Terms of Reference (ToR) for a Non-Key Expert: Software Development Quality Controller for the development of a financial application

The Project:	TA to MEHE – Technical Assistant to the Ministry of Education and Higher Education
Financing Institution and contracts number:	European Commission: NDICI-GEO-NEAR/2022/ 440-883
Expert Category:	Non-Key Expert
Duration of the mission:	Up to 16 Working days
Period of the mission:	From 15/03/2024 to 31/03/2025
Working Language:	English
Project activity:	1.3.1 Provide technical support to MEHE on fiduciary systems and financial management for sound financial execution and financial governance, with improved internal controls, robust budget templates and reliable accounts. – Software Development Quality Controller

1 Project Background

1.1 The situation

Lebanon has been suffering from instability on all levels for decades, but the situation has further aggravated in the last few years. Three years of layering of crises on top of one another - the economic crisis, compounded by COVID-19, the 2020 Beirut Port explosions and political instability have left all families residing in the country struggling to survive. Currently, Lebanon finds itself in a never before faced compounded crisis of extreme complexity, which was the result of several factors including the refugee crisis that started in 2011, noting that country is currently hosting 831,053 Syrian refugees[1] and 479,537 Palestinian refugees[2] according to latest UN agencies reports, in addition to the economic vulnerability and contraction, continuous political crisis, social unrest and heightened challenges since October 2019, the on-going debt crisis, COVID-19 and health crisis, banking and currency crisis, cumulative inflation rate, education sector crisis, which was preceded by teachers' protests since 2017-2018 against low remuneration and the Beirut Blast in August 2020 and its on-going consequences. All these crises resulted in enormous strains on population's physical and mental health, access to food, basic services, education, and safety among others.

1.2 Current situation in the target sector

The events that took place in the last few years have added further layers of obstacles on top of an already compromised Lebanese public and private schooling system in its efforts to provide education for children residing in Lebanon. The crisis left an impact on the different levels of the education system, starting with MEHE's inability to perform normally due to the economic and social situation, teachers and staff's losing motivation and students unable to attend classes on daily bases for several reasons among many other levels. The crisis' impact on the educational sector affects children's wellbeing and threatens their future, the social stability (including people's ability to escape the vicious cycle of poverty) and country's abilities to overcome the socioeconomic and political depression and to set up a sustainable governance and economic model. The

[1] UNHRC, 30 June 2022
[2] UNRWA in figures, UNRWA, 31 December 2020

below provides a detailed insight on the current situation in the education sector in Lebanon and sheds the light on major gaps and existing issues:

- Access to education opportunities and disruption of education services
- Quality of education services
- Governance of education systems
- Education-related expenditures for families and MEHE
- Large donor group involved in the sector.
- MEHE needs and gaps.
- Budgeting and Planning
- Capacity Gaps
- "Internal Politics"

1.3 About the project

With the country slipping deeper into an economic and financial crisis, the education sector and the Ministry Education and Higher Education (MEHE) are in high need of support to ensure their ability to sustain their operations and remain able to deliver high quality education to all children residing in Lebanon. While the complexity of the situation is increasing, with high number of dropouts and out-of-school children, a significant number of students migrating from private to the public school because they cannot afford the high fees anymore, low teachers' motivation, challenges on the level of transportation and unavailability of basic needs at schools such as power, in addition to a considerable decline in the quality of education, support is needed to ensure that MEHE, including Directorate for General Education(DGE) and all other departments, guarantee learning continuity under a multiple crisis context through a more resilient education system, that is able to provide quality, inclusive and safe education for all children.

To cover the existing gaps, the Technical Assistance to the Ministry of Education and Higher Education (TA to MEHE), aims at "building an education system (Ministry for Education and Higher Education) better equipped and able to deliver quality basic education", through the below 3 outcomes:

- **Outcome 1:** enhance the governance capacities of the MEHE in the field of strategic and operational planning, monitoring, and reporting, budgeting, and public finance management.
- **Outcome 2:** enhance the capacities of the MEHE for the delivery of quality teaching and learning by management and educational staff empowered with 21st century skills development.
- **Outcome 3:** enhance the performance of the public education system (MEHE) through improved management and business operating procedures.

2 The assignment

2.1 Background for the assignment

The Ministry of Education and Higher Education in Lebanon is currently moving its financial processes to a more efficient format using currently available digital tools.

2.2 Outline of the mission

The current financial application utilized by MEHE produces reports that lack sufficient data quality and timeliness. Additionally, its subpar user experience prompts stakeholders to resort to other applications, thereby complicating MEHE governance and management. Compliance and security issues further compound the challenges with the current application.

These shortcomings have significant implications for MEHE, which include: Potential loss of funding opportunities; Inefficient allocation of resources, potentially resulting in underfunding of critical priorities; Reliance on alternative software disrupts MEHE-GDE's ability to effectively steer, manage, monitor, and evaluate educational performance.

In 2023, the MEHE determined that an improved PFM app would need to be developed in order to address the existing challenges in the following areas: Budget execution; Budget review; Compliance and internal control; and Facilitating interaction between EMIS and PFM systems, especially those based on Oracle.

Overall, the Software Development Quality Controller (SDQC) will review, assess and make recommendations on the deliverables of the Technical Lead, the consultant who conducts the technical development of the Fin-App software application, as recorded in the project charter. Thus, the SDQC shall help in guiding the technical aspects of software development projects, ensuring high-quality code, and resolving technical challenges and providing related support to the TAMEHE team.

