



COMMUNIQUÉ

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COMMUNICATING INFORMATION TO AND AMONG PIAC MEMBERS

向 PIAC 成员传达信息以及成员之间的信息交流

The Evolution of the Custody Business A Canadian Perspective

托管业务的演变

一个加拿大视角



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The Evolution of the Custody Business A Canadian Perspective - Part I of II

COMPILED BY PIAC COMMUNIQUÉ COMMITTEE MEMBERS **BETSY SPRINGER**, PIAC HONOURARY MEMBER, AND **STEVE MAHONEY**, CHIEF INVESTMENT OFFICER, NOVA SCOTIA PENSION SERVICES CORPORATION

Introduction

As with almost every industry, even the largest organizations recognize they lack the scale and resources to be the very best at everything for which they are ultimately accountable.

Pension plan sponsors are accountable for a huge swath of risks and activities, which can make it easy to overlook or take for granted the role that specialized, reliable, high-scale providers like custodians play in carrying out investment and pension operations. The sound foundation of custody helps pensions keep assets safe, carry out transactions by the millions, and enables an array of other services that help pension plans deliver on their missions.

The core purpose of pension plans is to provide greater certainty for members in retirement. The certainties available to those investing pension assets are few and far between: Increasing complexities; quickly shifting markets; new demands from stakeholders; and growing expectations from Boards. Likewise, geopolitical risks, shifting demands around ESG, and myriad new technologies. Canadian pension plan sponsors rightly feel like they can't do everything for everyone at the pace increasingly demanded, and indeed they should not *do* all the things for which they are accountable.

A custodian helps uphold the foundation of trust, resilience and sound execution of investments across global markets. A custodian plays a vital role in pension and investment activities, including holding assets in trust in segregated accounts,

supporting trade execution with managers, to opening new markets and delivering complex multi-asset-class and multi-currency accounting. Many plans even choose to rely on custodians for what is perhaps the most important task of all: the delivery of pension payments to retirees.

PIAC invited senior executives of four major custody firms and two consulting firms to provide their insights on the evolution of the custody business, key changes and developments, and the issues that will define superior custody services going forward.

This issue of Communiqué will look at the evolution of the custody business over the last few years, and technological advances. The Winter edition of the newsletter will continue the discussion and focus on ESG issues affecting custodians and asset owners, and the impact of private assets on custody services.

How has the custody business evolved over the last few years? - What the Custodians Say

Robert Baillie, State Street

In a word: innovation. At State Street, we've been honing our asset servicing expertise since being named custodian of the first US mutual fund in 1924. We dropped the label of "traditional custody bank" years ago and today are focused on innovations that benefit not just asset owners but the financial services industry at large.

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托管业务的演变 加拿大视角——上篇（共两篇）

由 PIAC 公报委员会成员贝齐·斯普林格（PIAC 名誉成员）与史蒂夫·马霍尼（新斯科舍省养老金服务公司首席投资官）编撰

介绍

与几乎所有行业一样，即便是最大型的机构也承认，它们缺乏足够的规模和资源来在其最终负责的所有领域做到尽善尽美。

养老计划发起人需对大量风险和活动负责，这很容易让人忽视或将专业、可靠且具备大规模能力的服务提供者（如托管人）在执行投资和养老运营中所扮演的角色视为理所当然。稳健的托管基础有助于养老金保持资产安全、执行数以百万计的交易，并支持一系列其他服务，帮助养老金计划实现其目标。

养老计划的核心目的在于为成员的退休生活提供更大的确定性。对养老金投资者而言，可获得的确定性屈指可数：日益复杂的环境；迅速变化的市场；来自利益相关者的新需求；以及董事会不断增长的期望。同样还有地缘政治风险、围绕 ESG 的不断变化的要求以及各种新技术。加拿大的养老计划发起人理所当然地感觉自己无法以日益被要求的速度为所有人做所有事，而且事实上他们也不应当承担所有那些他们被要求负责的事务。

托管机构有助于维护跨全球市场的投资的信任基础、韧性和良好执行。托管机构在养老和投资活动中发挥着至关重要的作用，包括以受托方式在隔离账户中持有资产。

支持与管理人的交易执行，开拓新市场，并提供复杂的多资产类别和多币种会计服务。许多计划甚至选择依赖托管机构来完成或许是所有任务中最重要的一项：向退休人员发放养老金。

PIAC 邀请了四家主要托管公司和两家咨询公司的高级管理人员，分享他们对托管业务演变、关键变化与发展以及未来定义卓越托管服务的问题的见解。

本期通讯将回顾过去几年托管业务的发展及技术进步。冬季版通讯将继续讨论，并聚焦影响托管机构和资产所有者的 ESG 问题，以及私有资产对托管服务的影响。

托管业务在过去几年如何演变？——托管行的看法

罗伯特·贝利，州街银行

一句话：创新。自从 1924 年被指定为首批美国共同基金的托管行以来，州街银行一直在打磨我们的资产服务专业能力。多年前我们就不再称自己为“传统托管银行”，今天我们专注于那些不仅对资产所有者有利、也能惠及整个金融服务行业的创新。

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委员会主席 西瓦·奈杜, 加拿大邮政

The Evolution of the Custody Business

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Meet the Contributors**The Custodians**

ROBERT BAILLIE
PRESIDENT AND CHIEF
EXECUTIVE OFFICER,
STATE STREET CANADA



KATIE PRIES
PRESIDENT AND CEO,
NORTHERN TRUST
CANADA



EDWINA EASTON
MANAGING PARTNER,
AMACES, LLC.



