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# A Systematic Approach and Framework for Business Transformation through Enabling Technology

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**Abstract:** ***Technology is no more back bone accounting application, technology has taken a front seat to drive business. Technology has completely transformed the way of doing business. As technology, has becomes key driver to transform the business, organizations have started emphasizing having Chief Digital Officer to drive Digital disruption. Systematic approach and framework can ensure the technology advancement can bring value and transform the business. This paper proposes the systematic approach and framework for technology modernization, radical shift in Digital platforms to transform the business.***

**Keywords:** Business Transformation, Technology Modernization, Digital, IoT, ERP, Legacy Modernization

## 1. Introduction

Fast changing macro-economic environment is pushing organizations to have change and/or transform the business model, business strategies. These lightning fast changes or transformation can be achieved by technology. ICT (Information and communication technology) has changed the business models. eCommerce, mCommerce have challenged the traditional brick and mortar business. Huge capital investments which was needed for physical shops have moved to virtual space in the form of Digital stores.

Recently, since 2015 onwards, we see a trend, where eCommerece and mCommerce organziations have started opening brick and mortar stores.

Legal and fiscal requirements are changing very fast, due to most of the counties are moving towards e-governance, cleaner and safer planet, reducing carbon impact, electronic payments and so on. Organizations need to keep evolving via change or completely transform to meet fast changing legal and fiscal requirements. Competition is at its peak; every industry is launching new models every day. Be it mobile phone, car models or any other products. Most of the newer products have high degree of automation and artificial intelligence which means now technology can transform new products. Smart TV, Smart Schools, Smart building, Smart Bathrooms, Nano technology, robotics all are technology innovations. Organizations have realized that technology has become extremely important part of business. Business transformation in this era is highly dependent on technology.

## 2. Statement of the Problem

Digitalization and technology adoption is no more optional for the businesses. Most of the businesses have technology footprint (AS-IS) and completely aligned as per business processes and strategy. When companies decide to transform the business through enabling technology, the biggest problem is from where to start, what framework to be used, what methodology to be used? To achieve the success in technology based business transformation, business need to have strategy and technology implementation going hand in hand. Strategy consulting and technology consulting cannot work in silos any more. The CIOs and CDOs are aiming at the following

- Business – IT alignment. IT transformation to enable business transformation
- Overall Cost reduction
- Allocate higher budget percentage to innovation (By reducing the overall Maintenance cost)
- Invest in cloud computing and enablement of social media
- Improve the IT application agility and make it future ready
- Cloud First Mobile First mindset
- Artificial Intelligence & robotics
- Nano Technology

## 3. Proposed Framework

### 3.1 Key Solution Consideration

While every CIO and CDO wants to jump into the technology driven business transformation, there is no single method which is proven beyond doubt as the best way to achieve the technology transformation. Let us examine the key considerations while deciding on the technology modernization method.

Key Solution Considerations While Taking Up Modernization Program include:

- Protect the past investments: Millions of Dollars were spent on building and stabilizing the legacy applications. Throwing it out through the window is not an option. Cost

of building new apps is prohibitive. Hence, they need to extend the value of the existing legacy apps thereby protecting past investments.

- Minimal Impact: There should be minimal business impact during project execution. Overall risk to business should be minimal. One must use the least disruptive modernization approach.
- Incremental execution: The project may run for years. However, it is important to progress incrementally. There should be tangible benefit in the first year itself, which will strengthen the business case to continue the project in coming years.
- Clearly defined savings objectives: A detailed assessment phase is required to establish a strong business case. The business value to be achieved should be accepted as one of the project objectives.
- Future Proofing the Application: After the transformation, the applications should be future proof. Loose coupling between modules, Introduction of efficient application architectures such as SOA, complete overhaul of presentation layer (mobile ready / web ready), complete end to end documentation and conformance to industry standards are the various aspects to be considered to meet this objective.
- Change Enablement: Organization Change management must be diligently planned. Modernization implies that some of the work force need to re-skill themselves. Hence there will be resistance.
- Use of Open source should be a key consideration
- Journey to Self-Funding: Application Modernization Programs should be ideally self-funded. The project should be planned in that way.

We suggest an end to end solution framework which can overcome the perceived challenges and can strengthen and complement the Agile, Intelligent and Connected approach of new generation theme.

### 3.2 Suggested Solution Framework – Accelerated Modernization Framework (AME)

We suggest a comprehensive solution framework which combines the strategy, business case preparation, technology consulting, technology architecture and Infrastructure architecture. We would like to name the suggested framework as Accelerated Modernization Environment (AME) framework. A high-level component view of the AME framework is illustrated below

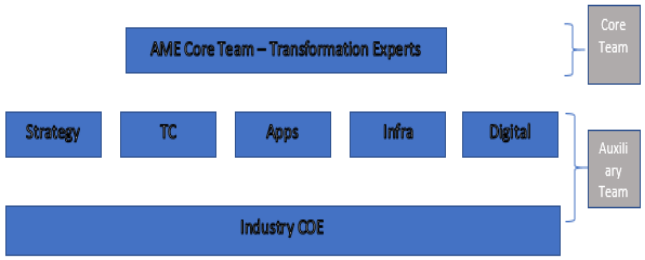


**Figure 1:** Accelerated Modernization Environment (AME) Framework Components

The AME is founded firmly on the fact that the Application Modernization initiatives in enterprises cannot be ad-hoc. It needs to be a continuous process.

