

# The Vlamis Maturity Model (VMM)

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Vlamis Software Solutions, Inc. is a leader in delivering Business Intelligence (BI) solutions with more than 20 years of experience serving customers of all sizes across many industries. Throughout our experience, we have carefully analyzed our customers' business problems and the environments in which they operate. We have found that many of our clients have large and disparate operational systems that generate and gather the data they would like included in their analysis and reporting initiatives which leads to significant challenges in establishing effective performance measurements and parameters. Moreover, organizations often struggle with a reactive set of measurement and reporting requirements, which in turn negatively impact the accuracy and consistency of the results on which they base their decisions. This leads to costly mistakes and missed business opportunities.

For the initial step in resolving the business intelligence concerns, it is important that a company identifies the health and maturity of their current business intelligence applications within their organizations. Vlamis has adopted a maturity model framework that evaluates enterprise reporting and analysis needs in three contexts -- Executive, Business and Technical. Each context is a set of roles that will help demark activities and foster collaboration. This establishes clear relationships between *Meaningful Information* required for the enterprise and the data collection, manipulation and aggregation required to present this information to a variety of audiences.

Business Intelligence, as discussed in this paper, is an umbrella term that describes operational and summary reporting, presentation, analytics, data modeling, data warehousing, data marts and data movement and transformation (ETL and ELT). The BI requirements that are discussed in the realm of VMM are meant to be considered from multiple business and technical contexts. It's also worth noting that while BI is usually associated with business performance, it's equally useful in other realms where information needs to be summarized, contextualized and presented. This can include manufacturing, quality assurance, scientific and engineering and more.

To address the challenges listed above, the Vlamis Maturity Model was created, which is loosely based on the Capability Maturity Model (CMM) originally developed by Carnegie Mellon University. The CMM describes five progressive levels of software processes' "maturity" and provides a structured methodology for measuring an organization's current state and for defining measurable goals and tactics as it advances to higher levels. The Vlamis Method applies CMM principles to enterprise business intelligence activities as they relate both to the business processes they measure, and their effectiveness in providing insight into process improvement. When Business Intelligence metrics are meaningfully defined and associated with business processes, true optimization can occur. The Vlamis Method addresses Business Intelligence as a business process in and of itself and serves an organization's established goals in a continually changing business climate.

An additional aspect of the VMM is an interactive visual environment, The VMM Dashboard, which enables the definition and management of projects and activities for deploying Business Intelligence capabilities within the contextual framework of VMM. The VMM Dashboard will be discussed later in this paper.

## ***1 Why a Maturity Model? (consistency, accuracy, completeness)***

Business Intelligence tools and capabilities are now available to a much wider audience compared to a few years ago. Increased ubiquity has significantly increased the popularity of reporting and visualization. This popularity, coupled with increased competitive pressure and compressed time available to address competitive threats or business opportunities, have strained IT departments forcing them to respond quickly and often in a manner contrary to their traditional lifecycle. The attractive visualization offered by many reporting tools has also caught the attention of business managers and corporate executives. Many BI tools are also simple enough to deploy quickly and often under the radar of IT. In medium to large companies, these factors can have negative consequences including data inconsistencies, summarization inconsistencies, strain on operational systems, data quality issues and more. These issues impact the accuracy of reporting and decision making in all levels of an organization. Additionally, executive decisions are under higher scrutiny now than ever before which can cause issues with shareholders and regulatory agencies if information is wrong or incomplete and leads to bad decisions.

A maturity model approach sets the structure for discipline in specifying, designing and verifying the systems and methods for deriving business information and sound decision making from summarized operational data.

### ***1.1 The Vlamis Maturity Model Structure***

The VMM is based on 3 contexts, or sets of roles: Executive, Business and Technical.

The Executive participants set overall direction. The Executive role is extremely important and has four main areas of participation:

- Provide High Level Vision to help drive requirements
- Help define high level data summarization and presentation aspects
- Set direction for the project
- Approve funding

The Business analyst is the one who best understands the data summarization and aggregation, and how it transforms into needed information. This role needs to be represented at all 5 levels (discussed below) to help craft the effort, and to define and participate in the verification process.

