TruStage™

Disruptive technologies

risk overview

The promise of innovations and enhanced consumer engagement offered by disruptive technologies can be an exciting opportunity. However, as with any opportunity for growth, the technologies also bring with them risks that leaders should consider for successful adoption.

New advances in technology are still disrupting our industry — in many cases — for the best.

Disruptive technologies are innovations which can significantly change the way industries, businesses, and consumers operate. And, since new technology attributes are often better than legacy systems or processes, it becomes "disruptive" and replaces a well-established process, product, or technology.

Successful technology adoption depends on credit union leadership anticipating several enterprise-level risks introduced by these up-and-coming technologies. When an established organization willingly embraces disruptive technology, it typically enjoys prime opportunities for growth either within its current industry or within a new industry that's been created by the technology.

Your leadership, people leaders, risk management and information security departments need to be able to build strategies and initiatives to prepare the credit union for these technologies.

Most technology is considered sustaining rather than disruptive. Sustaining technology evolves slowly and steadily over time. To be considered disruptive, technology must be easily accessed by most of the population. A disruptive technology is usually one that enters the mainstream and changes the way most people and consumers think or behave.

Technology trends to monitor

- Artificial intelligence (AI)
- Cloud computing
- Internet of Things (IoT)
- Robotic process automation
- Block chain & distributed ledger technology
- Open banking
- Big data analytics

Disruptive technology considerations

The business case

As competitive businesses, credit unions need to ensure the financial reward or upside is compelling enough to invest in new technologies and partnerships.

Operational forces

How does the new technology fit into existing systems? Weak or conflicting designs can increase errors. New technologies must work seamlessly with legacy infrastructures in order to realize expected gains.

Strategic forces

Do the potential advantages of the new technology justify its cost and commitment of time and resources? A key decision is whether your organization wants to be an early adopter or wait for the technology to mature to ensure more predictable outcomes.

Regulatory forces

These new technologies may generate unwanted regulatory concerns or missteps. Credit unions will need to clearly understand and document how technologies work so they can know and explain processes and controls to regulators.

Talent skill challenges

A talent gap related to the necessary skills to implement new technology can significantly inhibit the ability of a credit union looking towards adoption. Without established continuous learning programs and robust upskilling, credit unions will continue to face obstacles.

User adoption or resistance

Credit union employees may find new technologies unsettling. It can challenge their expertise with legacy systems and exasperate fears of skill loss or standing within the organization. The same can be true for members facing new technologies. These fears can lead to resistance and impede adoption and desired results.

The next wave of disruptive technology is here, providing forward-looking organizations with an opportunity to be ready for consumer demands today and in the future.

Technology trends

Artificial intelligence (AI)

AI has rapidly evolved from a buzzword to a transformative force across industries — and financial services are no exception. Depending on your role, or simply your curiosity, you may already have a solid understanding of what AI is, how it works, and which tools are gaining traction.

At its core, AI refers to systems that can perform tasks typically requiring human intelligence, such as understanding language, recognizing patterns, making decisions, and learning from data.

Artificial intelligence (AI) continues to be a big part of our lives and has yet to reach its full potential.

In the financial services industry, AI is being used to streamline operations including automating loan and insurance underwriting, enhance member experiences with customer service chat and phone response tools, and strengthen security & fraud detection.

AI also includes language-based models that allow for rapid advancements.

Generative AI leverages generative models to create new content such as text, images, videos, and other data types. These models learn the patterns and structures within their training data and use that knowledge to generate original outputs based on user input.

Machine learning (ML) enable systems to learn from data and enhance their performance without being explicitly programmed. It drives many AI applications by identifying patterns, making predictions, and automating decision-making processes.

Robotic process automation (RPA) uses software robots known as "bots" to automate repetitive, rule-based tasks that are typically performed by humans. These tasks often involve interacting with digital systems and applications, such as entering data, processing transactions, or responding to simple queries.

Artificial intelligence offers a wide array of opportunities to enhance operations and member engagement. Some ways that AI is helping organizations transform include:

- Enhanced member engagement with AI-powered chatbots and virtual assistants
- Fraud detection and prevention
- Account authentication
- Credit scoring and risk assessment
- Automated document processing
- Predictive analytics
- Enhanced data security and threat detection
- Incident response
- Compliance automation
- Target-driven marketing
- IT staffing efficiencies
- Employee life cycle enhancements including recruitment, performance management, and employee development

Routine process automation such as document handling and compliance checks can also help reduce costs, minimize errors, and accelerate service delivery.

