

ENGINEER TO ORDER ERP SYSTEMS

A GUIDE TO SELECTION AND IMPLEMENTATION

sabre

INTRODUCTION

This is a book on implementing an ERP system in a small engineer to order business. By "small business," I mean a company with less than about 100 knowledge workers – people who use a computer to do their job. This is an arbitrary cut-off, but for most manufacturing companies, it's a reasonable definition.

To be fair, we usually work with companies of 50 or fewer office staff – which are split half and half between engineers and other computer users. Occasionally a customer might only have 10 office staff (computer users) but that's rare.

This book will apply to almost any ERP system on the market designed for Engineer to Order, but I'm most familiar with the Microsoft Dynamics 365 Business Central, so that's what I'll reference if I need to use an example.



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Robert Jolliffe has a combined 40 plus years background in manufacturing engineering, software design, project manufacturing and production and inventory management.

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WHO IS THIS GUY, ANYWAY?

Some of you may be saying to yourself, “what makes this guy think he could write a book about this?” Let me give you a brief background so you can decide if this is the right book to read.

I started doing ERP consulting when I was 28 years old. This was after working as the IT manager at an Engineer to Order (ETO) equipment manufacturer in Waterloo, Ontario. I had decided to make a career change from being a production engineer (which is closer to my education) into IT.

I have worked as a production scheduler, buyer, quality engineer, product designer and IT technician, IT manager, and finally an entrepreneur.

Despite my engineering degree, I avoided being a mechanical design engineer – which is lucky for my employers!

Over twenty years ago, I began my journey down the path of ETO manufacturing ERP systems.

I’ve helped hundreds of manufacturing companies ranging from 10 employees to 700 with their ERP systems. I’ve spoken at Microsoft Dynamics conferences to colleagues and customers about the best tactics to run successful projects. I’ve taught supply chain and MRP fundamentals at Conestoga College in Kitchener, Ontario.

I somewhat know what Debits and Credits are (they aren’t positive and negative numbers for you non-accountants). I know enough to talk to accountants intelligently, but I’m by no means a professional.

Over the years I've worked with various project manufacturing and engineer to order manufacturers. Some example products from these manufacturers are: conveyor systems for food; size reduction mills for pharmaceuticals; die builders for automotive stamping; material handling and packaging line integrators, and more.

Amazingly, I have found that the majority of “manufacturing” ERP systems didn’t handle their business very well at all.

Over twenty years ago, I began my journey down the path of ETO manufacturing ERP systems. There are a lot of differences between “traditional” cookie-cutter manufacturing and ETO, also known as project or custom manufacturing.

That said - there are more similarities between job shop manufacturing (another area I am very knowledgeable in) and ETO. I’ve worked with dozens of custom manufacturers over the years, and I’ve refined and designed software specifically for their needs for over 20 years.

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MY BLATANT PLUG

I am writing this book to help prospective customers of my own business, Sabre Limited. I want to get this out in the open. Over the years, I've honed the concepts in this book into a system that ensures our projects are successful, time and time again.

It's not perfect, but it is pretty darn good. About 95% of our customers remain active with us after their project, which is an outstanding retention in the Microsoft Dynamics space.

Microsoft Dynamics is a great product for customers because you have more flexibility and choices. You can choose to dump your partner at any time — Microsoft makes this very easy. Implementation partners must do an amazing job to keep you happy or they risk losing your business.

I designed Sabre ETO shortly after I started selling Dynamics 365 Business Central (previously called Dynamics NAV). I was frustrated with other ERP systems that failed to meet the project manufacturing needs of an Engineer to Order (ETO) business. Dynamics, however, was designed to be customized. Ironically, we've taken a customizable system and created a "cookie-cutter" solution **tailored for custom manufacturing.**

Given that Sabre ETO is a Microsoft-certified product available in Microsoft AppSource, some of our competitors have decided to sell it too. We are happy to work with anyone who wants to offer Sabre ETO to their customers. We think it's a great product and a great fit for many ETO businesses.

In this book, I will teach the methods that Sabre Limited follows to implement Sabre ETO and Business Central. These are methods that have resulted in many satisfied customers and successful partnerships.

By the end of this guide, you'll have a solid understanding of what it takes to achieve a successful Business Central implementation in your Engineer to Order business.

Implementation partners must do an amazing job to keep you happy or they risk losing your business.

THE BENEFITS OF SABRE ETO



SELECTING AND IMPLEMENTING AN ETO ERP

From this point forward in the book I'm going to focus on the steps you need to select and implement the ERP on your own.

In my opinion, there are 7 steps to complete this properly.

THE 7 STEPS

1 Choose the Product
2 Find the Leader
3 Choose a Project Coordinator (Not a Project Manager!)
4 Pick Your Team
5 Project Pitfalls
6 Test Your System Thoroughly
7 Listen to the Experts

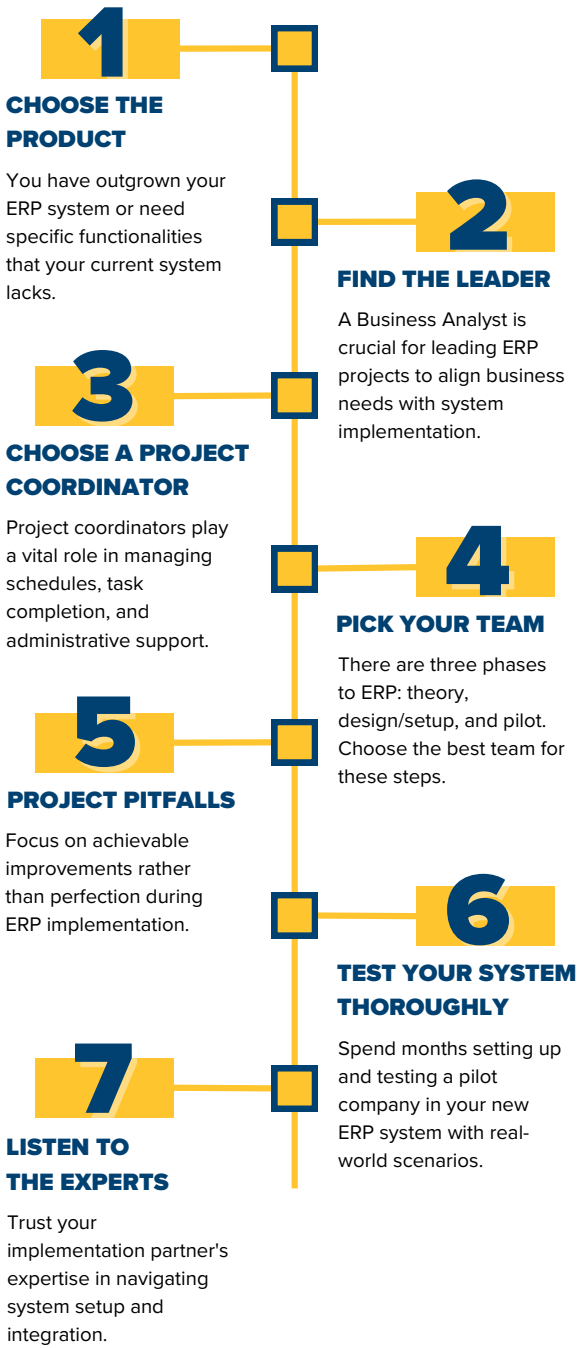
The first step can be overwhelming for most customers, but is actually easy. This is the only step that you do by yourself.

The other steps are executed by you and the ERP vendor. These are the steps that work the best, in my humble opinion.

It is not by any means perfect, and I've changed the approach a number of times over the years. That said, I've been changing it less and less as we've refined and improved our process.