Participants in the technical role actually build the systems. They work closely with the business analysts to ensure that the objectives are being met with their implementation. They also ensure that corporate architectural, security and governance standards are being met. The technical analyst's close relationship with the business analyst is important in order to ensure that the data they deal with is harmonious with the *business information* it represents, and is meaningful to the

Business and Executive participants.

These three contexts and associated roles help break down the objectives in a logical manner, and serve to identify the distinctive points of view of business intelligence stakeholders: Executives, Business Analysts and Technical practitioners.



The logical grouping of stakeholders helps reinforce the notion that executives and upper level business analysts are dealing in the realm of *information* while the specialized business analysts and technical analysts deal in the realm of *data*. This helps to accurately map the lower level data to the actual information elements that form the basis for business decisions. During the execution of BI projects which will be discussed shortly, the efficiencies and effectiveness of work breakdown, acceptance and verification of these projects are enhanced since each group has clearly defined roles, responsibilities, and relationships with respect to the other groups –all within the context of a given project.

## ***1.2 Vlamis Maturity Model Levels***

VMM follows the 5 levels of the CMM defined by Carnegie Mellon University. Additionally VMM divides the 5 levels into two main categories, plainly stated (1) *Understanding where you are* (2) *Getting to where you want to be*.

When you understand where you are with respect to where you want to be, you can then breakdown the steps to close the gap. Moreover, using the VMM methodology, you can approach your desired state in harmony with corporate standards, regulations, and security requirements. As discussed below, when BI is approached from a reactionary stance, the results can be suspect, and the methods and related systems are at risk with respect to security and corporate governance

requirements. Ask yourself, Is your corporate data is at risk for accuracy, consistency, confidentiality and integrity when it's accessed and dumped into spreadsheets based on one-off needs? How many versions of the same data are being inconsistently summarized, visualized and distributed with no thought to controls, or records management? How many people show up with their own version of the *same data* with completely different interpretations, analyses and conclusions? How many times have executives become frustrated because they don't trust what they are being told by their business analysts? What proprietary data could be "leaking" out of the company in spreadsheets attached to email, or residing on memory sticks? The answers to these questions may indicate the need to reconsider how BI is implemented, and to apply more formality to BI initiatives. VMM will help in this transformation. As discussed below, VMM and the related interactive management tool will help determine where in the maturity continuum a particular BI initiative or system is, and what steps are required to optimize it.

### ***1.3 The 5 categorized levels of VMM are:***

Understanding where you are:

- (1) Initial (reactive, inconsistent, unmanaged)
- (2) Reactive but Repeatable -Gaining Insight

Getting to where you want to be:

- (3) Defined
- (4) Managed
- (5) Optimizing

The levels of the VMM are loosely based on the CMM as mentioned above.

When considering actual situations, it's likely that many BI initiatives and systems currently exist. Therefore, the initial activity is to determine how to map current systems and initiatives into VMM. The key point to consider is that each BI activity is unique in its level of maturity, and will likely fall in its own place in the VMM scale. Higher priority BI systems are likely higher up the VMM scale than those of lower priority, or at the departmental level. The VMM Interactive Management (Dashboard) tool supports multiple projects concurrently so regardless of what VMM level a particular project is; tracking it not affected by other projects.

It's also important to note that VMM is designed to easily meld into existing BI processes and methods –otherwise it would be cumbersome and never adopted. Also discussed below; implementing project plans and tracking activity to assess VMM levels is flexible in nature. These are guidelines that should enable easy collaboration and tracking by analysts in all three areas: Executive, Business and Technical.

## ***Understanding Where You are***

### ***1.4 Level 1 – Initial***

Level 1 describes a state where BI activities are reactionary in nature and often conceived to only occur once. Typically, some sort of "business emergency" requires a quick report or analysis.

This leads to informal access to corporate data or reporting to accommodate the immediate need. One-off's like this are a fact of life, and are no less important than any other request or analysis. Where they can become problematic is when they are repeated in an unplanned fashion. Without formal planning and participation of all related roles, there is no guarantee that the requested report or analysis is accurate, consistent or secure. There may be many more reactionary activities than one would expect since businesses are under more scrutiny and competitive pressure now than ever before.

To best understand the nature of Level 1 activity in an organization, first establish agreement across the executive and business roles that improvement is needed. From here, sponsorship and funding for improvements will be easier to obtain. Corporate IT is also instrumental as they are usually the executors fulfilling one-off requests and can offer valuable insight. Departmental reporting systems and point-solutions can also be indicative of Level 1 activity. Careful analysis should be taken to determine what Level 1 type of BI activity should be formalized into the VMM.