**The Transformation Team:** AME framework envisages a global practice to be set up in organization which would have permanent members who are modernization experts. The AME practice would also be supported by a strong auxiliary team consisting of application group experts, Infrastructure experts, Digital experts and Industry experts.

The AME practice (core team) would closely work with business and market research companies to identify the transformation opportunities.

The AME practice would ensure continuous watch on current applications to identify the need and benefits of modernization much ahead and will keep the organization market position as the pioneers in the respective industry.

### 3.3 The Transformation Methods:

The multiple technology transformation approaches are explained in detail below.

1) Re-platforming (ex: Port from IBM AIX to Unix/Linux on Cloud): This is fairly low cost and low risk method. You just lift & shift the application from an old platform (Mainframe / IBM AIX) onto cloud platform with Open Source OS such as Linux. This reduces the operating cost by up to 75% and the savings & freed resources can be used for further modernization initiatives. Once the migration is done, new functionality could be delivered 40% faster. The migration also improves the transaction through put.
2) Technical Upgrade: Upgrade to new version of the same product.
3) Functional Upgrade: Upgrade to new version with additional functionalities
4) Replace with COTS. Re-engineer the business process
5) Reuse – best solution- less time, safer, cheaper
   - Extend the value of existing applications
   - Incremental approach
   - Bring in SOA concepts
   - Start with presentation layer first; Web enablement, Mobile enablement
   - Rejuvenate the applications look and feel
   - Enhance – add new code; Extend the business logic
6) Rewrite – You need to rewrite the whole applications onto a new platform. One must follow the complete SDLC lifecycle. This is not recommended highly as it is very time consuming, with not so high probability of success.
   - Reverse – Refactor – Remake is the formula used in 'rewrite' scenarios. First the application is reverse engineered. Every code block is analyzed and trans-modeled using UML (which is platform independent). After that the UML model is again trans-modelled to the new platform.

The figure below illustrates the Transformation methods employed by AME and the resulting benefits.

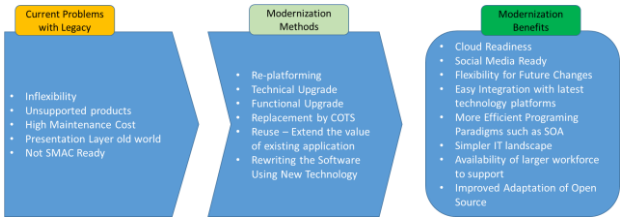


**Figure 2:** AME Employs Multiple Modernization Methods

The appropriate modernization method for each application is determined by the AME consultants during assessment phase. The implementation approach described below gives the different steps involved in the execution.

## 4. AME Implementation Approach

Excellent program management and regular validation of the business case are of at most importance to ensure success of the transformation program. The key tenets of the AME transformation project execution are listed below:

a) Agile / Devops method for project execution.
b) Tangible benefits and cost savings by end of year 1
c) Achieving self-funded program status in the least possible timeframe (Less than 2 years ideal)
d) Impeccable Program management and progress reporting
*e)* The program management need to be water tight and would ensure that the above tenets are not compromised during the execution.

The different phases of AME Life cycle are illustrated below.

### 4.1 Step 1: Application Assessment

The AME practice team will lead the assessment phase of every transformation project, with support from auxiliary team (application experts). The assessment will be based on the 'High-Velocity' and 'Agile, Intelligent and Connected' principles.

The assessment will establish the business value of each application and suggest the best method of transforming the same. Key deliverables include a clear application heat map (visual representation based on complexity), application criticality ranking, suggested outlook of each application and high level program roadmap.

### 4.2 Step 2: Identify the Modernization Approach for Every Application

The list of applications identified for modernization would undergo detailed scrutiny in this step.

Based on assessment and workshops, the team identifies the suggested approach for each application. Once the application modernization map is prepared, the same need to be reviewed with the senior IT staff and approved by the CIO. The overall project would be planned in a phased manner. The final plan would include different waves and scope of each wave, strong business case and productivity improvement targets for each wave.

### 4.3 Step 3: Identify the Quick Wins and include in Year 1 plan

Identify the applications which can be planned for Year 1 which has minimum impact and considerable benefit. The choice of activities for year 1 is very critical, as the results achieved at the end of first year can make or break the overall modernization program.

