

SaaS ERPs

The benefits and limitations of a SaaS Enterprise Resource Planning (ERP) model compared to a traditional model.

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INTRODUCTION

In the rush to digitally transform retail businesses, the growth of Software as a Service (SaaS) or 'cloud' software providers has been notable.

Companies such as Demandware (ecommerce platform), SmartFocus (marketing) and Revel (POS) have experienced rapid growth as a result. However, one application that remains overwhelmingly wedded to the on-premises model is Enterprise Resource Planning (ERP).

This paper examines the emergence of the SaaS ERP model, its benefits and limitations against the traditional on-premises model, and SaaS ERP solution adoption and selection considerations.



TRADITIONAL ERPs

ERP is a software system for managing key company resources and business processes.

ERP evolved from the manufacturing domain – the first ERP systems were built in the early 1990s by extending manufacturing resource planning (MRP) suites with finance, accounting and HR capabilities. Continued development expanded ERP to other domains (including retail), further extending its functional scope and advancing the architecture by making it more modular, open, and scalable.

Today ERP functionality includes finance and accounting, sales (orders and customers), inventory, planning, supply chain, merchandising, administration and corporate services (e.g. HR, payroll and expenses). A traditional ERP system may also support customer relationship management (CRM), marketing and campaigns, logistics and distribution and other features.



Tier-1

Traditional tier-1 ERP systems, such as SAP ERP and Oracle E-Business Suite, are targeted at large and complex business organisations. One of their core premises is a client's individuality, which is reflected in a system design that offers unrestricted customisability, single tenant architecture, and an on-premises (or hosted/serviced) deployment model.

Traditional tier-1 ERP systems are targeted at large and complex business organisations.

These design characteristics allow the traditional ERPs to meet both common and unique requirements across different clients and industries. However, this kind of adaptability comes at the expense of poor business agility and high start-up and on-going support costs due to:

- Complex source code and configurations
- A customisation-heavy development process
- IT involvement even for small change requests (poor business-level configurability)
- Complex hardware and infrastructure setup to support multi-layered architecture
- Poor geographical expansion ability (a new location requires hardware and infrastructure setup)
- Manual migration of customisations (via development) during major version upgrades
- High expertise required from IT staff

For small and mid-sized organisations, high costs and poor agility block the adoption of traditional ERPs.

