the campaign need to be approved by GIZ.
- The marketing campaign shall include the following:
 - o Develop marketing materials
 - o Advertising the course on at least 3 (three) different media platforms, including social media
 - o Creating and distributing flyers

- o Drafting at least 2 blog posts over the duration of the course, highlighting the impact of the training programme
- **Application and Selection Process**
 - Develop and conduct call for applications to participate in the training, which shall be publicised on at least 3 different online platforms (including social media platforms).
 - The call for applications must be designed together with FAIR Forward and NEMISA and will include the number of participants which the program will accept, any pre-selection and/or minimum criteria required by the participant to apply as well as the format and platform which participants must use to ensure an eligible application.
 - The service provider must ensure that all eligible applications received are reviewed, align with the pre-selection criteria which will be determined by the service provider in close coordination with NEMISA and FAIR Forward, and then only suitable candidates are selected, duly informed and fully processed in to participate in the training.
- **Participant preparation**
 - The service provider is required to contact successful applicants to the program in writing and provide them with all required next steps for their journey in the program both regionally and nationally. This will be the start of the support process for the participants.
 - A maximum of 3 (three) attempts must be made at contacting successful applicants (in writing and telephonically, combined) after which affording the applicant a period of 1 (one) week to respond, the next successful, eligible applicant must be contacted by the service provider.
 - The service provider is required to collect and process all information from the applicants, to ensure veracity and completeness to process the applications and the participants for participation in the program in each region – this includes transport and logistics queries, noting and facilitating allowances for persons with disabilities, etc.
 - The service provider must maintain one open line of communication for queries and questions during this process (e.g. email) and must ensure responses are sent to any queries within a 24 (twenty-four) hour turnaround time. Upon commencement of the program, other additional channels may be utilised for engagement with participants.
- **Course Logistics, Implementation and Disaster Risk Management (DRM)**
 - The service provider must ensure that the logistical requirements for end to end development, delivery and post training evaluation should adhere to the project timeline, specifically the milestone dates, stated in the next section. This includes implementation of any DRM plans.
- **Training Implementation**
 - The service provider shall implement and facilitate of the AI training program over a minimum of 6 (six) and maximum of 9 (nine) months. 6 months should consist of training, while an additional 3 months may be planned for project work, internships, company placements, among others.

- The programme will kick-off with a virtual engagement and community-building process with all participants in all the regions, followed by the actual in-person module region specific. In the same logic, the last module will conclude with a final ceremony to formally close the AI Skills Training Programme.
- The training and knowledge transfer will be implemented in the manner and format, utilising the tools and methodologies as outlined in the approved training program framework. The service provider may not deviate from approved process, unless by agreement with GIZ.
- **Program Logistics and DRM**
 - The service provider shall procure, provide and maintain all resources (including personnel), communication channels, platforms, services, tools, hardware, software and infrastructure necessary for design, development and delivery of this project.
 - The procurement and provision shall include stable, consistent connectivity throughout this project (including delivery of the training) and a disaster management plan for alternate options where the primary mode, method or tool and/or resource personnel cannot be used or accessed as the case may be.
 - In the instance the venue is procured by GIZ/FAIR Forward, then the service provider shall work with the venue to ensure back-up connectivity is in place in the instances of power outages or connectivity loss and should endeavour to reschedule training delivery where it cannot be conducted on that date / time.
 - The service provider should work with NEMISA to conclude a DRM plan that ensures an efficient back-up / recovery operation is enabled and enacted, to minimise interruption or downtime for GIZ, partners and participants as may be applicable.
 - It is the duty of the service provider to ensure that any resources procured and /or utilised (in whatever form or manner) to design, distribute and delivery the course (and this project in its entirety) is fit for purpose, and authorised by the partner or the partner resource (e.g. co-Labs). If the resource (human, electronic or otherwise) is unsuitable or is (or becomes) unauthorised, a suitable alternative must be procured and provided.
- **Communication and collaboration with participants and partners**
 - The service provider is responsible for all communication with participants and partners before, during and after the scoping, design and implementation of the training, in coordination with FAIR Forward and NEMISA.
 - The communication with participants would specifically include, but is not limited to:
 - Coordinating written and verbal correspondence, queries and feedback in respect of the application process as well as training and post training evaluation as detailed in this TOR
 - Organising meetings, workshops and other forms of engagement required for the course design and development, course training and implementation, and post training evaluation and support

