An Executive Guide for AI in Service Operations

PART 1

The Journey from Idea to ROI

Co-created by

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Introduction

Technology and innovation, and all the wonders and disruptions they bring, surround us. Service operations leaders navigate digital and physical worlds increasingly filled with the solutions that will help them plot their course into an AI future. Smart, connected products have the potential to provide significant market advantages, but new possibilities require new strategies from leadership.

However, as this disruption unfolds around industrial enterprises, how do they position themselves to thrive among and navigate new and unfamiliar challenges? How do they prepare for what comes next? How do they empower their people so that the investments needed to support these new technologies from idea to deployment reach AI ROI as soon as possible?

At Emerj, we aim to answer these questions through our interviews with Fortune 100 enterprise leaders and AI practitioners around the world.

In this service operations-focused white paper, we combine our insights and our range of primary research experience with expert perspectives.

Throughout the whitepaper, we will explore a roadmap approach that industry enterprises can adopt to bring about the transformation that has to happen within organizations in order to bring AI to life.

We will map the major stages of AI project deployment and discuss what it takes to progress from one to the next - from organizing enterprise data to deploying a successful AI solution. Along the way, we will review use-cases that can help guide organizations as they determine their own strategic journeys from the conception of an AI idea to the fruition of AI ROI.

PART 1

AI in Services Operations
A Journey in Five Stages

Five years ago, almost all enterprise firms treated AI initiatives like an IT project - totally focused on near-term ROI without any understanding of the challenges of working with data, or maintaining a deployed AI system.

Today, many more enterprise leaders have begun to take AI maturity into account in their decision-making processes, and have started seeing AI as a capability to build, and as a supporting factor in creating a winning strategy in the market.

In the section below, we'll break down five phases of AI adoption - with a specific focus on trends and use-cases that are relevant for leaders of services operations firms.

STEP 1

Align Your Data and Business Strategies

Adopting AI begins with framing the problem that you are trying to solve. Determine the specific outcome you are looking to achieve, and how success is measured.

Once the desired outcomes are defined, it's important to consider the potential data sources that might be relevant in solving a problem. For a predictive maintenance issue, that might be (but isn't limited to) sensor data from existing equipment. For a document search-related problem, that might be the current categories or labels applied to our existing corpus of documents.

Next, leaders must determine what aspect of the company's business strategy this outcome is aligned to. Aligning with strategy is critical to not only get executive buy-in for important initiatives, but to help ensure that a project is supported through the challenges that naturally arise with AI projects (the requirement to clean and organize the data, challenges with aligning data scientists and subject-matter experts).

As an example, a service executive at an industrial company may have the goal of lowering the cost of service. ***What approaches might they use to achieve this goal? What data might help to inform or automate those approaches? Which of those approaches aligns best with the businesses overall strategy?***

This careful consideration of both data assets and business goals becomes even more critical when the stakes rise. Consider a worse-case scenario: An industrial asset breaks down and needs immediate repair - imposing severe downtime costs for the customer.

As a critical component of optimizing that process, we need to arm our service personnel with the right tools and parts to fix the problem, and in the case of connected equipment, detect or even predict the problem before it happens.

With reactive service cycles, operational failures are inevitable. AIoT solutions can proactively determine downtime risk. These solutions rely on having connected products - and strategies for data processing - that predict which parts will be needed when, or when a piece of equipment should be reviewed. These insights offer industrial companies the ability to schedule proactive maintenance and service and align it with the customer's operational schedule.

When the service executive designs a strategy that includes data and connected products, they need to consider a wide variety of process and data factors, such as:

- Which assets are we servicing?
- What is my service workflow?
- What data do I already have available?
- Which connected devices contribute to my data?
- How do my customers submit a request?
- What actions can I take to maximize cost efficiencies?

