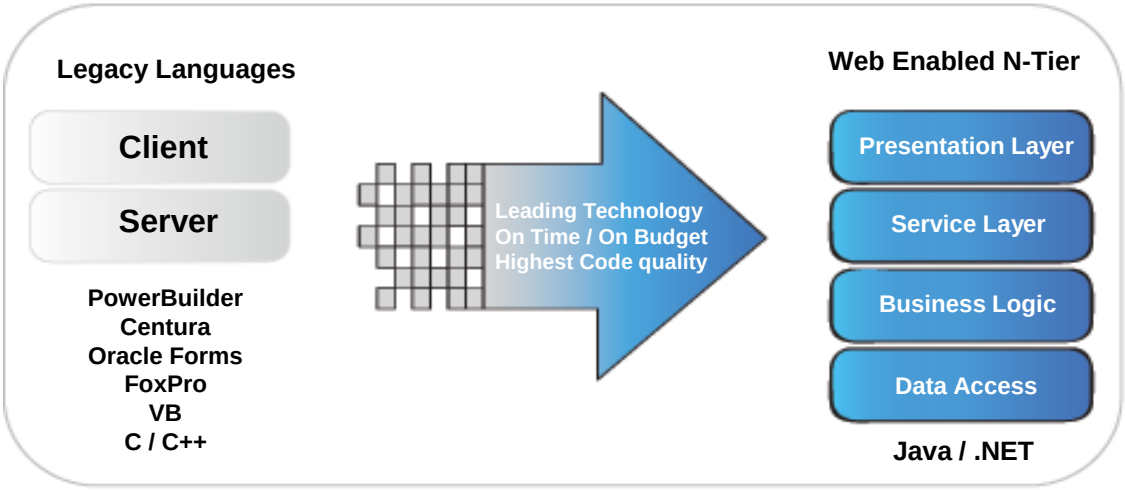
The Metex Application Modernization Solution

Modernizing Legacy Client Server Applications to Java / .NET

Leadership in Automated Enterprise Application Modernization

Established in 1989, Metex is today the leader in the Modernization of Legacy Client\Server applications. Governments, Fortune 500 corporations and ISVs around the world are attracted to Metex for proven expertise and ability to upgrade and enhance older systems into new, high-quality, native web enabled Java and .NET applications. Metex's highly experienced team uses an advanced suite of in-house technologies to deliver an optimal solution.



