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Business Lifecycle Morphing:

Metamorphic Application Cloning

Resolving the Myths about ERP, CRM & SCM

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Introduction

The myth strategy – driving your business on static IT wheels (systems)

Is it an illusion? Organizations cannot expect correct system functionalities or adaptable user requirements when end-users are often unaware and not able to predict their business lifecycle changes. Like living things, the stages of growth and development of organisations can be aligned to the evolutionary lifecycle stages of birth, growth, maturity, decline and termination.

The complex world of dynamic, overlapping and evolving business operational networks impose certain challenges on today's business managers. Failure to successfully manage these changing networks across the business lifecycle will most likely result in excessive expenditures, inadequate service and loss of customers due to the following factors:

- Flaws in transactions, processes and workflows – e.g. the overuse of spreadsheets
- Loss of data, information, knowledge and intelligence – due to poor data integration
- Limited sharing of valuable knowledge and strategies – implying weak support systems
- Duplication of efforts and poor resource utilization – inadequate work transparency
- Lack of coordination of communications and IT systems – business changing too fast

On the matter of strategy, if IT systems are expected to effectively support the future pursuits of organisations then we need to find out the future business requirements in order to effectively deliver correct system functionalities. It's a myth: businesses cannot evolve through their lifecycle stages while IT systems remain static. Organisations are desperately in need of systems that are adaptable and agile to the growth and development challenges of their business lifecycle.

Organization and Product Lifecycle

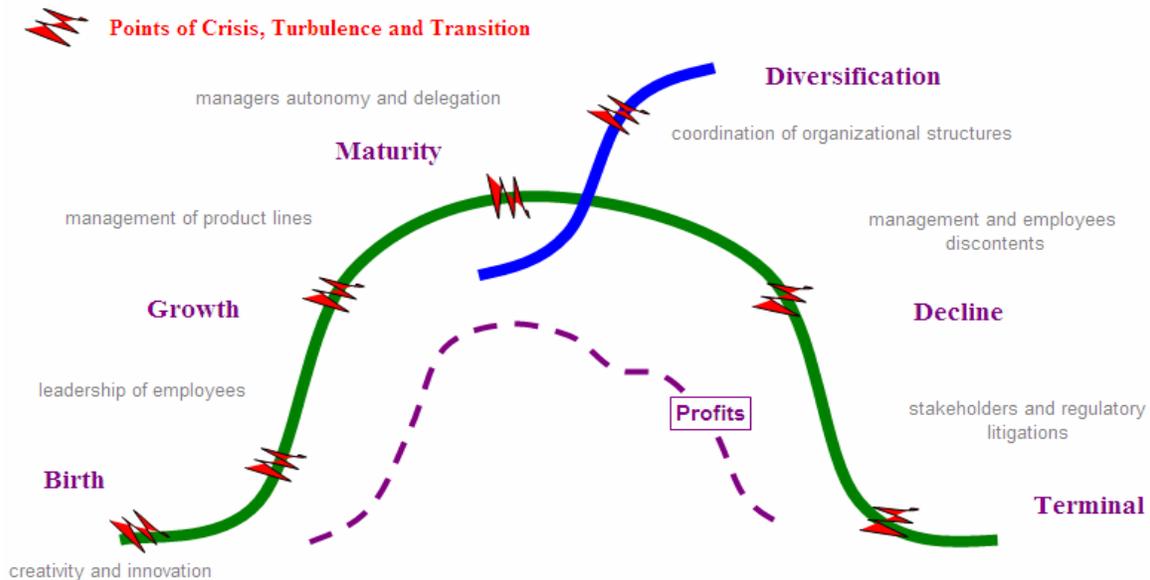


Figure 1: A high-level view of the Business Lifecycle Stages

This diagram depicts an organisation's business lifecycle, which can also be associated with a product's lifecycle. The transition between each stage of the business lifecycle is characterized by points of crisis and turbulence in the organization's life. The actions of managers, employees and other stakeholders determine

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whether the business will successfully traverse its optimal and intended path or experience unintentional termination. The 'profits' line illustrates that the business lifecycle activities have an impact on the bottom-line of organisations.

In the following paragraphs you will find a short description of the key concepts of the Krys Business MorphIT solutions platform and the use of Business Lifecycle Morphing as a strategy for providing business systems that are adaptive and agile to the business lifecycle challenges of organizations.

The paradigm Krys strategy – evolving IT systems (revolving IT wheels)

The **Krys Business MorphIT** solutions platform takes a paradigm shift in strategy to promote a class of evolutionary business solutions, which are driven by the novel concept of **Business Lifecycle Morphing (BLM)**. By emulating and harnessing the business lifecycle success stories of several organizations, we create a knowledge repository of best of breed practices for managing business lifecycle challenges. Organizations can leverage this repository to effectively empower their business capabilities relating to product designs, employees, customers, organizational strategies and market integration. By using the repository to configure customer-specific turnkey solutions, organizations can leapfrog as they are able to better shape and execute their goals and strategies within the competitive global market.

By analyzing the hereditary business lifecycle processes and initiatives, it is feasible to develop systems that effectively **Morphise (i.e. adopt, optimize, integrate and manage)** the behavioral patterns and strategies of organizations. According to Mikkel Schnack (Director of Sales and Channels, Websydian A/S, Copenhagen) the electronic (data, information, knowledge) adoption of dynamic business transactions, communications, workflows and collaborative initiatives are subsequently optimized and integrated with existing organizational structures to effectively drive business intelligence. Business managers leverage this intelligence to shape, execute and maintain successful strategies across their evolving business lifecycle.

In other words, Morphing the business lifecycle processes, initiatives and collaborations of organizations will effectively improve systems adaptability and agility to new changes in management, regulatory and customer requirements. In hindsight, especially for new entities and product offerings, this approach is proactive and predictive as it presents solutions in expectation of evolutionary organizational lifecycle challenges.

Organizations often muddle up their ERP's (Enterprise Resource Planning systems) while trying to evolve the business through its lifecycle stages. There is no doubt that conventional ERP's have made significant contributions to the financial accounting framework of organizations. However, ERP's are not designed (or not intended) to handle transactions that are distributed across web-enabled, dynamic and diversified business workflows. This is explained in later paragraphs.

BLM systems utilize the principles of Application Cloning and Metamorphism to provide a new class of business software that extends beyond the scope of conventional ERP's. BLM supports the web-enabled interaction and collaborative initiatives of organizations while maintaining the coherent patterns of business methodologies including financial and management accounting.

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Document Overview – looking from a bird’s eye view

The above pages have given a short *introduction* to the factors that lead to several disadvantageous practices in organisations. These practices paramount to an unconscious strategy based on the misleading notion that organisations can drive or evolve their businesses on static information technology (IT) systems (business management applications). IT systems (including Enterprise Resource Planning –ERP, Customer Relationship Management –CRM, Supply Chain Management –SCM, etc.) are considered static because they are quite often designed to solve problems relative to a specific point in time. These systems, otherwise called point solutions, are not scoped to solve future problems due to the difficulties in predicting future business requirements.

This has resulted in a crisis management culture in which organisations are patching their systems in order to respond to changing business demands. Though not intentional, this practice has been triggering a terminal effect on the life of systems. Organisations are often trapped spending millions of dollars annually on patching and replacing their systems, which quite often become useless or obsolete every 4 to 5 years due to significant changes in governments, regulatory policies and other business lifecycle challenges.

The above challenges can be solved by the Krys solution model, which leverages the evolutionary characteristics of the business lifecycle of organisations as a guide or best of breed practice to predict and fulfil future business requirements. This approach resolves the fundamental issue that, up until now, business management applications for the most part have not viewed organisations as coordinated systems of human activities. Hence these applications have not been designed to relate to requirements including non-monetary concerns, business workflows, qualitative based performance, personality traits, collaborations, and business strategies.

Conventional business management applications have been designed to track the monetary values related to the distribution of goods and services. However, the human related factors including taste, behaviour, preference, culture and religion are indirectly responsible for the evolution in business. Therefore, by building systems to include these requirements, business management applications will effectively achieve the expected levels of adaptability and agility towards changing human related business demands (including customers, employees, regulators and other stakeholders).

As part of its value proposition to organisations, the Krys Business MorphIT solutions platform seeks to integrate and complement (and replace only where necessary) existing legacy business management solutions. Organisation with existing IT systems (e.g. ERP, CRM, SCM, etc.) will not lose on their existing investments as Krys can be used to integrate required information into these legacy systems. This process will significantly reduce if not remove the need to patch existing legacy systems and indirectly extend their useful lifespan as there is no need to modify their scope.

The Krys Business MorphIT solutions platform employs a partnership based strategy for deploying various industry-based solutions. The maintenance of configurations relating to customer-specific solutions does not require high level programmers but rather End-users, Business Analyst and Developers with knowledge of spreadsheet formulas and entry-level relational database programming. However, having a good knowledge of the requirements for the targeted industry, sector or business subject-area is required for delivering effective customer-specific solutions.

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The subsequent pages of this document provide further information as follows:

- **Scoping the Problem and the Solution:** An expanded view of key organisational challenges and their root cause. The misconceptions about ERP's are seen as major contributors. ERP's represents systems that are commonly used in various departments and functional areas of organisations. Examples include Payroll, Invoicing, Sales and Purchase Order Management, Inventory Control, Trading, General Ledger, Fixed Assets, Portfolio Management, etc. In order to resolve these business lifecycle challenges, the Krys Business MorphIT solutions platform focuses on the fact that organisations are coordinated systems of human activities in pursuit of distributing good and services to customers.
- **Background Technical Review:** Looks at the Domain Engineering research as a critical step to construct a solution that is equitable across several organisations. To this end, Application Cloning and Metamorphism exploits the software reuse philosophy. This is aimed at providing software systems that can be used to simulate the functionality of several legacy or native systems within organisations. A special focus is also placed on the reduction of the impact of Software Evolution and the extension of the useful lifespan of business software.
- **Krys Solution Features and Examples:** Displays the major features of the Krys Business MorphIT solutions platform including its ease of customisation and applicability across departments and the functional areas of organisations. A fundamental aspect of the Krys BLM solutions approach is concerned with the adopting, formalising, optimising, integrating and managing the evolving nature (dynamism) of business transactions, communications, workflows and collaborations.
- **Krys Solution Benefits and Market Scope:** The benefits of the Krys Business MorphIT solutions platform are distributed through the document. Hence, the presented list of benefits gives an overview and is used to support the subsequent market review. SAP All-In-One marketing model is a successful strategy for software deployment and marketing.
- **Conclusion:** Looks at the Krys development path and the scope of the Krys Business MorphIT solutions platform, in utilizing Business Lifecycle Morphing as a means of resolving several specific business challenges. The finale displays a feature and a benefit of end to end solutions.

