WHITEPAPER

Enterprise application modernization

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LEGACY POWERS LEGENDARY

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Introduction

Many organizations are realizing that they must modernize their Rocket® Uniface applications to minimize the cost of ownership while increasing agility. Or it may be the case that resources and budgets become available for revisiting an older Rocket® Uniface application that has been successfully in production for a number of years. The approach outlined in this paper shows how to modernize at a pace and to the extent that suits your organization's aspirations while considering its constraints. You can choose to modernize the front end, the back end, or both. This paper outlines the case for modernization in the current economic and technological climate and describes a flexible, efficient approach to modernization programs.

Background

Many organizations that have yet to modernize their Rocket® Uniface applications may be approaching the point where they cannot postpone it any longer; they urgently need the cost savings and the agility that modernization can bring. In the meantime, the repercussions of failing to modernize have become more serious, while maintaining and enhancing obsolete software and hardware has not gotten any easier.

10 Ways Rocket® Uniface Helps You Succeed

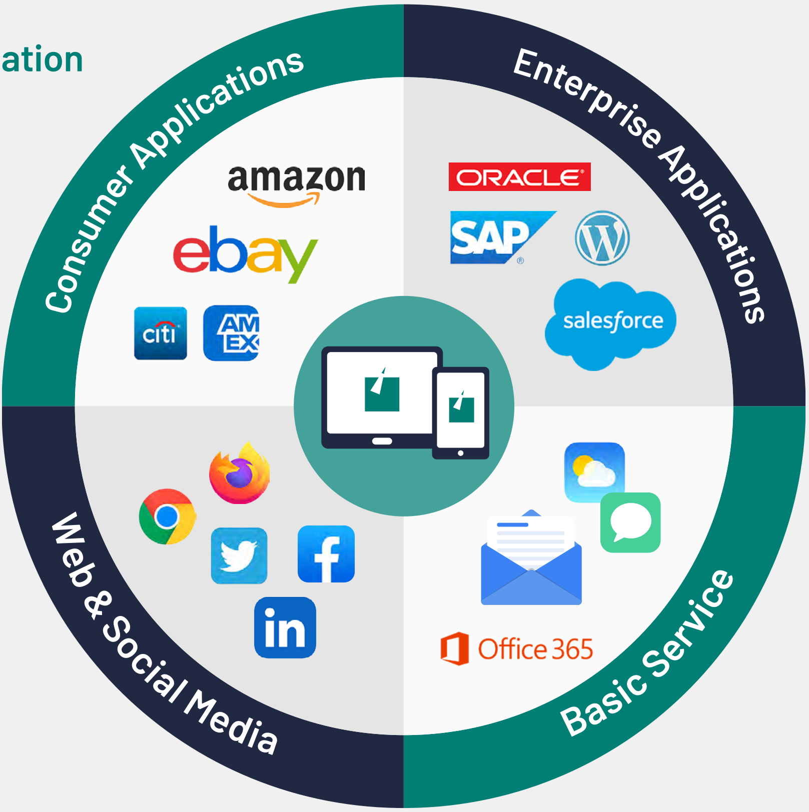
1. Productivity
2. Reliability
3. Security
4. Integration & Reuse
5. Scalability
6. Agility
7. Sustainability
8. Technology Independence
9. Community
10. Partner Program

What do modernized applications look like?

Today's "consumerization" trend means that instead of being used by 100 internal users who have no alternative, your application now could potentially be used by a thousand or even a million external users who have many other options. Users also have high expectations in terms of usability because they compare any applications they use, including those that they need for work, with the user-friendly apps and games they enjoy in their leisure time. Ideally, enterprise applications must be appealing; that is to say they should have an engaging user interface and be easy to run, like the Apple and Android apps to which consumers are accustomed.

Figure 1

The consumerization of enterprise applications



Security is also a critical issue, as aged applications are more vulnerable to security attacks and viruses while users expect their applications to be secure—which means that applications must be able to keep up with the latest versions of operating software in order to take advantage of security patches and other adjustments. Consumerization trends mean that business is exposing corporate assets to the outside world, making them more vulnerable to security attacks.