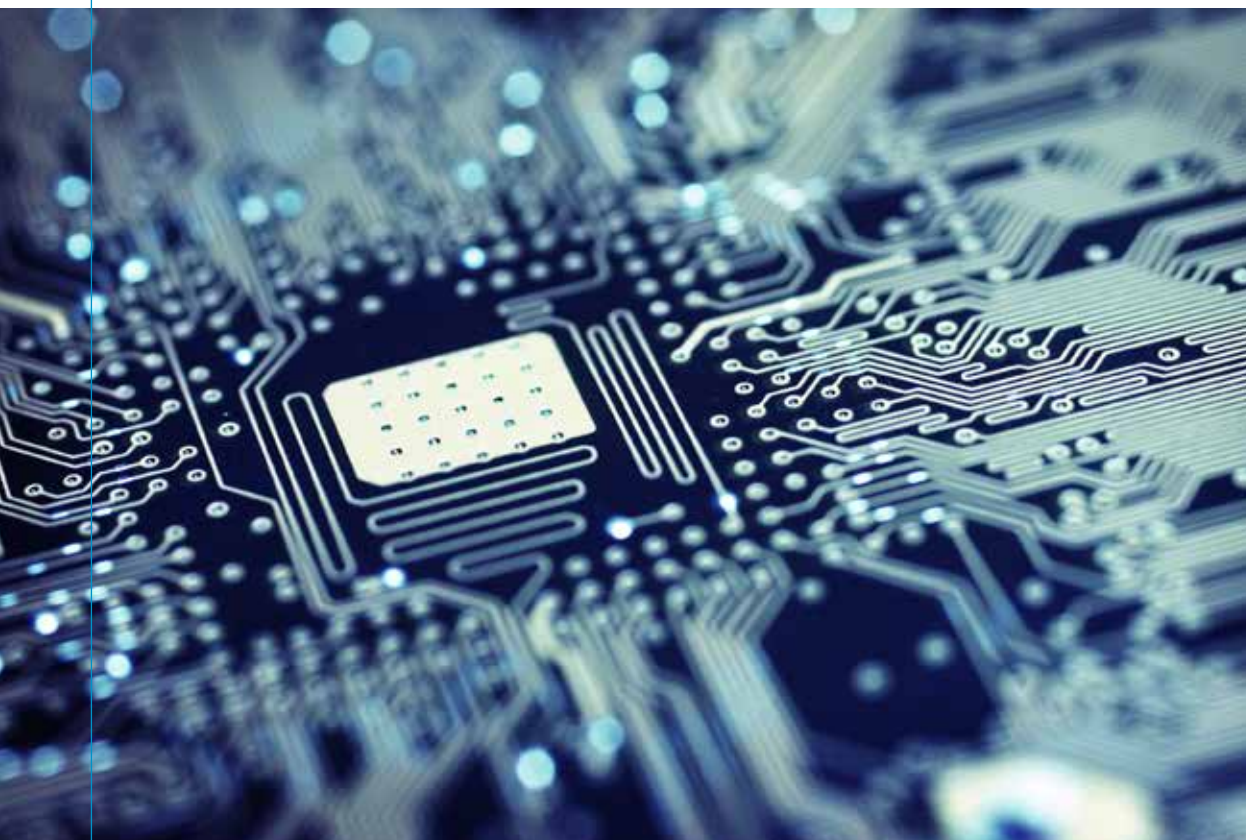


Tier-2

Templated and downsized tier-2 ERP solutions, such as Microsoft Dynamics NAV, alleviate the problem by introducing pre-configured industry-/sector-specific builds and reducing the code base. Unfortunately, the templated approach fails to significantly lower the adoption barrier. While providing support for most common features and business processes, a tier-2 ERP rarely meets all of a retailer's requirements out of the box (OOTB) and the complexity and cost of changes to the OOTB function tend to be comparable to the complexity and cost of customising a traditional tier-1 solution.

The reason for this is that the tier-2 ERPs are based on the same architectural principles as their tier-1 counterparts, including hard-coded features/processes and single-tenant multi-layered infrastructure setup. Tier-2 ERPs thus fail to resolve the business agility and cost blockers for small and mid-sized business. Their benefits are usually limited to initial implementation cost and quicker implementation times. For example, the choice of Microsoft Dynamics NAV for a mid-market project may lower initial implementation costs and timelines by 20%-40% as compared to a Microsoft Dynamics AX deployment, but at the cost of reduced functional and non-functional capabilities.

A tier-2 ERP rarely meets all of the retailer's requirements out of the box.



SaaS AS THE NEXT ERP ARCHITECTURE

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Drawbacks of the traditional ERP model follow from the individuality premise, which is applicable mostly to large complex enterprises. Small and mid-sized organisations are often similar in their requirements.

The new SaaS ERP model takes advantage of these similarities and bases its design on a generalisation premise, i.e. the ability to effectively generalise feature and process requirements for a large set of clients and support them with a single, uniform solution. The premise results in a solution design that depends on advanced feature and process configurability.

Uniformity and configurability principles are well aligned with the SaaS architecture, in which software is:

1. Centrally delivered and upgraded
2. Licensed on a subscription basis
3. Available to users via thin UI clients (usually via a web browser)

Added benefits of delivery and upgrade centralisation make SaaS a natural choice for the new ERP architecture. SaaS ERPs take responsibility for providing the initial solution instantiation and configuration, and the on-going support, thus optimising a client's implementation, maintenance and upgrade timelines and costs.



