

The Changing Landscape of Enterprise Architecture

Integrating CMDB and Enterprise Architecture Technologies

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Table of Contents

Overview	4
Changing Needs Across the Enterprise	5
Visibility into the Enterprise	5
CMDB adoption on the rise	5
Selecting a CMDB	6
Predictability and Long-Range Strategic Planning	6
The next step: enterprise architecture	6
Selecting an EA product	7
Breaking New Ground: Integrating CMDB and EA Technologies	7
HP/Telelogic Partnership	8
Consolidated knowledge	8
Using Universal CMDB and Telelogic System Architect	9
How It Works	9
The structured meta-model	10
UML Modeling	11
Queries with the Structured Meta-model	11
Data models	11
System architecture diagrams	11
Reporting	12
Enriching the CMDB	12
Operational Benefits	12
Faster data discovery and analysis	13
Top-down/bottom-up planning	13
Think before you act	13

Simplified “what if” scenarios	13
Reduced costs, higher productivity	13
Improved responsiveness, easier migration to SOA	13
IT aligned with business strategies	13
Some Common Questions	14
Resolution of Naming Differences	14
Support for UML	14
Responsiveness	14
Ease of Use	15
Partner Support	15
Summary	15

Overview

Enterprises are under pressure to accommodate the massive changes that are occurring in the today's dynamic economic and technological marketplace. In response to these demands, strategic initiatives such as service-oriented architecture (SOA) and other enterprise-wide approaches to business services and processes have begun to stress IT organizations, far surpassing previous operational and reporting requirements. In addition, constantly evolving internal and external compliance requirements have forced IT to adopt new management techniques, along with new ways of thinking about and acting on the IT infrastructure.

Technology vendors are responding to these developments with new applications and platforms that provide IT organizations with the functionality and products they need to increase agility, to maintain deeper and tighter control over enterprise resources, and to keep IT services aligned with top-level business objectives and strategies.

Among these technologies, configuration management database (CMDB) solutions and enterprise architecture (EA) applications are leading the industry in helping to address many of today's IT issues. Both of these approaches are concerned with the management and manipulation of structured business information. EA products focus on information about the enterprise as a whole for strategic planning, organizational impact analysis, and business process improvement. CMDB products serve as the authoritative source for how the operational IT infrastructure delivers business services.

Operationally, both collate information from diverse sources at multiple levels throughout the enterprise. This ensures that users can view and conduct analysis on enterprise resources ranging from network routers to service level agreements, end users, and strategic business models—including the functional connections among these differing elements. In keeping with their different objectives, though, CMDB technology is used primarily to improve decision-making and control in IT operations in order to deliver on service level commitments to the business. EA ensures that IT services continuously and effectively support business strategies, especially with regard to long-range planning.

IT professionals and enterprise architects are adopting both technologies to address the challenge posed by continuous change. HP Universal CMDB™ (formerly Mercury Universal CMDB) and Telelogic System Architect® are two complementary solutions available today that provide mature, well-tested and coordinated features and capabilities covering the full scope of CMDB and enterprise architecture. In addition to supplying powerful independent capabilities, these two platforms now offer a joint solution that combines key functionality from each application, deepening collaboration among enterprise IT and EA teams.

Stemming from a formal partnership between HP and Telelogic, the combined solution minimizes IT time and costs, and significantly improves the IT organization's ability to deliver the on-demand information and services required for both everyday efficiency and critical strategic planning. The combined technologies reduce risk and improve re-

sponsiveness, enabling organizations to quickly, safely and efficiently adjust the enterprise architecture whenever change is required to accommodate evolving market demands and new business objectives. They also permit precise and powerful enterprise-wide change impact analysis reflecting the real-world enterprise architecture. This increases predictability, provides broader strategic options, and ensures that decision-makers are taking action based on an accurate view of complex enterprise resources and their relationships.

Changing Needs Across the Enterprise

Rapidly growing organizations today face two major operational challenges: how to maintain effective control over complex enterprise resources and how to enable top-level strategic planning for both business and IT needs.