Scoping the Problem and the Solution

The Crisis – businesses can't cope

Industry Research, in November 2005, shows that organizations which have been burned by years of overspending on ERP, SCM, and CRM deployments are increasingly demanding that these applications enable actual end-to-end business processes. Vendors are responding, with big players such as Oracle and SAP moving business processes out of applications and into infrastructure. This creates a centralized, shared store of processes that are used uniformly across the company.

http://www.b-eye-network.com/blogs/i_research/archives/forrester_research/enterprise_applications/

Research, in August 2006, shows that organizations around the world spent \$35 billion to purchase applications software and services that should effectively improve their customer relationship management. However, the benefits would have been greater if more organizations improved the way they interact with customers across channels and product groups – for example, by enhancing coordination among customer service calls, web-site visits, and direct sales. In other words, ***few organizations seamlessly pass sales leads and service information across the barriers of departments and business units***; however those that do enjoy substantial rewards and improved competitive advantage.

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The ERP design scope

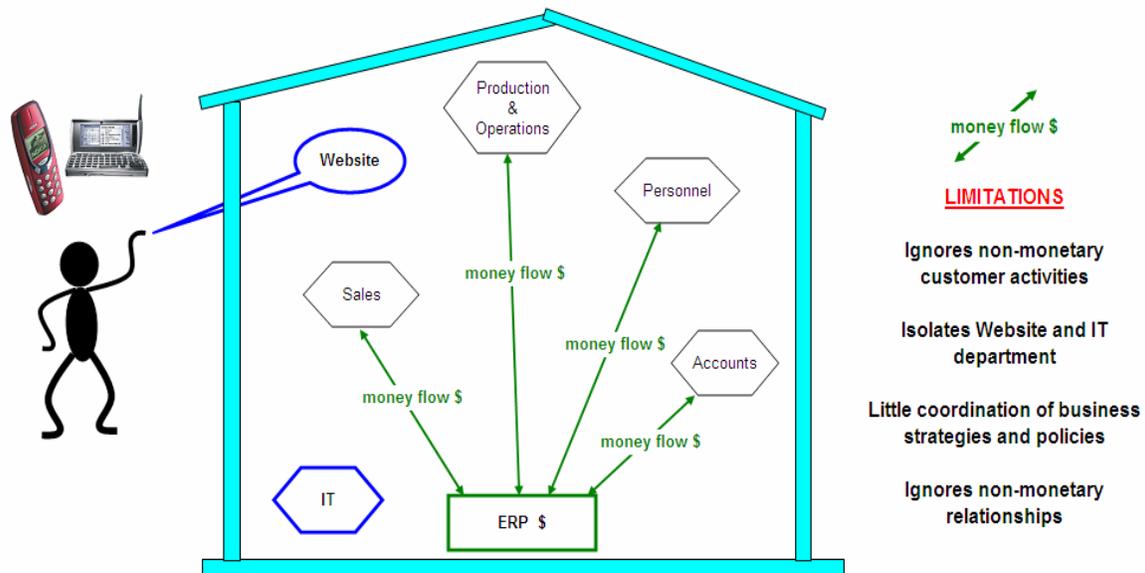


Figure 2: The role of ERP's in organisations

This diagram shows that ERP's are designed to provide information relating to the flow of monetary transactions within organizations. Non-monetary business activities are indirectly isolated as in the cases with the web-site and the IT department. The noted short comings of this design are primarily due to the misuse or misconceptions concerning the role of ERP's in organizations.

In their pursuit to maintain a competitive advantage, organizations strive to acquire the latest ERP's in order to reduce risk and improve customer service, operational efficiency and

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profitability. *These acquisitions although mission-critical will soon become obsolete or useless, due to their inability to effectively deal with changes resulting from the evolutionary business lifecycle of organizations.* ERP's are often perceived to be the silver bullet solution for unknown business challenges.

The Business + ERP reality

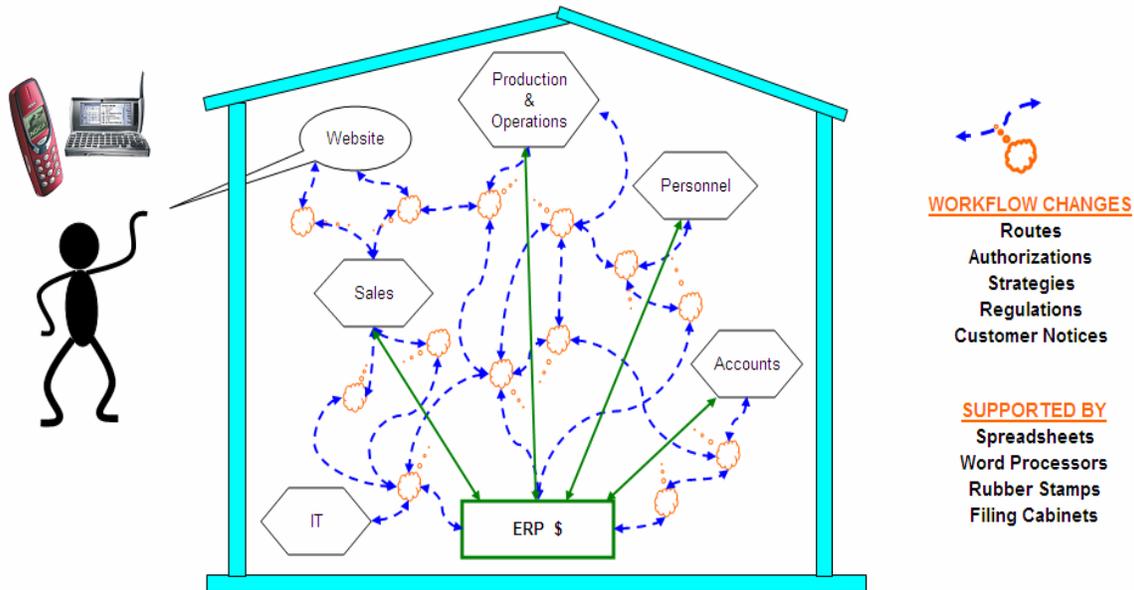


Figure 3: Identifying the gap between the Business and ERP's

This diagram demonstrates the buzz of business workflow activities that are performed on a daily basis in order to meet regulatory and customer demands. These various workflow activities often support the authenticity of monetary transactions. Several organizations have adopted the use of spreadsheets and other office systems to keep pace with the management of these activities.

The proliferation of misconceptions concerning the scope of ERP's has often resulted in several operational deficiencies in organizations as follows:

- Businesses are **trapped in a software maintenance and spending loop**, in their futile attempts to patch and extend ERP's in order to evolve the business and keep pace with the competition. Painfully, ERP's are frequently patched beyond their purpose or design scope to a point where they become obsolete or useless, as stated by the principles of Software Evolution.
- Information is often either **missing or disorganized and un-reconciled across different systems in various departments and work centers**. Apparently, ERP's are not responsive in dealing with workflow changes or diversity. Hence several spreadsheets are often used to hand-craft immediate solutions to capture new pieces of critical information, which are needed to meet changes in management and regulatory requirements. However this is no longer accepted as organizations face increasing pressure from government regulations, such as Sarbanes-Oxley and Basel II, to eliminate errors and strengthen internal controls around their business processes.
- **ERP's and websites often operate as if they are on remote islands** and are not able to supply management with real-time information concerning customers' complaints and preferences. Organizations are only able to formulate relationships with customers when monetary transactions are being executed. In other words, they cannot tell when they are losing customers who have contacted the business without performing a monetary transaction.

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The provocative different viewpoints between managers and regulators (including shareholders) are reflective of the ongoing battle with the highly regulated framework of Financial Accounting and the flexible intuitive practices of management. Financial Accounting is more concerned with the reporting of past or dated quantitative (monetary) information. However, managers heavily rely on qualitative (non-monetary) information in order to successfully direct businesses through their evolutionary lifecycle. As seen in the example above, the loss of non-monetary related customers is of no concern to Financial Accounting, but is of grave importance for managers to maintain the competitive advantage of organizations.

The Root Cause – businesses are short changed

Business organizations are coordinated systems of human activities in pursuit of distributing value (goods and services) to fulfill customer demands. Therefore, business management systems (including ERP's) should effectively aid the automation of these coordinated systems of human activities. This statement focuses on the interactions and collaborations between humans and other entities within organizations and the wider business ecosystem.