SaaS ERP vs. cloud deployment

A number of traditional ERP solutions, such as Microsoft Dynamics NAV, support a cloud deployment option. Deployment configuration and trade-offs in this case are essentially similar to a hosted/serviced deployment model with additional advantages of on-demand scalability, improved availability, better failure tolerance and failover, and reduced IT infrastructure operational load and costs.

However, cloud deployment alone does not make a SaaS ERP – IT implementation, support, and upgrade efforts and costs remain. SaaS ERP has evolved from the traditional ERP model, architecturally. It is the new architecture that enables an accelerated solution and feature delivery, seamless software support, maintenance, upgrades and a subscription-based pricing model.

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Multi-tenant vs. single-tenant architectures

Most SaaS ERPs are built on a multi-tenant architecture, in which a single ERP instance serves multiple business clients with different features and process configurations. Although it is argued that multi-tenancy is not a must-have for SaaS, it enforces a solution's uniformity, configurability, delivery and upgrade centralisation principles and thus can be seen as an indicator of SaaS design "purity". Examples of multi-tenant SaaS ERP solutions include NetSuite ERP, SAP Business ByDesign, Epicor Express (SaaS version of the on-premises Epicor ERP), Aplicor 3C and PLEX.

Single-tenant SaaS ERPs do exist, but rather as an exception than a rule. Single-tenant solutions are generally easier to design and build as they allow vendors to relax SaaS ERP design principles, such as the level of configurability. Major drawbacks of the single-tenant approach are increased operational load to maintain multiple client stacks and degraded infrastructure utilisation (although infrastructure sharing can be achieved via server virtualisation). These drawbacks create support and upgrade risks to clients and negatively impact on subscription costs. One example of a single-tenant SaaS ERP solution is QAD Cloud ERP.



BENEFITS OF SaaS ERPs OVER TRADITIONAL ERPs

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Key benefits of SaaS ERPs over traditional solutions include seamless version upgrades, reduced IT scope, increased business agility, on-demand expansion capability, extended channel and omni-channel feature support and lower TCO.

Seamless version upgrade support is a fundamental advantage of the SaaS ERP architecture. The architecture sets a clear interface between core functionality and client-specific customisations, and enforces the interface throughout the version upgrades. Interface stability enables a centralised vendor-controlled upgrade process that poses minimal (if any) impact on client solution instances.

SaaS ERP vendors continuously run minor and major version upgrades, and keep solution instances for all clients up-to-date. For example, NetSuite performs two major version upgrades per year, and releases minor updates, patches, and fixes on a weekly basis. Epicor updates its SaaS solution with minor releases on an as-needed basis, and ties major version upgrades to the release cycle of its on-premises ERP (every 12-18 months).

In contrast, version upgrades, patches, and fixes for traditional ERPs are owned by the clients, and often require significant effort and cost investments.



IT scope reduction follows from delegation of the ERP software and infrastructure support, upgrade, scalability, and management responsibilities to the solution vendor. The reduction allows the client to optimise IT team size, minimise and stabilise IT operations, and focus on delivering new business features.

Increased business agility. SaaS ERPs are usually quicker and easier to implement and change than traditional solutions. The key enabler of this agility is superior configurability at the feature and business process levels. Along with on-demand solution and infrastructure instantiation, configurability significantly reduces ERP time-to-market and start-up costs. For example, NetSuite reports a 3-9 month time-to-market for small and mid-sized retailers (six months on average) with about 75% of implementations completed via configuration only.

Some solutions also expose configurations to business users through point-and-click tools, thus allowing them to change workflows, customise UIs, update dashboards, build reports, etc. Delegation of the configuration management to business gives the latter more control over on-going changes, and reduces time-to-value for simple/standard business requests.

On-demand geographical expansions are supported by the scalable cloud infrastructure and solution architecture, distributed data centre network, global ERP service availability, localised and global feature support. Note, however, that support for different locales and geographies varies across SaaS ERP solutions. NetSuite, for example, has wide international support including more than 100 countries and 20 languages, while SAP Business ByDesign is available in 35 countries and eight languages only.