Visibility into the Enterprise

The first step toward controlling—and thereby optimizing—valuable resources is finding a more accurate, faster and easier way to view the entire enterprise infrastructure. Although most IT organizations have recognized the need for comprehensive insight into the current state of the enterprise, they have been limited for the most part to manual data collection, a process that is labor-intensive, time-consuming, error prone and costly. In addition, manual techniques for data gathering, tracking and reporting are inherently inaccurate, since by the time any single data collection process has been completed, hundreds of changes can have occurred at multiple levels throughout the infrastructure.

CMDB adoption on the rise

Configuration management database (CMDB) technology is specifically designed to address these concerns. An effective CMDB includes automated discovery and dependency mapping, and provides a holistic view of the enterprise, ranging from end-users who access business services to the complex infrastructure that delivers those services. It increases the value of IT services to business planners and users through:

1. Improved visibility and control that result in better asset utilization, environment stability, and service levels to the business.
2. Significant reduction in the cost of outages by increasing the effectiveness and speed of incident recovery, root cause analysis, and problem resolution.
3. Reduction of risk through proactive impact analysis prior to the implementation of changes to the production environment.
4. Improved compliance from the continuous audit of the current environment detecting changes approved or otherwise.

In particular, CMDB technology supports business service management (BSM) and ITSM initiatives. This allows organizations to more easily align IT efforts with business requirements and ensure that IT operations run efficiently and effectively.

Selecting a CMDB

While CMDB solutions available today offer a variety of features and interfaces, not all provide comprehensive, reliable functionality that can fully meet the sophisticated needs of today's competitive enterprises. It is important to carefully evaluate CMDB solutions to ensure that they include the range and depth of features required.

HP Universal CMDB offers a rich data model containing all the elements that make up a business service infrastructure, including:

- physical elements (such as servers, network, storage and software),
- logical elements (such as business services, VPNs, end users, and service-level agreements) and
- the inter-relationships between these elements.

Universal CMDB, with agentless, automated discovery and dependency mapping capabilities, populates the CMDB with IT configuration items and their attributes and all associated relationships, thus enabling accurate maps of the infrastructure and its impact on business services.

Other advantages include scalable federation and reconciliation capabilities that leverage data from existing management systems and data repositories, along with extensive visualization, mapping and reporting features that make data available to IT and business decision-makers as comprehensible, actionable information.

Predictability and Long-Range Strategic Planning

In today's dynamic business environment, the ability to quickly predict not only the immediate but also the long-range effects of current business and technology decisions benefits organizations. This is particularly applicable to large-scale business initiatives such as the migration to SOA. Strategic planning on this scale requires comprehensive modeling of enterprise business processes and the IT infrastructure, with effective means for manipulating elements in these models to demonstrate the specific effects of change. Until recently, most organizations investigating this kind of approach to enterprise planning have relied on manually gathering data from diverse media in multiple repositories, and using this data to develop custom models—a time-consuming and error-prone process.

The next step: enterprise architecture

The technology marketplace has responded to the need for broader, deeper modeling products with various technologies and solutions that fall under the general category of enterprise architecture (EA). These technologies seek to deliver highly versatile enter-

prise modeling capabilities that enable accurate, real-world change analysis and planning, with emphasis on long-term goals.

EA models focus on modeling the enterprise in full, including detailed information on business processes, organization, locations, data or information models, applications and technology. They also include high-level factors such as business objectives and requirements. Furthermore, EA seeks to integrate these modeling domains so that interdependencies can be explored to solve business questions. This information can be used to plan and drive a wide range of projects, allowing users to simulate and explore changes to the business before they are executed.

Selecting an EA product

Although EA concepts have been around for some time, adoption and implementation historically have been slow, primarily due to a lack of acceptance among business and executive management. Some EA solutions are more advanced than others in terms of the quality of modeling, sufficient scope of functionality, and an interface that can be learned and applied easily. Market-leading EA products such as Telelogic System Architect deliver the capabilities necessary to implement increasingly successful enterprise architecture projects that align IT deliverables with business needs. Solutions like these enable the field of enterprise architecture to transition from reactive projects driven by immediate need to broader, more structured strategic positioning within the enterprise.

