





OWASP Low-Code / No-Code Top 10

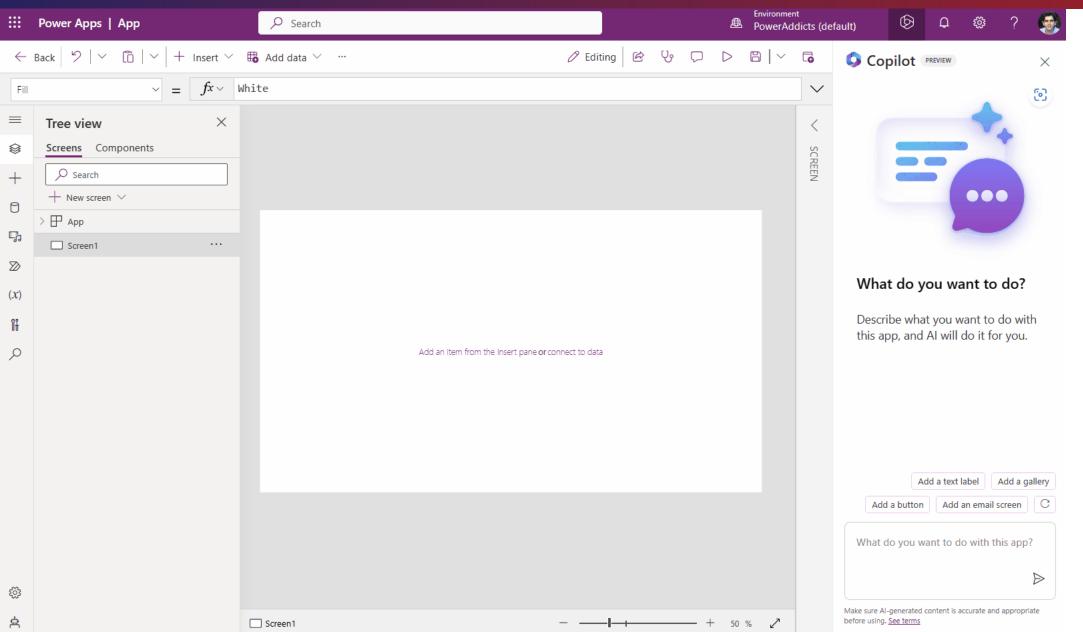
Michael Bargury (Zenity), Ory Segal (Palo Alto Networks), Don Willits (Microsoft), John McTiernan (DT Group), Yianna Paris (Xebia), Ziv Daniel Hagbi (Zenity) and many more!



OWASP TOP 10



Why LCNC? Why new?

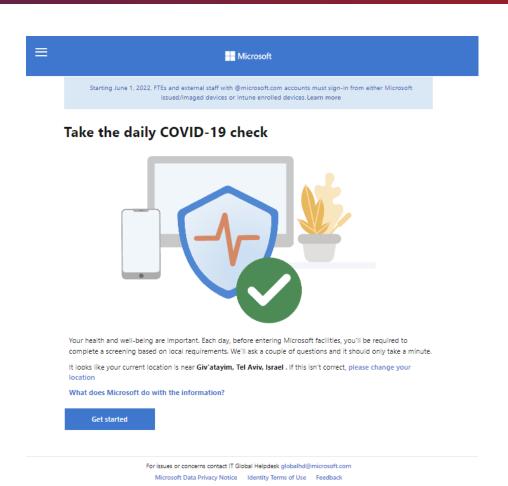


Source:

@RezaDorrani



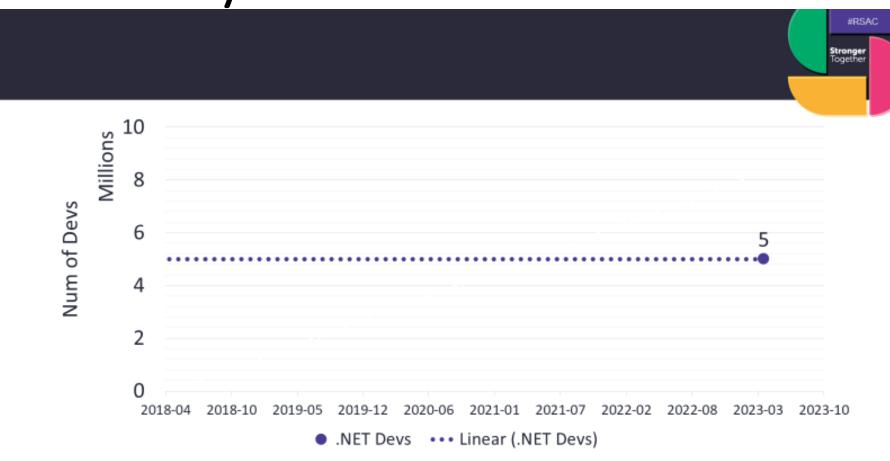
COVID health check app by Microsoft



© 2021 Microsoft



C# devs today



Credential Sharing as a Service: The Dark Side of No Code

Michael Bargury RSAC 2023

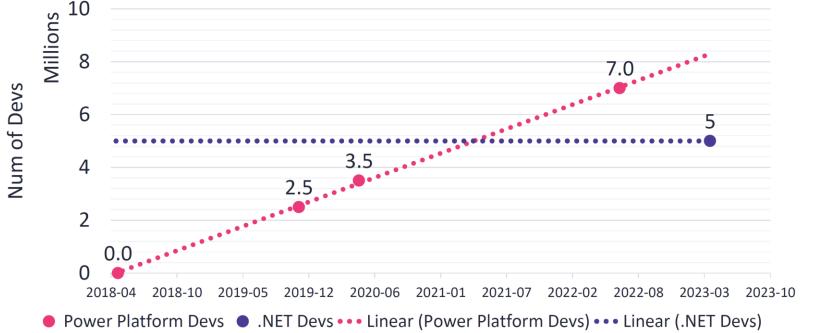




~8M active Power devs today!







Credential Sharing as a Service: The Dark Side of No Code

Michael Bargury RSAC 2023





Al implies No Code apps become more complex and more useful

Press release

14 Jun 2023 | London, GB

EY unlocks Microsoft Azure OpenAl Service to empower EY Tax professionals globally with EY Tax Copilot

Press contact



Barbara Dimajo

Assistant Director, Media Relations and Social Media Ecosystems, Ernst & Young LLP





Dolated topics

. The EY Tax Copilot program is designed to accelerate how the EY organization innovates, delivers services and provides value to teams and clients

EY today announces the launch of EY Tax Copilot, an education and enablement program to prepare EY Tax professionals across the globe for the future of low-code technologies powered by generative AI. EY Tax Copilot was created with Microsoft to provide a framework to take advantage of Microsoft Azure OpenAI Service, Power Platform and other Microsoft technologies to improve EY Tax platforms, including EY Global Tax Platform, EY Mobility Pathway, EY Global Payroll Operate, EY Tax FS, and EY Indirect Tax, as well as support tax professionals and clients.