The tips, tricks, and ideas I present here are meant to guide you on executing an ERP system successfully.

At least that's my 25 cents worth of advice.





STEP 1

CHOOSE THE PRODUCT

In this section, I'll walk you through a simple process to make a selection on your own.

WHY DO YOU NEED A NEW PRODUCT?

Choosing the right product starts with a bit of self-examination on why you want a new product. There are some common reasons:

1 YOUR CURRENT TECHNOLOGY IS OBSOLETE

This happens when your current ERP system can't be upgraded. The Windows 7 obsolescence caused this to happen in some companies. Close to home for me, the end of Microsoft® GP support is pushing a lot of businesses to look.

2 YOU HAVE OUTGROWN YOUR OLD SYSTEM

This happens when your business has outgrown more manual processes; has new customers with new needs; is selling new products; or you've just grown a lot. The inefficiency of the old system is pushing you to upgrade.

3 YOU NEED SOMETHING YOU CAN'T GET NOW

This is a bit like outgrowing your old system, only it's driven by a specific need. You might need a graphical scheduler; you may need purchase tracking and control; or lot/serial control for products you sell.

Sit down by yourself or with your team and write out why you are looking for a new ERP, and what the needs are. If you fall into type 1 above, think of new benefits to the company you wish you had.

> ***ASIDE:*** *You may be tempted to hire a selection consultant to help you do this step. Before you do, read the appendix on selection consultants. In general, I'm not impressed by the work they do and I don't think they lead to a better decision most of the time.*

Try and avoid thinking in terms of features. Features themselves don't do anything but satisfy a need.

Consider all the needs you have as a business, even ones your current software supports. Things like "I need the ability to track purchased product due dates" or "I need to confirm all long lead time items on a Bill of Material are purchased" are examples.

Avoid making lists of features based on what you *think* your current software should add.

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EXAMPLE: *Let's say your current system makes it very hard to purchase. You need to click 10 levels deep to get to a screen where you select a material needed on a job. Don't add "purchase without clicking 10 times" as a need.*

If you have done the exercise correctly, you should have a list of 10 to 20 different "needs" that you have identified. If you have more, you've missed the mark.

SCORE THIS NEEDS LIST

If you have more than 20, go back to the drawing board and make sure that you are not choosing "wish list items" or features. This should be a detailed list of the core needs. Leave the wants out for now.

Now you need to score those and categorize them by importance. Pretend you have $100,000 for a budget. Put how much of that $100k you would be willing to pay beside each need. If Estimating is the most important, maybe it gets $20k. If engineering/purchasing workflow is the next, maybe it gets $15k etc.

You may end up with just $1k or even $0 on some low priority needs. This helps you separate the low-priority items.

The reason you need to do this exercise is that as an ERP vendor, if you give me a list of 20 items, I can tell you that I can do them all. If you give me a list with priority, and say "If I had $100K, how many could I get?" it won't be the same list.

SEND THE LIST TO SOME VENDORS

Send your list to a small group of vendors. I recommend no more than six or seven. If you want to focus on Cloud ERP (I recommend that) then make sure they are NATIVE Cloud ERP systems.

Native Cloud ERP Systems:

- Are hosted in professional data centers managed by the vendor
- Have an app store like on your iPhone or Android
- Run on tablets, smart phones, and Mac or PC
- Are evergreen (upgraded regularly) even if customized

All vendors will sign confidentiality agreements – so make sure you ask for that.

Start by writing a brief intro about your business, how many staff you have, and what software you use today, etc.

It is very helpful to get an idea of your sales volume as well.

Send them the list of your needs, with their priority (leave out the $ value – maybe just classify them with a scale of 1 to 5). Add a spot to write comments on this needs list and ask the vendors to reply.

Interview the vendors you selected and ask them to talk about how they would handle the needs list you sent.

HOW TO PICK 3 TO WORK WITH

I believe this is the part where many businesses make mistakes.

Here's my recommendation:

1. Look for vendors that have experience with your type of business.
2. Look for products that are modern. That means that they fully support cloud in the future. If you don't have an IT background, **I recommend you get an IT professional to validate this part.**
3. Is it easily customized? This is quite important. You don't want to customize, but if you must, you don't want it to be prohibitive.
4. Look for billing that is modern. Monthly subscription software tends to be more modern than "buy it once."
5. Ask them for **a rough budget** (say you won't hold them to it or they might not want to share).
6. I recommend asking for a **fixed fee** or not to exceed.

Item 6 is very rare, and you might not find anyone. We are one of very few vendors who offer a fixed fee.

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FINAL THOUGHT: *Look for Google Reviews, blogs, YouTube or any other source to validate what the vendors say. If something seems too good to be true, the truth is probably on the internet.*

CLOSE THE DEAL

Now you'll have selected a short list of vendors to work with, ask them to do a demo for you. Offer to let them meet with the team before the demo for a couple of hours if they need.

If you have selected a vendor that knows your business, that is all they really need. Remember your business is not likely as complicated as you think.

> ***ASIDE:*** *You are probably not a multi-continent, multi-entity, vertically integrated business. You are likely a single (or few) facility business where multi-currency is the most complex part of the finances. ERP vendors have sold to literally hundreds or thousands of businesses like you.*

When you have held your "long-form" demo and interviewed the vendors, you'll establish a favourite pretty quickly. I recommend calling references at this point. If you have two vendors that you feel are tied, you should call references for both.

No vendor is going to give you a reference that is bad. However, there are two "tells" that a reference might not be the best.

1. **They are really new.** Someone who purchased the product in the last 3 months is not a good reference. They should be "Live" or very close.
2. **They are really old.** A reference that's 10+ years old is not running the current system (and maybe didn't work with the current staff).



CHECKLIST: CHOOSING THE PRODUCT

WHY DO YOU NEED A NEW PRODUCT?