JEFF ALEXANDER
MARKET EXECUTIVE,
ATLANTIC & CUSTODY
PRACTICE LEAD,
TELUS HEALTH



CLAIRE JOHNSON
CEO,
RBC INVESTOR SERVICES



RICHARD ANTON
CHIEF CLIENT OFFICER,
CIBC MELLON

托管业务的演变

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与撰稿人会面**托管人**

罗伯特·贝利
总裁兼首席
执行官，
加拿大州街银行



凯蒂·普里斯
总裁兼首席执行官，
北方信托
加拿大



克莱尔·约翰逊
RBC 投资者服务 公司首席执
行官



理查德·安东
首席客户官，加拿大帝国商
业银行梅隆 (CIBC Mellon)

顾问

埃德温娜·伊斯顿
管理合伙人，
AMACES 有限责任公司。



杰夫·亚历山大
市场执行官，
大西洋区与托管
业务主管，
TELUS HEALTH

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Perhaps the best illustration of this is the front-to-back platform. Integrating front-, middle-, and back-office processes can create real efficiencies by eliminating manual touchpoints, thereby enabling automation to reduce the costs and risks inherent in the investment process. Such a platform provides greater transparency from the front office into the back office intraday data, which also leads to more informed investment decisions. Underpinned by a robust data strategy and the cloud, the way asset owners use their investment data is transformed. Traditional data stores will be able to come together in an intuitive way to reduce time spent on reconciliation, reporting and oversight analysis.

For Canadian asset owners – whether you manage assets in-house, externalize asset management or run a hybrid program – the use of data is important. Data enrichment and orchestration brings clients curated and more available data to manage risk and performance, understand exposures and better manage asset allocation and capital deployment.

Claire Johnson, RBC Investor Services

Today's asset owners and managers face a world in which technology and data reign supreme. Settlement timeframes have contracted, placing increased demands on our clients' operations teams. Not only are they dealing with shorter settlement windows and a dramatically changed physical environment, but cyber security and emerging technologies such as artificial intelligence are continuing to change the landscape.

In step with this renaissance, custodians have transformed their business models by automating and streamlining repetitive processes. This has taken place as owners and managers alike confront a long list of challenges, including rising costs, changing regulatory requirements and more stringent governance considerations, combined with

"As data takes its place as the 'new gold,' asset owners and managers are looking to their custodians—the guardians of this valuable asset—to provide timely (generally real time) access to a consolidated view of their data that often resides across disparate platforms."

- Claire Johnson, RBC Investor Services

various analytics services.

Additionally, custodians are being called on to facilitate the rising globalization of investments. As investors look to diversify their portfolios and enhance performance, asset servicers are designing products that align with new types of assets like private capital, digital assets, and environmental, social and governance (ESG) investing. More and more, custodians are responding to a world of cyber security, generative artificial intelligence, cloud computing and blockchain.

As data takes its place as the "new gold," asset owners and managers are looking to their custodians—the guardians of this valuable asset—to provide timely (generally real time) access to a consolidated view of their data that often resides across disparate platforms. They expect this data to be curated, validated and available via the channel of

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托管业务的演变

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或许对此最好的说明就是端到端平台。整合前台、中台和后台流程可以通过消除人工交互点来创造真正的效率，从而使自动化能够降低投资过程中固有的成本和风险。这样的平台使前台能够获得更多后台日内数据的透明度，这也有助于做出更有依据的投资决策。在稳健的数据策略和云的支持下，资产所有者使用其投资数据的方式将发生变革。传统的数据存储将能够

加之持续的市场波动和政治紧张局势。

资产服务机构传统上专注于基本的托管服务，如保管、结算、公司行为等。然而，客户今天也在评估服务提供商是否能理解客户需求并以敏捷的方式完成工作。托管行正被评估其在提高效率和降低风险方面的能力，同时保持对客户服务的高度关注并提供一系列互补的解决方案，包括证券借贷、外汇和现金管理。

而且，这一切必须在一个具有弹性且可扩展的数字运营模式下进行。

投资者也在向其托管行施压，要求将服务从“后台”扩展到“中台”，作为外包趋势的一部分。因此，托管行正承担诸如抵押品管理、交易管理、公司行为管理、投资账簿记录

(Investment Book of Records) 与会计账簿记录 (Accounting Book of Records) 等职能，以及

“随着数据成为‘新黄金’，资产所有者和管理者正期待其保管人——这一珍贵资产的守护者——提供及时（通常为实时）访问其汇总数据的能力，而这些数据往往分布在不同的平台上。”

- 克莱尔·约翰逊，RBC 投资者服务

克莱尔·约翰逊，RBC 投资服务

当今的资产所有者和管理者面临一个由技术和数据主导的世界。结算时间窗口已缩短，这对我们客户的运营团队提出了更高的要求。他们不仅要应对更短的结算周期和显著变化的实体环境、网络安全和诸如人工智能等新兴技术也在不断改变格局。

与这一复兴同步，托管机构通过对重复性流程进行自动化和简化，转变了其业务模式。这一转变发生在所有者和管理者共同面对一长串挑战之时，包括成本上升、监管要求变化以及更严格的治理考量

各种分析服务。

此外，托管人还被要求促进日益全球化的投资。随着投资者寻求分散投资组合并提高绩效，资产服务商正在设计与新型资产相匹配的产品，例如私募资本、数字资产以及环境、社会和治理 (ESG) 投资。托管人越来越多地应对网络安全、生成式人工智能、云计算和区块链等领域的挑战。

随着数据成为“新黄金”，资产所有者和管理者正在寻求他们的托管人——这一珍贵资产的守护者——提供及时（通常为实时）访问其数据的能力，这些数据通常分散存在于不同的平台上。他们期望这些数据被整理、验证并通过

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their choice. This is necessitating asset servicers to make significant investments in emerging technologies to meet the growing demands of their clients.

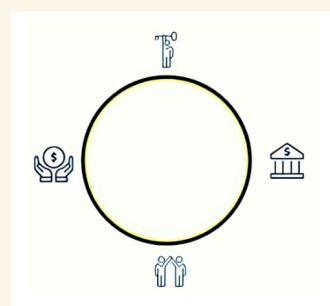
The continued transformation of custodians within today's chaotic world is essential to the future success of investors. Advanced technology and data are central to the new order. However, the safety and security of client assets remain the principal focus of asset servicers—even in today's digital world. A combination of strength, stability and getting the basics right is key to the custodial role.

Katie Pries, Northern Trust Canada

The custodian's role continues to evolve, still very much built on the foundation of providing core services to the investor community. At a high level, the custodian connects and administers a complex and diverse global operating model, which has evolved to support the full investment lifecycle, from the client's investment team to the back office.