Krys Business Solutions

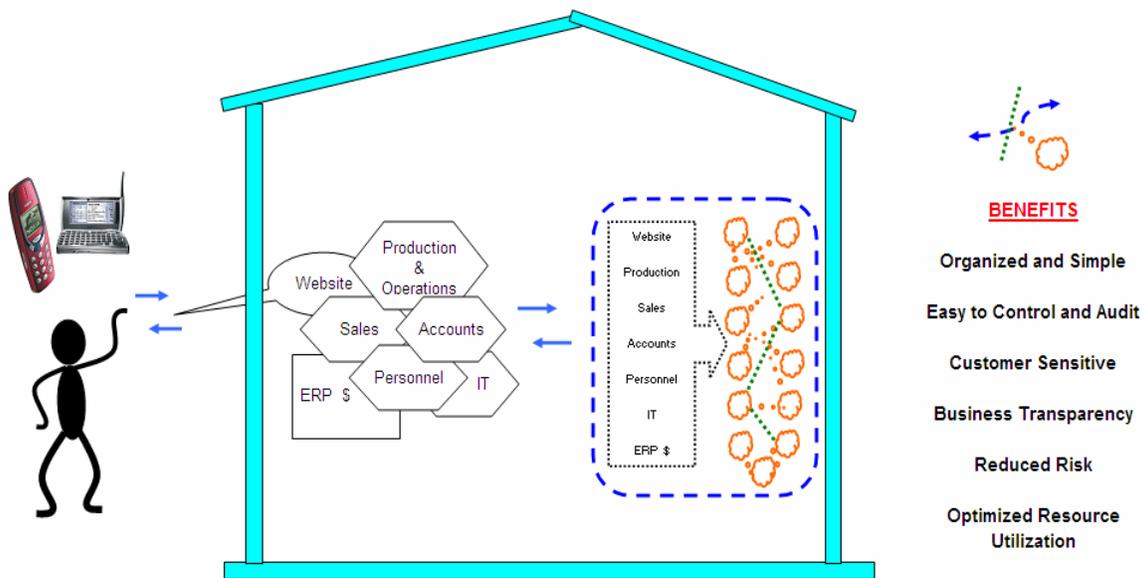


Figure 4: Integrating the landscape of Business Workflows

This diagram demonstrates the impact of BLM systems' integration of the perpetual changes (monetary and non-monetary) to the business workflows of organizations. These systems effectively coordinate the day to day execution of workflow activities and provide a repository of supporting information that is integrated across departments or the functional lines of organizations. Starting with one click on the business website customers interact with managers, employees and other organizational stakeholders, just as if they had physically visited the organization and had dialogue with various business representatives.

For the most part, business management systems have focused on the processing of financial related information. However organizations often experienced severe difficulties in processing and correlating pieces of monetary and non-monetary business data in order to improve the reliability of business information. ***In other words, the inability to harness pieces of business data (qualitative and quantitative) at different points within web-enabled, distributed, dynamic and diversified business workflows represents the root of the crisis facing organizations.*** By design, business management systems have encapsulated the flow of monetary transactions, but have

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quite often neglected the coordination of human related activities. Subsequently, these systems fail miserably when humans change their business workflows.

Stop the Crisis – let's ban ERP's misuse

As their name suggest, ERP's are primarily concerned with providing important financial information, which aids the planning and utilization of resources within organizations. Several organizations have reported success in the utilization of these systems to effectively manage their finances and keep pace with the competition. However, in a changing global market customers have been leveraging technology to do business at the speed of thought. Businesses are increasingly faced with challenges of systems adaptability and agility to effectively fulfill changing regulatory and customer demands.

After years of futile attempts including expended time and money, it is full time organizations coordinate themselves towards the common goal of resolving the crisis. Terminating the cycle of misconceptions and misuse of ERP's represents a major barrier and a critical success factor. Therefore, ***organisations need to take a paradigm shift in support of systems that effectively integrate the perpetual changes to their business workflows, including monetary and non-monetary activities.***

The Resolution – Morphise the business lifecycle

Necessity is the mother of inventions. The revelations of the Internet are as meaningful as Sir Isaac Newton's Law of Gravity. Business Lifecycle Morphing is a paradigm of software systems that supports the growth and development initiatives of organizations as they evolve through their business lifecycle stages. These initiatives and experiences are characterized by the levels of interactions and collaborations within organizations and the wider business ecosystem. That is the coordinated systems of human activities in pursuit of distributing goods and services to customers. To this end, the BLM paradigm utilizes techniques that emulate the process growth and development in living things and human knowledge as a means of managing the perpetual changes in business workflows.

The ability of software to emulate, execute and manage the levels of interactions and collaborations within organizations facilitates access to tiny pieces of business data that once seemed illusive. ***The correlation and integration of these tiny pieces of business data, relative to a common thread of business transaction or strategy, formulates an atomic kernel that provides the key to resolving the crisis.*** The use of this kernel allows organizations to gain the ability to access and harness pieces of business data at different points within web-enabled, distributed, dynamic and diversified business workflows.

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Krys Business MorphIT – a matter of managing risk

In recognition and realization of BLM systems, the Krys Business MorphIT solutions platform stemmed from research and development in 1994 to its productive use by several organizations since 1998. The concept of BLM was derived out of a study that was directed in identifying the competitive advantage that the Krys Business MorphIT solutions platform offered its end-users. The experiences relating to the successful implementation and use of the Krys Business MorphIT solutions platform in small, medium-size and large global organizations have confirmed its real contribution in supporting organizational pursuits. These organizations have demonstrated their ability to quickly adapt and respond to changes in management, regulatory and customer requirements.

Krys Business MorphIT solutions platform

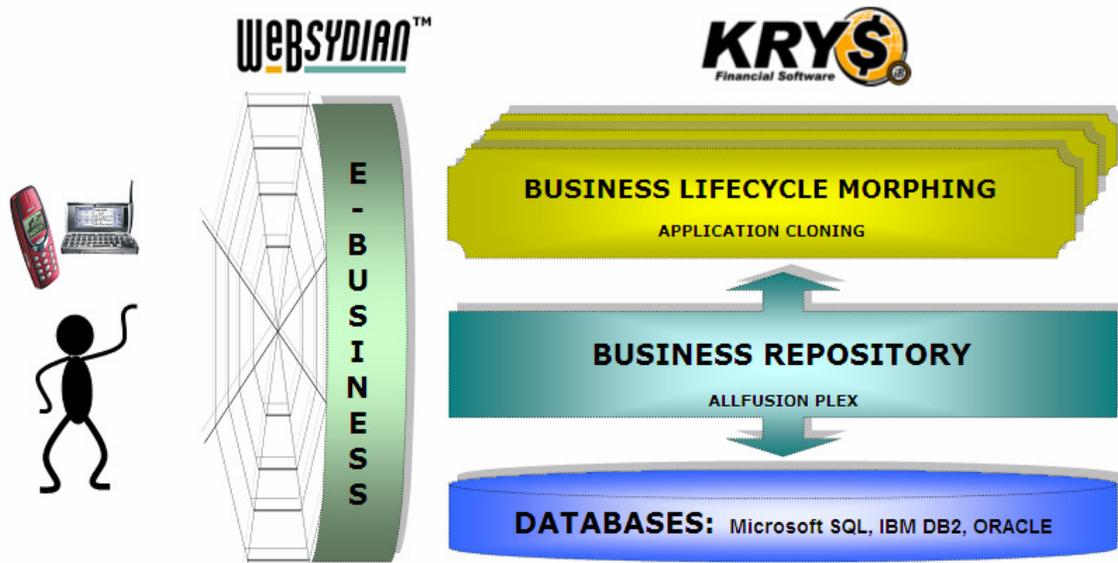


Figure 5: An architectural view of the Krys BLM solutions platform

This diagram gives a macro-view of the integration of major system units. End-Users connect via their web browser to the E-Business unit which manages the levels of security and provides the required user experience. The E-Business unit communicates with the Business Lifecycle Morphing (BLM) unit to process the various request from End-Users. The BLM unit utilizes the information from the Business Repository to dynamically formulate the required responses for End-Users. Organisations have several choices of hardware, operating systems and database platforms.

It's common for organizations that have implemented the Krys technology to experience a sharp increase their sales. End-users are empowered to focus their attention on building relationships with customers and other team members while the software manages the interactions, collaborations and the coherent patterns of business methodologies including financial and management accounting. The Front-Office, Back-Office and the IT-Offices are integrated: beginning with the interactions of customer transactions through the enforcement of production, financial and risk management controls and finally the executions of end of day and next day automated processes.

The following pages give a technical review of the Krys technology.

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Background Technical Review

Behind the Scenes – foundation principles

The proliferation of historical artifacts concerning business lifecycle experiences represents compelling evidence for research. Methodologies stemming from Domain Engineering, Knowledge Management, Business Management Science and Mathematical Models were employed to analyze this evidence in order to derive reusable patterns for constructing adaptable and agile business management applications.

Domain Engineering takes a couple of years in order to rationalize the evidence and engineer (refractor) a set of reusable business objects and a common business vocabulary. One of the major benefits is that once this job is done your rewards are significant. This process resulted in the creation of a reusable software platform that is capable of quickly generating (as in Rapid Application Development) adaptable and agile business management applications. The driving principle behind Domain Engineering is to leverage the benefits of *the reuse philosophy – Write once, reuse many times, maintain in one repository and publish multiple solutions.*

Krys Domain Engineering process

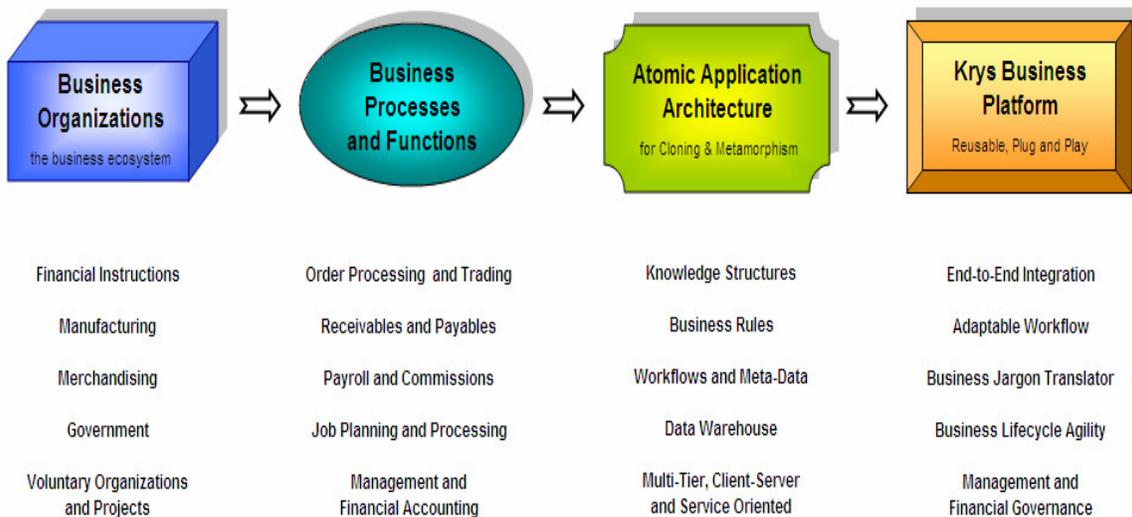


Figure 6: A macro view of the Business Domain research

In this diagram, the analysis of organizations resulted in the discovery of similarities within their product features and the operations of their departments and functional lines. For example the Accounts Receivables operation was similar to that of Accounts Payables except for the direction of cash flow – receipts versus payments respectively. The employment of knowledge management, meta-data services and business rules made it possible to derive a standard Atomic Application Architecture that is operational across the functional lines of organizations. The incorporation of web-enabled workflow and data warehouse methodologies facilitate the delivery of end-to-end integrated business solutions.

