THE CAPCO INSTITUTE JOURNAL OF FINANCIAL TRANSFORMATION

DESIGN



DESIGN THINKING

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 Nippon Life Professor Emeritus of Finance, University of Pennsylvania

PHILIPPE D'ARVISENET, Adviser and former Group Chief Economist, BNP Paribas

RUDI BOGNI, former Chief Executive Officer, UBS Private Banking

BRUNO BONATI, Chairman of the Non-Executive Board, Zuger Kantonalbank

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 of 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, Director of the Centre for Global Finance and Technology, Imperial College Business School

MITCHEL LENSON, Non-Executive Director, Nationwide Building Society

DAVID T. LLEWELLYN, Emeritus Professor 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, Chief Risk Officer, Mediobanca

ROY C. SMITH, Kenneth G. Langone Professor of Entrepreneurship and Finance, New York University

JOHN TAYSOM, Visiting Professor of Computer Science, UCL

D. SYKES WILFORD, W. Frank Hipp Distinguished Chair in Business, The Citadel

CONTENTS

DESIGN

- 8 Design thinking as a process for people-centered innovation in the financial sector Rama Gheerawo, The Helen Hamlyn Centre for Design, Royal College of Art Jeremy Myerson, The Helen Hamlyn Centre for Design, Royal College of Art
- 16 How DBS embraced data-informed design to deliver a differentiated customer experience Jurgen Meerschaege, Head of Culture & Curriculum, DataFirst, DBS Paul Cobban, Chief Data and Transformation Officer, DBS Mark Englehart Evans, Head of Experience, DBS
- 24 Empathy and co-creation in capital markets operations insights from the field Amir Dotan, Principal Consultant, Capco Digital
- 36 How design thinking is powering payments innovation: Our journey at Mastercard Karen Pascoe, SVP, Experience Design, Mastercard
- 42 Why design thinking matters
 - Anne-Laure Fayard, Associate Professor of Management,
 Department of Technology Management and Innovation, NYU Tandon School of Engineering
- The adoption and impact of design thinking in financial services
 Paul Lee-Simion, CEO, AA INFO, and Senior Consultant, DBS Singapore
- 54 The design thinking fallacy are banks immune to innovation? Arjun Muralidharan, Principal Consultant, Capco Digital Nikola Zic, Consultant, Capco Digital
- 64 Understanding the value of design thinking to innovation in banking Claude Diderich, Managing Director, innovate.d llc

TRANSFORMATION

76 Digitally-driven change in the insurance industry – disruption or transformation?

Jeffrey R. Bohn, Head, Swiss Re Institute

88 The case for a 21 million bitcoin conspiracy

Peder Østbye, Special Adviser, Norges Bank

98 Artificial intelligence: Chances and challenges in quantitative asset management

Fabian Dori, Quantitative Strategist, AQ Investment Ltd.

Egon Rütsche, Quantitative Strategist, AQ Investment Ltd.

Urs Schubiger, Quantitative Strategist, AQ Investment Ltd.

104 New technologies: Destruction or opportunity? Or both...

Thierry Derungs, Chief Digital Officer, Head Digital Solutions, IS Investment Solutions

- Wealth Management, BNP Paribas sa

112 Thoughts on the economics of bitcoin

Erik Norland, Senior Economist, CME Group

Blu Putnam, Chief Economist, CME Group

120 Trading bricks for clicks: Hong Kong poised to launch its virtual banks

Isabel Feliciano-Wendleken, Managing Principal, Head of Digital, Capco Hong Kong

Matthew Soohoo, Consultant, Capco

Dominic Poon, Consultant, Capco

Jasmine Wong, Consultant, Capco

Antonio Tinto, Principal Consultant, Capco

132 Financial and data intelligence

Charles S. Tapiero, Topfer Chair Distinguished Professor, Department of Finance and Risk Engineering,

New York University, Tandon School of Engineering

SUPERVISION

142 Early warning indicators of banking crises: Expanding the family

Iñaki Aldasoro, Economist, Monetary and Economic Department, BIS

Claudio Borio, Head of the Monetary and Economic Department, BIS

Mathias Drehmann, Principal Economist, Monetary and Economic Department, BIS

156 Supranational supervision of multinational banks: A moving target

Giacomo Calzolari, European University Institute, University of Bologna, and CEPR