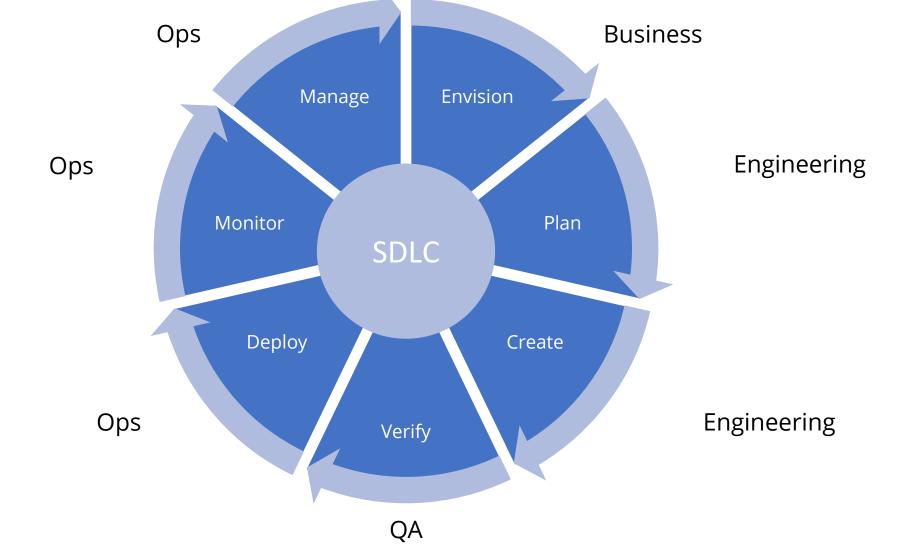
Tailored to one's skills and career path, this program will focus on building design and development capabilities that are appropriate for each individual's role at the EY organization and future as a tax or tax-law professional. Some professionals will focus on value creation and design, while others will be enabled to utilize Microsoft Power Platform to quickly create solutions. EY Fabric, which underpins EY Tax's platforms, is one of the largest B2B technology platforms in the world, analyzing over 1 trillion lines of financial data annually.

In collaboration with EY Tax Copilot, EY Fabric will allow EY Tax teams to not only leverage Microsoft Power Platform with EY accelerators, but also connect their efforts to other technology and data assets being built across the organization, reducing duplication across the organization and improving technology value for all. EY Tax professionals will be able to efficiently provide technology-based value as trusted tax advisors by taking advantage of EY Fabric's one-of-a-kind global deployment and governance capabilities.