The use of AI and machine learning can make data analysis and credit risk assessment more efficient, as it allows large quantities of data to be analyzed quickly and may lead to the discovery of new risk segments or patterns by filtering through variables for significant predictors. AI/ML may also expand credit availability for underserved populations by using nontraditional metrics.

Use case

AI and machine learning are increasingly deployed in credit and risk functions, enabled by greater data availability and affordable computing capacity.

The combination may improve operational efficiency and analytical outcomes but carries the risk of 'black box' decision-making and data, as well as potential programming deficiencies and biases.

Technology trends

Artificial intelligence (AI)

AI also leverages getting value out of data - now more pertinent than ever – aiding credit unions with the wide range of sources and consumer trends. AI can support strategy and control losses:

- **Account opening/loan evaluation**
  Validate the authenticity of applicant info to improve accuracy and efficiency.
- **Payment authorization**
  Evaluate requests and authorize payments in real-time.
- **More accurate product recommendations**
  Augment human decision-making with increased precision.
- **Personalized communications and advice**
  Applications like online virtual advisors can offer members real time accurate account solutions and financial advice

The key to successful adoption is to approach AI thoughtfully, balancing innovation with responsibility. A good place to start is to develop a strategic plan that aligns artificial intelligence initiatives with your organization's goals, capabilities, and risk appetite.

Potential challenges

- Data privacy and security
- Algorithmic bias and discrimination
- Regulatory and compliance complexity
- Over-reliance on automation
- Model drift and performance issues
- Lack of transparency and explainability
- High implementation costs
- Workforce impact, including a shortage of skilled talent

AI can also be used in the fight against fraudsters.

- **Threat detection and response** - AI systems analyze vast volumes of network traffic and system logs in real time to identify anomalies that may signal cyber threats. ML models are trained to detect patterns linked to phishing, malware, and zero-day exploits, enabling faster and more accurate threat identification.
- **Behavioral analytics** - By monitoring user behavior, AI can detect deviations from normal activity, such as unusual access times or locations that may indicate insider threats or compromised accounts. Reduce false positives with behavior analysis.
- **Predictive intelligence** - AI leverages historical data and global threat intelligence to anticipate emerging threats. This proactive approach helps organizations prioritize vulnerabilities and strengthen defenses before attacks occur.
- **Automated incident response** - AI-driven security operations centers (SOCs) can automate responses to common threats, such as isolating infected devices or blocking malicious IPs, significantly reducing response times and limiting damage.
- **Malware classification** - ML algorithms classify and detect new malware variants, including polymorphic threats that change their code to evade traditional detection. These models continuously evolve to stay ahead of attackers.

Unfortunately, cybercriminals are also using AI to develop more advanced threats, including AI-generated phishing campaigns, automated reconnaissance tools, and more sophisticated & adaptive malware to identify high-value targets, encrypt data intelligently, and bypass standard defenses.

