



Turn your
Supply Chain
into a Competitive
Advantage with AI

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Optilon

Turn your Supply Chain into a Competitive Advantage with AI

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Executive Summary

It may be difficult to imagine a world in which Artificial Intelligence (AI) creates production drawings, controls robotics to perform industrial operations or improves supply Chain performance. However, it was once unfathomable that a computer could beat a human at chess or drive a car autonomously.

At Otilon we believe that the next generation of competitive advantages in the Supply Chain will come from Artificial Intelligence (AI). We believe that it is necessary to have a platform that automates and empowers organizations to embrace the AI journey on their own. Otilon's AI-driven solutions are designed to solve existing Supply Chain challenges without the need for deep experience or knowledge of AI.

Artificial Intelligence (AI) is still the "stuff of the future" for some organizations. Some of the world's most significant leaders and thinkers are even suggesting that artificial intelligence is history's biggest paradigm shift. Yet, we are still only at the beginning of the AI (r)evolution.

Specifically, AI is interesting for Nordic companies due to our high cost levels. Our geographical position is also a challenge in the global market. Nordic companies are at a critical juncture in the uptake of AI. Some are experimenting, but few are scaling up.

According to a recent survey by McKinsey, only six percent of production companies in the small and medium-sized segments are working with AI. It is easy to optimize administrative processes, but it is far more time consuming to implement it in the operational processes. As we see it, the explanation is mainly a conceptual confusion and perhaps a little too far-fetched a picture of what the technology really can do. Still, all is not lost. Nordic companies are in a great position to generate momentum. The necessary digital competencies, technical knowledge, and workplace cultures are in place.

With this whitepaper, we want to inspire you to take your first steps on the AI journey. We hope you can utilize the possibilities AI Supply Chain technology provides to create competitive advantages for your business.

“Artificial Intelligence (AI) is still the “stuff of the future” for some organizations.”

6%

OF SMALL COMPANIES USE AI

Only 6% small and medium sized production companies are working with AI

90%

INCREASED AI INVESTMENTS

90% Expect to invest more in Ai in 3-5 tears

51%

LACK RELEVANT TALENT

- 51% lack talent with appropriate skillsets, while around a quarter lack the technological infrastructure to support AI, or and Ai Strategy.

37%

NEED AN AI STRATEGY

According to a recent Gartner survey, 37% of organisations are still looking to define their Ai strategies, while 35% are still struggling to identify suitable use cases.

78%

OF COMPANIES ARE PILOTING AI

According to a recent Gartner survey, 37% of organisations are still looking to define their Ai strategies, while 35% are still struggling to identify suitable use cases.

The traditional model of the Supply Chain is changing

The traditional model of the Supply Chain is fundamentally changing. We are shifting towards consumer-led, data-driven, highly complex supply networks. The consumer increasingly drives innovation from the heart of the supply network, rather than being on the receiving end of the supply chain. Companies have to act in a more globalized world and balance the global with the local. Companies have to be agile and willing to change by involving the whole organization. Companies have to put up a sustainable agenda internally as well as externally. They have to build a flexible and resilient culture that makes the organization robust toward disruptions. They have to provide visibility and transparency. Surrounded by an explosion of data, many Supply Chains are also struggling to leverage or take advantage of their data.



These shifts demand mass product customization, more accurate Supply Chain planning and synchronization, and faster multichannel responsiveness that go far beyond the abilities of the typical workforce and infrastructure. It requires instant visibility, quick decision making, and increased flexibility across the whole network.

5-20%

IMPROVEMENT WITHIN 24 MONTHS

Focusing on the Supply Chain can improve the bottom line by 5-20% within 24 months.

AI helps drive more value from data

The Supply Chain Management discipline is a major force for creating competitive advantages for a company. According to new literature focusing on the Supply Chain can improve the bottom line by 5-20% within 24 months.

As digital transformation continues to accelerate and the data that organizations collect and their data sources grow, business executives face the tantalizing prospect of deriving even more value from the increasing data volumes generated and stored. And that's why advanced analytics and AI are strategic investments. Everyone knows that data is gold. It takes a new mindset to see the possibilities.