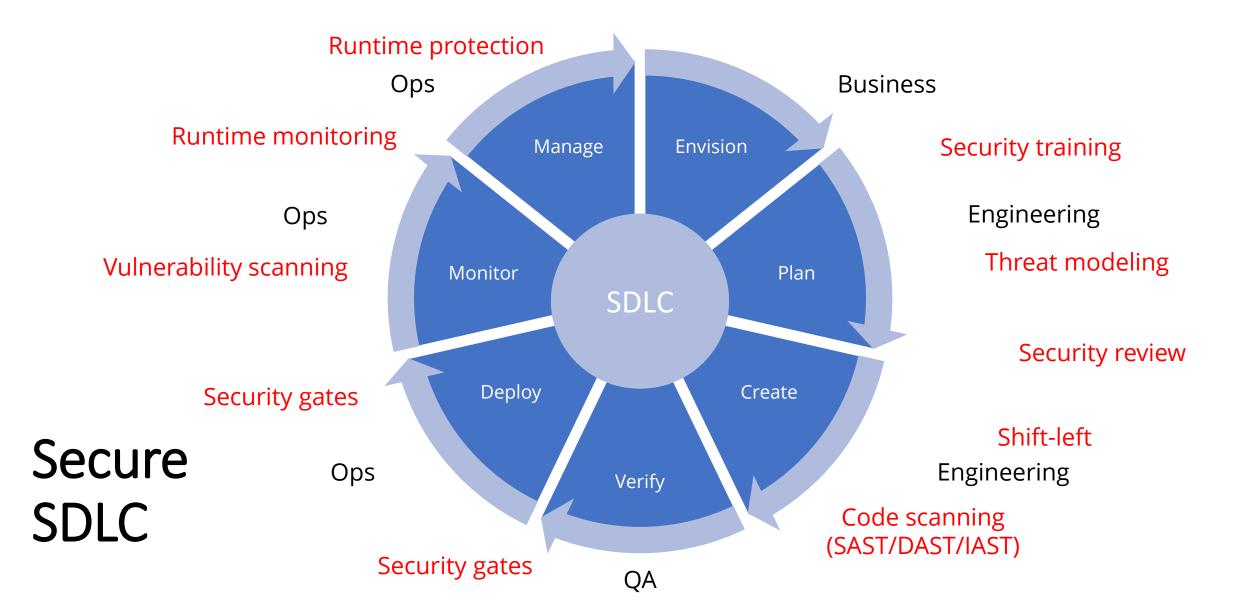


No Code No SDLC

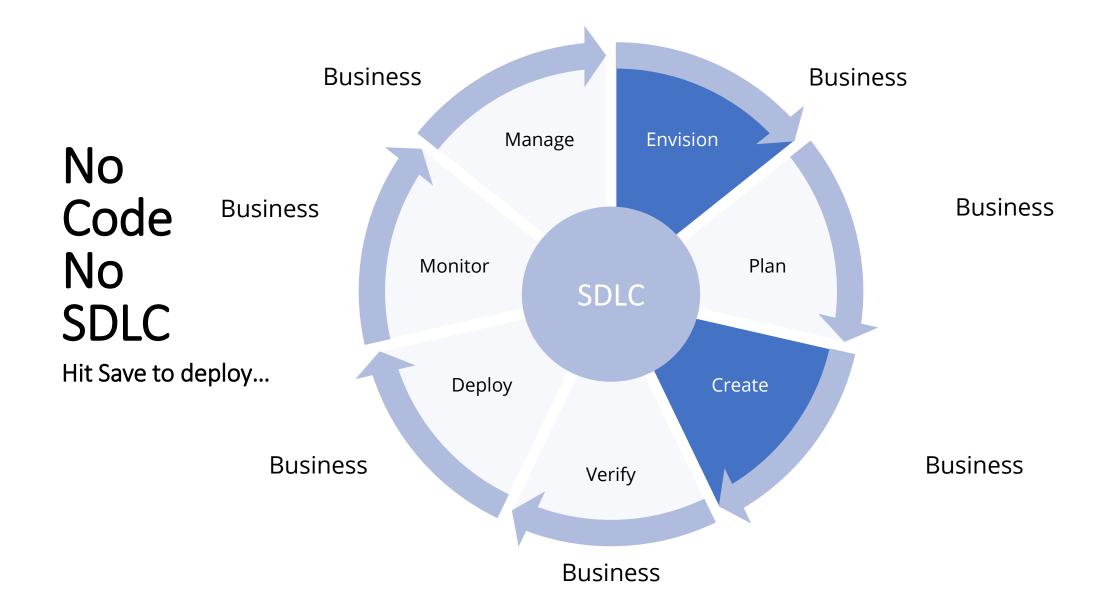














Lacking security controls

Existing security control	Low-code / no-code
Security training	Can we expect business users to be security savvy?
Threat modeling	Can't scale to 000s apps/year
Security review	Can't scale to 000s apps/year
Code scanning	No code to scan
Artifact scanning	Mostly unavailable, overwhelming FPs
Security gates	Lacking CI/CD
Vulnerability scanning	No awareness to low-code leads to overwhelming FPs
Runtime monitoring	Lacking logs
Runtime protection	Lacking instrumentation



Recap – security process and controls are severely lacking

- Has access to business, health, financial data
- Runs as SaaS
- Lacking SDLC
- Lacking security controls
- Developers with no security savviness
- 10-100x the scale of application development



OWASP LCNC Top 10



Unique about LCNC

- Devs can be anyone from a pro dev to a citizen dev
- No SDLC
- No security controls
- 10-100x scale of app development
- Code is generated (platform owns code-gen vulns)
- Focused on logical vulns



OWASP LCNC Top 10

- LCNC-SEC-01: Account Impersonation
- LCNC-SEC-02: Authorization Misuse
- LCNC-SEC-03: Data Leakage and Unexpected Consequences
- LCNC-SEC-04: Authentication and Secure Communication Failures
- LCNC-SEC-05: Security Misconfiguration
- LCNC-SEC-06: Injection Handling Failures
- LCNC-SEC-07: Vulnerable and Untrusted Components
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- LCNC-SEC-10: Security Logging and Monitoring Failures





OWASP LCNC Top 10

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The Gist

A short description for security pros

Low-code/no-code applications can be embedded with a developer account which is used implicitly by any application user. This creates a direct path towards Privilege Escalation, allowing an attacker to hide behind another user's identity, circumventing traditional security controls.

Business User Description

A critical component of any system is tracking what user is taking actions in that system. When account impersonation occurs it "looks" like actions taken by one user are being done by another.



A longer description for security pros

A short description for business users

contribution by John McTiernan, DT Group and Yianna Paris @punk_fairybread, Xebia

Description

Identities are embedded within each built application, and multiple users can use that application. This creates a direct path for application users to escalate privileges, which is atypical and should be avoided whenever possible.

Low-code/no-code applications can take advantage of embedded user accounts rather than having their own application identity. Embedded identities can belong to the application creator, or they could be a common identity shared by teams, such as database credentials. They could also be service accounts or shared identities.

The lack of application identity hides the application's existence from monitoring systems outside of the low-code/no-code platform. As an outside viewer, any user that uses the application is impersonating the application's creator, and there is no way to distinguish between the application and its creator. The problem becomes even more acute when applications use different identities to operate on various platforms. In such a case, one user could be used to store files on a file-sharing SaaS and another user to retrieve on-premise data.



Example Attack Scenarios

Scenario #1

A developer creates a simple application to view records from a database. They use their identity to log into the database, creating a connection embedded within the application. Every action that any user performs in this application ends up querying the database using the developer's identity. A malicious user takes advantage of this and uses the application to view, modify or delete records they should not have access to. Database logs indicate that all queries were made by a single user, the trusted developer.

Scenario #2

A developer creates a business application that allows employe responses, the developer uses their personal email account. Us the developer's personal account.

Scenario #3

A developer creates a business application and shares it with a user's identity. Aside from its stated purpose, the app also uses Scenario #2 Once the admin uses the app, they inadvertently elevate the de

Example Attack & Misuse Scenarios - Business Users

business users

Scenario #1

A developer builds a No Code/Low Code Robotic Process Automation (RPA) application that connects to a database to update records. The connection uses the Admin's authentication (username and password) to log updates. Although 10 different users use this RPA process, all actions are being recorded as being done by the Admin. Logging systems can no longer track productivity, attribute errors to specific users, or identify malicious behavior.

Attack and misuse scenarios for both security pros and

A developer builds an application to help the sales team in the field. The developer uses their credentials (username and password) when writing the application, so all sales made through the application are attributed to the developer, not the sales person facilitating the sale.



What can you do about it?

How to Prevent

- Adhere to the principle of least privilege when provisioning connections to databases/services/SaaS
- Ensure applications use dedicated service or application accounts rather than user accounts
- Ensure applications use a single consistent identity across all their connections, rather than a different identity for each.

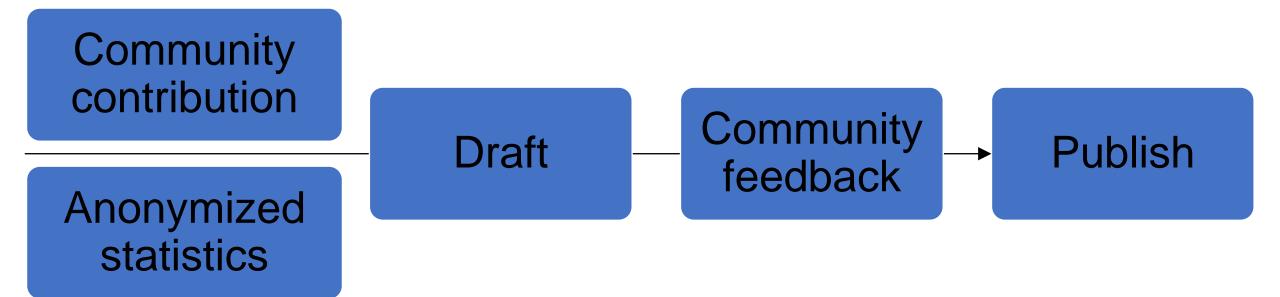
 Use a dedicated service or application account for those connections
- Ensure a proper audit trail is maintained to identify the actor behind actions performed through the shared connection, whether those connections are shared by virtue of users using the application or by granting users access to that connection directly

References

- Low Code High Risk Enterprise Domination via Low Code Abuse, DEF CON 2022
- Watch Out for User Impersonation in Low-Code/No-Code Apps
- Do low-code / no-code platforms pose a security risk?
- Credential Sharing as a Service: The Hidden Risk of Low-Code/No-Code



