

Finding the tipping point for a CEO to say yes to an ERP: a case study

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Parag Uma Kosalge

*Seidman College of Business: Management, Grand Valley State University,
Grand Rapids, Michigan, USA, and*

Elizabeth Ritz

Deloitte Tax, Grand Rapids, Michigan, USA

Abstract

Purpose – Most small- and medium-sized enterprises use some business management software to manage day-to-day operations. Eventually they consider transitioning to an enterprise resources planning (ERP) system. The purpose of this paper is to find what motivates the top management to consider a transition from an existing system to an ERP especially as such a transition can be painful, expensive, and involve considerable business risk. The research posits a decision model that top management may use to aid their decision.

Design/methodology/approach – The research question is about examining the organizational phenomenon of transition to an ERP system and so a case study research methodology is followed to understand the phenomenon.

Findings – The research concludes it is usually a change in scale of operations that drives the transition. The motivators are abstracted as: scalability – increased hierarchical controls and systems scalability driven by increasing number of employees; complexity – more business functions need systems support to address increased operational complexity; and integration – systems and process integration for seamless operations.

Research limitations/implications – There is a need to check if the same fundamental issue of change in scale of operations is true across industries and across geographies. Also it creates a need for a statistical validation of the motivators and their importance across organizations and industries.

Practical implications – ERP considerations are of strategic importance because of the high risk and the high expense. The research presents a decision model to aid top management to find if ERP systems make sense for their organization.

Originality/value – The research provides new directions for academicians as there are few empirical studies on the true motivators that drive ERP adoption.

Keywords SME, ERP, Adoption, Drivers, Motivators, Enterprise systems

Paper type Case study

1. Introduction

Businesses increasingly depend on software applications to manage their operations. Complex technologies such as enterprise resources planning (ERP) need considerable resources, time, money, knowledge, and people to implement and leverage them for business benefits (Peslak *et al.*, 2007; Helo *et al.*, 2008; George and Khoja, 2012; Mukwasi and Seymour, 2012). As small- and medium-sized enterprises (SMEs) rarely possess such resources in their early years, they usually adopt non-ERP systems to manage

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daily operations and run reports to help tactical and strategic decision making (Buonanno *et al.*, 2005; Peslak *et al.*, 2007; Thilmany, 2010). For instance, Intuit's QuickBooks accounting and business management system with its extensive graphics-driven interface makes it easy for a business owner to use it with minimal training. Along the way organizations tend to supplement the non-ERP system by cherry-picking a collection of add-ons and systems such as workflow management, human resources management, and customer relationship management (CRM) to support complex or critical business functions (Thilmany, 2010). Such disparate systems eventually lead to a significant time and effort in duplicating processes and manually entering information into different systems as the work crosses functional and application boundaries. An ERP system can help (Esteves, 2009).

Eventually the organization may consider transitioning to an ERP. It is believed that a major motivation for a transition is the need for systems and process integration (Esteves, 2009; Clemens *et al.*, 2012; George and Khoja, 2012; Jenkins, 2013), while there is little empirical evidence. A transition is usually not only expensive and painful (Griffiths *et al.*, 2013; Pishdad and Haider, 2013) but also quite risky. ERP implementations are complex and often fail to deliver on promised benefits, time, or budget (Peslak *et al.*, 2007; Subramanian and Peslak, 2010; Mukwasi and Seymour, 2012). They also have a high rate of failure sometimes leading a business to bankruptcy (Mukwasi and Seymour, 2012). Some practitioners suggest avoiding such a risky transition by choosing an ERP to begin with. The proper choice of business systems is therefore a matter of strategic importance to an SME. So it is important to understand the phenomenon and the motivators that drive an SME toward a transition.

This paper uses a case study to examine an SME's transition to an ERP system. A case study may not only surface some of the important motivators but also help understand the underlying phenomenon. The paper offers helpful guidelines to SMEs for selecting appropriate business information systems. Understanding the motivators can also help technology providers to shape their offerings. The research provides valuable directions to academicians to further explore this important research question that has few empirical studies.

For an SME the transition is often from QuickBooks to SAP. QuickBooks holds the highest market share in SMEs estimated at around 90 percent (Roush, 2014), while SAP holds the highest market share of ERP and a market leader for decades. The paper begins with a review of existing literature on motivators for ERP transition and a review of QuickBooks and SAP Business One software, followed by transition experiences of SMEs. The research methodology is then discussed followed by discussion of finding from the case study and a research synthesis. The conclusion section also provides recommendations for SMEs and discusses the limitations of this study.

2. Literature review

Recent empirical studies suggest "Perceived Systems Quality" that represents benefits from the features and capabilities of an ERP system, is positively linked to adoption (Wen-Lung *et al.*, 2009; Ram *et al.*, 2013). Also a perception of strategic value of an ERP in terms of better business management by the top executives is also positively linked to ERP adoption. Ram *et al.* (2013) suggest that an organization that has better organizational preparedness in terms of technology resources; synergy and cooperation of its information technology function with other business functions; and business functions cooperating rather than competing with each other than, will also be positively motivated to ERP adoption. However "Perceived Information Quality" in terms of

improved information output for better decision making, has no effect on decision for adoption. An uncertain and risky environment filled with dynamism and/or hostility will keep a business away from ERP. The researchers could not properly reconcile the symptomatic findings as there was a lack of a deeper understanding of the phenomenon of an organization facing a transition. This paper attempts to bridge the gap.

Transition motivators: existing system inadequacies vs ERP benefits

As seen in Figure 1, the motivations and the benefits are on the opposite ends of the technology adoption model and the practitioners constantly endeavor to match them. For a variety of reasons the gap might be considerable for ERP adoption (Häkkinen and Hilmola, 2008; Hawari and Heeks, 2010; May *et al.*, 2013). So the extant literature on ERP benefits may not help locate the motivators. The motivators may instead be found in the inadequacies or operational constraints of the current non-ERP system that are for some reason only now becoming apparent to the organization.