Custodians are contributing to solving their clients' needs in ways that were not available two decades ago. If they get it right, custodians are seen less as back-office providers, and more as key partners in the development of more efficient middle and front office services. The ability to integrate and customize means we can provide the core financial data to the client's entire operation (their "Whole Office") for a better operating model with fewer silos or bottlenecks.

What is a Custodian?



A custodian holds customers' securities for safekeeping

There are two types of custodians in Canada: Investment brokerage firms and trust companies

Trust companies do not rehypothecate assets (versus fractional reserve banking). They hold each client's assets in segregation from other clients.

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他们的选择。这促使资产服务商在新兴技术上进行大量投资，以满足客户日益增长的需求。

在当今混乱的世界中，托管机构的持续变革对于投资者未来成功至关重要。先进的技术和数据是新秩序的核心。然而，即便在当今的数字化世界中，客户资产的安全仍然是资产服务商的主要关注点。实力、稳定性与做好基础工作的结合，是托管角色的关键。

凯蒂·普里斯 (Katie Pries)，北方信托加拿大

托管人的角色仍在不断演进，但仍以为投资者群体提供核心服务为基础。从高层来看，托管人连接并管理着一个复杂且多样化的全球运营模式，该模式已发展到支持完整的投资生命周期，从客户的投资团队到后台办公室。

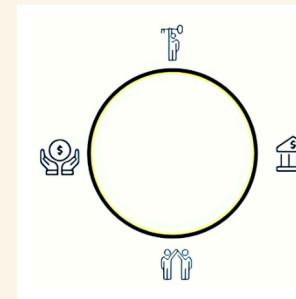
托管人正在以二十年前无法实现的方式，帮助解决客户的需求。如果他们做得好，托管人将不再被视为仅仅是后台服务提供者，而是成为在开发更高效的中台和前台服务方面的关键合作伙伴。整合和定制的能力意味着我们可以向客户的整个业务（其“全办公室”）提供核心金融数据，从而实现更多孤岛或瓶颈的更佳运营模式。

技术创新已成为关键焦点。该行业可以在与数字市场相关的资产服务解决方案开发中发挥关键作用，并在配置传统资产类别时投资数字资产。在各类资产中，全球托管人正超越其传统角色，提供部署人工智能 (AI)、云计算、数据分析和区块链技术的运营和投资组合监督服务。技术将继续改善自动化，减少人工干预，并为机构投资者提高速度、透明度和洞察力。

在这种环境下，专业知识和客户服务仍然至关重要。无论是理解不同市场中 T+1 结算的全球影响，还是为支持客户流动性管理需求寻找创造性且有效的方法，或是评估人工智能的潜力，都需要运用专业知识并与客户紧密合作，以最大化我们所提供的价值。

尽管市场要求资产服务提供商具有创新性和创造力，我们仍持续在业务各方面投资于安全性、弹性和效率，从而在各种市场状况下提供运营效率和高质量服务。

什么是托管人？



托管人保管客户的证券以确保安全

在加拿大有两类托管人：
投资经纪公司和信托公司

信托公司不进行再质押资产（与部分准备金银行不同）。他们将每位客户的资产与其他客户的资产隔离存放。

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The Evolution of the Custody Business

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The industry has been in an era of digitization and technological disruption for a decade. New technologies are taking over with amazing speed – no easy task for a heavily regulated industry with a large, complex technology stack already in place.

Richard Anton, CIBC Mellon

In recent years, the custody business has undergone a profound transformation. Gone are the days when custodians carried out ownership changes of physical stock certificates locked in vast underground vaults or helped investors initiate trades by phone. Today's modern custodian is a key inflection point for investment operations and technology, connected to a broad array of capabilities

and providers as part of a growing ecosystem.

Custodians continue to deploy billions of investment dollars into advancing technology designed to help investors access, use and action their data faster. Even as global market complexity has risen, custodians have focused on strengthening safeguards and relationships across the world's markets, helping investors confidently access global opportunities.

The business of custody continues to see transformation over the decades, with operating models evolving into a complex ecosystem of interconnected functions, encompassing everything from securities lending to fund administration.

托管业务的演变

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过去十年来，该行业一直处于数字化和技术颠覆的时代。新技术以惊人的速度取代旧有模式——这对一个监管严格且已建立起庞大而复杂技术栈的行业来说，并非易事。

理查德·安东, CIBC Mellon

近年来，托管业务经历了深刻的变革。过去那些托管人在巨大的地下金库中保管实物股票凭证并办理所有权变更，或通过电话帮助投资者发起交易的日子已经一去不复返。今天的现代托管人是投资运营和技术的关键转折点

Why do Investors Use a Custodian?

Safe-keep assets: Custodians hold assets "in trust," even as investment managers make investment decisions, the custodian moves funds and transfers ownership of securities to "settle" trades.

Service assets: Custodians are responsible for gathering the economic benefits of investment activities, such as processing corporate actions, collecting income such as dividends and voting proxies on behalf of shareholders.

Valuation and accounting: Multi-currency accounting for complex calculations to value assets including across 100 markets and in many currencies at once to give investors and their managers a clear picture of their holdings.

Scale and efficiency: Custodians are specialized, efficient and able to operate with a high degree of scale. CIBC Mellon has more than \$2 trillion of assets under administration. BNY's scale is global, administering more than USD \$49.5 trillion dollars. Scale allows custodians to amortize costs and deliver services more cost efficiently on a per-unit scale.

Value-added services: Holding assets in custody, as well as the associated scale and data, means that custodians can add additional offerings such as:

- Securities lending and other markets offerings to generate additional revenue for pensions.
- Investment data and reporting capabilities to help pensions better manage and oversee data
- Data delivery solutions to enable clients to transfer or optimize technology operations.
- Pension benefit payment services to deliver income to plan retirees.
- Outsourced call centres, and much more.

Typically, custodians also aim to deliver an array of market data and thought leadership to support clients as they navigate markets, as well as engage with relevant market utilities and industry groups to support the advancement of the industry.