SaaS ERPs are usually quicker and easier to implement and change than traditional solutions.



Extended channel and omni-channel features.

Unlike traditional solutions, SaaS ERPs have the same availability, performance and scalability requirements as customer-facing channel systems (e.g. ecommerce platforms), as businesses demand high availability from their core ERP. Some SaaS ERP solutions leverage this parity and extend their functional scope to include ecommerce, mobile, POS and in-store support, as well as cross-channel management features. Examples of SaaS ERPs with channel support include NetSuite (POS and ecommerce), IQMS (ecommerce), and Aplicor 3C (B2B ecommerce).



The extended SaaS ERP model offers clients a very strong and attractive omni-channel proposition that is difficult to build and maintain through the usual multi-system composition approach. Today the proposition is not yet ready for wide adoption due to poor channel support and gaps in core functions, such as lack of POS resilience and missing online personalisation support in NetSuite. However, once the channel support matures it is likely that the omni-channel offering will become one of the main SaaS ERP adoption drivers.

TCO reductions include significant capex savings at start-up and upgrade stages through on-demand white label solution instantiation, effective configuration-driven development process, little-to-nothing hosting and infrastructure upfront costs, and seamless version upgrade process.

Opex savings for software and infrastructure support are enabled through multi-tenant software deployment, shared hosting and cloud elasticity. These features allow the solution vendor to minimise utilisation of internal resources (IT and infrastructure) and optimise customer subscription costs.

Finally, delegation of ERP software and infrastructure support, upgrade, scalability, and management responsibilities to the solution vendor enable significant opex reductions in IT resource costs.

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SaaS ERP LIMITATIONS AND CONCERNS

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No solution is free of limitations and SaaS ERP is no exception. Its limitations and risks are due to a lack of maturity, restricted access to source code, and a client's data and suboptimal support for development, deployment and upgrade processes.

Lack of maturity and gaps in function support. SaaS ERP solutions are still immature in their feature support and often demonstrate gaps in extended and core functions. This is true not only for pure play SaaS vendors that are building their functional capabilities from the ground up (e.g. NetSuite and PLEX), but also for established ERP suppliers that are migrating their traditional solutions to SaaS (e.g. SAP, Oracle, Microsoft, Epicor). The migration involves complex and time-consuming feature re-architecting and refactoring tasks that hamper and limit expansion of the SaaS feature offering. For example, Epicor Express currently supports only finance, CRM, product, production, and material management features.

Limited customisability. SaaS ERP core features are owned and controlled by the solution vendor exclusively. Customisations are generally supported, but in a restricted and controlled manner, and the level of support varies between different solutions. For example, NetSuite supports advanced customisability mechanisms (enabling custom business logic, objects, workflows, forms, dashboards, and even extensions and applications), while Epicor Express only supports field addition and process flow modifications.

On-premises deployments, in contrast, usually allow for a full access to the source code, and thus enable unrestricted customisability.



Restricted data access. Persistence layer and data are managed by the vendor. Access to the data is usually limited to solution APIs, export/import mechanisms, and tools. This limitation hinders data mining, analysis and reporting capabilities. It also complicates migration to an alternative ERP solution – even if data can be exported on-demand, it reflects an internal ERP data model structure that is difficult to understand and parse. For example, although NetSuite allows a client to download the full account database in CSV format at any time, NetSuite professional services/support help is generally required to make sense out of the exported data.

In contrast, an on-premises deployment model generally provides a client with full control over the data and persistence layer, e.g. through direct database access. This kind of access typically lets clients manage, analyse, report, export, understand, parse and migrate data on their own.

SaaS ERPs generally support a limited number of locales and geographies, both functionally and non-functionally.



Geographies and expansion. SaaS ERPs generally support a limited number of locales and geographies, both functionally and non-functionally. Functional limitations are due to a significant amount of effort a vendor needs to invest into locale setup (including currency, language, taxes, accounting rules, reports, and legal regulations configurations) and on-going support (to keep the locale configuration up to date).