It is not easy for an SME to give up a system they used satisfactorily for a long time in favor of an unknown, expensive, resource-intensive system with a substantial risk of failure at implementation (Wan and Hou, 2012) unless the existing system is placing painful operational constraints. There is little empirical evidence on ERP adoption motivators defined in terms of system inadequacies or operational constraints. But there is some literature on retrospective evaluation of SME's perception of ERP benefits received. One such benefit mentioned earlier is the need for systems and process integration on account of multiple, disparate business systems that automate various business functions. By providing a broad suite of business applications, it minimizes issues of systems integration to allow smooth coordination across functions and provide a unified view of operations (Jenkins, 2013). Integration of diverse business processes can simplify operations for faster decision making resulting in corporate growth, increased customer service, and reduced expenses (Esteves, 2009). This is also supported by (Helo *et al.*, 2008) where researchers found one of the ERP benefits SME most valued after ERP implementation is "Enables departments to integrate activities," as seen in Table I.

Table I may provide possible motivators but only if we assume that motivators (areas of great operational pain or organizational constraints) would be most frequently noticed when they are resolved by an ERP. An assumption that means unresolved motivators possibly may not appear in the list. As post-implementation perceptions of benefits change over the months and years following an ERP implementation (Esteves, 2009), the above table could be inaccurate. Also there is a lack of a deeper understanding of the underlying phenomenon that drives an SME to consider a transition.

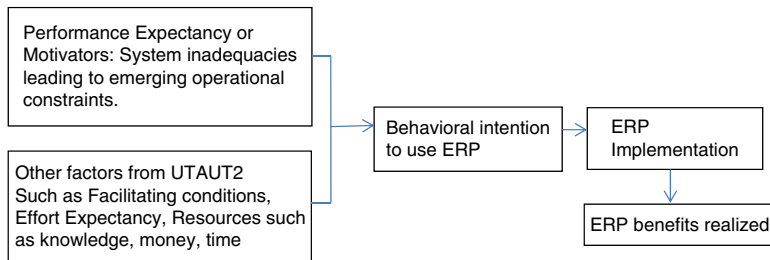


Figure 1. Motivators or system inadequacies vs ERP benefits as located in the context of UTAUT2

Source: Venkatesh *et al.* (2012)

	Perceived benefits of an ERP post-implementation	Frequency of mention (%)
1	Process improvement and increased process controllability	66.1
2	Improved process quality and predictability of business	55.93
3	Standardization of business processes	47.56
4	Organization transparency	44.07
5	Enables departments to integrate activities	37.29
6	Improved reporting	32.30
7	Discipline in operations	27.12
8	Customer/supplier network management	23.73
9	Reduction of lead-time	22.03
10	Real-time information from products and processes	20.34
11	Improved reliability of system	20.03
12	Improved on-time delivery	16.95
13	Savings on transaction costs	15.25
14	Enables new business strategies	10.17
15	Improves market responsiveness	10.17
16	Supports operative design	8.47
17	Simplified system support	5.08
18	Improved flexibility	5.08
19	Reliable database systems	5.08

Source: Helo *et al.* (2008)

Table I.
Post-implementation
perceived benefits
of ERP

Existing cases of transition

Three cases from practitioner literature are examined below to understand the motivators for a transition to an ERP system. The information for practitioner literature could be sourced from the technology providers and so the information could be biased.

Di bella Coffee. Di Bella Coffee, an Australian-based coffee roaster and retailer, founded in 2002, made the transition from QuickBooks to SAP Business One in 2010. They needed a system to help manage the size of the business and act as a platform for growth (Banks, 2010; SAP, 2010). The company decided to make the transition because the business required greater integration between its business functions. They had relied on QuickBooks until then. They needed something more substantial to integrate the business process as they needed to balance their wholesale and online retail businesses with their manufacturing operations of roasting coffee blends to order. They needed the systems to work together to deal with the rapid turnover of inventory in each of the wholesale and retail business model. They turned to SAP Business One (Banks, 2010) for two reasons, to integrate the core business functions: sales, customer relations management, and operations, and to allow the company to consider avenues for future growth.

4G Identity Solutions Pvt Ltd. 4G Identity Solutions, based in India, provides large-scale biometric identity management solutions. They wanted to automate the business processes and to receive accurate real-time business information across functional areas (Anonymous, 2013b). They wanted to streamline accounting, finance, HR, sales, CRM, purchase, and inventory management. They wanted to capture business information in a single system while maintaining scalability as the business expands. In July 2013, 4G Identity Solutions went for SAP Business One. SAP Business One helped them automate and integrate all accounting and financial processes across the organization and provide

timely and accurate financial information (Anonymous, 2013b). Similar to Di Bella Coffee, 4G Identity Solutions also needed an IT solution that provided real-time business data that were integrated across all areas of their company.

LJA Miers. LJA Miers is a family-run company based in UK that makes gaskets and seals. When updating their IT systems, LJA Miers focussed on their business process in particular, which required time-consuming manual input, further complicated by the fact that they had factory locations across the UK. Similar to the previous two companies, LJA Miers was also in the market for an ERP system that would organize information from all parts of their business, in a business process and a geographical sense, as well as produce reports related to the company’s operational data anywhere and at anytime.

Initially the business owner of LJA Miers did not see SAP as a solution suitable for an SME. The business is based on volume with little profit margin on each product. The number of products manufactured as well as the number of daily transactions is huge. This generates a flood of information every day. They chose SAP Hana version for its enhanced database capabilities as it is a scalable solution embedded with data analytics for better decision making (Anonymous, 2014). SAP Business One helped them be responsive to their customers in real-time and more efficient in their workforce utilization (McKenna, 2013). According to owners of LJA Miers, access to operational information through iPad or any other mobile devices combined with the overall ease of use will help them transform their business and help move it to the next level (McKenna, 2013).

The above three cases are assessed for motivators in Table II. These cases are from practitioner journals. There are few empirical case studies available for proper examination of motivators for transition from a QuickBooks-type of system to an ERP such as SAP. This research paper attempts to fulfill this need.

Some of the areas of operational pain or organizational constraints might be located by examining and comparing the software involved: QuickBooks and SAP. The information below is corroborated by extensive personal experience of the researchers with the software. Later we discuss the limited literature from practitioner journals on transition from QuickBooks to SAP to locate further possible motivators.

