

# Predictive Analytics for Enterprise Modernization

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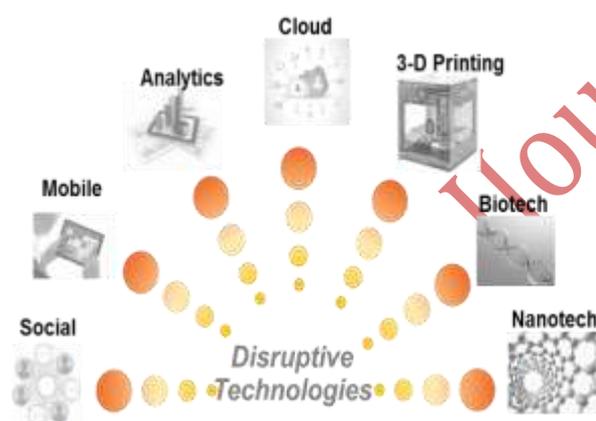
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## 1. INTRODUCTION

The advent of the digital revolution has changed the role of IT infrastructure from back office integrator in to a core component of business strategy. McKinsey Global Institute in their study about Disruptive technologies point out that Internet of things, Mobile Internet, Cloud Technology and Automation of knowledge networks as some of the key technologies that are going to transform the way we live and work. IT strategy plays a pivotal role in embracing these emerging technologies.



**Figure 1: Disruptive Technologies**

Twenty years ago, Professors at Harvard Business School introduced the term “disruptive technology” in their article “Disruptive Technologies: Catching the Wave” and noticed that the most established companies are consistently ahead of their industries in developing and commercializing new technologies as long as those technologies address the next-generation-performance needs of their customers. However, the same companies are rarely in the forefront of commercializing new technologies that do not initially meet the functional demands of mainstream customers and appeal only to small or emerging markets. To remain at the top of their industries, Organizations must adapt emerging technologies, innovate rapidly, deliver unique customer

experiences, and leverage their knowledge of customers and the marketplace.

The single most important decision organizations fail to make, is how to make those decisions. Organizations are investing in sophisticated analytics to process millions of transactions and to distill insights and context from data. We are at a cusp of smarter era where systems are not only built to synthesize the data but to learn and guide the organizations in the decision making process.

## 2. NEW APPLICATION ARCHITECTURES

Organizations are creating new business initiatives to meet the demands of emerging technologies. The convergence of mobile, cloud and social business technologies, along with instant access to information in context, is transforming how the new applications are designed and implemented. Industry is moving from a traditional three-tiered architecture in to a much more complex model where the clients are native, hybrid or web applications connected via various protocols running on different ecosystems.

Enterprises are interacting with its customers through social, business networks and mobile. Social functionality is injected into their business to make effective use of the data available from social interactions and networks to deliver information in new ways that fully utilize the power of mobile and social technologies. The interaction itself is moving away from the core of the enterprise, from the dependence on the legacy and internal systems towards consumer centric systems of engagement. Add to this new data sources like the explosion of social data, which provides a window into real world and real-time customers’ behavior. The data accumulates quickly and changes frequently and the ability to capture, analyze and derive insights from it will be key to offering true customer-centric value across companies, and even entire industries



**Figure 2: New Application Architectures**

New applications are being implemented with the following characteristics at the heart of their design

- (1) Deep industry expertise focusing on industry transformation.
- (2) Strong mobile design skills and the ability to leverage mobile consumption and interaction patterns.
- (3) Create repeatable solutions and assets.
- (4) Use a cloud platform to deploy these solutions.
- (5) Deliver and Consume value through API's

Enterprises are experimenting with scalable services ecosystems in two ways. First, enterprises are transforming their back-office by externalizing core-capabilities through API's for others to consume. Second, enterprises are transforming their front office through consumption of business functions offered as a service.

