Enterprise Resource Planners: Growing Pains in Tech

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1.0 Introduction

Imagine trying to organize all of the parts of a large company. Between accounting, human resources, sales, production, and more, streamlining the processes necessary for corporations to operate would be a nightmare to perform manually. This is where Enterprise Resource Planners (ERPs) come into play. With an ERP, a company has a single platform to access and update essential information. ERPs communicate between "modules" for each business group in real-time to prevent non-optimal decisions (Koleva). ERP systems are intentionally very different from company to company, customized to best serve the company's individual workflow. These systems were originally used to manage, track, and control inventory, but now integrate with every aspect of a business.

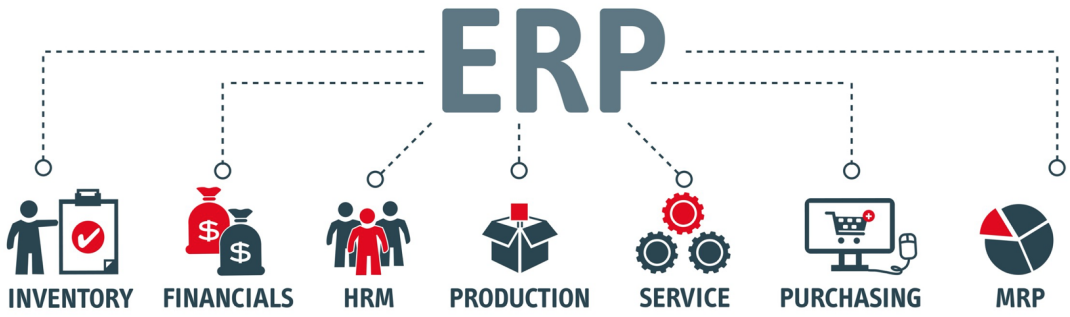

Figure 1: Breakdown of ERP modules (Redwood Logistics)

Cloud ERPs are the combination of off-site computing and company-wide computer systems. The two giants of this space, SAP and Oracle, are constantly competing to provide their ERP solutions to the biggest companies in the world, a battle for more than $70 billion in combined revenue. These two companies are both top-100 most valuable companies in the world without having a single end-user interaction, which is why they aren't household names like similarly valued Nike, Mcdonald's, and Netflix. This article will provide an in-depth look at the landscape, implementation, and impact of the ERP world.

2.0 Stakeholders

There are many stakeholders when it comes to an ERP implementation. One can look at ERPs from the side of the company purchasing the ERP. These companies have strengths (competitive advantages in their processes) that they want to bolster and weaknesses that they want to remove in the process of the ERP implementation. This company undertakes a huge journey by getting a new ERP that must be managed wisely. The risks of a bad investment can linger over executives that are trying to keep their company current with the times. The implications of a new system mean that employees may experience growing pains as they adapt to a new system and possibly find some tasks automated away.

One can also look at ERPs from a consultant's perspective. Consultants are often brought on to manage an ERP implementation. These consultants are supposed to accomplish a variety of objectives such as ensuring that a company buys the right software, customizing the software to "strike a balance between the organisation's and the ERP system's adaptation requirements," (Luo and Strong 2004) preparing the client's employees to smoothly embrace the new software,

completing a data transfer to migrate possibly-messy data into the new ERP, and whatever else is needed to make the implementation a success.

The third major player in this equation is the ERP vendor themselves. ERP vendors often have their own consultants and/or partner with consulting firms to push their products and conduct a successful implementation. ERP vendors have slowly integrated into their products advancements in technology such as cloud computing, advanced analytics, and machine learning, but their priority is providing a trustworthy platform that can support the necessities of their customer corporations. Vendors boast success stories from recognizable companies. In one example from SAP, Hershey updated from "outdated, disconnected finance processes, manual, spreadsheet-driven activities, and error-prone reporting" to now being a company with a single database and advanced, real-time analytics streamlined on SAP's ERP system "S/4HANA" (SAP). However, these vendors will only talk about their successes. Before getting to where they are now, Hershey went through an SAP launch failure that caused an inability to deliver $100 million in candy right before Halloween (Pemeco).