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投资者为什么使用托管机构？

资产保管: 托管人以“受托”方式持有资产，即使投资经理做出投资决策，托管人也负责调动资金并转移证券所有权以完成交易结算。

服务资产: 托管人负责收集投资活动的经济收益，例如处理公司行为、收取股息等收入并代表股东投票委托书。

估值与会计: 多币种
考虑到复杂的计算以对资产进行估值，包括同时跨越 100 个市场和多种货币，以便为投资者及其管理者清晰呈现其持有情况。

规模与效率: 托管行是专业化、高效并能够在高度规模化的情况下运作。CIBC Mellon 管理的资产超过 2 万亿美元。BNY 的规模遍及全球，管理的资产超过 49.5 万亿美元美元。规模使托管行能够摊销成本并以更低的成本提供服务。

在每单位规模上高效地运作。

作为日益壮大的生态系统的一部分，现代托管人与各种能力和服务提供者相连。托管人持续投入数十亿美元推进技术，以帮助投资者更快地访问、使用并执行其数据。即便在全球市场复杂性上升的情况下，托管人仍致力于加强全球市场间的保障措施和关系，帮助投资者自信地把握全球机遇。

托管业务在数十年间持续发生变革，运营模式演变为一个由互联功能组成的复杂生态系统，涵盖从证券借贷到基金管理的一切。

增值服务: 持有资产于托管以及相关的规模和数据，这意味着托管人可以增加诸如以下的额外服务：

- 证券借贷及其他市场产品，为养老金创造额外收入。
- 帮助养老金更好地管理和监督数据的投资数据与报告能力
- 支持客户迁移或优化技术运营的数据交付解决方案。
- 向计划退休人员发放收入的养老金福利支付服务。
- 外包呼叫中心，以及更多服务。

通常，托管机构还旨在提供一系列市场数据和专业见解，以在客户应对市场变化时提供支持，并与相关市场机构和行业团体进行合作，推动行业发展。

The Evolution of the Custody Business

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Where an accountant once derived a net asset value by individually checking each price for an underlying security, modern custody processes involve sophisticated pricing engines, technical workflow platforms and extensive automated controls to keep pace with complex modern markets and instruments in support of both high scale and high capacity. The vast scale of custodians has enabled a shift towards a more holistic approach to custody, where providers offer integrated solutions that go beyond traditional safekeeping and asset servicing. This comprehensive suite of services enables custodians to add greater value to their client's investment strategies, driving efficiencies and enhancing overall performance.

The rapidly growing sophistication of clients and even the expansion of pension investment teams around the world has created new requirements and opportunities – for example, data platforms that can enable pensions to access an “investment book of record” or IBOR that provides a “golden record” standard for multiple teams to understand holdings. Accessing intraday cash data or allowing teams in multiple markets to “follow the sun” with accurate start of day cash across multiple markets are helping pension investors further optimize their activities.

How has the custody business evolved over the last few years? - What the Consultants Say

Edwina Easton, Amaces

Over the last few years, the global custody business has been evolving, not only in how it delivers core services but also in the breadth of services it provides. Custodians have been investing in technology or developing strategic partnerships with Fin Techs to streamline and automate processes as well as to create “value added” services that institutional clients often need but haven’t historically been associated with core custody.

The cornerstone of a global custodian is to safeguard and value a client’s assets. They ensure the oversight of this critical service through two primary pillars – people and technology.

From a people perspective, we have seen an increase in attrition across the industry in the last 2-3 years, likely due to custodians offering more flexible working arrangements

widening the employer market for key talent. Custodians are combatting this by implementing talent management strategies such as appointing a Chief Talent Officer to help attract and retain key personnel. From a technology perspective, core capabilities for securities movement are largely unchanged with some of the investment dollars focused mostly on risk management and cyber security given the increase in cyber-crimes across all industries.

The evolution of global custodians is most prevalent in their expanded capabilities for “value-added” services, such as performance measurement, risk analytics, compliance monitoring, alternatives administration, and PAN-asset class reporting. Just looking at the evolution of these value-added services, we are seeing the global custodians continuously enhance their infrastructure or create strategic partnerships with other technology firms to be able to offer these services.

Jeff Alexander, TELUS Health

Historically, the custody business was static, without much difference between the Custodians. Regulatory environments were straightforward, and the business did not change materially. There was some consolidation, but generally the industry did not change very much. Frankly, custody was not sexy!

That was then, this is now! The custody business has faced serious headwinds in recent years, marked by challenges in global market conditions, tighter regulations in many countries that must be adhered to, increased client demands and increased costs. These changes have come as custody is perceived to be a commoditized business. This has driven a shift among the Custodians towards technological enhancements, client empowerment and customization, and expansion of service offerings to create a sustainable path forward. Technology has played a key role in streamlining operations, reducing costs, and increasing efficiency.

Additionally, there has been a growing emphasis on risk management and compliance to meet evolving regulatory requirements and ensure the safety of client assets. Overall, Custodians have been asked to elevate their role in the global marketplace as the gatekeepers of information, while providing more services in a technology-friendly way.

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曾经会计师通过逐一核对每一种基础证券的价格来计算净资产价值，而现代托管流程则采用复杂的定价引擎、技术化的工作流平台和大量自动化控制，以跟上复杂的现代市场和工具，从而支持高规模与高容量。托管机构的巨大规模促使托管业务转向更整体的方式，供应商提供超越传统保管和资产服务的一体化解决方案。这一综合服务套件使托管机构能够为客户的投资策略增添更大价值，提高效率并增强整体绩效。

客户日益增长的复杂需求，甚至全球养老金投资团队的扩张，催生了新的需求和机遇——例如，能够让养老金访问“投资记录簿”(IBOR)的数据平台，为多个团队提供理解持仓的“黄金记录”标准。获取日内现金数据或允许多个市场的团队以“日不落”方式在各市场获得准确的开市现金，有助于养老金投资者进一步优化其活动。