Methodology loop

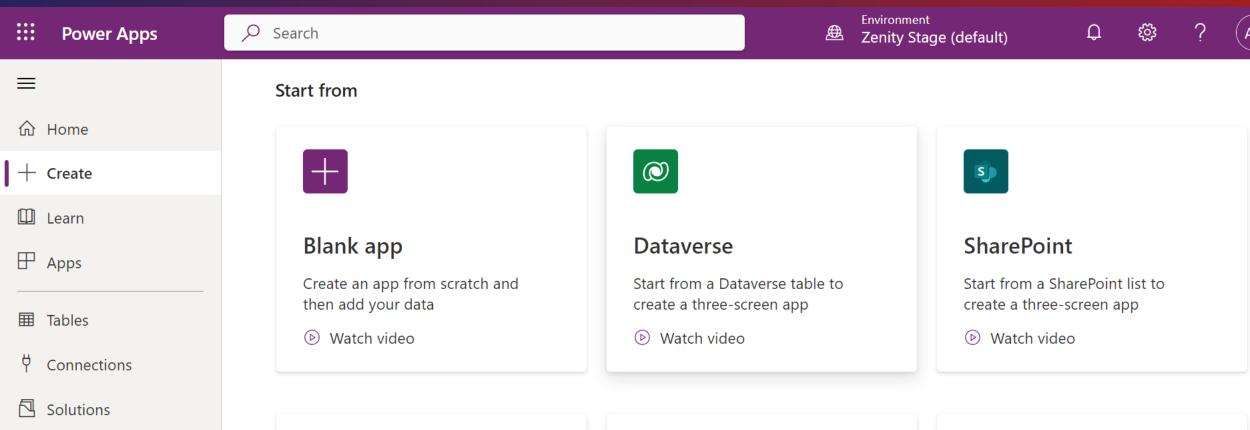


- >1M apps and automations
- >8M credentials

Ty to all collaborations and contributors!