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Enabling the reuse philosophy – join the vision

Research predicts that by 2008/9 at least 70% of programming code will be automatically generated by means of Business Process Modelling (BPM) systems and no longer by conventional programmers. It's time for professionals to join the vision and not get left behind.

The maturity of model-based Rapid Application Development tools such as AllFusion Plex uses software patterns, models, and generators to accelerate the design and maintenance of business applications. The Krys Business MorphIT solutions platform leverages these AllFusion Plex features to build a repository of business objects in order to automatically and rapidly generate business management applications.

Krys is aimed at creating applications that are multi-purpose both at the development stage (model-driven or design-time) and at customer execution stage (run-time). Hence the Model-Based Architecture of AllFusion Plex enables the Krys repository to create applications that are relatively small in size but heavy-weight in terms of business functionality.

Application Cloning and Metamorphism – cloning human behaviour

Business management applications are concerned with the automation of business activities by means of capturing, manipulating and distributing information. This means the automation of coordinated systems of human activities, which should include some consideration for the following entities:

- Parties – suppliers, consumers, employees, riders or third parties
- Products – items of value to be exchanged or transformed by parties
- Transactions – contracted actions concerning products, as agreed by parties
- Workflows – transaction execution routes, rules and performance controls
- Media – technology used for information storage, presentation and distribution

Application Cloning is the ability for one application to role-play the purposes of different legacy applications across the functional lines or departments of organisations. Metamorphism relates to the ability of the software to be surgically integrated where needed during Application Cloning. This characteristic emulates the process of growth and development in living things and human knowledge.

According to John Leadbetter (Head of Software Engineering, Soft Design A/S, Copenhagen), Application Cloning and Metamorphism can also be termed 'Binary Patterns' (as opposed to Model-Based Patterns), which are realized during the configuration and execution (run-time) of business systems.

This is a new concept that leverages old techniques that are quite popular in development tools which focuses on using a model to improve the efficiency and integrity of the software development process. In practice 'Binary Patterns' will therefore improve the efficiency and integrity of the software configurations during the execution (run-time) stages of business applications. Systems will improve their adaptability and agility, but more importantly their reliability stemming from an improvement in controls and audits as well as a significant reduction of risk.

The Krys Business MorphIT solutions platform leverages ***Application Cloning and Metamorphism to build a repository of business objects which is primarily responsible for managing the coherent patterns of business methodologies across the lifecycle stages of organisations.*** This facilitates the creation of applications that are adaptable and agile to various business management practices.

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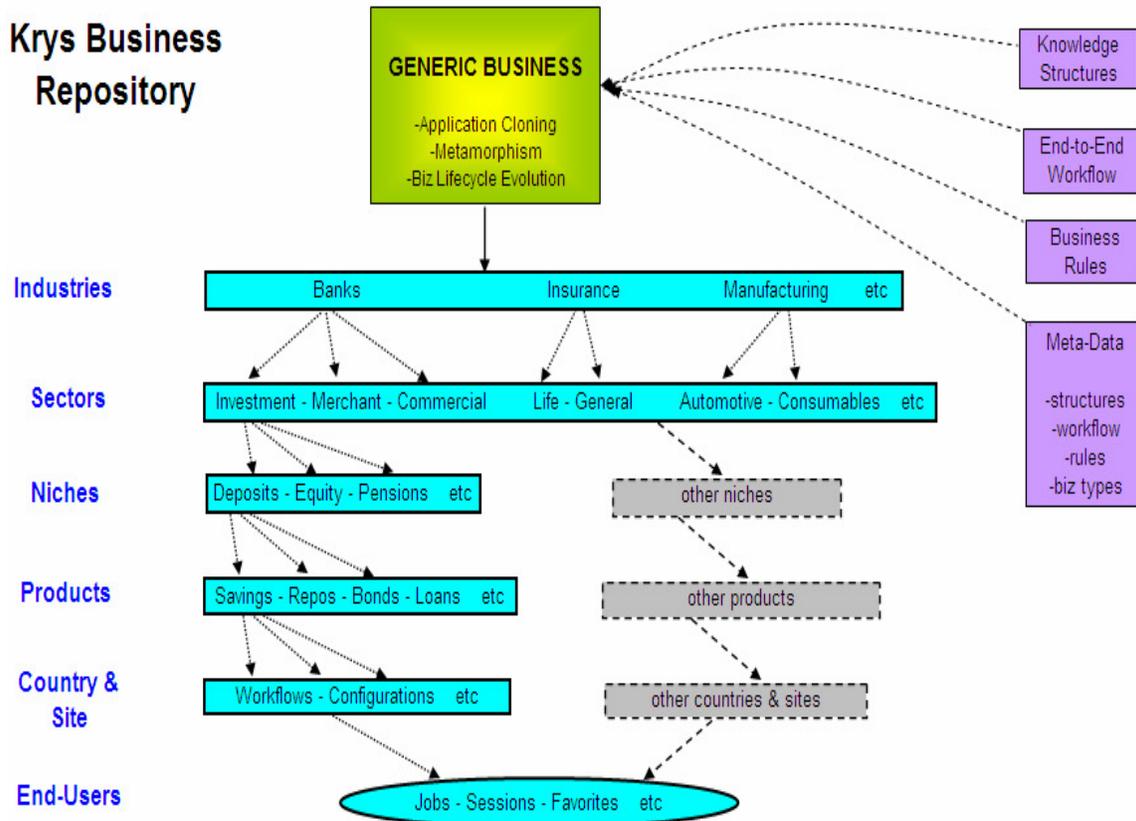


Figure 7: A simplified view of the reusable Business Repository

In this diagram, the repository utilizes an inheritance mechanism to reuse and share business objects and rules at the different business levels (Industries, Sectors, Niches, Products, Country / Customer-Site and End-Users). The automatic generation of any solution will extract only its related business objects from which it compiles a specific and flexible solution, as opposed to extracting the entire repository. This process will create a solution that is relatively small in size from a comparatively large repository. The Krys platform's Application Cloning and Metamorphism features ensure a relatively high level of adaptability for generated solutions.

Eradicating Software Ageing – extending useful lifespan

All the great improvements in the Software Development lifecycle (Waterfall Model, Requirements Engineering, Model-Based Architecture, Service Oriented Architecture, etc) are overcast by the pessimism of Software Evolution (ageing). **In principle, this predicts the termination stages of software even before it is written.** Also, the reliance on Software Maintenance (patching) represents a crisis management approach that software developers use to bandage the wounds of systems that have been hammered by end-users due to lack of adaptability.

Well, its now time to take the bull by the horns and deal with the realities. It's not feasible for business managers and end-users to give the correct system requirements when they are often unaware and worst not able to predict the business lifecycle changes within their organizations.

The initiatives from BLM have taken a paradigm shift to developed systems that are empowered with a significant amount of knowledge about the evolutionary lifecycle changes within organizations. This knowledge base creates a new class of systems that are proactive and predictive of business requirements. Organizations in their early development phases will be able

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to leapfrog with the assurance that these systems are already empowered to support their growth and maturity. This represents a significant step in reducing the negative effects of Software Evolution with respect to systems adaptability and agility to changes in business requirements.

Promoting End-less Software Lifespan

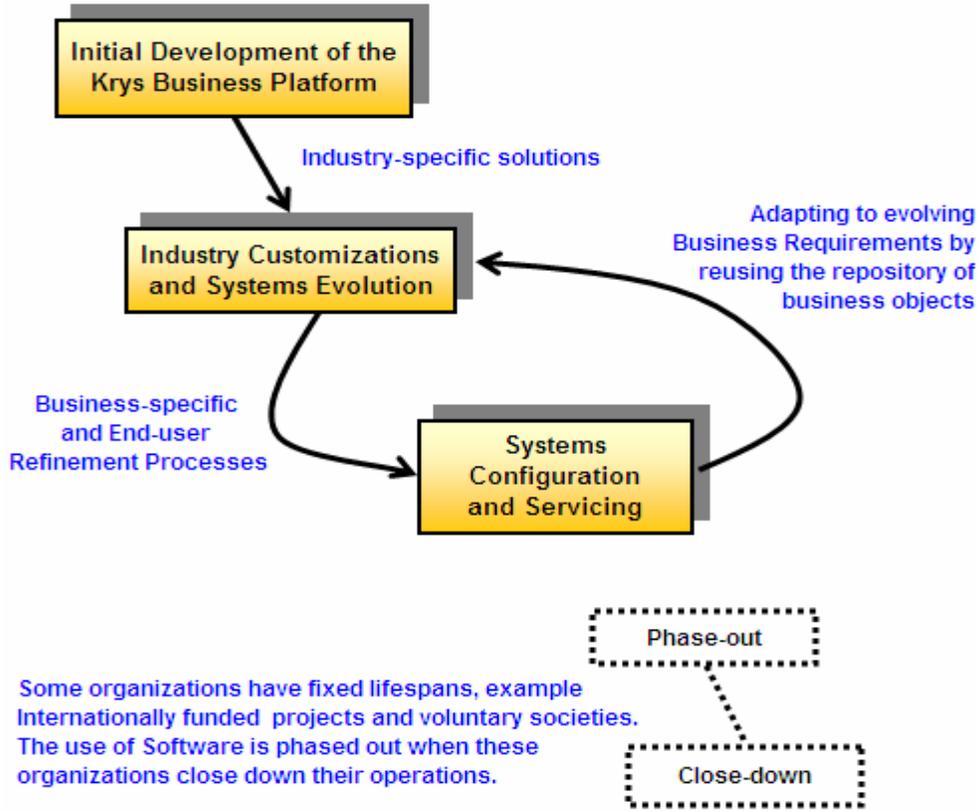


Figure 8: Extending the Usefulness of Business Software

This diagram depicts the end-less usefulness of business software, as opposed to the conventional staged-model in which software is expected to lose its ability to evolve and subsequently becomes useless and obsolete. The usefulness of software has been re-defined to extend to the full lifespan of organisations. This is opposed to the conventional approach in which every 4 to 5 years business systems often fail to adapt to meet major changes in governments, regulatory and market policies.

