10/16/2025

Smartsheet Handbook

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TABLE OF CONTENT

PERSONAL LEARNING

INTRODUCTION

SERVICENOW IS A CLOUD BASED PLATFORM, WHICH WAS MAINLY DEVELOPED FOR WORKFLOW AND PROCESS AUTOMATION AS PER THE ITIL PRINCIPLES. SERVICENOW IS MORE OF A TICKETING TOOL, REQUEST CATALOG, ENTERPRISE DB ETC. SERVICENOW PROVIDES SCALABILITY, SECURITY, LOAD BALANCING AND DATA BACKUPS. THE LATEST VERSION OF SERVICENOW IS **ORLANDO**.

SERVICENOW OFFERS MANY READY TO USE SOLUTIONS, WORKFLOWS AND PRODUCTS FOR ORGANISATION. THE ORGANISATION CAN DEVELOP THE CUSTOMISED APPLICATIONS AND MODULES AS PER THE BUSINESS REQUIREMENT USING THE SERVICENOW SCRIPTING AND EXISTING TOOLS.

THE SERVICENOW PLATFORM

1. DATABASE
   A. JUST ABOUT EVERYTHING IN SERVICENOW IS A RECORD IN A DATABASE TABLE
   B. SINGLE ENTERPRISE-WIDE (THERE IS ONLY ONE DATABASE)
   C. OVER 4000 TABLES DESIGNED TO MEET THE NEEDS OF MOST COMMON IT SERVICES
2. APPLICATIONS
   A. HUNDREDS OF APPLICATIONS INSTALLED OUT OF BOX
   B. BUSINESS APPLICATIONS TO PROVIDE SERVICES FOR THINGS LIKE APPLCATION LEVEL MANAGEMENT, APPLICATION PROGRAM MANAEMENT, CONTROL MANAGEMENT, SECOPS, ITSM ETC\
   C. SERVICENOW STORE
3. DEV PLATFORM
   A. MODIFY EXISTING APPLICATIONS OR BUILD CUSTOM APPLICATIONS
   B. NO CODE/ LOW CODE/ FULL CODE
   C. CREATE CUSTOM DATABASE TABLES, WORKFLOWS AND SCRIPTS

ADVANTAGES

- EASILY ACCESSIBLE FROM THE CLOUD
- CAN BE EASILY INTEGRATED WITH OTHER TOOLS
- PROVIDES GOOD REPORTING AND ANALYTICS

SERVICES OF SERVICE NOW

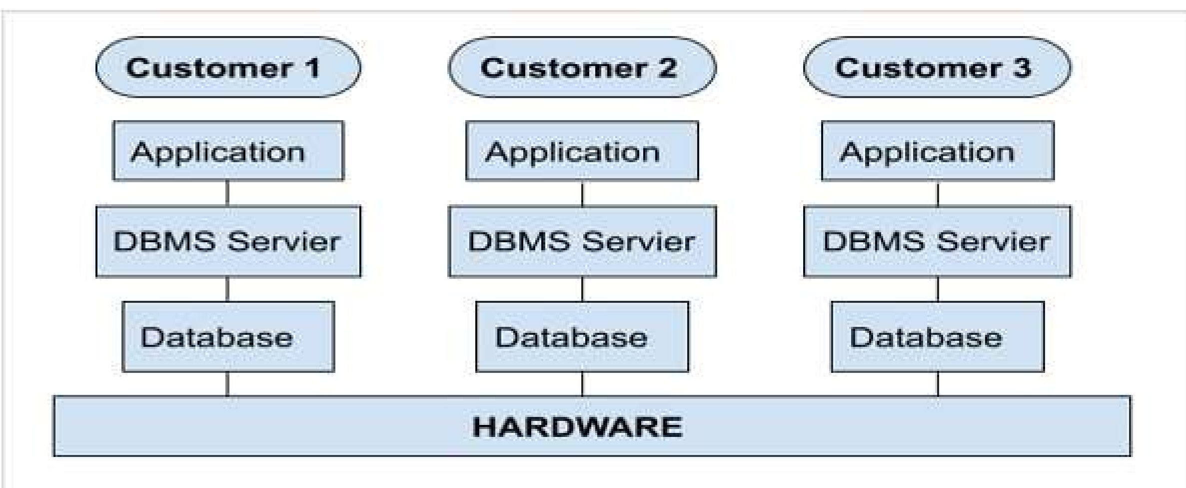
1. **IT SERVICE MANAGEMENT:** SERVICENOW IS MAINLY USED AS A TICKETING TOOL TO MANAGE INCIDENTS, PROBLEMS AND CHANGES. IT HAS MANY ADVANCED FEATURES, ANALYTICS AND INSIGHTS THAT IMPACTS THE SPEED AND DELIVERY OF IT.

2. **HR MANAGEMENT:** SERVICENOW CAN BE USED FOR ALMOST ALL HR DELIVERY SERVICES LIKE LEAVE MANAGEMENT, TIMESHEET MANAGEMENT, EMPLOYEE DOCUMENT MANAGEMENT, NEW ONBOARDING MANAGEMENT, PERFORMANCE MANAGEMENT, ETC.
3. **IT ASSET MANAGEMENT:** WITH SERVICENOW, WE CAN MANAGE OUR HARDWARE AND SOFTWARE ASSETS TO OPTIMISE COST AND INCREASE EFFICIENCY. SERVICENOW HAS FEATURES SUCH AS LICENCE MANAGEMENT, WARRANTY MANAGEMENT, CI MANAGEMENT, ADVANCED REPORTING AND INSIGHTS, ETC.
4. **FINANCE OPERATION MANAGEMENT**: SERVICENOW MANAGES ALL THE ACTIVITIES RELATED TO FINANCE CLOSE AND AUTOMATES THE FINANCIAL PROCESSES. APART FROM OFFERINGS MENTIONED ABOVE, SERVICENOW ALSO OFFERS SERVICES FOR IT BUSINESS MANAGEMENT, SECURITY OPERATIONS, VIRTUAL CHATBOTS, ETC.

SERVICE NOW INSTANCE

A SERVICENOW INSTANCE IS A SET OF DATABASES, APPLICATIONS, VIRTUAL MACHINES, LIBRARIES GROUPED TOGETHER TO PROVIDE THE REQUIRED SERVICES TO A SPECIFIC CUSTOMER. SERVICENOW CUSTOMER INSTANCE IS BUILT ON MULTI-INSTANCE ARCHITECTURE.

THE IMPORTANT POINT TO NOTE HERE IS THAT EACH CUSTOMER HAS A SEPARATE CUSTOMISED APPLICATION(S) ALONG WITH SEPARATE DATABASE(S) RUNNING ON SHARED HARDWARE RESOURCES. THE CUSTOMER DATA IS ENCRYPTED AND THEREFORE, IT IS COMPLETELY SECURE. THE DEPLOYMENT OF SERVICENOW IS VERY FLEXIBLE AND IT CAN ALSO BE IMPLEMENTED IN A PRIVATE CLOUD.



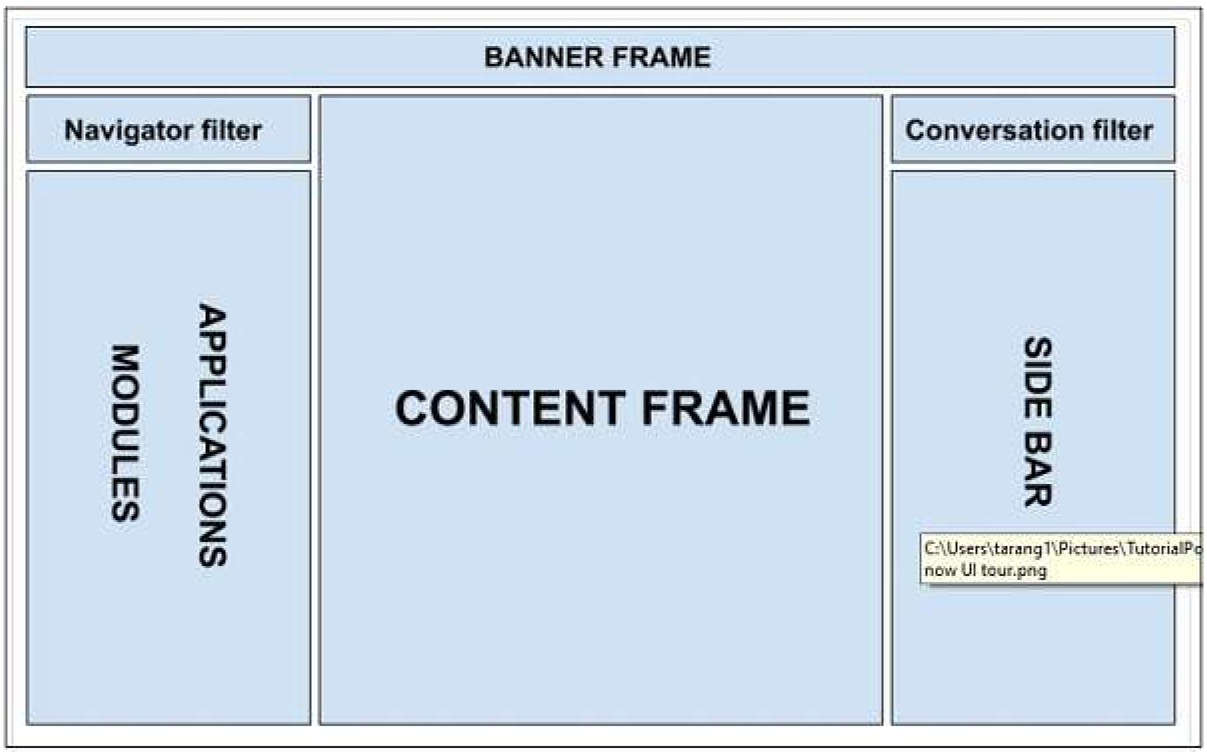
GENERATING DEVELOPER INSTANCE

- GO TO THE URL **HTTPS://DEVELOPER.SERVICENOW.COM/** AND CLICK ON REGISTER.
- SERVICENOW REGISTRATION FORM WILL OPEN. GIVE YOUR DETAILS AND CLICK SUBMIT
- SERVICENOW WILL SEND THE CONFIRMATION EMAIL. CLICK ON THE LINK IN EMAIL TO CONFIRM THE REGISTRATION.

- NOW, LOGIN TO YOUR SERVICENOW ACCOUNT. YOU WILL SEE THE DASHBOARD BELOW. GO TO MANAGE → INSTANCE.
- NOW, CLICK ON REQUEST INSTANCE.
- CLICK ON THE LATEST RELEASE OF SERVICENOW AND CLICK ON REQUEST INSTANCE. AT THE TIME OF WRITING THIS TUTORIAL, THE LATEST VERSION IS ORLANDO.
- IT WILL TAKE AROUND 20 MINUTES AND YOUR INSTANCE WILL GET READY. ON THE FOLLOWING PAGE, YOU WILL GET THE LINK FOR INSTANCE, THE ADMIN USERNAME AND PASSWORD. CLICK ON THE INSTANCE LINK AND GIVE YOUR USERNAME AND PASSWORD. AFTER LOGIN, YOU WILL BE REQUIRED TO CHANGE THE DEFAULT PASSWORD GIVEN BY SERVICENOW.

SERVICENOW USER INTERFACE (UI)

SERVICENOW USER INTERFACE (UI) IS MADE OF DEFAULT ELEMENTS. THE INTERFACE IS HIGHLY FLEXIBLE AND CAN BE CUSTOMISED AS PER THE BUSINESS REQUIREMENTS.



- **BANNER FRAME:** THE BANNER FRAME HAS LOGO, SETTING OPTIONS, USER PROFILE, GLOBAL SEARCH BAR, AND OPTION TO TOGGLE BETWEEN CONVERSATION AND HELP IN THE RIGHT-SIDE BAR.
- **APPLICATION NAVIGATOR:** ALLOWS US TO BROWSE THROUGH ALL THE APPLICATIONS AND MODULES UNDER THE APPLICATIONS. WE CAN GIVE THE NAME OF APPLICATION OR MODULE IN THE NAVIGATION FILTER AND SERVICENOW WILL AUTOMATICALLY SHOW US ALL THE MATCHING APPLICATIONS AND MODULES. FOR EXAMPLE, INCIDENT IS AN APPLICATION IN SERVICE NOW AND CREATE NEW IS A MODULE UNDER IT, USING WHICH, WE CAN CREATE A NEW INCIDENT. SIMILARLY, OPEN IS ANOTHER MODULE INSIDE INCIDENT APPLICATION, WHICH WILL LIST ALL THE OPEN INCIDENTS.

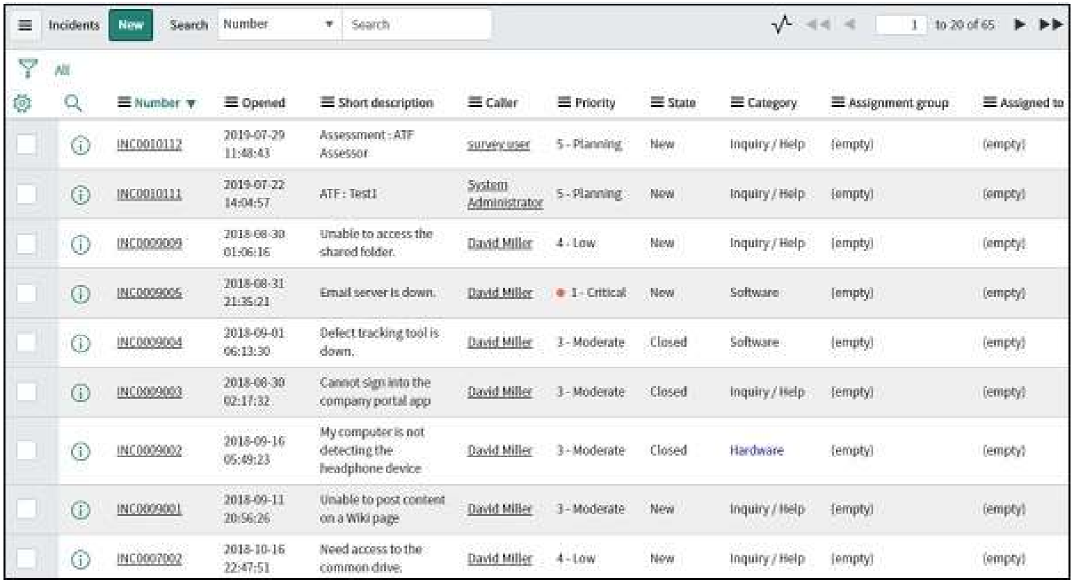
- **SIDEBAR:** THE SIDEBAR IS NOT PROVIDED BY DEFAULT. THE USER HAS TO ACTIVATE IT FROM THE BANNER FRAME. THE SIDEBAR CAN DISPLAY THE CONVERSATIONS OR THE HELP OPTIONS. USING THE CONVERSATION FEATURE, WE CAN CHAT WITH FELLOW COLLEAGUES AND BROWSE THROUGH CHAT HISTORY. THE HELP OPTION ALLOWS US TO REFER TO THE SUPPORT ARTICLES WHICH ARE ADDED BY ADMINISTRATORS.
- **CONTENT FRAME:** THE CONTENT FRAME IS THE CENTRE PART OF SERVICENOW PORTAL, WHICH LISTS THE ENTIRE CONTENT OF APPLICATIONS AND MODULES. THIS ALSO CONTAINS THE CENTRALISED MENU OF THE APPLICATIONS, WHICH ARE IMPORTANT FROM THE ADMINISTRATION POINT OF VIEW. BELOW, THE SAMPLES OF CONTENT FRAME DISPLAYING CENTRALISED MENU AND DISPLAYING CONTENT OF THE OPEN MODULE IN INCIDENT APPLICATION.

SERVICE APP ENGINE STUDIO

1. FAVOURITES: DISPLAYS FREQUENTLY USED TABS
2. HISTORY: DISPLAYS THE LAST USED TABS
3. WORKSPACES: SHOWN ONLY FOR ADMIN USERS. DEPENDS ON THE TYPE OF ACCESS GIVEN
4. SEARCH TOOL: TO SEARCH FOR KEY TOOLS OR DB RECORD OR EVEN THE REQUEST NUMBER
5. DISCUSSIONS: SERVICENOW INTERNAL CHAT OR COLLABORATION TOOL
6. QUESTION MARK: EMBEDDED HELP ICON
7. NOTIFICATIONS: SHOWS THE NOTIFICATIONS RECEIVED CAN BE ACCESS RELATED OR ANY OTHER NOTIFICATION
8. PROFILE: SHOW YOUR PROFILE
    A. PREFERENCES: PROVIDES THE ACCEBILITY FOR IMPROVING THE LOOK AND FEEL
    B. IMPERSONATE USER: FOR ADMIN OR IMPERSONATOR ROLES. ALLOWS TO ACCESS SOME OTHER USERS ACCOUNT AND OPEN IN THEIR NAMES
    C. ELEVATE ROLES: FOR ADMIN USERS. TO BUMP UP THE ACCESS
    D. LOG OUT: TO LOG THE USERS OUT OF SESSION

SERVICENOW SCREEN TYPES

1. LIST VIEW: DISPLAYS A LIST OF RECORDS FROM A DB TABLE AND INCLUDES TOOLS FOR FILTERING, SORTING AND CONFIGURING HOW THE RECORDS ARE DISPLAYED
2. FORM VIEW: DISPLAYS A SINGLE RECORD FROM DB TABLE, AND INCLUDES TOOLS FOR VIEWING RELATED RECORDS AND MAKING CHANGES TO THE RECORD
3. WORKSPACE: DISPLAYED IN A SINGLE PAGE THAT ARE DESIGNED TO SOLVE A SPECIFIC TYPE OF PROBLEM OR ENABLE THE COMPLETION OF A SPECIFIC TYPE OF WORK.
4. DASBOARD: CUSTOM ARRANGEMENT OF WIDGETS THAT ENABLE THE DISPLAY OF MULTIPLE PERFORMANCE ANALYTICS AND REPORTS ON A SINGLE SCREEN
5. SERVICE CATALOG: COMPANY’S ONLINE STORE FOR ORDERING IT SERVICES MADE AVAILABLE BY OTHER DEPARTMENTS



Incidents New Search Number Search 1 to 20 of 65

All

		Number	Opened	Short description	Caller	Priority	State	Category	Assignment group	Assigned to
		INC0010112	2019-07-29 11:48:43	Assessment : ATF Assessor	survey user	5 - Planning	New	Inquiry / Help	(empty)	(empty)
		INC0010111	2019-07-22 14:04:57	ATF : Test1	System Administrator	5 - Planning	New	Inquiry / Help	(empty)	(empty)
		INC0009009	2018-08-30 01:06:16	Unable to access the shared folder.	David Miller	4 - Low	New	Inquiry / Help	(empty)	(empty)
		INC0009005	2018-08-31 21:35:21	Email server is down.	David Miller	1 - Critical	New	Software	(empty)	(empty)
		INC0009004	2018-09-01 06:13:30	Defect tracking tool is down.	David Miller	3 - Moderate	Closed	Software	(empty)	(empty)
		INC0009003	2018-08-30 02:17:32	Cannot sign into the company portal app	David Miller	3 - Moderate	Closed	Inquiry / Help	(empty)	(empty)
		INC0009002	2018-09-16 05:49:23	My computer is not detecting the headphone device	David Miller	3 - Moderate	Closed	Hardware	(empty)	(empty)
		INC0009001	2018-09-11 20:56:26	Unable to post content on a Wiki page	David Miller	3 - Moderate	New	Inquiry / Help	(empty)	(empty)
		INC0007002	2018-10-16 22:47:51	Need access to the common drive.	David Miller	4 - Low	New	Inquiry / Help	(empty)	(empty)

FUNDAMENTALS

THE SERVICENOW DEVELOPER INSTANCE HAS AMPLE OF DUMMY DATA LIKE USERS, INCIDENTS, GROUPS ETC., WHICH WE CAN REFER TO GAIN GOOD UNDERSTANDING ABOUT THE CONCEPT.

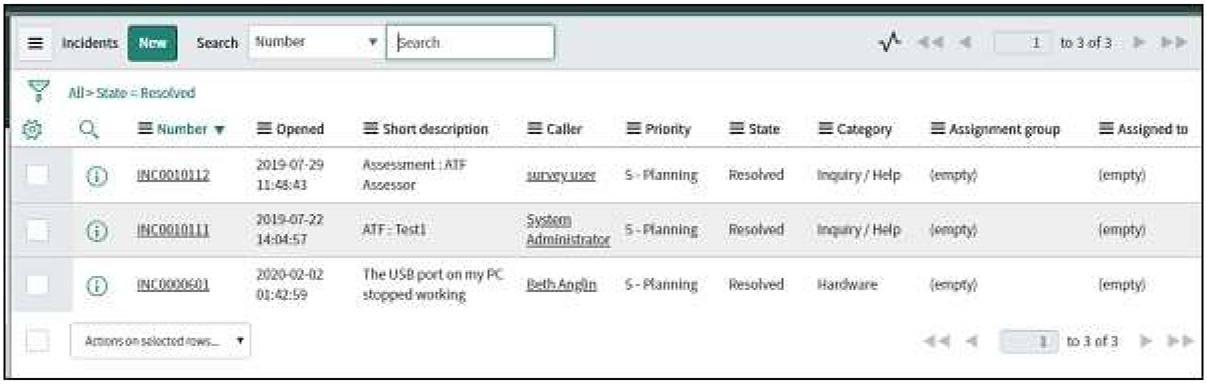
APPLICATIONS AND MODULES

SERVICENOW DEFINES APPLICATION AS, A COLLECTION OF FILES AND DATA THAT DELIVER A SERVICE AND MANAGE BUSINESS PROCESSES AND MODULES ARE, CHILDREN OF APPLICATION LINKING TO OTHER PAGES OR RECORDS IN THE PLATFORM.

LISTS AND FORMS

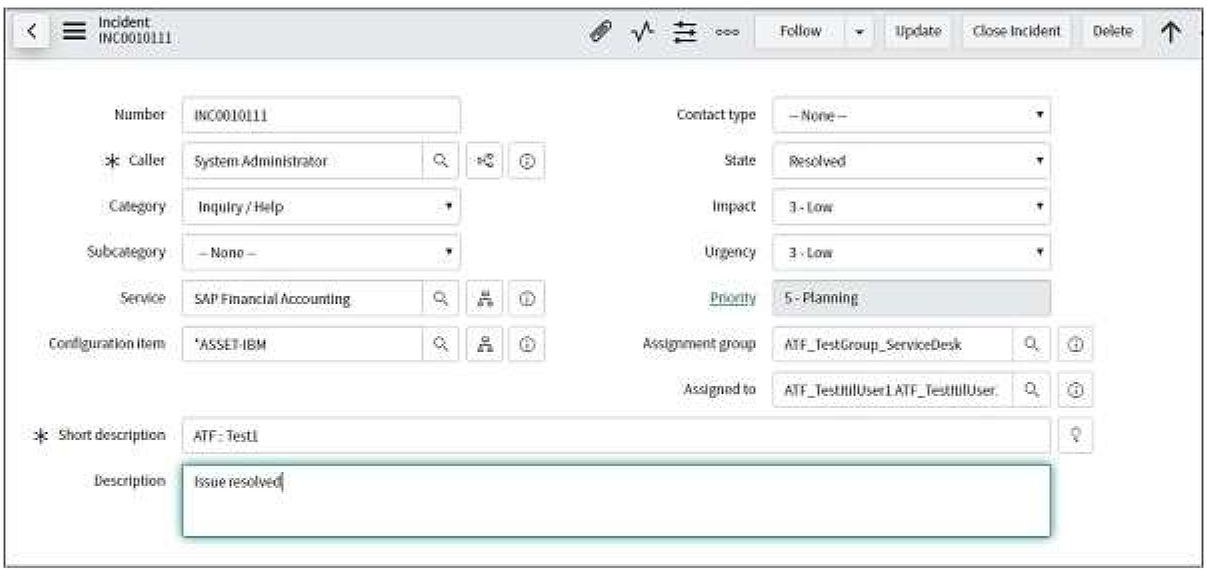
LISTS

IT DISPLAYS THE SET OF RECORDS (BASED ON CERTAIN CONDITIONS) FROM THE DATA TABLE. IT COULD BE A LIST OF INCIDENTS ASSIGNED TO A CERTAIN GROUP, FROM THE INCIDENT TABLE OR LIST OF PROBLEMS NOT ASSIGNED TO ANY GROUP FROM PROBLEM TABLE, ETC. THIS LIST IS GENERATED VIA THE RESOLVED MODULE OF INCIDENT APPLICATION. THIS IS A DEFAULT MODULE PROVIDED WITH SERVICENOW. TO OPEN THIS MODULE AND EXPLORE THIS LIST, SEARCH FOR THE INCIDENT IN APPLICATION NAVIGATOR AND INSIDE THE INCIDENT APPLICATION FIND RESOLVED MODULE.