- Sharing pre-work and post work content, assignment and test feedback, group work information and planning, course material and other relevant information (e.g. new use cases, breaking news, changes in course structure, DRM plans, etc.
- Have a platform in which learners can engage each other as well as trainers, in real time, during the training period (including outside of the training hours and on weekends or holidays for the participants themselves) as well as during the support period, e.g. Slack
- The communication with partners would include, but is not limited to:
 - Managing queries from media and third parties, including reasonable response times in close coordination with FAIR Forward
 - Facilitating the marketing component of the training program, including engaging with media outlets and third parties to ensure a successful marketing campaign as well as fielding questions from the public
 - Engaging and responding to all queries, feedback and correspondence, including attendance of in-person and/or or online meetings, workshops and engagements in the course and scope of this project, including pre and post training scoping and evaluation.
- The service provider must maintain open lines of communication and ensure that they are available for engagement on at least one written electronic channel and where possible one telecommunications channel (i.e. mobile/ telephone), during ordinary business hours for participants and partners during the course of the training and for any post training support, where provided.

Work package C: Post training evaluation, certification, knowledge transfer and reporting

- **Post training review and participant assessment:**
 - The service provider shall conduct a written evaluation process of the training after its completion at each site / campus. The post training evaluation should contain feedback from students on trainers and third parties (guest lecturers), including qualitative feedback on teaching pace, content, level of complexity, professional applicability, methodology, ease of understanding and recommendation of the course, at a minimum.
 - Based on the evaluation, the service provider shall suggest potential amendments and changes to the content, structure and format of the training programme for potential future cohorts.
- **Evaluation process after 3 months:**
 - The service provider shall conduct one engagement exercise (individually or collectively) with the participants, to evaluate whether all participants have applied the acquired knowledge in their professional context (public sector, private sector or

academia) within 3 months after the training and can prove this with a practical example (e.g. deploying artificial intelligence in chatbot software development).

- For this purpose, participants should be requested to hand in short reports describing how they applied their knowledge after the training (include in TPF).

- **Reporting:**

The service provider will provide a written interim and final report for the project.

- **Interim Report**

This report will be provided midway through the program, and will detail, at a minimum:

- General remarks regarding the training process implementation
- participant engagement level and ease of participant understanding of content
- any logistical difficulties experienced in rolling out the course
- any envisaged aspects that should be considered, or elements that may affect program roll-out

- **Final Report**

The service provider will provide a final, combined, report after conclusion of the training program and evaluation process.

The report shall be provided in pdf or other suitable format, including statistics, images, tables, infographics and other tools and methodology to efficiently convey the information required.

The report must be provided by no later than one calendar month after the conclusion of the evaluation process.

This report will contain information of the service provider's efforts in formulating and implementing the following service requirements, including, but not limited to:

- Assessment and evaluation of the AI training landscape (pre-training)
- Design process of the curriculum (level of ease for this landscape, design concepts, experts engaged and thought process utilised)
- Selection process of participants (what criteria was used and why, including disaggregated data on gender)
- Training of the participants as well as remarks regarding the training process (including participant engagement level, ease of participant understanding, methodology that worked well and what did not work well, which participants excelled and who did not – disaggregated by gender, field of expertise and age)
- Post training evaluation content