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Krys Solution Features and Examples

Customers cherished Solutions – at the price of research

The Krys repository will provide help with information that will aid business managers and end-users in developing a clear vision of their system requirements and proposed solutions. The predictive feature of the Krys platform will also extend the lifespan or usefulness of generated business applications.

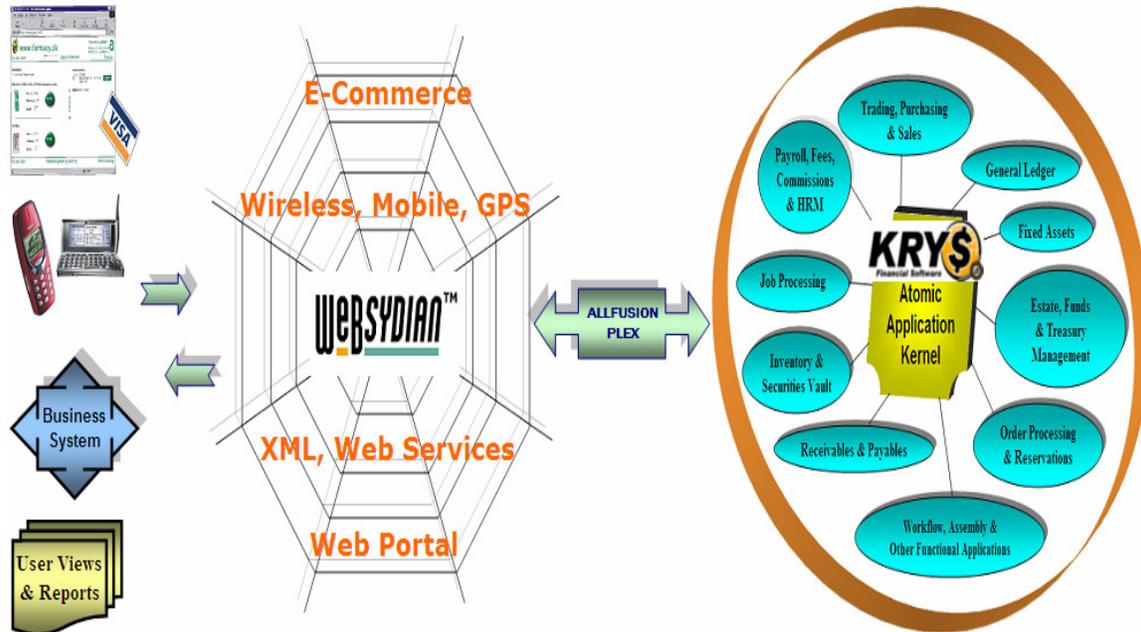


Figure 9: An End-User's solutions view of the Krys technology

This shows the different types of end-user technologies that can be used to interact with the Krys Business MorphIT solutions platform. AllFusion Plex acts as the glue that supports the flexibility and robustness of the Krys platform. The Atomic Application Kernel has a myriad of business solutions that can be delivered to organisations.

Some major features include:

- ADAPTIVE BUSINESS WORKFLOW and BUSINESS ACTIVITY MONITORING (BAM): Business Workflow is usually unstructured and hard-coded or non-existent within Applications. Quite often organisations utilise unstructured spreadsheets and mini-applications to capture data outside the scope the workflow of their applications. Changes to operational workflows (including BAM) are configurable within the Krys Business MorphIT solutions platform.
- MANAGEMENT, CORPORATE and FINANCIAL GOVERNANCE: The regulatory framework of Financial Accounting often conflicts with intuitive methods of Management Accounting. For example, whenever there is a lack of monetary impact, Financial Accounting will not be concerned with the number of cancelled sales orders within an organization. However dissatisfied customers undermine the competitive advantage and goodwill of the business and hence they are of grave importance for Managers. The correlation and integration of workflow artifacts within the financial framework resolves the deadlock between Management and Financial Accounting. The Krys Business MorphIT correlates Workflow metrics with

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Financial and Trading activities to provide stakeholders with business intelligence that are vital for effective Management, Corporate and Financial Governance.

- DATA INTEGRATION: The Krys Business MorphIT is reflective of research concerning the analysis and management of Unstructured or Narrative data. This aims to capture, correlate and communicate different pieces of information that is present within the workflow of an organisation.
- SYSTEMS INTEGRATION: The idea of being able to store any piece of information within the workflow has evolved data structures that are capable of providing middle-ware services for connecting dissimilar Business Applications. The Krys platform is an open framework featuring Web Services and XML wrappers. The System can role-play as an Application Wrapper for legacy systems and allow organisations to meet new customer and regulatory challenges without the hassle of creating silos of dissimilar applications.
- END-TO-END INTEGRATION: Customer to Business (C2B) and Business to Business (B2B) collaborations as well as automated Application to Execution (A2E) processes are made possible via web-enabled adaptable workflows that are distributed across the enterprise. By using the Krys Business MorphIT solutions platform to host websites, the click stream data from customers and end-users can be configured to trigger business rules and events to employees and managers within organisations. ***Whenever customers visit these websites they are in fact walking through the doors of several organizations expecting a 24x7 service delivery.*** In these cases, ERP's and websites no longer operate as if they are on a remote island because they are now able to formulate a relationship with customers whether or not a monetary transaction has been executed.
- END IN MIND (JARGONS): User Interfaces can be customised to meet the Business Jargons associated with particular industries. All this, while the System's internal operations are achieved by means of a set of generic data structures and vocabulary. This facilitates effective B2B collaborations as well as end-to-end vertical and horizontal integration with respect to the supply chain and value chain organisations.
- METAMORPHIC AND POLYMORPHIC DATABASE RULES: These enforce the level of agility needed for systems to evolve or adapt to different business operational models via Meta-data Services – data Registry, data Cloning, data Partitioning, data Versioning, data Correlation and data Aggregation.
- ECONOMIES OF SCALE AND SCOPE: These are represented by the Krys platform's ability to use one relatively small set of data structures to resolve the requirements for several businesses within the same industry (vertical integration) or a conglomeration of businesses across industries (horizontal integration).
- EMBEDDED DATA WAREHOUSE METHODOLOGIES: These are essential in order to achieve the high level of Business Intelligence and Analytics derived from stored data.
- MBA, SOA, BPM and DATABASE INDEPENDENCE: The features and benefits of Model-Driven or Model-Based Architectures, Service Oriented Architecture and Business Process Modelling are well documented on the internet. AllFusion Plex has a proven track record for delivering solutions on several databases including IBM DB2, Oracle and MS SQL Servers among other SQL compatible databases.

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Can Krys provide support for ERP's?

ERP's provide mission-critical support for most organization. The Krys Business MorphIT solutions platform is not intended for organizations to lose from their existing investments. Rather, the Krys platform aims to automate and manage the interactions and collaboration initiatives of organizations which include providing support and integrating information across departments, functional lines and existing legacy ERP's. This approach will significantly reduce if not remove the misuse and the need to patch existing legacy ERP's. Also this will indirectly extend the useful lifespan of ERP's as there is no need to modify their scope and hence improve the levels of operational excellence and return on investments for organizations.

Krys Business MorphIT solutions platform can be used to deliver ERP system functionalities, which in principle is primarily concerned with the Financial Accounting framework of organizations. However it's important to ensure that solutions are adaptable across business lifecycle stages. So, the focus is more on business workflows, as previously stated the coordinated systems of human activities. The integration of financial accounting features can then be made where applicable.