Characteristics of Level 1 are listed below:

- Reactive (often one-off emergency requirements)
- Isolated (one-off – departmental, unaware of other copies)
- Informal (non-standard, spreadsheet dumps and “spreadmarts”)
- Unsecure (no verification or governance applied)
- Non-standard (different summarizations, visualizations, interpretations)
- Inconsistent (no single source of the truth)
- Uncontrolled (no proof of confidentiality, integrity, availability)
- Unstable (may not be repeatable with same results)

### ***1.5 Level 2 - Reactive but Repeatable Gaining Insight***

Once a BI system has achieved the characteristics listed below, it is at a Level 2 state. This is where a BI system or initiative will start to converge on consistency and repeatability. Consistency is where analyses, measurements and results are consistent with those of other systems within the business. This could include comparison with operational level data, verification of calculations as defined by domain experts, and uniform data quality. Repeatability refers to the system's ability to produce consistent results across multiple runs of the system. Level 1 activities can suffer from repeatability issues since they are often quickly prepared to accommodate a specific need in isolation. Without the formalized verification against operational or source data, and corporate standard calculations, depending on the results could be problematic. Level 2 activities address these areas. While still categorized in the “Where you are”, Level 2 activities will help define the desired state that is considered *optimized* for this process. At this level, it's also time to address business linkages for this process. These linkages will help establish requirements and determine the effectiveness of the process against those requirements. Participation from line of business experts will also ensure that the process, method or related system is indeed consistent with the business level *information* required. Because the information and audience are being determined from the business linkages, this is

also the time to ensure corporate governance and security are being addressed in addition to user roles and access control. Records Management considerations may also become relevant at this level in order to ensure corporate retention policies are met.

Characteristics of Level 2 are listed below:

- Converging on consistency
- Understanding Requirements
- Identifying Business linkages
- Addressing security
- Gaining Discipline
- PM Techniques are applied

## ***Getting to Where you Want to be***

### ***1.6 Level 3 - Defined***

When a BI system reaches Level 2, the requirements and objectives are set and understood, and it is at the stage of becoming a sustainable corporate level system. At this stage, like any other corporate system, it should conform to the corporate architectural, security and technical standards. Ownership, funding and lifecycle are established. This is also the stage where service levels are defined and production metrics are established. Level 3 systems are crossing departmental reporting into an enterprise business intelligence system. Part of this transition will include verification of security and governance specifications. Certain systems may require little in the way of security and governance, however close attention to these details will ensure that confidential information is protected according to corporate standards and requirements.

Characteristics of Level 3 are listed below:

- Standardized
- Documented
- Funding Defined
- Consistent Results
- Security established
- Governance established
- Target architecture
- Identifying gaps with corp standards

Subsequent maturity levels (Levels 4 and 5) focus on measuring and maintaining effectiveness.

## **1.7 Level 4 - Managed**

BI Systems at Level 4 are managed, production level systems.

Where BI systems often differ from traditional systems is the need for agility. While production systems that *run the business* may evolve over time, the expense and effort required to successfully deploy these systems generally prohibits significant or frequent alterations. BI systems require more agility since their objectives are more dynamic based on business climate, regulatory issues and technology. It's precisely this reason that so many Level 1 systems exist, and hence the opportunity and need to develop the Vlamis Maturity Model to begin with. However, the agility often required of BI systems does not negate the need to apply the rigor and discipline to ensure they are effectively meeting clearly stated objectives.

Level 4 describes the characteristics necessary to ensuring that BI systems are effective and continue to meet the objectives for which they were built. Level 4 activities focus on measurement against objectives. Level 4 ensures that related business processes and operational systems are accurately reflected in the BI realm for reporting and analysis.

Characteristics of Level 4 are listed below.

- Measured
- Specified
- Metrics Captured
- Mainstream "process" status
- Mapped to "Business" Processes

The business process term here is used somewhat generically as the Analytics may related to the financial aspects of a company, or could be used to measure any other type of metrics that may reside outside of core traditional business processes.