The Metex Accelerated Automated Application Modernization Enterprise Solution

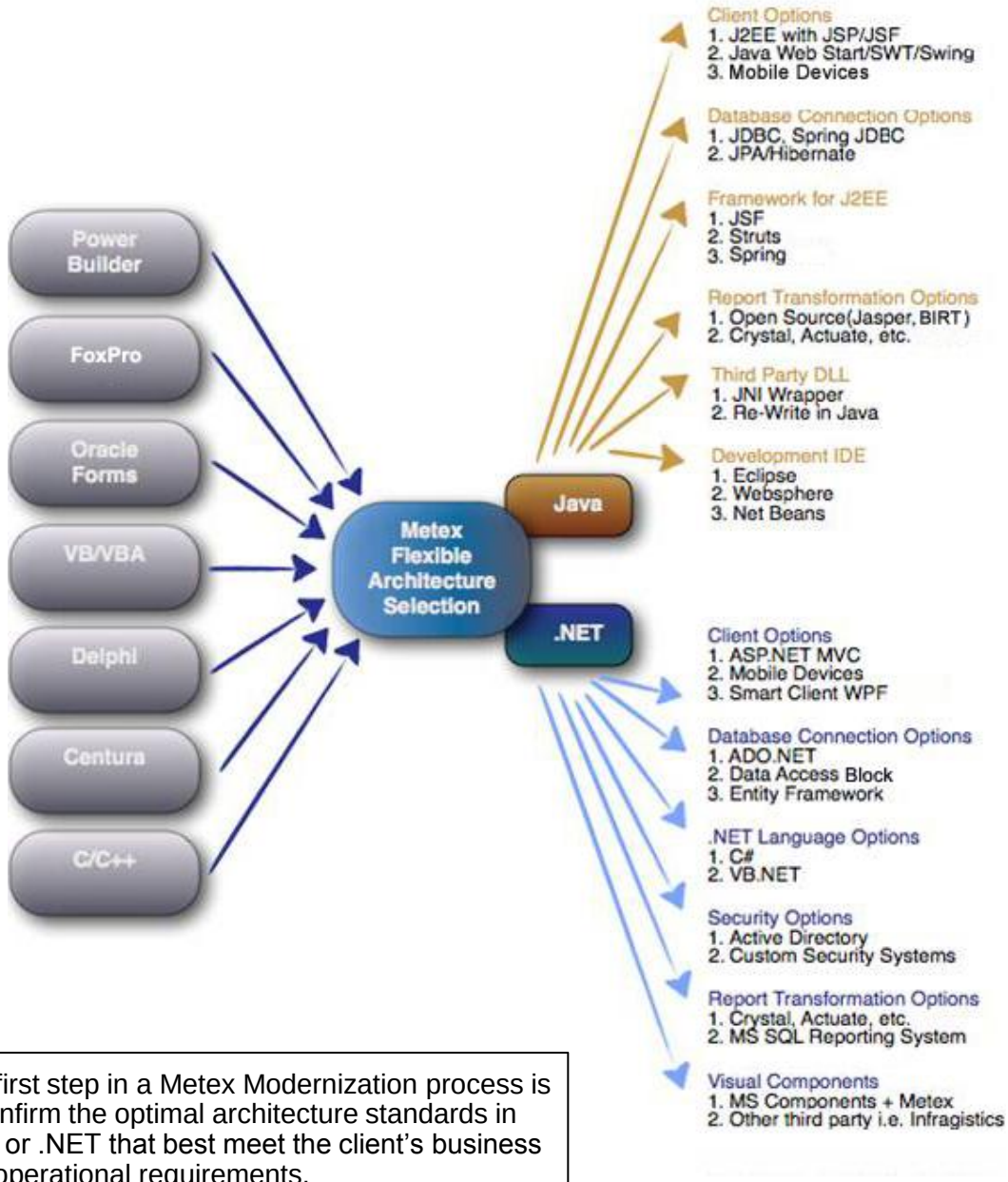
- Data and Code Mining
- Application Architecture Design
- Automated Test Case Creation
- Code Conversion
- Application Enhancements
- Advanced Visual Documentation

USA: 1321 Upland Drive Suite 4600 Houston, TX USA 77043 | Tel: (866) 817-8137
INTERNATIONAL: 789 Don Mills Road, Suite 218, Toronto, ON CAN M3C 1T5 | Tel: (416) 203-8388

metex INC.
www.metex.com

Target Language Architecture Selection

It is essential to define an optimal target Java and .NET architecture for any application migration. Metex solution provides a wide range of architect solution to select to meet the enterprise standard. There are a range of decisions that must be made in determining the optimal architecture selection in both target language options. Some organizations have clearly defined corporate standards for all applications in Java or .NET, while other organizations may request information from Metex to clarify the pros and cons of the various code architecture options. Metex uses a variety of automated tools to convert the majority of the Legacy code into Java or.NET, but the automated portion of the Modernization is run in a series of steps that are configured to produce the required code structures and code to meet the client's standards.