- **Post training evaluation**
 - Ability and success factors contributing to participants application of knowledge (or inability to apply that knowledge)
 - Lessons learnt from undertaking this activity as well as what elements would be changed or done differently in the future if the service were to be redone and/or the program were to continue for a second pilot
 - Any relevant elements from the interim report necessary for consideration and inclusion.
- **Knowledge transfer towards future providers of this course**
 - Compile a written knowledge retention strategy (including replication kit) of this pilot training, for FAIR Forward
 - The strategy shall include, at a minimum:
 - a document of methodology and teaching format through appropriate means for online / offline knowledge transfer, which document shall include, *inter alia*:
 - which shall include experts and third parties were used and for what purposes
 - tasks undertaken by trainers during training implementation
 - reliance placed on trainer by students
 - observations and recommendations for conducting training, enabling knowledge retention by participants
 - implicit and tacit knowledge sharing tips and tools
 - a replication-kit and trainer guidelines, material etc.
 - an open access repository of all “open educational resources” and other reading, research and publications used and recommended for this training
 - a hand over to NEMISA or other partner, in a SCORM format (as may be required) for timeous and efficient integration and adaptation, post the training
 - Identify a methodology or make recommendations to implement the strategy or adopt the training onto an OER, which enables this training to be sustained, as either:
 - All or part of an existing curriculum (of a university, institute or education body)
 - Run as a stand-alone program run by NEMISA or other entity
- **Certification, Media and Accreditation**
 - The service provider shall conduct one marketing campaign at the completion of the course, celebrating the success of the individuals who participated and completed the program. The campaign shall be discussed and approved by GIZ but will primarily serve to publicize the newly acquired skills of the participants, their economic employability, any collaboration undertaken in the course of the program to acquire work skills and 4IR in SA. This will include advertising on at least 3 (three) different media platforms.
 - The service provider shall manage the certification process following successful completion of the course. Certificates must be presented to all participants who successfully complete the course and should be made available in paper format as well as digitally (in a printable format).
 - The service provider shall engage GIZ as well as the partners (NEMISA, DCDT) during the course design process to ascertain whether this training can be certified by an

accredited institution or accredited in terms of the SAQA, or other qualifications body guidelines and rules based on the pilot. Where possible, the course should be designed based on national SAQA and/or DHET design guidelines.

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

Milestone	Deadline
Kick off workshop with GIZ, NEMISA and DCDT	1 week after start of contract
First draft of TPF and knowledge transfer strategy	1 month after start of contract
Final approved TPF and knowledge transfer strategy	2.5 months after start of contract
Marketing campaign launched	3 months after start of contract
Call for Applications published	3 months after start of contract
Close Applications & Notify Successful Participants	3.5 months after start of contract
Design learning platform	4 months after start of contract
Testing / UAT of Learning platform	4.5 months after start of contract
Course Commencement	5 months after start of contract
Interim Report	8 months after start of contract
Course Conclusion	11 months after start of contract
Post Training Evaluation after 3 months	14 months after start of contract
Final Report	14 months after start of contract

Period of assignment: **From 11.10.2021 until 31.12.2022.**

4. Concept

In the bid, the bidder is required to show how the objectives defined in Chapter 2 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 1.1.1 of the assessment grid).

Following this, the bidder presents and justifies the **strategy** with which it intends to provide the services for which it is responsible (see 1.1.2). This should include **high-level draft of curriculum, learning and facilitation methodology**.

The bidder is required to present the actors relevant for the services for which it is responsible and describe the **cooperation** with them (1.2.1 and 1.2.2).

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 (1.4.1 and 1.4.2).

The bidder is required to describe its **contribution to knowledge management for the partner and GIZ** and promote **scaling-up effects (learning and innovation)** (1.5.1 and 1.5.2).

Project management of the service provider

The bidder is required to explain its approach for coordination with the GIZ project (1.6.1).