Non-functional support is effectively constrained by the solution's infrastructure – users in regions with no data centre presence experience degraded solution availability, technical performance and scalability. Specifically, most SaaS ERPs focus their data centre networks on US and EU and have uptime SLA of 99.5% (excluding planned downtimes).



No control over support costs. SaaS ERP clients are completely locked to the vendor, and are fully dependent on its subscription policy and pricing.

No control over upgrade cycle. Upgrades are controlled and managed centrally by the vendor. Clients cannot refuse the upgrade and only have a limited opportunity to delay it to a time of their choosing.

Limited support for development and deployment processes. Conventional development and deployment tools are not readily applicable to SaaS environments. SaaS ERP vendors provide solution-specific toolsets that often lack full support for features like testing, developer-specific sandbox environments, packaging and deployment automation. Gaps in testing support are especially important as they strongly impact on development efficiency, scalability and product quality.

Upgrade testing. Although the vendor owns the upgrade cycle, a client is still responsible for testing its features and business processes as part of the upgrade process. This may be challenging in cases where the solution's testing support is lacking or poor. For example, Epicor Express provides no automated test support.

Gaps in testing support are especially important as they strongly impact on development efficiency, scalability and product quality.



RETAIL SECTOR FIT AND GAPS

The pros and cons of SaaS ERPs have specific implications for retailers.

Some core retail function may be weak and some non-functional characteristics may prevent deployment in certain retail scenarios. Fig 1 below visualises a mapping of a retailer's needs for core function and growth-enablers to the generalised (non-product-specific) capabilities of SaaS ERPs.

