The LexisNexis® True Cost of Fraud™ Study helps companies grow their business safely by navigating the growing risk of fraud.

The research provides a snapshot of:
• Current fraud trends in the U.S. and Canadian financial services and lending markets
• Key pain points related to adding new payment mechanisms, transacting through online and mobile channels and expanding internationally

COVID-19 Impact:
• Data collection occurred during August and September 2021; many of the survey questions reference the past 12 months; therefore, findings reflect activity, fraud risks, challenges and costs that have been impacted by COVID-19 fears, changing behaviors and forced lockdowns.

Fraud Definitions:
• Fraudulent transactions due to identity fraud, which is the misuse of stolen payments methods (such as credit cards) or personal information
• Fraudulent requests for refunds/returns, bounced checks
• Lost or stolen merchandise, as well as redistribution costs associated with redelivering purchased items
• Fraudulent applications (e.g., purposely providing incorrect information about oneself, such as income, employment, etc.)
• Account takeover by unauthorized persons
• Use of accounts for money laundering

This research covers consumer-facing fraud methods:
• Does not include insider fraud or employee fraud

The LexisNexis Fraud Multiplier™ cost:
• The cost of fraud is more than the actual dollar value of a fraudulent transaction. It also includes additional costs related to labor/investigation, fees incurred during the applications/underwriting/processing stages, legal fees and external recovery expenses. Therefore, the total cost of fraud is expressed by saying that for every $1 of lost value due to fraud, the actual cost is higher based on a multiplier representing these additional costs.
• For a common base of comparison between the U.S. and Canada, all currency is in USD.
The study included a comprehensive survey of 502 risk and fraud executives in financial services and lending companies in the U.S. (426) and Canada (76).

### Segment Definitions

<table>
<thead>
<tr>
<th>Financial Services Companies Include:</th>
<th>Lending Institutions Include:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Retail/Commercial Banks</td>
<td>Auto Lenders</td>
</tr>
<tr>
<td>• Credit Unions</td>
<td>Finance Companies</td>
</tr>
<tr>
<td>• Investments</td>
<td>Mortgage Companies</td>
</tr>
<tr>
<td>• Trusts</td>
<td>Non-Bank Credit Card Issuer</td>
</tr>
<tr>
<td>• Wealth Management</td>
<td>Non-Bank Personal Loan Issuer</td>
</tr>
</tbody>
</table>

#### Company Type and Size

<table>
<thead>
<tr>
<th># Completions</th>
<th>Financial Services</th>
<th>Credit and Lending</th>
<th>Total</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>502</td>
<td>250</td>
<td>252</td>
<td>252</td>
<td>117</td>
</tr>
</tbody>
</table>

**Small**
- Earns less than $10 million in annual revenues

**Mid/Large**
- Earns $10 million+ in annual revenues

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[Images of financial symbols and segment definitions]
1. **Attacks and Costs**: Fraud costs and attack volumes remain significantly higher compared to before the COVID-19 pandemic. U.S. banks and mortgage lenders are driving much of this.

2. **Mobile Channel Impact**: The mobile channel continues to impact higher fraud costs and volumes, as financial services and lending firms say that criminals have particularly targeted this channel for fraud during the pandemic.

3. **Customer Journey Fraud Risks**: Fraud losses are occurring across the customer journey, though the point of funds distribution is seen as most susceptible for fraud by many, with banks and mortgage firms also indicating new account creation. Identity verification is a top challenge, while others are more specific to journey points. Study findings show that layering specific digital identity solutions at different journey points can lessen these challenges.

4. **Fraud Prevention Best Practice**: Best practice fraud detection and prevention includes a multi-layered solutions approach, and the integration of fraud prevention with cybersecurity operations and the digital customer experience. Laying in supportive capabilities such as social media intelligence and AI/ML further strengthens fraud prevention. Study findings show that firms which follow this approach have lower fraud costs and challenges.
Key Finding 1

Fraud costs and attack volumes remain significantly higher compared to before the COVID-19 pandemic. U.S. banks and mortgage lenders are driving much of this.

The cost of fraud for U.S. financial services and lending firms is between 6.7% and 9.9% higher than before the pandemic. This is driven by mortgage lending (up 23.5% since pre-COVID-19) and a continued upward trend among banks (+13.0%).

There was clearly a spike in fraud costs and volume at the start of the pandemic, as these rose significantly in 2020 and have softened some for credit lending and investment firms (though still above pre-pandemic levels).
The cost of fraud continues to be significantly higher than pre-COVID-19 for both U.S. and Canadian financial services and lending firms.

For every $1 of fraud loss, it costs U.S. financial services firms $4.00 compared to $3.25 in 2019 and $3.64 in 2020 (pre COVID-19). While the LexisNexis® Fraud Multiplier™ is slightly less for Canadian financial services firms at $3.65, they have experienced a sharper year-over-year rise (15.5% compared to 9.9% for U.S. firms).

As has been the trend, lending firms have a somewhat higher cost of fraud compared to financial services firms.

Such fraud costs involve losses related to the transaction face value for which firms are held liable, plus fees/interest incurred during applications/underwriting/processing stages, fines/legal fees, labor/investigation and external recovery expenses. In this case, there have been increases related to labor and external recovery support. This reminds us that the cost of fraud is not just about the level of successful attacks, but the time and resources that are applied to preventing attacks as well.

Survey Question: Q16a: In thinking about the total fraud losses suffered by your company, please indicate the distribution of various direct fraud costs over the past 12 months.

% Comparison to 2020 Pre-COVID-19
- U.S. Financial Services: +9.9%
- U.S. Lending: +6.7%
- Canada Financial Services: +15.3%
- Canada Lending: +12.4%

* First wave of True Cost of Fraud™ Study for Canada

#1 #2 #3 #4

Overview
Key Findings
Attacks and Costs
Mobile Impact
Customer Journey
Risks
Best Practices
Recommendations

SEGMENT HIGHLIGHTS

The cost of fraud for Canadian lending firms has come closer to parity with U.S. lending firms compared to 2020.
U.S. mortgage lenders have experienced a significant rise in fraud costs since the start of the COVID-19 pandemic; it continues to be higher than other segments.

Attacks on larger mortgage lenders have been increasing in recent years, particularly among those originating a majority of loans through online/mobile channels. While slightly down from the early pandemic spike, every $1 of mortgage lending fraud loss actually costs them $4.40.

U.S. banks and investment firms’ fraud costs continue an upward trend over pre- and early pandemic periods.

Overall, these findings tell us that the impact of COVID-19 on fraud costs is still in progress.