Jean-Edouard Colliard, HEC Paris

Gyöngyi Lóránth, University of Vienna and CEPR

160 Financial stability as a pre-condition for a hard budget constraint: Principles for a European Monetary Fund

Daniel Gros, Director, CEPS

170 Regulation of crowdfunding

Tobias H. Tröger, Professor of Private Law, Trade and Business Law, Jurisprudence, Goethe University Frankfurt am Main, Program Director Research Center Sustainable Architecture for Finance in Europe (SAFE)



DEAR READER,

Design thinking, a collaborative, human-focused approach to problem-solving, is no longer just for the creative industries. It has become an important management trend across many industries and has been embraced by many organizations. Its results are hard to ignore. Indeed, design-driven companies regularly outperform the S&P 500 by over 200 percent.¹

To date, the financial services industry has not led in adopting this approach. However, leaders are recognizing that important challenges, such as engaging with millennial customers, can be best addressed by using design thinking, through the methodology's exploratory approach, human focus, and bias towards action. This edition of the Journal examines the value of design thinking in financial services.

Design thinking introduces a fundamental cultural shift that places people at the heart of problem-solving, which is critical in a technology-driven environment. If the customer's real problems are not fully understood, technological solutions may fail to deliver the desired impact. In this context, design thinking offers a faster and more effective approach to innovation and strategic transformation.

The case studies and success stores in this edition showcase the true value of design thinking in the real world, and how this approach is an essential competitive tool for firms looking to outperform their peers in an increasingly innovation-driven and customer-centric future. At Mastercard, design thinking has become a part of almost all organizational initiatives, from product development, research and employee engagement to solving challenges with customers and partners. Meanwhile, at DBS Bank in Singapore, a data-informed design model has been firmly embedded into the bank's culture, enabling them to successfully move from being ranked last among peers for customer service in 2009, to being named the Best Bank in the World by Global Finance in 2018.

I hope that you enjoy the quality of the expertise and points of view on offer in this edition, and I wish you every success for the remainder of the year.



Lance Levy, Capco CEO

 $^{^{1}\} http://fortune.com/2017/08/31/the-design-value-index-shows-what-design-thinking-is-worth/$

THE ADOPTION AND IMPACT OF DESIGN THINKING IN FINANCIAL SERVICES

PAUL LEE-SIMION | CEO, AA INFO, and Senior Consultant, DBS Singapore

ARSTRACT

The adoption of design thinking techniques is not an option for financial services, it is a must. The landscape is changing rapidly, and design thinking is affecting everything we do and use; the business case for it is indubitable. Governments are paying attention and adopting the approach, as well as showcasing the pronounced changes fintech is having on the financial industry. By adopting design thinking, the financial industry is undergoing a paradigm shift in the way they engage, organize, and deliver to their customers.

1. WHAT IT IS DESIGN THINKING?

Design thinking is affecting everything we do and use. Design thinking, as we know it today, was developed from the creative thinking of the 1950s, when mechanical engineers would add something to their products to make them distinctive with the intent of making them "less threatening" to customers. An iconic example of this is the coke bottle (Figure 1). Today, design thinking connects users with products for a meaningful experience.

Terms such as agile, customer centric, customer journeys, re-imagining, innovation, and infographics are all associated with design thinking. Design thinking is about delivering meaningful solutions to problems, that is change with impact.

The change can be a process, a product, an environment, or an artefact. The delivery itself may also change. Ensuring that those affected by the change have an

affinity to the solution is fundamental to design thinking. Achieving this is more than about understanding the users and the impact. It involves engaging those impacted right at the beginning of the process, and iterating outcomes. Apple's iPhone is a great example. The iPhone facilitated the change in how music is delivered, how photographs are taken, and how the world communicates. This product is also updated every few years because clients want a refresh.

It is because of design thinking that Apple went from a near defunct company to what it is today. Governments and other companies have noticed and are engaging with the concept as well. Apple has a long history with the design group Frog in aesthetics and usability of its products. Frog have also assisted UBS in the design of UBS's mobile app to "make its clients' personal financial information easily accessible, easily readable, and personally meaningful."

Upfront, design thinking focuses on the sensitivities of those who are the subject of the challenge one is resolving.

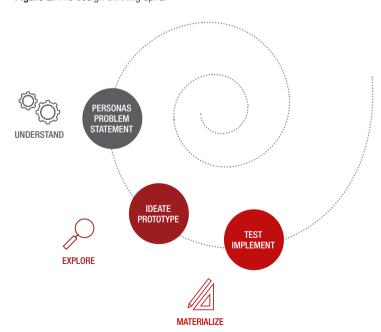
¹ https://bit.ly/20fk3fM

The issue being resolved is the "problem statement" such as, "how can every vehicle become a taxi." Those initially perceived to benefit from the outcome are the personas. Personas are imaginary people who develop, change, and grow with the ideas portrayed, such as the drivers and passengers. Going through several iterations,

Figure 1: The changing faces of the Coca-Cola bottles



Figure 2: The design thinking spiral



one ends up with several "opportunities" to resolve the task in hand and a reasonable idea of the group of people who will benefit from it. This process is always enlightening because anything is initially in bounds, the most outrageous ideas welcome and the perception of how your personas will react is surprising.