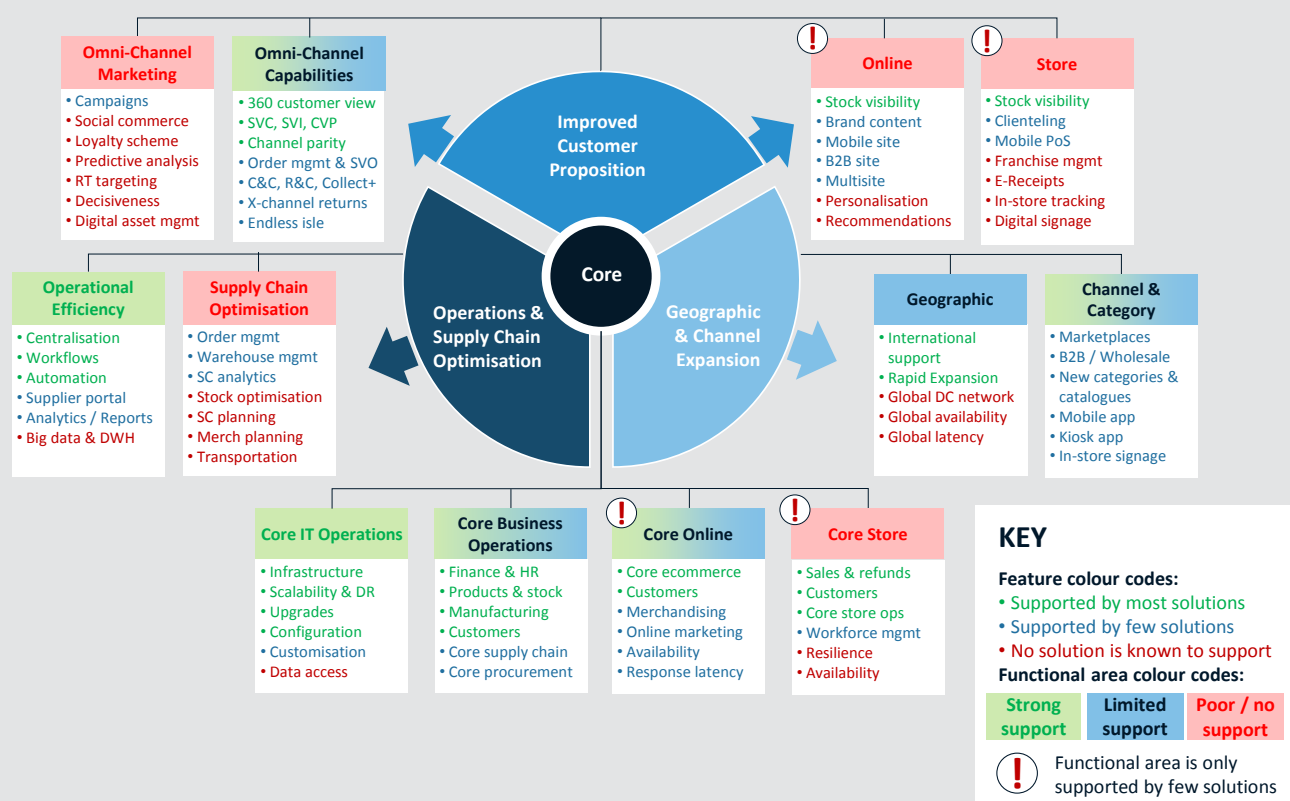


Fig 1: Generalised SaaS ERP: Retailer core operations and growth support

In the figure:

- *Feature font colour indicates generalised support level and spread across SaaS ERPs:*
 - *Green means good support level across most solutions*
 - *Blue denotes limited support level and spread (few ERPs only)*
 - *Red flags features that SaaS ERPs are not known to provide*
- *Features are grouped into high-level functional/operational areas (e.g. core IT operations, operational efficiency) that are presented via coloured boxes. Box colour generalises SaaS ERP fit and support level for a functional area, where:*
 - *Green means a good fit across most solutions*
 - *Blue denotes limited support where fit depends on a retailer's requirements*
 - *Red flags areas where SaaS ERPs are unlikely to fit*
 - *Gradient colouring denotes areas where support varies greatly across SaaS ERPs*
- *Online and Store areas are evaluated only against extended SaaS ERPs that support them*

As the figure shows, SaaS ERPs provide solid support for a majority of core IT and business operations. Furthermore, a subset of solutions also come equipped with core ecommerce capabilities. Store channel support, e.g. POS, (where present), however, is still immature and lacks the reliability most retailers require.



The level of business growth support varies across different dimensions. The geographic and channel expansion sector arguably demonstrates the strongest fit. Cloud architecture and built-in internationalisation and localisation support allows retailers to rapidly expand their operations to new markets and geographies, especially when they are located within the solution's data centre network coverage. Open and stable cloud-based APIs (and, sometimes, pre-built connectors and applications) facilitate integrations with new channels and external systems.



Cloud architecture and built-in internationalisation and localisation support allows retailers to rapidly expand their operations to new markets and geographies.

Support for optimisation and customer proposition growth sectors in general is limited to operational efficiency and core omni-channel areas respectively. SaaS ERPs allow retailers to optimise operational efficiency through system and data centralisation, configurable workflows, and increased process automation across supported operational areas. Centralisation of customer, inventory, order, product and pricing data, and business logic provides retailers with a strong basis for building omni-channel services, including click and collect, reserve and collect, cross-channel returns, endless aisle, store stock visibility online, store fulfilment, 360 customer view, etc.

SaaS ERPs, however, fall short of supporting advanced functions that are necessary for comprehensive operational and customer proposition improvements, including supply chain optimisation, omni-channel marketing, and online and in-store personalisation support. It is likely that retailers will rely on external/point solutions to fill SaaS ERP gaps in these areas. And it's likely that solution vendors will expand their capabilities in the areas where retailers are a significant customer base and/or target market for them.

CONSIDERATIONS FOR SaaS ERP SELECTION

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A SaaS ERP solution selection and adoption decision depends on a number of factors, including business size, complexity, structure and location, existing technology ecosystem, growth and expansion ambitions, desired level of control over the solution and data, and IT structure and maturity.