这很可能是因为托管机构提供了更灵活的工作安排，扩大了关键人才的雇主选择范围。托管机构通过实施人才管理策略来应对这一问题，例如任命首席人才官以帮助吸引并留住关键人员。从技术角度讲，证券流转的核心能力在很大程度上保持不变，部分投资更多地集中在风险管理与网络安全上，因为各行各业的网络犯罪活动有所增加。

全球托管行的发展最显著体现在其“增值”服务能力的扩展，例如绩效衡量、风险分析、合规监控、另类资产管理以及跨资产类别报告。仅从这些增值服务的发展就可见一斑，全球托管行不断增强自身基础设施或与其他科技公司建立战略合作，以便提供这些服务。

杰夫·亚历山大, TELUS Health

历史上，托管业务相对静态，各托管行之间差异不大。监管环境比较简单，业务并未发生实质性变化。虽然有一定的整合，但总体上行业变化不大。坦白说，托管业务并不吸引人！

那是过去，现在不同了！近年来，托管业务面临严重逆风，表现为全球市场状况的挑战、许多国家更为严格的监管必须遵守、客户需求增加以及成本上升。这些变化发生在托管被视为商品化业务的背景下。这推动了托管行向技术增强、赋能客户与定制化以及扩展服务范围的转变，以创造可持续的发展路径。技术在简化操作、降低成本和提高效率方面发挥了关键作用。

此外，人们越来越重视风险管理与合规，以满足不断变化的监管要求并确保客户资产安全。总体而言，托管行被要求提升其在全球市场中的角色，作为信息的守门人，同时以技术友好的方式提供更多服务。

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The broadening of their scope and technological investment has allowed Custodians to look at solutions that position them to be at the heart of their client's day to day activities – from the back office to the front office and everything in-between.

The drive by Custodians towards cost efficiency and pushing clients to a more self-service model has not been perfect, to say the least. As custody consultants, we have seen some Custodians struggling to adapt to the constant change – and the service levels to their clients have been impacted materially.

All of this change has meant that there is a big difference now among the Custodians in service levels, capabilities to support clients, and responsiveness. Something as simple as the dollar spent on client facing technology structure varies wildly among the Custodians. The spend in technology among the leading Custodians is eye-watering compared to some that are lagging behind. The investment is needed to accommodate everything going on in their environment. This is a far cry from the days of being looked at as simply a vehicle to clear trades and safekeep assets.

The custody business model has undergone significant changes over the last couple of decades, marked by a shift towards offering a wider range of services and a move into some spaces traditionally not in their purview. This has been driven by both client needs and the need for additional revenue streams, as margins for pure custody and pensioner payments has been squeezed.

Custodians can no longer rely on some of their core functions bringing in margins that are profitable enough. This led them to urgently look at ways to lower costs in their business through various means.

Offshoring various functions including accounting, tax form support, and technology support was a focus, similar to many other industries. Because much of what Custodians

"Overall, Custodians have been asked to elevate their role in the global marketplace as the gatekeepers of information, while providing more services in a technology-friendly way."

-Jeff Alexander, TELUS Health

do is based on raw data and numbers, they have been able to place more of these functions in lower cost jurisdictions than some similar industries.

Capital markets activities such as securities lending, foreign exchange trading, short term investment funds, etc. are still quite lucrative but margins are lower than they used to be. Some Custodians have leveraged their colleagues from the capital markets teams within the banks to create synthetic products that fill various needs for asset owners, and this is an additional revenue stream for Custodians.

Additionally, the integration of technology has transformed custody operations, with the introduction of digital platforms for real-time access to investment information and the automation of routine tasks. These changes reflect a more client-centric approach, with Custodians focusing on customization and transparency to meet the evolving needs of their clients. This self-service

model for clients also lowers the costs for Custodians. However, there is a fine line to where this approach impacts service to clients. This will continue to be an area for asset owners to monitor. In the end, this is still a service business and custody clients need support quickly and efficiently from someone they consider a key partner to their business.

What technological advances have you seen in the business? (Is AI a big focus, what is required, table-stakes, etc.) - What the custodians say

Robert Baillie, State Street Canada

Generative AI and deep learning algorithms can generate insights that help drive returns, accelerate operational efficiency across the middle and back office, and improve the customer experience with self-service tools. AI applications can improve the efficiency of data operations teams tasked with validating investment data. The results of work on domain-agnostic, deep learning is compelling.

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他们业务范围的拓展和在技术上的投入，使托管人能够寻求将自己置于客户日常活动核心的解决方案——从后台办公室到前台以及两者之间的一切。

保管行为了提高成本效益并推动客户更倾向于自助模式所做的努力，至少可以说并不完美。作为托管咨询顾问，我们看到一些保管行在适应不断变化方面举步维艰——以及对其客户服务也受到了影响。

由于托管机构的大部分工作基于原始数据和数字，它们能够比一些类似行业将更多此类职能安置在成本较低的司法管辖区。

资本市场活动如证券借贷、外汇交易、短期投资基金等仍然相当有利可图，但利润率已不若从前。一些托管行利用银行内资本市场团队的同事，开发出能满足资产所有者各种需求的合成产品，而这

成为托管行的额外收入来源。

已受到重大影响。

所有这些变化意味着各托管行在服务水平、支持客户的能力和响应速度方面现在存在巨大差异。用于面向客户的整体而言，托管机构需要满足客户的需求。托管行专注于客户的服务质量，从而降低了托管行的成本。

此外，技术的整合已经改变了托管业务运营，引入了用于实时获取投资信息的数字平台并实现了常规任务的自动化。这些变化反映了更以客户为中心的做法，托管行专注于客户的服务质量，从而降低了托管行的成本。

托管行在技术上投入与那些落后者相比令人大为惊讶。这些投资是必要的，这与过去那种仅被视为清算交易和保管资产工具的时代大相径庭。

然而，这种做法与客户服务质量和成本之间存在一条细微界限。资产所有者将继续对此保持关注。归根结底，这仍然是一个服务型行业，托管客户需要来自他们视为业务关键合作伙伴的快捷迅速而高效的支持。

您在业务中看到了哪些技术进步？（人工智能是否是重点，需哪些条件，基本要求等）——托管人怎么说

罗伯特·贝利, State Street Canada

生成式人工智能和深度学习算法能够产生有助于推动回报的洞见、加速中后台的运营效率，并通过自助工具改善客户体验。人工智能应用可以提高负责验证投资数据的数据运营团队的效率。关于与领域无关的深度学习的研究成果令人信服。

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While traditional rules-based validation methods flagged over 31,000 data exceptions across a six-month period (of which there were only 250 true exceptions), AADQ our prototype identified only 4,000 exceptions while discovering one hundred percent of the true exceptions.