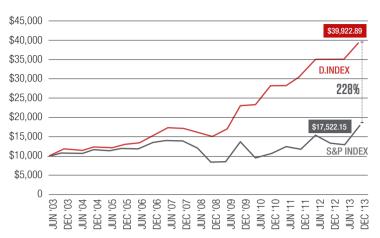
Finding the most "impact problem to solve," is very relevant to today's enterprises. The design thinking approach starts with prioritizing issues to attack and focuses on the ones that can help deliver the most value to the organization. Solutions are then proposed, empathized through the personas, and quickly iterated.

The practicalities come next. Some opportunities simply cannot be delivered. Timescales, technology, and budget dictate that these need to be put aside for later. At one design thinking workshop, the opportunity proposed was a dongle that would project a hologram so that clients could communicate with their bankers. The problem statement was "how can bankers spend more time with their clients." The practicable opportunity delivered was artificial intelligence that "listened" to conversations and produced an actionable list of tasks for the banker. (A further development was to automatically execute the actions on the list where possible.) This impact allowed the bankers to increase the amount of time they spend with their clients by 30%. The hologram opportunity was put aside for later.

Representative users are exposed to the opportunities emanating from the design thinking process; this is akin to bringing your persona to life. The insights from the users could even rephrase the problem statement and then iterate again. Opportunities are prototyped. Prototypes come in many forms, users experience them, and the personas adapt with the feedback. More ideas are generated, and opportunities develop. We spiral round and round with the opportunities that have been encapsulated by the prototype flying out (Figure 2).

Only then is production or implementation considered, and at all times the impact on the persona assessed. Leaving the business benefits of design thinking to one side, this way of resolving issues is fun. It ticks all the boxes, including all stakeholders, especially those often forgotten, who tend to those most impacted by the change.

Figure 3: DMI – design value index



Source: Westcott and Rae (2014)

2. ECONOMIC IMPACT OF DESIGN THINKING

Design thinking has been applied with tremendous impact in many industries, including consumer products, education, financial services, healthcare, NGOs, and transport. Examples include:

- Consumer products: over 2 billion iPhones, enabling Apple's profits to increase to over U.S.\$50 bln annually from U.S.\$3.5 bln.
- Education: classroom layouts designed with the needs and desires of pupils taken into consideration, resulting in pupils being far more engaged. Fidget modules increase attention span of eight year olds from 7 to 20 minutes.
- Financial services: moving banks to realize that their customers dictate the way business is to be done.
 150% increase in new investment product sales.
- Healthcare: moving beyond controlling pain and taking care of medical emergencies – U.S.\$400 bln market in U.S. alone.
- NGOs: 500% increase in meals delivered.
- Transport: increased passenger throughput by repositioning and synchronizing trains, escalators, barriers, and ticket offices accommodating 5% year on year growth in passenger capacity.

Analysis by Westcott and Rae (2014)² clearly shows that design-centric organizations benefited from a 228% share price uplift over a 10-year period. Further analysis

DESIGN-CENTRIC ORGANIZATIONS:

APPLE PROCTER & GAMBLE
COCA-COLA STARBUCKS
FORD STARWOOD
HERMAN-MILLER STEELCASE
IBM TARGET
INTUIT WALT DISNEY
NEWELL-RUBBERMAID WHIRLPOOL

NIKE

indicates that if it was easy, everyone would be doing it — only 1/5th of U.S. listed companies have actually benefited from the uplift, as compared to those who proclaim to practice design thinking.

The question every CEO, shareholder, and government asks is: "how do we make money?"

To make money, the institution first and foremost needs people to buy their products (or use their services). Second, the institution needs to be maintained by people continuing to buy its products. Design thinking changes the paradigm from products and services being purely functional to a user experience that people perceive they need.

Henry Ford paraphrased the cycle:

1909 – about the model T: "You can have any color as long as it's black"

1927 – "Failure is only the opportunity more intelligently to begin again"

Design thinking brings failure upfront. The product solves a real problem and in so doing people will want the product. Then, the institution moves onto the next real problem. Consequently, upfront, design thinking identifies and validates the problem, positions that with potential customers, and puts opportunities on the shelf that the customer is unlikely to buy into or cannot be delivered at that time.