## **1.8 Level 5 – Optimizing**

The VMM is continuous (i.e. there will always be an optimizing level). This does not mean a project is never “complete”, it simply recognizes that as business requirements evolve due to internal or external factors, or technology and methods evolve, this recognized optimizing level enables easy assessment of deployed BI systems, and whether or not to make adjustments. A BI system may become completely obsolete, or the methods and business operational systems against which the BI system was built to measure, may have evolved to the point of obsoleting a current BI system.

BI analysis and reporting systems may also become obsolete in favor of a newer method or system that has more relevance to the current state of the business - perhaps due to mergers or reorganizations.

Other examples may include disruptive technological development that completely displaces a current BI technology (e.g. data network speeds that completely redefine how data ETL and movement occurs)

If the BI system is at Level 5, periodic decisions regarding the its relevance to the business, and how it should evolve, can be made easily and accurately.

Characteristics of Level 5 are listed below.

- Continuous Improvement
- Business linkages reviewed and adjusted
- Continued feedback established
- Variance Measurements
- Technology Enhanced



VMM Maturity Levels

### 1.9 Summary of VMM Levels:

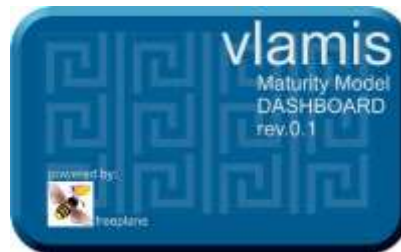
The VMM levels illustrate successive states of BI systems from completely reactive, one-off, reports or analyses that have little or no formality, to highly optimized systems that are mainstream corporate information systems. Level 5 systems conform to corporate architectural, security and governance standards, and maintain traceability to related business processes to ensure relevance, accuracy and usefulness.

## 2 The Vlamis Maturity Model Dashboard

The remainder of this paper will address a tool that Vlamis has developed to help implement a



VMM into the business. It's important to note that while lifecycle approaches and maturity models may seem to add complications, VMM was developed with simplicity in mind. As BI systems are identified throughout an organization, there will likely be a variance in the levels of formality, sophistication and maturity of these systems. Therefore, the variety of BI systems within a company could fall anywhere across the VMM levels, which is to be expected. How can all these be accurately and efficiently tracked? An adjunct to the VMM is a management environment that Vlamis has developed to help track these systems. This tool (The VMM Dashboard) easily integrates with current documentation and project management systems and can serve as a "Meta-Manager". It was also built to help collaboratively manage multiple sets of activities across the three BI role sets: Executive, Business Line and Technical.



The Vlamis Maturity Model Dashboard is based on a Mind Mapping metaphor<sup>[1]</sup>. Mindmapping was chosen for the following reasons:

1. Very low (almost non-existent) learning curve
2. Abundance of open source (and proprietary) tools
3. Very flexible –plays into the flexibility of the Vlamis Maturity Model implementation options
4. Almost limitless flexibility in expressing ideas and relationships
5. Excellent for presenting visuals of VMM implementations

Additionally, we specifically chose to base the Dashboard on Freeplane<sup>[2]</sup> which is an open source tool that is very easy to install and use. A key feature of Freeplane is the ability to drill from any part of the mind map directly into a project plan, presentation, document or other program. Hyperlinks are also supported for accessing any web based environment. The power of drilling lies in the ability to use the powerful diagramming features of Freeplane to designate specific parts of activity to different roles (Executive, Business and Technical), and further to associate specific parts to individuals or groups based on particular needs. Freeplane also has a flexible security model to provide access control to specific parts of a map, and has time-driven reminders that automatically notify users of events. The overall VMM Map is illustrated below in Figure 2.