The massive reduction in false positives translates into a 25-fold productivity gain for data ops teams tasked with investigating each exception as a potential error. The ability to build AI models in-database rather than running SQL extracts significantly accelerates the productivity of data science teams and their ability to add greater value across the modelling process.

This is important because in a world where our Canadian asset owners are investing across more asset classes, geographies, strategies and structures than ever before, an exception-based approach built on advanced technology is going to be crucial to minimizing disruption and delivering value-added service to the industry.

Industry participants need to be focused on advanced technologies and how these forms of technology can be deployed to help reduce costs, save time and lower risk within the investment life cycle. The intent of advanced tech deployment is that these efficiencies can be leveraged by the clients through the solutions that we provide to them.

Ultimately, our aim is to allow our clients to focus on running and growing their own businesses and trust in our ability to excel at the service delivery. In being a trusted outsourcing partner, we don't just want to mirror what our clients did or are doing – we want to excel and add business value. By future-proofing the business with next-gen technology, the expectation is that we can grow our current and future partnerships within Canada.

Claire Johnson, RBC Investor Services

Asset servicers, as the guardians of highly valuable client data, are investing in emerging technology solutions to

build operating models that deliver data quality, integrity and security. It's all about looking at portfolios through a data lens—part of the data transformation journey, including modern platforms that are being integrated with core operational systems.

This technology investment is designed to provide clients with access to structured, intelligent data via the channel of their choice, including traditional core reports with scheduled delivery; self-serve access to raw data; automated

delivery of raw data through tools such as Application Programming Interfaces (APIs) and Secure File Transfer Protocols (SFTPs); and self-serve access to pre-canned reports with built in insights.

The result is more informed decision-making, improved oversight and enhanced performance of pension plans. For example, pensions are finding it easier to meet stringent requirements around Board

reporting and risk management. As larger plans establish offices in various locations across the globe, the need for timely, easy access to reliable data becomes increasingly vital. Improved access is particularly important to the more sophisticated pension plans and OCIOs, who interact with multiple custodians and are no longer willing to log onto a portal to access their data.

A vast pool of RBC employees is focusing on emerging technologies, including generative artificial intelligence (AI), blockchain and cloud computing. We consider this to be a core competency. In our view, AI is one of the most transformative technologies impacting the world today with the potential to make things better for our clients.

Katie Pries, Northern Trust Canada

Clients increasingly see technology and data as the key to achieving their goals – to the point that it can be the deciding factor in their choice of providers. We are focused on continually enhancing our global platform, with

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而传统的基于规则的校验方法在六个月期间标记了超过 31,000 个数据异常（其中只有 250 个是真正的异常），我们的原型 AADQ 只识别出 4,000 个异常，同时发现了 100% 的真实异常。

误报的大幅减少意味着负责将每个异常视为潜在错误进行调查的数据运营团队的生产力提高了 25 倍。能够在数据库内构建 AI 模型，而不是运行 SQL 提取，显著加快了

正在投资新兴技术解决方案，以构建能够提供数据质量、完整性和安全性的运营模式。关键在于通过数据视角审视投资组合——这是数据转型旅程的一部分，包括与核心运营系统集成的现代平台。

该技术投资旨在通过客户选择的渠道为其提供结构化、智能化的数据访问，包括带有定期交付的传统核心报告；自助访问原始数据；自动化

通过诸如应用程序编程接口 (APIs) 和安全文件传输协议 (SFTPs) 等工具传送原始数据；以及可自助访问带有内置洞见的预设报表。

“客户越来越把技术和数据视为实现目标的关键——以至于它们可能成为客户选择服务提供商的

其结果是决策更有依据、监督更到位以及养老金计划绩效得到提升。例如，养老基金在满足关于董事会报告和风险管理的 he 要求变得更加容易。随着大型养老计划在全球各地设立办事处，对及时、便捷获取可靠数据的需求变得愈发重要。对于那些与多家托管行合作、不再愿意登录门户网站来获取数据的更成熟的养老金计划和委外首席投资官 (OCIO) 而言，改进的数据访问尤为重要。

RBC 大量员工专注于新兴技术，包括生成式人工智能 (AI)、区块链和云计算。我们认为这是核心能力。在我们看来，人工智能是当今影响世界的最具变革性的技术之一，具有为客户创造更好体验的潜力。

凯蒂·普里斯，北方信托加拿大

客户越来越把技术和数据视为实现目标的关键——以至于它们可能成为选择服务提供商的决定性因素。我们一直专注于不断增强我们的全球平台、随

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our technology backbone enabling interoperability and optionality for different service models.

A lot of effort has been focused on making use of new tools that are available, like artificial intelligence, to automate processing and client service support.

Through use of the cloud, we are creating the ability to normalize disparate data sets from different applications and make all that data more easily available to clients via multiple channels.

Our technology strategy and vision will seek to seamlessly evolve our tech stack away from large, monolithic applications ("the custody system") to a microservices architecture of cloud-enabled components that can be organized and recombined to support different functions.

An effective data offering needs to take on data management and allow for the consolidation and normalization of data from multiple sources without the need for cumbersome upgrades and disruptions. We believe data-as-a-service product, can de-couple applications and data to deliver a data service that tailors to clients' specifications while addressing more complex client needs, such as geographical restrictions, security, variety of data dimensions and timeliness of data availability.

Richard Anton, CIBC Mellon

Technological innovation lies at the heart of the custody business's evolution. From cloud data platforms to artificial intelligence (AI) to blockchain technology, custodians are leveraging cutting-edge tools to streamline operations, enhance security, and deliver superior client experiences.