Developing products to which customers will have an affinity saved GE U.S.\$15 mln in development costs when they first took this approach in 2010.³ It also allows maintenance costs to be halved.⁴

Westcott, M., and J. Rae, 2014, "Design-drive companies outperform S&P by 228% over 10 years – the DMI design value index," Design Management Institute, March 10, https://bit.ly/2LTnT9G

³ Forrester Customer Experience Marketing

⁴ Silver AG/Lucerne University of Applied Science and Arts 2017

Design thinking also allows for value-based pricing. The manufacturing costs of an iPhone X is U.S.\$370 and the customers will pay U.S.\$1000 [Richter (2017)⁵]. This has contributed to Apple becoming a trillion dollar company. Apple spends U.S.\$10 bln annually on research and product development, which is only 0.1% of Apple's market capitalization. Design thinking is at the heart of everything Apple does and is commercially effective. Who would not spend 0.1% of their market capitalization to be the world's first trillion-dollar company?

3. GOVERNMENTS AND DESIGN THINKING

While companies that embrace design thinking have been found to outperform those that do not, the manner in which governments embrace and support it creates an innovative culture in their country to attract more companies (and, therefore, add to their revenues), as well as promoting social cohesion, decreases in taxes, and saving lives by delivering services with affinity to their citizens, who after all pay for it.

Design thinking by the Singapore government has had immense impact, including:

- Law and order: making courts family friendly with children's play areas and upbeat décor instead of a somber environment.
- Healthcare: all disciplines for patient groups (e.g., the elderly) around the same "island," that is on the same floor with practitioners spreading out from the center. Results are a 40% increase in daily patient treatment and freeing up space.
- Town planning: minimizing the distance anyone has to travel for public transport, health, social, and shopping facilities, including making the journey accessible to the disabled.

In Canada, the Canada Beyond 150 program has introduced "cultural probes." These engage people through their own recordings, drawings, notes, and artefacts to make them comfortable in portraying their insights to the government. Through their Employment and Social Development Innovation Lab, Canada has bought together people from various disciplines to simplify the application to and running of the Canada Pension Plan.

MindLab in Denmark was the first government innovation lab, established in 2002. However, Mindlab will close down at the end of this year with activities going to Denmark's Disruption Task Force. Notable outcomes from MindLab include driving the Danish government's digitization program and knowledge transfer to the U.S., U.K., and Mexican governments in setting up innovation labs.

U.S.: there is probably no other organization in the world other than the U.S. government that has the power to improve lives. Yet while design thinking is prominent in the private sector and intergovernmental agencies, it is less prominent in U.S. agencies. Some federal agencies have had success in the specific context in which design thinking has been applied. These include:

- Call centers eradicating the need for the public to know every form and detail in order to get information by having the customer state what they want and the burden passed to call center staff equipped with natural language search technology.
- Re-imagining the U.S. Air Force, under the slogan "doing smarter stuff faster."
- · Simplifying federal tax forms.

The South Korean Government has taken the approach of immediately partnering with commercial organizations to leverage the technology available. Outcomes with SAP include:

- An Internet of Things (IoT) solution to monitor livestock feeding.
- A public service design model, increasing participation and literacy rates.

The U.K. Government Digital Services are delivering services through .gov.uk. This includes "verifying," which uses third-party data to determine who you say you are in order to access services through .gov.uk

Brazil has had its recent challenges. Prior to these challenges and throughout them, all administrations remained committed to disclosing detailed information about federal spending — and giving citizens a clear view of their tax dollars in action.

Given that governments are beginning to understand the impact of design thinking, it is not surprising that they are paying particular attention to the areas in which it is applied, one being fintech. Government support,

 $^{^{\}rm 5}$ Richter, F., 2016, "The cost of making the iPhone X," Statista, November 16, https://bit.ly/2A3Nkl0

especially in Australia, Canada, Hong Kong, Singapore, South Korea, China, the U.K., and U.S., is through regulators and industry associations. Singapore's Monetary Authority hosts the world's largest fintech festival in November with over 500 start-ups from over 40 countries.

Institutions that are adopting design thinking will retain their clients and gather more.
Those that do not will become extinct.

4. ADOPTING DESIGN THINKING IN FINANCIAL SERVICES

Companies such as PayPal, WoldRemit, WeChat, FWD, and Uber continue to challenge traditional thinking in retail financial and insurance services. In the wholesale financial market, companies such as Rippel may give Swift a run for their money. iRX is changing the wholesale insurance paradigm and companies such as Aquan/Zilliqa are providing platforms, reaching U.S.\$1 bln market capitalizations.