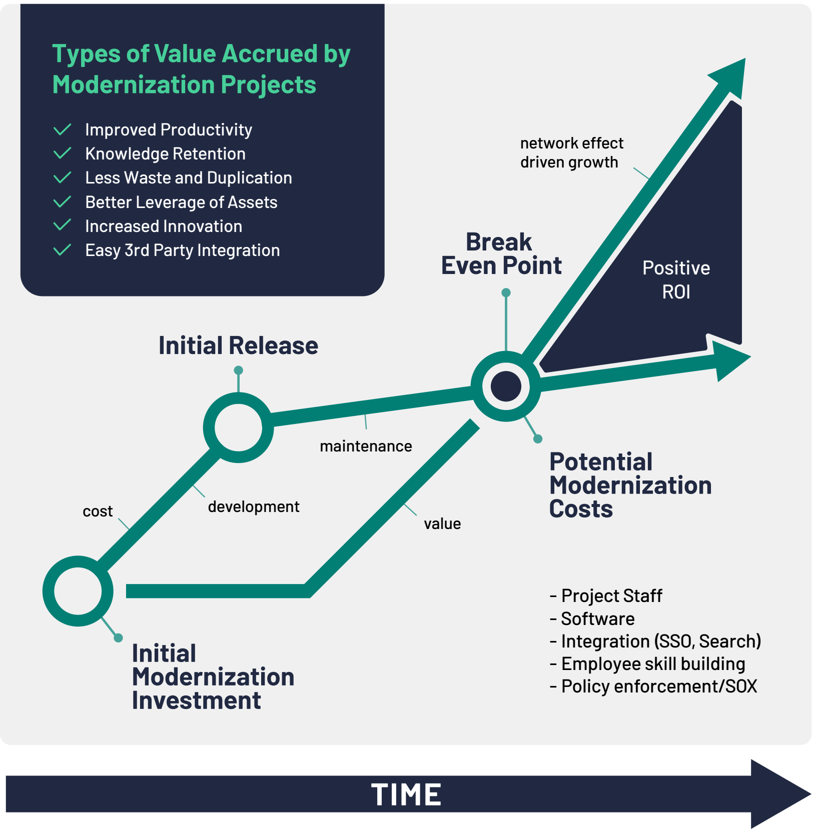
In addition, modernized applications should be able to run on any platform (Windows, web, mobile, and so on), and the applications, which need to be scalable, should be available 24/7. They must be transparent and robust so that they can share data with other systems; for example, an airline's ticket price information may be used by travel agents. Applications must be easy to maintain and enhance so that organizations can respond to changing demands in an agile way—new features are needed in days, not months, in order to shorten time to market. All this becomes much easier if your applications comprise easy-to-use units. Packaging up your applications in this way is one of the main aims of modernization.

What is modernization?

Modernization is the continuous evolution of an organization's existing application and infrastructure software.
It is about preserving and renovating critical business logic, reducing operational and maintenance costs, and opening up applications to make it easy to add new capabilities.

Figure 2

Achieving ROI with modenization


Types of Value Accrued by Modernization Projects
✓ Improved Productivity
✓ Knowledge Retention
✓ Less Waste and Duplication
✓ Better Leverage of Assets
✓ Increased Innovation
✓ Easy 3rd Party Integration
network effect driven growth
Break Even Point
Positive ROI
Initial Release
maintenance
development
cost
value
Potential Modernization Costs
- Project Staff
- Software
- Integration (SSO, Search)
- Employee skill building
- Policy enforcement/SOX
Initial Modernization Investment
TIME

The business case for modernization

Organizations need to reduce cost and increase agility

Most organizations are under pressure to reduce their cost of ownership for IT systems, particularly given the economic climate. The resources consumed by existing application portfolios' ongoing operations and maintenance hang like storm clouds over the heads of applications professionals.

It is well known that around 75%[1] of IT resources are focused on maintaining legacy applications. Re-directing some of the maintenance budget to modernization projects can dramatically lower future maintenance costs, so that there is more to spend on innovations that enable new products and bring a competitive advantage.