AI's implications for custody operations goes beyond automating tasks and uncovering insights from data; it also requires thoughtful focus on trust, governance, and security given the vast sums of both investor and investment information held by custodians as well as the rising urgency and complexity of requests for information. The idea that

"According to primary research from CIBC Mellon, 38% of large Canadian asset owners indicate long processing times, 22% report inconsistent data and 26% point to manual processes."

- Richard Anton, CIBC Mellon

22% report inconsistent data and 26% point to manual processes.

CIBC Mellon and our global enterprise are investing in technological capabilities to bring additional efficiency to our clients as they operate from and invest into Canada.

What technological advances have you seen in the business? (Is AI a big focus, what is required, table stakes, etc.) - What the consultants say**Edwina Eason, Amaces**

It is critical for the custodians to deploy resources and capital into new technologies to remain competitive, although we also recommend, they not lose sight of the core values they offer. Given the recent market, clients seek asset safety as well as a partner to help them solve for new industry challenges. Custodians must remain focused on providing quality client service, disciplined in ensuring asset safety, efficient transaction processing, and accurate valuation of a client's total book.

Once the people and technology are aligned, then a custodian will be ready to expand the relationship with their clients and be that strategic partner servicing all front, middle and back-office needs.

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我们的技术骨干，支持不同服务模式之间的互操作性与可选性。

大量精力已投入于利用诸如人工智能等新工具，以实现处理和客户服务支持的自动化。

通过使用云技术，我们正在构建能够对来自不同应用程序的各类数据集进行标准化的能力，并通过多种渠道更便捷地将所有这些数据提供给客户。

“根据 CIBC Mellon 的初步研究，38% 的大型加拿大资产所有者表示处理时间长且从报告到报告不一致，26% 指出存在手工流程。”

理查德·安东，CIBC Mellon

我们的技术战略和愿景将寻求将技术堆栈无缝地从大型单体应用（“托管系统”）演进为由云支持组件组成的微服务架构，这些组件可以被组织和重组以支持不同的功能。

一个有效的产品需要承担数据管理的职责，允许在无需繁重升级和中断的情况下整合并规范来自多源的数据。我们相信，“数据即服务”产品可以将应用与数据解耦，提供符合客户规范的数据服务，同时应对更复杂的客户需求，例如地理限制、安全性、数据维度的多样性以及数据可用性的时效性。

理查德·安东，CIBC Mellon

技术创新是托管业务演进的核心。从云数据平台到人工智能（AI）再到区块链技术，托管机构正在利用前沿工具来精简运营、增强安全性并提供更优质的客户体验。

人工智能对托管业务的影响不仅在于自动化任务和从数据中挖掘洞见：鉴于托管机构持有的大量投资者与投资信息，以及日益紧迫且复杂的信息请求，这还要求对信任、治理和安全进行审慎关注。

“不应由单一机构为所有客户做所有事”这一理念在托管领域同样显现，托管机构与科技巨头和灵活的金融科技公司签署联盟，帮助客户接入新能力，同时这些技术也在进一步重塑托管业务运营。

很明显，技术和创新既带来了新的需求和新的机会，也在机构投资者之间引发了一场军备竞赛。然而，资产所有者仍在努力解决阻碍他们获取所需及时信息的重大瓶颈。根据 CIBC Mellon 的初级研究，38% 的加拿大大型资产所有者表示处理时间过长，22% 报告数据不一致，26% 指出存在手工流程。

“根据 CIBC Mellon 的初步研究，38% 的大型加拿大资产所有者表示处理时间长且从报告到报告不一致，26% 指出存在手工流程。”

理查德·安东，CIBC Mellon

在该业务中你看到过哪些技术进步？（人工智能是否是重点，需具备哪些条件，哪些是入场门槛等）——顾问们的观点

Edwina Eason，Amaces

保管机构必须在新技术上投入人力和资本以保持竞争力，这一点至关重要，尽管我们也建议他们不要忽视所提供的核心价值。鉴于近期市场状况，客户既寻求资产安全，也寻求能够帮助他们解决新行业挑战的合作伙伴。保管机构必须继续专注于提供高质量的客户服务，严格确保资产安全、高效处理交易，并准确评估客户的整体账簿。

一旦人员与技术达成一致，保管机构就可以准备与客户扩大合作关系，成为为所有前台、中台和后台需求提供服务的战略合作伙伴。

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Jeff Alexander, TELUS Health

Technological advancements in our world have elevated expectations and the minimum standard of service. Online reporting capabilities, quality reporting on Alternatives, accommodating the shortened timelines for clearing trades, moving funds electronically, these are all now table-stakes for custody clients. Custody clients expect to have increased autonomy and control when using the Custodians digital platforms and self-service tools.

Interestingly, the Custodians were early adopters of AI and machine-learning to assist in back-office functions that were unseen by clients. This included various accounting tasks, clearing tasks, etc.

Custodians realized they have an immense amount of data on their systems, and if they can intake other data and have a method to build a reporting tool over top all this data to effectively mine it, they can become indispensable to their clients. Several custodians have taken this approach to create a “data lake” that can take inputs from virtually any source. The custodians then collate that data and report on it for clients. This could be quite useful to some asset owners and organizations.

Practical Innovation AI Predictive Analytics in Trade Settlement

A global custodian settles upwards of 100 million trades a year. Despite best efforts, trades sometimes end up settling late. Late settlement causes problems not only for our clients but for the market as a whole: the seller's funding of securities is inefficient, buyers don't have the securities they expected to be able to utilize, and market participants can face higher costs. With billions of dollars of capital locked up per day in late settling trades, the challenge was to predict the probability of a trade settling late in order to increase market efficiency and enable clients to save themselves time and extra expenses.

A predictive AI engine can uncover patterns and settlement predictions 24 hours before the intended settlement date, so

ESG reporting has been another area of development. Several custodians have built linkages to a myriad of vendors and captured all of that in their reporting structure. Some of this is quite sophisticated on the back end and the custodians hope to be able to support clients with this.