**Cost of Fraud: LexisNexis Fraud Multiplier™**

<table>
<thead>
<tr>
<th>Sector</th>
<th>Pre-COVID-19</th>
<th>During COVID-19</th>
<th>% Comparison to 2020 Pre-COVID-19</th>
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</thead>
<tbody>
<tr>
<td><strong>Banks</strong></td>
<td>$3.34</td>
<td>$3.63</td>
<td>+13.0%</td>
</tr>
<tr>
<td><strong>Investment Firms</strong></td>
<td>$2.96</td>
<td>$3.30</td>
<td>+11.5%</td>
</tr>
<tr>
<td><strong>Credit Lenders</strong></td>
<td>$3.49</td>
<td>$4.09</td>
<td>+3.2%</td>
</tr>
<tr>
<td><strong>Mortgage Lenders</strong></td>
<td>$3.30</td>
<td>$4.40</td>
<td>+23.5%</td>
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</tbody>
</table>

Survey Question: Q16a: In thinking about the total fraud losses suffered by your company, please indicate the distribution of various direct fraud costs over the past 12 months.

- **Key Finding 1**
  - INCREASED FRAUD COSTS

- **SEGMENT HIGHLIGHTS**
  - Mortgage lending fraud costs are 23.5% higher than just before COVID-19 hit in early 2020.
  - Banks and investment firm lending costs continue to rise above the early pandemic period.
Average successful monthly fraud attacks against financial services and lending firms remain above pre-COVID-19 pandemic levels, with financial services firms’ attacks continuing to rise.

This is driven by larger firms. U.S. and Canadian lenders experienced a dramatic spike in average monthly fraud volume during the early pandemic months. While their month fraud volumes have dipped (U.S.) or remained constant (Canada), they remain above pre-COVID periods. This is a key indicator that fraudsters are still looking for ways to exploit the pandemic at a time when mobile banking options increase for consumers, including bill-to-mobile payments and adoption of a financial firm’s branded apps for transactions.

### Key Finding 1
**INCREASED FRAUD ATTACKS**

<table>
<thead>
<tr>
<th>Survey Questions:</th>
<th>Q22: In a typical month, approximately how many fraudulent transactions are prevented by your company? Q24: In a typical month, approximately how many fraudulent transactions are successfully completed at your company?</th>
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<tbody>
<tr>
<td><strong>Average Monthly Fraud Attacks</strong></td>
<td><strong>U.S. Financial Services</strong></td>
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<tr>
<td><strong>Prevented Attacks</strong></td>
<td><img src="image" alt="Diagram" /></td>
</tr>
<tr>
<td><strong>Successful Attacks</strong></td>
<td><img src="image" alt="Diagram" /></td>
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<tr>
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<td>2019</td>
<td>1,570</td>
<td>1,801</td>
<td>1,570</td>
<td>1,801</td>
<td>985</td>
<td>1,184</td>
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<td>2020</td>
<td>1,801</td>
<td>1,821</td>
<td>1,821</td>
<td>1,821</td>
<td>965</td>
<td>1,184</td>
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<td>2021</td>
<td>2,034</td>
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<td>1,184</td>
<td>912</td>
<td>750</td>
<td>991</td>
<td>750</td>
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</tbody>
</table>

**SEGMENT HIGHLIGHTS**

- **U.S. Financial Services**
  - Prevented Attacks: M/L = 1,427
  - Successful Attacks: M/L = 893

- **U.S. Lending**
  - Prevented Attacks: M/L = 953
  - Successful Attacks: M/L = 737

*First wave of True Cost of Fraud™ Study for Canada*
Larger banks, on average, have a higher number of monthly fraud attacks, which have increased year-over-year.

Average monthly fraud volume continues to rise among U.S. banks and mid/large mortgage firms as other segments have seen their attack volumes soften a bit from the initial pandemic spike.

As shown earlier, the cost of fraud is highest among mortgage firms and continues an upward trend among banks—which also act as mortgage originators. A pandemic such as COVID-19 brings market uncertainty and unemployment, which increases the risk of mortgage fraud through misrepresentation and credit washing.¹ Increased use of synthetic identities adds to the difficulty of battling fraud and increases the cost of resources where solutions are not being used to assess the digital transaction risk and behaviors.

### Key Finding 1: INCREASED FRAUD ATTACKS

#### Segment Highlights

<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td><strong>U.S. Financial Services</strong></td>
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<tr>
<td><strong>Banks</strong></td>
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<td>1,839</td>
<td>2,056</td>
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<tr>
<td></td>
<td>1,095</td>
<td>1,239</td>
<td>1,479</td>
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<tr>
<td></td>
<td>595</td>
<td>617</td>
<td>775</td>
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<td><strong>Investment Firms</strong></td>
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<tr>
<td></td>
<td>1,057</td>
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<td></td>
<td>779</td>
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<td></td>
<td>519</td>
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<td>1,405</td>
<td>1,834</td>
<td>1,509</td>
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<td></td>
<td>850</td>
<td>929</td>
<td>832</td>
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<tr>
<td></td>
<td>555</td>
<td>905</td>
<td>677</td>
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<tr>
<td><strong>Mortgage Lenders</strong></td>
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<td></td>
<td>1,280</td>
<td>1,887</td>
<td>1,511</td>
<td></td>
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<tr>
<td></td>
<td>820</td>
<td>964</td>
<td>895</td>
<td></td>
</tr>
<tr>
<td></td>
<td>460</td>
<td>933</td>
<td>536</td>
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</tr>
</tbody>
</table>

¹ [https://www.wsj.com/articles/SB1000142405274803824304575435383161436658](https://www.wsj.com/articles/SB1000142405274803824304575435383161436658)
Canadian financial services and lending firms have experienced a significant increase in the percent of fraud attributed to international transactions. U.S. firms have had only a directional increase, with investment firms continuing to record the highest percent of fraud from international transactions (39% in 2021, 34% in 2020).

International transactions carry additional, unique risks including difficulty determining the origination source and authenticating identities based on data privacy restrictions, different consumer behaviors and other payment methods.

Survey Questions:
Q13: Please indicate the percent of annual fraud costs generated through domestic compared to international transactions in the last 12 months.

нской or directionally higher/lower than previous period
Key Finding 2

The mobile channel continues to impact higher fraud costs and volumes, as financial services and lending firms say that criminals have particularly targeted this channel for fraud during the pandemic.

Where mobile transactions are, fraudsters tend to follow. As banks and mortgage lenders have conducted more transactions through the mobile channel, these firms have also begun to attribute more of their fraud costs to it.

And these two segments are getting hit harder by fraud costs and volume as noted earlier.

Some of this can be the relational overlap between these types of organizations where fraud involves loan originations.

But across financial services and lending firms, there is a significant rise in the percent of transactions that are malicious bots. Without support from digital identity and transaction fraud detection solutions, it is difficult to identify such bots, as well as other types of fraudulent transactions involving synthetic identities.
The percent of financial services and lending firms which offer mobile channel transactions remains high, continuing a significant increase since the start of the pandemic.