2.1 Why a Company Buys an ERP

ERP software is a purchase made by a company that wants to transform its ways into the most up-to-date and dependable option. First, a company realizes that its processes aren't modernized. Their data lives in silos, causing delayed and inaccurate decision-making. Or possibly a startup wants to pay for a cloud-based solution that can grow or shrink with costs dependent on the amount they use the solution.

"Indicators like increased inventories, imbalance of stock, no systematic operations, poor customer response levels, relatively high costs compared to competitors and inefficiency of operations may suggest the need for an ERP system" - (Vilpola 2007)

Once a company realizes that they have systematic issues that could be solved with enterprise technology, they've started its ERP implementation timeline.

3.0 ERP Implementation Projects

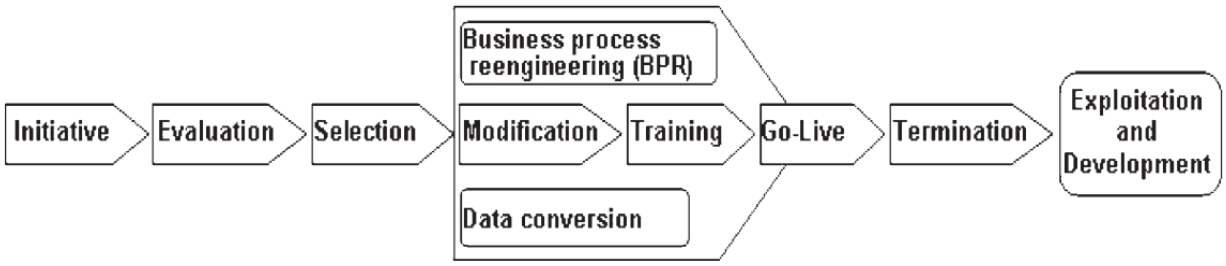

Figure 2: Model of ERP implementation (Mäkipää 2003)

Above is the timeline of an ERP implementation. Other timeline models have been frequently used such as "project charting, project configuration, shakedown, onwards and upwards," but Mäkipää's model has clear sections that encompass the process aptly. The first step in the timeline is *Initiative*. Initiative is when a company finds a reason to upgrade to a modern ERP system. As described in the last section, these reasons vary but include avoiding future growing pains, unlocking faster analytics, and automating business processes. ERP implementations are considered very risky so a company must be confident in each step before moving on to the next. At the Initiative step, this means that due diligence must be done to ensure an ERP implementation will likely be a good return on investment. A company must consider the risks, costs, and disruption to operations that comes with ERP implementations before continuing down its journey. After a company finds a reason to upgrade to a cloud ERP they typically engage with a consulting firm to guide them through the process. The main objective of these consultants is to help the project run smoothly through the steps of the timeline.

3.1 Implementation Steps: Evaluation and Selection

The next step in the timeline is *Evaluation*. Evaluation encompasses an analysis of a company's processes and the ERP market to find a fit right for the company's needs. There are various factors to consider in this step: ERP synergies, consulting firms' proficiencies with different technologies, budget constraints, the potential for future mergers and acquisitions, and more. The mergers and acquisitions point refers to the fact that it is easier for two merging companies to integrate their systems if they both have a modern ERP system, and it's even easier if they both have the same ERP system. Once a company has settled on an ERP with the right capabilities, at the right price point, with the right support system, it has completed the next step of the implementation process, *Selection.* A general trend for selection is that large companies tend to "seek good support and process improvement, whereas small and medium-sized companies look for adaptability and flexibility of software" (Vilpola).

3.2 Modification: Business Process Reengineering and Data Conversion

The next step in the ERP implementation process is to adapt both the company processes and customize the ERP modules so that the software works in harmony with the company, aka *Modification*. *Business Process Reengineering (BRC)* is the process of changing how a business operates to better flow with the ERP system. ERP systems are designed to facilitate industry best practices so the idea is that disparate business groups across a company will now all follow a standardized system. However, if a business group was functioning optimally, they "may actually lose their competitive advantage when they re-engineer their processes to align with those of the ERP system" (Ptak 2003). Although the ERP implementation may disrupt the current business processes, the general consensus is that the consistency across the company that ERP implementation brings helps facilitate the efficient exchange of information and strategy implementation. A concurrent step to *BRC*, part of preparing the system to work for the specific company at hand, is *Data Conversion*. A company needs to move all of the data from its current

databases to the cloud storage that the ERP vendor provides. Messy data can be a nightmare at this volume so tests must be conducted to ensure the data transfer was conducted properly. In fact, testing is such a critical activity that it should be conducted thoroughly before the system gets into the end-user's hands. Although the aforementioned Hershey is now receiving a return on its investment, its first attempt at ERP implementation was catastrophic:

> "When Hershey embarked on a $112 million ERP implementation, it cut its testing phases to meet an overly aggressive deadline. When it went live, transactions reportedly didn't flow across CRM, ERP and supply chain management systems. As a result, Hershey couldn't process $100 million of orders during Halloween, one of its busiest seasons. Hershey's profits dropped by 19 percent the quarter of its ERP launch, while its stock price fell by eight percent. Proper testing would likely have prevented this disaster." (Pemeco Consulting)

This is just one example of how risky an ERP implementation can be, as one significant misstep can paralyze a company.

3.3 Go-Live: Flipping the "On" Switch

Before the *Go-Live*, the day the system starts facilitating the company's actual operations, it is critical that employees are properly trained on the new system. These employees will be operating the ERP on a daily basis and major disruptions to their workflows can result in huge losses for the company. Training the employees can include supplementary videos, simulations, and on-site walkthroughs of the technology. "Buy-in" is a very important component for a successful implementation so if the employees cannot or won't commit the time towards preparing to accept the new technology, the Go-Live can be disastrous, with the technology being rejected by the employees in the worst case. To avoid rejection from the employees, modifications should be made to the ERP system to align the system processes with the current business processes. However, an additional factor to consider is that too many customizations

made to the ERP system may render the company's system incompatible with new updates to the ERP from the vendor themselves, decreasing the utility time of this investment (Vilpola).

The Go-Live is the grand finale of the implementation. Every step before this day has led up to creating a transition that is as seamless as possible. Prior to the Go-Live, there are many items that must be checked off the list to make this day a success. The most critical is preparing the system. This includes testing the system thoroughly by having key personnel simulate business activities on the new ERP. This allows some users to practice on the new system as well as allows for the chance to find inadequacies in its functionality. Another key component to a successful Go-Live is to know the company's risks and how to mitigate them. A major risk is that certain business functions won't work properly at first. Having a way to bypass the system or having developers ready to fix these issues right away can help minimize the damages of a faulty system. In addition to developers, make sure that the entire organization is ready for anything this day (ERP Advisors Group).

At the bare minimum, everyone in the organization should know when the Go-Live is happening, and business leaders should be available to provide damage control in their respective departments. Keep in mind that the Go-Live day is most likely the day that the employees function the worst with the ERP and that over time the company will see the benefit of streamlined processes etc. However, glitches in the future can occur as well. Notably, Nike's demand-planning engine predicted thousands too many Air Garnetts and thousands too few Air Jordans to be produced. This "speed bump" lost Nike approximately $100 million in sales and caused the company's share price to drop by 20% (cio.com).

3.4 ERP Maintenance

After a company implements its ERP, it gets to enjoy the fruits of its labor. One interconnected system now paves the way for efficient dataflows, real-time analytics, unified processes, mergers & acquisitions, and more. However, certain steps should continue to take place to ensure the software continues to meet all of the requirements of the company. One of these steps is updating the software

when the vendor releases updates. This will keep the system more secure from attacks and ensures that no advantageous features are being left on the table. Another step is to invest in more process automation and analytics. Now that a company has all of the parts of the company at its fingertips, creating automated workflows can free up time for its important employees and reduce busywork. These automated workflows can include automated emails after client purchases, auto-generated reports sent between business groups, and analytics dashboards that keep business analysts up to date on the most important metrics.

4.0 Key Players

In basketball, you have *Michael and Lebron*. In boxing, you have *Mayweather and Ali*. And in enterprise software, you have *SAP and Oracle*. In this section, we will look at how these companies came to be so dominant in their fields and what other companies we should keep an eye out for. There are also certain consulting companies that are recognized by the vendors as global system integrators that play a huge role in the ERP world.