Gartner predicts that by 2016, 25 percent of external application implementation will be on mobile, cloud, analytics and social computing services and more than 50 percent of application modernization efforts will address business demand for enhanced functionality to legacy systems and not cost reduction

### 3. APPLICATION MODERNIZATION STRATEGY

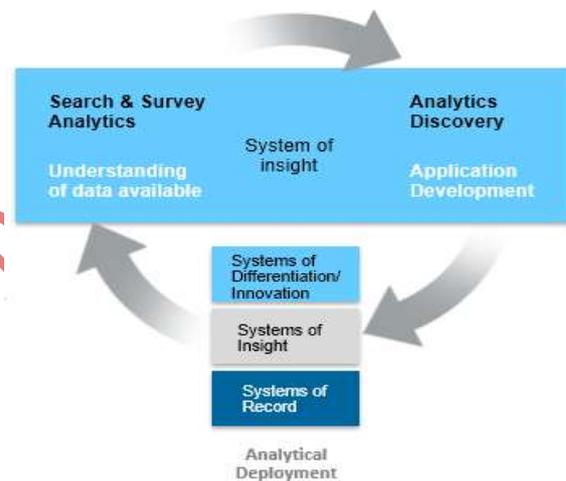
For an enterprise to be successful across technological eras, it must continuously reinvent itself embrace innovation and be early adopters. These new technologies enable rapid change, growth and innovation in business.

Many companies develop a modernization strategy, which classifies applications based on technical, financial, and application viability. The downside of this method is that all applications irrespective of their role

are assumed equal at the beginning of the modernization assessment. Because each application is inherently different, they cannot be judged on similar values.

In the Gartner Report, "Accelerating Innovation by Adopting a Pace-Layered Application Strategy", Gartner has defined three application categories, or "layers," to distinguish application types and help organizations develop more appropriate strategies for each

- Systems of Innovation - New Applications that are built on adhoc requirements.
- Systems of Differentiation –Application that enable unique business processes or industry specific capabilities
- Systems of Record – Application that are core to the enterprise and rarely change



**Figure 3: System of Insight**

The modernization strategy should not just focus on reduction of IT costs and eliminating redundant applications but also should establish application innovation index. Application innovation index is a measure to identify how an application can evolve to meet the changing demands of business situations and adapt to emerging technologies.

Today with big data and sophisticated analytics, Organizations are able to determine if a machine or a manufacturing unit requires maintenance to avoid failures. Similarly, Organizations must harness big data and develop systems of Insight (Figure 3) to drive the modernization strategy. While, there are several methods that are used to measure the value of the application like ROI (Return on Investment), TCO (Total Cost of Ownership) and Business value of IT (ITBV) – Today's analytics makes it possible to use all the data and methods available and develop a decision analysis

framework based on probabilistic models on a range of parameters.

#### 4. PREDICTIVE ANALYTICS FOR APPLICATION MODERNIZATION

Standard decision tree algorithms allow you to develop classification systems that predict or classify future observations based on a set of decision rules. Decision tree algorithms can be used to classify applications into three pace layers suggested by Gartner. Process characteristics, content, data, analytics, security and collaboration are some of the key decision rules that help aid in initial segmentation. The tree model makes the reasoning of classification evident as we browse through the tree nodes. Secondly, the process will include in its rule only the attributes that really matter in making the decision.

Tree algorithms examine all of the fields of your dataset to find the one that gives the best classification or prediction by splitting the data into subgroups. The process is applied recursively, splitting subgroups into smaller and smaller units until the tree is finished or there are no other criteria or rule to apply. Modern predictive analytics tools allow you to visualize and browse through the tree nodes if you want to see how attributes in the data can split, or partition, the population into subsets relevant to the problem.

While decision trees allow you to classify, association models allow you to find patterns in the given set of

data. Association models can look through “n” number of attributes to determine patterns in the data. Looking for patterns can give us insight into what is likely to happen to affect our operations or strategy. Building scenarios to model the impact of patterns of impact on our patterns enable us to more adequately create multiple models that show how new patterns can affect modernization strategy.