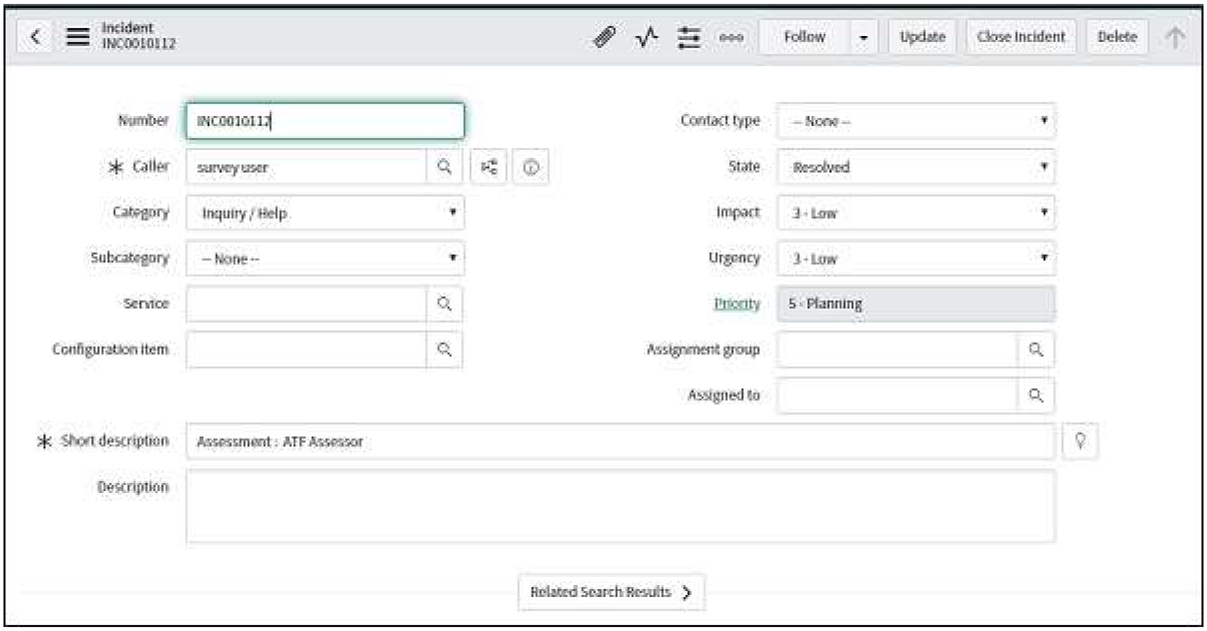
FORMS

IT DISPLAYS ONE RECORD FROM THE DATA TABLE OR IT CAN BE USED TO ENTER/UPDATE A RECORD IN A DATA TABLE. FOR EXAMPLE, AN INCIDENT FORM WILL DISPLAY DETAILS RELATED TO A SINGLE SELECTED INCIDENT OR IT CAN ALSO BE USED TO ENTER DETAILS OF A NEW INCIDENT IN AN INCIDENT TABLE.



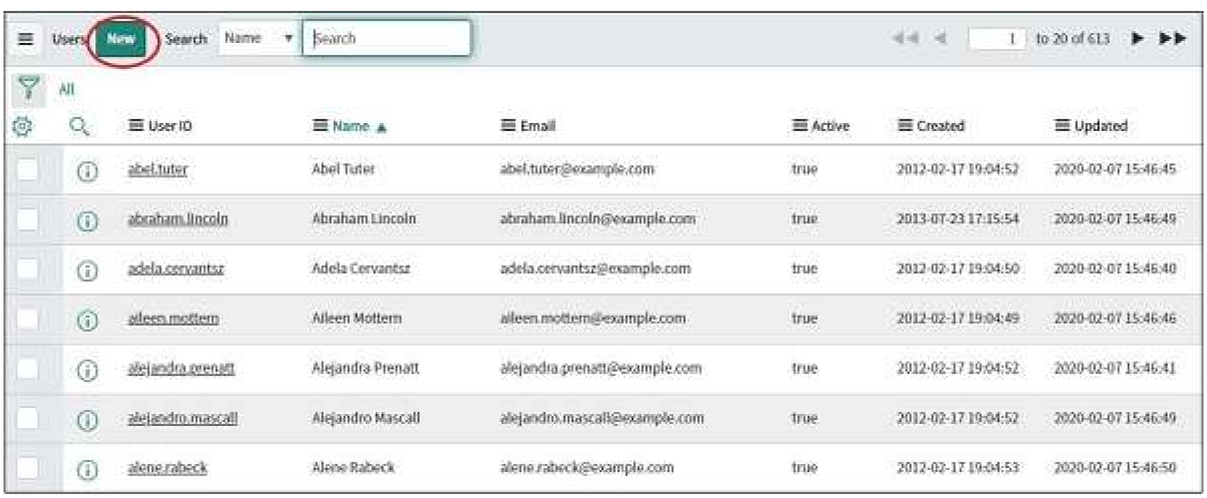
TO ACCESS THE FIRST FORM IN THE ABOVE EXAMPLE, GO TO RESOLVED MODULE INSIDE INCIDENT APPLICATION. A LIST OF RESOLVED INCIDENTS WILL APPEAR. CLICK ON ANY INCIDENT NUMBER TO OPEN THE FORM.

THE SECOND SCREEN IN THE ABOVE EXAMPLE, HAVING A FORM TO ENTER NEW INCIDENT DETAILS, CAN BE ACCESSED VIA CREATE NEW MODULE OF INCIDENT APPLICATION.

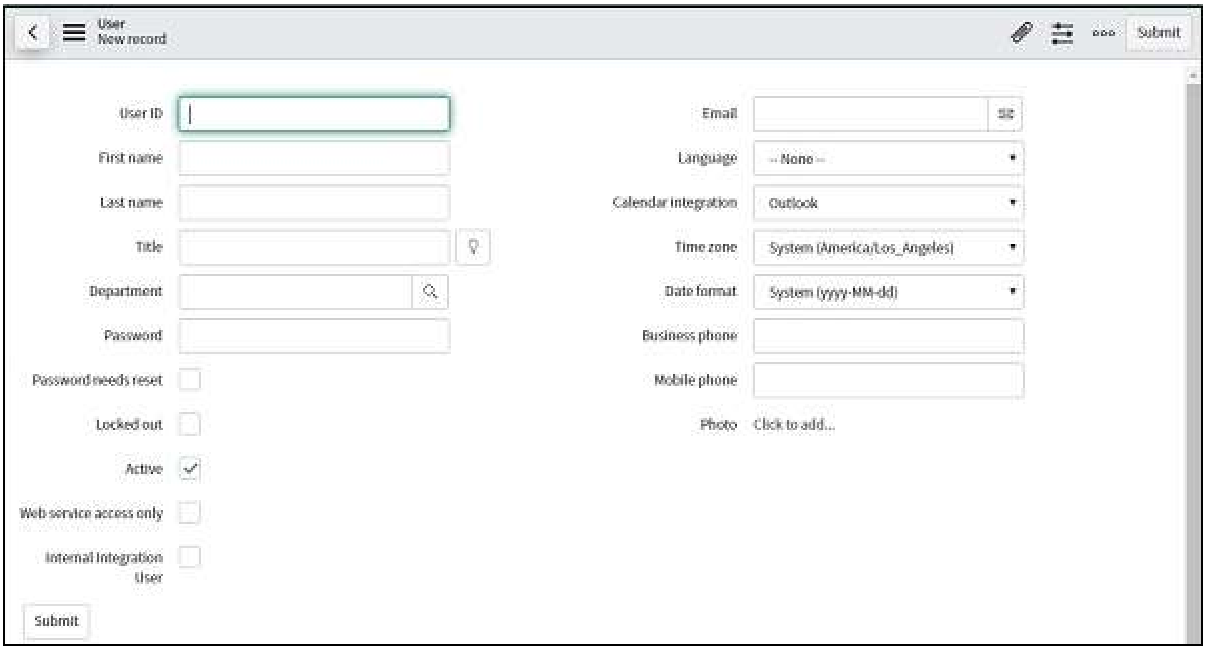


USERS, ROLES, AND GROUPS

USERS: ARE THE INDIVIDUALS WHO USE THE SERVICENOW WITHIN AN ORGANISATION. THEY HAVE ACCESS TO THE PLATFORM VIA A USER ID AND PASSWORD. THE SYSTEM ADMINISTRATOR HAS THE AUTHORITY TO CREATE A NEW USER, BROWSE THROUGH THE LIST OF EXISTING USERS, DELETE A USER, AND IMPERSONATE A USER. TO OPEN THE LIST OF EXISTING USERS, GO TO USERS' MODULE INSIDE USER ADMINISTRATION APPLICATION.



TO CREATE A NEW USER, CLICK ON THE NEW BUTTON IN TOP LEFT OF THE CONTENT FRAME. THE FOLLOWING FORM WILL OPEN TO ENTER A NEW DATA RECORD FOR THE USER TABLE.



ROLES

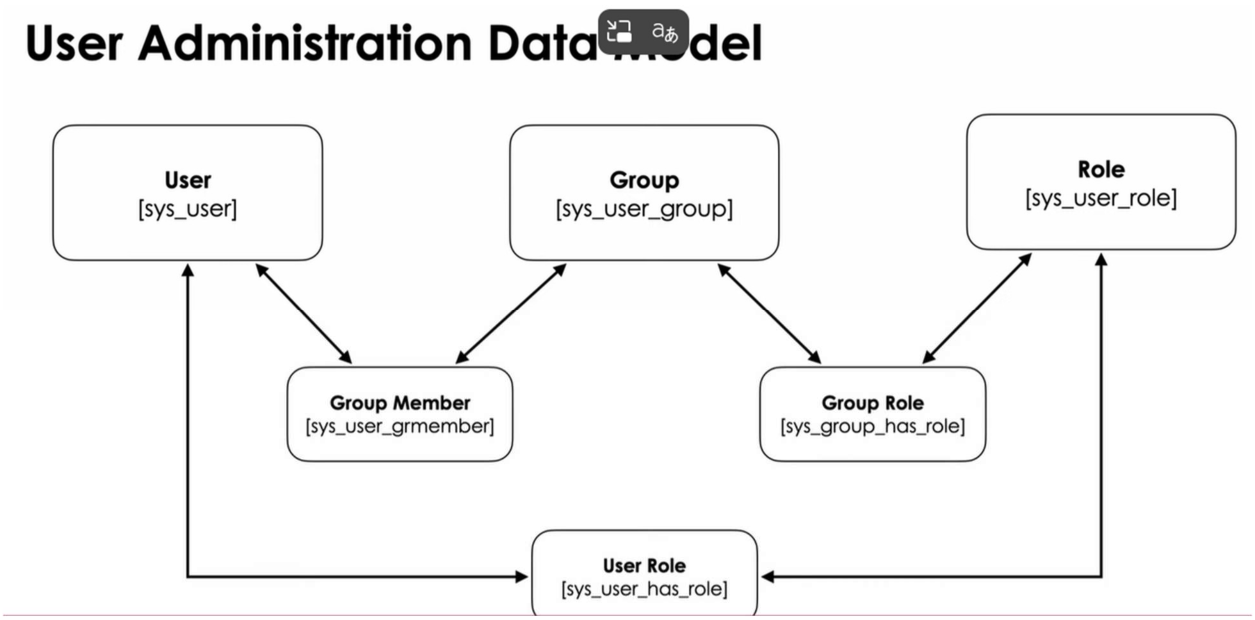
ARE ASSOCIATED WITH THE TASK THAT USER PERFORMS WITHIN AN ORGANISATION. THE ROLE IS ASSIGNED BASED ON THE WORK PROFILE. FOR EXAMPLE, THERE CAN BE AN INCIDENT MANAGER ROLE, APPLICATION DEVELOPER ROLE, INCIDENT ANALYST ROLE, ETC. THE ROLES CONTROL THE ACCESS TO THE FEATURES AND CAPABILITIES IN APPLICATIONS AND MODULES. SO, A SYSTEM ADMINISTRATOR ROLE MAY HAVE ACCESS TO A FEW APPLICATIONS WHICH INCIDENT MANAGER ROLE MAY NOT HAVE. THE LIST OF ROLES AND FORM TO ADD A NEW ROLE CAN BE FOUND IN SYSTEM SECURITY APPLICATION UNDER USERS AND GROUPS.

GROUPS

GROUPS ARE THE COLLECTION OF USERS, WHICH PERFORM A SIMILAR TASK. FOR EXAMPLE, THERE CAN BE A GROUP OF CHANGE MANAGERS, WHO CAN APPROVE THE CHANGES IN PRODUCTION, OR THERE CAN BE A PROCUREMENT GROUP, WHO HAVE THE ACCESS TO RAISE THE PURCHASE ORDER, ETC. THE GROUP CAN BE ACCESSED VIA SYSTEM SECURITY → USERS AND GROUPS → GROUPS.

USER ADMINISTRATION DATA MODEL

- SYS_USER -> STORES A RECORD FOR EACH USER
- SYS_USER_GROUP -> STORES A RECORD FOR EACH GROUP
- SYS_USER_ROLE -> STORES A RECORD FOR EACH ROLE



TABLES, COLUMNS AND FIELDS

TABLES: TABLES ARE THE COLLECTION OF DATA IN SERVICENOW. THE APPLICATIONS AND MODULES USE TABLES TO STORE, DISPLAY AND PROCESS THE DATA. FOR EXAMPLE, THE INCIDENT APPLICATION HAS AN INCIDENT TABLE. SIMILARLY, THERE IS A USER TABLE, CHANGE REQUEST TABLE, ETC. TO CHECK THE STRUCTURE OR UPDATE THE STRUCTURE OF ANY TABLE MAKE USE OF THE TABLES MODULE OF SYSTEM DEFINITION APPLICATION.

Tables New Search Name Search 1 to 20 of 1,918

All > Update name is not empty > Name >= incident

Label	Name ▲	Extends table	Extensible	Updated
Incident	incident	Task	false	2020-02-15 06:56:43
Incident Fact Table	incident_fact_table	(empty)	false	2020-02-07 14:16:32
Incident Task	incident_task	Task	false	2020-02-07 14:36:12
ServiceNow Instance	instance	(empty)	false	2020-02-07 14:21:18
Interaction	interaction	(empty)	true	2020-02-07 14:55:18
Interaction Context	interaction_context	(empty)	false	2020-02-07 14:55:18
JSON Blob	interaction_json_blob	(empty)	false	2020-02-07 14:55:18
Interaction Log	interaction_log	(empty)	false	2020-02-07 14:55:18
Interaction Related Record	interaction_related_record	(empty)	false	2020-02-07 14:55:18
Catalog Variable Set	io_set_delivery_plan	Application File	false	2020-02-07 14:40:49
Catalog Variable Set	io_set_item	Application File	false	2020-02-07 14:39:13

THE TABLE NAME CAN BE SEARCHED IN THE TOP SECTION OF THE CONTENT SCREEN. LET'S EXPLORE THE INCIDENT TABLE. ONCE, WE CLICK THE DESIRED TABLE, WE CAN FIND ALL THE COLUMNS IN THE TABLE, COLUMN TYPE (INTEGER, STRING, ETC.), MAXIMUM LENGTH, ETC. THE NEW COLUMN CAN BE ADDED TO THE TABLE, USING THE NEW BUTTON.

RELATIONAL DATABASE

SERVICENOW COMES WITH A SINGLE DATABASE THAT SUPPORTS THE DATA STORAGE REQUIREMENTS OF THE SYSTEM AND ALL APPLICATIONS AND WORKFLOWS. SERVICENOW DATABASEE IS A RELATIONAL DATABASE STORING DATA IN TABLES AS RECORDS AND FIELDS AND ENABLING RELATIONSHIPS BETWEEN TABLES

A DATABASE THAT STORES DATA IN TABLES AND USES RELATIONSHIPS BETWEEN TABLES TO MAXIMIZE EFFICIENCY AND ELIMINATE DATA DUPLICATION. EACH ROW IS A RECORD AND EACH COLUMN IS A FIELD. EACH COLUMN CREATED A DATA TYPE HAS TO BE DEFINED.

EG:

- NAME FIELD -> STRING TYPE
- CREATED FIELD -> CREATED DATE
- PRICE FIELD -> NUMBER DATA TYPE
- SYS_ID -> PRIMARY KEY UNIQUE FOR EACH TABLE

DICTIONARY TABLES ARE TABLES IN THE DATABASE THAT STORE DATA ABOUT THE DATABASE ITSELF.

REFERENCE TABLE CAN BE CREATED BASED ON A COMMON COLUMN PRESENT IN BOTH THE TABLES.

SCHEMA MAP IS A PAGE IN SERVICENOW THAT DISPLAYS A GRAPHICAL REPRESENTATION OF A TABLE AND ALL OF ITS RELATIONSHIPS TO OTHER TABLES

SERVICENOW ACL (ACCESS CONTROL)

MECHANISM THAT DEFINES A SET OF CONDITIONS UNDER WHICH A USER GETS TO PERFORM SOME OPERATIONS IN SERVICENOW. TYPE AND NAME FIELD DEFINE TO WHICH ACCESS IS GIVEN. OPERATION INCLUDES THE ROLES

OPERATIONS FIELD HAS THE FOLLOWING **CREATE, READ, DELETE, WRITE**

ITIL

ITIL STANDS FOR INFORMATION TECHNOLOGY INFRASTRUCTURE LIBRARY.

STAGES OF ITIL

DIVIDED INTO 5 STAGES

SERVICE STRATEGY: IT IS THE FIRST STAGE OF ITIL, WHICH LAYS DOWN THE BLUEPRINT OF A NEW SERVICE (OR CHANGES IN AN EXISTING SERVICE). THE PROPER PLAN AND ROADMAP OF THE SERVICE IS PREPARED IN THIS STAGE. ALL THE ASPECTS OF SERVICES LIKE VALUE CREATION, RESOURCES, CAPABILITIES, INVESTMENT, PORTFOLIO, ETC. ARE DISCUSSED IN THIS PHASE.

SERVICE DESIGN: THIS IS THE NEXT PHASE OF ITIL, WHEREIN, THE ARCHITECTURE OF THE NEW OR CHANGED SERVICE TAKES PLACE, AS PER THE SERVICE STRATEGY. IT ALSO LAYS DOWN THE PROCESSES, POLICIES AND SOLUTIONS AS PER THE BUSINESS REQUIREMENTS.

SERVICE TRANSITION: THIS IS THE THIRD STAGE OF ITIL AND THE MAIN OBJECTIVE OF THIS STAGE IS PLAN, MANAGE, BUILD AND DEPLOY THE NEW OR CHANGED IT SERVICE IN THE PRODUCTION (REAL WORLD). THIS STAGE ALSO DRAFTS THE RISK MANAGEMENT AND BACK OUT PLANS. CHANGE MANAGEMENT IS ONE OF THE IMPORTANT PROCESSES WHICH COMES UNDER SERVICE TRANSITION, WHICH IS EXPLAINED LATER.

SERVICE OPERATION: THIS STAGE OF ITIL FOCUSES ON THE DAY TO DAY IT SERVICES, WHICH ARE DELIVERED TO THE CUSTOMERS. IT MAKES SURE THAT EVERY IT SERVICE IS DELIVERED EFFICIENTLY WITHOUT ANY (OR AT MINIMUM POSSIBLE) DISRUPTION. THIS STAGE INTRODUCES VARIOUS PROCESSES, WHICH NEED TO BE CARRIED OUT IN CASE OF SERVICE DISRUPTION, INCIDENT MANAGEMENT AND PROBLEM MANAGEMENT BEING IMPORTANT AMONG THEM.

CONTINUAL SERVICE IMPROVEMENT (CSI): THIS STAGE HIGHLIGHTS THE STEPS THAT COULD BE TAKEN, TO INCREASE THE OVERALL EFFICIENCY AND PERFORMANCE OF THE SERVICE. THE CSI WORKS CLOSELY WITH ALL THE OTHER STAGES AND IDENTIFIES IMPROVEMENT OPPORTUNITIES WITH METRICS DRIVEN APPROACH.

PROCESSES IN ITIL

THE CHANGE MANAGEMENT COMES UNDER SERVICE TRANSITION AND INCIDENT MANAGEMENT AND PROBLEM MANAGEMENT COMES UNDER SERVICE OPERATION.

- **CHANGE MANAGEMENT**: IT IS AN APPROACH WHICH GUIDES ON HOW TO PREPARE, MANAGE AND SUPPORT TRANSITION IN THE SERVICE. IT DEALS WITH ANY KIND OF CHANGE WITHIN THE ORGANISATION. MAY IT BE TECHNOLOGICAL CHANGE, PROCESS CHANGE, ORGANISATIONAL RESTRUCTURING, PHYSICAL DATACENTER RELATED CHANGES, SOFTWARE RELATED CHANGES, SERVER RELATED CHANGES, ETC. SPECIFIC CHANGE REQUEST IS RAISED IN ANY ITIL TOOLS LIKE SERVICENOW, REMEDY, ETC. TO TRACK THE CHANGE. THE CHANGE REQUEST UNDERGOES SEVERAL STAGES LIKE REVIEW, APPROVAL, BUDGETING, DOCUMENTATIONS, ETC. WHICH MAY VARY AS PER THE ORGANISATIONS POLICIES.
- **INCIDENT MANAGEMENT:** IT IS AN APPROACH TO IDENTIFY, ANALYSE, MANAGE AND RESTORE ANY DISRUPTION CAUSED IN THE SERVICE. INCIDENT MANAGEMENT ENSURES THAT THE PERFORMANCE OF THE SERVICE IS UP TO THE MARK AND ANY INTERRUPTION IN THE QUALITY OF THE SERVICE IS RESTORED AS SOON AS POSSIBLE. A SPECIFIC INCIDENT RECORD WITH UNIQUE TICKET NUMBER IS RAISED IN ITIL TOOL, BY SUPPORT/SERVICE DESK EXECUTIVE FOR EACH AND EVERY DISRUPTION REPORTED. THE CORRESPONDING TEAM FURTHER ANALYSES AND RESTORE THE SERVICE AND UPDATES THE INCIDENT TICKET ACCORDINGLY IN THE ITIL TOOL.
- **PROBLEM MANAGEMENT**: THE PURPOSE OF PROBLEM MANAGEMENT IS TO FIND A PERMANENT ROOT CAUSE FOR THE RECURRING INCIDENTS. PROBLEM MANAGEMENT MITIGATES THE IMPACT OF

THE RECURRING INCIDENTS IN THE SERVICES. AS PER THE ITIL PRACTICE, A PROBLEM RECORD IS RAISED FOR RECURRING TYPES OF INCIDENTS. THE CORRESPONDING TEAM FINDS THE EXACT ROOT CAUSE AND PROPOSES CHANGE OR FIX IN THE SERVICE FOR THE PERMANENT RESOLUTION OF THE INCIDENT. A CHANGE REQUEST IS RAISED FOR THE PROPOSED FIX/CHANGE AND IT IS IMPLEMENTED IN PRODUCTION THROUGH CHANGE MANAGEMENT PROCESS.