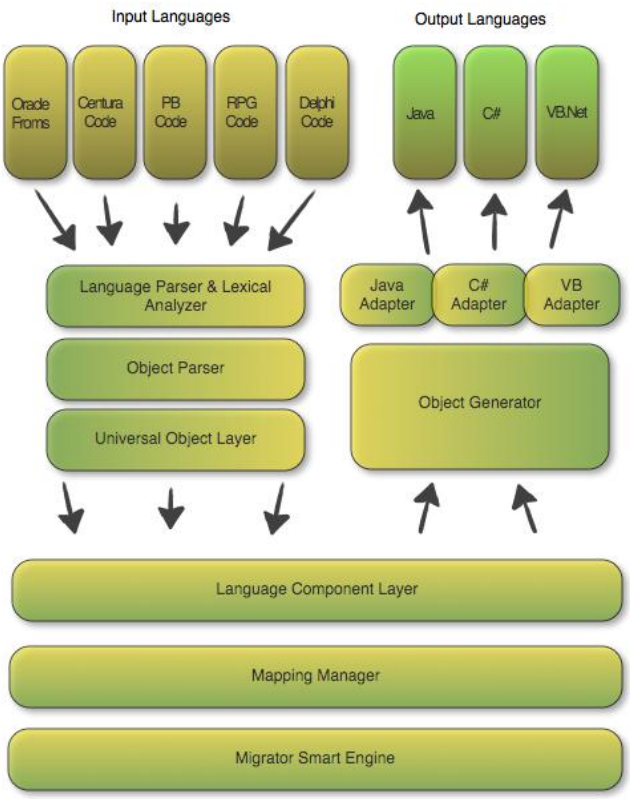
The first step in a Metex Modernization process is to confirm the optimal architecture standards in Java or .NET that best meet the client's business and operational requirements.

Modernization – Automation But NO Compromise on Code Quality

Metex in fact does use automated tools to convert the majority of the code in legacy application into Java or .NET. The automated portion of a Metex application modernization process does take several weeks and is configured to match the unique architecture options that the customer has selected. In the conversion or migration process provided by other vendors, automated tools are run quickly in a one time pass of the legacy code and always create the same format output code. The conversion tools (much like a sausage machine) create code in the same format regardless of the input and generally have the characteristics of the legacy language now inside of Java or .NET.

How Does The Metex Code Conversion Engine Work?

A key step in the Metex modernization services is the next generation of automated tools, the Metex Code Conversion Engine is a key element. This is a multi-layered, object-oriented technology that automatically reproduces the framework of objects in the original application and translates the original application's functionality into Java or .NET. The revolutionary Metex Code Conversion Technology is based on an advanced artificial intelligence functionality and produces native code that is easy to work with for future maintenance, support and upgrades.



INSIDE THE METEX CODE CONVERSION ENGINE

Here's what happens inside the Metex code conversion engine

1. **Code loaded into Metex Code Engine**
   The source code of the original application is loaded as input.
2. **Functionality of code identified**
   The functionality of the code is analyzed by the LPLA.
3. **Object structure marked**
   The inheritances and relationships of the business logic framework is mapped.
4. **Code converted to universal layer**
   The input code is converted to universal code to allow for interface to Metex code engine libraries layer.
5. **Functionality transformed to new language**
   The functions of the original language are mapped into native functions, data types, etc. Any remaining functions are transformed using Metex Libraries.
6. **Code reassembled into the new structure.**
   The object structures and inheritances marked in the Object Parser are re-assembled by the Object Generator.
7. **Code output in new language**
   The new application is output in the new language, ready for our professional services team to begin their work on the Java or .NET code.

Accelerated Application Modernization with Advanced Technology

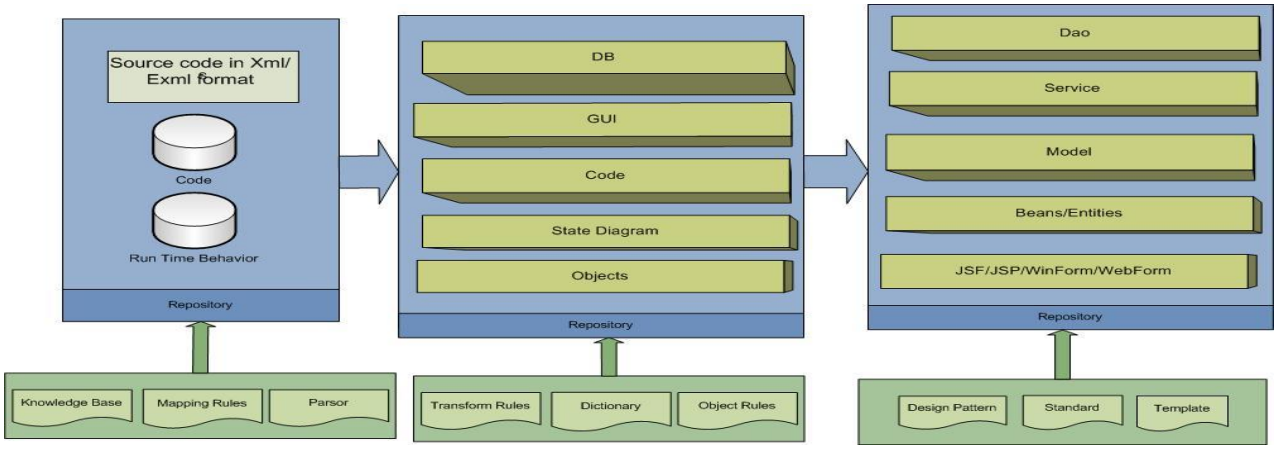
Metex Application Modernization uses automated software tools, developed by people who understand both the old and the new technologies. Together with specialist services from qualified and experienced consultants, Application Modernization delivers fully-tested, working (and, where appropriate, enhanced) applications utilizing a five-stage approach.

