

Brief for MEI International

Useful Links:

- <https://www.jakobmueller.com/technologies/digital-solutions/muecad/>
- <https://www.jakobmueller.com/info/news/news-detail/muecad-50-update-to-version-51/>
- https://www.jakobmueller.com/fileadmin/Storages/mueller-frick.com/Products/Digital_Solutions/Muecad/EN/MUECAD.pdf

We are conducting a technical scouting aimed at modernizing (revamping) a Windows-native desktop textile CAD platform developed in C++, with advanced graphical features and CAD/graphic-intensive logic. With this brief, we wish to verify your availability and technical suitability to conduct Phase 0 of the project, consisting of code due diligence and proof-of-concept (PoC) on key functionalities.

Concise Technical Context

Application: Windows desktop (not web-based), legacy C++ codebase (GUI components + core modules), use of historic libraries/frameworks (e.g., Win32/MFC/...).

Modernization Objectives:

- Technical upgrade for Windows 11/12+ compatibility;
- Refactoring/modularization of the C++ core;
- Development of distinct GUI interfaces for different user profiles (same logic, differentiated UX);
- Preparation of local APIs (DLL/COM/IPC/local REST/file-based) for future integrations (external wrappers, automations).

Constraints:

- On-premise / local execution;
- Maintaining performance and reliability on real-size datasets;
- Portability to future major Windows releases (forward-compatibility).

Planned Project Phases (for context)

Your proposal is requested only for Phase 0 and will be formulated after your requirements list and an initial discussion with NDA.

Phase 0 – Due Diligence & PoC

Architectural analysis and code audit (sources, dependencies, build system). Mapping of technical debt, risks, bottlenecks (performance, memory management, concurrency). Definition of an executable PoC on 1–2 critical functionalities (e.g., project opening/import, rendering/preview pipeline, saving/export to machine format).

Expected Deliverables:

- Technical report (as-is architecture, risks, pain-points, stepwise refactor plan);
- Executable PoC with technical notes (assumptions, limitations);
- Work plan and executive estimate for Phase 1–2–3 (high level, milestones, resources).

Phase 1 – Core Refactor & Modernization (post Phase 0)

Re-engineering in modern C++ (C++17/20/23 where appropriate), clear separation between core and presentation layer. Review/upgrade of toolchain (Visual Studio 2022+), CMake/build system,

dependency management, CI.

Phase 2 – Multiple GUIs (brand/profile-aware)

Implementation of two distinct GUIs (same core), with skin/feature toggling and dedicated UX (operator vs. power-user). Localization, accessibility, permission profiles, persistent preferences.

Phase 3 – Local APIs & Integration

Definition of API contracts (IDL or specification) and implementation of local binding (DLL/COM/IPC/local REST). Adapter for import/export to external ecosystems (file/machine formats, proprietary protocols if present).

Phase 4 – Qualification & Validation

Functional, performance, regression testing; definition of test harness and automated suites; packaging and installer.

Phase 5 – Support & Evolutionary Maintenance

Handover, developer/user documentation, patching plan and security hardening.

Information/Artifacts We Request You List to Quote Phase 0

To formulate a proposal for Due Diligence + PoC, we ask you to indicate what you need (customizable checklist).

As an example:

Code & Build

- Access to source repository (or archive); module structure; main branches.
- Current build instructions (IDE/VS version, toolchain, scripts, CMake/MSBuild).
- Dependencies (internal/third-party), versions, licenses; any proprietary SDK/drivers.

Executables & Data

- Current binaries, complete sample projects (small/medium/large), test files.
- Any proprietary formats (specifications, examples, constraints).

Documentation

- As-is architectural drawings, functional specifications, user manuals.
- Known issues, bug list, performance notes, regression history.

Environment & Constraints

- Target operating systems, security/integrity requirements, networks/permissions, antivirus/EDR.
- Packaging requirements, installer, code signing, update policies.

Use-cases & Test

- Typical use flows ("happy path", edge cases), functional priorities.
- Existing test cases, acceptance metrics, performance KPIs (opening/render/export time, RAM/CPU).

Technical Contacts

- Technical contacts for Q&A; any sessions with "domain experts".

Please return to us your complete and customized list of prerequisites/artifacts needed, with any preferences on formats and delivery methods (VPN access, secure transfer, etc.), so we can proceed with NDA and planning.

Targeted Technical Questions (for preliminary alignment)

- Approach to reverse engineering and code comprehension (tools: static analysis, call-graph, coverage, sanitizer, linter, SAST).
- Experience porting from MFC/Win32 to Qt/WPF native wrappers or modernizing MFC while maintaining stability; GUI framework selection criteria.
- Performance management (CPU/GPU profiling, memory leaks, contention, I/O); experience with 2D/3D rendering, caching, tiling.
- CI/CD for desktop: build/test pipeline, automated smoke/regression, artifact repository, binary signing.
- Local APIs: preferred patterns (DLL/COM/IPC/local REST), versioning, backward compatibility.
- Quality & Safety: testing strategy (unit/integration/e2e), test data, field bug replication.
- Documentation: dev docs, architecture, ADR (Architecture Decision Records), user guides.
- Team: expected roles/seniority (C++ architect, senior GUI, core dev, QA, devops).
- Security/IP: policies on code ownership, open-source libraries, licenses, SBOM.

Governance & Operating Methods (expectations)

Co-design approach (brief but regular technical meetings), shared issue tracking, dedicated Q&A; channel. Deliveries per milestone with clear acceptance criteria (definition of done). Possible on-site collaboration (in critical phases) and periodic technical progress audits.

NDA and Next Steps

The first step following the scouting will be signing a mutual NDA to provide you with the technical materials. We propose an initial introductory meeting, according to your availability, in a remote call (30–60 min) for alignment and definition of the checklist for Phase 0.