Clustering models allow you to group a set of applications together based on similar set of attributes. Clustering models allow you to experiment with multiple combinations of options in a single modeling pass. Models can be compared using basic measures with which to attempt to filter and rank the usefulness of the cluster models, and provide a measure based on the importance of particular characteristics.

Decision tree, association and clustering models can be applied in any order to come up with investment decision matrix and implementation decision matrix. Predictive analytics tools allow you to retain the models you built and any slight change in the variables quickly allow you to determine application maturity levels.

After segmentation and profiling, predictive models result in couple of decision matrices

- Investment Prioritization Matrix (see Figure 4)
- Implementation Prioritization Matrix (see Figure 5)

These results serve as move forward recommendations for organizations modernization strategy.

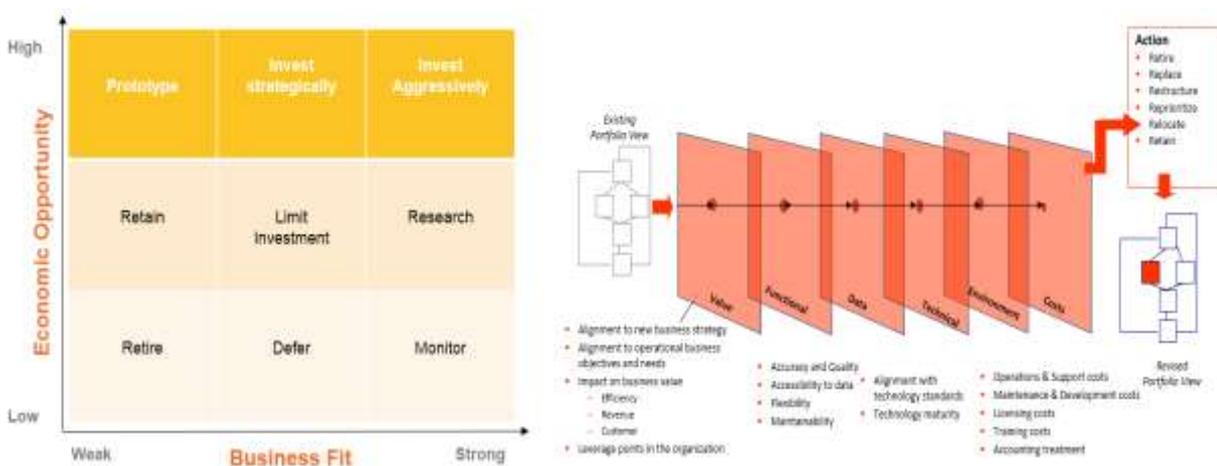
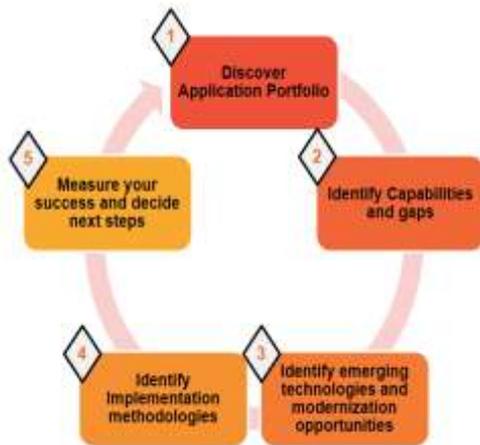


Figure 4: Investment Prioritization Matrix Figure 5: Implementation Prioritization Matrix

## 5. CONCLUSION

Traditional modernization frameworks focus on reduction of IT and operational costs and eliminating redundant applications.



**Figure 6: Modernization Framework**

In a rapidly changing technology world, where every day there are breakthrough opportunities – a new age modernization framework (see Figure 6) is required to evaluate the usefulness of application in lieu of your business strategy. With several parameters and multi-dimensional analysis, an emerging technology based predictive/cognitive approach will capture the core organizational values and provide the necessary insights against organization's business strategy.

## 6. ACKNOWLEDGMENTS

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## 7. BIOGRAPHY

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