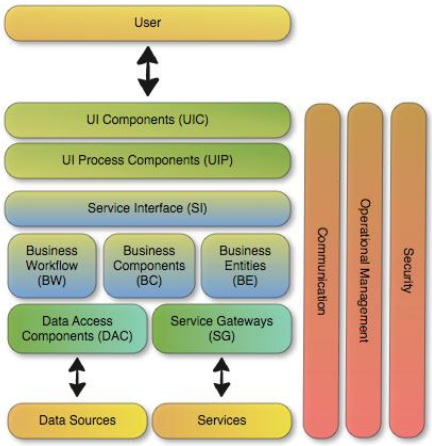
1. Project Planning – Architecture, Security, Design, Dynamic Aspects

Detailed application analysis and Application Modernization project planning takes place after the client has confirmed the architecture requirements in the target language. The detailed application analysis will be used in both the automated and the professional services phases of the code modernization project.

2. MMTS – Metex Model Transformation System

The Metex Model Transformation System (MMTS) was developed to enable code structure analysis of legacy languages into modernized 3-tier architectures in Java or .NET. The MMTS technology is an integral part of the Metex modernization solution and it is the reason that Metex is the only vendor that can transform 4GL applications such as PowerBuilder, Oracle Forms, etc. into a pure N-tier structure compliant with SOA requirements.

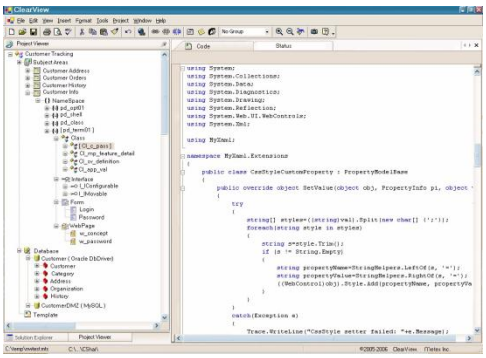




3. Metex Transformation Suite of Tools

The process of legacy code through the Metex Application Transformation technology is a complex multi-step process that requires special knowledge and effort by senior architects. The process that Metex to run legacy code through the Transformation tools has never been a simple "double click" on the Transformation application and select an input file. The automated portion of the Application Transformation process is difficult because Metex is focused both on matching the client's architecture standards and producing a very high quality of code that will be used in the next phase by the Transformation professional services team.

4. Transformation Professional Services



The Metex Professional Services Team takes the output from the Transformation Tool and completes any code that could not be converted by the Transformation automated tool suite. During this phase the Services Team extensively makes use of code mining and code analysis tools that have been developed by Metex to facilitate the accurate completion of the code. The Services Team works on the transformed code in a highly organized manner and progress Is tracked daily with the ClearView project control system.

