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# Transforming the IT Services Lifecycle with AI Technologies

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ISSN 2191-5768 ISSN 2191-5776 (electronic)
SpringerBriefs in Computer Science
ISBN 978-3-319-94047-2 ISBN 978-3-319-94048-9 (eBook)
https://doi.org/10.1007/978-3-319-94048-9

Library of Congress Control Number: 2018947830



This Springer imprint is published by the registered company Springer Nature Switzerland AG
The registered company address is: Gewerbestrasse 11, 6330 Cham, Switzerland

# Abstract

Today, the services industry is being disrupted by the digital transformation of their clients and of their own delivery processes. In this book, we will show how AI technologies can help to fundamentally transform the services delivery lifecycle to improve speed, quality and consistency. We will discuss how AI is applied to gain insight from operational data, augment the intelligence of experts and their communities and provide intuitive interfaces for self-service. While our use cases are taken from our practical experience of applying AI at scale in the IT services industry, we are convinced that these methodologies and technologies can be applied more broadly to other types of services.

# Contents

# Introduction


As more and more industries are experiencing digital disruption, using information technology to enable a competitive advantage becomes a critical success factor for all enterprises. Enterprises need to provide an engaging experience to their clients, while ensuring reliable fulfilment of the promised quality of service. In fact, their digital operations often determine the strength of their brand.

Faced with rapidly changing business needs and accelerating business cycles, enterprise technology leaders increasingly rely on a supply chain of services from multiple vendors. These leaders become service brokers and service providers to their lines of business. Like their own clients, they cannot and will not compromise between choice and reliability, and in their turn these leaders need the services they are using to evolve continuously. This provides unique opportunities for IT service providers to move from providing "piece parts" (fragmented service management support) and integrating systems to becoming services integrators themselves.

The ability to quickly adjust and expand services, to continuously improve service delivery based on operational insights, and to apply the knowledge of their expert teams become crucial differentiators for service providers. At the same time, growing complexity of IT environments like hybrid clouds, a deluge of data and high user expectations of instantaneous fulfilment of their service requests create significant challenges for IT service management.

This book describes a way forward from a service provider perspective; it will discuss the experience of the authors working for a leading technology services provider (IBM Global Technology Services), and the application of artificial intelligence technologies (which involve extracting knowledge, understanding structured and semi-structured information, reasoning, and learning) to the services lifecycle. The insights, technologies and methodologies presented apply broadly, to internal service providers and other industries beyond IT.



K. Kloeckner et al., *Transforming the IT Services Lifecycle with AI Technologies*, SpringerBriefs in Computer Science,
https://doi.org/10.1007/978-3-319-94048-9_1

## The Main Areas for Applying AI to the IT Service Lifecycle

For a service provider, there are three major problem spaces that hold promise for the application of artificial intelligence. We would, in fact, argue that they cannot be successfully addressed without also combining AI with automation and data analytics.

1. Gaining insight from operational data coming from hundreds of sources like event management systems, ticketing systems, incident root cause analysis, change logs, service requests and others and generated both by humans and systems. Service providers deal with thousands of client environments comprising millions of devices. They handle tens of millions of events per month and hundreds of thousands of change requests that contain both structured and unstructured information, making this a true big data problem.

   Insights from this data need to be made actionable. This can lead to preventive actions to remove the causes of situations, and thus improve the quality of service overall. Operational data can also be used to **automate the responses even to non-deterministic use cases, or at least to provide input for better human decision making**. Machine learning is indispensable for this problem space, but approaches taken in other domains have to be adapted to the unique circumstances of IT, as we will demonstrate in later chapters.

2. **Capturing and enhancing expert knowledge throughout the lifecycle.** Very few individual experts have all the knowledge required for complex environments spanning hybrid clouds and infrastructure and applications from many different providers. Knowledge is often spread across many internal and external sources. Sometimes the most important organizational knowledge is tacit, rather than explicit. Artificial intelligence technologies like concept extraction, text understanding and mapping to domain ontologies can help to apply the right knowledge consistently and in a timely fashion, whether it is during solution design, operational health checks or compliance control. AI-infused tools would in most instances serve as advisors or virtual 'buddies' to human experts.
3. **Enabling self-service** for service requests and problem resolution, through intuitive natural language interfaces. The main AI challenge here is to correctly identify the user's intent and to map it to an automated resolution in most cases, and in the remaining cases give services personnel additional information to improve speed and quality of the response. Over time, these approaches can also deliver a more personalized experience through learning about the users and their context.

In our experience, where enterprises have invested in automation, but the results do not meet expectations, this is usually due to insufficient attention to the value of data. By using analytics enhanced by AI enterprises can remove systemic issues within the environment, instead of automating a reaction to unsolved problems.