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As described earlier, companies are facing many new challenges, which are forcing Supply Chain leaders to rethink their Supply Chain. With the right predictive data AI can support the company in getting a more agile approach to sales patterns, deliver a more efficient service across the Supply Chain, and lower the risk of inventory-related events. By adopting advanced analytics in the supply chain, businesses can run more efficiently, mitigate risk, and ultimately offer a better customer experience. With the right data, the right skills, and the right systems, AI could potentially solve complex Supply Chain problems.

Summing up we could say that:

- AI could reduce the time spent on manual labor, freeing employees to make more valuable contributions to your business.
- AI could allow you to make better, more informed decisions based on prior historical data.
- AI could provide critical alerts and recommendations for when things go wrong.
- AI could help you monitor suppliers in other regions of the world to proactively prevent problems.
- AI could simplify supply chain relationship management.
- AI could help you optimize your supply chain processes to increase customer satisfaction and generate more profit for your business.

A basic understanding of AI

Later we will provide you with a case study showing how we deployed AI technology in the Supply Chain. Before we do that, we want to ensure that you have a basic understanding of AI.

In its simplest form, artificial intelligence is when a computer or computer-controlled device runs functions and performs tasks that would normally need human assistance. Depending on its use, this may require a computer to understand speech, have visual perception, or be able to make decisions that are independent of human intelligence (aka manual intervention).

Many AI machines can also learn on their own and make decisions based on past events. Or, they can interpret massive amounts of data from a company's Supply Chain history to predict future outcomes with incredible accuracy.

Terminologies used within AI:

- Artificial Intelligence: A program that can sense, reason, act and adapt
- Machine learning: Algorithms whose performance improve as they are exposed to more data over time
- Deep learning: Subset of machine learning in which multilayered neural networks learn from vast amounts of data

These three trends have put AI within everyone's reach.

- Costs for data storage and processing has gone down
- Data availability has increased, not only inside the company but also outside
- Advanced mathematics has enabled complex data modelling

Though the concept of AI is half a century old, interest in the technology has snowballed over the past decade. This has been driven particularly by increased data availability, a lower cost of data processing, and new advanced mathematics, allowing for a significantly lower cost of predictions and analytical capacity.

We are seeing particularly fast growth in three areas of AI:

- Text and numbers: Today, a wealth of information can be found in text and number formats
- Speech: AI can also be used for speech recognition, which translates spoken words into text
- Images: One of the most common uses of AI is image recognition. AI can be used to categorize, edit, and parse this image data





51%
LACK RELEVANT TALENT

51% lack talent with appropriate skillsets, while around 25% lack the technological infrastructure to support AI, or an AI Strategy.

Challenges you need to know about

AI projects differ, and AI projects can seem costly without any immediate gains. This is particularly true if the hypotheses they're based on are somewhat loose. It can then be a challenge for organizations to set aside budget or resources. AI projects require different technology and problem-solving skills.

Talent acquisition is likely to be one of the most significant barriers to AI adoption. For most companies working with AI requires a profound change in behaviors and ways of thinking. AI depends on data and the interactions of algorithms. So, when it comes to AI business cases and plans, success is mainly dependent on a robust data and analytics infrastructure. Organizations looking to move forward with AI technology must constantly be learning and iterating on algorithms and on how to select, prepare, and apply data. AI is the representation of a decision model, rather than a process event. The same characteristics that make AI a good solution for dealing with data are also the attributes that make it difficult to support with a business case. Traditional analytical models use fixed rules to arrive at a conclusion. However, AI analytics use dynamic data and heuristic solutions to arrive at conclusions that might elude traditional methods. This makes them valuable but difficult to predict.

At the same time, it is also necessary to look at the maturity of your company. Do you have the capabilities needed to embark on the AI journey? According to a recent McKinsey study on the Nordic C-suite agenda, top barriers for AI adoption are lack of talent, a clear AI strategy, and technological infrastructure.



Explaining AI using examples

Function machine

Perhaps you remember back when you were in school there was something called a “function machine”. This was a machine that you fed with data at one end, and at the other end, it spits some figures out. Let’s call the figures which we add ‘x’ while calling the numbers that come out ‘y’. For example, a typical “function machine” was fed with the numbers 2, 3, and 4 (the x values). Out of that came the numbers 5, 7, and 9 (the y values).