Real-world example – employee onboarding





□/□ Flows

··· More

Power Platform

Ack a virtual agent

Excel

X

Start from an Excel file to create a three-screen app



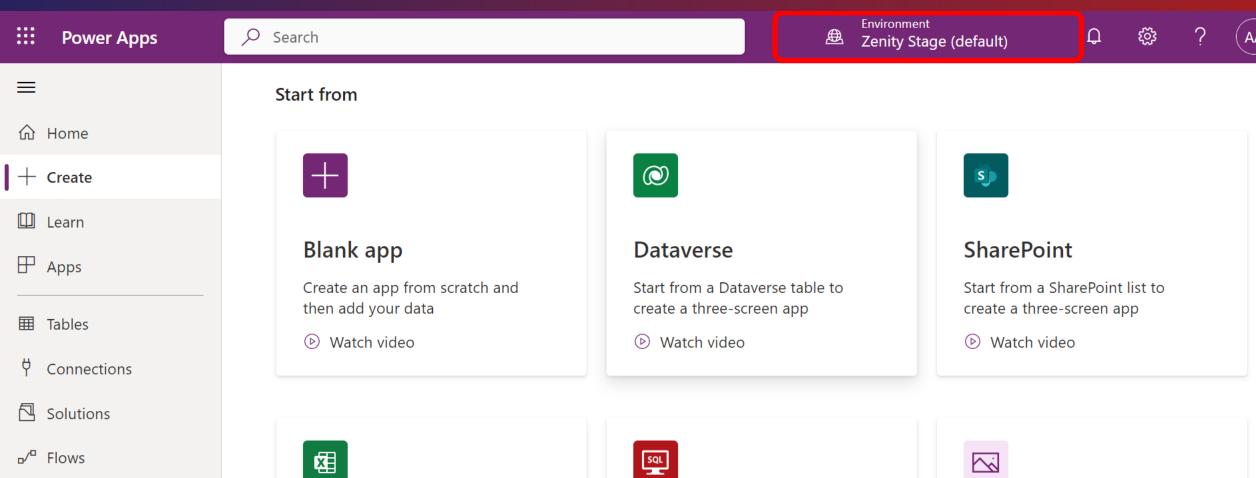
SQL

Start from a SQL data source to create a three-screen-app



Image

Upload an image of an app and we'll convert it into an app



Power Platform

Ack a virtual agent

··· More

Start from an Excel file to create a three-screen app

Excel

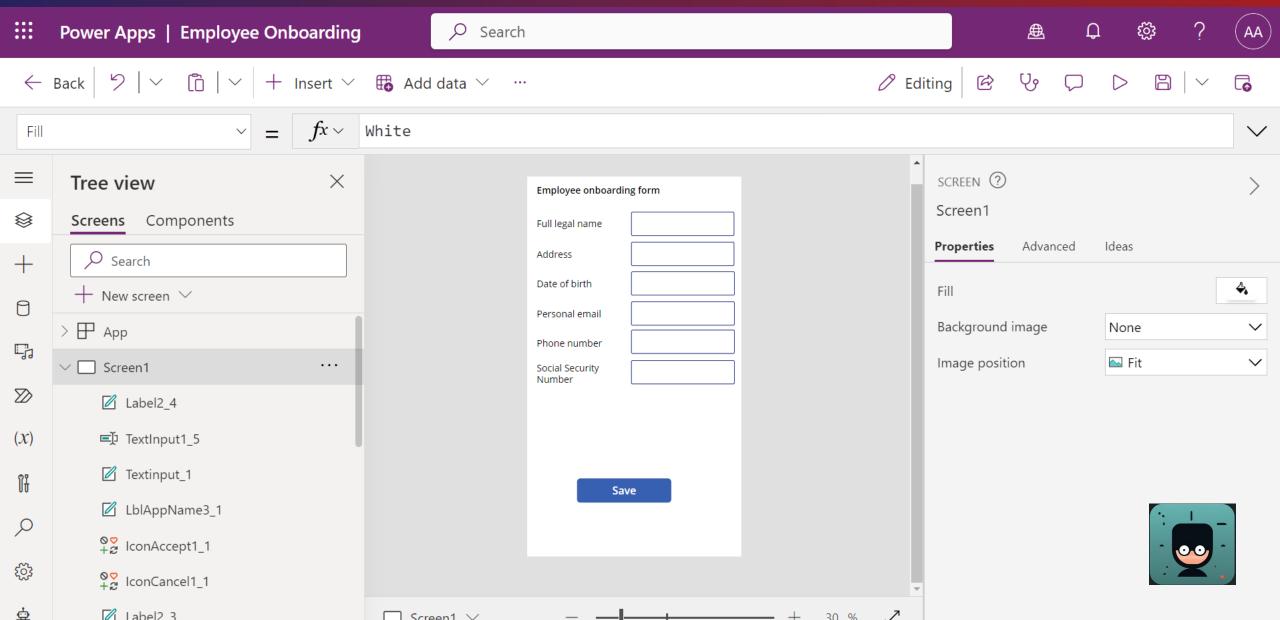
SQL

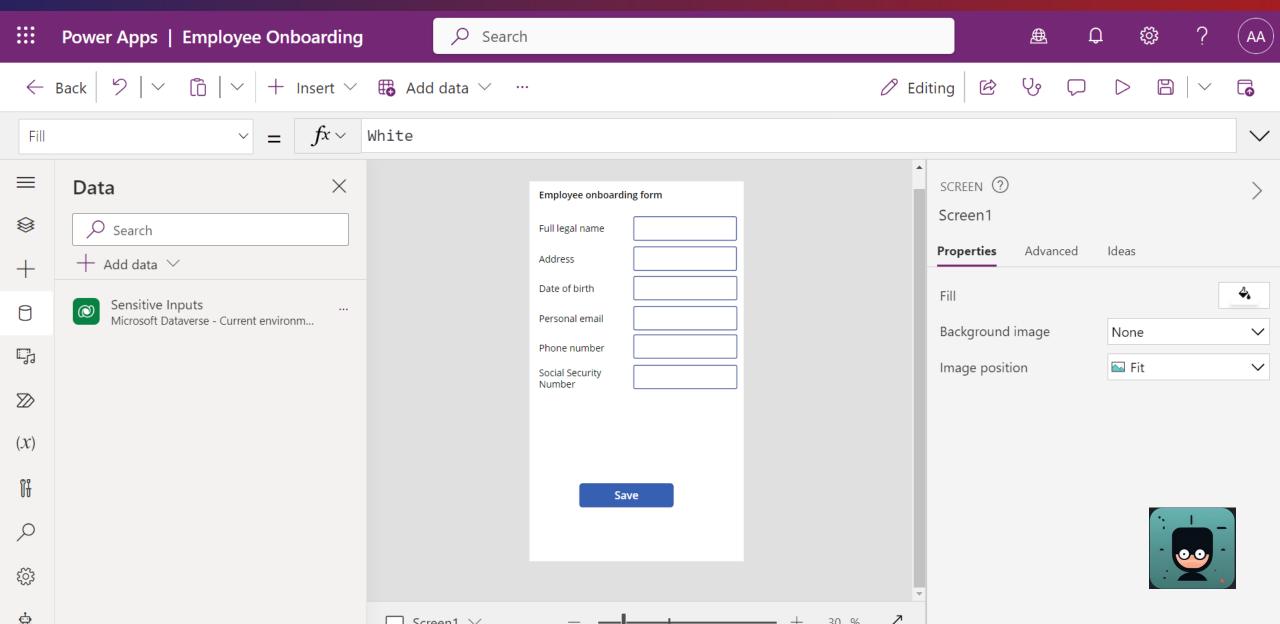
Start from a SQL data source to create a three-screen-app

Image

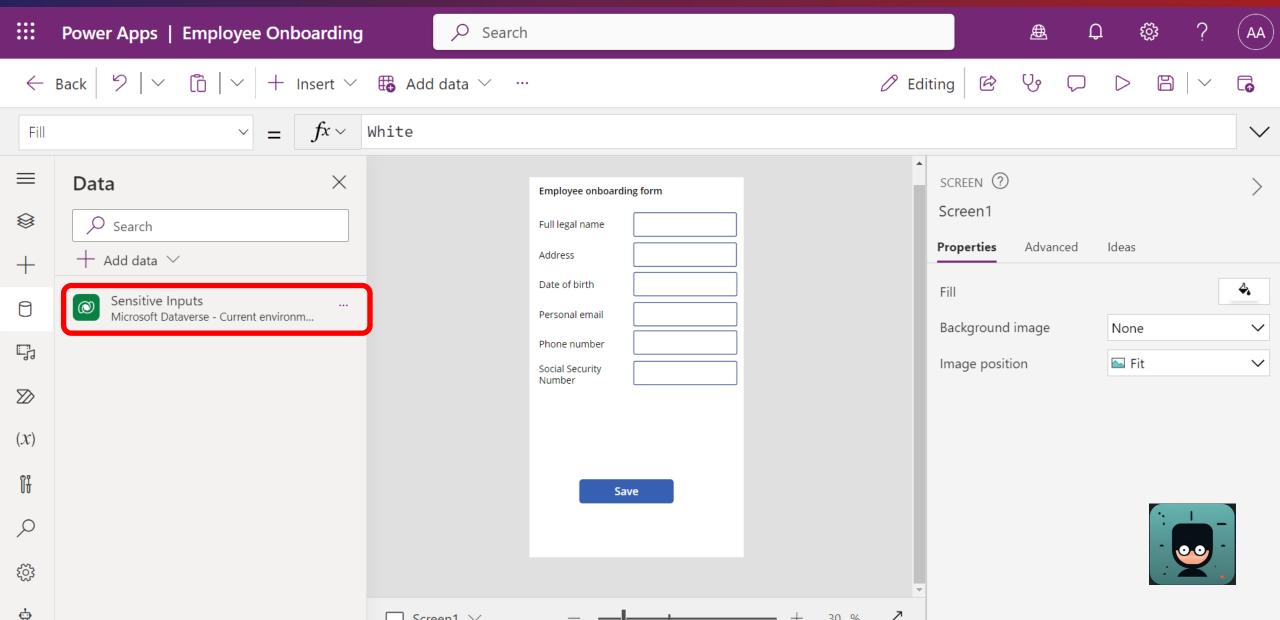
Upload an image of an app and we'll convert it into an app