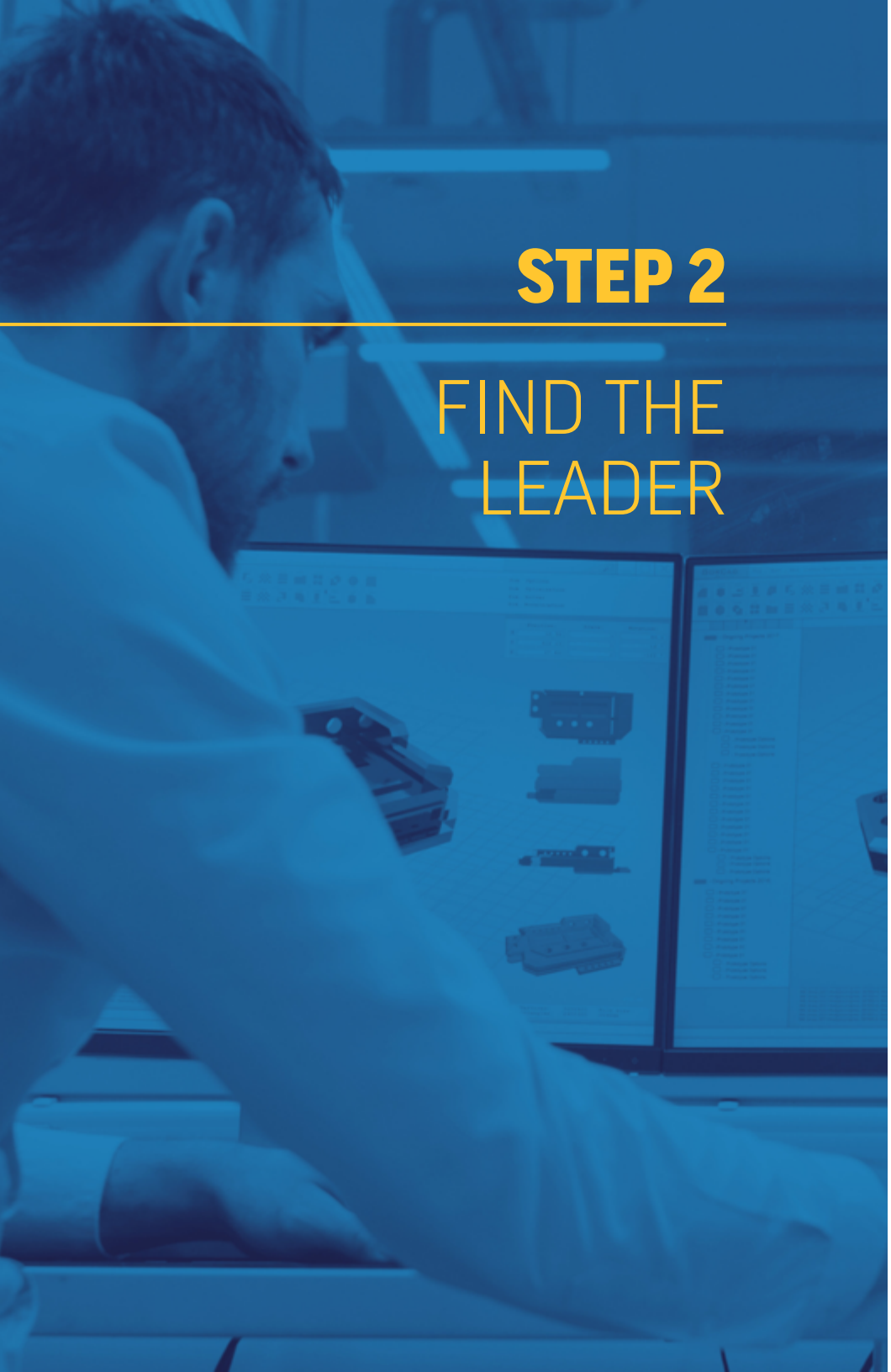
- Determine why you are looking for a new ERP
- Brainstorm the "Needs" you want to satisfy in the new system
- Write this list down and prioritize it
- Use the "assign a value" if that helps
- Write up a business introduction memo
- Add the prioritized list with a place for the vendor to make comments

HOW TO CHOOSE A VENDOR

- Send to 6-7 vendors
- Ask them to have a 45 minute introduction meeting with you
- Evaluate them based on my recommendations (page 17)
- Choose 3 you like and ask for a "bigger demo"
- Choose the one you think most closely aligns with your needs
- Ask for references

CLOSE THE DEAL

- Buy the ERP



STEP 2

FIND THE LEADER

If you follow our advice, then by this point you've decided on an ERP and purchased it. You are now getting ready to start implementing. This and the next steps are all about the best way to execute a project.

THE BUSINESS ANALYST IS YOUR LEADER

Now you need a leader for your project. This is not the project manager, although it can be.

What you need is a Business Analyst (BA).

The Business Analyst is the most important person on your ERP implementation team. They are the ones who will help you navigate the implementation process and ensure that your project stays on track.

They will work with you to understand your business needs and then develop a plan to implement the ERP system.

It's no secret that successful businesses are built on a foundation of strong goals and vision. Your chosen Business Analyst will work closely with management to understand the company's goals and objectives, and then develop a plan for how the ERP system can best be used to support those goals.

They also play a key role in testing and troubleshooting the system during implementation, and in helping to train users on how to use the new system effectively. In short, the Business Analyst is essential for ensuring that an implementation is successful.

For an ETO manufacturing company like yours, this person has three major characteristics that are important.

The three critical characteristics are:

1. They need to be someone that management and the team trust to make the right decisions and to have good judgement.
2. They need to fully understand your business (except financially) so that they can confidently answer any questions correctly and make informed decisions.
3. They need to be quick to learn software and technology. They don't need to be super stars, but they can't be afraid of software.

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ASIDE: *Don't worry about financial knowledge. The Controller or CFO will be the leader on the financial side. If you don't have a controller, it can be a good idea to hire a part-time CPA or vCFO (Virtual CFO) to help with that part – but you don't need a financial Business Analyst.*

A Business Analyst is someone who looks at a company and understands how all the pieces fit together. They need to have a good understanding of what the company does, how it makes money, and what its goals are.

Someone else in the company, for example a purchasing manager, only has a limited view of the company based on their job. They handle a specific part of the business (or task) and do not have the same overview as the Business Analyst.

This can make it difficult for them to see where improvements can be made or to understand how their part of the company fits into the bigger picture. As a result, Business Analysts are often people who worked in several areas of the business over a long period of time.

HOW TO CHOOSE YOUR BUSINESS ANALYST

Let me run down the typical mistakes people make trying to choose a Business Analyst.

Don't pick someone because they did an ERP project sometime in the past.

All ERP systems are not alike. Having done an old project in the pre-cloud days also might be not helpful. This is especially true if the person has experience with BIG ERP projects, in the multiples of millions. This person will bring BAD HABITS with them and probably make the project harder.

Don't hire someone from the outside who has experience with your new ERP.

A lot of people look for a specific ERP on a resume. If this was one of our projects and a customer wanted to hire, I'd rather have someone who worked for another small ETO. Experience at a similar size or type of company is much better than experience with the ERP at a very different company.

Don't hire someone from the outside that doesn't know much about your business.

The Business Analyst has to **really, really know YOU.** They must know your business better than almost anyone else you can pick. Someone from the outside cannot do this (unless they spend a year or so learning – which should involve a month in each department to learn the jobs of the staff).

Don't select someone that is not good with software.

Please don't pick someone who satisfies all the above requirements but is really weak with software! That will always backfire. The Business Analyst should be that weird person who loves learning new technology.

The Business Analyst needs to be someone that management and the team trusts to make the right decisions and to have good judgement.