Closing Comments

Edwina Eason, Amaces

As an industry consultant we help our clients understand and measure asset safety and value for money. An important factor for all clients to consider when assessing the viability of a global custodian's ability to safekeep the assets is understanding ones' risk imbedded in the custody/trustee contract.

Clients should review their contract to understand the custodian's level of responsibility around subcustodian negligence and insolvency, liens, set-off, general liabilities, valuation, cash, foreign exchange, etc. If the main service a custodian provides is asset safety, then their commitment around these critical contract clauses must align with the client requirements. 

托管业务的演变

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杰夫·亚历山大, TELUS Health

我们这个时代的技术进步提高了客户的期望值和服务的最低标准。在线报告能力、对另类投资的高质量报告、适应缩短的交易结算时间表、电子转移资金，这些现在都已成为托管客户的基本要求。托管客户期望在使用托管行的数字平台和自助工具时拥有更高的自主权和控制权。

有趣的是，托管行很早就采用了人工智能和机器学习来辅助那些客户看不到的后台职能。这包括各种会计任务、清算任务等。

托管行意识到它们系统中拥有大量数据，如果能够接入其他数据并有方法在这些数据之上构建一个报告工具来有效地挖掘数据，它们就能对客户变得不可或缺。几家托管行采取了这种方法，创建了能够从几乎任何来源获取输入的“数据湖”。托管行随后将这些数据整理并为客户提供报告。这对一些资产所有者和机构来说可能非常有用。

ESG 报告是另一个发展领域。一些托管机构已经与众多供应商建立了联接，并将所有这些纳入其报告结构。其中一些在后端相当复杂，托管机构希望能够为客户提供这方面的支持。

结束语

Edwina Eason, Amaces

作为行业顾问，我们帮助客户理解并衡量资产安全性和物有所值。在评估全球托管机构保管资产能力的可行性时，所有客户需要考虑的一个重要因素是了解托管/受托合同中所嵌入的风险。

客户应审查其合同，以了解托管人就次级托管人过失与破产、留置权、抵销、一般责任、估值、现金、外汇等方面所承担的责任程度。如果托管人提供的主要服务是资产安全，那么其在这些关键合同条款上的承诺必须与客户的要求保持一致。

实用创新 人工智能 在交易结算中的预测分析

our clients have the necessary time to resolve any issues. By determining which trades are at risk, this patent-pending technology prevents loss of time and revenue and holds the potential to unlock billions of dollars of capital daily.

The automation and standardization of core services and processes will deliver greater visibility, operational efficiencies and cost savings to clients, boosting service quality and enabling custodians to respond quickly to future needs. Custody digital enhancements offer vital benefits, driving operational alpha by significantly increasing operating efficiency and streamlining processes. With a specific focus on cost takeout, automation is injected to eliminate manual tasks, saving valuable time and resources.

一家全球托管机构每年需要结算超过 1 亿笔交易。尽管已尽最大努力，但交易有时仍会延迟结算。延迟结算不仅给我们的客户带来问题，也会影响整个市场：卖方对证券的融资效率低下，买方无法获得预期可用的证券，市场参与者可能面临更高的成本。每天有数十亿美元的资金因延迟结算的交易而被占用，因此挑战在于预测交易延迟结算的概率，以提高市场效率并使客户节省时间和额外开支。

预测型人工智能引擎可以在预定结算日前 24 小时发现模式并预测结算情况

从而让我们的客户有足够时间解决任何问题。通过识别哪些交易存在风险，这项正在申请专利的技术能避免时间和收入的损失，并有可能每天释放数十亿美元的资本。

核心服务和流程的自动化与标准化将为客户带来更高的可见性、运营效率和成本节约，提升服务质量并使托管人能够快速响应未来需求。托管数字化改进提供了重要收益，通过显著提高运营效率并简化流程来推动运营阿尔法。着重于削减成本、注入自动化以消除人工任务，节省宝贵的时间和资源。

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Practical Considerations for Asset Owners

A few thoughts for consideration that we conduct to help our clients assess asset safety, risk and value for money:

• What level of risk am I assuming in custodian contract?

- Does my custodian assume the risk for its subcustodian relationships?

- Are they accepting responsibility for the insolvency of a subcustodian if the custodian was negligent in their own monitoring processes and governance?

• What level of risk am I assuming for not having a proper governance model in place with my custodian measuring my total client experience?

• What level of operational alpha is being left on the table?

- Custodian executed standing instructions for FX – what spreads are my custodian taking and how do I get transparency?

- Am I getting value for money from my custodian relationship?

- What services should the client pay for?

- How can the client obtain more services for less or same fees?

- Are the commercial arrangements meeting best practices?

- How do we ensure the custodian/provider is meeting best practices today and in the future? (ex. Contracts and Service Level Commitments)

- Is the custodian/provider willing to implement 'fees at risk'?

The above are just a few areas we assess to help our clients measure the effectiveness of asset safety and the value for money equation with their strategic partner.

- Edwina Eason, Amaces

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资产所有者的实际考量

一些供参考的思考点，用以帮助我们的客户评估资产安全性、风险和性价比：

- 我在托管合同中承担的风险程度如何？

我的托管人是否对其分托管人关系承担风险？

如果托管人在自身的监控流程和治理上存在疏忽，他们是否会将分托管人的破产承担责任？

- 如果我的托管方没有建立适当的治理模型来衡量我整体的客户体验，我将承担多大的风险？

- 我在运营上的超额收益有多少被白白浪费掉了？

托管方执行外汇的常设指令——我的托管方收取了多少点差，我如何获得透明度？

- 我从托管关系中获得了物有所值的回报吗？

- 客户应为哪些服务付费？

客户如何以更低或相同费用获得更多服务？

这些商业安排是否符合最佳实践？

我们如何确保托管方/服务提供商目前及未来都能遵循最佳实践？（例如合同和服务水平承诺）

托管方/服务提供商是否愿意实施“费用风险”机制？

以上只是我们评估的几个方面，帮助客户衡量与其战略合作伙伴在资产安全性和物有所值方面的有效性。

- Edwina Eason, Amaces