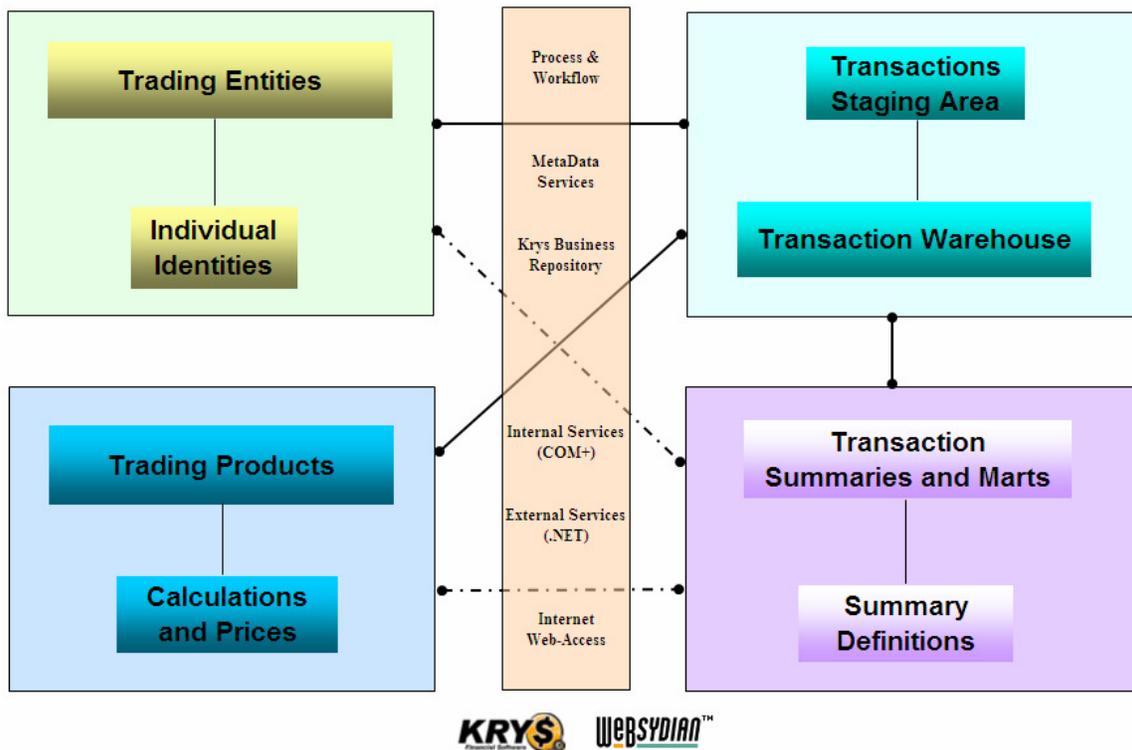


Figure 10: A Data Model view of the Krys Business MorphIT solutions platform

In this data model, Individuals (customers) are optionally grouped to form a legal bond or Trading Entity (customer account) from which they execute transactions (trading of products). The Transactions Staging Area is a flexible structure that meets the user specific trading terms and converts it in a form that is suitable for the Transaction Warehouse. This maintains the referential integrity relating to configured business methodologies including financial and management accounting. The definitions within the Trading Products and Calculations help to support the management of business referential integrity. Summary Definitions apply the needed flexibility for creating different type of Transaction Summaries and Marts. Web-enabled Workflows, Meta-Data Services and the Business Repository support the levels of interactions and collaborations between humans and other entities within organizations.

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Ease of Customization – what skills are required

End-Users, Business Analyst and Developers can be trained to customize the User Interfaces and Business Rules in a matter of days. However, having a good knowledge of the requirements for the targeted industry, sector or business subject area is required for creating effective solutions. There is no requirement for high-end programming skills; however a good knowledge of spreadsheet formulas and an entry-level knowledge of relational database programming would be an advantage.

The Krys Business Repository generally covers between 80 to 100 percent of your targeted solutions. In most cases you will configure or Morphise specific business workflows and updating end-user screens with the relevant business jargons.

The Krys Business MorphIT solutions platform features web-enabled customisations and configurations which enables a ‘Try and Buy’ culture for customer and partners. So customer-specific solutions can be configured online in order to facilitate used a user acceptance testing.

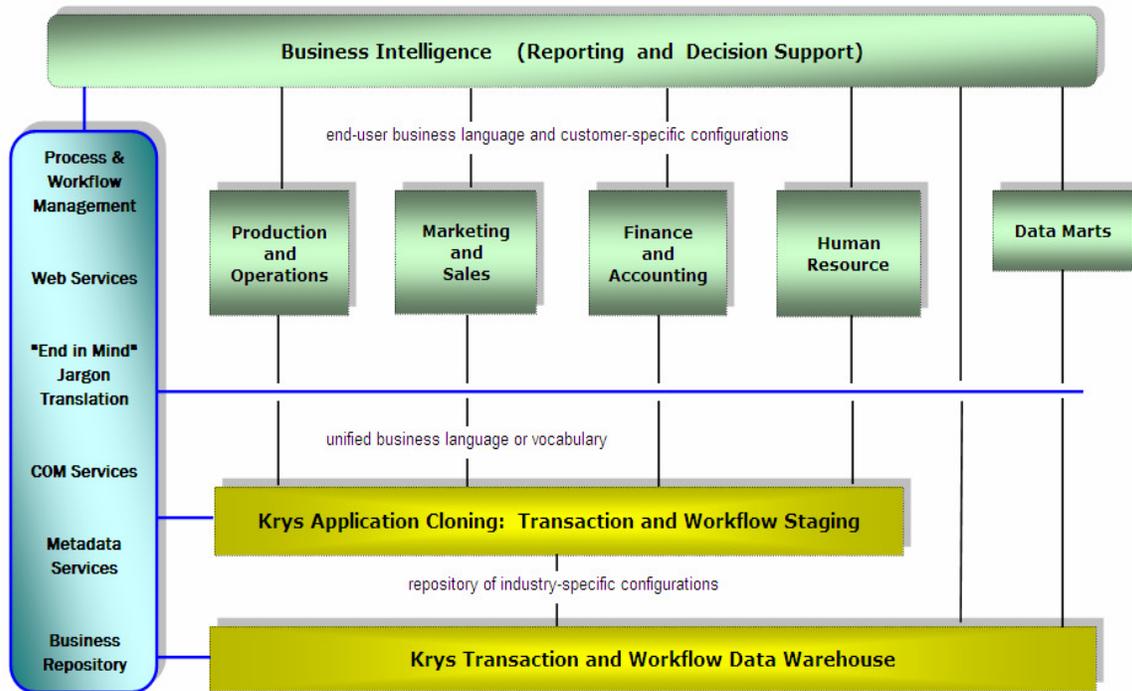


Figure 11: An Enterprise view of the Krys Business MorphIT solutions platform

In this diagram, the Krys Business MorphIT solutions platform supports several functional areas within organizations including Production and Operations, Marketing and Sales, Finance and Accounting and Human Resource Management. The Business Intelligence unit uses information from departments, functional areas and Data Marts in order to support the decision makers of organizations. The Transaction and Workflow Staging, Transaction and Workflow Data Warehouse, and Process Workflow Management components provide robust enterprise level infrastructures that support the operations of organizations.

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Krys Business Solutions and Workflow Examples

End-Users, Business Analyst and Developers can configure their business-specific workflow packages at various levels depending on the separation of duties within their organizations. Workflow packages are groups of business events that are executed at different instances within the day to day operations of the organisation. Events can be trigger based on specific profile of users, system processes, type of business activity, profile of customers, time schedules and so on.

Workflows can simulate a selection of existing system menu options or business objects with additional flexibility to transfer control, send messages and request approvals from different users. The system’s repository of executed workflows (history) provides real-time business activity monitoring (BAM) and metrics related to the performance of employees and business strategies.