APP ENGINE STUDIO PROCESS

CREATORS USE APP ENGINE STUDIO (AES) TO QUICKLY BUILD APPLICATIONS TO MEET AN ORGANIZATION'S BUSINESS NEEDS. APP CREATION WITH AES FOLLOWS A SIMPLE PROCESS:

APP ENGINE STUDIO'S INTERFACE ALLOWS YOU TO

- CREATE APPS AND APPLICATION COMPONENTS
- VIEW AND SELECT TEMPLATES TO CREATE APPS QUICKLY
- ACCESS RESOURCES RELATED TO APP ENGINE STUDIO

THE APP ENGINE STUDIO HEADER HAS FOUR TABS. SELECTING A TAB CHANGES THE CONTENT.

- HOME: CREATE AN APP OR APPLICATION COMPONENT, OPEN A RECENT APP, OR CREATE AN APP FROM A TEMPLATE
- MY APPS: OPEN APPS YOU CREATED
- TEMPLATES: VIEW TEMPLATES AVAILABLE TO CREATE APPS
- RESOURCES: VIEW DOCUMENTATION RESOURCES

BUILDING AN APPLICATION IN APP ENGINE STUDIO

APPLICATION IS MADE OF APPLICATION COMPONENTS:

- DATA MODEL: A TABLE TO STORE INFORMATION ABOUT COLLECTION ITEMS

- USER EXPERIENCE: AN INTERFACE FOR A USER TO INTERACT WITH COLLECTION DATA AND RECORDS
- LOGIC AND AUTOMATION: AUTOMATION TO AUTOMATICALLY SET A VALUE IN A RECORD
- SECURITY: A ROLE TO PROVIDE ACCESS TO THE APPLICATION

CREATING A TABLE

DATA IS A KEY COMPONENT OF AN APPLICATION. APPLICATIONS USE DATA TO:

- IDENTIFY USERS
- STORE INFORMATION FROM USERS OR ITEMS
- CAPTURE DETAILS ABOUT WORK PERFORMED AS PART OF A PROCESS

TO CREATE A TABLE IN APP ENGINE STUDIO, CLICK THE ADD BUTTON IN THE DATA SECTION ON THE APP HOME TAB.

1. SELECT THE CREATE A BLANK TABLE TILE ON THE HOW DO YOU WANT TO ADD DATA TO YOUR APP? SCREEN TO CREATE A TABLE TO STORE DATA.
2. CLICK THE CONTINUE BUTTON.
3. ON THE HOW DO YOU WANT TO CREATE A TABLE? SCREEN, SELECT WHETHER THE TABLE WILL BE EMPTY OR BE SEEDED WITH COLUMNS FROM ANOTHER TABLE. IN THE EXAMPLE, THE TABLE WILL BE EMPTY. SELECT THE CREATE NEW TABLE TILE.
4. CLICK THE CONTINUE BUTTON.
5. CONFIGURE THE TABLE PROPERTIES ON THE NOW, LET'S GET MORE INFO ABOUT YOUR NEW TABLE SCREEN. PROVIDE A TABLE LABEL FOR THE TABLE. THE TABLE NAME IS CONFIGURED AUTOMATICALLY.
6. CLICK THE CONTINUE BUTTON.
7. CONFIGURE THE PERMISSIONS FOR THE DEFAULT ROLES ON THE LET'S ADD PERMISSIONS TO YOUR TABLE. SCREEN. GRANT ROLES PERMISSION TO CREATE, READ, WRITE, OR DELETE RECORDS IN THE TABLE.
8. CLICK THE CONTINUE BUTTON. APP ENGINE STUDIO CREATES THE TABLE.
9. CLICK THE DONE BUTTON TO RETURN TO THE APP HOME TAB.

EACH TABLE INCLUDES DEFAULT FIELDS.

- CREATED: THE DATE THE RECORD WAS CREATED
- CREATED BY: THE USER WHO CREATED THE RECORD
- UPDATED: THE DATE THE RECORD WAS LAST UPDATED
- UPDATED BY: THE USER WHO LAST UPDATED THE RECORD
- UPDATES: THE NUMBER OF UPDATES MADE TO THE RECORD

BEFORE CREATING A FIELD IN TABLE BUILDER, IDENTIFY:

- THE LABEL FOR THE FIELD
- THE TYPE OF DATA STORED IN THE FIELD, SUCH AS TEXT, NUMBER, OR DATE
    - FOR GENERAL TEXT, USE THE TYPE *STRING* AND SPECIFY A LENGTH FOR THE TEXT
    - FOR NUMBERS WITHOUT DECIMALS, USE THE TYPE *INTEGER*
    - FOR DATE VALUES WITHOUT A TIME, USE THE TYPE *DATE*
    - FOR DATE VALUES WITH A TIME, USE THE TYPE *DATE/TIME*
- IF THE VALUES FOR A FIELD SHOULD BE LIMITED TO SPECIFIC OPTIONS
    - FOR VALUES FROM ANOTHER TABLE, USE THE TYPE *REFERENCE* AND SELECT A REFERENCE TABLE
    - TO DEFINE THE AVAILABLE OPTIONS FOR THE FIELD, SELECT THE TYPE *CHOICE* AND ADD OPTIONS

IN TABLE BUILDER, CLICK THE + ADD NEW FIELD BUTTON TO ADD A FIELD TO THE TABLE.

- ENTER A VALUE FOR THE COLUMN LABEL.
- PRESS THE RETURN/ENTER KEY ON THE KEYBOARD. TABLE BUILDER ADDS A COLUMN NAME VALUE FROM THE COLUMN LABEL AND SETS THE DEFAULT TYPE FOR THE FIELD TO STRING.
- FIELDS DEFAULT TO A STRING TYPE TO STORE TEXT VALUES. TO CHANGE THE TYPE VALUE FOR A FIELD, CLICK THE TYPE FIELD AND SELECT A VALUE, SUCH AS INTEGER FOR NUMBERS OR DATE/TIME FOR DATE AND TIME VALUES.
- CLICK THE SAVE BUTTON.

DATA CAN BE ADDED FROM SPREADSHEET AS WELL

SELECT A SOURCE FOR THE TABLE:

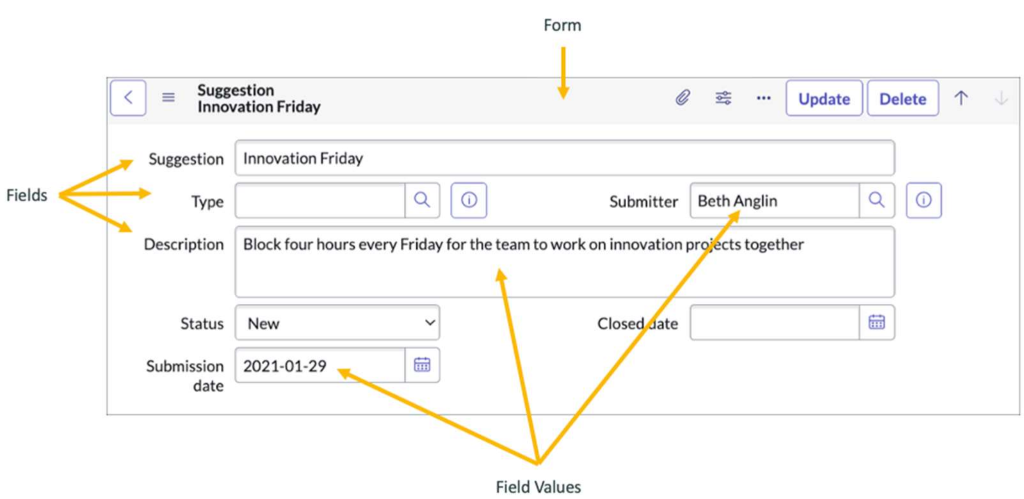
- ***UPLOAD A SPREADSHEET***: CREATE A TABLE FROM A SPREADSHEET
- ***CREATE FROM AN EXISTING TABLE***: CREATE A TABLE BY EXTENDING AN EXISTING SERVICENOW TABLE AND ADD CUSTOM FIELDS
- ***CREATE FROM SCRATCH***: CREATE A TABLE WITH A STANDARD SET OF FIELDS AND ADD CUSTOM FIELDS

REGARDLESS OF TABLE CREATION METHOD, THE FINAL STEP IN TABLE CREATION IS TO CONFIGURE THE TABLE PROPERTIES.

- ***TABLE LABEL***: THE USER-FRIENDLY LABEL FOR THE TABLE
- ***TABLE NAME***: THE AUTOMATICALLY-GENERATED NAME FOR THE TABLE USED PROGRAMMATICALLY BY THE APPLICATION
- ***MAKE EXTENSIBLE***: ALLOW THE TABLE TO BE EXTENDED BY OTHER TABLES
- ***AUTO NUMBER***: CONFIGURE A FIELD TO ASSIGN A UNIQUE, AUTOMATICALLY-GENERATED NUMBER TO EACH RECORD IN THE TABLE

FORMS

APPLICATION USERS CREATE AND EDIT RECORDS USING FORMS. A FORM IS A PAGE THAT DISPLAYS FIELDS AND VALUES FOR A SINGLE RECORD FROM A DATABASE TABLE.



VIEWS

VIEWS ARE ALTERNATE FORM LAYOUTS FOR THE SAME TABLE. APPLICATION USERS MAY ONLY NEED TO SEE A SUBSET OF A RECORD'S FIELDS, WHEREAS REVIEWERS, MANAGERS, OR APPLICATION ADMINISTRATORS NEED TO SEE MORE OR ALL OF A RECORD'S FIELDS.

THE VIEW NAME APPEARS IN A FORM'S HEADER. IF THERE IS NO VIEW NAME IN THE HEADER, THE FORM IS USING THE *DEFAULT* VIEW.

TO CHANGE A FORM'S VIEW, OPEN THE **ADDITIONAL ACTIONS** MENU AND SELECT THE **VIEW > <VIEW NAME>** MENU ITEM.

ADDING LOGIC AND AUTOMATION

AUTOMATION USES AN APPLICATION TO MANAGE REPEATABLE PROCESSES INSTEAD OF USING PEOPLE. AUTOMATION IS OFTEN REFERRED TO AS A WORKFLOW, OR FLOW. APP ENGINE STUDIO ALLOWS CREATORS TO ADD PROCESS FLOWS TO THEIR APPLICATIONS. FOR EXAMPLE:

A. UPDATE A FIELD IN RESPONSE TO ANOTHER FIELD'S VALUE

B. SEND EMAIL NOTIFICATIONS

C. REQUEST AN APPROVAL

D. CREATING A REQUEST

E. UPDATING FIELDS ON THE REQUEST

F. SENDING A COPY OF THE REQUEST TO THE REQUESTOR

G. SUBMITTING THE REQUEST FOR APPROVAL

THE FLOW EDITOR IS MADE UP OF:

- ***HEADER***: DISPLAYS THE FLOW NAME, ACTIVATION STATUS, AND CONTROLS TO CONFIGURE, TEST, AND ACTIVATE
  - ***ACTIVATION STATUS***
    - **INACTIVE FLOW**:
    - **ACTIVE FLOW**:
  - ***TEST***: INITIATES A TEST OF THE FLOW
  - ***DEACTIVATE*** (NOT DISPLAYED): DEACTIVATES AN ACTIVATED FLOW
  - ***ACTIVATE***: ACTIVATES A FLOW
  - ***SAVE***: SAVES THE FLOW
- ***FLOW TAB***: DISPLAYS THE NAME OF THE FLOW
- ***MORE ACTIONS MENU:*** LISTS FLOW MANAGEMENT OPTIONS SUCH AS *PROPERTIES*, *EXECUTIONS*, *COPY FLOW*, AND *MANAGE SECURITY*
- ***FLOW FOOTER***: DISPLAYS THE STATUS AND APPLICATION FOR THE FLOW
  - ***STATUS***: INDICATES FLOW STATUS OF DRAFT, MODIFIED, OR PUBLISHED
  - ***APPLICATION***: IDENTIFIES THE FLOW'S APPLICATION
- ***FLOW CANVAS***: WORK AREA FOR ADDING AND CONFIGURING FLOW COMPONENTS
- ***DATA PANEL***: DISPLAYS A LIST OF DYNAMIC VALUES USED TO CONFIGURE FLOW COMPONENTS
- ***ERROR HANDLER***: ACTIONS TO EXECUTE IF EXECUTION ERRORS OCCUR

IN THE LOGIC AND AUTOMATION SECTION OF THE APP HOME TAB, CLICK THE ADD BUTTON

- ON THE WHAT DO YOU WANT TO ADD? SCREEN, SELECT THE FLOW TILE.
- ON HOW DO YOU WANT TO ADD AN AUTOMATED WORKFLOW TO YOUR APP? SCREEN, SELECT THE TYPE OF AUTOMATION TO ADD. FOR EXAMPLE, THE BUILD FROM SCRATCH OPTION.
- ON THE LET'S SET UP YOUR FLOW SCREEN, PROVIDE A NAME AND A DESCRIPTION FOR THE FLOW, THEN CLICK THE CONTINUE BUTTON.

- WHEN FLOW CREATION IS COMPLETE, CLICK THE EDIT THIS FLOW BUTTON IN SUCCESS! YOUR FLOW IS READY. SCREEN.

TRIGGERS

FLOWS ARE MADE UP OF TRIGGERS AND ACTIONS.

- TRIGGER: WHEN TO EXECUTE
- ACTIONS: WHAT TO DO

TRIGGERS DETERMINE WHEN A FLOW'S LOGIC EXECUTES. SELECT THE RIGHT TYPE OF TRIGGER FOR THE PROCESS FLOW. THE TRIGGER TYPES ARE:

- RECORD: EXECUTE THE FLOW WHEN A RECORD IS CREATED OR UPDATED
- DATE: EXECUTE THE FLOW AT A SPECIFIC TIME OR INTERVAL
- APPLICATION: EXECUTE THE FLOW WHEN SOMETHING HAPPENS ON AN INSTANCE SUCH AS RECEIVING AN EMAIL

SELECT THE RIGHT TRIGGER TYPE FOR THE PROCESS. FOR EXAMPLE, IF A FLOW NEEDS TO EXECUTE ONCE / DAY, CHOOSE A *DATE* TRIGGER. CHOOSE A *RECORD* TRIGGER IF A FLOW NEEDS TO EXECUTE WHEN A RECORD IS UPDATED, CHOOSE A *RECORD* TRIGGER.

TO ADD A TRIGGER TO A FLOW, CLICK THE ADD A TRIGGER LINK.

- IN THE TRIGGERS DIALOG, SELECT A TRIGGER. HOVER OVER A TRIGGER TO SEE THE TRIGGER DOCUMENTATION.
- AFTER SELECTING A TRIGGER, THE TRIGGER'S CONFIGURATION FIELDS ARE ADDED TO THE TRIGGER SECTION. EACH TRIGGER HAS ITS OWN CONFIGURATION OPTIONS. RECORD TRIGGERS REQUIRE SPECIFYING A TABLE.
- WITH ONLY THE TABLE FIELD CONFIGURED, THE FLOW WILL EXECUTE FOR EVERY RECORD ADDED TO THE TABLE. TO TRIGGER A FLOW FOR SPECIFIC RECORDS ON THE TABLE, CLICK THE ADD FILTERS BUTTON IN THE CONDITION FIELD.
- CONFIGURE THE CONDITION. THE GENERAL SYNTAX FOR CONDITIONS IS: [FIELD] [COMPARISON OPERATOR] [VALUE].
- [FIELD] AND [COMPARISON OPERATOR] ARE REQUIRED FOR ALL CONDITIONS. SOME [COMPARISON OPERATORS], LIKE IS EMPTY, DO NOT USE [VALUE] IN THE CONDITION DEFINITION.

THE *RUN TRIGGER* CONFIGURATION OPTION SPECIFIES WHAT TO DO WHEN A CONDITION IS REPEATEDLY MET FOR A RECORD.

- ***ONCE***: RUNS ONLY ONCE FOR THE RECORD.
- ***FOR EACH UNIQUE CHANGE***: RUNS ONLY FOR EACH UNIQUE CHANGE TO THE RECORD.

- ***ONLY IF NOT CURRENTLY RUNNING***: RUNS ONLY IF A FLOW IS NOT ALREADY RUNNING FOR THE RECORD.
- ***FOR EVERY UPDATE***: RUNS EVERY TIME THE RECORD IS UPDATED TO MEET THE CONDITION UNLESS A FLOW IS ALREADY ACTIVE FOR THE RECORD.

THE *RUN TRIGGER* OPTION ONLY APPLIES TO *UPDATED* AND *CREATED OR UPDATED* TRIGGERS.

THE *WHEN TO RUN THE FLOW* FIELD INCLUDES CHOICE LISTS TO CONFIGURE:

- INTERACTIVE SESSIONS
  - ***ONLY RUN FOR NON-INTERACTIVE SESSION***: EXECUTE THE FLOW WHEN THE RECORD IS CREATED OR UPDATED FROM AN API. SEE THE SERVICENOW DOCS SITE FOR MORE INFORMATION ON NON-INTERACTIVE SESSIONS.
  - ***ONLY RUN FOR USER INTERACTIVE SESSION***: EXECUTE THE FLOW WHEN A LOGGED IN USER CREATES OR UPDATES A RECORD.
  - ***RUN FOR BOTH INTERACTIVE AND NON-INTERACTIVE SESSIONS***: EXECUTE THE FLOW REGARDLESS OF HOW THE RECORD IS CREATED OR UPDATED.
- USERS
  - ***DO NOT RUN IF TRIGGERED BY THE FOLLOWING USERS***: SPECIFY A LIST OF USERS WHO CANNOT EXECUTE THE FLOW.
  - ***ONLY RUN IF TRIGGERED BY THE FOLLOWING USERS***: SPECIFY A LIST OF USERS WHO CAN EXECUTE THE FLOW.
  - ***RUN FOR ANY USER***: EXECUTE THE FLOW FOR ANY USER.
- TABLES
  - ***RUN ONLY ON CURRENT TABLE***: EXECUTE THE FLOW ONLY WHEN RECORDS ARE CREATED OR UPDATED ON THE SELECTED TABLE.
  - ***RUN ON CURRENT AND EXTENDED TABLES***: EXECUTE THE FLOW WHEN RECORDS ARE CREATED OR UPDATED ON THE SELECTED TABLE OR ANY TABLE THAT EXTENDS THE SELECTED TABLE.

CONFIGURE WHERE TO RUN THE FLOW:

- ***RUN FLOW IN BACKGROUND (DEFAULT)***: EXECUTE THE FLOW ASYNCHRONOUSLY. USE THIS OPTION FOR FLOWS THAT DO NOT REQUIRE IMMEDIATE UPDATES AND TO ALLOW OTHER SYSTEM PROCESSES TO RUN AT THE SAME TIME.
- ***RUN FLOW IN FOREGROUND***: EXECUTE THE FLOW SYNCHRONOUSLY TO PROVIDE IMMEDIATE UPDATES TO THE USER. RUNNING A FLOW IN FOREGROUND MAY BLOCK THE CURRENT SESSION THREAD AND PREVENT USER INPUT UNTIL THE FLOW FINISHES.

ACTIONS

ACTIONS SPECIFY WHAT A FLOW DOES WHEN TRIGGERED. FLOWS HAVE ONLY ONE TRIGGER BUT CAN HAVE MANY ACTIONS.

TO ADD AN ACTION TO A FLOW, CLICK THE ADD AN ACTION, FLOW LOGIC, OR SUBFLOW LINK.

- CLICK THE BUTTON FOR THE TYPE OF ACTION TO ADD: ACTION, FLOW LOGIC, OR SUBFLOW. THE EXAMPLE SHOWS ADDING AN ACTION TO UPDATE A RECORD.
- AFTER SELECTING AN ACTION, THE ACTION'S CONFIGURATION FIELDS ARE ADDED TO THE ACTIONS SECTION OF THE FLOW EDITOR. EACH ACTION HAS ITS OWN CONFIGURATION OPTIONS. THE UPDATE RECORD ACTION REQUIRES SPECIFYING THE RECORD TO UPDATE, THE RECORD'S TABLE, AND THE FIELDS TO UPDATE.
- TO DYNAMICALLY SET VALUES IN ACTION CONFIGURATIONS, USE DATA PILLS. DATA PILLS ARE VARIABLES THAT HAVE NO VALUE UNTIL A FLOW EXECUTES; THEY ARE PLACEHOLDERS FOR VALUES. THE DATA PANEL CONTAINS THE AVAILABLE DATA PILLS. DATA PILLS ARE GROUPED BY TRIGGER AND BY ACTIONS.

AVAILABLE ACTIONS INCLUDE:

- *ASK FOR APPROVAL*
- *CREATE OR UPDATE RECORD*
- *CREATE RECORD*
- *CREATE TASK*
- *DELETE RECORD*
- *LOG*
- *LOOK UP RECORD*
- *LOOK UP RECORDS*
- *SEND EMAIL*
- *UPDATE RECORD*

TO DYNAMICALLY SET VALUES IN ACTION CONFIGURATIONS, USE DATA PILLS. DATA PILLS ARE VARIABLES THAT HAVE NO VALUE UNTIL A FLOW EXECUTES; THEY ARE PLACEHOLDERS FOR VALUES. THE *DATA* PANEL CONTAINS THE AVAILABLE DATA PILLS. DATA PILLS ARE GROUPED BY TRIGGER AND BY ACTIONS. ANY FIELD WITH THE *DATA PILL PICKER* BUTTON CAN DYNAMICALLY SET VALUES USING DATA PILLS. TO USE A DATA PILL, DRAG THE DATA PILL FROM THE *DATA* PANEL TO A FIELD. 

SELECT **SERVICENOW CORE > FOR ANY ACTION RELATED PART IN THE AUTOMATION**

TESTING FLOWS

AFTER CREATING A FLOW, TEST THE FLOW LOGIC BY CLICKING THE **TEST** BUTTON IN THE FLOW EDITOR HEADER. THE *TEST* FEATURE IGNORES THE TRIGGER LOGIC AND EXECUTES ONLY THE FLOW ACTIONS. THE TRIGGER IS *NOT* TESTED BY THE *TEST* FEATURE.

THE *TEST FLOW* DIALOG OPENS. THE TEST CONFIGURATION OPTIONS IN THE *TEST FLOW* DIALOG DEPEND ON THE TRIGGER TYPE. THIS LEARNING MODULE DISCUSSES TESTING FLOWS WITH *RECORD* TRIGGERS.

FLOWS WITH *RECORD* TRIGGERS REQUIRE A RECORD TO TEST THE FLOW. SELECT THE RECORD TO USE FOR THE TEST IN THE *TEST FLOW* DIALOG.

- USE THE **LOOKUP RECORDS** () BUTTON TO OPEN THE LIST OF RECORDS TO FILTER AND SELECT.
- CLICK THE **CREATE NEW RECORD** () BUTTON TO CREATE A RECORD TO USE FOR THE TEST.
- WITH A RECORD SELECTED, USE THE **PREVIEW SELECTED RECORD** () BUTTON TO PREVIEW THE SELECTED RECORD.

BY DEFAULT, FLOW TESTS EXECUTE IN THE FOREGROUND TO EXPEDITE TESTING. TESTING IN THE FOREGROUND MEANS THAT COMPUTING RESOURCES ARE UNAVAILABLE UNTIL THE TEST EXECUTION IS COMPLETE. TO TEST IN THE BACKGROUND, SELECT THE RUN TEST IN BACKGROUND CHECKBOX.

WHEN THE TRIGGER IS SET TO UPDATED OR CREATED OR UPDATED, THE TRIGGER INCLUDES A CHANGED FIELDS ARRAY TO PASS CHANGED FIELD VALUES TO THE FLOW. TO SIMULATE CHANGED INFORMATION IN A TEST, THE TEST FLOW DIALOG INCLUDES A CHANGED FIELDS SECTION TO ADD DATA TO THE ARRAY FOR USE IN TESTING THE FLOW.

ALL VALUES IN THE ARRAY ARE STRINGS.