### Businesses Offering Mcommerce

<table>
<thead>
<tr>
<th>Region</th>
<th>Financial Services</th>
<th>Lending</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>% Allowing Mcommerce in 2020</td>
<td>91%</td>
<td>93%</td>
</tr>
<tr>
<td>% Allowing Mcommerce in 2019</td>
<td>68%</td>
<td>71%</td>
</tr>
<tr>
<td>Canada</td>
<td></td>
<td></td>
</tr>
<tr>
<td>% Allowing Mcommerce in 2020</td>
<td>94%</td>
<td>94%</td>
</tr>
<tr>
<td>% Allowing Mcommerce in 2019</td>
<td>87%</td>
<td>87%</td>
</tr>
</tbody>
</table>

### Survey Questions:
Q4. Please indicate the % of transactions completed (over the past 12 months) for mobile payments by your company.

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**Key Findings**

1. **MORE MCOMMERCE**
2. **Overview**
3. **Key Findings**
4. **Attacks and Costs**
5. **Mobile Impact**
6. **Customer Journey**
7. **Risks**
8. **Best Practices**
9. **Recommendations**

---

**LeXisNexis Risk Solutions**
Both online and mobile have become the dominant channels for U.S. banks and mortgage lenders since the start of the pandemic.

A significant shift to remote transactions isn’t surprising given early COVID-19 period shutdowns.

Some of the mobile channel growth is due to changed consumer environments/behaviors. Working remotely did not necessarily mean more laptop time; blurring home and office did allow for more mobile device time (free from the boss’ eyes).

Survey Questions:
Q2: Please indicate the percentage of transactions completed (over the past 12 months) for each of the following channels used by your company.

\[\text{\(\uparrow\)}\] = significantly or directionally higher/lower than previous period
Mobile channel transactions continue to increase as a contributor to U.S. financial services firms’ fraud costs.

This is driven by a significant increase of mobile channel-related fraud costs among U.S. banks since the start of the pandemic.

U.S. financial services and lending firms with higher volumes of mobile transactions attribute a higher percentage of fraud costs to that channel compared to those with less mobile transaction volume. They also have a higher cost of fraud.

**MOBILE = FRAUD**

**U.S. FINANCIAL SERVICES FIRMS**
- Above avg. mobile transactions (>25%); percent of fraud costs from mobile = 33%, with a Fraud Multiplier™ of $4.01.
- Below avg. mobile transactions (<25%); % fraud costs from mobile = 19%, with a Fraud Multiplier™ of $3.63.

**U.S. LENDING FIRMS**
- Above avg. mobile transactions (>25%); percent of fraud costs from mobile = 33%, with a Fraud Multiplier™ of $4.42.
- Below avg. mobile transactions (<25%); % fraud costs from mobile = 18%, with a Fraud Multiplier™ of $3.79.

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### Key Finding 2
**INCREASED MOBILE CHANNEL FRAUD COSTS**

<table>
<thead>
<tr>
<th>Channel</th>
<th>2019</th>
<th>2020</th>
<th>2021</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>U.S. Financial Services</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Banks</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mobile</td>
<td>22%</td>
<td>28%</td>
<td>27%</td>
</tr>
<tr>
<td><strong>Investment Firms</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mobile</td>
<td>29%</td>
<td>25%</td>
<td>28%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Channel</th>
<th>2019</th>
<th>2020</th>
<th>2021</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>U.S. Lending</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Credit Lenders</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mobile</td>
<td>29%</td>
<td>25%</td>
<td>27%</td>
</tr>
<tr>
<td><strong>Mortgage Lenders</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mobile</td>
<td>29%</td>
<td>23%</td>
<td>26%</td>
</tr>
</tbody>
</table>
And where transactions are, fraudsters go. Nearly all U.S. financial services and lending firms surveyed said that there has been an increase in fraud targeting mobile channel transactions.

More than half of U.S. banks and credit lenders indicated a 10% or more increase in mobile channel fraud.
Similarly, nearly all Canadian financial services and lending firms surveyed said that there has been an increase in fraud targeting mobile channel transactions.

Compared to U.S. firms, the average percentage increase is slightly lower for Canadian firms (up to 9%), but still sizeable.

Survey Questions:
Q17B: To what degree has fraud that targets your mobile channel transactions increased during the past 12 months?
The average percent of transactions representing malicious botnet attacks has increased significantly for U.S. banks and lending firms.

Survey Questions:
B1: In a typical month, what percent of your transactions are determined to be malicious automated bot attacks (i.e., rapid creation and placement of hundreds of orders/transactions by fraudulent automated bots at the same time)?

Key Finding 2
INCREASED BOT ATTACKS

Average % of Transactions Determined as Malicious Bot Attacks

U.S. Financial Services

U.S. Lending

Canada Financial Services

Canada Lending

SEGMENT HIGHLIGHTS
U.S. Financial Services
- Bot Attacks: S = 15%; M/L = 28%

U.S. Investment Firms
- Bot Attacks: S = 12%; M/L = 34%

Overview

Key Findings

Attacks and Costs

Mobile Impact

Customer Journey

Risks

Best Practices

Recommendations

- significantly or directionally higher/lower than previous period
Key Finding 3

Identity verification, including digital attributes, is a top challenge across the customer journey. This aligns with identity fraud representing a significant percent of fraud losses at the point of funds distribution while these losses continue to grow with new account openings as well.

There are additional challenges that tend to be more pronounced for banks and mortgage lenders at certain points in the journey.

• For banks, balancing fraud detection with customer friction is a top challenge with new account openings and account logins, while identifying malicious bots and the transaction origination are more concerning at funds distribution.

• Mortgage lenders tend to rank balancing fraud detection with customer friction, identifying malicious bots and knowing the transaction origination as top challenges across the customer journey. But they are also more likely than others to include lack of tools to detect and prevent international fraud, especially with account takeover.

Financial services and lending firms are taking a limited approach in their use of fraud detection solutions across the customer journey. This weakens fraud prevention efforts and contributes to the above challenges.

As challenges and the nature of the transaction/customer interaction changes by journey point, there is no single solution to address these issues. A multi-layered solutions approach is required, particularly including those which assess the digital identity and transaction risk. Different combinations may be required at different stages. For example, this could include layering behavioral biometrics with other digital identity solutions for new account creation; laying device assessment tools at the point of funds distribution; and both of these layers plus other biometrics at account login.

Study findings show that the above layering approach can significantly reduce the challenges across each customer journey point.
For the True Cost of Fraud™ Report, the customer journey is defined as follows:

- **New Account Opening**
  - On-boarding a new customer
  - Establishing a new account
  - Verifying new identity, credentials

- **Account Login**
  - Accessing an account
  - Verifying identity before allowing access to the account

- **Distribution of Funds**
  - Disbursing funds from a bank or investment account
  - Disbursing funds for a loan
  - Verifying identity before distribution of funds
Fraud losses are occurring across the customer journey for U.S. financial services and lending firms, though distribution of funds is perceived to be most susceptible to fraud.

