

THE CAPCO INSTITUTE
JOURNAL
OF FINANCIAL TRANSFORMATION

OPERATIONS

Preparing for critical disruption:
A perspective on operational resilience

SANJIV TALWAR

20
YEAR ANNIVERSARY

**OPERATIONAL
RESILIENCE**

#53 MAY 2021

THE CAPCO INSTITUTE

JOURNAL OF FINANCIAL TRANSFORMATION

RECIPIENT OF THE APEX AWARD FOR PUBLICATION EXCELLENCE

Editor

Shahin Shojai, Global Head, Capco Institute

Advisory Board

Michael Ethelston, Partner, Capco

Michael Pugliese, Partner, Capco

Bodo Schaefer, Partner, Capco

Editorial Board

Franklin Allen, Professor of Finance and Economics and Executive Director of the Brevan Howard Centre, Imperial College London and Professor Emeritus of Finance and Economics, the Wharton School, University of Pennsylvania

Philippe d'Arvisenet, Advisor and former Group Chief Economist, BNP Paribas

Rudi Bogni, former Chief Executive Officer, UBS Private Banking

Bruno Bonati, Former Chairman of the Non-Executive Board, Zuger Kantonalbank, and President, Landis & Gyr Foundation

Dan Breznitz, Munk Chair of Innovation Studies, University of Toronto

Urs Birchler, Professor Emeritus of Banking, University of Zurich

Géry Daeninck, former CEO, Robeco

Jean Dermine, Professor of Banking and Finance, INSEAD

Douglas W. Diamond, Merton H. Miller Distinguished Service Professor of Finance, University of Chicago

Elroy Dimson, Emeritus Professor of Finance, London Business School

Nicholas Economides, Professor of Economics, New York University

Michael Enthoven, Chairman, NL Financial Investments

José Luis Escrivá, President, The Independent Authority for Fiscal Responsibility (AIReF), Spain

George Feiger, Pro-Vice-Chancellor and Executive Dean, Aston Business School

Gregorio de Felice, Head of Research and Chief Economist, Intesa Sanpaolo

Allen Ferrell, Greenfield Professor of Securities Law, Harvard Law School

Peter Gomber, Full Professor, Chair of e-Finance, Goethe University Frankfurt

Wilfried Hauck, Managing Director, Statera Financial Management GmbH

Pierre Hillion, The de Picciotto Professor of Alternative Investments, INSEAD

Andrei A. Kirilenko, Reader in Finance, Cambridge Judge Business School, University of Cambridge

Mitchel Lenson, Former Group Chief Information Officer, Deutsche Bank

David T. Llewellyn, Professor Emeritus of Money and Banking, Loughborough University

Donald A. Marchand, Professor Emeritus of Strategy and Information Management, IMD

Colin Mayer, Peter Moores Professor of Management Studies, Oxford University

Pierpaolo Montana, Group Chief Risk Officer, Mediobanca

John Taysom, Visiting Professor of Computer Science, UCL

D. Sykes Wilford, W. Frank Hipp Distinguished Chair in Business, The Citadel

CONTENTS

OPERATIONS

08 Collaborating for the greater good: Enhancing operational resilience within the Canadian financial sector

Filipe Dinis, Chief Operating Officer, Bank of Canada

Contributor: **Inderpal Bal**, Special Assistant to the Chief Operating Officer, Bank of Canada

14 Preparing for critical disruption: A perspective on operational resilience

Sanjiv Talwar, Assistant Superintendent, Risk Support Sector, Office of the Superintendent of Financial Institutions (OSFI)

18 Operational resilience: Industry benchmarking

Matt Paisley, Principal Consultant, Capco

Will Packard, Managing Principal, Capco

Samer Baghdadi, Principal Consultant, Capco

Chris Rhodes, Consultant, Capco

24 Decision-making under pressure (a behavioral science perspective)

Florian Klapproth, Professorship of Educational Psychology, Medical School Berlin

32 Operational resilience and stress testing: Hit or myth?

Gianluca Pescaroli, Lecturer in Business Continuity and Organisational Resilience, and Director of the MSc in Risk, Disaster and Resilience, University College London

Chris Needham-Bennett, Managing Director, Needhams 1834 Ltd.