Forrester says, "IT decision makers must reduce portfolios' overall complexity and cost and bring business-level transparency to IT activity to enable more-strategic business/IT planning."[2]

Organizations also need to stay competitive. Increasingly, this means making available to customers, in a suitably consumerized form, applications that were previously only internal. Demands from customers and pressure from competitors are major influences when it comes to deciding what and when to modernize. Given these pressures, many organizations know they are reaching the point where they must take the first steps toward modernization.

Typical modernization contenders

Modernization should be considered in cases in which a legacy application has one or more of the following characteristics:

- *It has been in production for a number of years*
- *Its architecture has deteriorated, making maintenance difficult*
- *The front-end architecture is obsolete (e.g., character UI or 1st-generation GUI interfaces)*
- *The back-end architecture lacks integration features and is not SOA-enabled*
- *The operating system and database may no longer be supported and may require obsolete hardware, which may only be available for second-hand purchase*
- *Key functionality is lacking, such as integration with Google Maps and social media channels*
- *Employee turnover results in the loss of crucial knowledge of applications*

[1] The economics of software maintenance in the twenty-first century, Capers Jones, Chief Scientist Emeritus, Software Productivity Research, Inc.

[2] A Workable Application Modernization Framework is Job No. 1 Now, Phil Murphy, Forrester Principal Analyst

Modernization helps both enterprise and IT functions to respond to business and technology pressures

In addition to reducing costs and increasing agility, modernization of your IT assets allows both enterprise and IT functions to respond to specific pressures that they are currently encountering. Some of these pressures arise from business trends, others from technology trends.

Figure 3 illustrates some of these.

- In the top left quadrant, we see that organizations (whether or not they are aware of it) may be under competitive pressure to consumerize their applications by, for example, creating an online presence
- In the top right quadrant, we see that the industry sector may require adoption of emerging trends, like supply chain management and social media, to enable data sharing and collaboration with partners
- In the bottom left quadrant, we see that the IT function is likely to be under pressure from the business to adopt new development models such as agile
- In the bottom right quadrant, we see that the IT function is facing pressure to align with technology used in other parts of the organization—for example by:
    - Being able to reuse software elements created elsewhere
    - Following a policy of hosting applications in the cloud with appropriate security
    - Making applications available for mobile devices

Modernizing applications equips the IT function and the enterprise as a whole to respond to all of these pressures.

Figure 3

Drivers for modernizing

	Business	Technology
Enterprise	**Changing Industry Models** Webshops, Consumerization of IT, Time to market, Layering of applications	**Emerging Information Technologies** Supply Chain Management, Social Media
IT Function	**Changing Development Models** Agile development	**New IT Architectures** Cloud Computing, Web Services, Web apps, Mobile apps

How to undertake a modernization program

A structured and customized approach to modernization

The process of modernization will be different for each organization, and it depends on time, budget, and management buy-in, among other factors. If the organization is not sure it can afford a complete transformation, a "facelift" could convince decision makers that it is worth undertaking complete modernization. The best option for an initial modernization project is usually to choose a low-risk but highly visible application and to proceed with a phased approach, identifying the areas with the biggest potential impact.

Regardless of how far you plan to take your modernization program and whether you tackle the front end, the back end, or both, we recommend thinking of it in terms of three modernization programs: new Windows GUI, Implement a Service Oriented Archetecture (SOA), and client-server to Web.

New Windows GUI

In recent years, the end-user experience for enterprise applications has been drastically improved. Both recent web and Windows functionality have made applications more productive—easier and faster to use. End users who have been working with legacy applications for many years have grown accustomed to the user interface. However, a new generation of end users expects enterprise applications to be intuitive and efficient to use.