### 4.4 Step 4: Project Execution

The project must be tracked very closely and must be a joint endeavor between the enterprise IT division and Business. Agile / Devops methodology would be followed with clear deliverables for each sprint. Business case must be evaluated at the end of each sprint and necessary corrections made.

There would a review committee comprising of AME practice experts who would help bring in learnings from other modernization projects and also would help the execution team by giving technology and business related inputs.

The tools and accelerators developed from Year 1 is a critical input for the subsequent phases.

### 4.5 Step 5: Assess the Benefits Realized vs Approved Business Case

This is a very critical step. How much ever we plan the project, we will face challenges during execution. The learnings from all those instances should be captured and provided as input to the planning for Year 2.

### 4.6 Step 6: Prepare the Business Case for Subsequent Year based on the learnings

Repeat the cycle. Incorporate the learnings from past cycle and improve the efficiency this time.

## 5. Conclusion

Application transformation via Legacy modernization is a common challenge for large enterprises across the globe. IT modernization cannot be taken up as a short-term panic reaction mode project. It requires a lot of analysis, assessment and deliberations. It requires a highly-experienced IT & Consulting vendor to successfully carry out each phase of the program. Many transformation programs have failed due to lack of thorough planning and the inability to show business value.

Despite the challenges ahead, as of 2017, many CIOs are setting out on the transformation journey. And AME framework would assist the CIOs in implementing the IT transformation strategies in line with the business transformation strategy.

The benefits that the AME framework can realize by a successful legacy modernization exercise is huge and it can even propel the enterprise into the next level in the industry.

Given below are a few of the expected benefits:

a) Huge reduction in Total Cost of Ownership (TCO) of applications – Up to 30%.
   - Reduced cost of hardware and software maintenance.
   - Newer technology are a lot lighter. For example, The Java code base is about 80 percent smaller than the legacy COBOL code base for the same functionality.
b) Reduces the overall business risk
c) In case of upgrade of the same product, the old, unsupported version could be replaced with new supported version
d) Improved presentation layer and better customer experience
e) Social media adaptability
f) Future ready design; Easy extendibility; Easy Maintainability;
g) Better documentation
h) Better collaboration with partners (More automation in collaboration)
i) More automation in the operational processes
j) Business process and workflows are configurable in the new system, unlike old systems
k) Productivity of the IT system gets a boost. Productivity of the IT resources also improves. Multiple tools available for developer community for modern platforms.
l) Results in Better data quality
m) Modernization improve business agility as it becomes easy to add new IT features
n) Easier integration of new applications with existing landscape

Overall, technology transformation transform the business and makes the enterprise future ready and places the enterprise in a higher pedestal than the competitors.

## 6. Contrarian View

CIOs realize that technology transformation is imperative, however, there are multiple factors which hold back the enterprises from taking the plunge.

1) An old maxim goes "if it's not broke, please don't try to fix it." In spite of the disadvantages of the legacy applications, the fact is that they work. In fact, they have been working for last 20-30 years! So, sometimes, the decision makers in IT division are not in favor of modernization.
2) The senior engineers in the IT division would argue that the system is very robust! The system has been around for 20 years. We just got all the bugs out! Now, don't replace it with a new system which will take another 20 years to stabilize.
3) Modernization programs throws past investments into the dustbin is another common argument.
4) The company is doing great business; a small disruption may cause a big negative impact. So, let's not take it up now!
5) The firm is expecting major changes in near future – such as taking over of another large firm, or the prospect of being taken over by another firm etc… so this is not the right time to start the modernization exercise. IT rationalization will happen after the M&A anyways.
6) Another argument is that ditching old applications is risky, costly and time consuming. Many modernization programs have died even before they start, when the CIOs fail to come up with a valid business case which can get the board approval.
7) Even after the Enterprises take a bold decision to go ahead with the modernization program, the challenges do not end. It is just the beginning. There are multiple other reasons due to which the modernization programs fail. Some of the common reasons include:
8) The application complexity is logarithmically proportional to the number of lines of code. If the application has 10 Million + LOC (*Line of Code*), the probability of project failure is very high. It would be 'dis-economies of scale' at play in this case. When you have 1 Million+ LOC, no one really understands the system, making the modernization very difficult.
9) In many cases, the program team underestimate the full complexity at the outset. This leads to unexpected delays and demotivation of the key team members. Delay in benefit realization may kill the program.
10) The modernization vendor may think that the business owners have clearly understand the system and they have given all the requirements clearly at the requirements gathering phase. In fact, that is a big faulty assumption in many cases. In most cases, only 50% of the requirements will be captured in the plan & analyze phase.

## 7. Recommendation

Despite all the challenges listed above, technology transformation, legacy modernization is a mandatory initiative which CIOs should embark on. There is no escape. If you don't transform, your business would die. Every enterprise must jump on to the bandwagon sooner than later. Thorough planning, impeccable program management, Incremental modernization and Establishment of clear business benefit targets per year are all key aspects of a successful legacy modernization & transformation program.

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