- ***FIELD NAME***: THE *NAME* OF THE CHANGED FIELD, NOT THE LABEL.
- ***PREVIOUS VALUE***: THE FIELD VALUE BEFORE THE UPDATE.
- ***CURRENT VALUE***: THE FIELD VALUE AFTER THE UPDATE.
- ***PREVIOUS DISPLAY VALUE***: THE FIELD DISPLAY VALUE BEFORE THE UPDATE.
- ***CURRENT DISPLAY VALUE***: THE FIELD DISPLAY VALUE AFTER THE UPDATE.

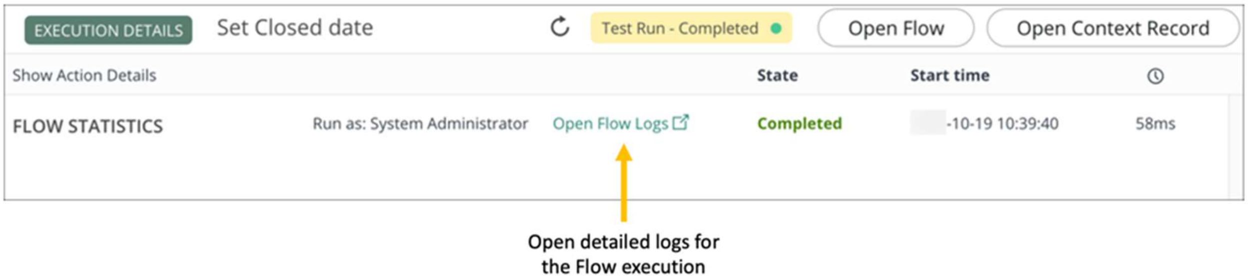
THE VALUES ENTERED IN THE *CHANGED FIELDS* SECTION DO NOT CHANGE THE VALUES IN THE RECORD SELECTED FOR THE TEST.

VIEWING FLOW EXECUTION DETAILS

A FLOW EXECUTION (OR CONTEXT) IS A FLOW'S RUNTIME ENVIRONMENT. A FLOW EXECUTION IS CREATED WHEN A FLOW EXECUTES. A FLOW EXECUTION LOADS THE FLOW CONFIGURATION AT EXECUTION TIME. USE FLOW EXECUTIONS TO TEST AND DEBUG FLOWS.

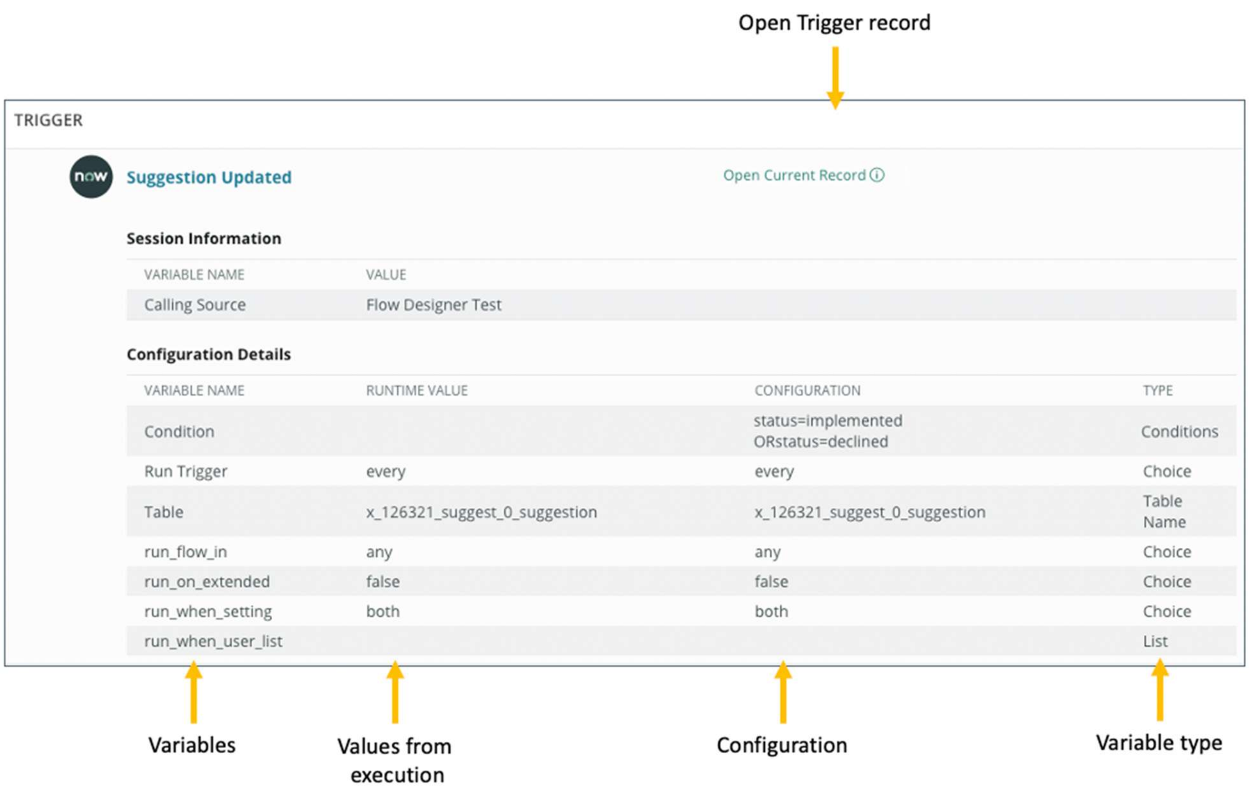
WHEN TESTING, AFTER FLOW EXECUTION IS COMPLETE, CLICK THE **YOUR TEST HAS FINISHED RUNNING. VIEW THE FLOW EXECUTION DETAILS.** LINK IN THE *TEST FLOW* DIALOG. THE EXECUTION DETAILS OPEN IN A NEW TAB.

THE *FLOW STATISTICS* SECTION SHOWS WHO EXECUTED THE FLOW, WHAT THE FLOW EXECUTION STATE IS, WHEN THE FLOW BEGAN EXECUTION, AND HOW LONG THE FLOW TOOK TO RUN.



A FLOW CAN BE IN ONE OF THREE STATES:

- ***COMPLETED***: THE FLOW SUCCESSFULLY RAN ALL ACTIONS
- ***WAITING***: THE FLOW EXECUTION PAUSED AND IS WAITING FOR AN ACTION TO COMPLETE
- ***ERROR***: THE FLOW EXECUTION STOPPED WITH AN ERROR

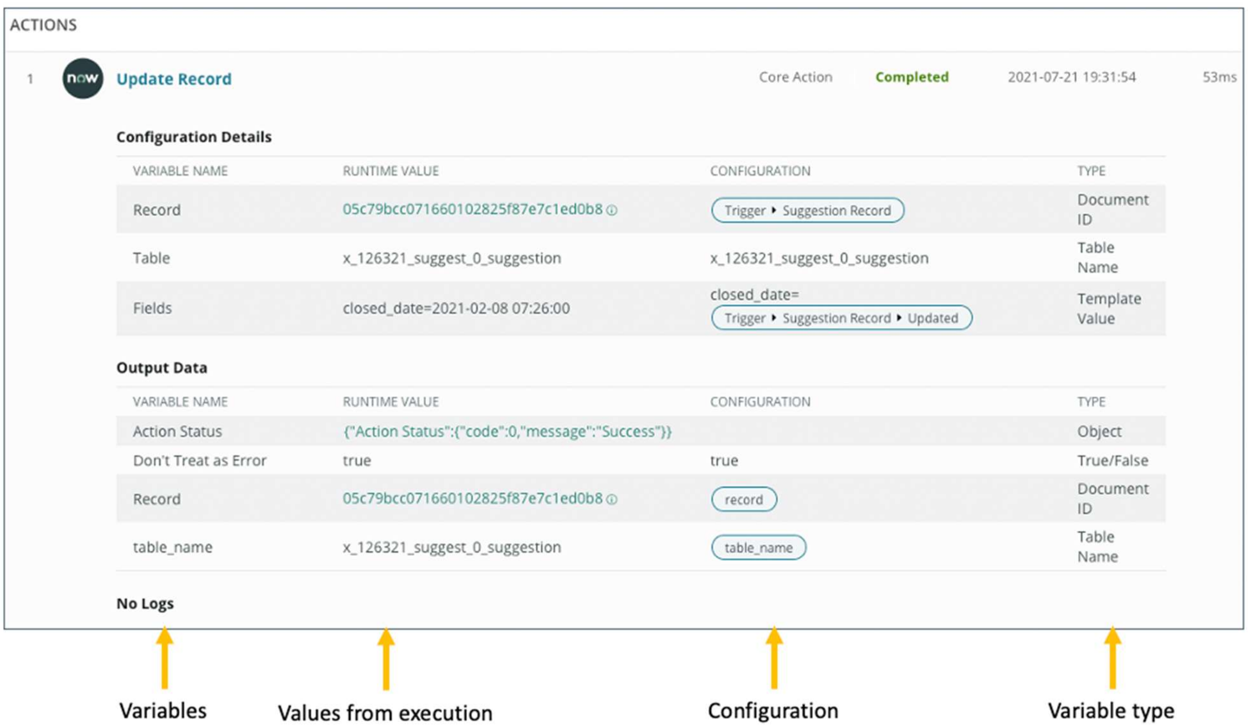


THE *SESSION INFORMATION* SECTION SHOWS WHAT CAUSED THE FLOW TO EXECUTE: A TEST OR TRIGGER.

THE *CONFIGURATION DETAILS* SECTION SHOWS HOW THE TRIGGER INPUT VARIABLES WERE CONFIGURED WHEN THE FLOW EXECUTED. *RECORD* TRIGGERS SHOW THE TABLE AND CONDITIONS FOR A RECORD TO TRIGGER THE FLOW.

THE *TRIGGER OUTPUT* SECTION SHOWS THE OUTPUT VARIABLES AND RUNTIME VALUES FROM THE TRIGGER. IN THE EXAMPLE, THE TRIGGER INCLUDES THREE OUTPUT VARIABLES: *RECORD*, *RUN START TIME*, AND *TABLE NAME*. THE RUNTIME VALUE FOR *TABLE NAME* IN THE EXAMPLE IS *X_126321_SUGGEST_0_SUGGESTION*. RUNTIME VALUES FOR RECORD AND REFERENCE VARIABLE TYPES ARE SYS_IDS. CLICK THE LINK TO PREVIEW DETAILS FOR THE REFERENCED RECORD.

CLICK AN ACTION TO SEE CONFIGURATION AND RUNTIME DETAILS. CLICK THE **SHOW ACTION DETAILS** LINK IN THE EXECUTION DETAILS HEADER TO SEE THE RUNTIME DETAILS FOR ALL ACTIONS IN THE FLOW. EACH ACTION INCLUDES ACTION STATE, WHEN THE ACTION EXECUTION STARTED, AND HOW LONG THE ACTION TOOK TO RUN.



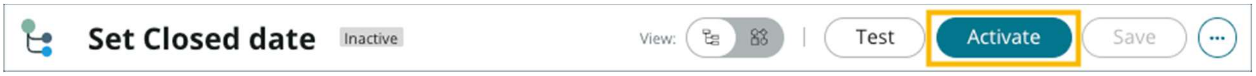
THE *CONFIGURATION DETAILS* SECTION SHOWS THE ACTION INPUT VARIABLES AND RUNTIME VALUES WHEN THE ACTION EXECUTED. IN EXAMPLE, THE *CLOSED_DATE* FIELD WAS UPDATED.

THE *OUTPUT DATA* SECTION SHOWS OUTPUT VARIABLES AND RUNTIME VALUES WHEN THE ACTION EXECUTED. RUNTIME VALUES FOR *RECORD* AND REFERENCE VARIABLE TYPES ARE LINKS. CLICK THE LINK TO PREVIEW DETAILS FOR THE REFERENCED RECORD.

ACTIVATING FLOWS

NEW FLOWS ARE NOT PART OF THE RUNTIME ENVIRONMENT FOR AN APPLICATION. UNTIL A FLOW IS ACTIVATED, TRIGGER CONDITIONS DO NOT CAUSE A FLOW TO EXECUTE.

FLOWS SHOULD BE TESTED BEFORE ACTIVATION TO ENSURE THE FLOW LOGIC WORKS AS INTENDED. TO ACTIVATE A FLOW, CLICK THE **ACTIVATE** BUTTON IN THE FLOW HEADER.



DEACTIVATING A FLOW STOPS THE FLOW FROM BEING TRIGGERED IN THE RUNTIME ENVIRONMENT. TO DEACTIVATE A FLOW, CLICK THE **DEACTIVATE** BUTTON. ALL ACTIVE EXECUTIONS OF THE SAME FLOW CONTINUE TO RUN UNTIL COMPLETED OR CANCELED.

CREATING A WORKSPACE

A WORKSPACE IS A TARGETED EXPERIENCE FOR A SPECIFIC TYPE OF USER OF AN APPLICATION. A WORKSPACE INCLUDES DATA VISUALIZATIONS AND OTHER USER EXPERIENCE COMPONENTS TO ALLOW A USER TO INTERACT WITH AN APPLICATION.

AN EXPERIENCE, ALSO KNOWN AS USER INTERFACE, IS HOW A USER INTERACTS WITH AN APPLICATION. CREATE USER INTERFACE COMPONENTS IN THE EXPERIENCE SECTION OF THE APP-HOME TAB. ONE TYPE OF EXPERIENCE IS A WORKSPACE, WHICH IS A DASHBOARD TO INTERACT WITH APPLICATION DATA.

- CLICK THE ADD BUTTON FOR EXPERIENCE ON THE APP HOME TAB.
- SELECT THE WORKSPACE TILE ON WHAT TYPE OF EXPERIENCE DO YOU WANT TO ADD TO YOUR APP? SCREEN.
- ON THE A WORKSPACE HELPS USERS MANAGE AND FULFILL REQUESTS SENT TO THEM. SCREEN, CLICK THE GET STARTED BUTTON.
- ON THE LET'S DESIGN YOUR WORKSPACE SCREEN, PROVIDE A NAME AND DESCRIPTION FOR THE WORKSPACE. REMOVE ANY ROLES CREATED PREVIOUSLY THAT SHOULD NOT HAVE ACCESS TO THE WORKSPACE, THEN CLICK THE CONTINUE BUTTON.

CONFIGURING A WORKSPACE

- CLICK THE PREVIEW LINK ON A WORKSPACE'S CARD IN THE EXPERIENCE SECTION TO OPEN THE WORKSPACE.
- CLICK THE EDIT BUTTON IN THE WORKSPACE HEADER TO EDIT THE COMPONENTS.
- THE WORKSPACE CONSISTS OF ELEMENTS LAID OUT ON A PAGE, SUCH AS HEADINGS, DATA VISUALIZATIONS, AND LISTS.
- THE CONFIGURATION PANEL OPENS. USE THE CONFIGURATION PANEL TO MAKE CHANGES TO THE SELECTED ELEMENT ON THE PAGE.

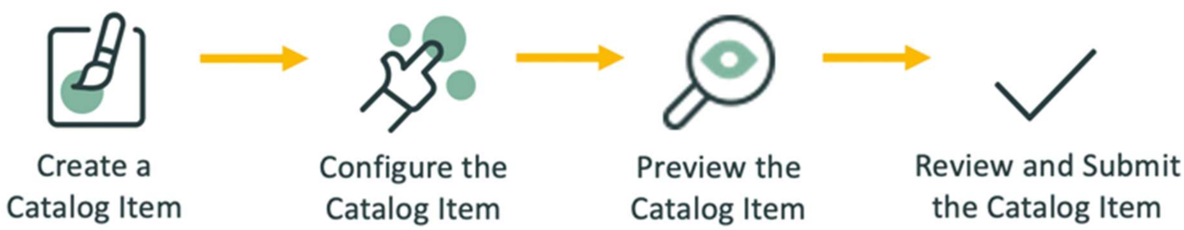
WHAT IS A RECORD PRODUCER?

A SERVICE CATALOG IS A CONSUMER-LIKE USER INTERFACE (UI) FOR REQUESTING SERVICES OR PRODUCTS. THE SERVICE CATALOG UI IS FOR USERS OF ALL SKILL LEVELS AND IS FAMILIAR TO ANYONE WHO HAS ORDERED ITEMS FROM CONSUMER WEBSITES. USERS CONFIGURE THEIR REQUESTS BY ANSWERING A SERIES OF QUESTIONS. RECORD PRODUCERS USE THE CATALOG ITEM USER INTERFACE TO CREATE RECORDS IN APPLICATION-SPECIFIC TABLES.

CATALOG ITEM CREATION PROCESS

CREATORS USE THE *EXPERIENCE* APPLICATION COMPONENT TO CREATE CATALOG ITEMS. CREATE A CATALOG ITEM THEN USE THE CATALOG EDITOR, ALSO KNOWN AS CATALOG BUILDER, TO CONFIGURE THE CATALOG ITEM.

CATALOG ITEMS ARE CREATED USING A SIMPLE PROCESS:



THE CATALOG EDITOR CONTAINS THREE PANELS.

- **NAVIGATION PANEL**: CONTAINS THE CATALOG EDITOR STEPS.
  - DETAILS
  - DESTINATION (RECORD PRODUCER ONLY)
  - LOCATION
  - QUESTIONS
  - SETTINGS
  - ACCESS
  - FUL
  - REVIEW AND SUBMIT
- **CANVAS**: SHOWS THE FIELDS TO CONFIGURE IN EACH *CATALOG EDITOR STEP*.
- **SECTION INFO PANEL**: DISPLAYS A DESCRIPTION FOR EACH *CATALOG EDITOR STEP*.

WHAT IS A CATALOG ITEM?

A SERVICE CATALOG IS A CONSUMER-LIKE USER INTERFACE (UI) FOR REQUESTING SERVICES OR PRODUCTS. THE SERVICE CATALOG UI IS FOR USERS OF ALL SKILL LEVELS AND IS FAMILIAR TO ANYONE WHO HAS ORDERED ONLINE.

CREATING RECORD PRODUCER

A CATALOG ITEM CAN BE EASILY CREATED TO SUBMIT INFORMATION, FULFILL A REQUEST, OR CREATE A TASK. CREATE A CATALOG ITEM, THEN USE THE CATALOG EDITOR TO CONFIGURE THE CATALOG ITEM.

APP ENGINE STUDIO CAN CREATE TWO TYPES OF CATALOG ITEMS:

- ***STANDARD CATALOG ITEM***: A CATALOG ITEM USED TO REQUEST GOODS AND SERVICES
- ***RECORD PRODUCER***: A CATALOG ITEM USED TO CREATE A RECORD IN A TABLE

1. TO CREATE A RECORD PRODUCER EXPERIENCE, OPEN THE *APP HOME* TAB. CLICK THE **ADD** ICON IN THE *EXPERIENCE* SECTION.
2. ON THE *WHAT TYPE OF EXPERIENCE DO YOU WANT TO ADD TO YOUR APP?* SCREEN, SELECT **RECORD PRODUCER**.
3. ON THE NEXT SCREEN, CLICK THE **BEGIN** BUTTON.
4. ON THE *LET'S SET UP YOUR STANDARD RECORD PRODUCER* OR *LET'S SET UP YOUR RECORD PRODUCER* SCREEN, CONFIGURE THE *NAME* AND *SHORT DESCRIPTION* FOR THERECORD PRODUCER

CONFIGURING RECORD PRODUCER

CREATORS SHOULD PROVIDE A UNIQUE NAME AND DESCRIPTION WHEN CREATING RECORD PRODUCERS. THE NAME AND DESCRIPTION GIVE USERS THE BASIC INFORMATION NEEDED WHEN DETERMINING WHICH RECORD PRODUCER FITS THEIR NEEDS.

THE *DETAILS* STEP CONTAINS THE *BASIC INFO* AND *ITEM DETAILS* OF A RECORD PRODUCER.

THE *BASIC INFO* IS AUTOMATICALLY POPULATED WITH THE *ITEM NAME* AND *SHORT DESCRIPTION* ADDED WHEN THE RECORD PRODUCER WAS CREATED.

- **ITEM NAME**: A UNIQUE NAME TO IDENTIFY THE RECORD PRODUCER.
- **SHORT DESCRIPTION**: A BRIEF DESCRIPTION TO HELP USERS UNDERSTAND THE PURPOSE OF THE RECORD PRODUCER.
- IN THE *ITEM DETAILS* SECTION, ADD A DETAILED DESCRIPTION TO THE *DESCRIPTION* FIELD, THEN CLICK THE **INSERT/EDIT IMAGE** ICON
    - IMAGE: AN IMAGE TO DISPLAY ON THE RECORD PRODUCER FORM. IMAGES ARE OPTIONAL.

- DESCRIPTION: DETAILS THE USER NEEDS TO KNOW TO COMPLETE THE RECORD PRODUCER.
- CLICK SAVE BUTTON
- CLICK THE CONTINUE TO DESTINATION ➔ LINK TO MOVE TO THE NEXT CATALOG EDITOR STEP.

PREVIEWING A RECORD PRODUCER

IN THE CATALOG EDITOR, CREATORS CAN PREVIEW RECORD PRODUCER DURING CONFIGURATION. USE THE *PREVIEW* BUTTON TO SEE A REPRESENTATION OF THE RECORD PRODUCER IN SERVICE PORTAL, ON MOBILE DEVICES, AND IN VIRTUAL AGENT. CATALOG ITEMS CANNOT BE SUBMITTED FROM THE PREVIEW. TO PREVIEW A CATALOG ITEM, SELECT THE **PREVIEW** BUTTON IN THE CATALOG EDITOR. IN THE *PREVIEW YOUR CATALOG ITEM* DIALOG, SELECT **PORTAL**, **NOW MOBILE**, OR **VIRTUAL AGENT** IN THE *VIEW WITHIN* FIELD. SELECT THE **OPEN PREVIEW IN A NEW TAB** LINK TO OPEN THE CATALOG ITEM PREVIEW IN A NEW BROWSER TAB.

SELECTING A DESTINATION TABLE

A RECORD PRODUCER CATALOG ITEM CREATES A RECORD IN A TABLE. THE DESTINATION TABLE, ALSO CALLED THE RECORD SUBMISSION TABLE, SPECIFIES WHERE A RECORD PRODUCER CREATES RECORDS. WHEN A USER SUBMITS A COMPLETED RECORD PRODUCER FORM, A RECORD IS CREATED IN THE DESTINATION TABLE.

ADDING QUESTIONS TO A RECORD PRODUCER

QUESTIONS IN A RECORD PRODUCE CAPTURE INFORMATION FROM USERS THAT IS NEEDED TO CREATE A RECORD IN A TABLE. IN THE CATALOG EDITOR, THE *QUESTIONS* STEP ADDS QUESTIONS TO A RECORD PRODUCER. WHEN ADDING QUESTIONS TO A RECORD PRODUCER, INCLUDE IMPORTANT DETAILS USERS SHOULD KNOW TO ANSWER EACH QUESTION.

QUESTION TYPES AND SUBTYPES

CATALOG ITEM QUESTIONS ARE CATEGORIZED INTO TYPES AND SUBTYPES. SELECT A *QUESTION TYPE* AND *QUESTION SUBTYPE* FOR EACH QUESTION TO CONFIGURE HOW USERS SHOULD RESPOND TO THE QUESTION IN A CATALOG ITEM.

QUESTION TYPE	QUESTION SUBTYPE	DESCRIPTION
TEXT	SINGLE-LINE	ENTER A SINGLE LINE OF TEXT.
TEXT	MULTI-LINE	ENTER MULTIPLE LINES OF TEXT.