Technology trends

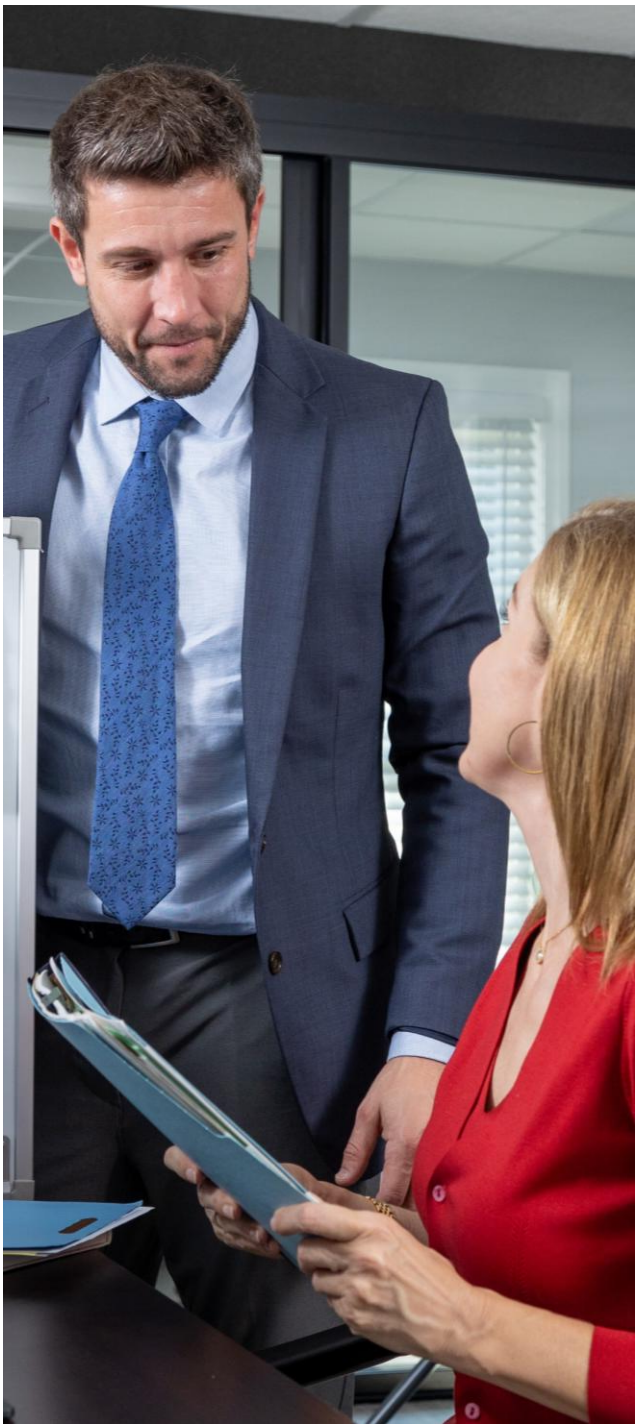
AI: lending & collections

A possible benefit of artificial intelligence is the potential to remove bias from loan underwriting; however, it is not a given. The traditional process which was dependent on human thought processes not only impacted speed but also results. Bias inevitably factored into the underwriting process, leading to declines or interest rate adjustments applied to certain loans. This increases the risk of member dissatisfaction and disparate impact to protected classes.

Artificial intelligence and machine learning have the potential to remove this bias altogether by churning the applications through its algorithms to search for patterns and deliver decisions based on the same consistent and factual data.

Credit unions have been somewhat cautious to leverage digital technologies for default management, whether to increase efficiency or improve the member experience. Collection strategies should no longer be based one-size-fits-all models but rather should be personalized for individual members. The right collection strategy for each member is based on their past repayment behavior.

By analyzing data, credit unions can build predictive models based on past behaviors and current financial standing. Artificial intelligence will play an important role in identifying critical new factors and fine-tuning existing factors to ensure that the model aligns with evolving conditions. Eventually, bots can be deployed to define the optimal strategy based on AI and ML algorithms to facilitate the best possible collection outcome.



Technology trends

Robotic Process Automation (RPA)

RPA continues to gain traction in the financial services industry, automating repetitive manual tasks and improving operational efficiency. By deploying software robots, financial institutions can streamline processes such as member/ customer onboarding, data entry, and compliance checks - which reduces errors and enhances productivity.

Intelligent automation technology is used to drive efficiency, eliminate repetition, and improve consumer satisfaction. The technology behind this automation is often referred to as robotic process automation (RPA).

- Standard tasks are increasingly being automated using RPA:
- customer onboarding processes
- account opening
- loan processing
- compliance reports

RPA can capture data from know your customer (KYC) onboarding documents and match it to new member documentation, as well as read through compliance documents and extract the necessary information for completing SAR's and CTR's.

Big data analytics

Big data refers to large and complex datasets. By leveraging data analytics and big data technologies to derive actionable insights from vast member/customer data, financial institutions can better understand customer behavior, personalize offerings, and make data-driven decisions to mitigate risks and optimize operations.

These big data analytics can often pose challenges for traditional data management and analysis tools who struggle to interact with and provide valuable strategic insight from these datasets.

Using advanced analytics, credit unions can apply technology to efficiently extract valuable data insights and use those insights to improve strategic decision-making.

The possibilities appear to be endless when the power of data analytics is combined with consumer experience channels. These connected experiences provide a deeper understanding of member profiles and can produce highly personalized interactions and relationships that meet or exceed consumer service expectations, fulfill revenue opportunities, and potentially reduce operating expenses.

Big data analytics also has significant utility and risk management optimization.