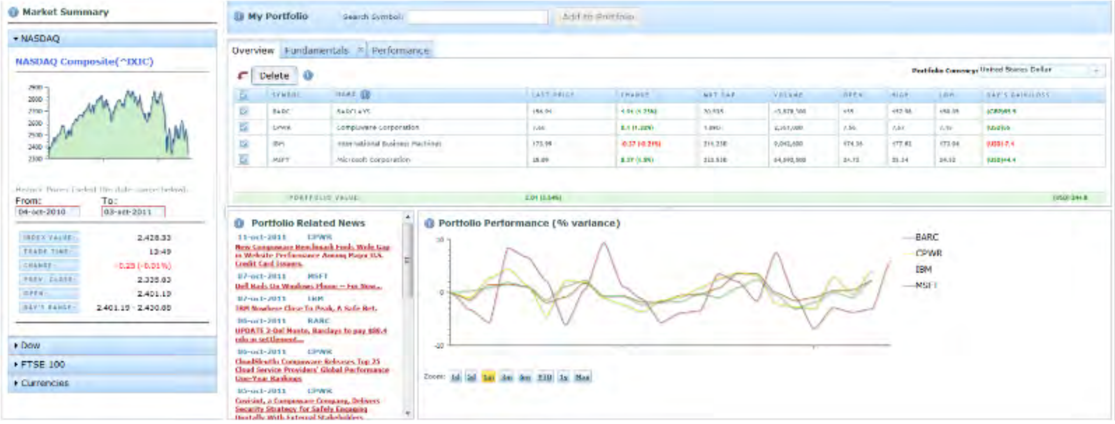
Advantages of front-end modernization with Rocket® Uniface include:

- The modernized applications have immediate appeal to end users and can create momentum for further modernization projects
- Rocket® Uniface has many front-end modernization options that can be used "out of the box"
- An organization can take advantage of future Rocket® Uniface versions' support of HTML5 within applications for both web and Windows, and specifically for Windows 10
- Rocket® Uniface Professional Services can help implement these enhancements with a program that uses predictable and repeatable steps

This approach makes better use of the applications' capabilities without necessarily making code changes. For example, it is possible to add Windows features and color to present a new look and feel that can extend the life of the application; this does not require any significant changes to the back end. Also implementing functionality such as tab and tree widgets enhances the user experience.

Figure 4

A modernized Rocket® Uniface application



Market Summary

NASDAQ

NASDAQ Composite(^IXIC)

From: 04-oct-2010 To: 03-oct-2011

INDEX VALUE:	2,428.33
TRADE TIME:	13:49
CHANGE:	-0.23 (-0.01%)
PREV. CLOSE:	2,335.83
OPEN:	2,401.19
DAY'S RANGE:	2,401.19 - 2,430.85

My Portfolio Search Symbol:

Portfolio Currency: United States Dollar

	SYMBOL	NAME	LAST PRICE	CHANGE	MKT CAP	VOLUME	OPEN	HIGH	LOW	DAY'S GAIN/LOSS
☑	BARC	Barclays	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
☑	CPWR	Compuware Corporation	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
☑	IBM	International Business Machines	[illegible]	-0.37 (-0.21%)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
☑	MSFT	Microsoft Corporation	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

PORTFOLIO VALUE: [illegible] [illegible]

Portfolio Related News

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Covisint, a Compuware Company, Delivers Security Strategy for Safely Engaging Digitally With External Stakeholders

> Modernizing legacy systems requires detailed understanding of the existing business logic and data models, regardless of the modernization strategy selected.
>
> *Dale Vecchio,*
> *Gartner Analyst*

Implement a Service Oriented Architecture (SOA)

This type of modernization is usually chosen by those wanting to make sure the application architecture (or a certain part) is future-proof, easy to integrate with other apps and services, and ready to be deployed as a web app.

Many of the most successful SOA efforts start small, transforming one business process or function at a time into a service, reusing as much as possible code used in the business functionality. The services functionality can then be made available as web (or other) services via an enterprise service bus. Once legacy services have been wrapped in this way, they can be used to build new systems or to integrate directly with other systems.

This approach offers the following benefits:

- ✓ The same back end can be used for all applications: client-server, web, or mobile
- ✓ Up to 80% reuse of Rocket® Uniface code can be achieved
- ✓ High-level security can be added
- ✓ Rocket® Uniface 10 supports complex web services
- ✓ There is an opportunity to introduce and improve security using the guidelines available from Rocket® Software
- ✓ Rocket® Uniface web services can be used easily by third-party systems without expensive rewrites in different languages

In addition, it becomes easier for new Rocket® Uniface developers to learn and maintain the application functionality. Developers only need to learn the services they will be working on to maintain the system; the rest they just need to know about without looking inside, because boundaries are clearer and there are no hidden dependencies. You can also use technologies that non-Rocket®-Uniface developers are already familiar with, such as JavaScript and web services.