QuickBooks. QuickBooks was launched in 1994 by Intuit as an accounting software. Now it goes beyond accounting to address functional and cross functional needs of business management, for instance it can help create invoices, purchase orders, and sales orders. It supports payroll management, inventory and procurement management, and sales management. They offer desktop as well as cloud versions. For desktops they offer

Table II.
List of motivators for migration from the three practitioner case studies

Motivator: pain area or an operational constraint	Frequency of mention
1 Lack of: scalability in hierarchical controls: more role definitions needed for a growing organization, restricting further growth	A, C
2 Lack of: systems and process integration for end-to-end seamless integration of systems and business functions and business process	A, B, C
3 Lack of: system scalability for more users	B, C
4 Lack of: complex reports to include increasing number of operational variables	C
5 Lack of: database scalability to accommodate a torrent of data	C

Notes: A, Di Bella Coffee; B, 4G Identity Solutions; C, LJA Miers

QuickBooks Pro and Premier designed for small businesses and QuickBooks Enterprise for mid-sized businesses. Cloud-based versions are Simple Start, Essentials, and Plus (QuickBooks, 2014) with an open platform strategy to help integrate emerging web services such as Google Maps. This provides additional customization to help an SME. They have partnerships with other providers for increased versatility and seamless integration of data in QuickBooks with data in non-QuickBooks systems (Anonymous, 2013a). For instance, they partnered with Square, a Point-Of-Sale (POS) system (Jenkins, 2013) to allow an SME to automatically import POS transactions from Square to QuickBooks (Tsuruoka, 2013). This is remarkable as QuickBooks offers its own “GoPayment” POS system that rivals with Square (Table III).

SAP Business One. SAP Business One is an application designed for SME. It was launched in 2002 based on acquisition of TopManage Financial Systems (Missbach *et al.*, 2013) and TopTier commonly known as SAP Portals, which web-enables SAP’s ERP (Anonymous, 2001). Therefore SAP Business One is fully integrated with the SAP’s ERP and offers a subset of the features. It provides an SME access to a single system containing e-commerce and financial transactions, accounting, sales, CRM, manufacturing and inventory management, and management control functionalities (Russo, 2006; Niefert, 2009). It can manage an entire business process

QuickBooks desktop versions→features	Enterprise	Premier	Pro
Maximum number of simultaneous users	Up to 30	Up to 5	Up to 3
14 predefined and changeable user roles to set up new business users quickly	✓	No	No
Optimized for larger data files and network usage	✓	No	No
Import data from previous versions of QuickBooks, and from Excel, Quicken, Peachtree	✓	✓	✓
Set reminders and create to do lists	✓	✓	✓
Create and e-mail quotations, invoices, purchase orders. Customize invoices and other forms	✓	✓	✓
Multiple currency capabilities			
Create and e-mail sales orders	✓	✓	No
Print checks, pay bills, manage expenses	✓	✓	✓
Track sales, sales tax, customer payments			
Download bank, credit card transactions			
Track credit cards			
Manage payroll, payroll taxes, direct deposits	✓	✓	✓
Track inventory, set reorder points	✓	✓	✓
Create inventory assemblies and bills of material	✓	✓	No
Track inventory in multiple warehouses, serial/lot number tracking, bin location tracking, bar coding capabilities, and FIFO costing	✓	No	No
One-click business reports	150+	150+	100+
	industry-specific	industry-specific	
Create business plan, forecast sales, and expenses	✓	✓	No
Create industry-specific reports			
Create, manage budgets for P&L, and balance sheet accounts	✓	✓	✓
Pricing	From \$1,000	From \$400	From \$250

Source: QuickBooks (2014)

Table III.
QuickBooks desktop offerings, a brief comparison

from price quotations, customer orders, set up deliveries, update stock balances, to manage invoices, and accounts receivables (Niefert, 2009). It can also handle procurement process as it maintains vendor contracts and transactions, issuing purchase orders, handling returns and credits, and processing supplier payments (Niefert, 2009). It serves as the client's central ERP hub with standard interfaces for internal and external data sources and CRM applications among others. SAP Business One can be integrated with other SAP versions as well as other systems (Russo, 2006) to connect with customer and suppliers. It offers multiple products for various business management needs of an SME. This allows an SME to graduate from an ERP subset to a full-fledge ERP as the organization grows in size and complexity.

The integration framework allows customers access to data on-demand, cloud, mobile devices, web services, collaboration tools, and social networks. This allows ubiquity in information access and decision making and allows an SME to go beyond organizational boundaries (Clemens *et al.*, 2012). Their on-demand service introduced in 2012 provides a cloud environment for smaller companies for minimal up-front expense and lower IT operations and infrastructure expense (Missbach *et al.*, 2013). Companies can choose a complete cloud deployment or combine it with an on-premise deployment to control expenses and control SAP deployment (Missbach *et al.*, 2013) (Table IV).

Limitations of QuickBooks

Scalability. QuickBooks Enterprise version limits a business to a maximum of 30 simultaneous users. So QuickBooks lacks the functionality and scalability to support a business as it grows beyond a certain size. SAP does not have such constraints.

Hierarchical distribution of authority. SAP Business One allows for distribution of authority using "roles" (Niefert, 2009, p. 119). For example, a salesperson may create a quotation but only the sales manager may have the authority to change it. Relevant functions upstream and downstream may only view the quotation. Others in the organization may have no access to it whatsoever. Typically each process role, such as Salesperson, has a structured access over a handful of programs or transaction codes, thereby limiting access to information, documents, as well as process execution. Figure 2 briefly shows how this is done in SAP.

QuickBooks allows only 14 such roles. Most likely this is not an issue in a small SME. As the SME grows with more employees and functions, the organizational hierarchy becomes complex with more role definitions required than the fourteen permitted roles. The limit of 14 distinct roles with distinct levels of permissions may be created as follows: Three for the CXOs (e.g. CFO, CEO) and the owners; three for each of the main product-line or service chiefs; four for functional department heads (e.g. sales, accounting, manufacturing, purchasing); four for the managers/officers in each of these departments. This roughly shows the size of an organization that can keep using QuickBooks. If the SME wishes to support a more complex hierarchy with process automation, such as more functional departments (e.g. shipping, warehousing) or more managerial layers, it may need to consider an ERP.