Small and mid-sized businesses are the best match. The SaaS ERP model has been initially designed around the needs of small and mid-sized businesses. Most of the SaaS ERP solutions are focussed on small and/or mid-sized clients, and provide good support for their business requirements and processes. The track record of large business implementations is limited due to restricted feature coverage, insufficient customisability and suboptimal development, and deployment process support.



Hybrid and second tier architectures are case studies for large businesses. While SaaS ERP is unlikely to support a large business back-office in full, it can be used to manage standardised and regulated areas, such as finance and accounting. This approach yields a hybrid architecture where SaaS and traditional ERPs (and/or point solutions) are employed collaboratively. For example, a retailer may proceed with a SaaS ERP implementation despite a major functionality gap in the chosen solution, and plug this gap with a best-of-breed point solution. Large businesses can also use SaaS ERP to support subsidiary business units. In this two-tier ERP scenario, SaaS ERP occupies the second tier for a subsidiary and feeds into a traditional ERP at the central enterprise office. Two-tier ERP architecture allows for prompt and cost-effective subsidiary expansion and management.

A two-tier ERP architecture, where SaaS and traditional ERPs are employed collaboratively, allows for prompt and cost-effective subsidiary expansion and management.



Migration off an existing technology is not always the best option. Although SaaS ERP promises TCO savings, its implementation, business adoption, support, and upgrade activities still carry significant costs and risks. The to-be architecture design process must consider existing technology evolution, hybrid approach, and alternative technology options. For example, if the existing stack includes strong finance and MMS modules, to-be architecture considerations should include hybrid options (e.g. using SaaS ERP in addition to existing MMS and finance modules) and best-of-breed options (e.g. introducing stand-alone OMS and PIM solutions instead of ERP).

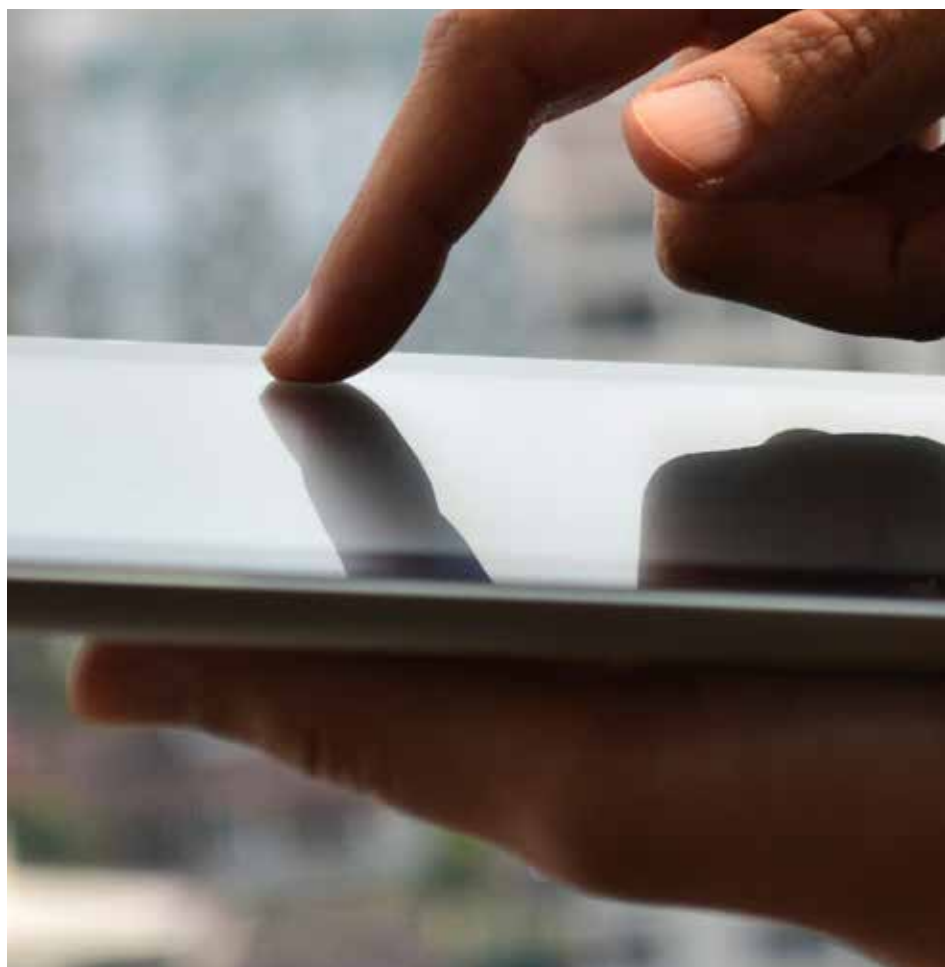
Take into consideration extended SaaS ERP functions. An ecommerce platform, store/POS systems, and cross-channel merchandising and marketing (e.g. promotions) need to be taken into account. Adoption of the built-in extended functions may greatly reduce IT operational load, simplify enterprise architecture, and ease future developments and upgrades.