Directionally, U.S. banks and mortgage lenders attribute somewhat more losses at account login, with roughly one-third saying that this is most susceptible to fraud. But, there is still a sizeable percentage occurring at distribution of funds where these firms feel most vulnerable, as do credit lenders.

The exception to this is with investment firms, with just under half pointing to new account creation as generating the most fraud risk.

The COVID-19 pandemic saw a rise in phishing scams designed to trick consumers into giving away their passwords and account information in response to seemingly legitimate messages from their bank. This contributes to fraud at both the account login and payments/funds distribution points in the customer journey.

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Survey Questions: Q11B: Approximately, how much of your fraud losses would you attribute to each of the customer journey stages: new account creation (fraudulent new accounts), distribution of funds and account login/security (i.e., related to account takeover)?

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Fraud losses are also occurring across the customer journey for Canadian financial services and lending firms, though they differ on which part is most susceptible to fraud.
Identity verification, including digital identities through devices, email and phone numbers, is a top online and mobile challenge for U.S. banks and investment firms at various points along the customer journey.

This contributes to other challenges related to distinguishing malicious bots from legitimate customers, manual reviews, determining origination source and optimizing risk assessment with the customer experience.

There are issues that are more of a top challenge for certain journey points than others. Balancing fraud with friction is more of an account creation/login challenge for banks than at the point of funds distribution, where identifying malicious bots and determining the transaction source become more pressing.

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Survey Questions:
Q20B: Please rank the top 3 challenges for each customer journey stage related to fraud faced by your company when serving customers using the MOBILE channel.

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#1
Overview

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Key Findings

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Attacks and Costs

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Recommendations

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U.S. Financial Services
Identity verification is also a top online and mobile challenge for U.S. lending firms. Additionally, there are challenges with assessing fraud from other countries and determining origination source while trying to balance fraud detection with friction.

At the same time, there is limited use of fraud assessment solutions among lenders that can provide insights into transaction risk and location as well as distinguishing malicious bots from legitimate customers.

Unlike with banks, balancing fraud detection with customer friction, identifying malicious bots and determining the transaction origination source are mortgage firm challenges across the customer journey. There is also need for tools that can support detection of international-based fraud.
Identity verification is also a top online and mobile challenge for Canadian financial services and lending firms, as well as with international fraud and balancing fraud detection with friction.

As with other segments, this contributes to other challenges related distinguishing malicious bots from legitimate customers, manual reviews and determining origination source.
Key Finding 3
INCREASED LOSSES DUE TO IDENTITY AND ACCOUNT-RELATED FRAUD ACROSS THE CUSTOMER JOURNEY

Friendly/first party and third party/synthetic identity fraud are driving financial services and lending fraud losses across the customer journey.

% Distribution of Fraud Losses by Fraud Type

Survey Questions: Q12aa, Q12bb, Q12cc: For each specific customer journey stage, please indicate the percentage distribution your past 12-month’s fraud losses across the following fraud methods.
Identity-related fraud is occurring similarly across the customer journey for U.S. financial services and lending firms, with new account creation continuing its upward trend as a source of this type of fraud.

Increased identity-fraud related to new account creation has primarily come from U.S. banks and credit lenders, though this is not perceived as the most susceptible part of the customer journey for them. Canadian financial services firms also attributed an increased percentage of identity-related fraud to new account creation, though again distribution of funds is viewed as being the riskier customer journey point.

Survey Questions:
Q12b: For identity-related fraud, what is the distribution of these by the following types of activities?

Key Finding 3
INCREASED LOSSES DUE TO IDENTITY AND ACCOUNT-RELATED FRAUD

Identity-Related Fraud: % Distribution by Activity

<table>
<thead>
<tr>
<th>Activity</th>
<th>Distribution of Funds</th>
<th>With account takeover</th>
<th>At point of new account creation</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S. Financial Services 2021</td>
<td>35%</td>
<td>34%</td>
<td>31%</td>
</tr>
<tr>
<td>U.S. Lending 2021</td>
<td>35%</td>
<td>34%</td>
<td>30%</td>
</tr>
<tr>
<td>Canada Financial Services 2021</td>
<td>32%</td>
<td>31%</td>
<td>37%</td>
</tr>
<tr>
<td>Canada Lending 2021</td>
<td>36%</td>
<td>37%</td>
<td>27%</td>
</tr>
<tr>
<td>U.S. Financial Services 2020</td>
<td>34%</td>
<td>37%</td>
<td>29%</td>
</tr>
<tr>
<td>U.S. Lending 2020</td>
<td>35%</td>
<td>45%</td>
<td>24%</td>
</tr>
<tr>
<td>Canada Financial Services 2020</td>
<td>35%</td>
<td>35%</td>
<td>30%</td>
</tr>
<tr>
<td>Canada Lending 2020</td>
<td>34%</td>
<td>39%</td>
<td>27%</td>
</tr>
<tr>
<td>U.S. Financial Services 2019</td>
<td>34%</td>
<td>48%</td>
<td>18%</td>
</tr>
<tr>
<td>U.S. Lending 2019</td>
<td>31%</td>
<td>56%</td>
<td>13%</td>
</tr>
<tr>
<td>Canada Financial Services 2019</td>
<td>35%</td>
<td>37%</td>
<td>29%</td>
</tr>
<tr>
<td>Canada Lending 2019</td>
<td>36%</td>
<td>37%</td>
<td>27%</td>
</tr>
</tbody>
</table>

#1 Overview
#2 Key Findings
#3 Attacks and Costs
#4 Mobile Impact
#5 Customer Journey Risks
#6 Best Practices
#7 Recommendations

Legend: ▲ significantly or directionally higher/lower than previous period
Across the customer journey, there is limited financial services use of solutions to assess digital identity threats that contribute to key online and mobile channel challenges.

Latter slides illustrate case studies in which the use of a multi-layered solutions approach, involving those that detect and assess fraud within the digital channels, can lessen these challenges and increase the effectiveness of fraud verification efforts.

Survey Questions: Q27. Which fraud detection/mitigation solutions does your company currently use for the following transaction or customer journey points?
There is also limited use of digital identity solutions among U.S. lenders across the customer journey, with an average number of 3-4 solutions used per stage.

Survey Questions:
Q27: Which fraud detection/mitigation solutions does your company currently use for the following transaction or customer journey points?

= significantly or directionally higher than same response in other segment
There is limited solutions use among Canadian financial services and lending firms.