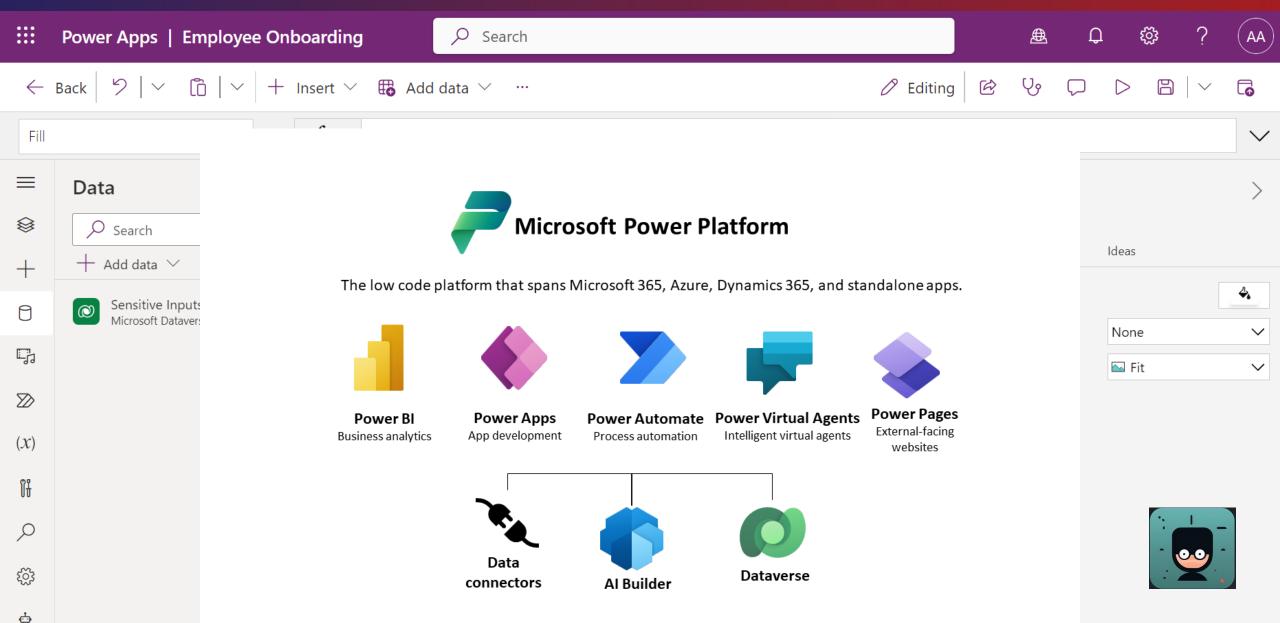




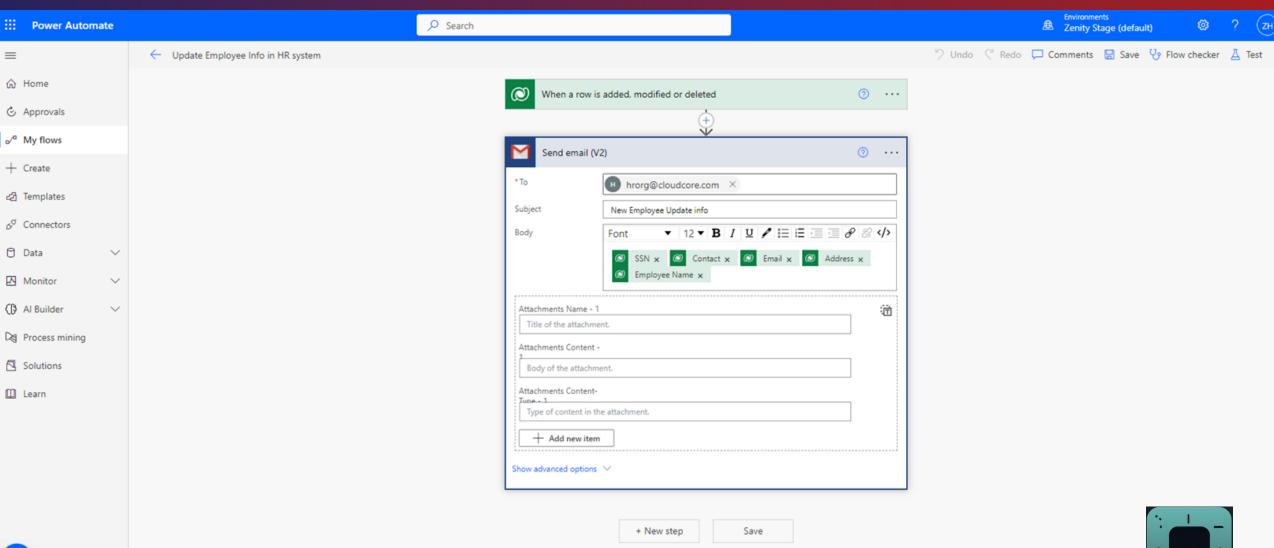








Ask a chatbot





Employee

- LCNC-SEC-01: Account Impersonation
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- LCNC-SEC-09: Asset Management Failures
- LCNC-SEC-10: Security Logging and Monitoring Failures