The task was then to figure out how the 2, 3, and 4 were turned into 5, 7, and 9. In the example, the answer could be that the number doubles and adds one on. Or explained as a formula: $y = 2x + 1$.

A neural network, which is one of the most common forms of artificial intelligence, is like a functioning machine. It takes one number row and transforms it into another number row. It’s that simple.

The Real Estate Agent

Imagine a real estate agent who sells apartments. Every time a new seller signs up, the first task is to suggest how much their apartment can be sold for. The real estate agent is busy, and it is time-consuming to inspect all those apartments, so he decides to automate the task using artificial intelligence. The formula behind the intelligence sounds simple. Price is equal to the number of square meters times 20,000. Therefore, an apartment of 100 square meters is always priced at two million. After a short while, the real estate agent discovers the challenges of using this method.

Obviously, there are other things than just land, which affects the price. As an example, ground floor apartments are typically not nearly as expensive as apartments with views. Therefore, the next generation of intelligence puts a sum for each floor apartment located above ground level.

After looking at data for actual sales prices, the formula is refined a bit, because it is mainly on the lower floors that the distance from street level makes a difference. In other words, there is a greater difference in price between the living room and the first floor than between the sixth and seventh floors. In the real estate agent's formula, it is fixed by taking the square root of the floor number and multiplying by DKK 100,000. Then an apartment on the first floor will be priced DKK 100,000 higher than the ground floor, while one on the ninth floor will be DKK 300,000 higher.

The following generations of formula incorporate further conditions: Whether there is a lift in the property, how attractive the area the apartment is in, whether the apartment is in good condition, how busy the road is, and whether one can see the sea.

Along the way, the formula has become somewhat longer and somewhat more complicated. It has been necessary to use both square roots and logarithms, but it can still be shown on an A4 sheet of paper if you use small print. One can question whether it is reasonable to call the formulas in the real estate example and software in self-propelled cars "intelligent". As we have seen, in both cases, these are just formulas. Very long formulas, but still only formulas.

They are not, in principle, different from the functional machine whose intakes consisted of the formula $y = 2x + 1$. Artificial intelligence is, therefore, in no way intelligent. Absolutely not. The name probably describes researchers' wet dreams about what technique one day they will be able to develop themselves. Not what it actually is.

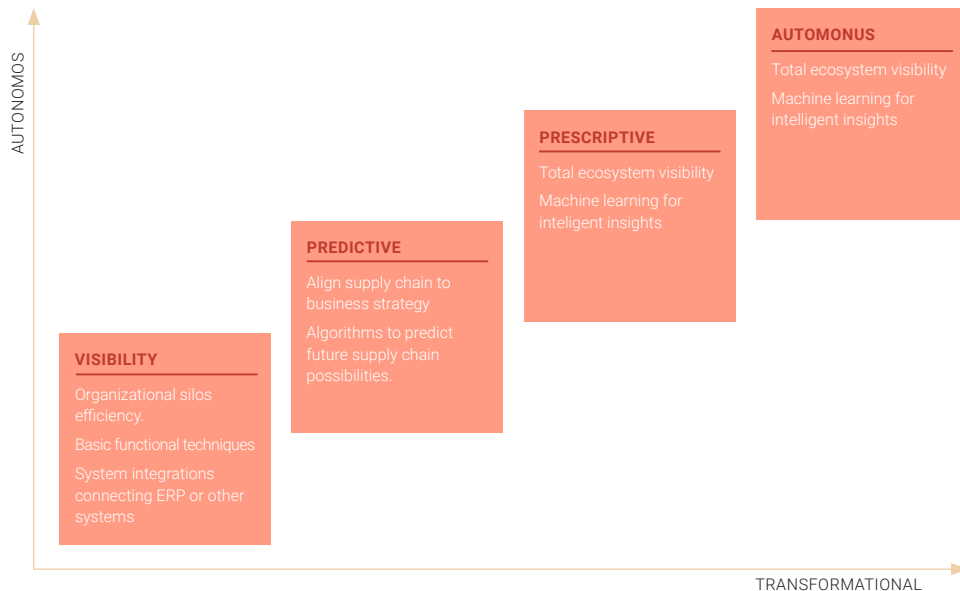
So, now we hope we have taken out all the mystery, and you should be ready to look at how you can incorporate it into your own business.