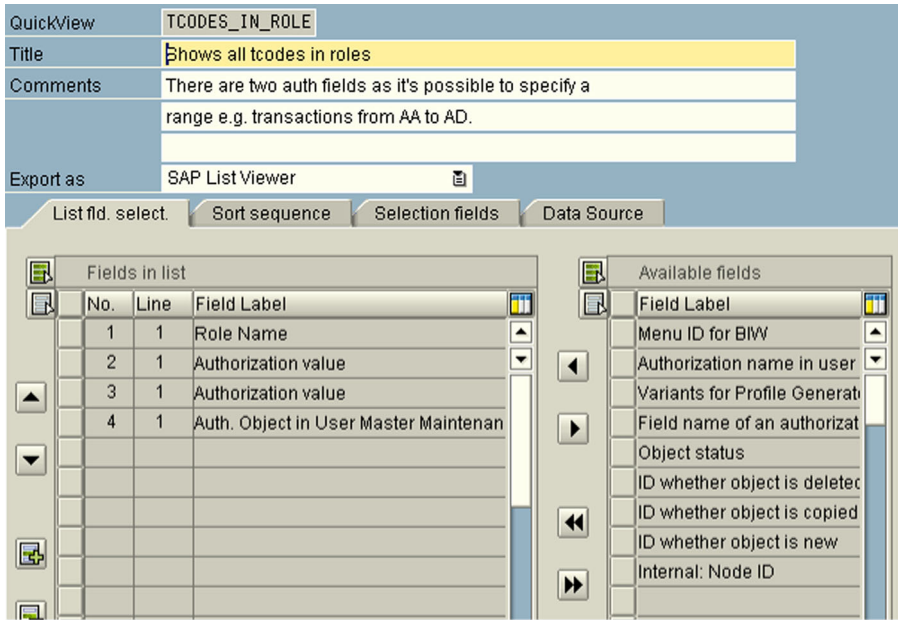
Audit trail manipulation. Although QuickBooks records the transaction history, these registries can be purged to remove any trail (OchestratedBEER, 2013). It is important for companies to accurately trace actions in the system to the users that performed them. Again this may not be a concern for a small business with only a few users. With a detailed activity log, SAP makes it easy to keep a trail for internal or external audits (Niefert, 2009, p. 119).

Versions→	SAP Business One	SAP Business ByDesign	SAP Business All-in-One
Built for...	Small businesses that want to fully integrate their end-to-end business and grow	High-growth small or midsize companies that want to limit their IT infrastructure	Midsize or fast-growing small companies with a drive to optimize business performance
Best fit for companies that...	Have outgrown packaged accounting-only software and need to replace multiple, nonintegrated applications	Need to replace point solutions, manual processes, and spreadsheets	Have outgrown current point solutions, legacy systems, or ERP systems
Industry support	All	Automotive, CP, high tech, IM&C, manufacturing, mill products, wholesale distribution	All
Features	SAP's most affordable entry-level ERP solution	ERP delivered on-demand as a software as a service (SaaS)	Most scalable ERP with deepest industry-specific functionality
On-premise	✓		✓
Hosted	✓		✓
On-demand	✓	✓	
Implementation time	2-4 weeks As few as 3 days with the SAP Business One starter package	4-8 weeks	8-16 weeks or 8-12 weeks with the SAP Business All-in-One rapid-deployment
Recommended solutions	Embedded analytics, ad hoc queries, and standard reports; integrated with SAP Crystal Reports software Create and run standard and ad hoc reports in seconds with analytics powered by the SAP HANA platform	Embedded analytics, ad hoc queries, and standard reports; integrated with SAP Crystal Reports software	Embedded analytics, ad hoc queries, and standard reports; graphical reports and dashboards through SAP Best Practices packages; integrated with SAP BusinessObjects BI, Edge edition
Pricing (payment plans available through SAP financing)	Depending on project scope, pricing can start as low as \$7,000 for one user, including software licensing and implementation	Minimum number of users is 15 of any enterprise or team user type. Five enterprise standard or team users covered by \$1,111/month	A subscription-based hosting option is available to minimize up-front costs and in-house IT requirements

Source: SAP (2014)

Table IV.
SAP product offerings

Report generation. A lack of flexibility in types of reports and complexity of reports could be an issue for QuickBooks users (Worth, 2013). It is good at creating reports along common business accounting methods but fails at other reports, such as report on total sales based on a combination of location, size of order, products ordered, customer industry, and country. As businesses grow in markets and operations they may frequently require complex database queries and reports that QuickBooks does not offer, thereby limiting an SME's decisions making ability. An SME would either need to construct complex queries on the database, or import into a spreadsheet and piece together the desired report. This can be time consuming and expensive. SAP does not have such limitations (Niefert, 2009).



Transaction Codes: Lock/Unlock

Locked	TCode	Program	Scr .	Transaction Text
<input type="checkbox"/>	MB1C	SAPMM07M	0400	Other Goods Receipts
<input type="checkbox"/>	MB21	SAPMM07R	0500	Create Reservation
<input type="checkbox"/>	MB22	SAPMM07R	0560	Change Reservation
<input type="checkbox"/>	MB23	SAPMM07R	0560	Display Reservation
<input type="checkbox"/>	MB24	RM07RESL	1000	Reservation List
<input type="checkbox"/>	MB25	RM07RESL	1000	Reservation List
<input type="checkbox"/>	MB26	PP_PICK_	1000	Picking list
<input type="checkbox"/>	MB31	SAPMM07M	0300	Goods Receipt for Production Order
<input type="checkbox"/>	MB51	RM07DOCS	1000	Material Doc. List
<input type="checkbox"/>	MB52	RM07MLBS	1000	List of Warehouse Stocks on Hand
<input type="checkbox"/>	MB53	RM07MRK1	1000	Display Plant Stock Availability
<input type="checkbox"/>	MB54	RM07MKBS	1000	Consignment Stocks
<input type="checkbox"/>	MB55	RM07MMST	1000	Display Quantity String
<input type="checkbox"/>	MB56	RVBBWULS	0100	Analyze batch where-used list
<input type="checkbox"/>	MB57	RM07MCHW	1000	Compile Batch Where-Used List

Figure 2. Roles with authorization for certain programs or transaction codes in SAP

End-to-end integration. QuickBooks has limited ability to integrate with other systems. SMEs often opt for best-of-breed point-solutions wherever they face business constraints. Each such system brings its own architecture, user interface, and data input needs. This often results in the same data keyed-in multiple times (Minney, 2012).

Eventually it leads to a mosaic of software packages increasingly difficult to manage if they do not talk with each other.

For instance an SME may start with QuickBooks and then add Salesforce.com, CRM, and payroll from ADP. Then if you add a project management tool, an HR admin system, a procurement system, a contracts system, time, and expense tracking, a supply chain system, reporting and collaboration, workflow tools, and a few mobile apps, an SME with 25 employees may end up with more than 25 systems, each one with its own management bottlenecks and IT budgets, duplicate entry of data, and no single version of the truth (Minney, 2012). Lack of systems integration can turn a carefully crafted web of software into a jumble of disconnected information. It limits an SME's ability to implement an effective IT strategy directed toward its core competence. Seamless integration with other business systems is also a challenge for SAP but it handles it way better and integrates effectively with a range of systems (Niefert, 2009).