To the degree differences emerge between financial services and lending, there is broader use of solutions by financial services firms, particularly at the new account creation and login journey points. Canadian financial services use an average of 4-5 solutions at each customer journey point, compared to 3-4 for lending firms. That said, there is varied use of specific solutions and limited use of those that support digital identity proofing.
Findings show that a multi-layered digital identity solutions approach, including behavioral biometrics, for new account openings is significantly more effective at verifying identities while reducing customer friction and fraud costs.*

### U.S. Banks

**Limited Digital Solutions Use**
- **Fraud Mitigation Solutions Use**
  - Challenge Questions: 25%
  - Quiz or IDA: 25%
  - Authenticating using Behavioral Biometrics: 24%
  - Phone # Risk & Verification: 34%
  - Geolocation: 16%
- **Top Online Channel Challenges**
  - Balancing fraud w/ friction (35%)
  - Verification
    - Address (34%)
    - Identity (31%)
- **Top Mobile Channel Challenges**
  - Balancing fraud w/ friction (32%)
  - Verification
    - Address (36%)
    - Identity (36%)
    - Email, device (31%)

### U.S. Investment Firms

**Limited Digital Solutions Use**
- **Fraud Mitigation Solutions Use**
  - Challenge Questions: 21%
  - Quiz or IDA: 39%
  - Authenticating using Behavioral Biometrics: 20%
  - Phone # Risk & Verification: 54%
  - Geolocation: 36%
- **Top Online Channel Challenges**
  - Balancing fraud w/ friction (35%)
  - Verification
    - Address (15%)
    - Identity (21%)
  - Geolocation: 36%
- **Top Mobile Channel Challenges**
  - Balancing fraud w/ friction (32%)
  - Verification
    - Address (26%)
    - Email, device (21%)

### Multi-Layered Digital Solutions Use Involving Behavioral Biometrics*

#### U.S. Banks
- **Limited Digital Solutions Use**
  - **Fraud Mitigation Solutions Use**
    - Challenge Questions: 42%
    - Quiz or IDA: 48%
    - Authenticating using Behavioral Biometrics: 100%
    - Phone # Risk & Verification: 58%
    - Geolocation: 64%
- **Top Online Channel Challenges**
  - Balancing fraud w/ friction (35%)
  - Verification
    - Address (15%)
    - Identity (21%)
  - Geolocation: 36%
- **Top Mobile Channel Challenges**
  - Balancing fraud w/ friction (31%)
  - Verification
    - Address (34%)
    - Identity (31%)
    - Email, device (31%)

#### U.S. Investment Firms
- **Limited Digital Solutions Use**
  - **Fraud Mitigation Solutions Use**
    - Challenge Questions: 64%
    - Quiz or IDA: 50%
    - Authenticating using Behavioral Biometrics: 100%
    - Phone # Risk & Verification: 53%
    - Geolocation: 72%
- **Top Online Channel Challenges**
  - Balancing fraud w/ friction (42%)
  - Verification
    - Phone # (37%)
    - Identity (34%)
    - Assessing risk by country (43%)
    - Address verification (39%)
- **Top Mobile Channel Challenges**
  - Balancing fraud w/ friction (35%)
  - Verification
    - Phone # (14%)
    - Identity (15%)
    - Assessing risk by country (19%)
    - Address verification (20%)

---

* Represents one type of multi-layered digital solutions approach; each organization has its own unique circumstances and challenges such other multi-layered combinations are required/will produce effective fraud mitigation results.

---

Survey Questions:
Q20: Please rank the top 3 challenges for each customer journey stage related to fraud faced by your company when serving customers using the ONLINE/MOBILE channel.
Digital identity solutions assessing the device, transaction and behaviors can also provide more effective fraud detection and mitigation during the account login stage.

### U.S. Banks

<table>
<thead>
<tr>
<th>Limited Digital Solutions Use</th>
<th>Multi-Layered Digital Solutions Assessing Device, Biometric Behaviors/Attributes and Transaction*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Email &amp; Verify</td>
<td>34%</td>
</tr>
<tr>
<td>Phone &amp; Verify</td>
<td>31%</td>
</tr>
<tr>
<td>Behavioral Biometrics</td>
<td>17%</td>
</tr>
<tr>
<td>Behavioral Biometrics (Fingerprint, facial)</td>
<td>20%</td>
</tr>
<tr>
<td>Automated Scoring</td>
<td>10%</td>
</tr>
</tbody>
</table>

- Identifying malicious bots (29%)
- Verification
  - Address (41%)
  - Phone # (32%)
  - Identity (29%)
  - Email/device (34%)

- Identifying malicious bots (14%)
- Verification
  - Address (41%)
  - Phone # (14%)
  - Identity (14%)
  - Email/device (34%)

- Identifying malicious bots (32%)
- Phone # verification (33%)
- Balancing fraud/friction (34%)

### U.S. Investment Firms

<table>
<thead>
<tr>
<th>Limited Digital Solutions Use</th>
<th>Multi-Layered Digital Solutions Assessing Device, Biometric Behaviors/Attributes and Transaction*</th>
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<tr>
<td>Email &amp; Verify</td>
<td>30%</td>
</tr>
<tr>
<td>Phone &amp; Verify</td>
<td>32%</td>
</tr>
<tr>
<td>Behavioral Biometrics</td>
<td>39%</td>
</tr>
<tr>
<td>Behavioral Biometrics (Fingerprint, facial)</td>
<td>23%</td>
</tr>
<tr>
<td>Automated Scoring</td>
<td>21%</td>
</tr>
</tbody>
</table>

- Verification
  - Address (36%)
  - Email/device (32%)

- Address verification (32%)
- Manual reviews (38%)

### Survey Questions:

Q20: Please rank the top 3 challenges for each customer journey stage related to fraud faced by your company when serving customers using the ONLINE/MOBILE channel.

<table>
<thead>
<tr>
<th>#1</th>
<th>#2</th>
<th>#3</th>
</tr>
</thead>
</table>

### Key Findings:

- U.S. Investment Firms: Every $1 of fraud loss actually costs $3.72.
- U.S. Banks: Every $1 of fraud loss actually costs $3.82.

---

*= Represents one type of multi-layered digital solutions approach; each organization has its own unique circumstances and challenges such other multi-layered combinations are required/will produce effective fraud mitigation results.

= significantly or directionally higher than same response in other segment within the same industry

= point of customer journey selected by many as being most susceptible to fraud
During distribution of funds, a multi-layered digital identity solutions approach assessing the device, transaction and behaviors can significantly improve identity verification by determining bots, origination source and risk by country. It can also lower costs.
Key Finding 4

Best practice fraud detection and prevention includes a multi-layered solutions approach, and the integration of fraud prevention with cybersecurity operations and the digital customer experience. Laying in supportive capabilities such as social media intelligence and AI/ML further strengthens fraud prevention.

Fraud prevention must assess both the physical and digital identity attributes, as well as the risk of the transaction. Without the aid of solutions that detect digital behaviors, anomalies, device risk and synthetic identities, it is difficult for even the best trained professional to detect the increasingly sophisticated crime occurring in the remote digital channels.