How to apply AI to your own Supply Chain

Now that you know the basics of AI, it is time to build your own AI roadmap. We suggest you scroll down over the ideas and imagine how these ideas could fit into your business. Before you do that, you should have a closer look at the Otilon Supply Chain Digital Development model. You should ask yourself the following questions:

- Which Supply Chain problems are we looking to solve with AI?
- How transformational are we looking to be, i.e., how big a step are we looking to take?
- How automated or autonomous are we looking to become?

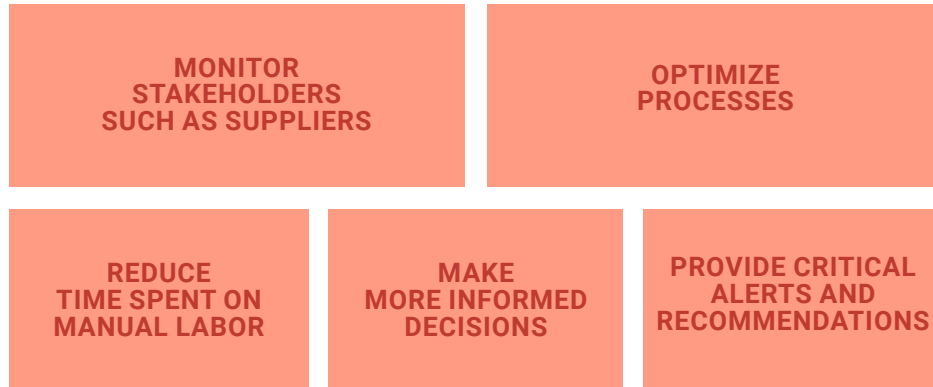
Otilon Digital Supply Chain Development



STEP
01

Which Supply Chain problems are you looking to solve?

We encourage you to create a catalogue of real Supply Chain problems that you may have. Are any of those problems that could potentially fit into any of the boxes below?



STEP
02

How automated or autonomous do you want to be?

Your decision on how autonomous the process should be has an impact on how the AI technology should be designed to work. Below you will find a description of the different levels:

Predictive

What if you could predict how your suppliers will perform? You can. The technologies available can interpret massive amounts of data from your Supply Chain and make educated scenarios on future performance based on past deliverables. It is a prediction, so it might not be 100% correct.

It is all about using real-time and past data to create likely or ideal scenarios for a given situation. The ability for AI algorithms to learn from historic data sets transforms decision-making. It allows executives to work alongside AI to make more efficient, informed decisions. For example, supply and demand can be monitored and predicted more accurately, keeping your business one-step-ahead at all times.



Prescriptive

Imagine if you could automate the selection of suppliers or the route optimizations for your vehicles? This can be done with the technologies available. By inferring and producing simple predictive and transparent “if-then logic rules”, you can enable the automation of many of the decisions currently being made.

Basically, using the intelligence, you can examine examples of correct past decisions, discover the logic behind those decisions, and use that logic to evaluate new data to make optimum predictive decisions.

Autonomous

Imagine if you could predict product demand so that you could order the right amount of materials from your suppliers before you need them? With AI, you can. Low-power, low-cost IoT edge devices cannot process conventional, math-based predictive models. They must send data, often lots of data, over the network to a large prediction server and await a response. Logic-based models can be processed by virtually any computing device and used in real-time to respond to events as they happen. They can make informed decisions based on automated alerts.

It’s possible to use predictive AI technology to help you take control of the ordering and distribution of your products. Using data from past orders, as well as the analysis of current sales, customer browsing history, wish-lists and more, technology can make a logical estimation of how many products you’re going to sell. Then order the right amount of materials needed from suppliers to be delivered on time, with the appropriate quantity, for the products you’re distributing.

Examples of where it can be applied in the supply Chain

SUPPLY CHAIN AREA

THE OUTCOME WHEN USING AI, USING HISTORICAL RECORDS

Demand sensing and modelling

Using AI for demand sensing could mean monitoring and predicting low in-stock items in advance, significantly reducing the impact of late and incomplete shipments, predicting how profitable special quantity deals really are, forecasting the optimal inventory needed for promotions, and the best times to ship inventory, and provide retailers with the ability to suggest pricing and allocation strategies when no historical data is available.

Theoretically, demand sensing and shaping can be done automatically without human interference.