WHAT THE BUSINESS ANALYST DOES

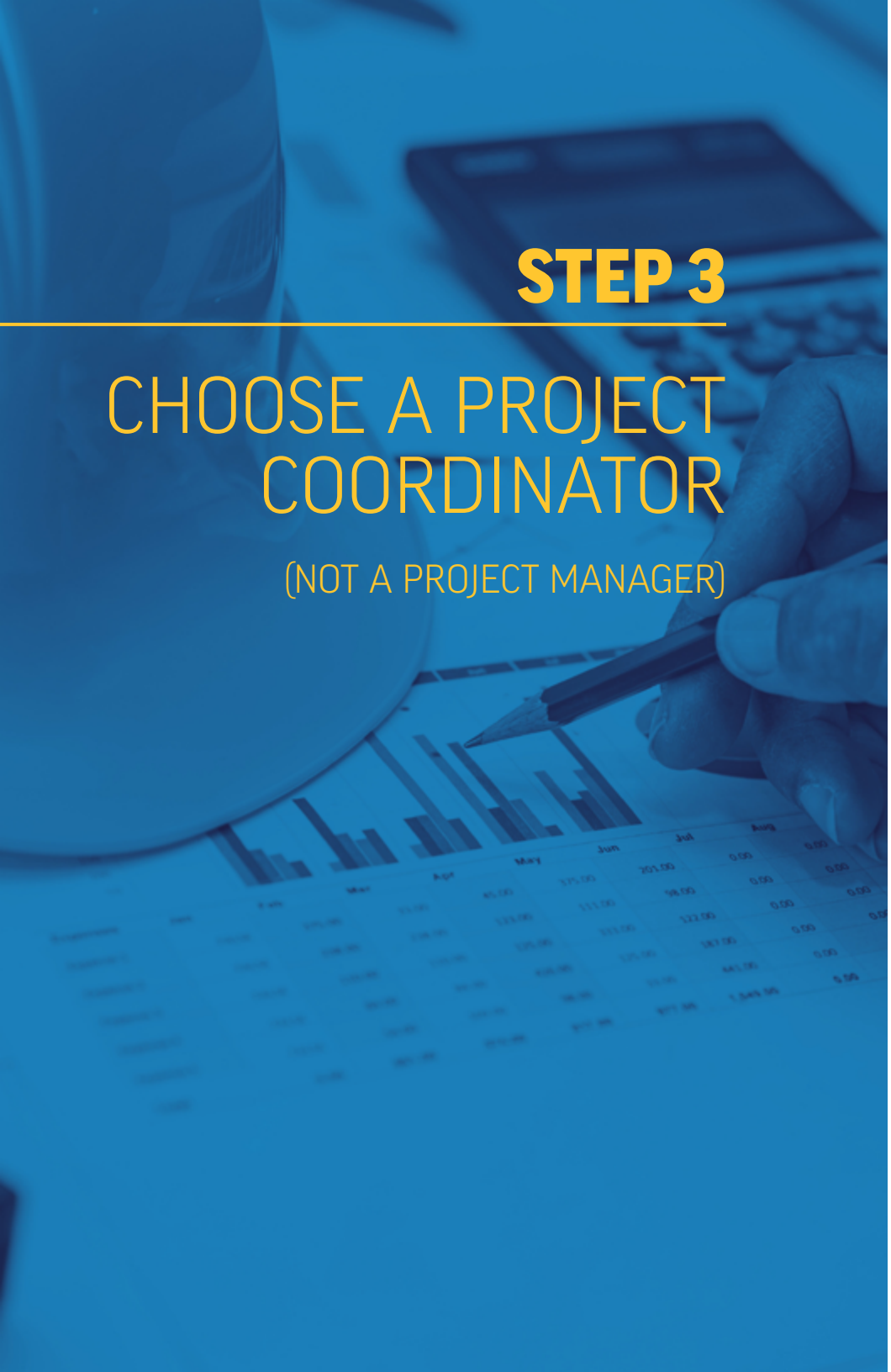
The Business Analyst is going to learn the ETO capabilities of the ERP. They don't need to learn accounting (as I mentioned previously) but they do need to understand how operational data flows to accounting. They are going to get their hands around the product and make decisions.

The decisions they make will impact your business.

These are business transformation decisions. These are the choices that will change your internal processes and fit them into the new ERP.

They will also be a tie breaker.

That means when you have people in your team that disagree, the Business Analyst needs to be the person who can make a final decision.



STEP 3

CHOOSE A PROJECT COORDINATOR

(NOT A PROJECT MANAGER)

By now you should have decided on an ERP and appointed a Business Analyst. **What you need next is a Project Coordinator.**

Most customers believe they need someone to guide the project and make crucial decisions. They often ask me about hiring an external Project Manager to handle this role.

Don't do it! For small and medium-sized businesses, hiring a Project Manager can be a terrible idea. Instead, **choose a Project Coordinator!**

WHY PROJECT MANAGERS ARE A BAD IDEA

In any enterprise-sized ERP project (say $2M or more), Project Managers are necessary. The ERP vendor often can't provide this resource because the business is too large.

In projects this large, the customer has a big IT department with multiple Business Analysts who work with the Project Manager.

The entire project is thousands of hours in duration, with dozens or scores of people working together. A central actor is required to manage custom programming, complex decisions and often design the implementation.

The trouble is that small and medium businesses are not at all the same. It is not apples to apples.

Once you have your own Project Manager controlling the project – then you need to be responsible for the entire project and its success or failure. The Project Manager drives the implementation and sets the plan and process in place. Most small businesses don't understand this.

A small or medium business should think twice before hiring an external Project Manager.

Your small business ERP vendor will have a Project Manager of their own. They will have a standard methodology they use. If you hire an external Project Manager (in my experience) they will replace the ERP vendor Project Manager, and use their own methods. This means you're taking full ownership of the project's outcome. However, **you will still pay for the ERP vendor's Project Manager** because they need them.

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For this reason, a small or medium-sized business should think twice before hiring an external Project Manager. If you want to hold the partner accountable, then the relationship needs to be directly between your ERP partner and the Business Analyst. The Business Analyst will be the one who makes all the real decisions.

An external Project Manager simply becomes **an unnecessary intermediary** between the implementation partner, who are the true experts in the ERP system, and **the Business Analyst** who knows best what the business's needs are.

In fact, it often becomes an excuse for your staff to ignore the project and let it fail. They can blame the Project Manager. Most Project Managers do not have the authority (in a small business) to discipline staff. Often the Business Analyst does.

> ***ASIDE:*** *Occasionally, I have customers tell me they want to have their own experienced external Project Manager run the project (hired for the purpose of the ERP project). When this happens, I have to decline to do a fixed fee because I can't guarantee outcomes controlled by someone else.*

To be honest, when you have hire your own Project Manager to work for you, it creates a lot of conflict with the Project Manager that your ERP partner has assigned to the project. When this happens things usually don't work out.

The ERP partner will almost always take "the customer is always right" stance and give them exactly what they want, even if it makes no sense. We ERP vendors know our products and the industry we sell into. What the customer's Project Manager wants is not always in the customer's best interest.

ONE EXCEPTION TO THIS RULE

There is one exception to this rule. It's when the Project Manager has the experience and knowledge to be a Business Analyst.

When the Project Manager comes from the same industry and has full and complete knowledge of the business, then it can work. The Project Manager in this case is actively participating in the project, not just supervising it. They see why things are done the way they are done.

This is more collaborative and therefore will succeed.

THE PROJECT COORDINATOR: A BETTER CHOICE!

At Sabre Limited, we love Project Coordinators. This role is quite important, but it is not at all the same as a Project Manager. A Project Coordinator is responsible for managing the schedule and ensuring that tasks are completed in a timely manner.

They work with the project team and Business Analyst to establish deadlines and milestones, and then follow up to ensure that these are met. They are the ones that get the right people in the room, to have the right meetings, and hopefully do their homework.

Think of a Project Coordinator as the Business Analyst's assistant. Sometimes they are there to keep the BA on track, sometimes they are there to do the grunt work the BA needs done.

In addition to coordinating the project team's work, they provide administrative support, such as preparing meeting materials and taking minutes.

A Project Coordinator is an essential member of any ERP implementation, and their skills are critical for ensuring the success of the project. They just need to be organized, disciplined, and (usually) a bit bossy. Think of them as the project's executive assistant. They are there to make sure people get stuff done. They are also paid an appropriate salary as an executive assistant.

In fact, the most successful projects we do is when the owner steps in to as the role of Business Analyst (almost 100% guaranteed success) and their executive assistant steps in as the Project Coordinator. This works out fantastically well.



STEP 4

PICK YOUR TEAM

With your Business Analyst and Project Coordinator in place, it's now time to assemble the team that will work on the project.

> ***TIME COMMITMENT:*** *Customers often want to know what the time commitment looks like. While it varies for every vendor, at Sabre, we estimate about 40 hours per week for the entire team. The Business Analyst typically spends about twice as much time working on the project as the other staff. So, if you have a team of five staff, the Business Analyst will spend around 12-14 hours a week, while the rest of the staff should spend 6-7 hours a week.*

In my experience, this is an area where customers make the most mistakes. I'm going to share a few of the most important things you need to understand and remember to maximize your chances of success.

PHASES OF AN ERP PROJECT

ERP projects involve three distinct phases before you start The Pilot (at least this is how we see them).

Theory and Discovery: This phase typically starts with a discovery and documentation process. Some partners do more of this, some less.