Some financial services and lending firms are doing this, along with fully integrating cybersecurity operations, the digital customer experience and fraud prevention. These firms tend to have a lower cost of fraud and fewer challenges.
Fraud has become more complex; various risks can occur at the same time with no single solution. Fraud tools need to authenticate both digital and physical criteria, as well as both identity and transaction risk.

**FRAUD ISSUES**

**DIGITAL SERVICES**
- fast transactions, easy synthetic identity and botnet targets;
- need velocity checking to determine transaction risk along with data and analytics to authenticate the individual

**ACCOUNT-RELATED FRAUD**
- breached data requires more levels of security, as well as authenticating the person from a bot or synthetic ID

**SYNTHETIC IDENTITIES**
- need to authenticate the whole individual behind the transaction in order to distinguish from a fake identity based on partial real data

**BOTNET ATTACKS**
- mass human or automated attacks often to test cards, passwords/credentials or infect devices

**MOBILE CHANNEL**
- source origination and infected devices add risk; mobile bots and malicious malware makes authentication difficult; need to assess the device and the individual

**SOLUTION OPTIONS**

**ASSESSING THE TRANSACTION RISK**

**Velocity Checks/Transaction Scoring:** monitors historical transaction patterns of an individual against their current transactions to detect if volume by the cardholder matches up or if there appears to be an irregularity. **Solution examples:** real-time transaction scoring; automated transaction scoring

**AUTHENTICATING THE PHYSICAL PERSON**

**Basic Verification:** verifying name, address, DOB or providing a CVV code associated with a card.

**Solution examples:** check verification services; payment instrument authentication; name/address/DOB verification

**Active ID Authentication:** use of personal data known to the customer for authentication; or where a user provides two different authentication factors to verify themselves. **Solution examples:** authentication by challenge or quiz; authentication using OTP/2 factor

**AUTHENTICATING THE DIGITAL PERSON**

**Digital Identity/Behavioral Biometrics:** analyzes human-device interactions and behavioral patterns, such as mouse clicks and keystrokes, to discern between a real user and an impostor by recognizing normal user and fraudster behavior. **Solution examples:** authentication by biometrics; email/phone risk assessment; browser/malware tracking; device ID/fingerprinting

**Device Assessment:** uniquely identify a remote computing device or user. **Solution examples:** device ID/fingerprint; geolocation
Best practice approaches involve a layering of different solutions to address unique risks from different channels, payment methods and products. And they go farther by integrating capabilities and operations with their fraud prevention efforts.

Integration of Cybersecurity and Digital Customer Experience Operations with Fraud Prevention Approach

Strategy and Focus

Minimizing Friction While Maximizing Fraud Protection

- Tracking successful and prevented fraud by both transaction channel and payment method
- Use of digital/passive authentication solutions to lessen customer effort (let solutions do the work behind the scenes)
- Assessing both the individual and transactional risk
Tracking fraud costs by both transaction channel and payment method is essential to fraud prevention. Many track one or the other, but fewer track both.

While there are more firms tracking fraud costs by payment method compared to previous years, there has been a drop in the number which track by both transaction channel and payment method.

Since fraud occurs in different ways depending on selling physical or digital goods and if using the mobile channel, this creates multiple endpoints and ways that fraudsters can attack. These fraudsters will continue to test for the weakest links and where they can operate undetected. Knowing where fraudsters have been successful is important for "plugging the gaps"; but also knowing where they’ve tried and failed is important in order to maintain vigilance.

% Businesses Tracking Fraud Costs by Channel and/or Payment Method

Survey Questions:
Q14a: Does your company track the cost of fraudulent transactions by payment channels or methods used?

<table>
<thead>
<tr>
<th>Year</th>
<th>Transaction Channel</th>
<th>Payment Method</th>
<th>Both</th>
<th>Do Not Track</th>
</tr>
</thead>
<tbody>
<tr>
<td>2020</td>
<td>21%</td>
<td>14%</td>
<td>57%</td>
<td>7%</td>
</tr>
<tr>
<td>2019</td>
<td>14%</td>
<td>30%</td>
<td>49%</td>
<td>7%</td>
</tr>
</tbody>
</table>

#2 significantly or directionally higher/lower than previous period
Of those who do track fraud costs by payment method, a significant number of firms say that this includes tracking authorized-party fraud.

They also indicate tracking synthetic identity fraud separately from credit losses.
Key Finding 4
FRAUD DETECTION AND PREVENTION APPROACHES

There is sizeable familiarity with the FraudClassifier℠ Model to classify across mid/large U.S. and Canadian financial services and lending firms, with just over half or so using it to classify fraud related to payments.

Awareness and use is somewhat higher among Canadian firms. Canadian lending firms are most likely to be using this model; among firms aware but not using, roughly four in ten Canadian firms expect to do so within the next 6 months.

A majority of U.S. mid/large firms indicate current use of the model, with over half of those familiar and not using expecting to do so within the next 12 months.

Survey Questions:
Q14e: To what degree is your organization familiar with the FraudClassifier℠ Model, published by the Federal Reserve in June 2020, to classify fraud related to payments?

Future Plans to Use FraudClassifier℠ Model*

*Asked of those whose company is familiar with the FraudClassifier℠ Model but are not using it in their organization
Key Finding 4
FRAUD DETECTION AND PREVENTION APPROACHES

Mid/large U.S. banks and investment firms are more likely to be using the FraudClassifier℠ Model than lenders.

However, a majority of lenders familiar with but not using this model expect to do so within the next 12 months.

Survey Questions:
Q14e: To what degree is your organization familiar with the FraudClassifier℠ Model, published by the Federal Reserve in June 2020, to classify fraud related to payments?

Degree of Familiarity with FraudClassifier℠ Model
- Familiar and using
- Familiar but not using
- Not familiar/Never heard of it

Future Plans to Use FraudClassifier℠ Model*
- Within next 6 months
- Within next 6-12 months
- Within next 12-24 months
- No plans
- Don’t know

Note: * Asked of those whose company is familiar with the FraudClassifier℠ Model but are not using it in their organization.
While somewhat more U.S. financial services and lending firms have become extremely focused on optimizing risk assessment with the customer experience, Canadian firms represent a significant year-over-year increase.

Significantly more Canadian financial services and lending firms indicate being extremely focused on optimizing risk levels with the customer experience compared to 2020.

**Survey Questions:**
Q30. To what degree is your company focused on minimizing customer friction during an online or mobile channel transaction checkout? Q30a. To what degree is your company focused on minimizing customer friction when someone opens a new account online or through a mobile device?

**Best Practice**
Friction is a concern. Minimize that through layered approaches that allow you to apply more or less identity authentication efforts based on the risk of the transaction. Not all transactions carry the same level of risk.
Somewhat more U.S. and Canadian financial services and lending firms have become extremely focused on optimizing risk assessment with the customer experience, though many remain only somewhat focused.