Supplier Reliability and Quality

AI is generally good for reducing time spent on repetitive tasks. In many companies, quality control is done manually. It requires a lot of time and might also cause human errors.

In terms of supplier reliability, it is possible to configure and train an algorithm to accurately predict which order lines would be delayed versus arrive on-time. This would help in reducing the amount of rescheduling and could potentially improve customer satisfaction.

Furthermore, the modeling output can be used on a strategical level, helping organizations with optimal carrier selection and SLA negotiations to name a few use cases.

Assortment optimization

There is a continuous need to optimize the assortment to cater for new product introductions and safeguard against loss-leading products being stocked. Reduce the long tail of product items that you have in your portfolio. Not only based on price but also on other criteria. Traditional methods of selecting products for removal do not necessarily remove products with the least impact on margin and profit as well as customer preference. This is where AI can make a difference.

Master data quality

Accurately and automatically recommend data corrections without human-inferred logic or rule generation.

Strategic Transport Route optimization

If you are a company with a transportation network, then you will be able to use AI to optimize the routes. AI can help you find the patterns which you are unable to see.

Supplier selection Contract handling

Theoretically, it is possible to search in contracts and provide alerts, as well as automatically detect suppliers to include in future RFQ's.

Root cause analysis and Predictive Maintenance

It is possible to track down the root causes of service failures and predict potential service failures. This allows the companies to fix the problems to prevent them from happening again as well as taking action to avoid an issue in the first place.



Case Study

Robotic Data Correction™: Swedish manufacturer cleans delivery address data with artificial intelligence - and saves 22% on logistics cost

Background

The Swedish manufacturer recognized that the quality of master data for customers' delivery addresses could be improved in one of their affiliated companies. Therefore, they resorted to artificial intelligence and, in a pilot project, cleaned address data of approximately 500,000 shipments per year.

The client found that their master data on customers' delivery addresses was characterized by fluctuating quality and that they did not have one standardized format. After careful examination, it was found that the address data was recorded in six different ways, which created a lot of waste, returns, and manual corrections in the logistics processes.

The client said "When companies optimize logistics, they traditionally focus on factors such as packaging optimization, inventory productivity or transportation costs. These logistics cost drivers are also important factors. But there are a group of factors that are more about consumption and behavior, which also have a big impact on overall logistics costs. These factors are less well known, less studied and are often overlooked. One of these factors is the quality of address master data".

He went on to say "The lack of standardization of address data meant that we had costs for extra administration, packaging, storage and transport," and added that "We, therefore, invited Optilon to help us use artificial intelligence to reduce variance in address data and achieve a higher degree of consolidation of our more than 500,000 shipments per year to customers in that specific country".

How does Robotic Data Correction™ work?

The client and Optilon collaborated to design a so-called Robotic Data Corrections™ (RDC) program that systematically corrected and standardized the data of nearly 500,000 addresses using four parameters: city name, zip code, road name and road number, company name. The RDC process uses artificial intelligence and can detect as well as correct the way the address data is recorded.

Typically, there is a wide variance in the data, and since the data is interdependent, it is imperative to use computing power and artificial intelligence. A manual or semi-manual correction process would be far too imprecise and time-consuming.



Address variance has a significant impact on logistics costs because it creates extra costs for packaging, picking and packing, administration, return shipments and further administration. Also, the more precise address database provides opportunities to optimize transport and delivery, so that fewer routes and fewer kilometers can be driven at lower frequencies. The number of deliveries has actually fallen by 45 percent compared to before the project began.

The results

- 496,000 delivery addresses with a total of 2.48 million address components were automatically cleaned
- Stakeholders spent 40 hours evaluating the outcome
- Impact: 20 percent fewer unique addresses
- 277,000 address components were corrected

Accumulated financial gains

- Logistics costs = 3 percent
- Plus optimized transport segmentation = 4 percent
- Plus consolidation of deliveries and delivery rates = 22 percent lower logistics costs
- Trucks with the clients products fill significantly less of the roads. AI-driven cleaning of address data means that the client has reduced the number of deliveries by 45 percent

How to get started with AI and take it to the next level?

Make sure to solve real Supply Chain problems and take a step by step approach

First of all, getting started with AI is not difficult. Given the broad scope of AI and variations of use cases, it is vital to start out by identifying what problems to solve (key objective) and what opportunities to pursue and learn through piloting.