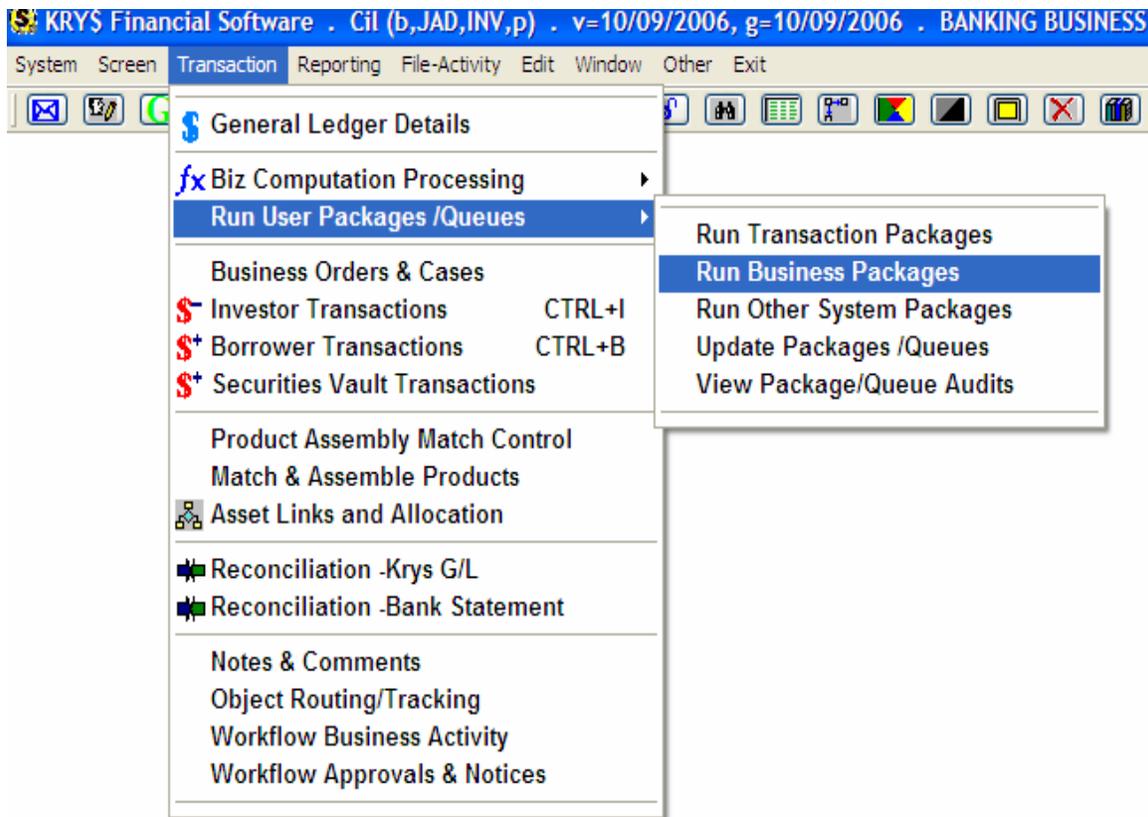


Figure 12: Example of Krys Business Workflow Menu Options

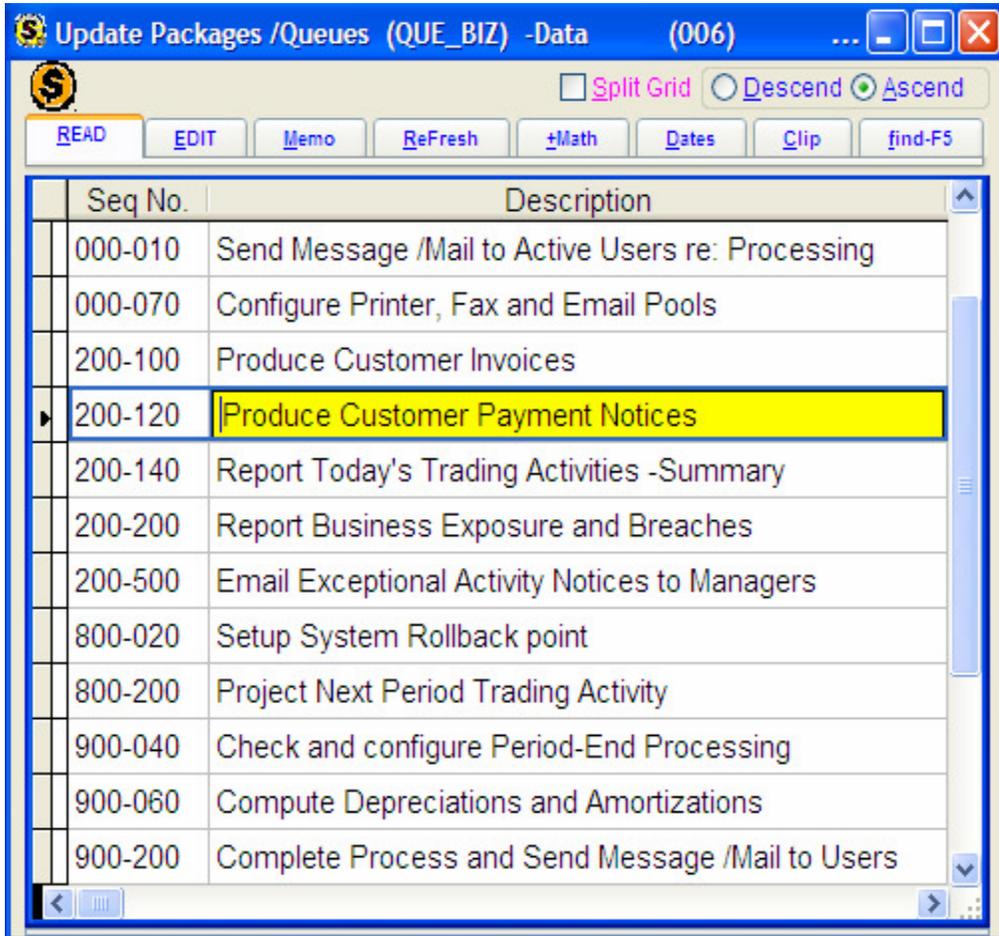
In this diagram, the 'Run Business Packages' represents a collection of business workflow events that are executed at an enterprise level, typically at the end of business day or start of new business day. This simulates a selection of existing system menu options with additional flexibility to transfer control, send messages and request approvals from different users.

An example of some of the popular investment related products and applications that can be quickly configured on the Krys Business MorphIT solutions platform include: **Pension Fund, Mutual Fund, Estate Management, Unit Trust, Stock or Equity Trading, Fixed Deposits and Savings Accounts, Bond Trading, Portfolio Management, Mortgages, Loans and Leases, Foreign Currency Trading, Fixed Assets and Security Vault Management.**

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All products will have their related online sub-ledgers and integrated general ledgers; accounts receivables and payables; payrolls and trade commissions, cash books for checks, receipts and reconciliation; and facilities to generate checks, receipts, business vouchers and journals, invoices, contracts, certificates, tax notices and other client confirmation notices – in a real-time or batch mode.

The flexibility and adaptability of these product configurations is an example of what can be leveraged across different departments and functional lines of organizations.



Seq No.	Description
000-010	Send Message /Mail to Active Users re: Processing
000-070	Configure Printer, Fax and Email Pools
200-100	Produce Customer Invoices
200-120	Produce Customer Payment Notices
200-140	Report Today's Trading Activities -Summary
200-200	Report Business Exposure and Breaches
200-500	Email Exceptional Activity Notices to Managers
800-020	Setup System Rollback point
800-200	Project Next Period Trading Activity
900-040	Check and configure Period-End Processing
900-060	Compute Depreciations and Amortizations
900-200	Complete Process and Send Message /Mail to Users

Figure 13: Example of an enterprise level Business Workflow.

In this diagram, the sequence of workflow events represent a complete Business Workflow Package, which is executed at the end of a given business day. The sequence can be modified by end-users to exclude or include various business activities.

Krys clients view their business workflow configurations as their competitive advantage. This is related to the quality, control and speed at which business activities and transactions are executed throughout organisations. It's all about managing the coordinated systems of human activities in pursuit of distributing goods and services to customers.

Krys Solution Benefits and Market Scope

Major Benefits of the Krys Business MorphIT solutions platform

The use of the Krys Business MorphIT in organisations delivers the following benefits:

- A simplified and efficient business landscape, in which web-enabled business workflows are seamlessly integrated across various departments and functional lines of organizations.
- User-friendly work environments, in which the business language is based on end-users business jargons.
- Improved management of the interactions and collaboration initiatives of suppliers, employees and customers. This will effectively improve the optimization of resource utilization.
- Improved ability to correlate, audit and google search tiny pieces of related information that once seemed illusive.
- The levels of transparency will be significantly improved across work environments as information is readily available and there is one point of control and audit of information.
- Improved management of organizational strategies and policies as well as reduce operational risks. This will positively affect the management and financial governance of organizations.
- Reduced patching and spending on the maintenance of ERP's. This will effectively extend the useful lifespan of ERP's and expand the scope and usefulness of software within organizations.
- In order to create an efficient global market-place, information needs to be readily available and at a low cost. This can be achieved by effectively improving the levels of efficiency of business workflows within organizations. This will subsequently improve the overall efficiency of organizations. The interactions and collaboration initiatives among efficient organizations and customers within the global market-place will create an efficient market. In other words, efficient business workflows or collaborations lead to efficient organizations; efficient organizations or market-players lead to efficient markets.

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The Market Focus – accelerated growth by design

The Krys Business MorphIT solutions platform has a standard template deployment methodology that is implemented by Krys partners and end-users. Partners can implement industry-specific offering that uses a combination of both Krys and partner-specific business rules to configure turn-key solutions for their customers. This enables Partners to develop plug and play solutions which are customized to meet customer-specific requirements with a fixed implementation time and price. This approach carries a simple and valuable customer message or tagline:

Turn-Key: Shaping Goals; Securing Victories.

The Krys Business MorphIT solutions platform provides turn-key solutions that help you to shape your business goals and strategies. Krys enables to better secure your success and victory without hassle.

By shaping your goals, you effectively customize your business environment by means of modifying or adding new controls to the existing Krys business rules repository. Now, remove the hassle or monotony and allow the system to effectively execute and manage your complex day to day business transactions and workflow activities. Relax, the Krys business intelligence unit provides real-time decision-making support which embraces your successful rivalry and competitive advantage. All this and more, while you secure your victory within the global market.

We are currently targeting the Financial Services industry as our bowling alley (or market niche) but other Partners (developers) could create solutions for their own bowling alley. The Financial Services industry is torridly competitive and fast-paced and IT is increasingly seen as the competitive differentiator. It's also common for other industries to look to the Financial Services sector as both leaders and pioneers in the key IT technologies and data governance. In other words, the Financial Services Industry is a good test or benchmark of mission-critical business management applications.

The Krys marketing strategy is similar to the one used to market the SAP All-In-One platform for the manufacturing sector. The All-in-One platform is actually the mySAP product with a template deployment methodology that is implemented by SAP partners. This strategy has contributed to SAP All-In-One Leadership position in software solutions for the manufacturing sector.

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End-to-End Web Integration – the customers are waiting

Research shows that in 2003 approximately 10% of front-office applications are integrated with the back-office. Approximately 75% of e-business projects fail and 90% of Workflow projects succeed. It's possible that the 75% of e-business projects failed due to a lack of front-office to back-office workflow integration. Intuitively approximating over 3 years could imply that 30% of front-office web applications are now fully integrated to the back-office and 70% are stand-alones not integrated with back-office legacy systems. Hence a large proportion of organisations are waiting for End-to-End Web solutions in order to improve their performance and competitive advantage in the global market place.

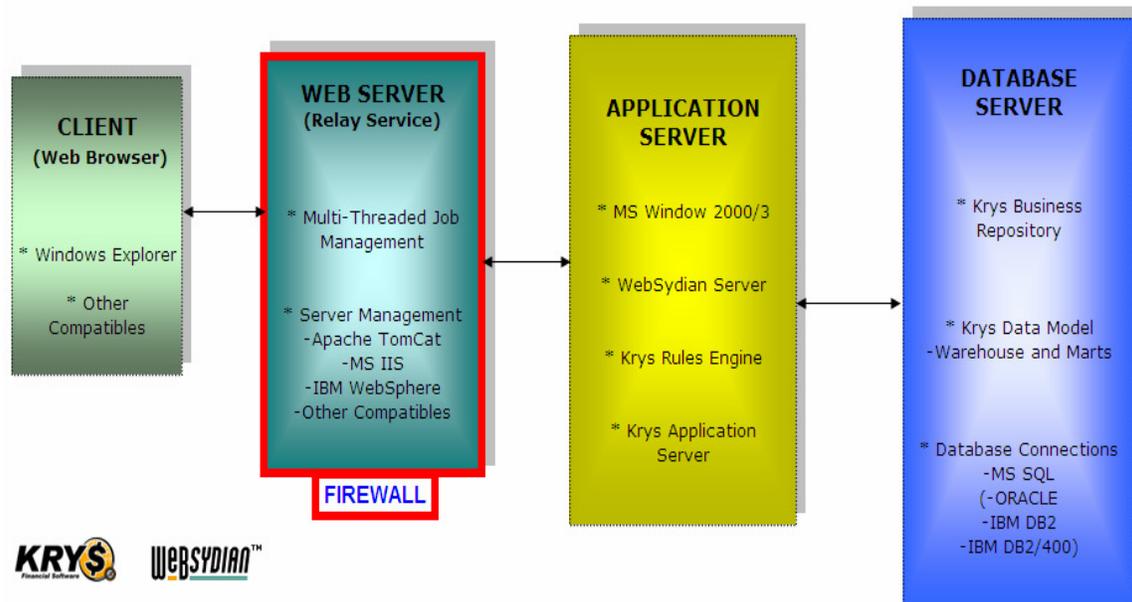


Figure 15: An Infrastructure view of the Krys technology

In order to effectively delivery its targeted business solutions, the Krys Business MorphIT solutions platform utilises a multi-tier and client-server architecture, as noted in the diagram above. This infrastructure includes the following technologies:

- HTML Web Browser Client: MS Internet Explorer or compatible
- Web Servers: Apache TomCat or MS IIS or IBM WebSphere
- Application Servers: Windows Server 2000-2003, Websydian Express
- Database Servers: MS SQL or IBM DB2 or ORACLE or SQL compatibles
- Development Environment: AllFusion Plex, C++, C#, Java
- Rules Engine – Perl, MS Visual FoxPro, Awk, other Interpretive Programming Languages
- Hardware Platform: Windows PC Servers or Linux/Unix PC Servers or IBM System i5

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Krys Partners, Supporters and Well Wishers

Theories of the Krys Business MorphIT solutions platform have formulated a Body of Research at the University of the West Indies. The intension is to publish the work as a global Standard for the development of adaptable and agile Business Application software. This will also represent a significant contribution to the knowledge-base of Reusable Software Engineering with a particular aim of reducing the impact of Software Evolution and extending the useful lifespan of business applications.

