MICHIGAN STATE UNIVERSITY Project Plan Transaction Anomaly Detection The Capstone Experience

Team MSUFCU

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From Students... ...to Professionals

Functional Specifications

- Detect and alert users of anomalous transactions
 - Fraud / account takeover
 - Changes in recurring payments
- Provide visualization of member spending habits
- Implement anti-money laundering rules according to Bank Secrecy Act
 - Stretch goal

Design Specifications

- Create web, Android, and iOS applications for user interaction
- Use colors and icons to indicate severity of anomaly
- Potentially fraudulent transactions will be brought to an employee's attention for review
- Members will be alerted according to MSUFCU's notification protocol

Screen Mockup: Mobile App

| III Sketch 🗢 | 9:41 Acco | ^{AM} unts | ∦ 100% 🔳 |
|---|---------------------|-----------------------|---------------------------|
| 99 - TOTALLY GREEN CHECKING | | | |
| 9999 | | А | \$498.18 |
| Vlisa Card Contro | ols | | - |
| Transaction His | story | | |
| SEP 13, 2018 | | | |
| ALERT - SUS | PICIOUS TR | ANSACTION | |
| | | | |
| SEP 18, 2018 | лапосалон . Р | ease tap tor mor | e iniomation. |
| MSU BOOKSTO | RE | | \$-240.79 |
| CABLE BILL This repeating tran SEP 17, 2018 | saction appea | rs to have increa | \$-69.79 sed this mont |
| RICK'S AMERIC | AN CAFE | | \$-4.50 |
| | | SEE | MORE - |
| \$\$ _ | | | |
| Accounts M | loveMoney | eDeposit | My Offers |

Screen Mockup: Member Web Portal

| FEDERAL CREDIT UNION | Account #:1234 \$2,550.9 Available Baland | 27 Ce |
|----------------------|---|------------------|
| Transaction descri | otion | -\$15.00 |
| Transaction descri | ption | <u>-</u> \$19.95 |
| Transaction descri | otion | -\$4.99 |
| | See all transactions | |

Screen Mockup: Member Web Portal



Screen Mockup: Employee Web Portal





Technical Specifications

- Server: Amazon EC2, AWS Elastic Beanstalk
- API: Django REST Framework
- Mobile Apps: iOS, Android
- Web Portals: Member-facing, employee-facing
- Database: MySQL hosted on AWS

System Architecture





Team MSUFCU Project Plan Presentation

System Components

- Hardware Platforms
 - All servers on Amazon Web Services
- Software Platforms
 - Member-facing iOS, Android, Web platforms
 - Employee-facing Web platform
- Technologies
 - Scikit-learn
 - TensorFlow / Keras
 - Django

The Capstone Experience

Risks

- Quality of data
 - Dataset has very few instances of fraudulent transactions
 - Mitigation: Techniques such as local outlier factor and single class support vector machines are designed to deal with this issue
- Connecting all components
 - iOS and Android apps are not connected to the AWS database
 - Have identified tutorials and resources on how to connect apps to AWS
- Provide value to members
 - Don't know how best to deliver meaningful information to members
 - Will utilize focus groups to test our apps and will implement changes based of their feedback
- Security
 - Must ensure transaction data is secure from end to end
 - Mitigation: Having no memory leaks and isolating our modules

Questions?