The result is that the organization becomes more agile. It can run more projects concurrently, because the work can be integrated later. SOA services can be reused and combined, enabling rapid developing of new functionality. All these benefits make SOA implementation an ideal way to work towards a completely modernized environment.

Client-server to web

Enterprise applications are making a big shift from traditional client-server towards being deployed in a browser. Given the shift we have seen in this area, bringing Rocket® Uniface applications to the web and into the cloud, allowing end users to use their applications anywhere and 24/7, is a business decision currently being made by many organizations.

For application managers, there are many benefits of deploying applications in the cloud. Application deployment is cheaper, as you only pay for what is used and global deployment becomes much easier. As your applications grow, you can add storage, RAM, and CPU capacity as needed. This means you can buy just enough and scale as the application demands grow. You also get automatic failover and disaster recovery for your servers.

Also, web applications can run on popular mobile devices like tablets and smartphones without requiring the development and maintenance of different versions of the application for different platforms. HTML5 allows these devices to even use onboard technologies like GPS and Bluetooth.

> ” Assessing your application modernization processes and effectiveness” is, according to Forrester, “one of the ways to take charge of your modernization framework. ”

Technology that helps with modernization

Although application modernization may sound like a lot of work, there is considerable potential for automation. A range of tools and Rocket® Uniface functionality is available to help with each of the three modernization programs outlined above.

New Windows GUI

Rocket® Uniface has always been known for the ease of using new functionality. Without learning new frameworks or reading 800-page manuals, Rocket® Uniface developers can use new capabilities of the product in a very short time because new Rocket® Uniface functionality can be used out of the box. Rocket® Uniface contains many Windows GUI features that can be used directly, including:

- Grid widget
- Tree widget
- Hover view on edit box and picture widgets
- Tab widget
- Form container widget
- HTML5 widget

Implementing the new GUI is a two-stage process that starts with the actual design of the new look and feel. This design adheres to corporate standards with colors, fonts, and logos and maximizes the usability of the application.

The second step is the actual implementation of the new GUI design. This is best done in a consistent, reproducible approach wherein each change to a user interface element—like colors, check box, or menu—is described in a number of steps that are always applied in the same order.

On every form where these elements appear, the same procedure is repeated for each of the elements that get the new look and feel. As the approach is consistent for all visual elements, the chance of errors is reduced and the implementation speed is optimized.

Our professional services team offers several services that will help in the application modernization process. These range from identifying dead code or the use of depreciated features through to application-wide services such as a version migration or modernizing an application.

Implement SOA

The implementation step is usually the most labor intensive, but with appropriate tooling up to 80% of the application code can be reused.

As a first step in implementing SOA, we advise cleaning up the legacy application. Many applications have unused code and/or code that uses deprecated constructions or that otherwise deviates from current standards. Any of these issues can result in faults after migration and can make maintenance and enhancement more time consuming and prone to error. It all adds up to what the industry calls "technical debt." This step therefore tidies the code and reduces technical debt before bringing it up to the level of the latest software.

Another important consideration of this step is to ensure that the application is properly documented. A clear understanding of the architecture and coding practices of the application is essential, both for assessing the required modernization effort and as a basis for SOA implementation.

We often find that legacy systems contain code that is designed to overcome the historic limitations of hardware and operating systems (e.g., to make sure the overnight run completes in the allocated time). Today's systems feature greatly improved performance and scalability and allow the creation of better-defined and easier-to-maintain processes. The code in the service contains the business functionality; platform-dependent technical code is thrown away, resulting in an application that has fewer lines of code and that is easier to understand, enhance, and maintain.

After the clean-up process is completed, the actual design and implementation of the SOA can start. The implementation depends on the chosen architectural style, such as component layer or domain based, and often depends on the industry type and the company standards.

Rocket® Uniface allows implementation of any architectural SOA style, as all relevant technologies are supported or enabled in the development suite. For instance, Rocket® Uniface supports functionality to build RESTful or SOAP services out of the box and recently introduced a flexible in-memory data type that holds complex data. The struct data type is particularly useful for manipulating data sent to and received from web services in XML or JSON streams.