The focus of enterprise architecture efforts is also shifting to a more holistic approach, necessitating the use of comprehensive modeling products to analyze and optimize the portfolio of business strategies, organizational structures, business processes/tasks and activities, information flows, applications, and technology infrastructure. System Architect is currently the only EA solution that comprehensively supports all modeling techniques, including business process management (BPM), component and object modeling with Unified Modeling Language™ (UML®), data modeling, and structured analysis and design. It allows users to easily visualize complex relationships among technology, business processes and data to determine the impact of change at multiple levels throughout the enterprise environment. Supported standards and EA frameworks include strategy maps, enterprise direction diagrams, BPM, Zachman, TOGAF, DODAF, NAF, MODAF, TMForum, NGOSS and eTOM/SID. System Architect enables an actionable enterprise architecture that enhances agility and increases competitive advantage.

Breaking New Ground: Integrating CMDB and EA Technologies

Although CMDBs and EA applications are extremely beneficial as standalone solutions, they are even more powerful when used together to map and model the full spectrum of enterprise resources, top to bottom, in both current and future states. Such a combination has the potential to integrate real-time visibility into the complete IT portfolio with

powerful long-range strategic modeling capabilities, adding substantial strength and accuracy to both IT and business planning, and ultimately improving an organization's ability to achieve its top-level business goals.

With the combined benefit, particular attention still needs to be given to the adoption of both types of technologies, where users could be faced with having to separately operate, manage, and coordinate two independent interfaces and environments, somewhat counteracting the time and cost savings of the solutions themselves. Fortunately, HP and Telelogic have established a partnership that leverages the proven technologies of both companies and delivers an integrated CMDB/EA solution offering several distinctive operational advantages.

HP/Telelogic Partnership

The combined technologies offer the following benefits to the IT team and system architects:

Consolidated knowledge

The partnership establishes faster, simpler, more accurate ways to map real-world business services to business processes or to the physical infrastructure for tighter control and predictability across the enterprise. As a complete package, it provides a consolidated business process view that incorporates business services knowledge from both IT and non-IT sources.

New collaborative capabilities

The combined solution provides a highly collaborative environment that maximizes IT productivity and quality of deliverables from both infrastructure management and EA perspectives. These two historically important perspectives have until now been distinctly separate, which means that the partnership provides new opportunities for cooperation and mutually beneficial functionality, with higher quality impact analysis throughout the enterprise.

Optimized governance and risk management

Broader, combined product sets permit greater control of enterprise resources, making it easier to monitor and adapt business and information systems to minimize risk factors and comply efficiently with evolving regulatory requirements.

Solid partnership support

From built-in, cross-platform federation of CI identifiers to expert, coordinated technical support and consulting from both HP and Telelogic, the partnership ensures that organizations can maximize the key features of the combined technologies in a reliable, easy-to-use environment.

The benefits of combining CMDB and EA technologies are summarized by Robert Handler, Vice President, Enterprise Architecture, Gartner Inc., and co-author of *IT Portfolio Management: Unlocking The Business Value of Technology*:

“This type of solution is of great benefit to organizations with complex information technology infrastructure landscapes and organizations looking to implement or extend their IT governance. Capturing useful current state information on infrastructure can be difficult. It’s a moving target. It’s a definite step in the right direction toward aligning that which is planned with that which exists and to minimize risk and uncertainty. Enterprise architecture is a key part of IT governance and portfolio management because it helps you understand what you have and where you are going, making it a lot easier to decide what to do next.”

Using Universal CMDB and Telelogic System Architect

Universal CMDB (UCMDB) and Telelogic System Architect features are highly complementary and can be coordinated easily through a comfortable Web interface that minimizes setup time, simplifies ongoing administrative tasks, and promotes effective collaboration among IT teams and enterprise architects. As a flexible federated environment, the solution ensures traceability among objects across the sum of UCMDB and System Architect data repositories, and also permits selective exchange of information between the two applications.

How It Works

Although users have choices for coordinating the technologies in ways that suit specific operational needs, the System Architect interface is typically the primary window into the combined solution, providing the “master” models as well as centralized management capabilities for the solution’s integrated capabilities. Real-time data from the UCMDB is shared with the System Architect environment, where users generate and update models, conduct queries and analysis, and produce reports that support high-level IT and business decision-making. The key elements of the process include auto-discovery, federating, modeling, querying, exporting, and reporting.

Auto-Discovery

Universal CMDB, with its advanced discovery and dependency mapping capabilities, captures detailed information about the IT infrastructure on a regular basis. This broad, out-of-the-box functionality ensures that the CMDB remains current, and eliminates the need for multiple-point discovery mechanisms. It also removes the time-consuming manual effort ordinarily required to continually populate a CMDB with commonly used Configuration Item (CI) information.