Limitations of SAP Business One

Configuration, customization, and implementation. Configuration followed with customization of an ERP system allows an organization to tailor the system to its own unique and exact business needs. Configuration and customization are complex tailoring projects that require people, money, and time, an SME might ill afford unless it really needs the capability of an ERP. SAP Business One provides a range of pre-fit variations, much like pre-fit shirts, that require little customization from an SME (Missbach *et al.*, 2013, p. 10). A pre-fit is never a perfect fit but makes it economical for an SME. When it outgrows a pre-fit they need SAP consultants to select the next pre-fit and help migrate to the new pre-fit. It is difficult for a pre-fit to grow and change in step with the business unless the SME employs SAP consultants to modify the configuration to support the changing business needs. And SAP Business One has many of the same organizational issues and concerns for implementation failure as the regular SAP ERP (Wan and Hou, 2012). So there is still considerable risk involved and SMEs should not take it lightly.

Learning curve. ERP can be intimidating due its complex nature. The learning curve is significant for executives, managers, as well as other employees as it is intricate and not user friendly. SAP Business One is easier compared to SAP's full-fledge ERP designed for large businesses. By providing a few graphic features such as drag and drop, SAP Business One attempts to be a stepping stone for users transition from a QuickBooks-type easy-to-use solution to the advanced, function-rich but user unfriendly SAP (Davis, 2005).

Expense. Like any ERP, SAP is expensive to implement, estimated at over 100,000 dollars (Davis, 2005) compared to about thousand dollars for QuickBooks. SAP Business One allows a degree of control over the expense with staggered licensing options to help an SME gradually move toward a full-fledge ERP (Davis, 2005). In addition a cloud-based SAP option allows for low-IT infrastructure costs, while QuickBooks can be acquired for less than ten dollars a month on the cloud.

Cloud capabilities. This also allows access to business information anywhere, anytime through the web. Many QuickBooks add-on/ partner software do not have cloud capabilities and this limits the utility of their cloud. SAP Business One can scale up on the cloud as long as the SME stays within the SAP suite. Keeping important process information that is critical for tactical and strategic success in the cloud

can sometimes deter an SME (Missbach *et al.*, 2013). It calls for a level of faith and trust in the availability, operational reliability, and security of a service provider without much control over the provider or an easy way to switch between providers. Also the daily usage costs can build to a substantial amount over time. So a cloud implementation asks for little initial investment at the cost of higher running cost and a lack of control.

Table V compares key features of QuickBooks Enterprise version with SAP's Business One. This helps locate additional motivators for a transition from QuickBooks to SAP.

The motivators now need to be validated in the field while examining the phenomenon for greater understanding. The next section presents the case study protocol followed to conduct research in an SME to verify some of the motivators and problems faced in moving from a system such as QuickBooks to a solution such as SAP Business One, the first step to an ERP system.

Feature/advantage	Business benefit	QuickBooks	SAP Business One
1 Market experience	Ability to address the market segment	Since 1994	Since 2002 for SMEs. SAP in business since 1974
2 Cloud based	Less IT infrastructure and maintenance	✓	✓
3 Integration with emerging web services and technologies	Cutting edge customized with Web 2.0 for greater business benefits	✓	Not as much
4 Ease of operation and simplicity	Less IT and more business focus	✓	
5 Low cost of implementation and training	Lower expenses, lower risk	✓/About thousand dollars plus	Estimated at 100,000 dollars
6 Easy to configure or customize	Requires less knowledge, less time, money	✓	
7 Low learning curve	Less time and efforts to go live	✓	
8 Extensive offerings for almost every functional need in a process	Capacity to automate an entire process more easily		✓
9 Configuration allows automation of complex business processes	Enforce complex business rules to improve operations		✓
10 Hierarchical distribution of authority	Defining "roles" to control authority. Leads to reduced mistakes, accountability for decisions	14 roles	✓/unlimited
11 Secure audit trail	Less data manipulation and data errors. Better traceability, especially in food and drugs-related industry		✓
12 Scalability	Does not restrict SME's growth		✓
13 End-to-end integration	Avoid data duplication efforts, full view, and control of the process	Not much	Excellent
14 Best practices in process execution	Encourage SMEs to adopt best practices that avoid short-term process compromises. Increase process quality		✓

Table V.
Comparison of features QuickBooks and SAP

3. Research and data collection method

A three stage research strategy is employed: first the research design is outlined, followed by data collection and then by data analysis. The study involved understanding the phenomenon of ERP transition and verifying the motivators for transition to an ERP system. Case study research methodology was found to be most suitable as it describes the real-life situation in which the phenomenon has occurred (Cronbach *et al.*, 1980; Patton, 1980; Guba and Lincoln, 1981). And it allows an investigation to “retain the holistic and meaningful characteristics of real-life events, such as organizational and managerial processes” (Yin, 2013). It addresses questions related to “why” and “how,” while focussing on contemporary events (Yin, 2013). The survey method of research is not suitable as its ability to investigate the context is extremely limited (Yin, 2013). While case study research helps explore real-life phenomenon that is too complex for the survey method (Yin, 2008).

Single case studies provide a good understanding of a phenomenon and the issues involved, and is therefore a common design for case studies (Galliers, 1992; Yin, 2013). Any concern that single cases offer poor generalization is based on an implicit contrast with survey research where a “sample” readily generalizes to a larger universe. This analogy to samples and universes is incorrect as survey research relies on statistical generalization while case studies rely on analytical generalization (Yin, 2013). In a case study the investigator strives to generalize a particular set of results to a broader theory. So a case study allows theoretical replication where the theory is seen to replicate in the field. In turn it helps refine the theory. In contrast, the survey method seeks literal replication. Any application of sampling logic to case studies is misplaced and case studies should not generally be used to assess the incidence of a phenomenon (Yin, 2013).

Case selection

New Holland Brewing Company was selected for study. Data were collected in the months immediately following their initial, limited ERP deployment in December 2013. This made sure they had extensively examined their business processes and were well aware of their own organizational needs. Also they were knowledgeable about ERP systems to provide an informed response. As they had not realized the ERP benefits yet, their perceptions of why they needed the transition was hopefully less influenced by factors such as buyer’s remorse, post-purchase rationalization, Stockholm syndrome, resistance to change, and other environmental factors.