To be honest, what we are also trying to say here is that the most important thing is to start with something rather than starting with the right thing. Embarking on the AI journey is a true learning process.

As Walmart's CEO says, "AI is less like a project and more like an ongoing effort. As an ongoing effort, you want to figure out how AI can impact every aspect of your business. You want to understand how it affects your businesses' core decisions, how it changes your overall strategy and business model, how you can get it into the hands of your frontline employees so they can better do their jobs, how it automates processes that don't really need human interaction and how roles in your organization need to change to best complement what AI can do for you".

“First of all, getting started with AI is not difficult. It is vital to start out by identifying what problems to solve.”

Hire new skills ahead of the curve – or train existing talent

Success depends very much on the trust and capabilities that the employees are able and willing to put into adopting a new technology. When designed with people at the center, AI can extend companies' capabilities, free up creative and strategic endeavors and help achieve more.

Start out by using historical data

A technology partner can guide you through your journey, establishing a solid foundational baseline model on which to layer more and different types of data. A phased approach will help ensure a sustainable solution that meets your business objectives today and as your needs change. Data volume, data granularity, data quality, and data variety play a vital role.

Choose self-adapting models

To achieve the stability and adaptability required for operational use, it's crucial to use self-adaptive models. These models will require less rework as time passes. Though model evaluation and tuning will always be necessary to a certain degree.



Ensure a digital culture that allows for experimentation

From a leadership perspective, it is essential to foster a culture that allows for experimentation and failure. Not all hypotheses will work or give the desired outcome.

Partner with a company which has practical experience with AI

In this approach, you are working with a partner firm that can help you with your AI journey. This partner can work with you to come up with the right AI strategies and projects, help you build out and test new ideas, and help you grow your internal capabilities. Obviously, not all firms can help you with this.

To make this work, you need to find the right partner. You should look for the following characteristics:

- 01** A partner that can help you generate AI hypotheses that will work or have a chance to change your Supply Chain. This comes with experience in the area and a mix of business and technical skills. This can be difficult when growing an internal team simply because of its small size.
- 02** A partner with a wide range of business and technical experience. As you develop your AI competences, you're likely to need a diverse range of skills to help you come up with innovative solutions.
- 03** A partner with a willingness to be transparent and share. You need to learn how AI works, and you need to own the overall solution moving forward. The AI journey will not be static.

About Optilon

We believe Nordic companies have the potential to become the most competitive in the world. However, their high-cost environment and challenging geographic location increase the need for efficiency and the smart use of resources – irrespective of the market segment.

By combining world-leading technology with Nordic expertise, we help companies optimize their use of resources. This gives companies and their employees more time and greater scope to build their businesses.

Supply Chain passion and experience is the second key to our concept. All Optilon consultants are specialized in business analytics, Supply Chain Design, Service & Inventory Optimization, or Supply Chain Planning. The best thing we know is to improve our customers' business using hard work, detailed knowledge, analytical ability, and joint cooperation.

Through the years, Optilon has conducted more than 500 projects and implementations. We use our long experience for your benefit, and provide measurable results in our projects.

We know by experience that substantial competitive advantages can be achieved by using the right strategies for your supply chain, combined with powerful applications based on mathematical optimization and modern technology.

We can help you turn your Supply Chain into a competitive advantage with AI.

Robotic Data Correction™ (RDC)

Within our partner application Rulex Analytics, we can leverage AI & Machine Learning algorithms to detect the univocal dependencies between data attributes to generate accurate data correction recommendations, quickly and cost-effectively.



Next step

Now that you have the inspiration for your own journey we would like to share with you our typical engagement model. This is how we typically help our clients go from experimenting to creating real results with AI. Feel free to contact us to learn more.

Discovery

Identification and assessment of:

- Challenges and opportunities
- Business value and impact
- Requirement specification
- Data

 DECISION POINT

Proof of Concept

Proof of Concept with focus on:

- High impact & low effort scenario
- Quickly demonstrating solution capability and return

 DECISION POINT

Production and Roll-out

Enhancing and adapting the Proof of Concept for:

- Viability and implementation

Producing a robust application process ready for:


- Implementation and continued use




TIME



Contact

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