With its origin from the UK and now owned and distributed from the USA, the AllFusion Plex family of 'Pattern-Based' and model-driven development tools has been delivering mission-critical business solutions since 1986. The tool represents a Business Software Pattern Repository, which is aimed at reducing the software development process. By reusing existing patterns from the repository, developers avoid reprogramming and reinventing the wheel.

The Krys Business MorphIT solutions platform leverages this 20 years history of business pattern experiences to deliver solutions that resolve specific business related challenges. The addition of the Krys Business MorphIT solutions platform to the repository represents a contribution to the pattern experiences to be leveraged by developers, business analyst and customers across the globe.

Soft Design's 20 years of expertise and successful experience with this development tool is renowned in the industry. To most developers, the maturity of Websyidian in the AllFusion Plex community has made it the de-facto AllFusion Plex Web Extension product. With over 200 customers across the world Websyidian is steadily becoming a major player in the development and delivery of web-based business solutions.

Indicated in a press release from IBM Denmark, on September 6, 2006, Soft Design has won an IBM's partner award (Spydspidsen – meaning pinnacle of the spear) for most innovative technology solution for 2006, with one of its products namely, 'Synchronicer' – a web-based GPS Delivery Management Solution. Soft Design has been an IBM Business Partner for over 20 years, and on several occasions IBM has pointed out the high quality of the Websyidian products and considers them to be: "... ideal for high security e-Business application at financial institutions".

https://www-304.ibm.com/jct03004c/servers/solutions/finder/solution/overview.jsp?solution_id=soq18364312250014002130

In 2006 Websyidian was selected as a System i5 Security and Compliance Tool by IBM and will be delivered with System i5 to customers. They were awarded the following certificates: IBM System i5 Security & Compliance Proven, IBM Server Proven and IBM Express Portfolio Proven.

From its headquarters in Copenhagen, Denmark, Krys Financials leverages best of breed skills, talents and partners as well as world class infrastructure to proudly host the home of the evolutionary Krys Business MorphIT solutions platform. Lots of respect to efforts of the Jamaica Investments Promotions Corporation, Ministry of Foreign Affairs –Invest In Denmark, Clients, Partners and Supporters for making this venture a success.

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Development Motivation and History

Krys Development Path – innovations from Jamaica

From its research lab, based in Jacks Hill, Kingston Jamaica, the Krys Business MorphIT solutions platform was developed from over 15 years of Domain Engineering initiatives with several private and public organisations across different industries.

The Krys platform started as early as 1992 when it was first designed to provide solutions for the manufacturing sector of Jamaica. However the impacts of globalisation caused the manufacturing sector to collapse due to its inability to compete with foreign imports. The pursuit for survival in a small market created the need to develop a solution that could evolve to meet the needs of several companies across different industries. Furthermore, faced with the challenges of a cash strapped economy, our company needed to focus on exporting software. Leveraging our years of experience in developing and implementing systems in various public and private businesses, the decision was taken to create a flexible architecture that could evolve and adapt to various business requirements.

1994 marks the year of delivery of the planned revolutionary architecture that would allow software to evolve and adapt to meet changing business requirements. As is usual in these novel innovation cases, no one believed and it's always difficult for the inventor to explain in the language of the listener. Having completed the research and prototype, it was time to find customers for this technology. Obviously, the only companies that are always cash rich in difficult times are financial institutions. As a result, we concentrated our efforts on customising the framework for banks and investment houses.

We installed our first copy of the Krys software at National Mutual Investment Bank, a subsidiary of National Commercial Bank of Jamaica, in 1998. It goes without saying that this was a free copy; as we all know banks don't take risk, they manage risk. The following years we found ourselves being challenged by the global market as local companies access the internet to purchase their software. In order to survive, we customised our solutions and business model to fit the local market niches and were able to win several customers. To date, the Krys software is being used primarily by Banks and Investment companies.

The world wide growth of Websyidian since 2001 was a major factor in our decision to formulate a partnership for the further development of the Krys Business MorphIT solutions platform. The pursuits of Krys Financials to improve the robustness and web-enablement of its products were the initial drivers of this partnership. Krys clients required web enabled expanded market access customers and employees. Through a disguised investigative trip from Kingston, Jamaica to Copenhagen, Denmark in November 2005, the Soft Design's team demonstrated that Websyidian and AllFusion Plex development products were suitable technology platforms for the development and deployment of robust enterprise solutions.

From an investigative trip to a partnership of bundled products, the Krys Business MorphIT solution platform is a joint effort between Soft Design and Krys Financials to develop, deploy and expand the marketing of web enabled, adaptable business management solutions.

The success stories that have been heralded from Microsoft and other software giants in Denmark combined with the novelty and market attractiveness of the Krys Business MorphIT solutions platform are evidence that this strategic move will be economically rewarding.

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Conclusion

Finale – Can Krys make my coffee?

The Krys Business MorphIT solutions platform is not a silver bullet or a silver pallet. It is a concerted initiative that leverages technology and business lifecycle methodologies to fulfill end-user requirements and business evolutionary challenges. These challenges include flaws in transactions, poor collaboration and resource utilization which often result in excessive expenditures, inadequate service and loss of customers.

Organizations can take the opportunity to de-mystify their static IT systems and improve their competitive advantage by exploiting the benefits of driving their business on revolving IT wheels – evolving IT systems. Organisations will profit from creation of a simplified, efficient and transparent work environment by adaptively Morphising (i.e. adopt, optimize, integrate and manage) their evolving behavioral patterns and business strategies. **The Krys platform aims to provide organisations, Business Management Applications that are adaptable and agile across their business lifecycle stages.** As a result, this will considerably improve the levels of maturity, operational excellence and return on investment for organizational stakeholders.

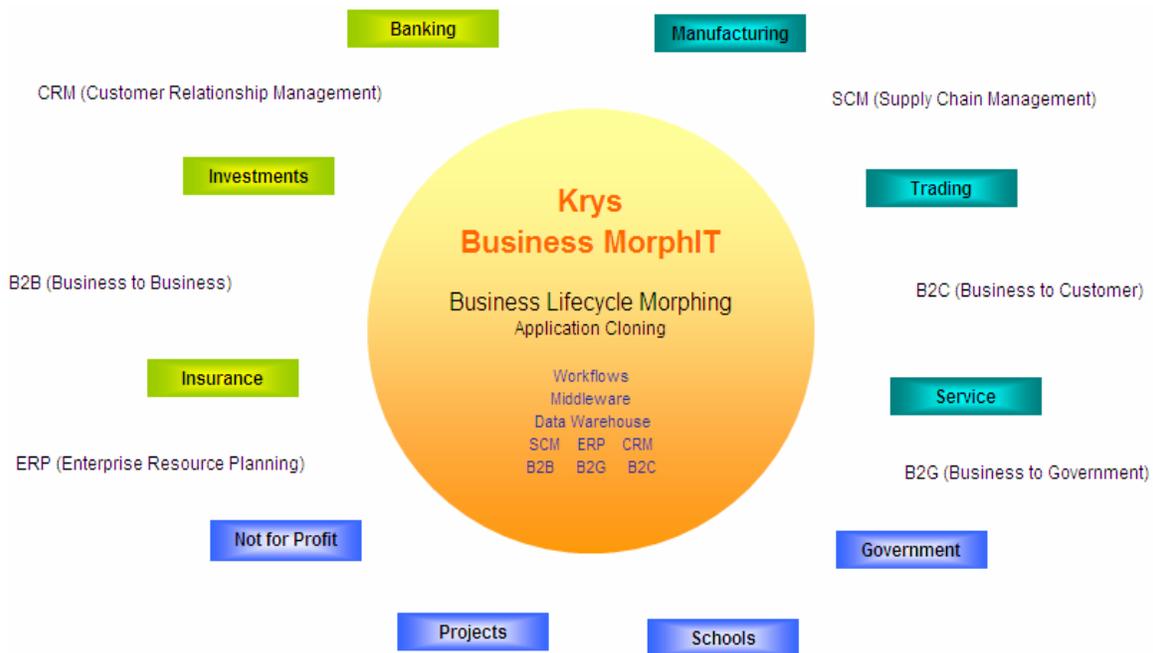


Figure 16: Revolving Organizations, Technologies and Market Integration

This diagram demonstrates the impact of Krys technologies across departments and the functional lines of organisations as well as across horizontal and vertical markets – business value chains and supply chains.

“The Krys Business MorphIT solutions platform will do more than make your coffee; it will bring your coffee to you” – the joy of end to end solutions.

This paper was written by Chris Green – Chief Architect of the Krys Business MorphIT solutions platform and President of Krys Financial Software. With over 15 years of experience in the IT Industry, he has been directly involved in the Analysis, Development, Implementation and Management of Business Systems. His expertise has fostered the development of several major companies in both the private and public sectors.