Eventually this leads into a lot of "theory" training. Someone needs to learn enough to make basic decisions (often about what **not to do**). The Business Analyst leads this part of the project with a small team, ideally four to five members.

As mentioned, this step involves a lot of theory and light introductory training. Nobody is walking out of the training able to "do their job."

Your ERP partner should teach you about the ERP system a lot more than you are teaching them about what your business does. If you feel the opposite is happening, **that is concerning.**

That said, some time spent in the discovery phase is necessary to identify differences and confirm assumptions.

Design and Setup: Once the theory has been taught, decisions need to be made. Again, the Business Analyst and their small team handle this part. The system gets set up, and gradually a larger group begins to run real-world examples through to see if they will work, and address any issues.

This phase includes more practical training, referred to at Sabre as

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"Adjustment & Advanced Training." It provides a sample system with sample data for training.

At this stage, we are still not training the general day-to-day users.

Piloting and Go Live: Piloting is the event (or series of events) that prepare your team for The Pilot.

Once the system seems to be working, you can begin executing end-to-end run-throughs. We call this piloting. It is probably the longest part of the project, as this is where your team is actually learning.

The biggest mistake people make is only utilizing 1 or 2 people while piloting. This slows things down.

Start with the small group and gradually add more people. The faster you add more staff to piloting, the shorter this phase will be.

Once you've finished piloting, it's then time to launch The Pilot.

KEY ACTIVITIES

The Pilot: Once your team feels the system is successfully configured, and you succeeded in running a full end-to-end testing, you can add daily users to be trained. This part is straightforward, focusing on teaching users how to perform their jobs in the new system.

Last-minute adjustments and corrections are made during this training and fixed before going live.

> ***ASIDE:*** *I have a theory about the "Discovery" process that I think is important to think about. Discovery is when you teach your partner about your business. I recommend that you avoid an ERP vendor that feels they need a LOT of time in this discovery phase. It should make you question, "Don't they already understand my business?"*

PICKING YOUR TEAM



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PICKING YOUR TEAM

While going through the first three phases you'll need to continue to add more people to your team. To explain this further, I've detailed how to do this for each phase.

THEORY: START OFF SMALL

Most businesses instinctively believe that adding more people to a project will speed up its completion. However, that approach doesn't work very well in the initial phase.

The theory phase is about understanding the new system. You can't rush understanding by putting more people on the project.

That's like having 10 people read the same book expecting them to learn it in 10% of the time.

It's best to pick a good representation of the job functions and **pick decision-makers from your team.** You can't delegate this to low-level staff. We've seen customers attempt to involve junior staff during this stage, and the decisions that get made are terrible.

The most successful teams (for businesses with 40 employees or less) typically have around 4-6 people.

DESIGN & SETUP: BRING IN MORE PEOPLE

Once the theory phase is complete, it's time to design and set up the system.

This doesn't take a long time, but it requires a lot of decision-making. We've seen this phase delayed by overanalyzing, so it's important to remember that **decisions made here are not permanent.** We are going to test and change these decisions if we got any of them wrong.

The goal is to set up enough of the system to get into the Test and Debug phase.

Once the basic decisions and setup are done, we should have a system that is theoretically sound. Now, we need to confirm that it will work in the real world.

By this point, your original small group of 4 to 6 people may be too small to effectively test their own work. It's now time to **expand the team,** bringing in another layer of staff for additional training, testing, and debugging.

WHO DO YOU ADD?

Add the original group's most trusted co-workers. So, if you have a purchasing manager on the original team, you bring the most senior buyer in. If you have the controller, you bring in their backup.

At this point more people are working, so realistically, each team member can spend less time working.

THE PILOT: GETTING READY FOR GO-LIVE

After thoroughly testing the ERP system with a variety of real-world scenarios, you may decide that it's ready for implementation. At some point, you'll conduct a Full Pilot Test, which may involve running the system in parallel with your current process.

To do this, you'll select an old project or a group of projects and run them through the ERP system from start to finish. This will help you evaluate the system's performance and identify any remaining issues before fully integrating it into your workflow.

If the team signs off that the system is fully functional, then you can pick a go-live date and start training the rest of your staff.

The people who have never seen the system will be shown their specific tasks, done their specific way.

We do not want to train anyone in areas they do not need.

This approach makes the final bit of training very easy. Each additional employee might get a TOTAL of 4 hours of training. **They don't need to spend weeks or months on the project.**

ETO ERP PROJECT TIMELINE WITH SABRE LIMITED

STEP 1

PURCHASE

Investigate, research, demo and eventually select a Print MIS (hopefully from Sabre :-).

STEP 2

DISCOVERY

At Sabre we spend several weeks meeting your team and learning about your business.

STEP 3

THEORY

A small group of your best staff learn the "Theory" of the ERP at a 40,000 foot view.

STEP 4

DATA LOAD

Together we will load sample data into the new MIS based on your learned THEORY.

STEP 5

ADJUST

We will work together to adjust the data you're loading and create a "Pilot" Company.

STEP 6

TRAINING

With a workable Pilot Company we train you to use the system with "real world" data.

STEP 7

*PILOTING

Training morphs into more team members testing increasingly complex scenarios with our support.

STEP 8

THE PILOT

Finally you run a full end to end test of the system with your team.

STEP 9

USER ACCEPTANCE

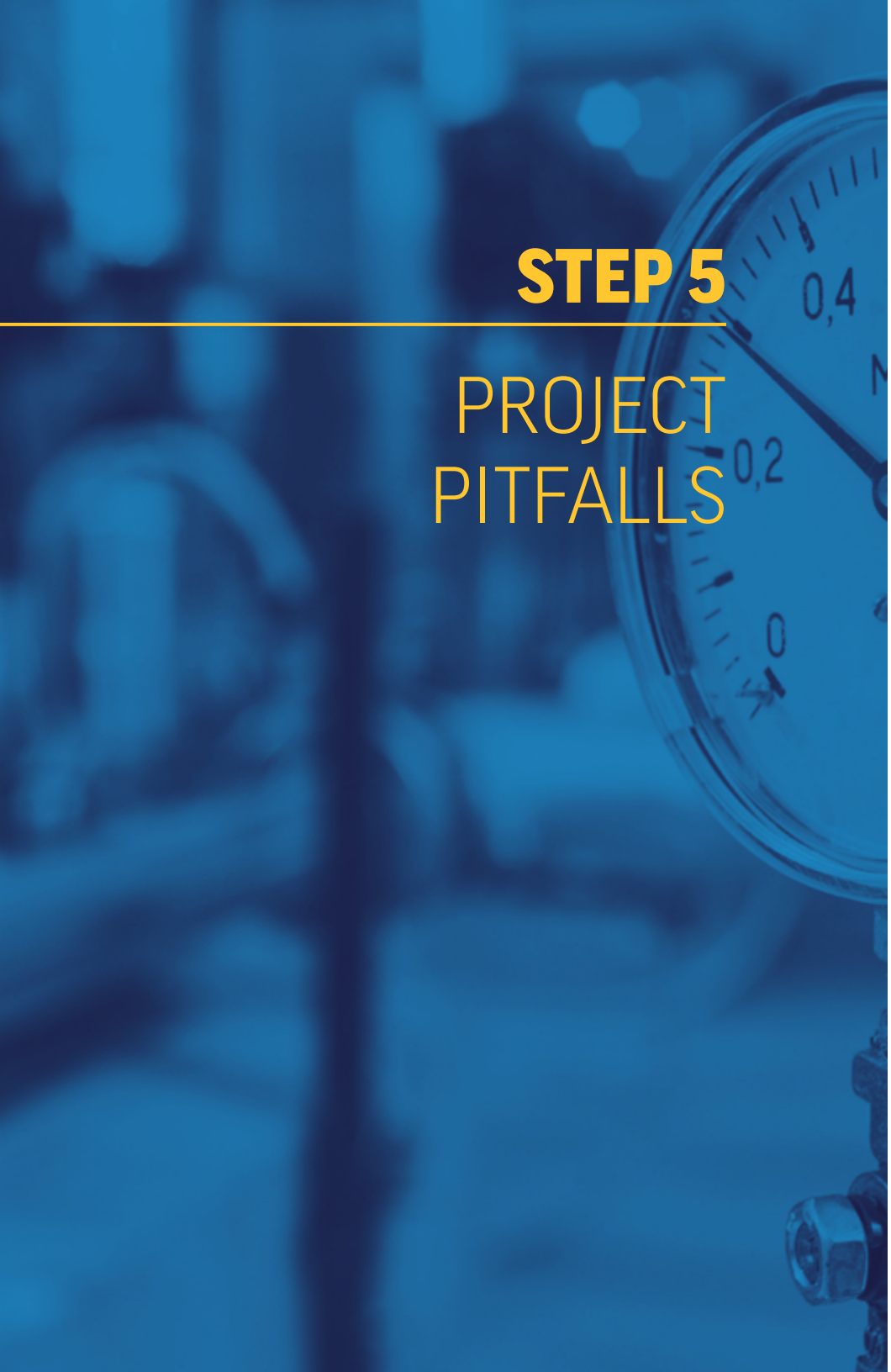
Together we "test" your team and confirm they are ready to go live.