44 Operational resilience approach

Michelle Leon, Managing Principal, Capco

Carl Repoli, Managing Principal, Capco

54 Resilient decision-making

Mark Schofield, Founder and Managing Director, MindAlpha

64 Sailing on a sea of uncertainty: Reflections on operational resilience in the 21st century

Simon Ashby, Professor of Financial Services, Vlerick Business School

70 Operational resilience

Hannah McAslan, Senior Associate, Norton Rose Fulbright LLP

Alice Routh, Associate, Norton Rose Fulbright LLP

Hannah Meakin, Partner, Norton Rose Fulbright LLP

James Russell, Partner, Norton Rose Fulbright LLP

TECHNOLOGY

80 Why cyber resilience must be a top-level leadership strategy

Steve Hill, Managing Director, Global Head of Operational Resilience, Credit Suisse, and Visiting Senior Research Fellow, King's College, London

Sadie Creese, Professor of Cybersecurity, Department of Computer Science, University of Oxford

84 Data-driven operational resilience

Thadi Murali, Managing Principal, Capco

Rebecca Smith, Principal Consultant, Capco

Sandeep Vishnu, Partner, Capco

94 The ties that bind: A framework for assessing the linkage between cyber risks and financial stability

Jason Healey, Senior Research Scholar, School of International and Public Affairs, Columbia University, and Non-Resident Senior Fellow, Cyber Statecraft Initiative, Atlantic Council

Patricia Mosser, Senior Research Scholar and Director of the MPA in Economic Policy Management, School of International and Public Affairs, Columbia University

Katheryn Rosen, Global Head, Technology and Cybersecurity Supervision, Policy and Partnerships, JPMorgan Chase

Alexander Wortman, Senior Consultant, Cyber Security Services Practice, KPMG

108 Operational resilience in the financial sector: Evolution and opportunity

Aengus Hallinan, Chief Technology Risk Officer, BNY Mellon

116 COVID-19 shines a spotlight on the reliability of the financial market plumbing

Umar Faruqui, Member of Secretariat, Committee on Payments and Market Infrastructures, Bank for International Settlements (BIS)

Jenny Hancock, Member of Secretariat, Committee on Payments and Market Infrastructures, Bank for International Settlements (BIS)

124 Robotic process automation: A digital element of operational resilience

Yan Gindin, Principal Consultant, Capco

Michael Martinen, Managing Principal, Capco

MILITARY

134 Operational resilience: Applying the lessons of war

Gerhard Wheeler, Head of Reserves, Universal Defence and Security Solutions

140 Operational resilience: Lessons learned from military history

Eduardo Jany, Colonel (Ret.), United States Marine Corps

146 Operational resilience in the business-battle space

Ron Matthews, Professor of Defense Economics, Cranfield University at the UK Defence Academy

Irfan Ansari, Lecturer of Defence Finance, Cranfield University at the UK Defence Academy

Bryan Watters, Associate Professor of Defense Leadership and Management, Cranfield University at the UK Defence Academy

158 Getting the mix right: A look at the issues around outsourcing and operational resilience

Will Packard, Managing Principal, and Head of Operational Resilience, Capco



DEAR READER,

Welcome to this landmark 20th anniversary edition of the Capco Institute Journal of Financial Transformation.

Launched in 2001, the Journal has followed and supported the transformative journey of the financial services industry over the first 20 years of this millennium – years that have seen significant and progressive shifts in the global economy, ecosystem, consumer behavior and society as a whole.

True to its mission of advancing the field of applied finance, the Journal has featured papers from over 25 Nobel Laureates and over 500 senior financial executives, regulators and distinguished academics, providing insight and thought leadership around a wealth of topics affecting financial services organizations.

I am hugely proud to celebrate this 20th anniversary with the 53rd edition of this Journal, focused on 'Operational Resilience'.

There has never been a more relevant time to focus on the theme of resilience which has become an organizational and regulatory priority. No organization has been left untouched by the events of the past couple of years including the global pandemic. We have seen that operational resilience needs to consider issues far beyond traditional business continuity planning and disaster recovery.

Also, the increasing pace of digitalization, the complexity and interconnectedness of the financial services industry, and the sophistication of cybercrime have made operational disruption more likely and the potential consequences more severe.

The papers in this edition highlight the importance of this topic and include lessons from the military, as well as technology perspectives. As ever, you can expect the highest caliber of research and practical guidance from our distinguished contributors. I hope that these contributions will catalyze your own thinking around how to build the resilience needed to operate in these challenging and disruptive times.

Thank you to all our contributors, in this edition and over the past 20 years, and thank you, our readership, for your continued support!

A handwritten signature in black ink, appearing to read 'Lance Levy', with a stylized, flowing script.

Lance Levy, **Capco CEO**

PREPARING FOR CRITICAL DISRUPTION: A PERSPECTIVE ON OPERATIONAL RESILIENCE

SANJIV TALWAR | Assistant Superintendent, Risk Support Sector, Office of the Superintendent of Financial Institutions (OSFI)¹

ABSTRACT

In recent years, and particularly in the immediate response to COVID-19, the ability to spring back from operational disruption has become an organizational and regulatory priority. But building operational resilience can be a significant challenge. Financial institutions are increasingly faced with complex operations, evolving third party relationships and reliance on new technologies to conduct their business effectively. This article outlines the foundational elements of building an operationally resilient organization, highlighting the necessary leadership attributes, culture and risk management practices. It makes the case for organizations and regulators to embrace a broadened perspective of resilience. Practicing these elements will help ensure the continuity of critical operations and overall confidence in the system.