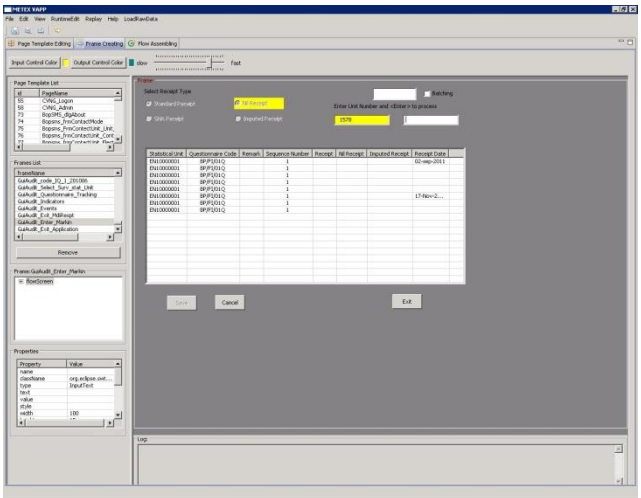
5. Metex Testing Methodology

Testing is a very taxing phase that is supported by proven Quality Assurance and Quality Control procedures as well as unique Metex technology. Metex has its own testing methodology but also uses test cases that are provided by the client to verify that business logic has been correctly moved into the new architecture. Metex has technology and a methodology to create test cases for a client to verify that the business logic has been correctly transformed.

6. VAPP – Virtual Application / Run Time Analyzer

The Metex Virtual Application (VAPP) is designed to capture the run time behavior of the application

- Run time analysis including state diagram, sequence diagram, business flow
- Identification of dynamic behavior screens
- Replay and analyze behavior for any specific window
- Testing of the application – use recorded information as test cases
- Analyses the screen operation and makes AJAX to reduce unnecessary refresh an easy job
- Facilitate UI reengineering: such as introducing hyperlinks, applying pagination, MDI emulation etc.
- Provides the foundation for Test Driven Development and Agile Development



7. Automated Test Script Generation

An extremely valuable feature of VAPP for all client's is the ability to generate automated test scripts. This is a capability unique to Metex that automated test scripts can be produced in very short time and requires minimum effort from the client. What Metex requests are a number of hours of several web sessions when application users demonstrate how to work with the application. The web sessions are recorded and used as an input for VAPP. As an outcome of this process the VAPP produces automated test scripts.

The Metex Modernization Advantage

Application Modernization NOT Application Migration

Standard application migration utilizes a code conversion or translation process based on parsers and syntax conversion. Applications migrated using this method retain of much of the original application's "look and feel" with the original programming language code structures, and often require the need for additional third party proprietary and or emulation libraries. The Metex solution is based on application modernization, a process that delivers higher quality code and more architectural flexibility than a standard application migration. Metex's solution provides a completely new code structure in pure, native-style Java or .NET that retains no characteristics of the original 4GL source language structure. The newly modernized application is now able to leverage powerful Java or .NET features that were not available in the original legacy environment.

Modernization Into Client-Specific Architecture Standards

The first step in a Metex application modernization project is to work with the client to design and confirm their architectural standards in the new target language. Metex offers the industry's most flexible choice of architecture options for both Java and .NET including multiple choices for client interfaces, database connection methods, external DLL handling, security, report solutions, and many others. Metex utilizes a suite of proprietary Business Intelligence and Code Mining tools for each application layer (data access, business logic and user interface) to re-engineer and re-architect the application to the client's desired architecture and coding standards.

High Quality Native Style Java or .NET Code

Metex's modernization process uses a suite of sophisticated, automated tools that produce high quality, native-style Java or .NET code that can be easily maintained with industry standard IDE tools. Unlike the output of other migration or conversion tools, Metex solutions include no non-standard code, proprietary libraries, or external dependencies. The transformed code has a standard Java or .NET format that replaces problematic 4GL functions with the improved functionality available in Java and .NET. The Metex solution also goes beyond simple migration of a 2-tier client server application to a 3-tier Java or .NET architecture by offering a wide range of options for improving the user interface, code structure and other aspects of the application.

Modernization Solution - Refined / Improved through Experience

The Metex solution maximizes project efficiency and code quality through the use of automated tools to perform the initial modernization stages and professional services to complete the modernization process. The Metex professional services team has honed its skills on numerous modernization projects of varying size and complexity over the previous ten+ years. Metex follows a systematic process and methodology which ensures a predictable, high-quality result that has been validated on over 100 million lines of modernized code.