STEP 10

GO LIVE

Pick a go-live date and start using your new Print MIS.

* Piloting is the process of preparation that happens before The Pilot.



STEP 5

PROJECT PITFALLS

These are some of my general thoughts of things you need to avoid during the project. Most of them are entirely generic and apply to any project with an ERP system.

DON'T LET THE PERFECT BE THE ENEMY OF THE GOOD

> ***REMEMBER:*** *You probably have a bad system with manual processes and many problems. Anything is better than what you currently have.*

As the business owner, you know that your team shouldn't bite off more than they can chew. You want a perfect system with everything automated, but the reality is, if your staff could do that – **it would have already happened.**

Set your sights at something achievable that is **better than what you started with** and that you can **grow with and keep improving.**

Accept that you won't ever have a system that is perfect. You should have a continuous process improvement mindset, always making small but meaningful improvements. Pick an easily achievable starting point so the team can see a win and is encouraged to keep going!

THERE WILL BE WINNERS AND LOSERS IN THE NEW SYSTEM. BE OK WITH THAT.

By this, I mean there are people who have it easy today. They don't really use their computers for anything that affects other users. In fact, that is a big part of the problem. Someone else "downstream" from them must double check their work and re-enter data.

Those people will now have to use their computer a lot more.

They do this for the common good. They have been letting other staff suffer so they have less work. Often, they'll argue that the new system is "a lot harder to use" and want to "automate" the new system so they have less to do.

They will complain – a lot.

1 Choose the Product
2 Find the Leader
3 Choose a Project Coordinator
4 Pick Your Team
5 Project Pitfalls
6 Test Your System Thoroughly
7 Listen to the Experts

WATCH OUT FOR THE SQUEAKY WHEEL

Back to the last pitfall – watch out for staff who are very loud and aggressive. They will almost always smother out the rest of the people.

The silent majority is probably fine with what's happening. The squeaky wheel can drown them out. Don't let these people be part of the project if you can avoid it.

DON'T TAKE YOUR FOOT OFF THE GAS

During the first half of the project, the ERP vendor is leading you and helping set up the test system. That is on us (the ERP vendor) more than it is on you.

At some point we need to remove the training wheels. You'll have to start learning the new system by exploring it more and using it on your own.

Once we are no longer pushing, we see a lot of customers who don't know what to do next.

I call this the "blank page" syndrome. If you've ever seen a teenager with an essay to write who just stares at the blank page not knowing what to do, you have seen this syndrome.

A lot of your staff may feel this.

This is where the Business Analyst or the Project Coordinator comes in. They need to motivate these people and get them working on things.

WEAK PROJECT COORDINATOR/BUSINESS ANALYST

Having a weak Project Coordinator or Business Analyst is hard to help with and is the one time an ERP vendor might tell you to bring someone in from the outside.

If your Project Coordinator AND Business Analyst are both below average, you will have a lot of trouble during the second half of the project.

The foot may come all the way off the gas.

This also happens if the team is weak. Even if the one Business Analyst is strong, it is a LOT of work to do all alone.

Finding someone who can push the team to do the testing and run the scenarios is necessary at this point. An outsider who can work with the ERP vendor can help with that. **Just avoid the person who wants to start over from scratch.**