Gopalan Oppiliappan, Intel's Head of the AI Center of Excellence, put it this way in a recent interview with Emerj:

> ***"I would say to start small … don't get carried away by big accomplishments or big successes. I think you need to first use a basic and simple technique. Look at the data and start by asking 'what is the real problem here?"***
>
> ***Gopalan Oppiliappan,*** *Intel's Head of the AI Center of Excellence*

Being grounded in the problem-space is critical. After defining a data-informed service optimization strategy that provides insight into products and their needs, it's time to bring together a cross-functional team of business stakeholders, subject-matter experts and data scientists to frame the central business problem that your project will attempt to address.

We've found that companies succeed in building cross-functional teams when they find team members:

A With genuine enthusiasm in data, AI, and/or innovation (people who want to be on the cutting edge).

B With robust experience on the business process in question.

STEP 2

Understand Your Target Business KPIs

After creating a data-informed perspective on an AI project - and aligning that project with business strategy, it is time to capture and formulate the key performance indicators (KPIs) that your project will optimize.

The most common error that enterprise teams face in this stage is when they accept a top-down KPI from management without considering it carefully to determine if it is the right KPI. For example, leadership may mandate that "reducing downtime" is the core outcome, but it may make more sense to measure other metrics, or related metrics - such as reduced maintenance costs, customer satisfaction, etc.

In order to arrive at a strong set of KPIs, a cross-functional team should find one or two metrics that:

→ Our ability to influence this number with our actions (it's utility/validity as a metric).

→ Align to leadership's definition of project success (alignment with their expectations and priorities).

The only reliable way to find good KPIs is team collaboration, and frank feedback. Data scientists will have perspective on the availability and quality of the data, business leaders will know what business outcomes are most important for the project, and importantly - subject-matter experts (SMEs) will know how success is how workflows operate currently.

> ***"Before I even go to an executive," says Chris MacDonald, Head of AI and Analytics, PTC "I always start with an experienced service manager or technician. They get a great deal of satisfaction when they solve a customer's problem. And they have experience on how they can work with the machine in a way that drives customer satisfaction, especially in heavy industrial equipment or medical devices."***

Early proximity to SMEs (the people closest to the problem already) is a common theme among experienced AI project leaders - and the right time to engage them is early in the process when projects and KPIs are still being decided upon.

These KPIs can take many forms and should measure the health of a company's initiatives and its business. They can target the optimization of costs or revenue. The key is to ask questions of the business and its initiatives and then consider the data you have or can make available to inform the answers.

In order to do this, services and heavy industry leaders are increasingly integrating IoT, and harnessing the power of the data that we obtain through connectivity. Data from equipment, from customer use of equipment, and from sensors (temperature, vibration, auditory, etc) allow the intuition of SMEs to become data we can track, measure, and use to make crucial decisions.

Companies must have quality data for the relevant historical period in question. That will include monitoring data—sensor data coupled with the tracking of adverse events. That quality data can ultimately flow into a data model that will learn from historical data and evolve into a predictive model. The better the data, the more predictive value it will provide.

One of our recent interviewees told us about a medical device company that brought the idea of "connected products" to life. The firm has purpose-built their equipment to track and transmit the most critical data for device performance (as opposed to using proxies from limited existing data streams, from devices that weren't built with data's value in mind).

That equipment is connected for two reasons, he continues. The first reason to connect devices within the process is for service. However, beyond that, they also integrate connected devices so that the data collected can help the Engineering Department innovate on that equipment and the analysis they perform and provide. Purportedly, the firm can even take that data and analyze, in collaboration with medical facilities, how these different factors predict conditions like Diabetes Type II.

STEP 3

Define User Actions and Tasks

Once a strategy-aligned project has been determined, and KPIs have been developed, leaders should consider which actions need to be taken as a result of the insights provided by data analytics. In other words:

? What will users do differently if we empower them with this new information?

We begin by determining what the data means when it is considered against the KPIs we established in Step 2. After concluding on the data and assigning accountability for follow-up actions, stakeholders begin taking the actions needed to attain the intended optimizations.