The validity of the case study was increased by employing multiple sources of data (Yin, 2013). Data were collected using observations, interviews, and archival sources. One of the researchers is with the consulting firm involved in assisting the SME’s transition from QuickBooks to SAP Business One and the other researcher is a certified SAP consultant with many years of experience in SAP implementation. Consequently they possess an intimate knowledge of the software involved as well as the transition project, the meetings, and the interactions between the constituencies involved. Interviews were conducted with the CFO, Amy Kenny, who headed the transition as well as the functional managers and the technology consultants. Data were also collected from the archival sources like reports, memos, web sites, and newspaper articles. This information provided documented evidence on the project management issues while enhancing the analytical objectivity of this research. Further, the project management consulting organization proof read and released the case, thereby eliminating factual errors or errors in our analysis.

Rationalized list of motivator

Looking at Tables II-V a list of possible motivators was created in Table VI. This list will be applied to the case study to validate it with theoretical replication. Theoretical replication, and not statistical replication, is the aim of a case study research (Yin, 2013). Database scalability was separated from system scalability because it is a more recent phenomenon where data from RFID implementations (Tewary *et al.*, 2009, 2010) and from Social networks, Web 2.0, Service Oriented Architecture (SOA) (Kosalge, 2013; Tewary and Kosalge, 2013) has led to a tremendous increase in data flow and a need for a new type of a database such as SAP HANA. Also a five-point scale with the following definition was to be used to evaluate the importance of resolution of each motivator: 5 = deal breaker, 4 = highly desired, 3 = would not mind if it makes economic sense, 2 = would not mind if it comes for free, 1 = not a motivator. The rating of 5 is for the motivators that are driving the transition. The rating of 1 is for the motivators that are absent and the company would avoid addition costs of learning and maintenance even if the constraint resolution was offered free.

4. Discussion of findings

Company background: the case setting

New Holland Brewing Company is a distillery, specialty brew house, restaurant, and pub. It was founded in 1996 in Holland, Michigan to brew hand-crafted beer unique to West Michigan. In 2004 their Mad Hatter Ale won the gold medal in the World Beer Cup and in 2006 a silver medal for its Poet Stout. In 2005 it launched Artisan Spirits. They opened their pub in downtown Holland, Michigan in 2002. Today they produce 24 varieties of beers and 11 varieties of spirits. In 2014 they expect to sell 35,240 barrels of beer distributed in 20 states and 22,530 cases of spirits in 15 states. They made a transition from a small-scale local operation to a large-scale enterprise with nationwide distribution.

New Holland Brewing Company used QuickBooks since 2004 and later moved to the cloud-based version. They used QuickBooks to track their sales and expenses, send

Motivator: pain area or an operational constraint	Importance of resolution
<i>Issue: increasing number of users</i>	
1 Lack of: scalability in hierarchical controls: more role definitions needed for a growing organization, restricting further growth	
2 Lack of: secure data audit trail	
3 Lack of: system scalability for more users	
4 Lack of: database scalability to accommodate a torrent of data	
<i>Issue: increasing complexity of individual functions</i>	
5 Lack of: extensive offerings for almost every functional need in a process	
6 Lack of: ability to configure for unique and complex business process needs	
7 Lack of: best practices in process execution	
<i>Issue: increasing isolation of business functions</i>	
8 Lack of: systems and process integration for end-to-end seamless integration of systems and business functions and business process	
9 Lack of: complex reports to include increasing number of operational variables	

Table VI.
List of possible motivators for migration to be tested in the field

invoices and pay bills. According to the CFO, QuickBooks performed these functions adequately and the main business benefit was the ease of learning for any new hire and its ease of use in every day operations. These benefits were not enough for them to warrant continued use of the system. They were a fast-growing mid-size organization and QuickBooks did not have enough managerial controls they needed in their operations, it could not scale up with their growing number of users, and it lacked the functionality to support multiple, complex business functions. In 2013 they decided to move to an ERP system. According to Amy Kenny, CFO of New Holland Brewing Company, they out grew QuickBooks because it “Lack[ed] true ERP functionality, that is, MRP, Lot/Batch tracking, CRM, etc. and [a] brewery specific focus.” After an extensive search for viable alternatives they decided to invest in “OrchestratedBEER” that extends and pre-configures SAP Business One for Breweries (OrchestratedBEER, 2012). This system integrates with their other systems as well as provides a hosted solution in the cloud, reducing issues of infrastructure management. They see SAP as a robust, secure, and control focussed system that not only meets their needs, but pushes them toward using the best practices for conducting and managing business.

By April 2014 New Holland Brewing was using the ERP system for accounting, sales, customers, inventory, and operations. As MRP and inventory management is critical to their cost control, they now have a perpetual inventory using cycle counting instead of a monthly physical inventory as the old method was rife with error and cutoff problems. Purchase order approvals for the procurement process will be set up soon. This should allow the system to process more orders. They plan to implement SAP CRM to monitor the sales activity on the field. Especially as they see that the system allows them to slice the data in many more ways to track profitability by segment, customer, sales employee, region, and many other. “This system includes all of our required [alcohol and tobacco tax and trade bureau] TTB reporting so it is a huge time savings and reduced opportunity for error in computing and reporting our Excise Taxes. Overall, better data lead to better decision making.”

They believe SAP will allow them to organize data across all areas of business so they can generate reports at a level of detail previously unknown with QuickBooks. The above observations of operational constraints were noted as motivators in Table VII along with the importance of resolving these constraints. The “Deal-breaker” constraints are the prime drivers, that is, if no other systems were found to resolve this constraint, the organization would most probably choose to stay with their existing system. It is important to note that lack of end-to-end integration of system and processes was not a deal-breaker concern for New Holland Brewing.