1. THE MEANING OF THE TERM “RESILIENCE”

The term “resilience” is generally defined as the ability to recover from difficulties. As an engineer by training, I also think about it as a measure of elasticity: the capacity to stretch out but return to a pre-stretched shape. Resilience is, therefore, a characteristic that can apply to a range of different things, such as materials, people, relationships, and organizations.

For people, resilience usually means the ability to spring back after a period of illness or discontentment. We can measure resilience in this context by the length of this period, with higher resilience often associated with shorter periods of malaise.

While this personal resilience is certainly at the forefront of our minds during the pandemic, the resilience of legal persons (i.e., corporations) is also important, particularly to regulators like the Office of the Superintendent of Financial Institutions (OSFI). In the context of an organization, I think of resilience as the ability to rapidly and seamlessly recover from difficulties

encountered. This could mean having sufficient financial resources, such as cash reserves or shareholder capital, to withstand a financial shock. At OSFI, we refer to this as financial resilience.

Resilience can also refer to the continuity of an organization's operations in the face of significant disruption. In this context, financial resources are less relevant and the emphasis is on the speed of recovery. Ideally, customers and other stakeholders would not even know that the organization encountered operational difficulties. We can think of these organizations as having operational resilience.

Traditionally, regulators have focused on financial resilience, primarily due to the high externalities associated with organizational failure and financial crises. However, as organizations have become more complex and the pace of adoption of new technologies has increased, the ability to spring back from operational disruption has risen in prominence.

¹ The views and opinions expressed in this article are those of the author and do not necessarily reflect the official policy or position of OSFI.

Many organizations' business processes once resembled a factory floor. Under these conditions, it was relatively easy for companies to identify possible points of failure and problems were contained by the figurative four walls of the factory. Today, many organizations are operating in an environment that is more like a rainforest: a complex ecosystem in which small, often undetectable, changes to particular layers can become threats to the entire forest's survival.

In this environment, operational disruption has become a question of when, not if. This creates a problem for regulators like OSFI, as a failure to spring back within an acceptable period could reduce confidence in a financial institution and potentially compromise system stability. Consumer expectations have also changed, meaning that institutions cannot afford large-scale outages from a competitive perspective.

2. HOW DO ORGANIZATIONS BECOME MORE OPERATIONALLY RESILIENT?

When thinking about operational resilience, the first question I have is: how self-aware is the organization? Without this self-awareness, it is impossible for an organization to anticipate and prepare for disruptive events. Organizations will otherwise assume that their business-as-usual operations can simply continue into the future. Organizations' risk management programs (e.g., business continuity management) are an obvious response to these questions, but it cannot end there.

Resilience begins with the people involved, particularly the leaders of an organization. There is a foundational question of whether leaders have the mental fortitude and the leadership capabilities to operate through disruption. This requires a proactive mindset, confidence in people management, logical thinking under pressure, and strong communication skills. Leaders must also build personal resilience in the people around them during peace time, giving staff the confidence to respond to significant disruption on their own initiative, within their span of accountability.

The focus of leaders must then turn to the systems and processes of the organization. Some important activities for leaders to engage with before disruption occurs include:

- Understanding the organization's core functions, from all stakeholders' points of view, including society at large.

- Understanding critical dependencies that support core functions (both inside and outside the organization). In financial services, examples include technology-related suppliers, payments systems, and clearing and settlement partners.
- Considering the time interval between failure and contingencies being operational, with severe but plausible scenarios in mind. This must be within risk tolerance, or else further investment will be required to reduce it.
- Establishing controls and contingencies to prevent a critical failure and to minimize the impact when a failure does indeed occur.
- Where one is not in a position of strength in the operational ecosystem, efforts must be made to strengthen the organization's position within that ecosystem, or even potentially move to a new one.

When an organization has addressed these points, the focus then shifts to how, practically, organizations can maintain operational resilience over time. Similar to risk management, operational resilience is not a "once and done" exercise. It is an outcome requiring a cycle of evolution and learning, as events at home and abroad offer new insights.

Some of the key questions that organizations should ask are:

- Are tests of all systems and contingencies performed with regularity?
- Are lessons taken from the tests and leveraged in contingency processes?
- How is the teamwork and collaboration required to sustain resilience achieved?
- Is this continually discussed, built-on, and tested as the team membership changes?