Data centre network and availability are essential. The solution selection process must ensure that a SaaS ERP provides adequate functional and infrastructural support for current and future geographies. SaaS ERP downtimes fully or partially block back-office operations and may negatively impact on customers (e.g. if SaaS ERP supports customer channels). A solution's availability SLAs, planned downtime schedule, and history of unplanned outages are thus critical inputs for the selection decision and must be reviewed and well understood.

Plan for changes to business processes. A configuration-focussed SaaS ERP model strongly advocates the use of industry-standard business processes and operations, while providing limited customisation support. In practice, this means that some as-is processes and operations are going to change. Furthermore, support coverage for certain processes may degrade (e.g. due to functional gaps) thus decreasing their effectiveness and increasing costs. Assessment of business process impact and gap analysis must be incorporated into the solution selection process. Likewise, business change management must be incorporated into the solution implementation roadmap and project resourcing plan.

Understand IT operations support needs, gaps, and limitations. The SaaS ERP model minimises IT resources and operations necessary to maintain the solution by delegating software and infrastructure support responsibilities to the solution vendor. However, a client still has some responsibilities, such as application support (customisations and configurations), administration (e.g. users, roles, permissions, dashboards), on-going development, upgrade testing and approvals, and enterprise integration support. Failure to properly resource and manage these activities will put overall business operability and efficiency at risk.

A solution's availability SLAs, planned downtime schedule, and history of unplanned outages are critical inputs for the selection decision and must be reviewed and well understood.



Understanding the IT skill requirements and operational needs is thus important for selecting the right solution, especially as IT support in the SaaS domain is still immature and SaaS ERPs often have serious gaps in their development, deployment, and testing tools. Limitations in development and deployment support may also impact on a business's ability to scale IT development teams and processes to deliver more complex changes rapidly.

Finally, the SaaS ERP model takes control of the solution's code and data away from the client. This means that access to business data is going to be restricted, and limited to vendor-defined mechanisms and interfaces. As part of the selection process clients need to understand whether these restrictions are critical for the business, either now or when the business finally comes to migrate off the solution.

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ABOUT JAVELIN GROUP

Javelin Group, part of Accenture Strategy, provides strategy consulting and digital transformation services to the world's leading retailers and consumer brands.

From offices in London and Paris, our 250 specialists help retail and brand leaders across Europe, North America, the Middle East, China and Australia improve their competitiveness by anticipating and responding to the rapid changes in customer shopping habits and retail technologies. We support clients with their strategies, operations, technologies, locations and analytics, with a particular focus on digital and omni-channel retail.

Javelin Group has proven processes for defining a retailer's IT strategy, designing its Enterprise Architecture, selecting application packages against business requirements, implementing and deploying them. A particular area of expertise is ERP selection where we have helped numerous retailers to identify the role the ERP will play in the Enterprise Architecture and to select the right package(s) from the right vendor(s) and develop a full implementation plan, timetable and project team structure.

Contact us

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