5. Research synthesis

Simplicity and flexibility

Organizations in their early years may have fewer operational variables and few employees while facing budget and time constraints. Their choice of information system is often based on price considerations, simplicity, ease of use, and quick deployment/turn-around of systems. These are the needs of a small-scale operation. They do not need a strong managerial control, enforce a business process, or, require complex reports for effective decision making as these are typically the needs of a large-scale operation. Practitioners know ERP systems to be “as flexible as wet concrete before implementation and as flexible as dry concrete after implementation.” The simplicity and flexibility of a non-ERP system allows an SME to quickly explore various markets. For instance, New Holland Breweries could experiment with new

Table VII.
Table of motivators
rated on a
five-point scale
for New Holland
Brewing Company

Motivator: pain area or an operational constraint	Importance of resolution
<i>Issue: increasing number of users</i>	
1 Lack of: scalability in hierarchical controls: more role definitions needed for a growing organization, restricting further growth	5
2 Lack of: secure data audit trail	5
3 Lack of: system scalability for more users	5
4 Lack of: database scalability to accommodate a torrent of data	1
<i>Issue: increasing complexity of individual functions</i>	
5 Lack of: extensive offerings for almost every functional need in a process	5
6 Lack of: ability to configure for unique and complex business process needs	4
7 Lack of: best practices in process execution	4
<i>Issue: increasing isolation of business functions</i>	
8 Lack of: systems and process integration for end-to-end seamless integration of systems and business functions and business process	4
9 Lack of: complex reports to include increasing number of operational variables	4
Notes: 5, Deal breaker; 4, highly desired; 3, would not mind if it makes economic sense; 2, would not mind if it comes for free; 1, not a motivator	

products such as spirits and new distribution strategies such as opening a pub till it found the right market and the right product mix to grow and spread. As the supporting non-ERP system was simple, it did not impede the experimentation.

Hierarchical controls

Often an SME is a small, close-knit group of people with a high degree of coordination and collaboration. When it finds an area for market growth, the existing close-knit group gets overloaded and the organization hires hundreds of new employees. This transforms a close-knit group into a complex, hierarchical reporting structure. With multiple products shipping all over the country, New Holland Breweries needed a tool to enforce distribution of information and managerial control across a complex hierarchy. They needed more than the 14 roles provided by QuickBooks for better process operation and better decision making at all levels.

Systems for complex functions – systems integration and process integration

Expanding operations and increasing operational complexity demand advanced information systems. Many times organizations go for symptomatic pain relief by cherry-picking applications, such as CRM, supply chain management, and warehouse management. Seamless integration between cherry-picked systems is often expensive and also elusive due to differences in platforms and differences in data structures. Customizations and/or software updates on any system could quickly throw any integration out of sync. If New Holland Brewing had cherry-picked systems, then along with increased productivity they would face problems of system integration and process integration where each business function becomes increasingly isolated. The lack of process integration can lead to severe dysfunctional behaviors between increasingly isolated business functions (Kosalge and Chatterjee, 2011). A rapidly growing business needs the means to reduce dysfunctional behavior and enforce effective business processes.

Shift in scale of operations

If the motivators were located on a graph of shift in scale of operations, it may look like Figure 3. As these motivators are operational constraints they should lead to a boost in productivity and scale of operations when resolved. New Holland Brewing made their first systems transition from an earlier edition of QuickBooks to the enterprise edition. This offered an advanced system with highest possible scalability offered by QuickBooks. Soon New Holland Brewing reached Stage 1 where the non-ERP system could not support the scale of operations. If the Stage 1 constraints were somehow resolved – if QuickBooks offered a new version with unlimited simultaneous users with unlimited number of roles for hierarchical control, then New Holland Brewing would have transitioned to this version instead. Given their satisfaction with QuickBooks, New Holland Brewing may have delayed an expensive and risky ERP transition till they face the constraints of Stage 2.

By the year 2013 New Holland Brewing was close to Stage 2. They needed complex systems to support increasingly complex functions. These constraints could be eliminated without an ERP by cherry-picking individual systems as discussed earlier. This would take the SME to Stage 3 constraints of systems and process integration before it achieves full market potential. This will force it to consider an ERP.

The common belief that systems and process integration is the driver to ERP adoption was possibly true till a decade back. SAP implementation used to be a multi-million dollar expense, an economic barrier that led many businesses to wait till Stage 3 before they could afford a transition. While those SMEs with full market potential way below Stage 3 would never even consider a transition. The launch of SAP Business One in 2002 and cloud implementation in 2012 has removed the economic barrier. Now the motivators for ERP transition could easily be at Stage 1 or Stage 2 instead. New Holland Brewing may be located somewhere between Stage 1 and Stage 2 when they went for an ERP, thereby skipping Stage 3. Its rapid progress in scale of operations meant it would have reached Stage 3 soon, so the decision to skip Stage 3 was appropriate and visionary. They also appreciated getting the industry best practices

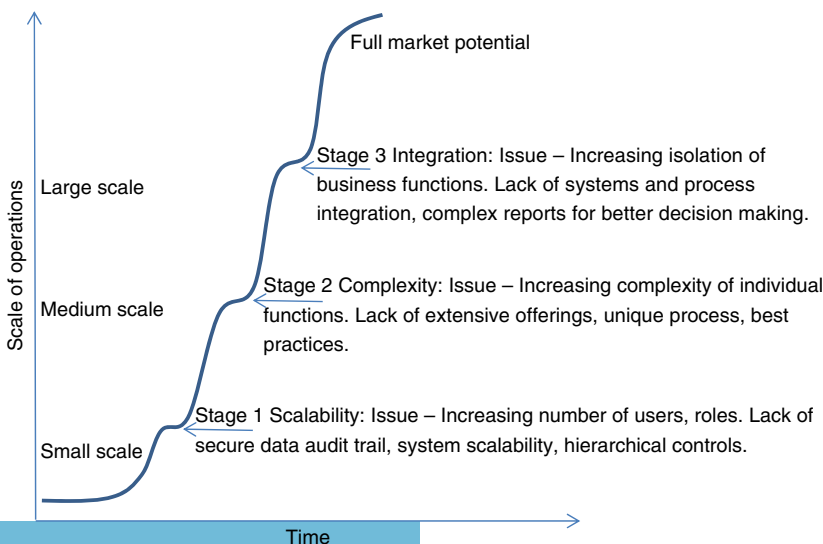


Figure 3.
Technology transitions and challenges of changing scale of operations

along with their ERP. It would help them govern increasing operational complexity with the confidence of proven and widely used business practices.

Sustaining the shift in scale of operations is one of the most important and critical survival challenges for an organization as it trades in operational flexibility for process efficiency. The suggestion that an SME could save the trouble and expense of transition by going for an ERP in its infancy appears incorrect. An ERP may offer little benefit while increasing the risk of failure due to increased cost of technology and reduced operational flexibility.