2.3 Description of the activities to be performed by the STE:

The role of Software Development Quality Controller (SDQC) in the development of the Fin-App software application is pivotal in ensuring the technical success of the project. Here are the SQC' key responsibilities and aspects of his/her role:

- **Technical Guidance**: Reviews and comments on the submitted workplan, overall architecture, design patterns, technologies, and coding standards to be used in the project.
- **Code Review and Quality Assurance**: Reviews and comments on code written by the team in charge to ensure adherence to best practices, coding standards, and quality guidelines. The SDQC provides feedback, suggestions to improve the overall codebase quality.
- **Problem Solving and Troubleshooting**: Reviews and comments problems encountered, root-cause analysis and solutions selected to keep the project on track.
- **Collaboration and Communication**: The SDQC will work directly with the TAMEHE team to provide independent technical assessments of the work produced in cooperation by other NKE and MEHE employees.
- **Risk Management**: Reviews and comments on technical risks and dependencies identified that may impact project delivery and mitigation strategies to address them.
- **Technology Evaluation and Adoption**: Reviews and comments on the technologies, frameworks, and tools selected to enhance the development process or improve the quality of the software application.
- **Performance Optimization**: Reviews and comments on approaches used to optimize the performance of the software application based on identified bottlenecks, analyzed system metrics, and implemented optimizations.
- **Documentation and Knowledge Sharing**: Reviews and comments the documentation of technical decisions, architectural diagrams, and other relevant information used to facilitate knowledge sharing and to maintain a clear understanding of the project's technical landscape.

2.4 Outputs/Results of the mission

The objective of this assignment is that the Software Development Quality Controller provides an independent and software developer's assessment of the various outputs delivered by the NKE entrusted with developing the application.

The outputs/results requested from the SDQC are:

1. An assessment of each of the deliverables of the NKE tasked with the actual development of the application. These assessments will follow the list of deliverables of the NKE as detailed in the Project Charter (attached) and reflected in the list below:

#	Project Phase	Milestones, Planning Deliverables	Target Completion Date	Review
	Initiation	Discovery Project Charter	31.03.24	+ 1 week
	Planning	Project Plan Communication Strategy/Plan	15.5.24	+ 1 week
	Requirements	Business Requirements may also include Service or Product Requirements	15.6.24	+ 1 week
	Analysis & Design	Functional Designs May also include Service, Product and Technical Designs Test Plan	15.7.24	+ 1 week
	Development	Tech Designs & Development May also include System, Service or, 3rd Party Service Integration, Service Page	31.8.24	+ 1 week
	Testing	Test Plans / Test Cases May also include a Proof of Concept or Pilot	30.9.24	+ 1 week
	Deployment / Rollout	Readiness Planning Documentation	30.11.24	+ 1 week
	Project Close	Project Financials and Close Docs Lessons Learned	15.12.24	+ 1 week

   The SDQC will provide an assessment at latest one week after the submission of each milestone in the table above. The exact schedule is subject to changes due to negotiation between GIZ-TAMEHE and MEHE representatives.

   The assessments shall use a brief memo format (2-5 pages each). TAMEHE will determine further details in cooperation with the SDQC.

2. The Software Development Quality Controller shall provide ad hoc advice to the GIZ-TAMEHE team.

3 Expert Profile

The qualifications and experience required for a Software Development Quality Controller are as follows:

1. **Education**: A bachelor's degree in Computer Science, Software Engineering, Information Technology, or a related field is often required for Technical Lead positions. Some employers may prefer candidates with a master's degree or relevant certifications in software development or related areas.
2. **Experience**:
   - Mid-level positions may require 5-8 years of experience, including hands-on experience leading software development teams, designing and architecting software solutions, and implementing best practices, or
   - Senior-level positions may require 8+ years of experience, with a proven track record of successfully leading complex software development projects, managing technical teams, and delivering high-quality products on time and within budget.
3. **Technical Skills**:

- Proficiency in programming languages and technologies relevant to the project requirements (e.g., Java, Python, C#, JavaScript, etc.).
- Strong understanding of software development methodologies, such as Agile, Scrum, Waterfall, or a combination of methodologies (hybrid approach).
- Experience with software design patterns, architectural principles, and best practices for software development.
- Knowledge of software development tools and frameworks, such as IDEs, version control systems (e.g., Git), build automation tools (e.g., Maven, Gradle), and continuous integration/continuous deployment (CI/CD) pipelines.
- Familiarity with cloud computing platforms, microservices architecture, and containerization technologies (e.g., Docker, Kubernetes) may be advantageous, depending on the project requirements.

4. **Leadership and Communication Skills**:
    - Excellent verbal and written communication skills to communicate technical concepts, architecture designs, and project plans to stakeholders and non-technical audiences.
5. **Problem-Solving Skills**:
    - Strong analytical and problem-solving skills to analyze complex technical challenges, identify root causes of issues, and propose effective solutions.
    - Ability to make informed decisions under pressure and adapt to changing project requirements or constraints.
6. **Organizational Skills**:
    - Excellent organizational skills to prioritize tasks, manage multiple projects simultaneously, and meet deadlines in a fast-paced environment.
    - Attention to detail to ensure that technical designs, architecture diagrams, and documentation are accurately maintained and updated.
7. **Customer Focus**:
    - Customer-centric mindset to understand and prioritize customer needs and expectations, ensuring that the software application meets user requirements and delivers value to stakeholders.