- The service provider is responsible for selecting, preparing, training and steering the experts (international and national, short and long term) assigned to perform the advisory tasks.
- The service provider makes available equipment and supplies (consumables) and assumes the associated operating and administrative costs.
- The service provider manages costs and expenditures, accounting processes and invoicing in line with the requirements of GIZ.
- The service provider reports regularly to GIZ in accordance with the AVB of GIZ from 2018
- The service provider is required to draw up a **personnel assignment plan** with explanatory notes that lists all the experts proposed in the bid; the plan includes information on assignment dates (duration and expert days) and locations of the individual members of the team complete with the allocation of work steps as set out in the schedule (1.6.2)
- Sharing the lessons learned by the service provider and leveraging the value of lessons learned on site

5. Personnel concept

The bidder is required to provide personnel who are suited to filling the positions described, based on 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

Tasks of the team leader

- 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 and supporting local and international short-term experts
- Regular reporting in accordance with deadlines

Qualifications of the team leader

- Education/training (2.1.1): University qualification in education, IT, or other relevant field
- Language (2.1.2): Good business language skills in English
- General professional experience (2.1.3): 10 years of professional experience in the educational / training or digitalization sector
- Specific professional experience (2.1.4):
 - 5 years in developing and implementing professional training programmes
 - 3 years of experience in the area of digital skills education / training. Experience in artificial intelligence (specifically concepts outlined in the core modules) is an advantage
- 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): 5 years of experience in projects in South Africa
- Development Cooperation (DC) experience (2.1.7): 3 years of experience working in / collaborating with DC institutes and/or working on projects
- Other (2.1.8): Experience with agile and state-of-the art facilitation methodologies, didactic principles for improving learning results such as co-construction of learning and online collaboration tools

Expert 1: Curriculum development expert

Tasks of expert 1

- Lead and coordinate curriculum development efforts of the project team, including assisting with the field research, focus group coordination and adaption of the feedback into course design, the curriculum and trainings materials developed.
- Coordinate with technical experts of GIZ, third parties, partners and trainers in the curriculum development and course material composition, as well as follow up questions and queries that may arise throughout the project and training implementation.
- Ensuring that a comprehensive situational analysis is conducted to inform the new curriculum is up to date and relevant for local audiences.
- Provide technical inputs and feedbacks to curricula guidelines, manuals, templates and other relevant documents to be developed and ensure the course material adhere to national training guidelines and qualification standards.

Qualifications of expert 1

- Education/training (2.2.1): University qualification in education, or related field
- Language (2.2.2): Good business language skills in English
- General professional experience (2.2.3): 10 years of professional experience in the educational / training sector
- Specific professional experience (2.2.4):
 - 5 years of experience in developing curricula for digital skills (either in an academic or professional training context)
 - 3 years of experience in designing blended learning course formats, including offline and online learning experiences
 - Knowledge of state-of-the art learning and training methodology and didactical principles
- Leadership/management experience (2.2.5): -
- Regional experience (2.2.6): 3 years of experience in South Africa
- Development Cooperation (DC) experience (2.2.7): -
- Other (2.2.8): -

Expert 2: Artificial Intelligence training expert

Tasks of expert 2

- Design and lead classroom-based or online, technology-enabled learning interventions
- Collaborate with the curriculum development expert to develop and deliver a training experience that help participants easily grasps the AI concepts, understand and master the core modules outlined in the curriculum.
- Work with guest and associated trainers to deliver the curriculum incorporating the constructivism and connectivism learning principles in the knowledge transfer process and translate complex concepts into relatable, understandable and contextual snippets of information.
- Monitor and moderate discussion forums for any online and offline engagement and encourage curiosity, dialogue and engagement from participants
- Maintain technical and updated knowledge of the modules (as a subject matter expert) in the curriculum, platform and applications for user level delivery

Qualifications of expert 2

- Education/training (2.3.1): University qualification in artificial intelligence, IT, digitization, or related field
- Language (2.3.2): Good business language skills in English
- General professional experience (2.3.3): 10 years of professional experience in the IT / digital sector
- Specific professional experience (2.3.4):
 - 3 years of experience in artificial intelligence and machine learning, including programming
 - 2 years of experience in natural language processing and machine learning
 - Experience in providing training / lectures in the field of AI is a strong advantage
- Leadership/management experience (2.3.5): At least 3 years of experience leading AI projects (preferably NLP, ML, data science or other AI technical area); with 3 years' experience in commercial / corporate projects (i.e., involved with creating a product, service or system).
- Regional experience (2.3.6): 3 years of experience in South Africa
- Development Cooperation (DC) experience (2.3.7): -
- Other (2.3.8): -