To support project stakeholders at this stage, it's important for leaders to define the parties responsible for the actions. These actions must include simple, measurable goals that define success, and the timeframes by which these actions need to be completed. An ideal system includes a process for monitoring progress and reacting when extra assistance is needed to attain a specific goal.

MacDonald continues on this line to say:

> ***"I would say the biggest miss across the board is when executives, data science companies, or even your own internal data science team is unwilling to spend time with the most experienced tactical person. Don't underestimate the power of listening to a domain or subject expert."***

Another manufacturing story from our interviews highlights importance of collaboration well. A large manufacturing plant that had spent tens of millions of dollars for the ability to predict a certain operational event that negatively impacted quality. The team didn't turn to the data first, but to the leading operations manager.

Following the operations manager through his rounds, they noted that he replaced a component that was not part of his core process, solely based on hearing a sound that indicated a problem. The observation led the team to conclude that they needed to add a microphone that would act as a sensor. That fix, which cost a few hundred dollars, provided the answer to the plant's multi-million dollar operations problem.

Jurgen Schmidhuber, co-director of the Dalle Molle Institute for Artificial Intelligence and one of Europe's most prominent AI researchers, frames the situation well:

> ***"There are so many industrial processes, currently controlled by machines, where there are a bunch of knobs and a couple of experts who sometimes try new constellations of these knobs to figure out what is a good constellation."***

Jurgen knows what more enterprise leaders should know - ***that the solution lies in understanding the nuances of the problem first, then the data***. Early in the adoption of predictive maintenance technologies, we observed enterprises leading first with new data and sensors, expecting to extract their desired business value from the data once it started streaming in. Without having close context on the business problem, this approach leads to data streams disconnected from genuine maintenance and operational issues.

This early SME involvement isn't limited to defining the problem and the KPIs, it's also crucial to get SME perspective on the outputs of the model.

- Will we be augmenting an existing operations dashboard with new AI recommendations or notifications?
- Will we need a new dashboard or interface?

In the industrial space, we can often safely assume that the end-users are not analytics experts. That means the metrics reported by our solutions have to be meaningful to domain experts. That means considering questions such as:

- When a user sees a prediction on their interface, is their next step clear?
- What is the training process to get operations folks to use this new interface?
- What do the users actually want to see - what are they asking for?

And the importance of buy-in extends beyond our end-users. On the executive level, leaders don't need to be experts on the data itself, but they should have a basic understanding of the three elements of AI fluency:

- **How AI Works** - i.e. What are the team, data, and resource requirements for AI projects?
- **AI Use-Case Range** - i.e. What are the most important AI use-cases at work in my industry today?
- **AI Transformation Vision** - i.e. How do AI capabilities support our 3-5 year goals?

This means that executives should be able to spot viable AI projects, and understand how data can support analytics goals and strategic business outcomes. Executive AI fluency determines the quality of AI projects that get the green light - so collaborating and co-creating a plan with executives, and informing them along the way, is crucial.

If we can determine the right projects, and define the next steps for end-users in a clear way, we're ready to focus on the end product and user interface.

STEP 4

Envision the End Product

Whether it's a new module in an existing interface, or a new iPad in the hands of people on the shop floor, we advocate that leaders think about these interfaces as individual applications.

That visualization means that project teams should determine who will use the application and then ask these users how they would use it, and how much time they would need to proactively integrate its information into their processes. Mock-ups and basic wireframes can be developed based off of this feedback, and these can help gather more feedback as to which interface types the end-users will find easy to use.

If you're in a field services organization, sometimes the most effective application may not be the most intuitive to a software engineer. A successful user interface is one that gets used. Whether it looks like a clean and modern mobile app, a simple set of gauges, or a modified Excel spreadsheet - if the end-users like it, can use it to improve their performance, it's a fit.

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PTC's portfolio of CAD, PLM, IoT, and AR technologies work together to enables data continuity for their enterprise clients in various industries, including: Industrial equipment, high-tech, automotive, aerospace and defense, life sciences.

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