Federating and Modeling

System Architect's interactive interface lets users view all the CIs in Universal CMDB and select which ones to federate. This allows users to focus on the specific CI subset required to address a particular business challenge. Users then have two options regarding the common "language" they would like to employ for creating the EA models: 1) a structured language of definition types, illustrated via diagrams such as a network concept diagram; or 2) UML notation via a UML deployment diagram.

This flexibility is a key benefit for users. EA relies on a robust and rigorous common language that consists of a taxonomy of defined terms linked together to form a meta-model and illustrated via defined diagrammatic notations. At present, however, there are no common languages that cover the full landscape of EA modeling domains (i.e., that entirely cover the now-standard Zachman Framework). Therefore, users have many options to choose from. With System Architect, users can select a modeling environment based on specific technical and business requirements as well as the particular experience and preference of the EA team.

The structured meta-model

In the case of a structured meta-model, a network concept diagram is automatically drawn, revealing the relationships among the selected CIs. The CIs and their connections become objects in the System Architect repository, with their own unique definitions and attributes. Once the diagram has been created, future imports of the same CIs will automatically populate the System Architect object definitions, permitting fast, easy updates at any time.

In addition, users can click on a particular network object and view all direct relatives stored in the Universal CMDB, including applications that are associated with a network component. Bringing in additional CIs either expands the diagram, or helps define the applications associated with that network.

- Built-in definition types - As an additional ease-of-use feature, System Architect provides built-in definition types that contain information and relationships for common CI types such as "server" or "router." Properties of these definitions can include data such as host operating system, owner, physical memory, service pack, and IP address. The property sets for definitions are easily extensible. Also, System Architect allows users to combine auto-discovered properties, such as physical memory and operating system, with information gathered through manual data collection and analysis, including physical location and owning organizational unit(s).
- Familiar icons - The network concept diagram replaces the time-consuming, custom-built diagrams that many organizations produce using simple drawing products such as Microsoft® Visio. Users can freely illustrate sophisticated definitions and concepts using symbols and lines, including familiar icons such as the Cisco® icon set. Multiple symbol depictions are included for different devices of

the same type. This approach allows users to approach the science of EA from within a familiar, comfortable interface.

UML Modeling

UML is a familiar environment for technical groups such as software developers or engineering teams. If users are migrating to an object or an object-relational design, System Architect can accelerate development by automatically mapping an ER diagram to a UML class diagram. Users who have already started with UML can map persistent classes to an ER diagram to perform relational data modeling. The user can import selectively from the CMDB to the System Architect repository, bringing in CIs as UML Components and Nodes, or can import them directly to a Deployment diagram. Thus the user can map from the logical software design all the way to physical deployment. These capabilities allow users to leverage existing UML knowledge and the extensive benefits of the UML model—in combination with near real-time data supplied via the UCMDB—to provide strategic guidance to the enterprise.

Queries with the Structured Meta-model

Once UCMDB information is available within System Architect, users can leverage the data to engage in real-world business queries. At the most basic level, the structured meta-model allows users to ask tactical questions such as “Which servers do not have an adequate disaster recovery plan?” It can also be extended to include structured relationships with domains such as the business service model, business process analysis suite and the data modeling suite (e.g. “Organizational Unit” -> carries out -> “Business Process” ->uses-> “Application” -> is hosted by-> “Server”). With this information, users can query in an even more complete manner, asking detailed business questions such as “Which business processes rely on servers that have no adequate disaster recovery plan?” Another example might be questions surrounding a new product launch, for which users might look at the business process model required to support the launch and ask “Which IT infrastructure elements are involved and can they provide the necessary revised service levels?”

Additional ways to leverage UCMDB data from within System Architect include:

Data models

The data domain itself offers users additional ways to approach operational challenges. For example, System Architect allows users to create conceptual and logical data models, or to reverse engineer the physical database schema to produce physical data models. By tying the physical data model to the logical data model—and also to physical database instances captured from the CMDB—users can answer questions such as “Which servers at which data centers store information about our customers?”