Expert 3: Admin and communications expert

Tasks of expert 3

- Coordinate communication and correspondence, amongst participants, partners, GIZ and third parties, including administrative support to participants and GIZ, through effectively maintaining and coordinating calendars, scheduling appointments and meetings, making travel arrangements and accommodations for participants as may be required throughout the project
- Collaborate with partner marketing team and GIZ to promote the training program per require media campaigns
- Assist with program application process for participants, including background research skills, information verification and project management skills in coordinating the program administrative and logistical requirements (e.g. procurement of training space)
- Provide tactical support to participants onsite and/or remotely and act as liaison between participants, partners, GIZ and third parties
- Organize, compile and submit support documentation on during and on completion of project, including interim and final reports, statistics and information as may be required
- Coordinate training logistics to schedule and plan for training sessions

Qualifications of expert 3

- Education/training (2.4.1): University qualification in business administration, communications, or other relevant field
- Language (2.4.2): Good business language skills in English (one additional South African language would be preferred)
- General professional experience (2.4.3): 5 years of professional experience
- Specific professional experience (2.4.4):
 - 5 years of experience organizing events and / or trainings, including participant management, logistics, and communications
- Regional experience (2.4.6): 3 years of experience in South Africa
- Other (2.4.8): 2 years of experience in managing virtual events and virtual learning formats

Soft skills of team members

In addition to their specialist qualifications, the following qualifications are required of team members:

- Team skills
- Initiative and proactive
- Interdisciplinary thinking
- Sociocultural competence
- Communication and engagement skills (especially with persons from diverse backgrounds)
- Efficient, partner- and client-focused working methods

Short-term expert pool with minimum 4, maximum 6 members: Trainers and AI experts

Tasks of the short-term expert pool 1 (Trainers)

- Provide input to development of Training Program Framework (curriculum) and Knowledge transfer strategy
- Act as trainers on specific topics for the course

Qualifications of the short-term expert pool 1 (Trainers)

- Education/training (2.6.1): 3-7 experts with university qualification in artificial intelligence, data science or another relevant field.
- Language (2.6.2): 3-7 experts with very good language skills in English
- General professional experience (2.6.3): 3-7 experts with at least 10 years of experience in the public or private sector
- Specific professional experience (2.6.4): 3-7 experts with at least 10 years of experience in the following fields (one expert can cover several fields).
 - Data Science
 - Data Analytics
 - Statistical programming
 - Machine Learning
 - Programming Algorithms
 - Digital Soft Skills
 - Interactive design thinking
 - AI Ethics
 - General Project management
 - Entrepreneurship / start-up project management
 - Natural Language Processing (NLP)

- Regional experience (2.6.5): 3-7 experts with at least 5 years of experience in South Africa
- Development Cooperation (DC) experience (2.6.6): -
- Other (2.6.7): 3-7 expert with at least 3 years of experience as a professional trainer / lecturer

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

Assignment of personnel

Work package	No. of expert days per work package
A: Scoping and Creating the curriculum content	60
B: Implementing the curriculum and facilitating course roll out	133
C: Post training evaluation, certification, knowledge transfer and reporting	27
	220

The bidder is required to submit a personal assignment plan which stipulates the number of days that each expert will be allocated to the individual work packages.

Travel

The service provider 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.