Where this differs is with Canadian financial services and lending firms at new account creation.

### Degree of Focus on Optimizing Risk Level to Appropriate Customer Friction Level

<table>
<thead>
<tr>
<th></th>
<th>U.S. Financial Services</th>
<th>U.S. Lending</th>
<th>Canada Financial Services</th>
<th>Canada Lending</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Distribution of Funds</td>
<td>New Account Creation</td>
<td>Distribution of Funds</td>
<td>New Account Creation</td>
</tr>
<tr>
<td></td>
<td>41%</td>
<td>39%</td>
<td>39%</td>
<td>36%</td>
</tr>
<tr>
<td></td>
<td>51%</td>
<td>54%</td>
<td>49%</td>
<td>46%</td>
</tr>
<tr>
<td></td>
<td>8%</td>
<td>7%</td>
<td>12%</td>
<td>18%</td>
</tr>
</tbody>
</table>

2020

<table>
<thead>
<tr>
<th></th>
<th>Distribution of Funds</th>
<th>New Account Creation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>31%</td>
<td>31%</td>
</tr>
<tr>
<td></td>
<td>57%</td>
<td>52%</td>
</tr>
<tr>
<td></td>
<td>11%</td>
<td>16%</td>
</tr>
</tbody>
</table>

* Asked of those with online and/or mobile channel translations; first asked in 2020

---

**BEST PRACTICE**

Friction is a concern. Minimize that through layered approaches that allow you to apply more or less identity authentication efforts based on the risk of the transaction. Not all transactions carry the same level of risk.
The largest increase in U.S. firms being extremely focused on optimizing risk assessment-to-customer experience has come from investment firms and mortgage lenders.

### Degree of Focus on Optimizing Risk Level to Appropriate Customer Friction Level

**U.S. Financial Services**

- **Banks**
  - Distribution of Funds: 38%
  - New Account Creation: 42%

- **Investment Firms**
  - Distribution of Funds: 48%
  - New Account Creation: 35%

**U.S. Lending**

- **Credit Lenders**
  - Distribution of Funds: 39%
  - New Account Creation: 39%

- **Mortgage Lenders**
  - Distribution of Funds: 40%
  - New Account Creation: 30%

Survey Questions:

Q30. To what degree is your company focused on minimizing customer friction during an online or mobile channel transaction checkout? Q30a. To what degree is your company focused on minimizing customer friction when someone opens a new account online or through a mobile device?

- = significantly or directionally higher or lower than previous period
- ▲ = significantly or directionally higher or lower than same category in other industry segments

#2 #3 #4

* Asked of those with online and/or mobile channel translations; first asked in 2020

---

**Key Finding 4**

**FRAUD DETECTION AND PREVENTION APPROACHES**

Overview

Key Findings

Attacks and Costs

Mobile Impact

Customer Journey Risks

Best Practices

Recommendations
There is continued movement among financial services and lending firms toward integrating fraud prevention efforts with the digital/customer experience, though most remain at a partially integrated stage.

The increase among U.S. firms is from banks and mortgage lenders.

Firms that are focusing on optimizing the risk level of the transaction to the appropriate customer friction level are more likely to integrate digital/customer experience operations with fraud prevention.

Survey Questions: Q30b. To what degree has your company integrated its digital/customer experience operations with its fraud prevention efforts?

* Asked of those with online and/or mobile channel translations

= significantly or directionally higher/lower than same category in other industry segments

= significantly or directionally higher/lower than previous period

Integration of Digital/Customer Experience Operations w/ Fraud Prevention*

<table>
<thead>
<tr>
<th>Region</th>
<th>Fully</th>
<th>Partially</th>
<th>Net: not integrated</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S. Financial Services</td>
<td>43%</td>
<td>52%</td>
<td>5%</td>
</tr>
<tr>
<td>U.S. Lending</td>
<td>36%</td>
<td>55%</td>
<td>9%</td>
</tr>
<tr>
<td>Canada Financial Services</td>
<td>27%</td>
<td>59%</td>
<td>14%</td>
</tr>
<tr>
<td>Canada Lending</td>
<td>38%</td>
<td>56%</td>
<td>14%</td>
</tr>
</tbody>
</table>

2020 % Fully Integrated

U.S. Financial Services

- Banks: 43% (6%)
- Investment Firms: 44% (5%)
- Credit Lenders: 34% (11%)
- Mortgage Lenders: 41% (5%)

U.S. Lending

- 29%
- 39%
- 31%
- 15%
There is also some continued movement toward integrating fraud prevention efforts with cybersecurity operations, though most also remain at a partially integrated stage.

The increase among U.S. firms is from banks and mortgage lenders, which suggests that these firms may be integrating cybersecurity operations and the digital customer experience with fraud prevention at the same time.
More U.S. banks have embraced supportive capabilities around cybersecurity alerts, social media intelligence and AI/ML models in the battle against fraud.

There is also an increase in the number of U.S. mortgage firms that are using social media intelligence and AI/ML models. In both cases, increased fraud volume and costs may be driving these organizations to expand their resources more so than others.
Fraud prevention performance metrics vary, with roughly half of U.S. firms using total fraud loss and false positives as key metrics.

There is a broader set of measures among Canadian financial services firms, also including approval and abandonment rates.
Study findings show that the cost of fraud and volume of successful attacks can be mitigated for financial services and lending firms that invest in the best practice multi-solutions layered approach which is integrated with cybersecurity and digital experience operations.

Using U.S. financial services and lending firms as an illustration, those which employ the best practice solutions and integration approach have a lower cost of fraud and level of successful fraud attacks.

For best practice followers, every $1 of fraud costs them less ($3.52) than those which do not follow this approach ($4.20), with nearly half the amount of successful fraud attacks per month compared to those not using this approach.

Integration of Cybersecurity, Digital Experience with Fraud Ops
- Not Using Best Practice Approach
  - Integration: No
  - Focus on Optimizing Fraud Risk-to-Friction Levels: No
  - Solution(s) to verify physical attributes (e.g., Name, DOB, Address): Limited or None
  - Solution(s) to verify digital attributes (e.g., E-mail, phone # risk, biometrics): Limited or None
  - Solution(s) to assess device risk, location (e.g., Device ID, Geolocation): Limited or None
  - Solution(s) to assess behavior (e.g., Behavioral Biometrics, Transaction Risk): Limited or None
  - Avg. # Successful Fraud Attacks / Mo.: $4.20
  - LexisNexis Fraud Multiplier: 654

- Fully Using Best Practice Approach
  - Integration: Yes
  - Focus on Optimizing Fraud Risk-to-Friction Levels: Yes
  - Solution(s) to verify physical attributes (e.g., Name, DOB, Address): Yes
  - Solution(s) to verify digital attributes (e.g., E-mail, phone # risk, biometrics): Yes
  - Solution(s) to assess device risk, location (e.g., Device ID, Geolocation): Yes
  - Solution(s) to assess behavior (e.g., Behavioral Biometrics, Transaction Risk): Yes
  - Avg. # Successful Fraud Attacks / Mo.: $3.53
  - LexisNexis Fraud Multiplier: 375
RECOMMENDATIONS
Identity proofing involves both verification and authentication. Verification relates to self-provided data (date of birth, national ID number, address, etc.) to determine if the person/identity is real and that the data relates to a single identity; this is particularly important with the rise of synthetic identity fraud. Authentication is about confirming that it the person is legitimate (who they say they are).