Client-server to web

The quickest way to get Rocket® Uniface applications onto the web is to use Rocket® Uniface Anywhere. This functionality allows Rocket® Uniface Windows applications to be deployed directly in a browser without the need to recode any parts of the application. This functionality will give web apps the same look and feel as traditional client-server applications.

In order to build native web apps, Rocket® Uniface 10 offers dynamic server pages. DSPs can be built quickly, and provide a browser based user experience comparable with traditional client - server environments.

Rocket® Uniface also has a session management API, as well as a JavaScript API that allows JavaScript triggers to be implemented. This means that developers can choose between client and server code execution and can write code for Rocket® Uniface applications even if they do not know the Rocket® Uniface scripting language. Security guidelines are also provided. They describe ways to design and implement Rocket® Uniface web applications to defend against web threats.

Modernizing business functionality

Most businesses have applications that have been deployed successfully and that only require minimal enhancements—because they work. The economic climate has caused IT budgets to be focused on the most pressing needs. But as businesses change, there is now a backlog of applications that require enhancements to business functionality. Targeted enhancements can be developed and implemented to quickly fulfill this backlog of requirements.

Legacy Rocket® Uniface applications can be upgraded or can have new functionality added, and non-Rocket®-Uniface applications can be upgraded by first using Rocket® Uniface to develop the new functionality and by then using SOA to integrate the legacy application with the new Rocket® Uniface functionality.

Get the skills you need

Some customers carry out the modernization process in-house, but if you do not have the resources or the skills, Rocket® Uniface Professional Services can do it for you. Forrester suggests getting firms with experience involved in the modernization process: "Leverage these firms' knowledge and experience to get a jumpstart on your framework—your competitors surely will."[3]

We can also transfer our skills to your staff: After working with us on one application, they can take over the process for subsequent projects. To tackle modernization, you need to familiarize your staff with not only the languages and functionality used in your legacy systems but also the migration tools that can help you, as well as the development tools that you are planning to use after modernization.

Rocket® Uniface eLearning is available to allow developers to acquire modernization skills at their own pace. It is free to use. Alternatively, instructor-led trainings are also available.

Rocket® Uniface mobile solution

- *Responsive*
- *Uniformity across front and back ends*
- *Security*
- *Reliability and availability*
- *Maintainability*
- *Flexible development strategy*

[3] A Workable Application Modernization Framework is Job No. 1 Now, Phil Murphy, Forrester Principal Analyst

Benefits of the Rocket® Uniface approach to modernization

As noted, modernization in general brings benefits such as:

1. **Reduced cost of ownership** because applications are easier to maintain, rely on rely on standard skills, and run on standard platforms
2. **Increased business agility** because applications can respond quickly to organizational needs such as consumerization

In addition to these general benefits of modernization, the Rocket® Uniface approach offers the following specific benefits:

- ✓ Proven technology (having undertaken more than 100 migration and web app projects so far)
- ✓ High reuse of code (up to 80%)
- ✓ Increased reliability and reduced error rate (resulting from having fewer lines of code)
- ✓ Fast response to changes, thanks to the multi-tier architecture of modernized Rocket® Uniface applications
- ✓ Exceptionally low total cost of ownership (because there are fewer lines of code, and because of the ability to deploy the same application on Windows, web, and mobile)

Rocket® Uniface is the tool of choice for rapidly implementing enterprise applications that not only run on all platforms but that are also efficient to maintain. Of all of today's maintenance tasks, application modernization is the most important. Rocket® Uniface allows the modernization option that you choose to be efficiently implemented without risk. Rocket® Uniface functionality is continuously updated to support the technologies and the development disciplines required to both build modern applications and modernize legacy applications.

This paper has outlined several areas where new Rocket® Uniface functionality can be used to modernize existing applications. The benefits of Rocket® Uniface's modernization program can be summed up by saying that it leaves your business ready for the future. Not only do you have a lean, agile IT function and IT assets that can be used in a multitude of ways, but you also have much more choice about how you do IT in the future.

About Rocket® Uniface

Rocket® Uniface, the most productive, reliable development tool in the industry, provides a model-driven environment for the rapid development of scalable-enterprise mission-critical applications. Learn more at www.rocketsoftware.com.

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