

Client

Construction

190+ Countries

Mining

3M+ Products

Turbines

\$38.5B Revenue

Engines

95K Employees

Locomotive

Stakeholders

Employees

21% Active Accounts

Suppliers & Dealers

36%

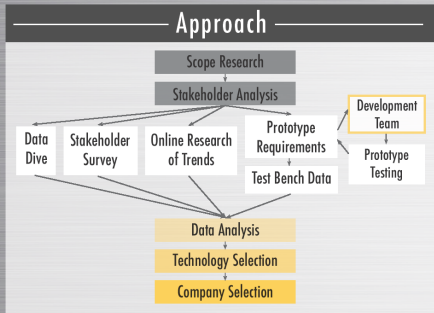
Customers

43%

Opportunity

- 6+ Logins per day
- 28% Login failure rate
- \$3.6M Average breach cost
- 3670 Password issues per month

Enhance user experience and security by phasing out password reliance and implementing new authentication solutions



Findings

Industry Research

Feasibility Matrix

UX | \$ | Wrench | Lock

16 New Technologies | 29 Factors Analyzed | 60 Companies Scoped

Stakeholder Survey

Twitter Data Mining

Love | Hate

90% desktop logins | 86% have access to sensitive data

Leading Technologies: Face, Iris, Fingerprint, Heart Rate, Social Password, USB Key

Authentication Prototype

Bar chart: User Experience (9), Password (7), Facial (5), Yubikey (3), Fingerprint (2)

Bar chart: Login Speed (1/seconds): Password (9), Facial (7), Fingerprint (5), Yubikey (3)

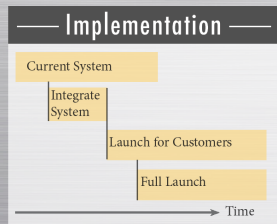
Legend: Face, USB Key, Smart Card, Heart Rate, Fingerprint, Facial, USB Key

Recommendations

	Finger	Face	Social	USB Key
Employees	✓	✓		✓
Suppliers & Dealers	✓	✓		
Customers	✓	✓	✓	

Companies: Bitium, Okta, Gemalto, Deepnet, SecureAuth, PingIdentity

✓ Analytics, FIDO, MFA, SSO, BYOD, Cloud, Scalable



Impact

- UX: Improved user experience, Reduced help desk calls, Less time spent on authentication
- Security: Improved security, Higher customer retention, Increased competitive advantage

THE QUEST - CATERPILLAR PROJECT
IMPROVING THE USER EXPERIENCE OF AUTHENTICATION

STUDENT TEAM: THE CATERPILLAR EFFECT

Rohan Bajaj Finance	Chloe Berman Marketing	Alyssa Hu Computer Science, Mathematics	Sam Lewando Mechanical Engineering	Julia Lomakina Info Systems, Operations Management
Project Champion: Rowland Nicholson, Enterprise Architect				
Faculty Advisor: Dr. Jim Purtilo				

PROJECT SUMMARY

With over 95,000 employees and \$38 billion in revenue, Caterpillar has expanded from its California roots into an internationally recognized symbol of quality machinery. Caterpillar's major product lines are Construction, Mining Equipment, Diesel & Natural Gas Engines, Industrial Gas Turbines, and Diesel-Electric Locomotives. The departments involved in this project are Global Information Services (GIS) Division and Identity and Access Management (IAM), which aim to eliminate reliance on passwords by 2020. Caterpillar passwords have grown in length and complexity in order to meet security requirements. This makes it more difficult to create and remember passwords, leading to exasperated users and increased demand on call centers. As a result, Caterpillar is exploring the idea of implementing password alternatives for their authentication system to increase user satisfaction with authentication. The users accessing Caterpillar Web Services are customers, workforce, and suppliers/dealers. The team's recommendations will fit into Caterpillar's overall timeline for password replacement, allow them to conduct proofs of concepts (POC's), select a product, and implement the solution.

CONTRIBUTIONS AND RECOMMENDATIONS

The Caterpillar Effect first conducted stakeholder analysis to define functional and technical requirements. Then, they conducted online research, gathered Caterpillar data, administered surveys, and worked with a CMSC435 team to develop an authentication test bench. Lastly, they did holistic data analysis to create a segmented strategy. The team recommends fingerprint and facial recognition for customers, employees, and suppliers/dealers. In addition, they recommend social login for customers and USB key for employees. Some technologies to keep on a watch list are behavior analytics and heart rate. Potential vendors include Okta, Bitium, Gemalto, Deepnet Security, and SecureAuth. Moving forward, Caterpillar will be able to improve user experience, provide increased security, and increase customer retention by investing in Caterpillar's digital strategy.