- For all combined travel costs will be reimbursed against documentary evidence (according to GIZ travel cost regulations). The travel budget includes flights, domestic travel expenses, overnight accommodation, airport transfer / car hire etc. for all experts/ trainers / team leader and other personnel. A reasonable combination of necessary economy, and special fares flights will be booked (GIZ General Terms and Conditions Local 2017)
- In case where travel and other restrictions related to the COVID-19 pandemic do not allow physical workshops or events when such is planned, the event shall be organized as a virtual event. If this or other reasons lead to an being conducted virtually then travel costs cannot be claimed. Accordingly, written approval is required from GIZ before any bookings are made by the service provider. All travel vouchers and tickets purchased by the service provider must be refundable.

Workshops, training

The contractor implements the following training courses:

- All training program running over 6 months (as a minimum) but not exceeding 9 months.
- The **training venues will be directly procured by GIZ** and do not need to be included in the costing. The same applies to **travel costs for participants and participant stipends / meals**, which shall **not be included in the bid**.
- Day field trips (at least 2) during the course of the training program, to institutes or organisations who are practically applying the training content in use cases or day to day operations. Field trips must be approved by GIZ and agreed in advance. **The travel and subsistence cost of the field trips for the participants in each will be covered by GIZ and the service provider does not need to include this in the bid.**

Other costs

- The service provider must include in their proposal any costs associated with or arising from the activities that they are required to fulfil, for the period of the contract, including:
 - provision of **internet bundles or data packages for 60 students for the duration of training** (ca. 6GB per student per month) (to access course content, download study material, participate in virtual sessions from their homes)
 - costs for **conducting research and focus groups**, including any gratuity / stipend / day costs (e.g. lunch) payable to the participants for their time
 - costs for **marketing campaigns (printing and advertisements), printing of course material and course certificates.**

Flexible remuneration

The service provider must include under this budget line in their proposal for the additional costs associated with or arising from for the period of the contract, **e.g. technical and admin support at training locations, external guest speakers, software and licence costs.**

These costs are to be calculated as applicable with **a maximum of R170 000.00** and to be **reimbursed against evidence by invoices/vouchers/proof of performance.**

8. 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.

The complete bid shall not exceed 10 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.

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

Please calculate your price bid based exactly on the aforementioned costing requirements. In the contract the contractor has no claim to fully exhaust the days/travel/workshops/ budgets. The number of days/travel/workshops and the budget amount shall be agreed in the contract as 'up to 'amounts. The specifications for pricing are defined in the price schedule.

0. Other Requirements

- Please submit your proposal (technical and price proposal) in separate files/folder to ZA_Quotation@giz.de no later than 20.09.2021, 23h00 all documents must be in PDF.
- Please do not mention any price for this measure on your cover letter/Technical proposal.
- Please submit your tax clearance certificate with the bidding documents.
- Please submit your price proposal in ZAR.
- Our General Terms of Conditions (attached) shall not be changed/amended should you be the winner of this tender. These General Terms and Conditions will form part of the contract should you be awarded this contract. By submitting your proposal we will conclude that you have read and accepted these terms and conditions.
- Participating more than once in same tender is not allowed and it will lead to your proposal as well as that of the company where you appear more than once being disqualified. The responsibility rests with the companies to ensure that their partners/experts are not bidding/participating more than once in same tender.
- **Bidders are not allowed to communicate directly with any other person regarding this bid other than the procurement official/s. Failure to comply with this requirement may lead to your bid being disqualified.**
- Bidders must strictly avoid conflicts with other assignments or their own interests. Bidders found to have a conflict of interest shall be disqualified. Without limitation on the generality of the above, Bidders, and any of their affiliates, shall be considered to have a conflict of interest with one or more parties in this EOI and tender process, if they:
 - a) are or have been associated in the past, with a firm or any of its affiliates which have been engaged by GIZ or the Interim Supply Chain Management Council to provide services for the preparation of the design, specifications, Terms of Reference, cost analysis/estimation, and other documents to be used for the procurement of the services in this selection process;
 - b) were involved in the preparation and/or design of the programme/project related to the services requested under this EOI and tender;

c) are serving or have been serving in the past three months in the structures of the Interim Supply Chain Management; or

d) are found to be in conflict for any other reason, as may be established by, or at the discretion of GIZ.