The history of these fintech companies is one of being outrageously disruptive and, in particular, embracing design thinking. Traditional financial services organizations are, therefore, endorsing the approach in order to be part of their clients' life as opposed to an unloved necessity. Examples include:

- One Singapore bank re-imagined their process of explaining products to clients, resulting in increased sales of its new investment product by 150%.
- A CIO of a global European bank defines innovation as a change in process and deploys design thinking to reduce costs by over 30%.
- An Australian insurance company increased profits by 35% by enabling interaction with clients to complete necessary tasks within 60 seconds.
- At a recent conference, Citibank suggested that it takes three years to build a mobile only bank. DBS took nine months to build one in India, which has over

1.2 million customers [Marous (2018)⁶]. Standard Chartered have announced they will build a digital bank in Hong Kong.

The problem statement for traditional financial services is around how to embed themselves in the client's daily life. To do so, they need to make delivering financial services not only fun but also seamless and subliminal, and embed it in customer journeys.

Consequently, financial services firms need a paradigm shift in understanding their clients, rapidly testing (and failing) products, and bringing the products to market within months. Everything the financial institution does now needs to have the client at the center and need to be continually evaluated by clients and personas. Success is having the customer availing themselves with the products and services provided without necessarily knowing that they are doing so. The product finds the clients when and where the client needs it. Within financial institutions, this requires a radical transformation in processes, controls, regulation, protection, technology, and delivery.

The manner in which financial institutions organize to deliver (and fail) rapidly varies. In all cases, financial institutions adopt a design thinking approach:

- Customers are continually surveyed by their current interactions with the financial intuitions (whether branches, agents visiting, online, or mobile), as well as directly through discussions. Their aspirations and challenges need to be understood and problem statements need to be formulated and personas developed.
- Teams involving people from all disciplines including user experience-experts, process, and support are assembled to come up with several ideas and to understand how these will affect the customer through developing several customer journeys.
- A prototype of the opportunities that will have the most impact is then developed in days or weeks and the user-experience is assessed. One or more opportunities are then agreed upon to be delivered as a product.
- The team is expanded to deliver continuously (at least daily), releasing features, and assessing the released features against the persona, clients, and those affected. Where the features are not well received, the user-experience is captured, adapted with the persona, and the change delivered immediately.

⁶ Marous, J., 2018, "How long should it take to build a digital bank?" The Financial Brand, https://bit.ly/2FCgDM1



5. THE IMPACT OF DESIGN THINKING ON FINANCIAL SERVICES

Institutions that are adopting design thinking will retain their clients and gather more. Those that do not will become extinct.

Banks are continually redesigning their branches. Now they are doing so for the customer experience instead of for throughput and staff efficiency/metrics. This has even developed into different brands, such as Frank by OCBC in Singapore for certain demographics. Other demographics want the social experience of being in the branch with the banker coming to them and delivering their transactions; for example, a cash withdrawal over a cup of coffee. Each branch can be different to cater for the local demographic they serve. The revamping of the branch takes weeks instead months.

The use of smart phones is where the impact of design thinking has been most pronounced for financial services. Not only are the traditional providers being challenged, they have technical debt that inhibits them to move quickly. Furthermore, traditional providers think like and have regulated processes of traditional providers. Their transformation has to be radical in technology, manner of organization, use of data, and delivery.

The adoption of design thinking techniques is not an option for financial services, it is a must. The landscape is changing rapidly and they need to adapt.

Copyright © 2018 The Capital Markets Company BVBA and/or its affiliated companies. 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 investment management, and finance, risk & compliance. We also have an energy consulting practice. We serve our clients from offices in leading financial centers across the Americas, Europe, and Asia Pacific.

To learn more, visit our web site at www.capco.com, or follow us on Twitter, Facebook, YouTube and LinkedIn.

WORLDWIDE OFFICES

APAC	EUROPE	NORTH AMERICA
Bangalore	Bratislava	Charlotte
Bangkok	Brussels	Chicago
Hong Kong	Dusseldorf	Dallas
Kuala Lumpur	Edinburgh	Houston
Pune	Frankfurt	New York
Singapore	Geneva	Orlando
	London	Toronto
	Paris	Tysons Corner
	Vienna	Washington, DC
	Warsaw	
	Zurich	SOUTH AMERICA São Paulo

WWW.CAPCO.COM