QUESTION TYPE	QUESTION SUBTYPE	DESCRIPTION
TEXT	RICH TEXT	ENTER HTML TEXT WITH ADVANCED FORMATTING OPTIONS.
OPTION	CHECK BOX	CREATE A WIDGET TO CHOOSE AN OPTION.
OPTION	YES / NO	CREATE A CHOICE LIST TO CHOOSE YES OR NO. SELECT THE **INCLUDE NONE CHOICE** CHECK BOX TO INCLUDE -- *NONE* -- AS AN OPTION IN THE CHOICE LIST.
CHOICE	DROPDOWN (FIXED VALUES)	CREATE A CHOICE LIST TO CHOOSE FROM A PREDEFINED LIST OF OPTIONS. SELECT THE **INCLUDE NONE CHOICE** CHECKBOX TO INCLUDE -- *NONE* -- IN THE CHOICE LIST.
CHOICE	DROPDOWN (VALUES FROM A TABLE)	CREATE A CHOICE LIST TO CHOOSE FROM A LIST OF OPTIONS MAPPED TO A FIELD IN A TABLE. SELECT THE **INCLUDE NONE CHOICE** CHECKBOX TO INCLUDE -- *NONE* -- IN THE CHOICE LIST.
CHOICE	RECORD REFERENCE	CREATE A CHOICE LIST TO CHOOSE FROM A LIST OF REFERENCES TO RECORDS IN ANOTHER TABLE.
CHOICE	RADIO	CREATE RADIO BUTTONS TO CHOOSE FROM A LIST OF QUESTION CHOICES. CHOOSE **DOWN** OR **ACROSS** TO CONFIGURE THE DIRECTION IN WHICH THE CHOICES WILL DISPLAY. SELECT THE **INCLUDE NONE CHOICE** CHECKBOX TO INCLUDE -- *NONE* -- IN THE CHOICE LIST. SELECT THE **DO NOT SELECT FIRST CHOICE** CHECKBOX TO EXCLUDE THE FIRST CHOICE FROM THE LIST.
CHOICE	MULTI-SELECT	CREATE A CHOICE LIST TO SELECT AND ADD MULTIPLE RECORDS FROM A TABLE TO A FIELD.
DATE / TIME	DATE	CREATE A WIDGET WITH A FIELD AND CALENDAR TO CHOOSE A DATE.

QUESTION TYPE	QUESTION SUBTYPE	DESCRIPTION
DATE / TIME	DATE & TIME	CREATE A WIDGET WITH A CALENDAR AND FIELDS TO SELECT A DATE AND TIME.
DISPLAY LABEL	PLAIN TEXT	CREATE A LABEL TO DISPLAY IMPORTANT INFORMATION ON THE CATALOG ITEM FORM.
DISPLAY LABEL	RICH TEXT	CREATE A LABEL WITH DETAILS THAT USERS NEED TO ANSWER A QUESTION.

CONFIGURING SETTINGS AND ACCESS

USE THE *SETTINGS* STEP IN THE CATALOG EDITOR TO CONFIGURE A CATALOG ITEM'S SETTINGS IN SERVICE PORTAL. GRANT ACCESS TO CATALOG ITEMS IN SERVICE PORTAL USING THE *ACCESS* STEP.

ADJUST THE *PORTAL SETTINGS* TO CUSTOMIZE THE CHECKOUT AREA OF A CATALOG ITEM.

- **HIDE 'ADD TO WISHLIST' BUTTON**: SELECT TO HIDE THE *ADD TO WISH LIST* BUTTON ON THE CATALOG ITEM.
- **HIDE ATTACHMENT BUTTON**: SELECT TO HIDE THE *ADD ATTACHMENTS* BUTTON ON THE CATALOG ITEM.
- **MAKE ATTACHMENT MANDATORY**: SELECT TO MAKE ADDING AN ATTACHMENT MANDATORY FOR A CATALOG ITEM.

FULFILLMENT

WHEN A USER ORDERS A CATALOG ITEM, A REQUEST IS CREATED THAT FOLLOWS A FULFILLMENT PROCESS. A FULFILLMENT PROCESS DEFINES THE STEPS TO REQUEST APPROVAL, ASSIGN FULFILLMENT TASKS, AND FULFILL REQUESTS. USE THE *FULFILLMENT* STEP IN THE CATALOG EDITOR TO CONFIGURE WHICH PROCESS TO USE TO COMPLETE THE SERVICE CATALOG REQUEST.

SUBMITTING A RECORD PRODUCER

WHEN CONFIGURING A RECORD PRODUCER, *REVIEW AND SUBMIT* IS THE FINAL *CATALOG EDITOR STEP* TO COMPLETE. IN THE *REVIEW AND SUBMIT* STEP, ENSURE THE INFORMATION IN EACH *CATALOG EDITOR STEP* IS CORRECT THEN SUBMIT THE RECORD PRODUCER.

IN THE *REVIEW AND SUBMIT* STEP, REVIEW THE RECORD PRODUCER CONFIGURATION.

USE THE **PREVIEW** BUTTON TO VERIFY THE CONFIGURATION OF THE CATALOG ITEM BEFORE SUBMITTING.

RETURN TO THE *REVIEW AND SUBMIT* STEP AND CLICK THE **SUBMIT** BUTTON.

IMPORTING DATA

DATA SOURCES

DATA SOURCES DEFINE WHAT DATA SHOULD BE IMPORTED. ONLY ADMIN USERS CAN CREATE DATA SOURCES. IN THIS MODULE, THE DATA SOURCE IS A MICROSOFT EXCEL SPREADSHEET. OTHER POSSIBLE DATA SOURCES ARE:

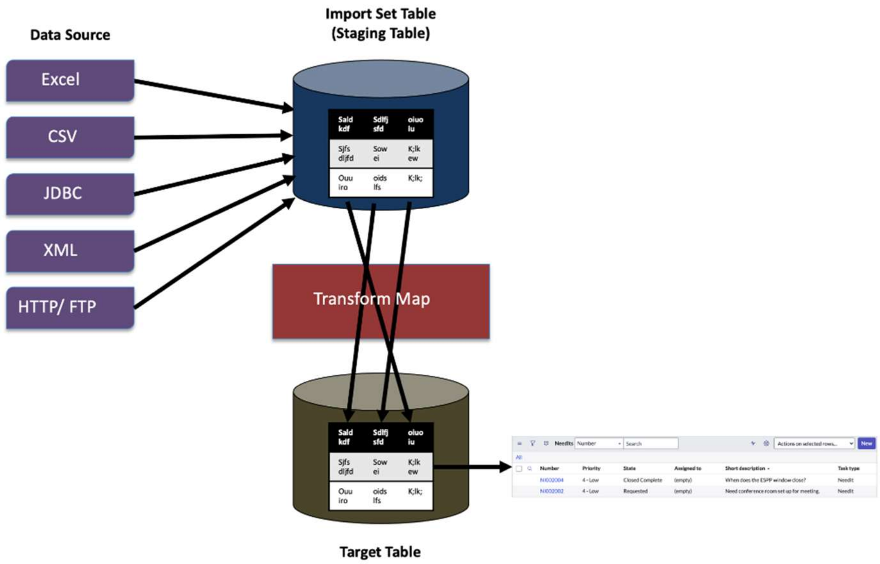
- CSV
- JDBC
- FTP
- HTTP
- XML

DATA SOURCE CONFIGURATION FIELDS VARY DEPENDING ON DATA SOURCE TYPE. TO CONNECT TO THE MYSQL DATABASE WITH JDBC REQUIRES THE *DATABASE NAME*, *USERNAME*, *PASSWORD*, *SERVER*, *DATABASE PORT*, *QUERY*, AND *TABLE NAME*. IF THE *QUERY* FIELD VALUE IS A SQL STATEMENT, A SQL FIELD IS DISPLAYED AND A VALID SQL STATEMENT MUST BE PROVIDED.

DATA IS NOT IMPORTED DIRECTLY FROM A DATA SOURCE INTO THE TARGET TABLE. THE STEPS ARE:

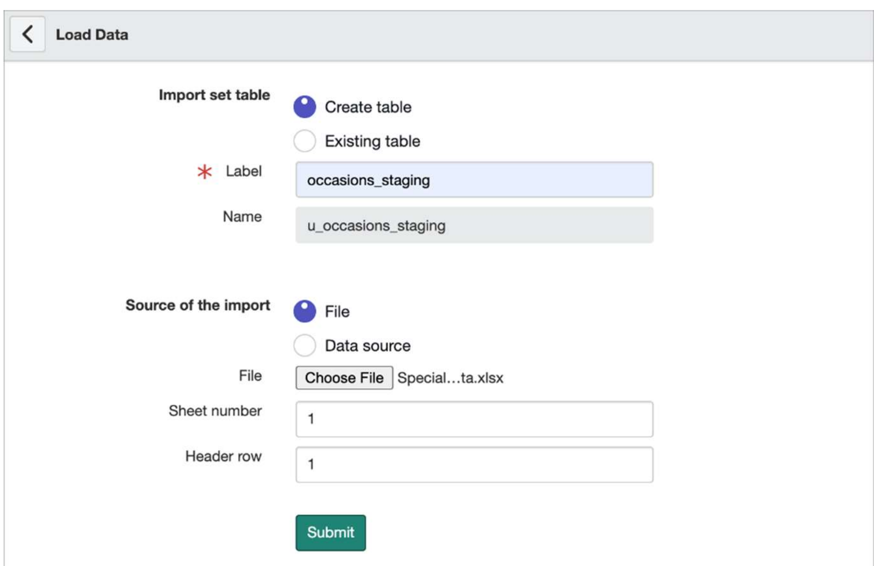
1. LOAD DATA INTO A STAGING TABLE
2. CREATE A TRANSFORM MAP
3. RUN A TRANSFORM TO MOVE DATA FROM THE STAGING TABLE TO THE TARGET TABLE
4. CHECK THE DATA INTEGRITY

USE STUDIO TO CREATE DATA SOURCES AND TRANSFORM MAPS. ALL OTHER DATA IMPORT OPERATIONS ARE DONE IN THE MAIN SERVICENOW BROWSER WINDOW AND ARE NOT CAPTURED AS PART OF A SCOPED APPLICATION.



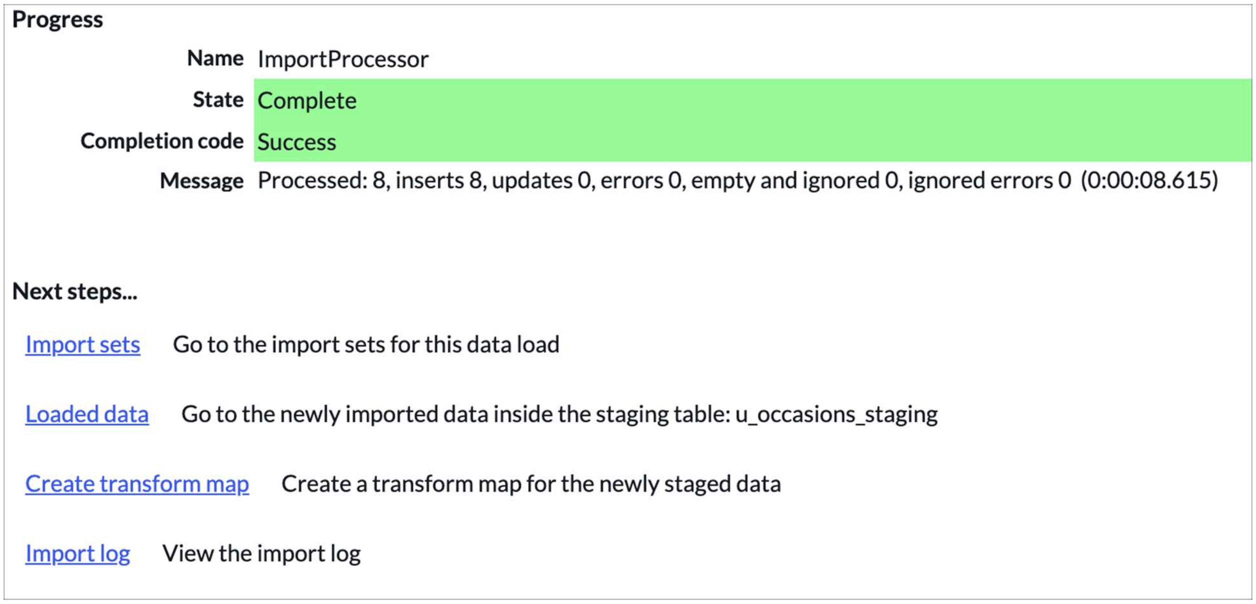
LOAD DATA

TO LOAD DATA FROM A DATA SOURCE INTO A STAGING TABLE, USE THE *ALL* MENU TO OPEN **SYSTEM IMPORT SETS > LOAD DATA**. THE CONFIGURATION OPTIONS VARY DEPENDING ON THE DATA SOURCE. IN THE EXAMPLE, THE DATA SOURCE IS AN EXCEL FILE. THE STAGING TABLE, *U_OCCASIONS_STAGING*, IS CREATED DYNAMICALLY.



CLICK THE **SUBMIT** BUTTON TO LOAD THE DATA FROM THE EXCEL FILE INTO THE STAGING TABLE.

AFTER THE RECORDS ARE IMPORTED INTO THE STAGING TABLE, A *PROGRESS* PAGE APPEARS.

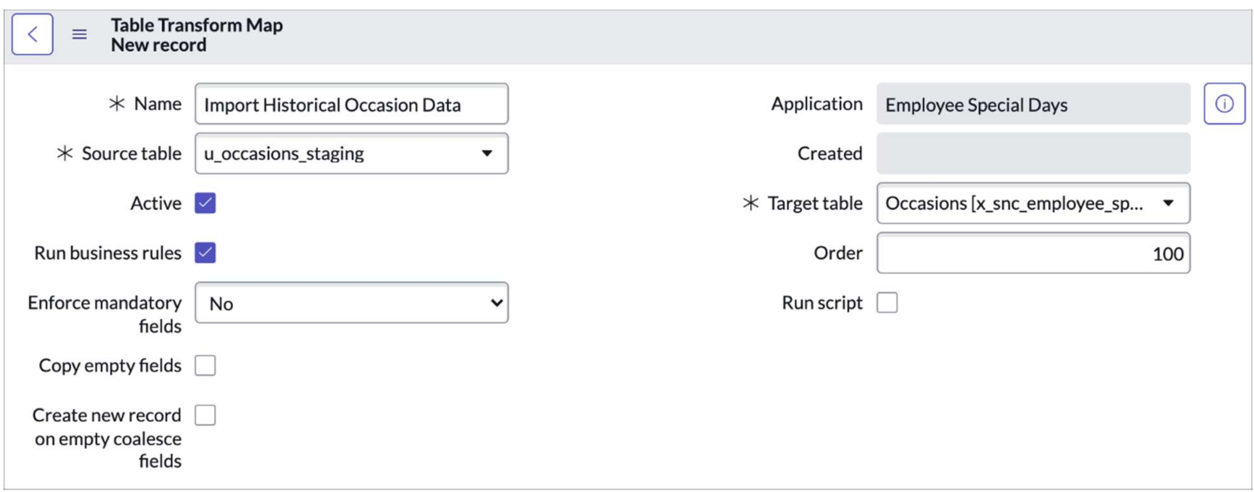


ONCE DATA IS LOADED, CLICK THE **CREATE TRANSFORM MAP** LINK IN THE *NEXT STEPS...* SECTION TO MAP DATA FROM THE STAGING TABLE TO THE TARGET TABLE.

CREATE A TRANSFORM MAP

A TRANSFORM MAP MATCHES THE COLUMNS FROM THE STAGING TABLE TO THE COLUMNS IN THE TARGET TABLE. EVERY IMPORT OPERATION REQUIRES AT LEAST ONE TRANSFORM.

CONFIGURE THE TABLE TRANSFORM MAP:



- ***NAME***: ENTER A USER-FRIENDLY LABEL FOR IDENTIFYING THE TRANSFORM MAP.
- ***SOURCE TABLE***: SELECT THE IMPORT TABLE CONTAINING THE RAW IMPORT SET DATA. YOU CAN SELECT ONLY TABLES WITHIN THE CURRENTLY SELECTED APPLICATION SCOPE.
- ***ACTIVE***: SELECT TO MAKE THE TRANSFORM MAP AVAILABLE FOR USE.

- ***RUN BUSINESS RULES***: SELECT TO RUN BUSINESS RULES, WORKFLOWS, APPROVAL ENGINES, AUDITING, AND FIELD NORMALIZATION WHILE THE TRANSFORMATION INSERTS OR UPDATES DATA INTO THE TARGET TABLE.

- ***ENFORCE MANDATORY FIELDS***: CHOOSE WHETHER TO ENFORCE MANDATORY FIELDS ON THE TARGET TABLE.

- ***COPY EMPTY FIELDS***: SELECT TO CLEAR FIELDS WITH EXISTING VALUES WHEN AN INCOMING FIELD CONTAINS AN EMPTY VALUE.

- ***CREATE NEW RECORD ON EMPTY COALESCE FIELDS***: SELECT TO CREATE A RECORD WHEN ALL COALESCE FIELDS ARE EMPTY, INSTEAD OF IGNORING THE RECORD OR OVERWRITING AN EXISTING RECORD.

- ***APPLICATION***: APPLICATION THE TRANSFORM MAP IS PART OF.

- ***CREATED***: SHOWS THE TRANSFORM MAP CREATION DATE. THIS FIELD IS AUTOMATICALLY POPULATED.

- ***TARGET TABLE***: SELECT THE TABLE WHERE YOU WANT TRANSFORMED DATA TO BE PLACED. YOU CAN SELECT ONLY TABLES WITHIN THE CURRENTLY SELECTED APPLICATION SCOPE, THE GLOBAL SCOPE, OR TABLES THAT GRANT WRITE ACCESS TO OTHER APPLICATIONS.

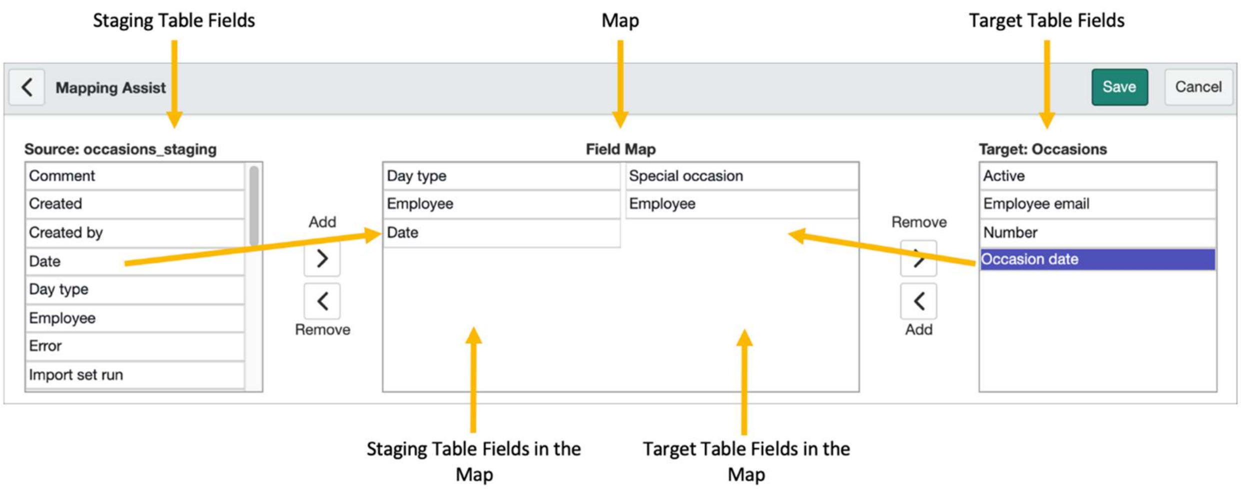
- ***ORDER***: ENTER THE ORDER IN WHICH TO APPLY TRANSFORM MAPS IN THE EVENT THAT MORE THAN ONE MAP FITS THE CONDITIONS. RUNS TRANSFORM MAPS FROM LOWEST TO HIGHEST ORDER.

- ***RUN SCRIPT***: SELECT TO DISPLAY THE *SCRIPT* FIELD.

- ***SCRIPT***:   ENTER THE TRANSFORM MAP SCRIPT YOU WANT TO USE TO TRANSFORM FIELD VALUES IN THE SOURCE TABLE TO THE TARGET TABLE. SERVICENOW RUNS THE TRANSFORM MAP SCRIPT IN ADDITION TO ANY FIELD MAPS.

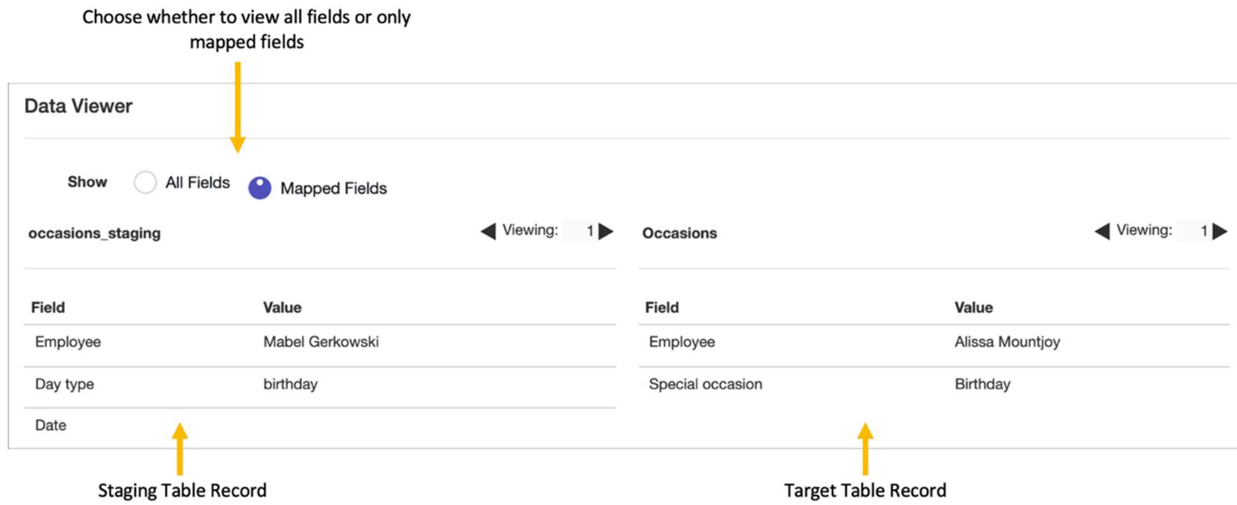
CLICK THE **AUTO MAP MATCHING FIELDS** RELATED LINK FOR SERVICENOW TO ATTEMPT TO MATCH THE STAGING TABLE COLUMNS TO THE TARGET TABLE COLUMNS BASED ON COLUMN NAME. THE AUTO MAPPED FIELDS APPEAR IN THE *FIELD MAPS* SECTION (TAB).

IT IS NOT ALWAYS POSSIBLE TO AUTOMATICALLY MAP FIELDS FROM THE STAGING TABLE TO THE TARGET TABLE. TO MANUALLY MAP FIELDS, CLICK THE **MAPPING ASSIST** RELATED LINK.



ADD FIELDS FROM THE STAGING TABLE TO THE MAP AND PAIR THEM WITH FIELDS FROM THE TARGET TABLE. TO ADD OR REMOVE FIELDS FROM THE MAP, CLICK THE FIELD TO HIGHLIGHT IT THEN CLICK EITHER THE **ADD** OR **REMOVE** BUTTON. MOVE FIELDS AROUND IN THE MAP BY CLICKING, HOLDING, AND DRAGGING.