In addition, by leveraging the big data analytics technology to monitor consumer spending patterns and identifying unusual behavior within transactions, credit unions may be able to increase fraud prevention.

It is critical that you strive to be good stewards of member/consumer data, from a business and ethical standpoint. Stay focused on compliance, data privacy, vendor due diligence, cyber threats, and efficient disaster recovery.

Technology trends

Internet of Things (IoT)

IoT technologies enable the interconnection of physical devices and objects, allowing them to collect and exchange data. IoT can be leveraged in the financial services industry for various applications, such as remote asset monitoring, real-time fraud detection, and personalized customer experiences. For example, credit unions can use IoT devices to monitor ATMs, track inventory levels, and provide personalized offers based on customers' locations and preferences.

Many financial institutions, including credit unions, have turned toward IoT technologies to enhance consumer experiences and reduce costs.

- Using beacons to send customized offers to consumer smartphones as soon as they enter the branch.
- ATMs and ITMs (interactive teller machines) live stream video support that allows customers to speak to tellers for additional assistance.
- Consumer reliance on smart devices, (e.g., smart speakers, Echo/Google Home devices, smart watches, fitness trackers etc.) to receive or deliver voice, text, or email instructions rather than using other virtual banking platforms or face-to-face interactions.

Additionally, developments and advancements to IoT devices continue to be implemented in your credit unions (e.g., Smart TV, security system, clocks, appliances, tablets, etc.) to enhance your operations and connections with your employees.

Use case

It is becoming more common to provide members' the ability to use voice-activated devices to review the last five transactions on their share draft account, or to transfer $100 from savings to checking. It is anticipated that members will soon want to complete a loan application using voice interfaces.

Risk mitigation, privacy disclosures, and opt-out options need to be carefully reviewed and considered.

Leveraging data analytics for fraud detection & prevention

With the increasing digitization of banking services, cybersecurity and fraud prevention have become critical priorities. Financial institutions are investing in advanced cybersecurity technologies, including threat intelligence, encryption, and biometric authentication, to safeguard customer data and protect against evolving threats.

When preventative controls use data analytics, patterns indicative of fraud can be detected much earlier causing less harm to the credit union.

A few years ago, credit unions found it sufficient to run nightly batches of fraud detection processes that relied on establishing fraud rules. The output would be reviewed the following day for suspicious transactions. By that time, however, the funds were already stolen from member accounts. Even real-time fraud solutions rely on fraud rules. The fraud rules had to be developed by staff and required constant monitoring of the fraud environment to identify trends and tactics used by fraudsters in order to develop appropriate fraud rules. Furthermore, fraudsters adjust to the fraud rules and design tactics to circumvent them.

Although machine learning has delivered a significant upgrade to fraud detection systems, you shouldn't give up on fraud rules completely. Your anti-fraud strategy should include rules where it makes sense.

With the increase in transactional channels and the increasing sophistication of fraudsters, there is a pressing need for real-time fraud prevention solutions that rely on data analytics and machine learning to detect patterns over multiple channels. This involves the use of data analytics to sift through the mountains of data. This can alleviate the burden on staff to develop rules for fraud monitoring solutions.

The main advantage of using data analytics for fraud prevention is that it can handle more data at once. The data helps to identify the most common areas where fraud is occurring, how it's perpetrated, and how to effectively deal with it. Data analytics also helps in identifying emerging fraud trends much faster than people could do without the help of technology.

Technology trends

Cloud computing

Financial institutions continue to rely on cloud computing to optimize infrastructure costs, improve scalability, and enable faster deployment of applications.

Cloud computing can be a low cost, scalable resource that offers an alternative to storing and accessing data and programs using a network of remote servers hosted on the Internet. The cloud typically provides greater flexibility and efficiency, making it a more affordable solution for IT infrastructures. These distinct features are incredibly attractive to credit unions, especially as members needs continue to grow and evolve.

Cloud-based solutions offer enhanced data security measures, agility, and the ability to integrate with other systems, enabling financial institutions s to innovate and launch new services quickly.

Blockchain

Blockchain continues to be a disruptive force in the financial services industry, transforming areas such as cross-border payments, trade finance, and identity verification. Its decentralized and secure nature has the potential to streamline processes, reduce costs, and increase transparency in transactions.

Blockchain technology and its associated distributed ledgers were devised as a simple solution to keep track of the Bitcoin cryptocurrency. The solution leverages a 'distributed ledger' under which all users who participate in the network have a copy of the entire ledger.