System architecture diagrams

System architecture diagrams use data flows to show how applications communicate. These diagrams are traditionally built manually and are both costly to produce and

prone to error. By combining UCMDB and System Architect technologies, users can create comprehensive, accurate, easily updated system architecture diagrams, and even tie them to the data domain, providing extensive insight into the relationships among data, applications and interfaces.

Reporting

System Architect offers numerous pre-built .rpt files such as Web, Microsoft Word and XML reports. Various add-on products can also enhance reporting functionality. Telelogic System Architect/XT™, for example, is a Web-based enterprise architecture and business process analysis solution that provides real-time, role-based data access and decision support to the extended enterprise. This solution enables an organization to share its architecture across the enterprise with direct, Web-based access to architecture data, reports, and dashboards.

Within System Architect, graphical representations are provided by explorer diagrams. Since these diagrams are actually a visual extension of the reporting system, users can easily drag-and-drop reports onto the diagram for quick cause-effect analysis. Overall, the versatile reporting structure ensures that, with the same reporting engine, users can produce tabular reports as HTML, graphical reports as explorer diagrams, or Web sites detailing models in full and incorporating both tabular and graphical reporting features.

Enriching the CMDB

Today the need to understand the impact of IT on the business has become paramount. The challenge facing IT organizations is that much of the data about business processes, business units and locations can be considered logical and stored in someone's head or on a static diagram like those created in Visio. By connecting the logical models in System Architect to their physical implementation in the Universal CMDB, this integrated solution provides a truly holistic approach to the problem.

In addition to leveraging the dependency maps from the Universal CMDB, System Architect also adds information such as new business elements and non-IT related process steps. CMDB users can benefit from this additional context and may want to view and manipulate an enriched business service model—created in System Architect—from within the CMDB itself. In this case, the model and mappings to the software layer can be brought into the UCMDB, providing additional ways to view and analyze relationships among applications, IT services and related business process steps.

Operational Benefits

The combined solution simplifies many critical day-to-day tasks, making it easier and more cost-effective for IT teams and enterprise architects to provide substantial support for high-level strategic decision-making.

Faster data discovery and analysis

The combined solution leverages Universal CMDB's broad auto-discovery capabilities to gather and organize application and IT infrastructure information that can be easily viewed, analyzed and shared through the System Architect interface.

Top-down/bottom-up planning

Resulting EA models reflect real-world business continuity and enterprise architecture so that the impact of change can be understood all the way from high-level business processes and objectives down to individual physical devices.

Think before you act

Scenarios for change can be simulated and clearly understood before implementation, offering tremendous potential for significant cost savings. Also enterprise architecture change projects can be intelligently coordinated not only to satisfy operational necessities, but also to provide vital support for long-term business strategies.

Simplified "what if" scenarios

Versatile matrices and automatically generated explorer diagram give users easy ways to quickly determine the real-world effects of minor or major changes anywhere in the enterprise architecture, from infrastructure components to higher level business processes. For example, users can ask, "If we change this business process, what strategies, hardware, network devices, users and locations will be directly affected?" Fast answers to sophisticated "what if" questions save enormous amounts of time, reduce IT expenses, and provide accurate up-to-date information reflecting true conditions throughout the enterprise.

Reduced costs, higher productivity

Ease-of-use features and well-coordinated functionality allow business analysts and enterprise architects to focus more of their efforts on critical architecture strategy, and less time on maintaining data repositories.

Improved responsiveness, easier migration to SOA

The integration simplifies the creation of an actionable architecture that supports effective decision-making for both immediate concerns and long-term initiatives such as SOA.

IT aligned with business strategies

Enterprise-wide data discovery and modeling ensures that all elements of an enterprise architecture are taken into account when decisions are made at any point within the infrastructure or in the context of business processes. The flexibility of the interface also

allows users to apply information to evolving enterprise management products and methodologies such as the balanced scorecard.

Some Common Questions

Resolution of Naming Differences

Question: Will we run into naming differences between Universal CMDB and System Architect data?

Answer: Meta-level reconciliation has been established between the two platforms, ensuring that identifiers are consistent at the meta-data level. The same identifier for each CI is contained in all repositories. This includes both the user accepted name and the CI reference code. When information is exchanged in either direction between the CMDB and System Architect, it is automatically reconciled.

Benefit: The integration allows users to start fast, and avoid unnecessary and time-consuming rework along the way.