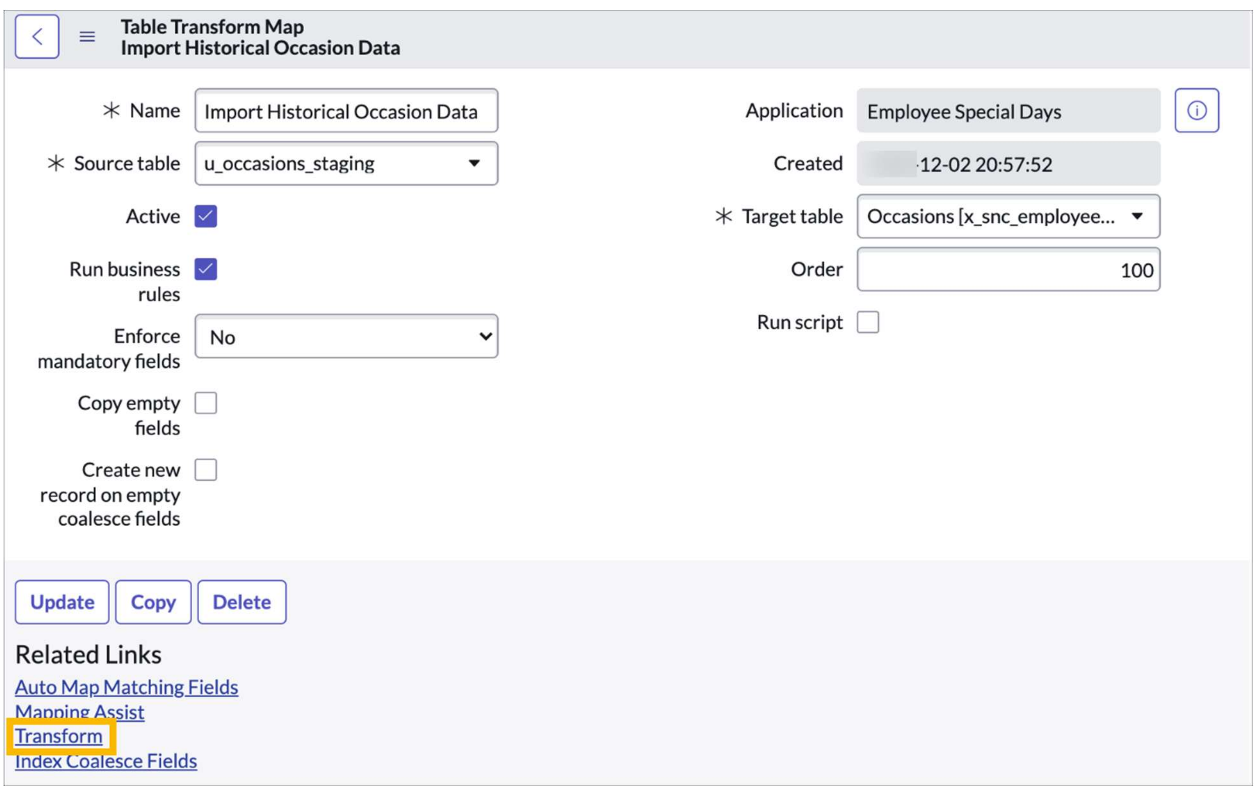
SCROLL TO THE *DATA VIEWER* SECTION TO SEE WHAT A RECORD FROM THE STAGING TABLE LOOKS LIKE WHEN THE MAP IS APPLIED. COMPARE THE MAPPED STAGING TABLE RECORD TO A RECORD FROM THE TARGET TABLE TO SEE IF THE FIELD VALUES AND FORMATTING LOOK CORRECT.



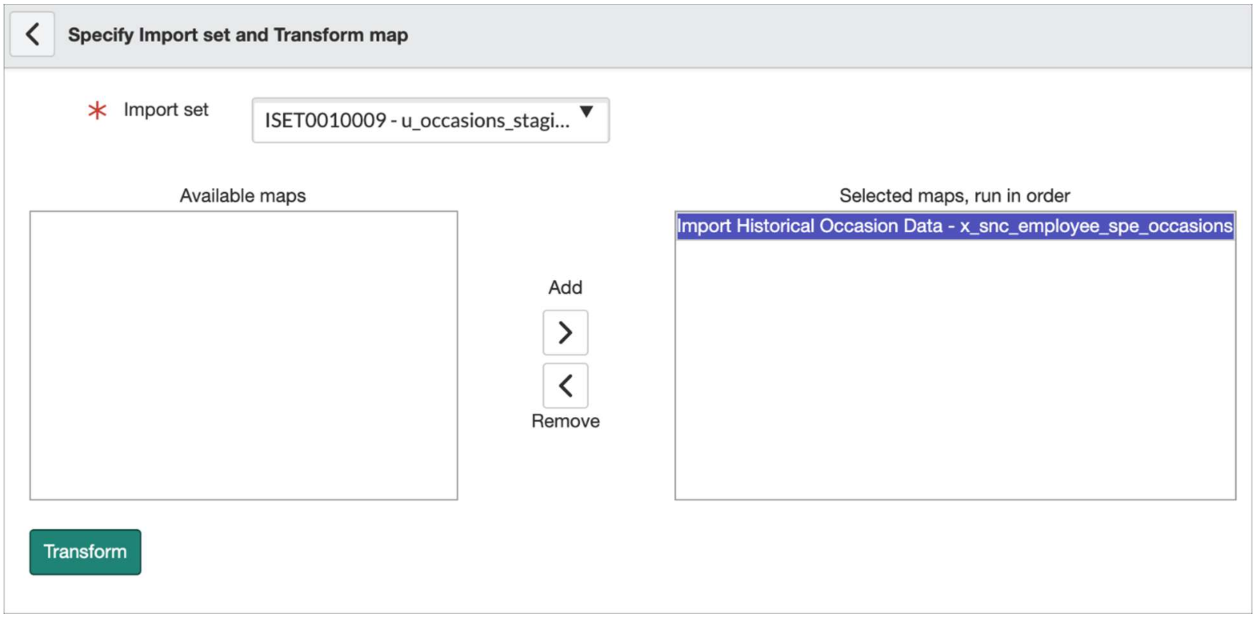
NOT ALL FIELDS HAVE TO BE MAPPED. THERE MAY BE FIELDS IN THE SOURCE DATA THAT YOU DO NOT WANT TO IMPORT TO THE TARGET TABLE. IN THE EXAMPLE, THE *DATE* FIELD FROM THE SOURCE DATA IS NOT YET MAPPED.

RUN A TRANSFORM MAP

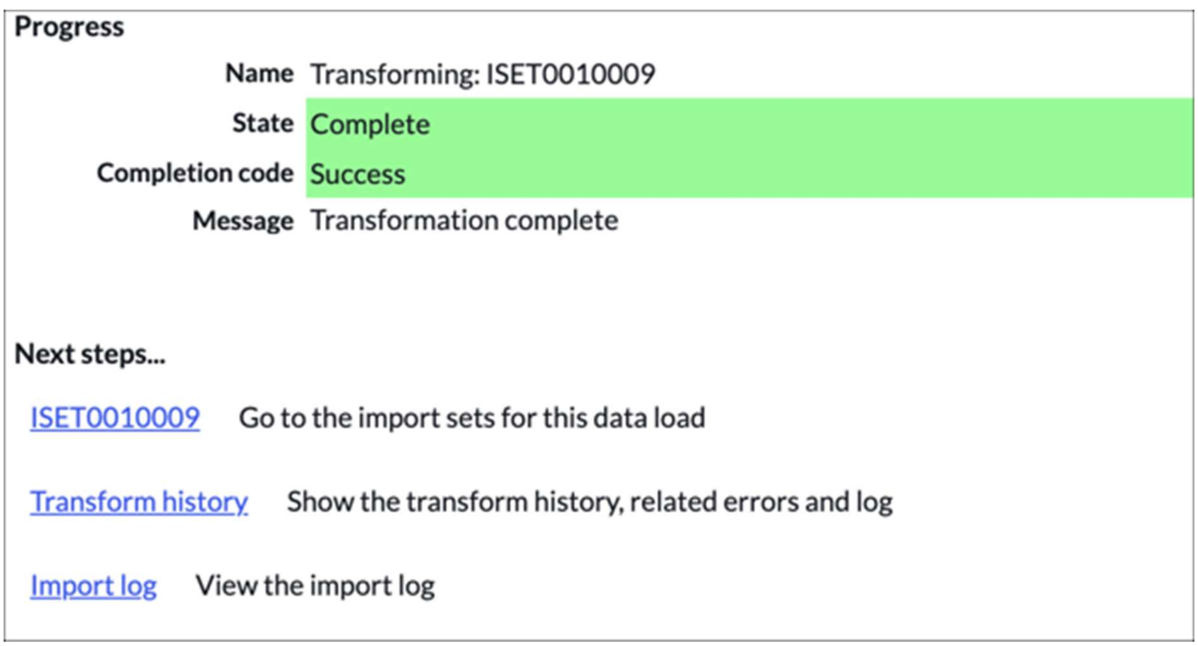
RUNNING A TRANSFORM MAP IMPORTS DATA FROM THE STAGING TABLE INTO THE TARGET TABLE. TO RUN A TRANSFORM MAP, CLICK THE **TRANSFORM** RELATED LINK IN THE *TABLE TRANSFORM MAP* RECORD.



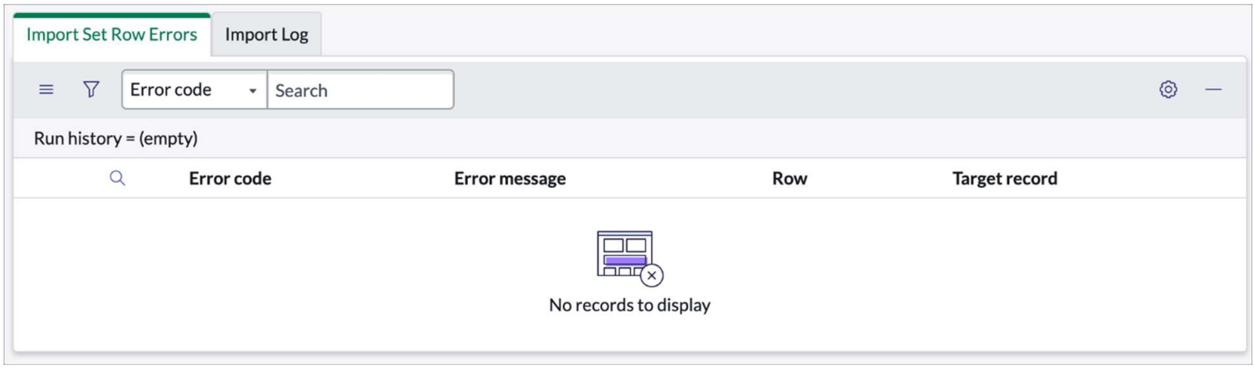
IN THE *SPECIFY IMPORT SET AND TRANSFORM MAP* FORM, VERIFY THAT THE TRANSFORM MAP TO RUN IS IN THE *SELECTED MAPS, RUN IN ORDER* SLUSHBUCKET. CLICK THE **TRANSFORM** BUTTON.



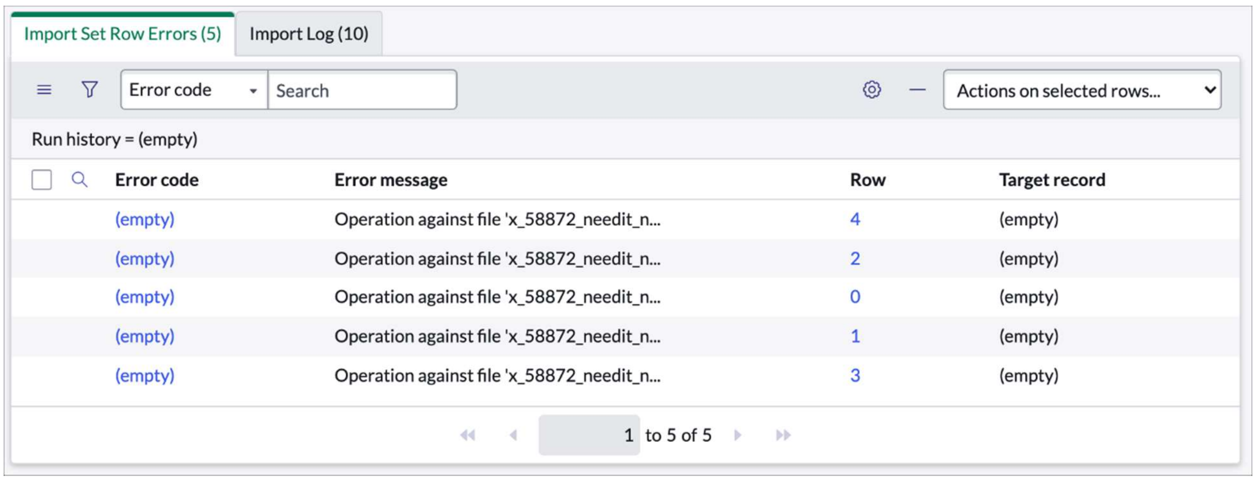
THE *PROGRESS* PAGE SHOWS THE TRANSFORM'S *STATE* AND *COMPLETION CODE*. A *COMPLETION CODE* VALUE OF *SUCCESS* DOES NOT MEAN THE RECORDS IMPORTED CORRECTLY. THE *COMPLETION CODE* INDICATES WHETHER THE TRANSFORM EXECUTED SUCCESSFULLY AND IS NOT INDICATIVE OF THE DATA INTEGRITY OF THE RECORDS.



CLICK THE **TRANSFORM HISTORY** LINK AND SELECT THE **TIMESTAMP** TO SEE IF THERE WERE ANY ERRORS WITH THE DATA. IN THE EXAMPLE, THERE ARE NO ERRORS IN THE *IMPORT SET ROW ERRORS* SECTION (TAB).

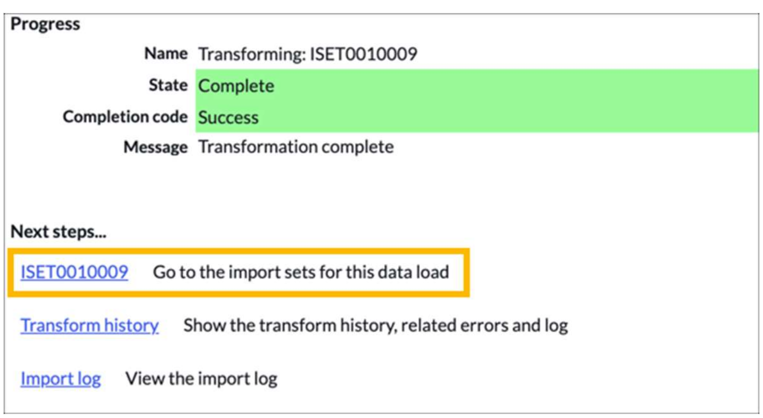


IN THE EXAMPLE, THE TRANSFORM COMPLETED SUCCESSFULLY BUT THE IMPORT HAD ERRORS. NO RECORDS WERE INSERTED.



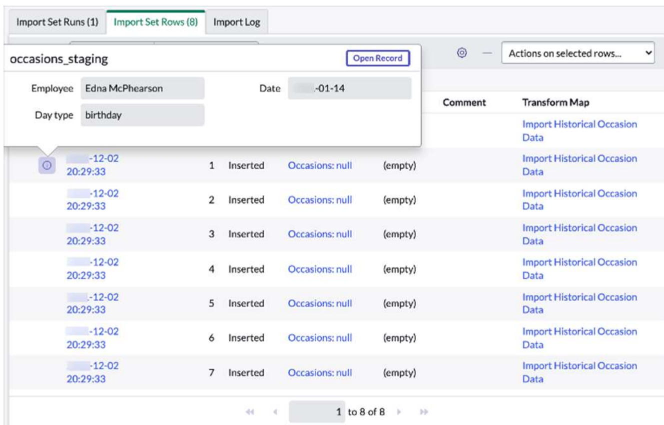
VERIFY THE DATA INTEGRITY

THE LAST STEP IN IMPORTING DATA IS TO VERIFY THE RECORDS CONTAIN THE EXPECTED DATA IN THE EXPECTED FORMAT. THE FIRST PLACE TO LOOK IS THE IMPORT SET. CLICK THE **ISET001XXXX** LINK IN THE *NEXT STEPS...*.

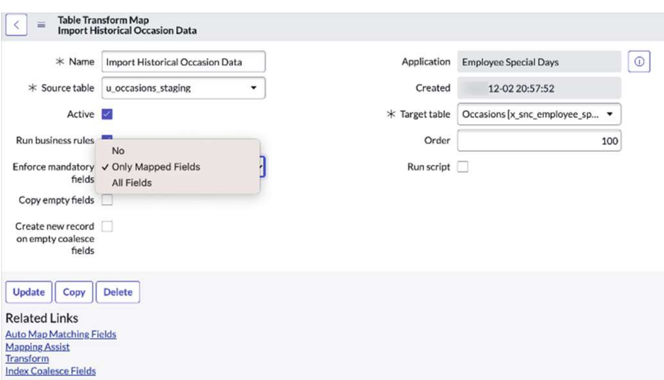


IN THE *IMPORT SET* RECORD, SCROLL TO THE **IMPORT SET RUNS** SECTION (TAB). VERIFY THE EXPECTED NUMBER OF RECORDS WERE INSERTED. IF RECORDS WERE IGNORED OR SKIPPED, RESEARCH IS REQUIRED TO DETERMINE WHY.

SWITCH TO THE **IMPORT SET ROWS** SECTION (TAB). HOVER OVER AN **IMPORT SET ROW**, THEN CLICK THE **PREVIEW** ICON ( ) TO SEE THE IMPORTED DATA. THE *PREVIEW* ICON DOES NOT SHOW THE COMPLETE RECORD; IT SHOWS ONLY THE IMPORTED DATA. CLICK THE **OPEN RECORD** BUTTON TO SEE THE COMPLETE RECORD.

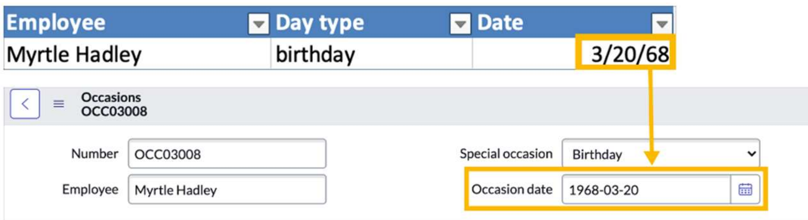


THE IMPORTED *OCCASION* RECORDS HAVE NO DATA IN THE MANDATORY *OCCASION DATE* FIELD. WHEN A USER OPENS THE RECORD IN A FORM, THEY MUST PROVIDE A VALUE FOR THE MANDATORY FIELD BEFORE THEY CAN SAVE THE RECORD. TO REQUIRE VALUES IN MANDATORY FIELDS DURING IMPORTS, SET THE *ENFORCE MANDATORY FIELDS* VALUE TO *ALL FIELDS* OR *ONLY MAPPED FIELDS* WHEN CONFIGURING THE TRANSFORM MAP.



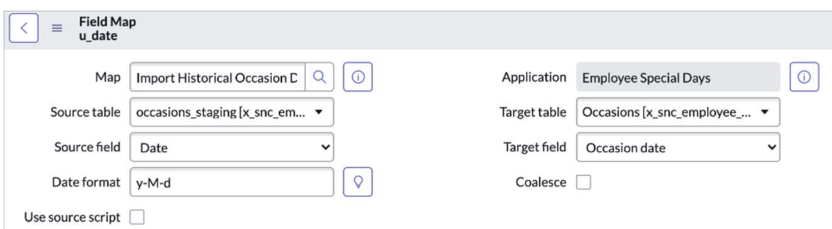
IMPORT A DATE FIELD

FIELDS CONTAINING DATES OFTEN CAUSE ERRORS ON IMPORT DUE TO A MISMATCH IN FORMAT BETWEEN THE DATE FORMAT IN THE DATA SOURCE AND THE DATE FORMAT SERVICENOW EXPECTS.



TO CORRECT THE FORMAT MISMATCH, OPEN THE TRANSFORM MAP FOR EDITING. SCROLL TO THE **FIELD MAPS** RELATED LIST AND CLICK THE **LINK FOR THE DATE FIELD** IN THE *SOURCE FIELD* COLUMN.

USE THE *DATE FORMAT* FIELD TO SPECIFY THE DATE AND TIME FORMAT OF THE FIELD IN THE *STAGING TABLE* DATA. SERVICENOW WILL CONVERT THE DATE TO THE FORMAT THE TARGET FIELD EXPECTS.



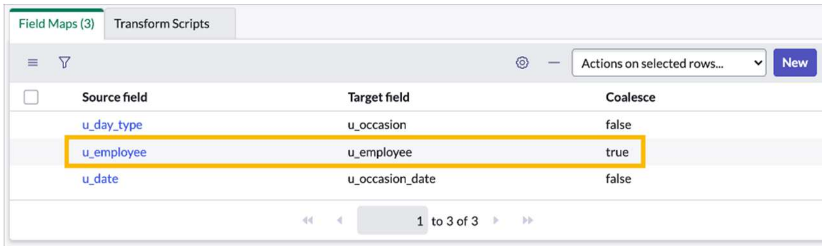
CLICK THE **UPDATE** BUTTON TO SAVE THE FIELD MAP THEN RUN THE DATA TRANSFORM.

COALESCING

BEFORE IMPORTING DATA, PLAN FOR HOW TO HANDLE COLLISIONS BETWEEN THE SOURCE DATA AND THE TARGET TABLE.

- KEEP THE RECORD ALREADY IN THE TARGET TABLE?
- OVERWRITE THE RECORD IN THE TARGET TABLE WITH THE SOURCE DATA?
- CREATE DUPLICATE RECORDS?

USE THE *COALESCE* OPTION IN A TRANSFORM MAP FIELD MAP TO DETERMINE IF A ROW IN THE STAGING TABLE MATCHES A RECORD IN THE TARGET TABLE. THE *COALESCE* OPTION MAKES A FIELD A RECORD'S UNIQUE KEY. SET THE *COALESCE* VALUE TO *TRUE* TO USE A FIELD TO CHECK FOR COLLISIONS.



Field Maps (3) | Transform Scripts

Source field	Target field	Coalesce
u_day_type	u_occasion	false
u_employee	u_employee	true
u_date	u_occasion_date	false

1 to 3 of 3

COALESCE ON ENOUGH FIELDS TO BE ABLE TO UNIQUELY IDENTIFY A RECORD. IN THE EXAMPLE, COALESCING ONLY ON THE *U_EMPLOYEE* FIELD IS NOT SUFFICIENT TO UNIQUELY IDENTIFY RECORDS BECAUSE AN EMPLOYEE COULD HAVE MULTIPLE *OCCASIONS* RECORDS: *BIRTHDAY* AND *WORK ANNIVERSARY*. WHEN COALESCING ON MULTIPLE FIELDS, ALL COALESCE FIELDS MUST BE A MATCH FOR THERE TO BE A COLLISION. MATCHING SOME COALESCE FIELDS BUT NOT ALL DOES NOT PRODUCE A MATCH.

- IF A MATCH IS FOUND USING THE COALESCE FIELDS, THE TARGET RECORD IS UPDATED WITH THE INFORMATION IMPORTED FROM THE STAGING TABLE.
- IF NO MATCH IS FOUND, A NEW RECORD IS INSERTED IN THE DATABASE.
- IF NO FIELDS ARE COALESCE FIELDS, RECORDS ARE ALWAYS INSERTED ON IMPORT.

DATA VISUALIZATION

DATA VISUALIZATION OPTIONS IN SERVICENOW

VISUALIZATIONS CONVEY COMPLEX DATA, WHICH CAN BE DIFFICULT TO DESCRIBE IN WORDS USING A CHART OR GRAPH. APPLICATION DEVELOPERS VISUALIZE DATA TO TRANSFORM RECORDS INTO MEANINGFUL INFORMATION FOR THE APPLICATION'S USERS. THE INFORMATION SHOULD DRIVE ACTIONS.