- In the event of any uncertainty in the interpretation of a potential conflict of interest, Bidders must disclose to GIZ, and seek GIZ's confirmation on whether or not such a conflict exists.

- Similarly, the Bidders must disclose in their proposal their knowledge of the following:

- a) if the owners, part-owners, officers, directors, controlling shareholders, of the bidding entity or key personnel are family members of GIZ staff involved in the procurement functions and/or the Interim SCM Council or any Implementing partner receiving services under this EOI or tender; and

- b) all other circumstances that could potentially lead to actual or perceived conflict of interest, collusion or unfair competition practices.

- **Failure to disclose such an information may result in the rejection of the proposal or proposals affected by the non-disclosure.**

- **Questions & Answers will be placed on the link provided.**

- **Bids sent via Dropbox and WeTransfer will not be accepted.**

10. Annexes

Technical Specifications and Data Privacy Requirements

Annex A:

Technical Specifications and Data Privacy Requirements

Technical Factors and Specifications

- Language
- Hosting Platform / Connectivity
- Online / Offline Access and Teaching Methodology
- Interactivity of learners and collaboration tools
- Accessibility and Inclusivity
- Tracking Learner Progress
- Responsive Design
- Licence of Course Material
- Updating Course Content
- Quality Assurance

Data Security & Data Privacy Requirements

- Collection and processing of data
 - Storage and sharing of collected data
 - Utilisation of cloud storage services
 - Online tools and data security
-
- **Hosting Platform**

To ensure proper hosting, elements of the course that are online / web based shall be hosted by NEMISA's own Learning Management System (LMS), which is run on the Microsoft Azure platform, with Moodle as an optional platform.

Upon completion of the course development, it should be handing over to NEMISA or other partner in a SCORM format, to ensure timeous and efficient integration and adaptation, where required or uploaded onto an OER approved by FAIR Forward (where all materials and content can be accessed, including replications kits).

The platform created or utilised by the service provider to facilitate the training should include a reporting structure for integrated learner management system reporting on both

student performance and demographics. There should also be a dashboard for retrieval of real-time statistics.

- **Online / Offline Access**

The course should be developed with the intent that all base activities will occur online, with offline (in-person) lecturing occurring to supplement the online course notes. The intent here is for accurate reporting on material access and use, as well as easy adaptability for note revision and updates. The course knowledge transfer process will predominantly be offline (in-person). Students who cannot access in person should have the ability to live-stream those lectures and follow with the online course notes.

All learning aspects, material and course content should be made available digitally (online) and available for download or access when not at the training venue. The intent here shall be to streamline and align the offline and online process, as much as possible to ensure no participant is prejudiced.

The digital format of the course should require only basic internet access and shall not require additional plug-ins, e.g. Flash or Java to be downloaded. The digital format shall be compatible for use on popular web browsers, e.g. Google Chrome, Microsoft Edge, Safari, Firefox, TOR browser, etc.

- **Interactivity of learners and collaboration tools**

The course should have a high level of interactivity in both online and offline modes, including for example the following features:

- 'Single player' role playing game format and/or 'multiple player' game format (as applicable) with success and failure paths for individuals or groups
- Adaptive feedback
- Scoring mechanisms
- Recording and adding sound and subtitles where required, for online aspects of the course

- **Accessibility and Inclusivity**

To the extent possible, the course content should be produced so as to not prejudice persons with hearing or visual impairments. Voice-over narration and subtitles for the content (and navigation features) should be included, where possible, as well as the possibility to switch to a higher contrast for display on the screen.

- **Tracking Learner Progress**

After each chapter / module, the service provider should employ a teaching methodology in which skills, experience and knowledge gained can be demonstrated by the participants (trainees) and tested

Learners should have the ability to take a short quiz or undergo another suitable testing method. When the learners successfully complete the quiz or testing process, the module is shown or regarded as "completed."