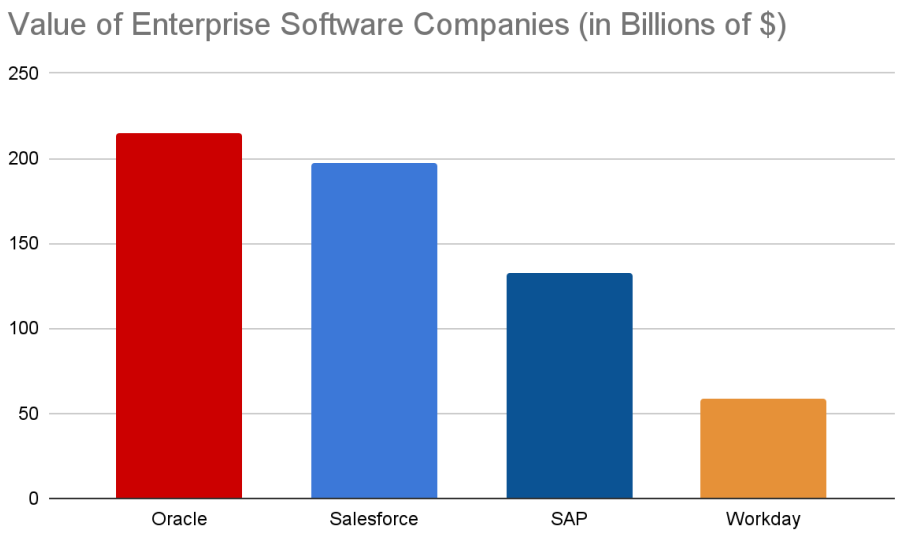

Figure 3: Comparison of enterprise software providers by market capitalization

4.1 SAP

SAP was the first provider of enterprise software. The German company Systemanalyse und Programmentwicklung ("System Analysis and Program Development") was founded in 1972 by five estranged IBM engineers. A project they were working on for IBM was scrapped so they created their own company based off of it, a company built to provide enterprise software. Their first product was “RF,” R for real-time and F for finance. By 1972, SAP released their second ERP system, SAP R/2, that offered material management and production planning in addition to its finance/payroll/accounting capabilities (SAP). Today, we see the same concept of digital business processes but modernized and customized to an extreme level. In 2014 and 2015, SAP started partnering with IBM and Hewlett Packard Enterprise to offer cloud services. IB and Hewlett Packard provide the infrastructure such as cloud storage and cloud computing that the SAP 4/HANA software runs on. SAP continues today to be the top ERP choice for the largest, most complex organizations worldwide. “SAP customers represent 98% of the top 100 most valued brands in the world” (SAP). With the largest companies in the world running their software, there is no shortage of cash flow for SAP to continue to push to be the industry leader for years to come.

4.2 Oracle

In 1989, Oracle Corporation started a similar journey when it released Oracle Financials, a parallel to SAP’s first product, RF. However, the two companies didn’t truly butt heads until 2004 when Oracle made a series of acquisitions to cement its place in the enterprise software market. In December 2004, Oracle acquired Peoplesoft for $10.3 billion, a company that creates ERP software with capabilities in human resources, financial management, customer relationship management, and supply chain management. In September 2005, Oracle acquired Siebel Systems for $5.8 billion, a company that primarily creates customer relationship management software. And finally, in March 2007, Oracle acquired Hyperion for $3.3 billion, a company known for corporate performance management and

business intelligence systems. Through the acquisition of these companies along with its own research and development initiatives, Oracle grew tremendously in size and capability to compete with the best in the industry. Although SAP and Oracle are ERP rivals, they do share many synergies that their clients take advantage of. Their relationship started with Oracle's relational database products integrating with SAP's R/3 ERP, which was released in 1992 (Britannica). Today, the Oracle database is the #1 database for SAP customers (Oracle).

4.3 Salesforce

SAP and Oracle are the largest ERP providers. However, another key player in this field is Salesforce. Salesforce is not an ERP provider, but instead provides a Customer Relationship Management (CRM) platform. CRM is one major component of ERPs and thus Salesforce is a relevant competitor to Oracle and SAP. In fact, Salesforce's acronym or "ticker" on the New York Stock Exchange is even "CRM," indicating how the company has made itself synonymous with this product. With a market capitalization bigger than SAP, Salesforce leads through a focused strategy on CRM and paves the way for advancements in cloud computing and the Software-as-a-Service (SaaS) model. Salesforce also features a more modern user interface and an easy-to-follow training program so that companies of all sizes can adapt their Salesforce system to their customized needs (Trailhead).