THE NOW PLATFORM'S VISUALIZATIONS ARE:

- REAL TIME: ALWAYS SHOW CURRENT INFORMATION
- SECURE: USERS CAN ONLY SEE DATA THEY ARE AUTHORIZED TO SEE
- NATIVE: EASILY USED THROUGHOUT THE NOW PLATFORM

DATA VISUALIZATIONS ALLOW DEVELOPERS TO PRESENT DATA TO USERS IN EASILY CONSUMABLE WAYS. THE FORMATS ARE:

- **REPORTS**: VISUALIZATION OF DATA FOR ANALYSIS
- **ON-DEMAND BAR AND PIE CHARTS CREATED FROM LISTS**: USERS CREATE CHARTS FOR ANY COLUMN ON A LIST
- **% COMPLETE INDICATORS IN LISTS**: BAR INDICATES HOW CLOSE A RECORD IS TO COMPLETION
- **CHART DATA TYPE FOR FORMS**: INSERTS A REPORT INTO A FORM

- **DASHBOARDS**: COLLECTION OF WIDGETS CONSISTING OF REPORTS AND ANALYTICS

REPORTS

REPORTS ORGANIZE, SUMMARIZE, AND PRESENT DATA TO CONVEY INFORMATION IN A MEANINGFUL WAY. DEVELOPERS CREATE REPORTS FOR APPLICATIONS FOR MANY REASONS, INCLUDING:

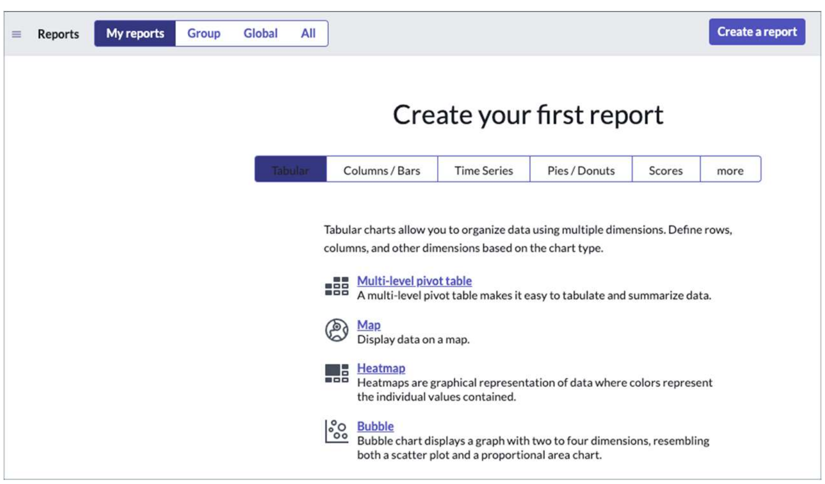
- IDENTIFYING TRENDS
- MONITORING FIELD VALUES
- LOOKING FOR OUTLYING DATA
- TRACKING WORK
- VIEWING PROGRESS

THE GOAL OF A REPORT IS TO CONVEY MEANINGFUL INFORMATION TO THE REPORT CONSUMER. SELECT A REPORT TYPE WHICH CONVEYS THE REQUIRED INFORMATION IN AN ACTIONABLE WAY. FOR EXAMPLE, IF THE GOAL IS TO IDENTIFY A TREND OVER TIME, A PIE CHART IS PROBABLY NOT THE BEST CHOICE. IF THE GOAL IS TO IDENTIFY THE CURRENT STATE, A PIE CHART MIGHT BE THE PERFECT CHOICE.

<u>IN THE LATEST VERISON UNDER ALL IN THE SERVICE NOW BROWSER TYPE DATA VISUALIZATION IN THE ALL TAB</u>

VIEW/RUN REPORTS

TO VIEW OR RUN A REPORT, USE THE *ALL* MENU TO OPEN **REPORTS > VIEW / RUN**. IF A USER IS AUTHORIZED TO CREATE REPORTS AND HAS NOT CREATED A REPORT, THE *MY REPORTS* TAB PROMPTS THE USER TO CREATE A REPORT.



THE *GROUP*, *GLOBAL*, AND *ALL* TABS CONTAIN A LIST OF REPORTS THE LOGGED IN USER IS AUTHORIZED TO VIEW AND RUN. USERS WITH THE CORRECT ROLES CAN ALSO CREATE AND EDIT REPORTS.

USE THE FILTERS TO SEE A SUBSET OF THE REPORTS:

- ***MY REPORTS***: REPORTS CREATED BY THE CURRENTLY LOGGED IN USER.
- ***GROUP***: REPORTS SHARED WITH A GROUP THAT INCLUDES THE CURRENTLY LOGGED IN USER.
- ***GLOBAL***: REPORTS THAT ARE AVAILABLE TO ALL USERS.
- ***ALL***: ALL REPORTS THE CURRENTLY LOGGED IN USER IS AUTHORIZED TO VIEW (*MY REPORTS + GROUP + GLOBAL*).

TO VIEW OR EDIT A REPORT, CLICK THE REPORT **TITLE** IN THE LIST. TO CREATE A REPORT, CLICK THE **CREATE A REPORT** BUTTON.

REPORT DESIGNER

REPORT DESIGNER IS SERVICENOW'S USER INTERFACE FOR CREATING AND EDITING REPORTS. USERS WITH A *REPORT* OR *ADMIN* ROLE CAN EDIT AND SAVE REPORTS. THE REPORT ROLES ARE:

- *REPORT_ADMIN*: MANAGE REPORTS
- *REPORT_ALIAS_ADMIN*: MAINTAIN FIELD AND VALUE ALIASES
- *REPORT_GLOBAL*: CREATE GLOBAL REPORTS
- *REPORT_GROUP*: CREATE REPORTS BELONGING TO A GROUP THE USER IS A MEMBER OF
- *REPORT_PUBLISHER*: MAKE REPORTS AVAILABLE ON A PUBLIC PAGE
- *REPORT_SCHEDULER*: SCHEDULE REPORTS TO BE DELIVERED BY EMAIL
- *REPORT_USER*: CREATE REPORTS AND VIEW REPORTS SHARED WITH THE USER

IN ADDITION TO REPORT ROLES, DEVELOPERS MUST HAVE THE RIGHT PERMISSIONS TO ACCESS THE DATA FOR THEIR REPORTS.

REPORT DESIGNER HAS FOUR TABS:

- *DATA*: DATA SOURCE FOR THE REPORT
- *TYPE*: VISUALIZATION OF THE REPORT SUCH AS BAR, PIE, OR HISTOGRAM
- *CONFIGURE*: REPORT CONFIGURATION BASED ON REPORT TYPE
- *STYLE*: REPORT APPEARANCE

CONFIGURING REPORTS

USE THE *DATA* TAB TO CONFIGURE THE REPORT NAME AND WHERE THE DATA COMES FROM.

- *REPORT NAME*: SPECIFY THE TITLE OF THE REPORT.
- *SOURCE TYPE*: CHOOSE *TABLE* OR *DATA SOURCE*. IF THE METRICBASE PLUGIN IS ENABLED, THERE IS A *METRICBASE* CHOICE.
- *TABLE*: IF THE *SOURCE TYPE* IS *TABLE* OR *METRICBASE*, SELECT THE TABLE FOR THE REPORT. ALL RECORDS FROM THE TABLE ARE INCLUDED.
- *DATA SOURCE*: IF THE *SOURCE TYPE* IS *DATA SOURCE*, SELECT THE SOURCE FOR THE DATA.

DATA SOURCES ARE FILTERED SETS OF TABLE DATA. TO CREATE DATA SOURCES, USE THE *ALL* MENU TO OPEN REPORTS > ADMINISTRATION > REPORT SOURCES.

WHEN A DATA SOURCE IS SELECTED IN THE *DATA* TAB, THE FILTER CONDITIONS ARE DISPLAYED IN BOTH THE *DATA* TAB AND THE REPORT

RUNNING AND SAVING

AFTER CONFIGURING A REPORT, CLICK THE RUN BUTTON TO RUN THE REPORT WITHOUT SAVING THE CHANGES. TO RUN THE REPORT AND SAVE THE CHANGES, CLICK THE SAVE BUTTON.

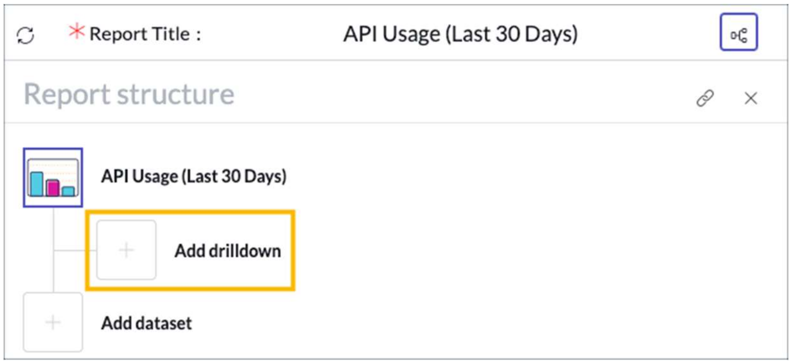
DRILLDOWNS

DRILLING DOWN MEANS CLICKING A REPORT SECTION TO SEE A SUBSET OF THE REPORT'S DATA IN A NEW REPORT. DRILLDOWN REPORTS CAN BE A DIFFERENT REPORT TYPE THAN THEIR PARENT, BUT MUST BE FOR THE SAME TABLE OR DATA SOURCE. THE LAST LEVEL IN A DRILLDOWN IS ALWAYS A LIST REPORT. ALL REPORT TYPES EXCEPT LIST, HISTOGRAM, CALENDAR, CONTROL, BOX, AND TRENDBOX SUPPORT DRILLING DOWN. DRILLING DOWN IS NOT AVAILABLE ON REPORTS ADDED TO FORMS, OR REPORTS EMBEDDED AS IFRAMES. DEFINE AS MANY DRILLDOWNS AS NEEDED.

CREATING DRILLDOWNS

TO ADD A DRILLDOWN TO A REPORT, CLICK THE SHOW REPORT STRUCTURE ICON IN THE REPORT HEADER.

CLICK THE ADD DRILLDOWN BUTTON.



CONFIGURE THE DRILLDOWN REPORT USING THE *DATA*, *TYPE*, *CONFIGURE*, AND *STYLE* TABS. CLICK THE SAVE DRILLDOWN BUTTON WHEN CONFIGURATION IS COMPLETE. TO TEST THE REPORT WITHOUT SAVING, CLICK THE RUN BUTTON.

SHARING REPORTS

SHARING REPORTS PREVENTS MULTIPLE USERS FROM CREATING THE SAME REPORT AND PROVIDES IMPORTANT INFORMATION TO APPLICATION USERS.

TO SPECIFY WHO CAN SEE REPORTS, CONFIGURE THE REPORT IN REPORT DESIGNER, THEN CONFIGURE SHARING. TO CONFIGURE SHARING, CLICK THE SHARE BUTTON ON *CONFIGURE* TAB, OR CLICK THE *SHARE* BUTTON IN THE REPORT HEADER.

THE REPORT VISIBILITY OPTIONS ARE:

- *ME*
- *EVERYONE*
- *GROUPS AND USERS*

REPORT DEVELOPERS WITH THE CORRECT ROLES CAN SELECT THE EVERYONE OPTION TO SHARE A REPORT WITH:

- ALL LOGGED IN SERVICENOW USERS
- ALL USERS WITH A SPECIFIC ROLE

LEAVE THE REQUIRES ROLE FIELD EMPTY TO SHARE THE REPORT WITH ALL SERVICENOW USERS. TO ENABLE VISIBILITY BASED ON ROLE, USE THE SEARCH FIELD TO ADD ROLES TO THE REQUIRES ROLE LIST.

REPORT DEVELOPERS WITH THE *REPORT_GLOBAL* ROLE CAN SET THE VISIBILITY TO *EVERYONE* BUT CANNOT REQUIRE THE USER TO HAVE A SPECIFIED ROLE. REPORT DEVELOPERS WITH THE *REPORT_ADMIN* ROLE CAN SET THE *EVERYONE* VISIBILITY INCLUDING REQUIRING THE USERS TO HAVE A SPECIFIED ROLE.

REPORT DEVELOPERS WITH THE CORRECT ROLES CAN SELECT THE *GROUPS AND USERS* VISIBILITY OPTION TO SHARE A REPORT WITH:

- MEMBERS OF A SPECIFIED GROUP

- INDIVIDUAL USERS

TO ENABLE VISIBILITY BASED ON GROUP MEMBERSHIP, SELECT THE GROUPS TAB AND USE THE SEARCH FIELD TO ADD GROUPS TO THE GROUPS LIST.

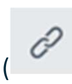
TO ENABLE VISIBILITY FOR SELECTED USERS, SWITCH TO THE USERS TAB AND USE THE SEARCH FIELD TO ADD SELECT USERS TO THE USERS LIST.

REPORT DEVELOPERS WITH THE REPORT_ADMIN OR REPORT_GROUP ROLES CAN SELECT THE GROUPS AND USERS SHARING OPTION.

PUBLISHING REPORTS

PUBLISHED REPORTS ARE VIEWABLE BY ACCESSING A URL INSTEAD OF USING THE **REPORTS > VIEW / RUN** MODULE.

TO PUBLISH A REPORT, CONFIGURE THE REPORT IN REPORT DESIGNER. ON THE *STYLE* CONFIGURATION TAB, CLICK THE **SHARE** BUTTON OR CLICK THE **SHARE** ICON () IN THE REPORT DESIGNER HEADER. IN THE *SHARING* PANE, SELECT THE **PUBLISH** MENU ITEM.

AFTER PUBLICATION, CLICK THE **LINK** ICON () TO COPY THE REPORT URL TO THE CLIPBOARD. THE *LINK* ICON IS ONLY AVAILABLE FOR PUBLISHED REPORTS.

ANYONE WITH THE LINK CAN VIEW THE REPORT UNLESS ACCESS IS RESTRICTED BY BUSINESS RULE. WHEN A VISUALIZATION IS A LIST OF RECORDS, USERS MUST AUTHENTICATE TO SEE THE RECORDS. ACCESS CONTROLS DETERMINE IF A USER CAN SEE THE RECORDS.

TO DISABLE A REPORT LINK, OPEN THE *SHARING* PANE AND SELECT THE **UNPUBLISH** MENU ITEM.

REPORT PDFS

REPORT PDFS CAN BE GENERATED FOR DOWNLOAD OR FOR DISTRIBUTION BY EMAIL. TO GENERATE A REPORT PDF, CONFIGURE THE REPORT IN REPORT DESIGNER. ON THE *STYLE* CONFIGURATION TAB, CLICK THE **SHARE** BUTTON OR CLICK THE **SHARE** ICON () IN THE REPORT DESIGNER HEADER. IN THE *SHARING* PANE, SELECT THE **EXPORT TO PDF** MENU ITEM.

IN THE *EXPORT TO PDF* DIALOG, SELECT AN ORIENTATION FOR THE PDF:

- *PORTRAIT*
- *LANDSCAPE*

TO CREATE A DOWNLOADABLE PDF, SELECT THE **GENERATE NOW** DELIVERY OPTION THEN CLICK THE **EXPORT** BUTTON. TO DOWNLOAD THE REPORT PDF, CLICK THE **DOWNLOAD** BUTTON IN THE *EXPORT COMPLETE* DIALOG.

THE FILE NAME FOR THE REPORT PDF IS *SYS_REPORT.PDF*. WHEN DOWNLOADING MULTIPLE REPORTS, THE FILE NAME WILL BE *<REPORT_NAME>_<DATE_PDF_CREATED>_<TIME_PDF_CREATED>.PDF*.

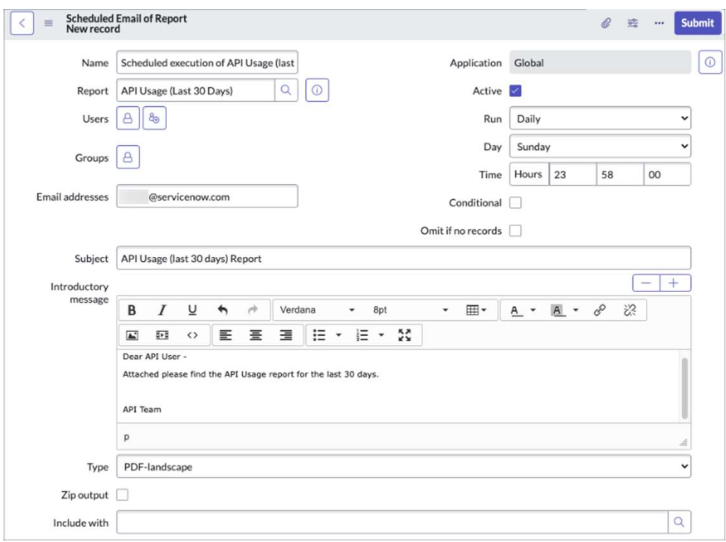
TO SEND THE REPORT PDF BY EMAIL, SELECT THE **SEND AS AN EMAIL** DELIVERY OPTION. ENTER THE RECIPIENT EMAIL ADDRESS IN THE EMAIL ADDRESS FIELD, THEN CLICK THE **EXPORT** BUTTON. IN THE CONFIRMATION DIALOG, CLICK THE **OK** BUTTON TO SEND THE REPORT PDF.

SCHEDULED REPORTS

SCHEDULED REPORTS ARE AUTOMATICALLY RUN AT A PRE-DEFINED FREQUENCY AND EMAILED AS FILES TO A LIST OF RECIPIENTS. SCHEDULED REPORT FORMATS ARE CSV, XLS, PNG, AND PDF.

IN THE MAIN SERVICENOW BROWSER WINDOW, USE THE *ALL* MENU TO OPEN **REPORTS > SCHEDULED REPORTS**. CLICK THE **NEW** BUTTON TO CREATE A SCHEDULE.

CONFIGURE THE SCHEDULED REPORT.



- ***NAME***: DESCRIPTIVE NAME OF SCHEDULE.
- ***REPORT***: SELECT A REPORT TO SCHEDULE FROM THE CHOICE LIST.
- ***USERS***: SERVICENOW USERS WHO RECEIVE THE NOTIFICATION.
- ***GROUPS***: SERVICENOW GROUPS THAT RECEIVE THE NOTIFICATION.
- ***EMAIL ADDRESSES***: COMMA-SEPARATED LIST OF RECIPIENTS' EMAIL ADDRESSES.
- ***ACTIVE***: ENABLE/DISABLE THE SCHEDULE.

- ***RUN***: THE FREQUENCY TO RUN THE REPORT AND SEND NOTIFICATIONS: DAILY, WEEKLY, MONTHLY, PERIODICALLY, ONCE, ON DEMAND, BUSINESS CALENDAR: ENTRY START, AND BUSINESS CALENDAR: ENTRY END.
- ***TIME/DAY/HOURS/REPEAT INTERVAL/STARTING/BUSINESS CALENDAR/OFFSET TYPE***: THESE FIELDS ARE AVAILABLE ON THE FORM ONLY FOR CERTAIN RUN VALUES AND ARE USED TO SPECIFY WHEN TO RUN THE SCHEDULE. TIME VALUES ARE SPECIFIED USING A 24-HOUR CLOCK.
- ***CONDITIONAL***: SERVER-SIDE SCRIPT TO DETERMINE WHETHER TO RUN AND EMAIL THE NOTIFICATION.
- ***OMIT IF NO RECORDS***: DO NOT SEND THE REPORT IF THERE ARE NO RESULTS IN THE REPORT.
- ***SUBJECT***: TEXT FOR THE SUBJECT LINE OF THE NOTIFICATION.
- ***INTRODUCTORY MESSAGE***: TEXT TO APPEAR IN THE NOTIFICATION MESSAGE BODY.
- ***TYPE***: CHOOSE A FORMAT FROM THE CHOICE LIST FOR THE REPORT.
- ***ZIP OUTPUT***: SELECT TO SEND THE NOTIFICATION WITH THE ATTACHED FILES IN .ZIP FORMAT.
- ***INCLUDE WITH***: SELECT ANOTHER SCHEDULED REPORT TO INCLUDE IN THE NOTIFICATION.

TO TEST A SCHEDULED REPORT, CLICK THE **EXECUTE NOW** BUTTON. THE *EXECUTE NOW* BUTTON IS NOT AVAILABLE UNTIL A SCHEDULED REPORT IS SAVED FOR THE FIRST TIME.

SCHEDULED REPORTS - NOTIFICATION RECIPIENTS

SCHEDULED REPORT RECIPIENTS ARE:

- SERVICENOW USERS
- SERVICENOW GROUPS
- ANY EMAIL ADDRESS

THE *USERS* FIELD IDENTIFIES SERVICENOW USERS TO RECEIVE A SCHEDULED REPORT. TO EDIT THE *USERS* LIST, CLICK THE **UNLOCK USERS LIST** BUTTON ( ).

USE THE **ENTER EMAIL ADDRESSES** FIELD TO ADD EMAIL ADDRESSES FOR RECIPIENTS WHO ARE NOT SERVICENOW USERS.

THE *GROUPS* FIELD IDENTIFIES THE GROUPS TO RECEIVE A SCHEDULED REPORT. TO EDIT THE *GROUPS* LIST, CLICK THE **UNLOCK GROUPS LIST** BUTTON ( ).

ON-DEMAND CHARTS

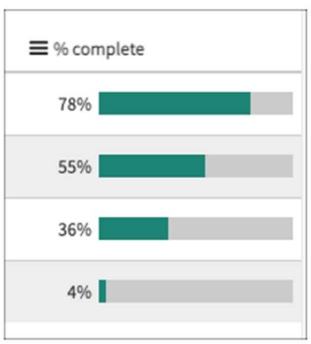
USERS CAN CREATE BAR AND PIE CHARTS FROM LISTS.

- **BAR CHART**: A GRAPH WHICH PLOTS CATEGORICAL DATA USING BARS THAT ARE PROPORTIONAL TO VALUES.
- **PIE CHART**: A CIRCULAR GRAPH WHICH PLOTS CATEGORICAL DATA IN SECTIONS PROPORTIONAL TO VALUES.

TO CREATE AN ON-DEMAND CHART FROM A LIST, HOVER OVER A COLUMN THEN CLICK THE **COLUMN OPTIONS** MENU (). SELECT THE **BAR CHART** OR **PIE CHART** MENU ITEM.

PERCENT COMPLETE

PERCENT COMPLETE FIELDS ACCEPT DECIMAL VALUES IN FORMS AND SHOW PROGRESS BARS WHEN DISPLAYED IN LISTS. *PERCENT COMPLETE* FIELDS ARE OFTEN USED TO SHOW COMPLETION PROGRESS FOR TASKS OR REQUESTS.



List

Form

PERCENT COMPLETE FIELDS HAVE A **PERCENT COMPLETE** DATA TYPE.

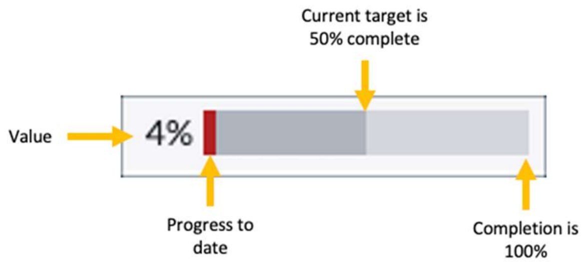
USE THE TABLE EDITOR TO ADD FIELDS WITH THE DATA TYPE *PERCENT COMPLETE*. DOUBLE-CLICK THE TEXT **INSERT A NEW ROW...** THEN ENTER A *COLUMN LABEL* FOR THE FIELD. DOUBLE-CLICK IN THE *TYPE* FIELD AND SELECT **PERCENT COMPLETE** AS THE DATA TYPE. USE THE **PERSONALIZE LIST** ICON TO ADD THE NEW FIELD TO THE TABLE'S LIST. DOUBLE-CLICK THE FIELD NAME IN THE *AVAILABLE* SLUSHBUCKET TO MOVE THE FIELD TO THE *SELECTED* SLUSHBUCKET. USE THE TABLE'S FORM TO ENTER A VALUE OR WRITE A SCRIPT TO ADD A VALUE TO THE *PERCENT COMPLETE* FIELD.

THRESHOLDS AND TARGETS

TARGET THRESHOLDS ARE A VISUAL INDICATOR TO SHOW PROGRESS FOR *PERCENT COMPLETE* FIELDS AGAINST A TARGET. THE PROGRESS BAR COLOR CHANGES WHEN THRESHOLD TARGETS ARE MET OR EXCEEDED. TO DEFINE A THRESHOLD, OPEN THE TABLE FOR EDITING IN STUDIO. CLICK THE **COLUMN LABEL** FOR THE FIELD WITH THE DATA TYPE *PERCENT COMPLETE*. SCROLL TO THE RELATED LINKS AND CLICK THE ADVANCED VIEW LINK. ADD THE TARGET_FIELD ATTRIBUTE.