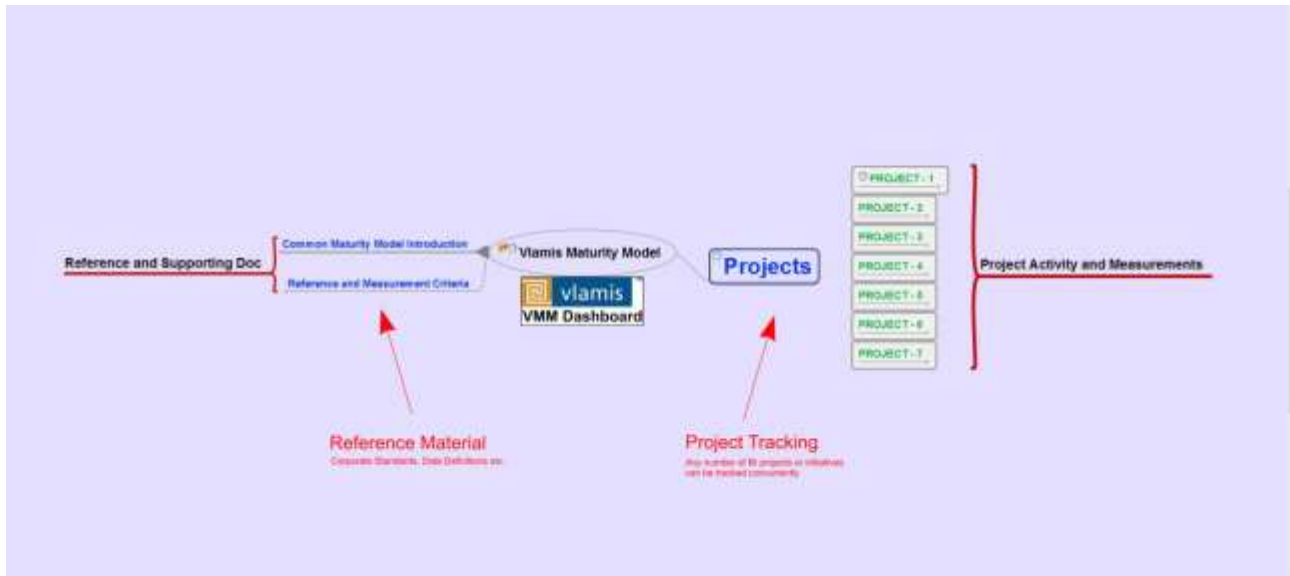


Figure 2 Main VMM Mind Map Model (overview map)

This is an example VMM Map. The Dashboard supports any number of maps, each of which can have an arbitrary number of nodes, edges and a completely optional layout. In the VMM default map, the left half contains reference information for VMM (i.e. levels and definitions) while the right side is the activity side, and contains expandable project nodes that can be decomposed and organized to suit specific needs. This is a *default map*, and can be easily customized or redefined to meet specific needs. In Figure 3 below, an expanded Project Node is illustrated. Each node can be recursively expanded to any number of sub-nodes required. It's also noteworthy that each of the role sets are represented per project. This supports close collaboration between members of different groups. Each node can be linked to an external program (or website) so project plans, spreadsheets, documents, presentations and so forth can be linked in the context of a specific project or initiative under the dashboard. This is represented in Figure 4 below.

With the addition of a content management system, or web based project management system, concurrency control can be established. Also, nodes can be hidden, password protected and otherwise controlled to ensure that no unauthorized access occurs.

The VMM dashboard is a flexible, easy to use method to classify BI activities in terms of a sustainable maturity model, and manage activities to take key BI systems and initiatives to higher levels of maturity and ensure they are meeting key business requirements, while maintaining conformance with corporate standards and regulations.