Support for UML

Question: Can we use UML?

Answer: Yes, System Architect supports UML. This may be especially useful during the software development process. For example, if there is a large integrated application spread across a number of servers, a major development project will most likely affect the functionality of this application set. With UML within System Architect, developers can easily view and understand the physical interfaces involved as well as the deployment of associated software components across the target servers.

Benefit: The combined technologies allow users to continue using the familiar UML environment, fully leveraging the benefits of UML while also taking advantage of the real-time auto-discovery capabilities of the Universal CMDB.

Responsiveness

Question: How does the combined solution respond to ongoing infrastructure changes?

Answer: Built-in auto-discovery and auto-synchronization capabilities help users create accurate models that truly reflect the real-world infrastructure. With a click of a button, users can import CIs from the CMDB to automatically re-populate an existing diagram. Textual properties are overwritten with the latest values, and newly linked items are automatically added. For instance, if a new application is installed on a particular server, it will be included in that server's properties at the next update.

Benefit: Improved responsiveness reduces IT time and costs and ensures greater accuracy to support enterprise-wide change impact analysis and strategic business initiatives.

Ease of Use

Question: What's the learning curve?

Answer: The combined solution is easy to deploy and use, especially for teams that have already been exposed to CMDB and EA concepts or are already using Universal CMDB and/or System Architect. Ease-of-use features include a simplified Web-based interface, single-point views and actions, quick updates, easy-to-read graphical representations and a highly responsive environment that facilitates sophisticated querying and reporting. In addition, users have easy access to a wide range of help files, training courses and professional services.

Benefit: The solution ensures fast deployment and reduced IT time and costs over the long term.

Partner Support

Question: Do HP and Telelogic offer consulting for the joint solution?

Answer: Both Telelogic and HP have advanced and experienced consulting organizations with knowledge in both EA and CMDB domains. Consulting solutions and best practices are available for the joint offering.

Benefit: Proven consulting services can ensure a quick, successful deployment, with easy access to expert support whenever necessary.

Summary

IT organizations that are looking for new, more effective ways to understand, react to, and proactively manage the total enterprise architecture can reap substantial benefits from both CMDB and EA technologies. Both improve administrative efficiency and productivity, while enhancing the accuracy and value of information that supports high-level strategic decision-making. HP Universal CMDB and Telelogic System Architect are examples of mature technologies that meet the growing needs of today's enterprise architects and IT professionals. They also provide the broadest range of features and capabilities available in the industry.

The strong partnership between HP and Telelogic permits seamless functionality between the two platforms, which adds significant value by facilitating enterprise-wide collaboration, further lowering administrative time and costs, and delivering a consolidated knowledgebase easily accessed throughout the enterprise. The commitment of both companies to the partnership also ensures that the combined solution will evolve to keep pace with industry changes and market demands, and that comprehensive services

are available to support the IT organization as it grows and diversifies. This comprehensive CMDB/EA solution provides the most complete and accurate information possible, so that organizations can more easily and cost-effectively achieve their strategic business goals.

About Telelogic

Telelogic® is a leading global provider of solutions for automating and supporting best practices across the enterprise—from the powerful modeling of business processes and enterprise architectures to the requirements-driven development of advanced systems and software. Telelogic's solutions enable organizations to align products, systems, and software development lifecycles with business objectives and customer needs to dramatically improve quality and predictability, while significantly reducing time-to-market and overall costs.

To better enable our customers' drive towards an automated lifecycle process, Telelogic supports an open architecture and the use of standardized languages. As an industry leader and technology visionary, Telelogic is actively involved in shaping the future of enterprise architecture, application lifecycle management, and customer needs management by participating in industry organizations such as INCOSE, OMG, The Open Group, Eclipse, ETSI, ITU-T, the TeleManagement Forum, and AUTOSAR.

Headquartered in Malmö, Sweden, with U.S. headquarters in Irvine, California, Telelogic has operations in 20 countries worldwide. Customers include Airbus, Alcatel, BAE SYSTEMS, BMW, Boeing, DaimlerChrysler, Deutsche Bank, ELM Messaging, Ericsson, General Electric, General Motors, Lockheed Martin, Motorola, NEC, Philips, Samsung, Siemens, Sprint, Thales, and Vodafone.

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