4.4 Workday

Similar to Salesforce, Workday excels by focusing its attention on a specific module of ERP. In Workday's case, this is Human Capital Management or HCM. This focused vision also allows Workday to be a more agile company than Oracle or SAP. Workday is considerably smaller than the previous three companies but is the leader in its own sector. For example, SAP's HCM division is called Successfactors and would be the HCM of choice for most large corporations running SAP. However, a more service-based organization such as a university would benefit from an HR-focused software system such

as Workday. They offer advanced human-centered analytics such as "employee enablement," the concept of fully utilizing an employee based on their career and job-function desires (Forbes, 360Learning).

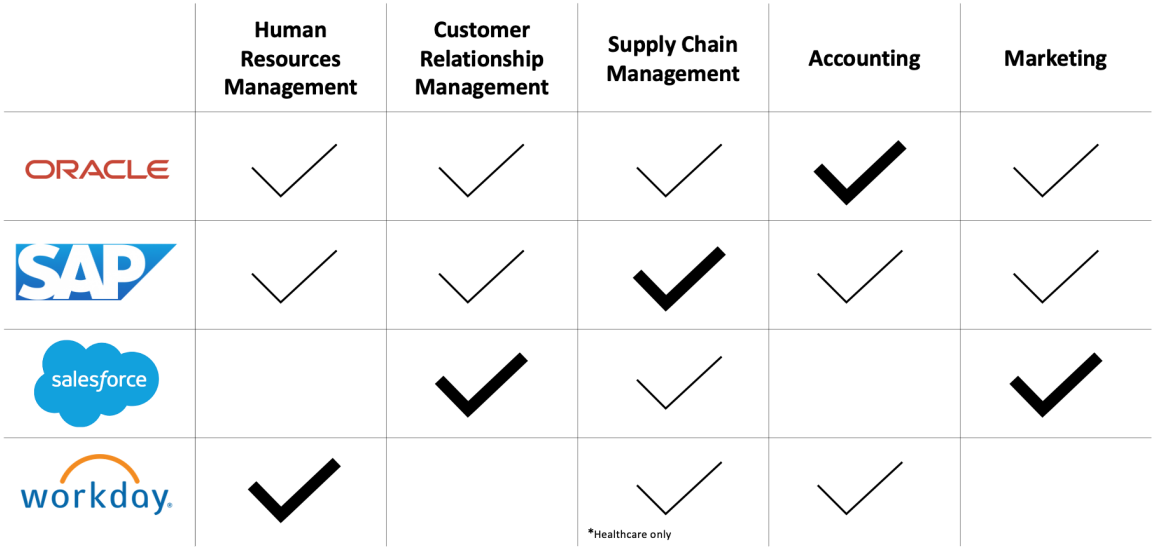

Figure 4: Snapshot of what modules each system provider excels at. Management should choose an ERP system that excels at the most critical parts of their company.

4.5 System Integrators

Oracle's featured global systems integrator (GSI) partners are featured on their website as companies that "offer unparalleled global industry expertise" (Oracle). These companies are Accenture, Deloitte, KPMG, and PwC. The latter three companies are the consulting branches for three out of the "Big 4" accounting firms, missing from the list is Ernst & Young. Accenture makes it onto their list as a top technology consulting firm. Other notable implementation partners that also service SAP are IBM, Dell, and Hewlett Packard. Implementation firms are often smaller companies in order to provide personalized services to their clients. Often the larger firms mentioned at the start will acquire smaller companies to expand their offerings and client base. The software vendors also provide their own implementation consultants.