Employee onboarding – findings

Power Apps | Employee Onboarding

∠ Search











X

Employee onboarding form

Full legal name

Address

Save

Personal email

Date of birth

Phone number

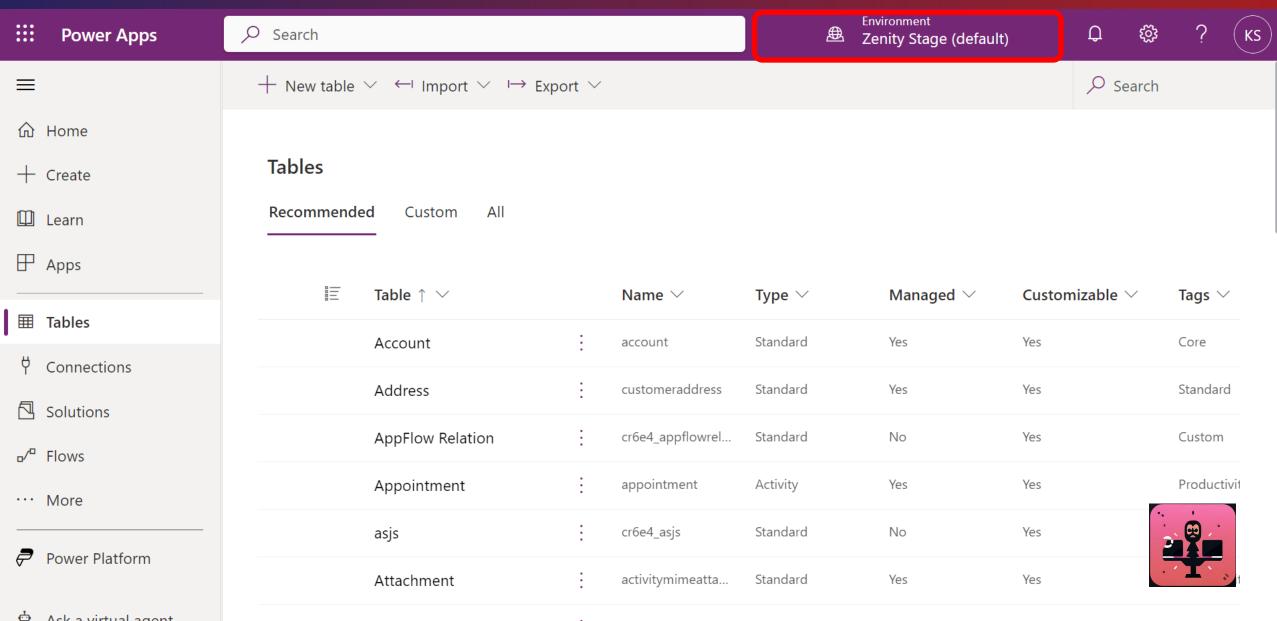
Social Security Number _ ~

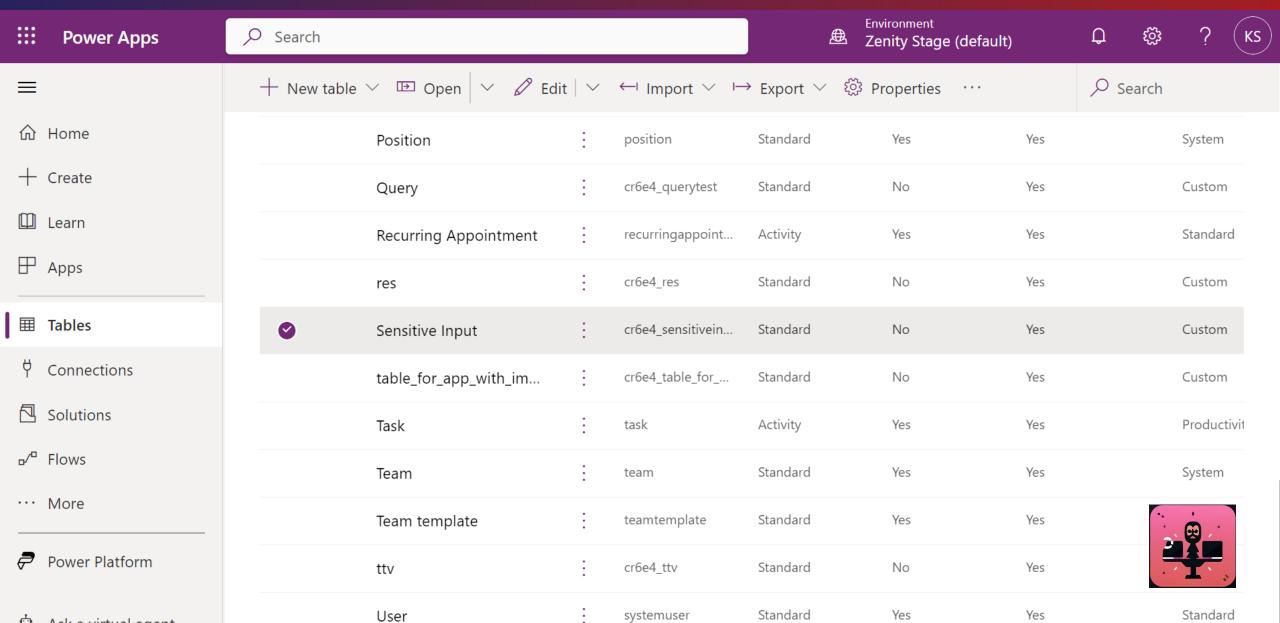












Environment Zenity Stage (default)



Data saved



Power Apps

Ella Gonzalez

Daniel Martin

Layla Conzaloz

Search

209-97-9876

209-97-6789

200 07 0976



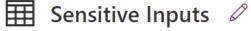
Abc Contact ∨

Update forms and views

+19 more \



Abc





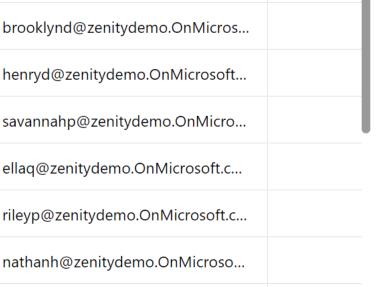


Brooklyn Gonzalez	209-97-9876
Henry Mitchell	209-97-0987

Savannah Perez	209-97-7890

Dilay Mitchall	200 07 0007
Riley Mitchell	209-97-0987





danielm@zenitydemo.OnMicrosof...

Jaylam@zonitydomo OnMicrocoft





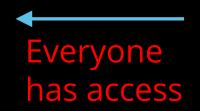
Employee onboarding – findings

Data accessible to all (Authorization Misuse)













Employee onboarding – findings

- Data accessible to all (Authorization Misuse)
- Sensitive data in plain text (Data and Secret Handling Failures)

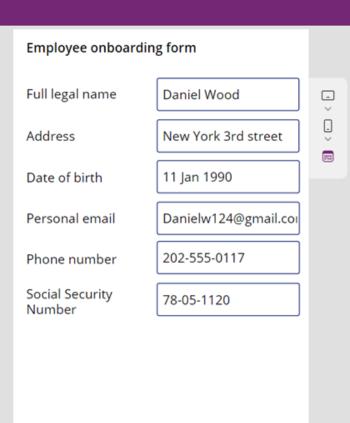


Power Apps | Employee Onboarding

Environment Zenity Stage (default)