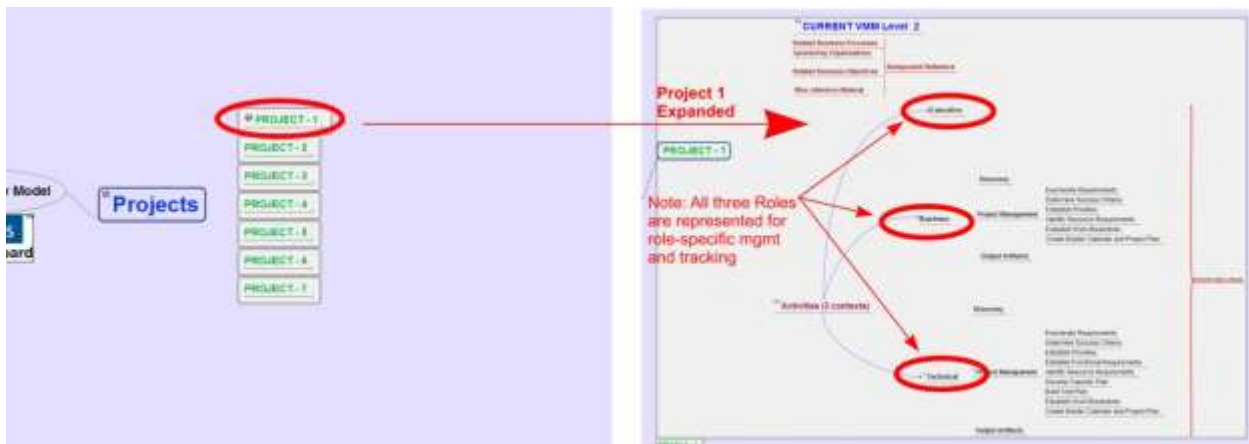


Figure 3 Exploded Project Section of VMM Map

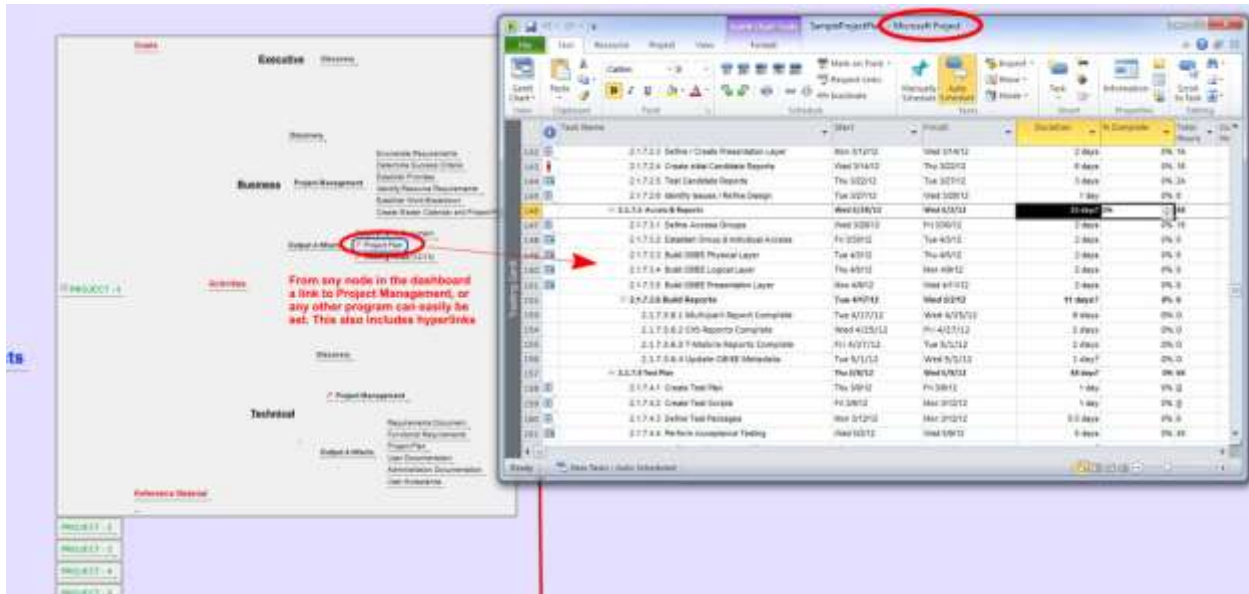


Figure 4 External Programs Linked

### 3 Summary:

The VMM is meant to help map out a sustainable Business Intelligence strategy for any organization that requires the use of Business Intelligence. VMM supports all phases of BI activity from data movement and transformation from operational systems to complete analysis, reporting and finally, disposition.

As unplanned and reactive BI activities are often performed in a vacuum, there is the risk of wasted time, duplicated effort, and lack of formal quality assurance, all of which can lead to inaccuracies and bad decisions. In designing VMM, Vlamis has called upon over 20 years experience, and has seen first-hand many of the symptoms that negatively affect decision making. These symptoms are addressed by VMM in a logical fashion that is sensitive to the current environment in a business such that it can be implemented in an efficient manner with

collaborative participation from Executives, Business Analysts and of course, Technical implementors. VMM also takes a holistic approach to ensure that BI is always optimized and relevant to the business, regardless of internal or external factors. Finally, VMM has enlisted mind mapping tools to best express the path up the maturity model levels, while seamlessly interacting with, and leveraging any project management tools, corporate methodology and reference information already established. This ensures that businesses can enjoy the advantages of this approach without painful alterations or incompatibilities with their current implementation methodologies and standards.