5.0 The Future for ERPs

The future of Oracle and SAP is stable because of the investments thousands of companies have already made into their products. However, some extrapolations can be attempted into the future of the market. One consultant says “I think down the line you will see significant amount of clients moving from SAP to Oracle Cloud!” citing Oracle’s more favorable progress towards cloud computing over SAP (Fishbowl). Another criticism towards SAP’s failure to adapt comes from a Deloitte consultant, “SAP is trying to figure out what others have been doing since last decade (read salesforce)... stories of SAP sales pushing cloud solutions which fails miserably during implementation are dime a dozen (read SAC)” (Fishbowl). SAC in this case refers to SAP Analytics Cloud. With the pace that software progresses in today’s age if your system isn’t being constantly updated, it quickly looks outdated and lacks the capabilities and performance that the market asks for. ERP software is massive and slow-moving, so investing down the right path is critical. For the vendors, customers, and consultants, *ERP systems are a necessary headache to achieve business efficiencies that will be grappled with for decades to come.*

Citations

"8 Ways to Go From Employee Engagement to Employee Enablement." *360Learning*, 360learning.com/blog/employee-enablement/#:%7E:text=Employee%20enablement%20is%20the%20strategic,engagement%20to%20the%20next%20level. Accessed 12 Apr. 2022.

Carlbert, Michelle. "16 Tips for a Successful Go-Live." *ERP Advisors Group*, www.erpadvisorsgroup.com/blog/successful-erp-go-live. Accessed 12 Apr. 2022.

Curoe, Matt. "How Does ERP Software Work?" *Redwood Logistics*, 27 Jan. 2020, www.redwoodlogistics.com/how-does-erp-software-work.

Forbes, Workday. "Building Companies That Enable Employees." *Forbes*, 24 May 2019, www.forbes.com/sites/workday/2019/05/16/building-companies-that-enable-employees/?sh=7a63fffe479a.

Gross, Jonathan. "A Case Study on Hershey's ERP Implementation Failure." *Pemeco Consulting*, 26 Oct. 2021, www.pemeco.com/a-case-study-on-hersheys-erp-implementation-failure-the-importance-of-testing-and-scheduling.

"History | About." *SAP*, www.sap.com/about/company/history.html. Accessed 12 Apr. 2022.

Koch, Christopher. "Nike Rebounds: How Nike Recovered From Its Supply Chain Disaster." *CIO*, 15 June 2004, www.cio.com/article/264637/enterprise-resource-planning-nike-rebounds-how-nike-recovered-from-its-supply-chain-disaster.html.

Luo, W. and Strong, D.M., 2004. A framework for evaluating ERP implementation choices. IEEE Transactions on Engineering Management, 51 (3), 322–333.

Mäkipää, M., 2003. Implementation of enterprise resource planning system – theoretical research approach and empirical evaluation in two cases. Proceedings of the 26th information systems research seminar in Scandinavia, Finland.

"Oracle Corporation | Definition, History, and Facts." *Encyclopedia Britannica*, www.britannica.com/topic/Oracle-Corporation. Accessed 12 Apr. 2022.

"Oracle Database for SAP." *Oracle*, https://www.oracle.com/solutions/sap/database/. Accessed 12 Apr. 2022.

Principal Business Analyst. "SAP Consultants." *Fishbowl App*, 2020, www.fishbowlapp.com/post/whats-best-for-an-erp-it-consultants-carrier-oracle-erp-or-sap-erp-2

Ptak, C.A., 2003. ERP: tools, techniques, and applications for integrating the supply chain. 2nd ed. Boca Raton, FL: St. Lucie Press/CRC Press.

"S/4HANA Value Story Brochure - Digital Supply Chain." *SAP*, www.sap.com/products/supply-chain-management.html?pdf-asset=38c2c4ee-657d-0010-87a3-c30de2ffd8ff&page=11. Accessed 12 Apr. 2022.

"SAP Customer Reviews and Stories | Software & Technology Solutions." *SAP*, www.sap.com/about/customer-stories.html?sort=latest_desc. Accessed 12 Apr. 2022.

"Trailhead | The Fun Way to Learn." *Trailhead*, trailhead.salesforce.com/en. Accessed 12 Apr. 2022.

Vilpola, Inka Heidi. "A Method for Improving ERP Implementation Success by the Principles and Process of User-Centred Design." *Enterprise Information Systems*, vol. 2, no. 1, 2008, pp. 47–76. *Crossref*, https://doi.org/10.1080/17517570701793848.