While this is by no means an exhaustive list, it does highlight the types of questions leaders need to ask themselves, and prepare for, when they are taking steps to make their organizations more resilient in the face of potential crises.

3. WHAT CHALLENGES AND OPPORTUNITIES LIE AHEAD?

One of the key benefits of resilience is that it results in reduced lasting stress from difficulties. For an organization, this means that many events, including extreme events, are handled as



due course activities, with reduced stress on staff members. We have seen this in the midst of a pandemic, with many truly resilient organizations delivering on their commitments to customers and the broader system, without excessive staff burnout.

For this reason alone, now is a good time for organizations to be investing in their operational resilience.

But even outside the lens of COVID-19, there is a need today for all organizations to think carefully about their ability to spring back. While many of the core services provided by financial institutions, such as deposit-taking or providing insurance coverage, have not changed, they are now underpinned by a large and increasing number of dependencies and rapidly changing technologies. Cyber risk has also become more prominent, raising the possibility that one or more organizations could suddenly become unable to provide critical services for an indefinite period.

These greater risks are magnified by the fact that organizations are still made of people, some of whom do not have the ability to cope well with the nature and scale of large-scale organizational transformations.

Some would argue that, for people, resilience is an innate characteristic. But for organizations that are made up of many individuals, I believe that resilience is something that can be worked on and maintained. Consequently, as organizations and regulators, we must continue to scale the twin peaks of operational and financial resilience. OSFI has historically emphasized the financial side of this equation. But we also see for ourselves a vital role in helping institutions maintain operational resilience.

While we cannot regulate resilience into existence, we will continue to encourage organizations to reflect on and improve their resilience. Institutions must have the right leadership, culture, and processes in place to deliver the critical services on which their customers and the entire financial system rely. As we have seen throughout 2020, this is a precondition to a sound and stable financial system.

4. CONCLUSION

Every major crisis is a wake up call for organizations to prepare their operations to be more resilient against future crises. However, few have been as profound as the one we are going through right now. The COVID-19 pandemic has shaken the world of business to its core, and yet we have seen examples of organizations that have not only survived the current crisis, but have even thrived. This was not merely a case of luck, many of these organizations had spent years preparing their infrastructures to be resilient through disruption.

My job, and that of OSFI, is to ensure the soundness and stability of Canadian financial institutions, and in doing so we work hard to prepare for crises. The current crisis was a

once-in-a-century event, or at least we hope so, but I feel that Canadian financial institutions have, so far, withstood the stresses quite effectively. They have passed the test of continuing to provide services to clients during extraordinarily challenging conditions.

Of course, we cannot rest on our laurels, and there are certainly lessons to be learned from the pandemic. The next crisis is unlikely to mirror the current one. It could be faster moving or could compromise the technologies that have served the industry so well in the last year. This article aims to highlight some of those lessons, and potential responses, so that we can as an industry be even better prepared for the next crisis.

© 2021 The Capital Markets Company (UK) Limited. All rights reserved.

This document was produced for information purposes only and is for the exclusive use of the recipient.

This publication has been prepared for general guidance purposes, and is indicative and subject to change. It does not constitute professional advice. You should not act upon the information contained in this publication without obtaining specific professional advice. No representation or warranty (whether express or implied) is given as to the accuracy or completeness of the information contained in this publication and The Capital Markets Company BVBA and its affiliated companies globally (collectively "Capco") does not, to the extent permissible by law, assume any liability or duty of care for any consequences of the acts or omissions of those relying on information contained in this publication, or for any decision taken based upon it.

ABOUT CAPCO

Capco is a global technology and management consultancy dedicated to the financial services industry. Our professionals combine innovative thinking with unrivalled industry knowledge to offer our clients consulting expertise, complex technology and package integration, transformation delivery, and managed services, to move their organizations forward.

Through our collaborative and efficient approach, we help our clients successfully innovate, increase revenue, manage risk and regulatory change, reduce costs, and enhance controls. We specialize primarily in banking, capital markets, wealth and asset management and insurance. We also have an energy consulting practice in the US. We serve our clients from offices in leading financial centers across the Americas, Europe, and Asia Pacific.

WORLDWIDE OFFICES

APAC

Bangalore
Bangkok
Gurgaon
Hong Kong
Kuala Lumpur
Mumbai
Pune
Singapore

EUROPE

Berlin
Bratislava
Brussels
Dusseldorf
Edinburgh
Frankfurt
Geneva
London
Munich
Paris
Vienna
Warsaw
Zurich

NORTH AMERICA

Charlotte
Chicago
Dallas
Hartford
Houston
New York
Orlando
Toronto
Tysons Corner
Washington, DC

SOUTH AMERICA

São Paulo



WWW.CAPCO.COM



CAPCO