Sub-modules should also be tracked and marked as completed, so the learners can avoid repeating content that they already did.

After the learners complete the entire module, including the last quiz and/or any other form of assessment that is required to rate a learner, a certificate of completion is generated.

- **Responsive Design**

- All aspects of the course that are online should be designed for use on computers / notebooks, tablets / iPads, and/or mobile phones and should be compatible with devices running iOS or Android as operating systems.
- The partner should have ease of access and integration into any learner management system / platform that they utilise.
- The elements of the platform / course that is hosted online

- **Licence of Course Material:**

Course material should be licenced under an appropriate open-source licence fitting to the “five R permission” of the “Open educational Resources” definition – e.g. a Creative Commons Share-alike licence CC-BY-SA or a creative commons non-commercial licence (CC-BY-NC).

Proposals on licencing should include the academic source material to be utilised and its license compatibility with the licence under which the training will be regulated (e.g. if Wikipedia articles are recommended as academic source content for the participants, it would be compatible with share-alike, and not align commercial use).

The course should be developed so that no license fees or other follow-up fees need be incurred.

- **Updating Course Content**

The training content should be designed in a manner that facilitates for easy updates by either the service provider or its successors.

The content must be kept updated with the latest developments in AI and any applicable use cases, the industries in which they apply, and should be reviewed at the end of the course for relevance, context and applicability to local and global factors. This shall include:

- **Fact updates** – maintaining the data, statistics, or information about the facts
- **Resource updates** – maintaining the links and references to external resources

- **Language:**

The training should be conducted in English, and all documents, material and associated resources (including external or supplementary training content) should be in the English language and designed in a simplistic, plain language, easy to understand manner.

- **Providing access to required infrastructure:**

The contractor is responsible for the provision of required infrastructure for the trainings. This applies for the provision of access to cloud computing resources for development and model training. Whenever possible, open source tools (e.g. Mozilla Deeps Speech) should be included in the training.

- **Quality Assurance:**

Develop and implement a quality assurance system for the training, which ensures didactical quality and responsiveness to needs of participants. The quality assurance system should be based on GIZ's Tool "Quality Assurance in Competence Building" (Tool 39 of Capacity Works) or other comparable frameworks and needs to be part of the offer and of implementation. It shall ensure compliance with, *inter alia* the following seven didactic principles for improving learning results:

- Ownership and self-organisation
- Learning support/advice
- Multiple perspectives and switching of perspectives
- Attitude of mutual regard and respectful comparison
- Spaces of experience
- Reflection

Data Security & Data Privacy Requirements

- **Collection and processing of data**

If personal data are gathered and processed in the course creation process, the process must comply with the legal requirements for data protection, including GDPR and POPI. The principles of data protection, such as purpose limitation, data economy and avoidance, transparency, and necessity must be considered.

The requirements of data protection law, such as the obligation to provide proof, to retain, and to delete data, must be fulfilled.

Furthermore, the Contractor shall ensure compliance with the GDPR and POPI formalities (as may be required) and shall include the necessary information in a protocol on processing activities. Company internal data and documents should be stored and processed in a secure environment that prevents unauthorized access.

- **Storage and sharing of collected data**

Personal data collected and processed must only be done in accordance with the privacy principle of data minimisation and stored in accordance with the POPI and/or GDPR (as may be applicable) for legitimate reasons as detailed in the regulations and in accordance with the timelines dictated by those regulations.

Personal information may only be shared in accordance with the regulation (i.e. explicit consent by and notification to individuals) unless such consent is not required by South African law. Where personal information and/or any associated data is to be shared or stored, and such consent is not required by law, notification of storage and/or sharing must still be provided.

- **Utilisation of cloud storage services**

The service provider must ensure that cloud storage services utilised comply with all cybersecurity requirements of GIZ and/or NEMISA, whichever may be applicable. Only pre-authorised cloud storage services may be utilised. This includes any hardware, infrastructure or devices that may be used to connect or temporarily enact or enable the disaster recovery plan.