Modernization Projects Managed with Efficiency & Transparency

To maximize project quality and deliver an efficient modernized solution, Metex utilizes the ClearView web-based tool, developed by Metex, for managing every aspect of modernization projects including; real time project status, testing, problem logging and resolution and project statistics, reporting and analysis. ClearView has evolved as a result of the experiences learned in modernizing millions of lines of code and is essential to Metex's guarantee to our clients to deliver on time and on budget.

Issues to Consider in the Legacy to Java / .NET Options

The following chart reviews the key issues with the various options to take legacy applications to Java or .NET. The manual project has the highest cost and high code quality but also has a high risk due to the very long time duration of the project. Applications that go through a "code conversion" are generally re-done several years after the initial project as the code is generally difficult to maintain.

Project Type	Issues	Cost
Manual Project	▪ Long Project Duration ▪ High code quality	▪ Very High Cost ▪ Cost not always counted in full for in house projects
Application Modernization …. The Metex Solution	▪ **Project duration time generally 1/4th of a manual migration** ▪ **High code quality as manual project**	▪ **Medium Cost** ▪ **Reduced Long Term Maintenance**
Conversion (Migration)	▪ Limited to taking Client Server Legacy to Client Server Java /.NET ▪ Code appears to be Legacy in Java/.NET	▪ Medium/Low Cost ▪ But high code maintenance cost
Syntax Translation	▪ Should not be used for 4GLs ▪ Intended for simple applications	▪ Very Low Cost ▪ No value for 4GLs or larger applications

Principles of Automated Application Modernization

1. Client must be able to select application architecture
2. Multiple automation for tools for different tasks
3. Different tools selected as per the architecture selected by the customer
4. Code created via automation must be native and "current" industry style and structure of code
5. Code must not appear to be 4GL style code in Java or .NET
6. Client must be able to maintain control of the required output with regular reviews
7. Detailed application project plan mutually agreed
8. Do not introduce any libraries where client does not have the source code.

"Metex is in the business of application modernization rather than code migration."

On-Time / On-Budget

The Modernization process with its rigorous project management and proven technology, provides a fixed price route from risk-laden, poorly supported code to a high quality, business focused solution.

"Metex worked closely with us.
They understood our requirements and proposed the best way forward for our business"

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Solution Highlights

- Project assessment and objectives definition
- Target architecture definition and roadmap
- Project management
- Legacy code quality review and clean-up
- Test case and test script creation
- User interface enhancements
- Internationalization
- SOA component creation
- Internationalization
- Cloud ready
- Application architecture re-engineering
- Database migration
- Application improvement and refactoring
- Report migration
- 3rd party application integration
- Documentation, training and ongoing support

Case Studies

(Download the Case Studies from our Website)

The Texas Computer Cooperative successfully converts it's Student Administration System from PowerBuilder to Java using Metex's Modernization Solution

The Bank of Montreal selected Metex to upgrade mission critical VB6 applications to a web based .NET solution.

Metex modernized the Allianz insurance system developed in PowerBuilder with million lines of code into a modern N-Tier Java structure.

Metex modernized the Australian Pacific National rail systems PowerBuilder Operation Control application into a modern .NET architecture.

MortgageFlex successfully upgraded its flagship LoanQuest mortgage and loan origination system from Centura to .NET using Metex's Modernization Solution.

About Metex

Metex started business in 1989 as an enterprise application development company, successfully completing numerous 4GL client\server applications for global government and commercial clients. In 1999, Metex recognized that the market was moving away from client\server to web-based architectures and made a significant investment to create advanced technology which transforms legacy client\server applications to high quality n-tier solutions in Java or .NET.

Today, Metex has become a leader in accelerated automated application modernization solutions. Metex's technology suite includes advanced, code mining, and business intelligence tools coupled with project management and control software to keep large modernization projects on track with progress transparent to the client. In addition, Metex has developed a tried and true methodology which ensures a successful project delivery.

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