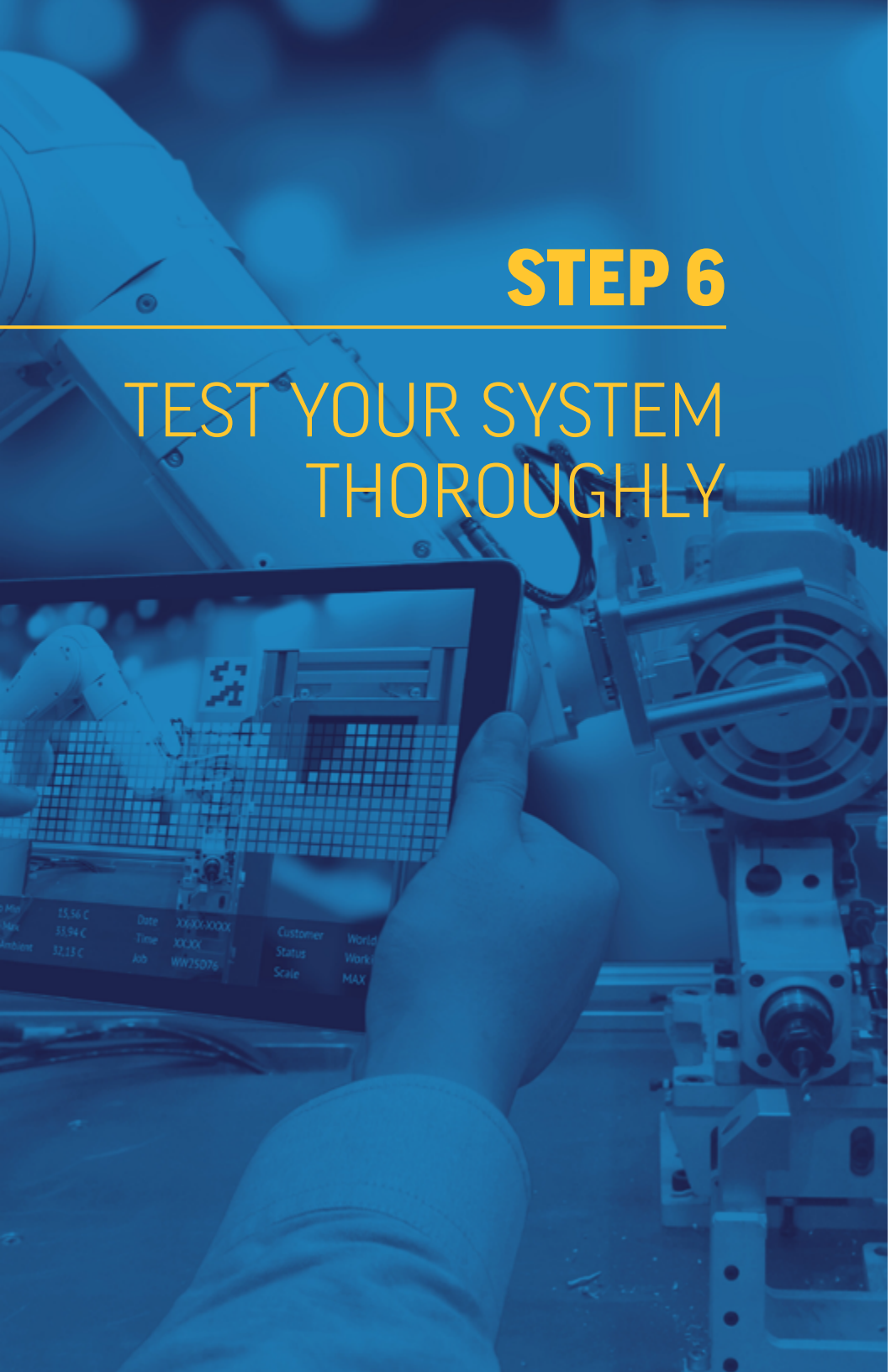
IF YOUR TEAM IS CHECKED OUT, WATCH OUT

Customers who leave the project to one or two people because the rest of their team is checked out will really struggle after they go live.

First, don't let this happen. Encourage your team to get involved and do not take "No" for an answer.

If you can't get them to buy in (for whatever reason) then there are a few things to keep in mind to mitigate things.

- **Do everything you can to keep things simple.** Anything that complicates the system is just going to make it more difficult.
- **Be prepared for things that were missed and processes that don't work.** Your team might not agree with all of these changes and may throw blame at the ERP vendor.
- **Force the team to try the new system before you go live.** Watch them. Once they realize it doesn't quite work, hopefully they'll be more interested helping with the project.



STEP 6

TEST YOUR SYSTEM THOROUGHLY

I want to really dig into one critical step of the project that a lot of people make shortcuts around.

PILOTING

If you decide to implement the way that I've described previously, the first sixteen weeks of your time is spent learning the system in theory classes, focusing on how to set up a system. You would then work with the trainers to configure the system with sample data.

By the end of four months, you should have something we call a Pilot Company. The Pilot is an ERP system setup with a good approximation of your “final” go live setup.

Once you have the Pilot Company, you need to do Piloting! Piloting is the process of testing a lot of different scenarios in the new system. Normally, you divide and conquer. Different teams work in their departments to test their own scenarios.

Here is where you need to invest most of the additional hours of the project. You need to test everything you can think of in that system.

This is the critical point of success or failure.

Customers who really take this seriously do the best, by far.

We believe the best approach is to grab several real-world examples. Go to the order desk, pick random projects, and start there. Be careful that you don’t pick all the same types of projects, if you have a variety.

Some customers have projects with a heavy field service component while others don’t need any. Some sell projects that take years to finish while others only require months. Pick examples of these different job types.

With good representations of your projects and orders in hand, you can start testing every aspect of the system.

DO NOT STOP WHEN SOMETHING DOESN'T WORK

Too many customers will stop testing the entire process when the first thing goes wrong. Avoid doing this at all costs.

The Project Coordinator and Business Analyst need to supervise this process and make sure it proceeds.

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I personally believe people stop testing because they don't look at testing as a checklist that can be done out of order. They treat it as if they must run the test in the order the real-world task would be done.

If something doesn't work then fix it by hand and keep testing. Obviously report that as a problem, but proceed to test releasing long lead time items, or placing purchase orders with contract manufacturers, etc.

Someone else will work on the other problem while you do that.

HERE'S ANOTHER EXAMPLE:

Let's say (hypothetically) something is wrong with the CAD import module for Solid Works. You're able to import top-level assembly items but it gives errors creating lower level BOM structures.

Just skip the lower-level stuff for now.

Manually create a sub-assembly BOM or manually fill in some other piece of information you need. You can test the process of dispositioning the materials you were able to load from Solid Works.

After all – this isn't real life. You won't make anything real anyway. Who cares if the CAD Import module didn't exactly work as expected?

TEST ALL YOUR SCENARIOS

You might sometimes purchase from a contract manufacturer or other times fabricate something in house. Maybe you hire a contractor to install some systems, and send your own team to do others. Occasionally, you place a PO for a long lead time item before you even have the order from the customer.

If you run a complicated business, then you have more scenarios to test. And if you have more scenarios to test, people will miss a lot of them unless they are careful.

When you ask some people to think about and record all these variations, they can't. It's like asking people what they had for dinner every day last week.

If you let them look in the fridge at the leftovers, or at the boxes in their recycling, they'll suddenly start to remember. **The same thing goes for your staff.**

Too often, they try to answer the consultant's questions about the variations of activities without looking and double-checking. They get the answer out quickly, rhyming off the things they remember off the top of their head.

Then they start to run real projects through the system as samples.

And they missed all kinds of combinations.

They will then accuse the consultant of not showing them how to do these things. We have thick skin. We can handle it.





STEP 7

LISTEN TO THE EXPERTS

THAT'S US

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One of the biggest mistakes customers make is second-guessing their consultants.

Keep in mind that this software works as an interconnected web of data.

> ***ASIDE:*** *I remember one time I was explaining to a customer how he needed to create his work orders for production. He looked at me and was very frustrated. He said "why are you coming in here and telling me how to make parts in my own company?!" To which I replied, "I'm not telling you how to make parts, I'm telling you how to use the software you paid for."*

The way you make things should not change with the implementation of an ERP (unless you want it to).

WE ARE EXPERTS IN HOW THESE PIECES ALL CONNECT

Many customers look at one part and start telling their implementation partner how the system "should work." This is often because they can't see the big picture yet.

This is why a Business Analyst is so important. The Business Analyst knows the business well enough and is good enough with software that as they pull back the curtain, they understand it.

When you second guess whether your implementation partner knows how the system works or how to run it properly, you might start running into issues.

We will miss important things because we need to pick our battles.

So, when these customers go live and start to use the system, they'll begin to find problem areas. Inevitably, these are areas where they disagreed with us.

WE DO THIS ALL THE TIME

We only do manufacturing. It's unlikely you will surprise us.

Sometimes things will seem illogical, but you need to **trust your ERP implementation partner.** There is a logical way to deploy your system — sometimes business owners don't understand WHY it is the logical way until they actually start using it.

APPENDIX I:
HIRING AN ERP SELECTION CONSULTANT

The selection of an enterprise resource planning (ERP) system can be a daunting task for any small manufacturing company. You might be tempted to hire someone to help you with this selection.

The hard truth is that **ERP selection consultants are not much help.**

HOW DO I KNOW THIS?

My background is in science. In science, we can't always measure something directly; instead we look for symptoms or side effects.

If my theory is that ERP selection consultants are not much help, what's the symptom that proves I'm right?

They almost never offer any advice.

I don't know if this is true with large companies, but I can say from a lot of experience that ERP selection consultants don't seem to help small businesses. They are hired for their experience, but they NEVER seem to share any advice about which products are good for small businesses.

If you have hired one of these consultants to find the best ERP program for your business, they would first talk to your team, learn about your company, and interview staff hiding behind mountains of spreadsheets. After that, they come back with a list of 100's of features that the new ERP program should have, included in their request for proposal (RFP).

They interview you and help you select the features you might need. They (usually) don't come with a list pre-done. Most of them don't say, "these are very expensive features and drive up the price, while these are more common for a business your size."

They go out to the market and identify vendors to send this list to. They'll pick 5, 10, or even more. They send this list to that group of system vendors, which might include me. All these features are left blank, waiting for feedback.

WHY IS THIS A PROBLEM?