6. Conclusion and implications

This research tries to understand the motivators for an organization to make a transition from an existing system to an ERP. Using review of extant academic and practitioner literature, combined with a review of the systems involved, a list of possible motivators or process constraints was created. Applying them to New Holland Brewing Company helped validate the motivators with theoretical replication as needed in a case study. Also a pattern was observed that linked these motivators on a graph as seen in Figure 3. The conclusion is that an organization is usually driven to a systems transition by a transition in their scale of operations from a small scale to a large scale. The overall research presented in this paper may be understood with Figure 4.

Implications for practice

The list of motivators in Table VI and Figure 3 can serve as a useful guide for an organization to decide when to venture into an ERP depending on its stage of business evolution and maturity. Although New Holland Brewing took the right decision, the logic behind the decision was not entirely clear. A similar company could easily take another path leading to serious operational problems they did not anticipate.

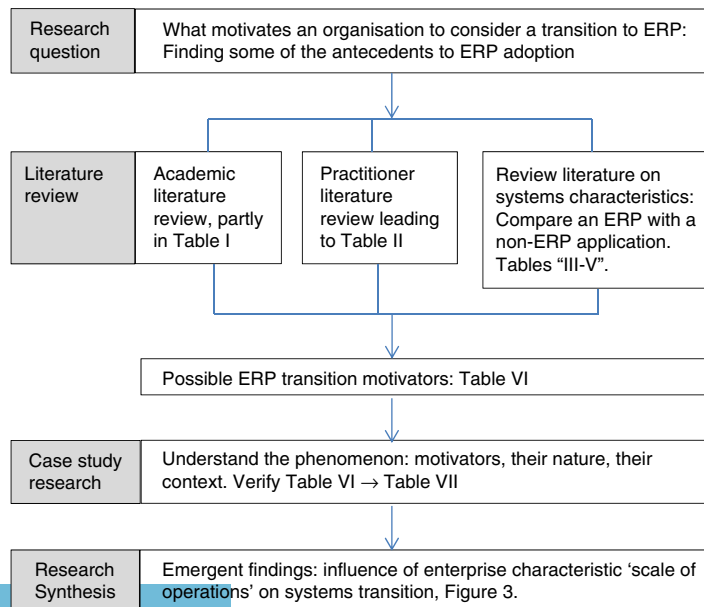


Figure 4. Overall flow of research

Considering Table VI and Figure 3, a CXO in an organization should find most motivators turn extremely important with a change in scale of operations. It is important to consider this along with the business context and an understanding of the technologies involved. If none of the motivators score “deal-breakers,” an organization probably should not consider a transition.

Cloud computing, Software as a Service (SaaS), and Infrastructure as a Service (IaaS) have radically altered the timeline for an ERP system. They remove the economic barrier as well as the constraint of needing a strong technology team to handle the transition and maintain a complex system. SOA and Mashups allow easier systems integration and update as well as unprecedented customization and user-based systems development (Tewary and Kosalge, 2013). This allows users to directly implement functionalities based on business process variations without involving the technology team, much like using Google Drive, Twitter, or any other Web 2.0 technologies for business (Kosalge, 2013). Such independence can move the decision for ERP adoption to middle management or lower as it can now be implemented piecemeal with lower financial risks. In such a scenario Figure 3 can guide managers in their technology decisions while helping CXOs understand the pattern of technology adoption they should expect and actively support.

Implications for theory

As seen in the literature review, there is little empirical evidence on the motivators that drive an organization to an ERP. Figure 1 provides an abridged version of UTAUT2 for technology acceptance as applied to ERP adoption. This model is static in time and does not show when and why certain elements in the model may reach a critical limit, driving ERP adoption. Figure 3 makes the model dynamic by providing the additional dimension of organizational growth over time. Compared to other information systems, enterprise-wide information systems have the added dimension of “enterprise characteristics” that need to be considered in ERP adoption. This element can influence many of the independent variables in UTAUT2. For instance, in a rapidly growing enterprise hiring hundreds of new employees, one may expect “Performance expectancy,” “Effort expectancy,” and “Social influence” to change rapidly – especially if the new hires are selected for their exposure to large-scale operations and their ability to operate in complex situations. This can imply an extension of UTAUT2 or at least a better enunciation of the model as applied to enterprise systems to include enterprise characteristics as part of the model.

As this is one of the few studies that explore the antecedents to ERP adoption, it has implications for future research in this field. Case studies are for theoretical replication and not statistical replication and even one case study is sufficient to add to the understanding of the phenomenon. And yet this research can benefit from a few more case studies to extend and refine the list of motivators. There is a need to check if the same fundamental issue of change in scale of operations is true across industries and across geographical contexts. As a change in scale of operations can turn almost all motivators at once, the motivators are only symptomatic of the underlying organizational issue. A different organizational issue or enterprise characteristic, could give rise to a different set of motivators. For instance, a business dependent on the internet or on RFID technology may chose SAP HANA only for its capacity to accept, analyze, and report on the huge data flow that other system cannot handle. Another direction for further research concerns a statistical validation of the motivators and their importance across organizations and industries.

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About the authors

Dr Parag Uma Kosalge is an Associate Professor in Management Information Systems at the Grand Valley State University, Michigan. His research focusses on business processes and the application of emerging technologies. This includes understanding business processes, process redesign, enterprise systems, and electronic commerce. His research is published in journals such as *Communications of the Association for Information Systems*, *Electronic Markets*, *International Journal of Electronic Business*, *Journal of Information Technology Management*, *Journal of Enterprise Information Management*, *International Journal of Business Excellence*, and various international conferences. He is a recipient of university-wide teaching awards: the Pew Teaching Excellence Award and the Pew Teaching with Technology Award. He has over a decade of industry experience in managing multi-national projects in process redesign, B2B e-commerce, XML databases, and SAP implementation. He is an SAP certified Application Consultant in the modules Project Systems, Sales and Distribution, and Financial Accounting. Dr Parag Uma Kosalge is the corresponding author and can be contacted at: kosalgep@gvsu.edu

Elizabeth Ritz is a Consultant in the Tax Group at Deloitte Tax in Grand Rapids, Michigan. She graduated Magna Cum Laude from the Grand Valley State University majoring in Accounting as well as Management Information Systems with a focus on SAP implementation. She has worked in the Accounting Services Department of The Windquest Group, Grand Rapids, Michigan, assisting in their QuickBooks-based business operations.

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