Blockchain and Distributed Ledger Technology (DLT) can deliver savings in infrastructure transaction and administrative costs. By disintermediating the transfer of certain assets, it reduces the role of central counterparties. This can improve the level of trust, accuracy and resilience in certain financial ecosystems.

It also has potential applications in payments, investments, payroll, ATMs and money service businesses. Additionally, a potential long-term use with application process interfacing and smart contracts.

While the application of blockchain can be transformational, its adoption is fraught with risks and challenges.

Technology trends

Blockchain and lending

Blockchain-based lending can provide a secure way of offering loans to a defined group of members. There are two possible applications to involve blockchain in the lending process:

- use blockchain-based products as collateral in lending i.e., cryptocurrency
- develop and use blockchain solutions to streamline the lending process

One of the fastest growing applications of blockchain is in the crypto-collateralized lending space. A crypto-collateralized loan is exactly what it sounds like— a loan collateralized by cryptocurrency. There are now numerous platforms providing crypto-collateralized loans. Given that cryptocurrency is a publicly traded asset, there are a variety of benefits in using cryptocurrency as collateral.

For example, Bitcoin holdings can be verified much like any other investment assets, and the current value of holdings can be easily determined based on market prices. Another benefit is that in the event of default, the collateral can be readily liquidated and with new advancements in banking regulations, financial institutions can now maintain custody of crypto assets which substantially reduces the lender's risk.

Crypto assets also create opportunity for international lending. Cryptocurrency can be evaluated and liquidated uniformly across the globe at any time. This allows lenders to monitor the value of collateral in real time over the course of a loan. Additionally, it reduces the challenges of perfecting liens across borders and the cost of enforcing liens across borders is virtually eliminated. This creates the possibility to reach borrowers that were previously unreachable due to liquidation and valuation risks.

There are still legal challenges for lenders of crypto-collateralized loans. The first is the difficulty of perfecting an interest in cryptocurrency. There is much debate over how crypto assets such as Bitcoin fit into the Uniform Commercial Code. Bitcoin can be considered money, investments, a commodity, or even a general intangible. Each of these has different procedures for lien perfection and choosing one or the other could risk a lender's priority if the choice proves incorrect. The proposed amendment to UCC Article 9 regarding crypto, which included provisions for treating digital assets like crypto as collateral in secured transactions, has passed and is now a part of the 2022 UCC amendments.

The UCC amendments include a new Article 12, which governs transfers of interests involving a subset of digital assets referred to as "controllable electronic records" or "CERs", as well as amendments to Article 9 addressing the perfection of a security interest in these CERs. However, it is important to monitor state legislative developments to see when each state amends their versions of Article 9 to address the perfection of security interests.

Technology trends

Open banking

Open Banking refers to the movement that financial institutions will work together in a technological ecosystem.

Open banking initiatives aim to increase competition and innovation in the banking industry by allowing customers to securely share their financial data with authorized third-party providers.

Through open APIs (Application Programming Interfaces), financial institutions can collaborate with fintech companies and other financial institutions to develop new products and services that meet customer needs.

Open banking promotes data sharing, enables personalized financial solutions, and enhances the overall customer experience.

This practice provides third-party financial service providers open access to consumer banking, transaction, and other financial data from credit unions and non-bank financial institutions. Using open API's (Application Programming Interfaces), credit unions can collaborate with third-party service providers like fintech companies and other financial institutions

The API interface allows the networking of accounts and data across institutions for use by consumers, financial institutions, and third-party service providers.

So how does open banking work?

Members are required to grant consent to allow their financial institution to share their personal financial data. This can be accomplished by checking a box on a terms-of-service screen in online banking or in a mobile app. Third-party providers, using APIs, can then use the member's shared data to offer a range of financial service options.

By relying on networks of service providers instead of one provider, open banking can help consumers securely share their financial data with other financial institutions. The API can also look at consumers' transaction data to identify the best financial products and services based on their financial profile.

The introduction of Open Banking has the potential to put consumers in control of their personal data, but it is counter-intuitive to traditional relationship banking.

Looking for additional insights?

- Access the **Business Protection Resource Center** (User ID & Password required) for exclusive risk and compliance resources.
- If you'd like to discuss in more detail, simply contact a TruStage™ Risk Consultant at **riskconsultant@trustage.com** or at **800.637.2676**.

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