To minimize fraud, organizations can no longer rely on manual processes with the assistance of limited technologies to reduce challenge rates, manual reviews and costs.

The digital transformation among consumers to more online and mobile transactions means that more of these transactions are occurring in an anonymous environment compared to traditional in-person interactions. Assessing only the physical identity attributes (name, address, date of birth, Social Security Number, etc.) won’t help businesses authenticate the identity. Businesses need to also assess the device risk, as well as the online/mobile behaviors and transaction risk.

Businesses need a robust fraud and security technology platform that helps them adapt to this changing digital environment, offering strong fraud management and resulting in a frictionless experience for genuine customers.

Deploying technologies which can recognize customers, pinpoint fraud and build the fraud knowledge base to streamline on-boarding can prevent account takeovers and detect insider threats.

Using valuable data attributes like users’ login from multiple devices, locations and channels is essential for identifying risks.

Enabling integrated forensics, case management and business intelligence can help to improve productivity.
Recommendation #2
A MULTI-LAYERED SOLUTION APPROACH IS REQUIRED, CUSTOMIZED TO EACH PHASE OF THE CUSTOMER JOURNEY AND TRANSACTION CHANNEL.

- Single point protection is no longer enough and results in single point of failure.
- As consumers transact across locations, devices and geographies, user behaviors, such as transaction patterns, payment amounts and payment beneficiaries, are becoming more varied and less predictable.
- Further, each stage of the customer journey is a unique interaction, requiring different types of identity verification, data and solutions to let your customers in and keep the fraudsters out.
- A multi-layered, strong authentication defense approach is needed. This includes a single authentication decision platform that incorporates real-time event data, third-party signals and global, cross-channel intelligence.
Recommendation #3

STOP FRAUD AT THE FIRST POINT OF THE CUSTOMER JOURNEY BY PROTECTING ENDPOINTS AND USING DIGITAL IDENTITY SOLUTIONS AND BEHAVIORAL ANALYTICS THAT ASSESS RISK WHILE MINIMIZING FRICTION.

New account opening is the customer journey point where fraudsters can become established, causing problems at latter stages. It is also the first point of contact for many legitimate customers; too much friction and they may abandon the effort.

**Multi-layered Solutions Approach**

- **Authenticate the Physical Person**
  - Verify physical identity attributions. **Solution examples:** name/address/DOB verification

- **Authenticate the Digital Person**
  - Analyze human-device interactions and behavioral patterns, such as mouse clicks and keystrokes, to discern between a real user and an impostor by recognizing normal user and fraudster behavior. **Solution examples:** authentication by biometrics; email/phone risk assessment – seamless risk assessment that minimizes customer effort and friction

**Protect Entry Points**

Implement strong customer identity and access management (CIAM) controls by starting with integrating cybersecurity and digital experience operations with fraud detection technology. This guards against attacks while minimizing friction.

**Visit Website** → **Input Identity Credentials** → **Account Created**
Recommendation #4

**Account Login**

**USE TECHNOLOGIES THAT RECOGNIZE YOUR CUSTOMERS, DETERMINE THEIR POINT OF ACCESS AND DISTINGUISH THEM FROM FRAUDSTERS AND MALICIOUS BOTS. LAYERED SOLUTIONS LET YOU APPLY MORE OR LESS FRAUD ASSESSMENT IN ORDER TO OPTIMIZE THIS WITH THE CUSTOMER EXPERIENCE.**

Biometrics using fingerprint or facial recognition are particularly useful for account login, based on this information gathered during account creation; this also provides a secure means of identification that speeds the process with minimal friction. Further layering should include device risk assessment to recognize the customer and assess anomalies with location of login. Where anomalies suggest potential risk, authenticate the person through more active ID authentication.

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**Overview**

**Key Findings**

**Attacks and Costs**

**Mobile Impact**

**Customer Journey**

**Risks**

**Best Practices**

**Recommendations**

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![Flowchart](image-url)

**Visit Website**

**Enter Credentials**

**Access Account**

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**Protect Entry Points**

Implement strong customer identity and access management (CIAM) controls by starting with integrating cybersecurity and digital experience operations with fraud detection technology. This guards against attacks while minimizing friction.

Breached data used to access accounts requires more levels of security and authentication of the person from a bot or synthetic identity.

**Authenticate the Digital Person to Distinguish Between Legitimate and Fake Customers/Fraudsters**

Analyze human-device interactions and behavioral patterns, such as mouse clicks and keystrokes, to discern between a real user and an impostor by recognizing normal user and fraudster behavior.

**Solution examples:** authentication by biometrics; email/phone risk assessment — seamless risk assessment that minimizes customer effort and friction

This is particularly important at account login since fraudsters deploy mass bot attacks, using breached data, to test passwords for account takeover.

Synthetic identities involve real and fake identity data. Physical identity attribute assessment alone will not make this distinction.

**Authenticate the Device**

Identify a remote computing device or user. **Solution examples:** device ID/ fingerprint; geolocation

**Active Identity Authentication**

Use personal data known to the customer for authentication; or where a user provides two different authentication factors to verify themselves. **Solution examples:** authentication by challenge, quiz or shared secrets; authentication using OTP/2 factor
Recommendation #5  

**Account Transaction/Distribution of Funds**

**ADD TRANSACTION RISK TECHNOLOGY TO THE LAYERING OF DIGITAL ATTRIBUTES, BEHAVIORAL ANALYTICS AND DEVICE ASSESSMENT SOLUTIONS DURING THE TRANSACTION/DISTRIBUTION OF FUNDS JOURNEY POINT.**

As consumers transact across locations, devices and geographies, their behaviors, such as transaction patterns, payment amounts and payment beneficiaries, are becoming more varied and less predictable.

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**Multi-layered Solutions Approach**

- **Authenticate the Digital Person**
  
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**Assess the Transaction Risk**

**Velocity checks/transaction scoring:**

Monitor historical transaction patterns of an individual against their current transactions to detect if volume by the cardholder matches up or if there appears to be an irregularity. **Solution examples:** real-time transaction scoring; automated transaction scoring
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