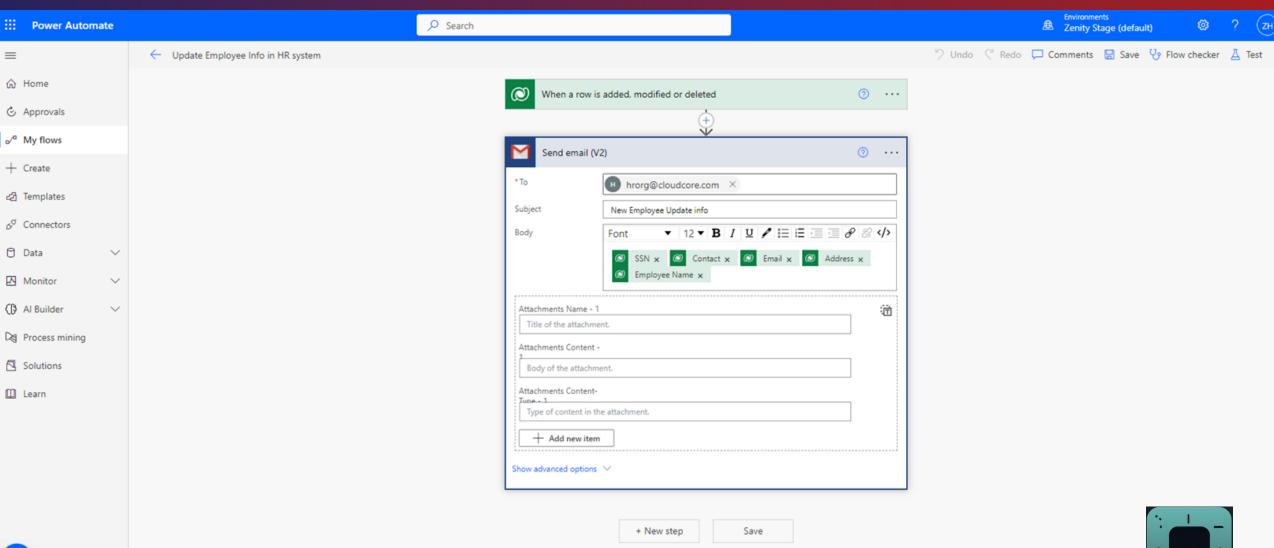


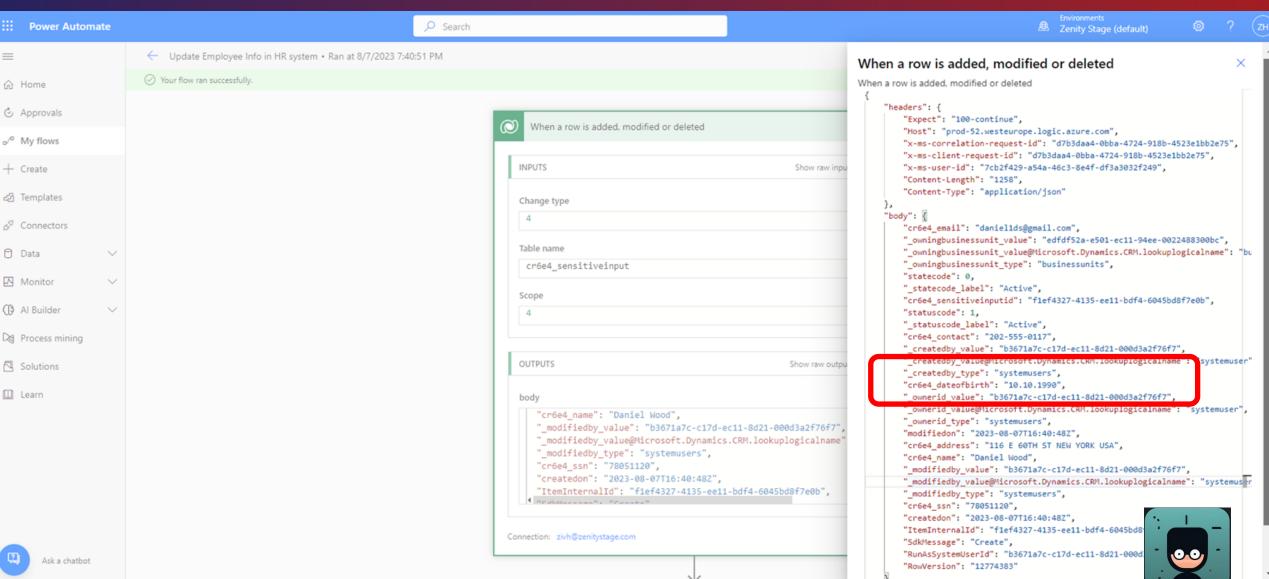


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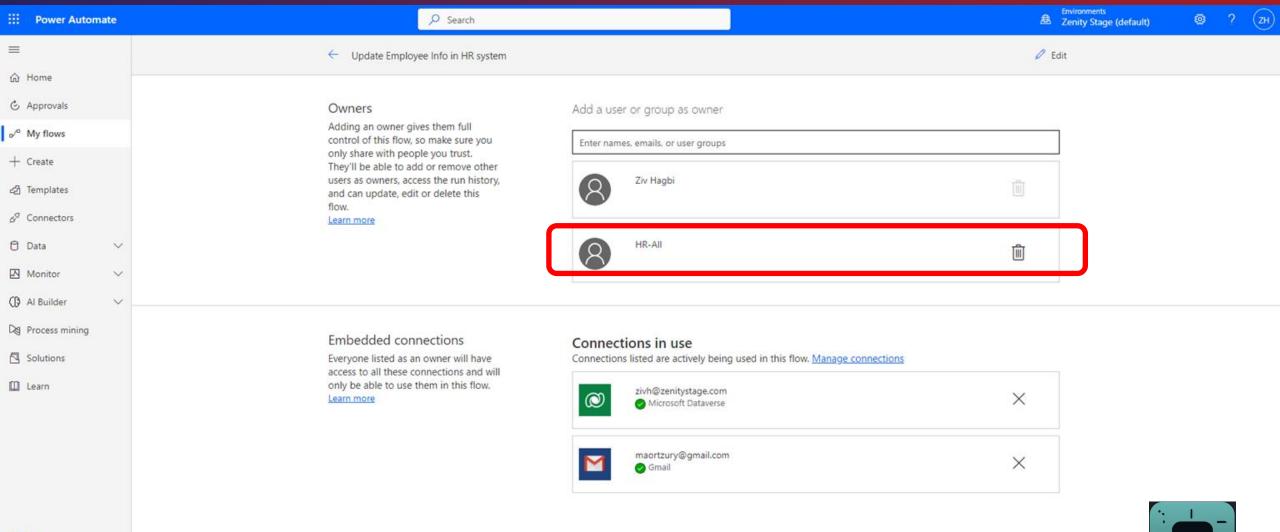


Ask a chatbot













Employee onboarding — findings

Data accessible to all (Authorization Misuse)

Sensitive data in plain text (Data and Secret Handling)

Failures)

 Sensitive data written to logs (Data Leakage)

```
"cr6e4 email": "daniel1ds@gmail.com",
"_owningbusinessunit_value": "edfdf52a-e501-ec11-94ee-0022488300bc",
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"_createdby_type": "systemusers",
"cr6e4 dateofbirth": "10.10.1990",
"_ownerid_value": "b3671a7c-c17d-ec11-8d21-000d3a2f76f7",
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 _ownerid_type": "systemusers",
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"cr6e4_address": "116 E 60TH ST NEW YORK USA",
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"SdkMessage": "Create".
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```



Employee onboarding – findings

- Data accessible to all (Authorization Misuse)
- Sensitive data in plain text (Data and Secret Handling Failures)
- Sensitive data written to logs (Data Leakage)



2023 recap and 2024 plans



2023 recap

- Lab project
- Stable 2023 Top 10 version
 - Better wording, better and more examples, clarity
- Virtual meetups → youtube.com/@owasplcnc
- Plain language for business users (contribution by John McTiernan, DT Group and Yianna Paris @punk_fairybread, Xebia) ->
 youtube.com/watch?v=s3lZ8fsMDDQ



2024 plans

- Top 10 revamp
 - Another look on categories
 - A different treatment for Low Code / RPA / BPA / ...
 - CALL FOR DATA
- Translation to different languages
- Collaterals (deck, infographic, ..)
- Transparency
- Virtual meetups



CALL FOR DATA

PLEASE SHARE YOUR STORIES!

GET INVOLED!

JOIN THE DISCUSSION

Slack bit.ly/owasp-lcnc-slack

Email group bit.ly/owasp-lcnc-group

CONTRIBUTE

Share stories, review, translate, create graphics, help on social...

michael.bargury@owasp.org



Get involved!

Michael.Bargury@owasp.org

@OWASPNoCode

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