Every time I get a spreadsheet like this, I roll my eyes. Don't they already KNOW what every ERP can and can't do? Don't they do this as a full-time job? Don't they have a database of these feature lists that have been repeatedly filled in by me (and all the other victims of the scam)?

> ***ASIDE:*** *I did encounter one of these guys who DOES keep a database and DOES use it with his customers. But most do not.*

I guarantee you from many years of experience, ERP systems never lose features; they only gain new ones.

> ***ASIDE:*** *It is an entirely pointless exercise to make me (or any of my competitors) fill in these feature lists. I refuse all such RFP requests today. It consumes way too much time. I've even had the same ERP consultant send me the SAME list for two customers and insist I fill both in because "something might be different."*

Why can't they just bring out their database of features and tell the customer (you) which fits best?

I've come to three possible conclusions:

1. They know exactly which ERP works well for your business, but **they can't bill for as many hours** by simply giving you the answer.
2. They never follow up with customers to see which ERP worked well or not, so they have no idea which is better. **They don't care if the ERP works or not.**
3. They don't want to put their neck on the block and give advice. As long as you make the decision without their input, **you can't hold them accountable.**

Going forward, ask your consultants how they personally rank the success of the ERP partners and implementations **after the customer selects one.** What are their recommendations regarding which products have the best outcomes?

Talk to some of their past customers who selected the final two ERP systems you are considering. They'll probably make some noise about confidential information, but remember: they are being hired to reduce your risk of making a bad ERP decision.

Why not interview the last two or three clients who purchased an ERP based on their recommendation to see if the experience was low risk?

WHY WOULD A SELECTION CONSULTANT DO THIS?

ERP selection consultants are reluctant to tell you which software has been most successful for their past customers.

The reason, they say, is client confidentiality. However, I think the real reason is that they're either afraid of being blamed if they recommend something that isn't good, or they have to justify the hours they bill for the project.

Gaining an accurate understanding of how other companies have implemented similar solutions is crucial. This will give you a realistic idea of what to expect and help you avoid potential pitfalls.

All of this is not to say there are no good ERP selection consultants out there. The good ones will have no problem sharing their experience with you and helping recommend the right software for your business. Furthermore, the good ones will already have a good summary of what each product does, and which works best for your company.

The experience of the ERP consultant counts for nothing if they won't share it with you.

It is important to get a clear picture of how the implementation went for other companies. If you think about it, this should be the value they bring. They recommend ERP systems to other businesses. They should be following up, recording that information, and sharing it with each new customer.

If a consultant tries to keep everything under wraps, be wary. You don't want to end up with a system that's a lemon.

When it comes to choosing an ERP, don't be afraid to ask to talk to previous clients. If a consultant won't give you straight answers, find someone who will – or better yet, do it on your own.



APPENDIX II

WHAT IS ERP?

ERP stands for enterprise resource planning. It is a software system that helps organizations manage their business processes, such as inventory and order management, accounting, human resources, customer relationship management, and supply chain operations.

ERP systems integrate these various functions into a single, centralized platform, providing a comprehensive view of an organization's operations and facilitating better decision-making. ERP software is often used by large and complex companies, but it can also be scaled down for smaller businesses.

WHAT THE HECK IS ETO?

I mention ETO constantly in this book.

ETO is short for Engineer to Order.

I have also heard it described as Custom Manufacturing, Project Manufacturing, and sometimes Job Shop — although that is wrong.

ETO is a type of manufacturing that has a few specific features that define it as such.

- It is very low volume. Usually, a quantity of 1 at a time.
- It is highly variable. Usually zero or almost zero repeat orders.
- Most ETO projects take months to complete – often years.
- Most ETO projects involve ordering long lead time parts before the design of the product is completed.
- Most ETO projects have a high percentage of the labor cost from engineering and designers and a lower percentage from “shop staff.”

WHAT IS MICROSOFT® DYNAMICS?

Microsoft® Dynamics 365 is a modern cloud-based family of ERP and CRM systems from Microsoft. It has been designed to be a platform as much as an ERP. It has great accounting, inventory control, generic manufacturing, fulfillment, warehousing, shipping, invoicing, etc.

Microsoft® put a huge effort into making it easy to create add-ons for Dynamics 365. “Out-of-the-box” it has ok support for project manufacturing, but it’s not spectacular.

Sabre has taken our 30 years of Engineer to Order experience and written our own add-on functionality. This is Sabre ETO – our solution for ETO manufacturing companies.

WHAT IS SABRE ETO?

This is another shameless plug. Sabre ETO is the add-on solution for custom project manufacturers and engineer to order manufacturers that contains all of the features that are missing in the out-of-the-box solution of Microsoft® Dynamics 365 Business Central.

Some of the advanced features include CAD imports into Business Central, one click purchase orders, and better communication for purchasing between the engineer and buyer.

Sabre ETO integrates seamlessly into Business Central to create the one-stop-shop for all of your custom manufacturing processes.

Get a Free 30 Day Trial of Sabre ETO on Microsoft® AppSource today.

ETO VS MAKE TO ORDER

I have a longer form of this online but I want to have a word about it here.

An ETO is technically a Make to Order (MTO) manufacturer, but most MTO are not ETO.

An ERP needs to support project manufacturing for an ETO to use. If you are looking at an ERP system that is designed for Make to Order – be careful. That is not what you do. Make to Order is more of a job shop model, where the product is not designed after the order is placed.

True ETO businesses start without a design and build out and adjust the product over the course of the project. They get change orders, release BOM in phases, have long lead time parts, and track engineering time as part of the direct labor towards a job.

You should look for an ERP system but especially a product integrator/ vendor who can articulate this.

CONFIGURATORS AND CTO

The Engineer to Order manufacturer is also not a Configure to Order (CTO) manufacturer. Configurator products are attractive because they promise the ability to generate estimates for your projects. CTO only works if you could take your product and create a catalog.

Imagine sitting down and designing a catalog of everything you sell with options and prices. You give the catalog to a customer, and they use it to choose a product. All the options and prices are in that catalog and the customer can follow along and produce their own quote. **That's when you would use a configurator.**

If your customer needs an engineering degree and open text books to understand the catalog – you are not a CTO.

APPENDIX III:

FREQUENTLY ASKED QUESTIONS

WHAT SHOULD ETO MANUFACTURERS LOOK FOR WHEN SELECTING AN ERP?

As an ETO manufacturer, you should look for ERP systems that offer strong project management features, flexibility to handle custom orders, robust integration with engineering tools, and the ability to manage long lead times and complex BOMs.

HOW LONG DOES IT TYPICALLY TAKE TO IMPLEMENT AN ERP SYSTEM FOR AN ETO?

Business Central Engineer to Order implementation projects are made up of three phases – Implementation, Go-Live, and Transition. At Sabre Limited, implementation varies depending on the tier of your project. Bronze tends to be 5 months, Silver is 7 months and Gold is 9 months in length. Go-Live takes an additional month and transition takes two months.

HOW CAN MANUFACTURERS ENSURE USER ADOPTION OF A NEW ERP SYSTEM?

User adoption requires effective change management strategies, comprehensive training programs, and involving key users early in the implementation process. Providing ongoing support, addressing user concerns, and demonstrating the benefits of the new system can also help encourage adoption.

WHAT ARE KEY SUCCESS FACTORS FOR AN IMPLEMENTATION?

Key success factors include strong leadership and project management, clear and realistic goals, effective communication, thorough training and support, and involving key stakeholders throughout the process. And of course, choosing the right ERP system and implementation partner can significantly help the success of your project.



CONNECT WITH ROBERT JOLLIFFE

Sabre Limited is a leading Business Central partner in the United States and Canada. Reach out to us today with your questions or to request a consulting session to discuss your needs.

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