THIS EXAMPLE USES FIVE COLORS TO VISUALIZE PROGRESS:

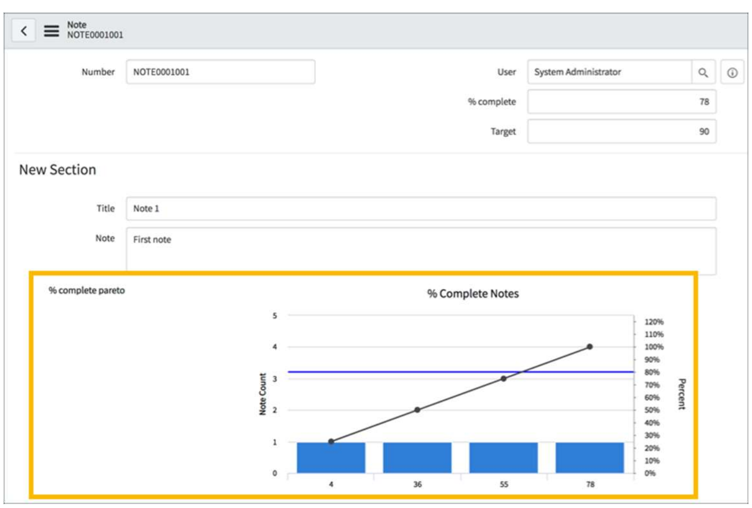
% COMPLETE VALUE	COLOR
0 - 24	FIREBRICK
25 - 49	DARKORANGE
50 - 74	GOLD
75 - 89	YELLOWGREEN
> 90	DARKGREEN



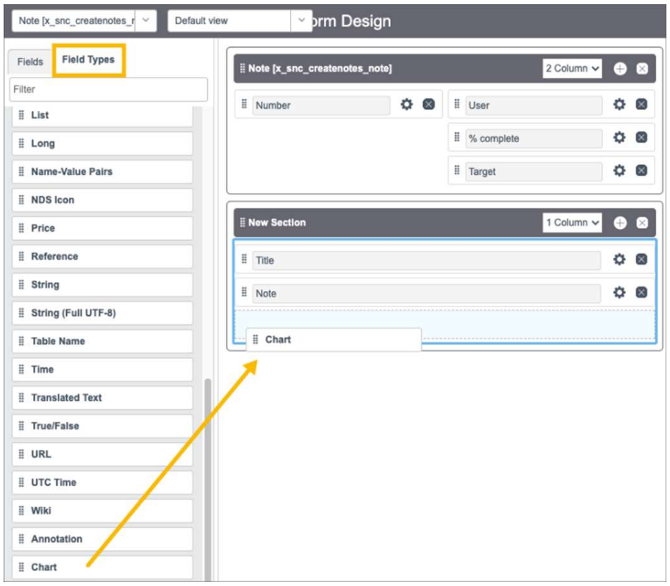
TO ADD A TARGET COMPLETION BAR, ADD A FIELD TO THE TABLE WITH THE TYPE **DECIMAL** TO DEFINE THE TARGET VALUE. EDIT THE **ATTRIBUTE** FIELD FOR THE *% COMPLETE* FIELD AGAIN AND ADD THE **TARGET_FIELD** ATTRIBUTE. ON THE TABLE'S FORM, SET VALUES FOR BOTH THE **% COMPLETE** AND **TARGET** FIELDS.

ADDING REPORTS TO FORMS

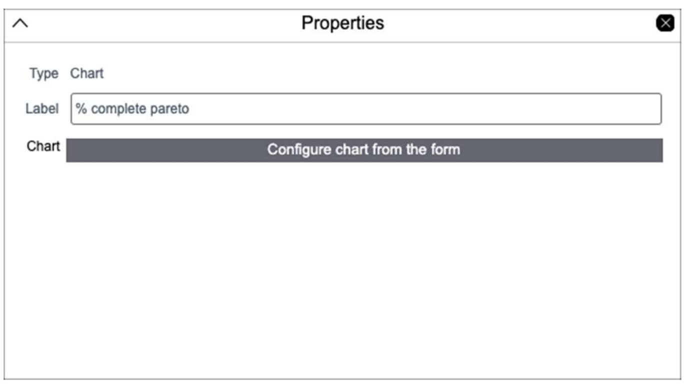
IN SOME CASES, DEVELOPERS MAY WANT TO ADD REPORTS DIRECTLY TO FORMS



TO ADD A CHART TO A FORM, USE FORM DESIGNER TO DRAG THE *CHART* DATA TYPE TO THE DESIRED LOCATION ON THE FORM.

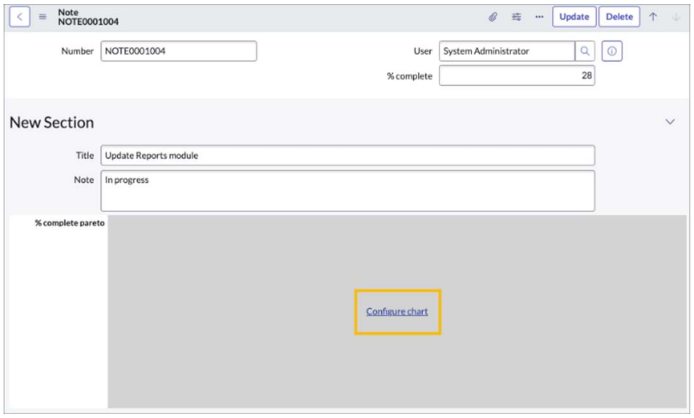


CLICK THE **FIELD SETTINGS** ICON ( ) FOR THE *CHART* FIELD TO ADD A *LABEL* TO THE FIELD.

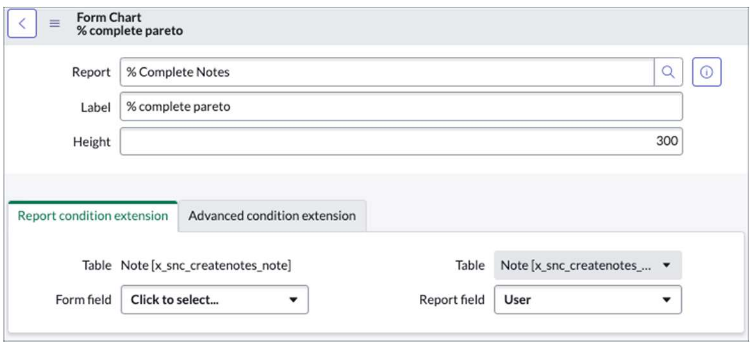


SAVE THE FORM IN FORM DESIGNER.

IN THE MAIN SERVICENOW BROWSER WINDOW, OPEN THE FORM. CLICK THE **CONFIGURE CHART** LINK IN THE *CHART* FIELD.



CONFIGURE THE *CHART* FIELD.



- ***REPORT***: REPORT TO DISPLAY.
- ***LABEL***: CHART LABEL.
- ***HEIGHT***: HEIGHT OF THE REPORT IN PIXELS. THE DEFAULT VALUE IS *300* PIXELS.

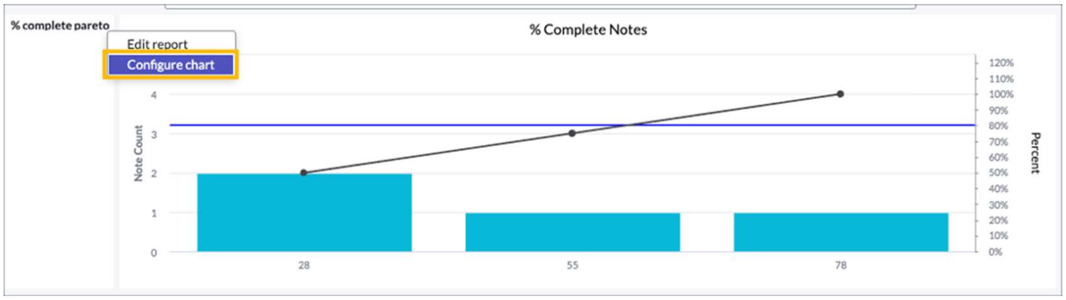
REPORT CONDITION EXTENSION TAB

- **TABLE**: FILTER RECORDS ON THE FORM FROM THE TABLE.
- **FORM FIELD**: ONLY SHOW DATA IN THE CHART THAT MATCHES THIS FIELD ON THE FORM.
- **TABLE**: FILTER RECORDS ON THE REPORT FROM THE TABLE.
- **REPORT FIELD**: FILTER RECORDS ON THE REPORT THAT MATCH THIS FIELD.

ADVANCED CONDITION EXTENSION

- **REPORT QUAL**: REFERENCE QUALIFIERS FOR FILTER REPORT DATA. FOR EXAMPLE, *ACTIVE=TRUE*.

TO EDIT THE CHART CONFIGURATION AGAIN, RIGHT-CLICK **THE CHART LABEL** ON THE FORM AND SELECT THE **CONFIGURE CHART** MENU ITEM.

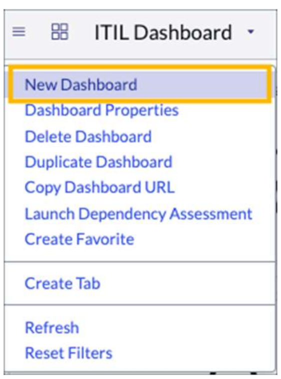


DASHBOARDS

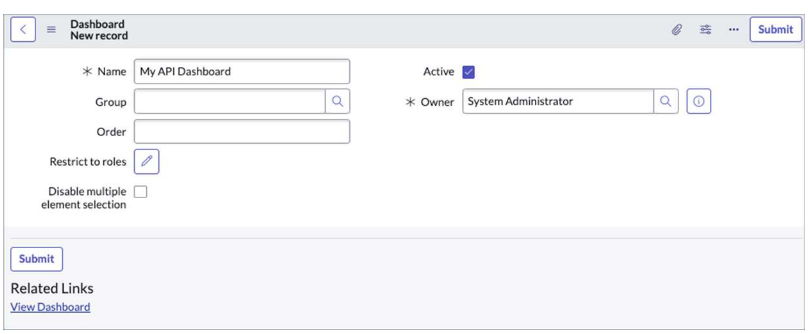
DASHBOARDS ARE A DRAG AND DROP CANVAS FOR GATHERING VISUALIZATIONS USED REGULARLY INTO A SINGLE LOCATION. DESIGN APPLICATION DASHBOARDS WITH MULTIPLE VISUALIZATIONS TO CONVEY MEANINGFUL INFORMATION TO APPLICATION USERS. TO SEE THE BASELINE DASHBOARDS, USE THE *ALL* MENU TO OPEN **SELF-SERVICE > DASHBOARDS**. SERVICENOW DEFAULTS TO DISPLAYING THE LAST DASHBOARD THE LOGGED IN USER VIEWED. WHEN ACCESSING DASHBOARDS FOR THE FIRST TIME, USERS SELECT FROM A LIST OF AVAILABLE DASHBOARDS.

CREATING DASHBOARDS

TO CREATE A DASHBOARD, USE THE *ALL* MENU TO OPEN **SELF-SERVICE > DASHBOARDS**, THEN CLICK THE **CREATE A DASHBOARD** BUTTON. TO CREATE A DASHBOARD WHEN VIEWING A DASHBOARD, CLICK THE **DASHBOARD CONTROLS** MENU (), THEN SELECT THE **NEW DASHBOARD** MENU ITEM.



CONFIGURE THE *DASHBOARD* PROPERTIES.



- ***NAME***: NAME OF THE DASHBOARD THAT APPEARS IN THE DASHBOARD SELECTOR.
- ***GROUP***: WHERE TO PLACE THE DASHBOARD IN THE DASHBOARD SELECTION LIST. THE BASELINE GROUPS ARE *CMDB DASHBOARD*, *FLOW DESIGNER*, *INCIDENT*, *PLATFORM*, *PROBLEM*, AND *SLA*.
- ***ORDER***: ORDER THE DASHBOARD APPEARS ON THE DASHBOARD LANDING PAGE AND PICK LISTS. ORDER IS ASCENDING FROM LOW NUMBERS TO HIGH. *ADMIN CONSOLE*, *FLOW DESIGNER OPERATIONS*, AND *ANALYTICS USAGE OVERVIEW* DASHBOARDS ARE ALWAYS BEFORE USER-CREATED DASHBOARDS.
- ***RESTRICT TO ROLES***: ROLES REQUIRED TO ACCESS THE DASHBOARD.
- ***ACTIVE***: SELECT TO MAKE THE DASHBOARD USABLE IN RUNTIME.
- ***OWNER***: SERVICENOW USER WHO OWNS THE DASHBOARD RECORD.

CLICK THE **ADDITIONAL ACTIONS** MENU TO SAVE THE DASHBOARD. CLICK THE **VIEW DASHBOARD** RELATED LINK TO ADD WIDGETS AND TABS TO THE DASHBOARD.

DASHBOARD WIDGETS

USE THE WIDGET PICKER () TO ADD WIDGETS TO DASHBOARDS.

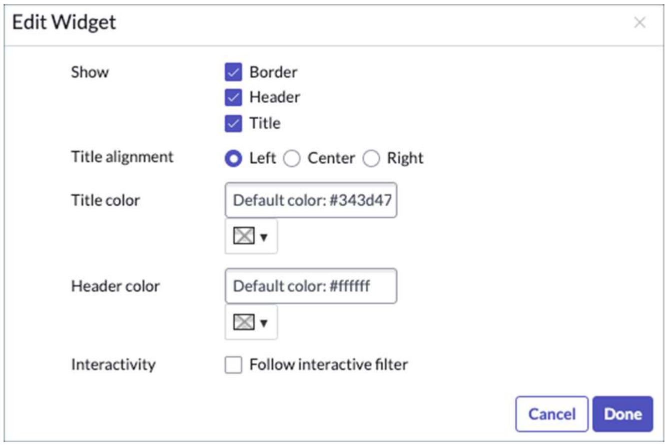
THE *ADD WIDGETS* PANE OPENS. CLICK A WIDGET TO PREVIEW BEFORE ADDING IT TO THE DASHBOARD.

CLICK THE **ADD** BUTTON TO ADD A WIDGET TO THE DASHBOARD.

CLICK THE **CONFIGURATION** ICON () TO MAKE CHANGES TO DASHBOARD AND WIDGET CONFIGURATION.

USE THE *DASHBOARD BACKGROUND* SECTION TO SET THE BACKGROUND COLOR FOR THE DASHBOARD. THE DEFAULT COLOR IS *#FFFFFF* (WHITE). ENTER THE HEXADECIMAL VALUE FOR A COLOR OR USE THE COLOR PICKER TO SELECT A COLOR. CHOOSE A LAYOUT FROM THE *APPLY QUICK LAYOUT* SECTION OF THE *CONFIGURATION* PANEL THEN CONFIGURE THE WIDGETS. TO SEE THE WIDGET CONFIGURATION HEADER, HOVER OVER THE HEADER AREA. TO MOVE A WIDGET, CLICK, HOLD, AND DRAG IN THE WIDGET HEADER AREA. USE THE GRAB HANDLES TO RESIZE A WIDGET.

CLICK THE **EDIT WIDGET CONFIGURATION** ICON () TO ENABLE/DISABLE REAL-TIME UPDATES, ENABLE/DISABLE BORDERS AND TITLES, SET THE TITLE ALIGNMENT, AND TIE THE WIDGET TO AN INTERACTIVE FILTER.



NOT ALL WIDGET CONFIGURATION OPTIONS ARE AVAILABLE FOR ALL WIDGETS. FOR EXAMPLE, THE *SHOW REAL-TIME UPDATES* CONFIGURATION OPTION IS ONLY AVAILABLE FOR *SINGLE SCORE* WIDGETS.

SECURE APPS AND DATA

WHAT IS SECURITY?

MANY APPLICATIONS CONTAIN SENSITIVE OR PRIVATE DATA THAT IS NOT APPROPRIATE FOR ALL SERVICENOW USERS TO SEE OR MODIFY. APPLICATION CREATORS USE ROLES TO GRANT AUTHORIZED USERS ACCESS TO PARTS OF APPLICATION. SECURITY PREVENTS ACCIDENTAL MODIFICATION OR DELETION OF DATA. SECURITY ALSO ENSURES ONLY AUTHORIZED USERS TO SEE APPLICATION DATA.

THE GENERAL PROCESS FOR APPLYING SECURITY IS:

1. *CREATORS* BUILDING APPLICATIONS IN APP ENGINE STUDIO CREATE ROLES.
2. *CREATORS* APPLY ROLES TO AN APPLICATION'S DATA MODEL AND USER EXPERIENCES.
3. *SYSTEM ADMINISTRATORS* ASSIGN ROLES TO USERS.
4. *CREATORS* AND *SYSTEM ADMINISTRATORS* COLLABORATE ON TESTING ROLE-BASED DATA ACCESS

DETERMINING WHAT ROLES TO CREATE

SECURITY IS AN IMPORTANT PART OF APPLICATION CREATION. SECURITY SHOULD BE DESIGNED INTO AN APPLICATION AND NOT ADDED AS AN AFTERTHOUGHT. BEFORE CREATING AN APPLICATION, TAKE THE TIME TO DETERMINE WHO SHOULD HAVE ACCESS AND WHAT LEVEL OF ACCESS THEY SHOULD HAVE.

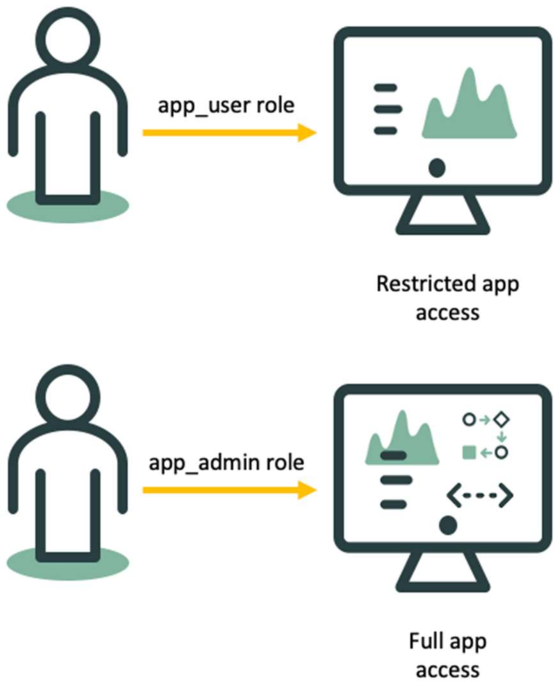
ROLES DETERMINE WHAT APPLICATION ACCESS IS GRANTED TO WHICH USERS. DESIGN YOUR APPLICATION'S SECURITY TO ENSURE YOUR APPLICATION AND DATA ARE PROTECTED.

- WHO NEEDS ACCESS TO THE APPLICATION AND DATA?
- WHAT ACCESS TO RECORDS DO THEY NEED? CREATE? VIEW? MODIFY? DELETE?
- WHICH USER EXPERIENCES CAN THEY ACCESS?

ALTHOUGH ALL APPLICATIONS SHOULD HAVE SECURITY, IT IS NOT NECESSARY TO CREATE UNIQUE ROLES FOR EVERY APPLICATION. IF A ROLE ALREADY EXISTS AND HAS BEEN ASSIGNED TO THE SAME SET OF USERS AS THOSE TARGETED BY YOUR APPLICATION, USE AN EXISTING ROLE.

IF AN APPLICATION'S SECURITY REQUIREMENTS ARE UNIQUE TO THE APPLICATION, CREATE ROLES INSTEAD OF USING EXISTING ROLES. IT IS COMMON FOR APPS TO HAVE AT LEAST TWO ROLES. WHEN CREATING AN APP, APP ENGINE STUDIO SUGGESTS CREATING TWO ROLES:

- ***APP_USER***: USERS WHO:
    - CREATE AND VIEW APPLICATION RECORDS
    - MAY BE ABLE TO MODIFY APPLICATION RECORDS
    - TYPICALLY, CANNOT DELETE APPLICATION RECORDS
- ***APP_ADMIN***: USERS WHO:
    - HAVE FULL ACCESS TO APPLICATION DATA
    - CAN MODIFY APPLICATION FILES



ADDING ROLES DURING APPLICATION CREATION

APP ENGINE STUDIO SUGGESTS BOTH A DEFAULT *ADMIN* AND *USER* ROLE FOR THE APPLICATION. THE DEFAULT ROLES ARE NOT REQUIRED AND CAN BE EDITED OR DELETED. TO ADD ADDITIONAL ROLES, CLICK THE **ADD A ROLE** BUTTON.

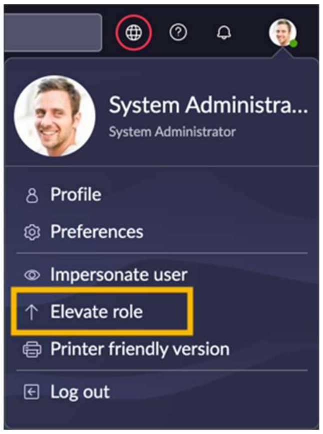
AN APPLICATION'S ROLES ARE LISTED IN THE *APP HOME* TAB'S *SECURITY* SECTION.

ELEVATING PRIVILEGES

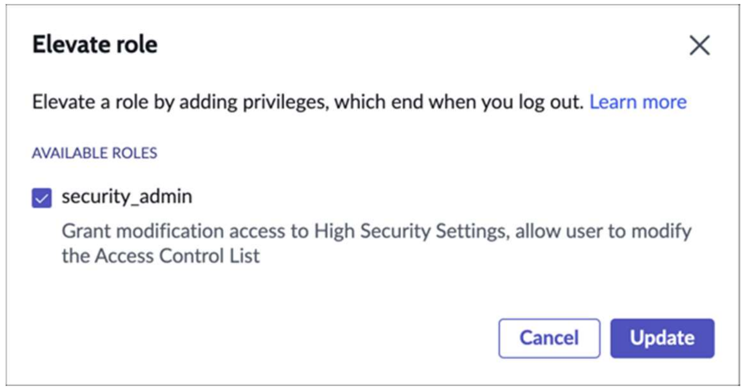
USERS WITH THE *ADMIN* ROLE CAN USUALLY MODIFY ANY RECORD ON ANY TABLE. UNRESTRICTED RECORD MODIFICATION COULD LEAD TO INADVERTENT CHANGES TO RECORDS ON TABLES PROTECTED BY SECURITY. TO PREVENT ACCIDENTAL MODIFICATION OF TABLE SECURITY, USERS WITH THE *ADMIN* ROLE ARE REQUIRED TO TEMPORARILY GRANT THEMSELVES AN ADDITIONAL ROLE, *SECURITY_ADMIN*, WHENEVER THEY MODIFY A ROLE'S ABILITY TO CREATE, READ, WRITE, OR DELETE A TABLE'S RECORDS.

ELEVATE SECURITY PRIVILEGES IN THE MAIN SERVICENOW BROWSER WINDOW (NOT APP ENGINE STUDIO). OPEN THE **USER MENU** IN THE BANNER AND SELECT THE **ELEVATE ROLE** MENU ITEM.

ELEVATE SECURITY PRIVILEGES IN THE MAIN SERVICENOW BROWSER WINDOW (NOT APP ENGINE STUDIO). OPEN THE **USER MENU** IN THE BANNER AND SELECT THE **ELEVATE ROLE** MENU ITEM.



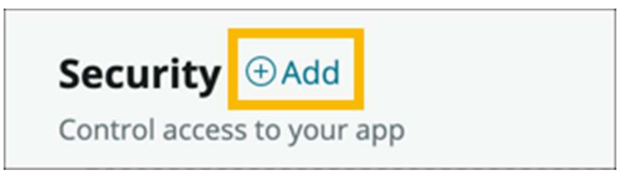
IN THE *ELEVATE ROLE* DIALOG, SELECT THE **SECURITY_ADMIN** OPTION, THEN CLICK THE **UPDATE** BUTTON.



WHEN THE *SECURITY_ADMIN* ROLE IS APPLIED, THE *USER MENU* AVATAR GETS A RED BORDER AND AN ARROW ICON TO INDICATE THE ROLE IS APPLIED. THE *SECURITY_ADMIN* ROLE TIMES OUT. WHEN CREATING OR EDITING SECURITY, IT MAY BE NECESSARY TO ELEVATE ROLES MORE THAN ONCE DUE TO TIMING OUT.

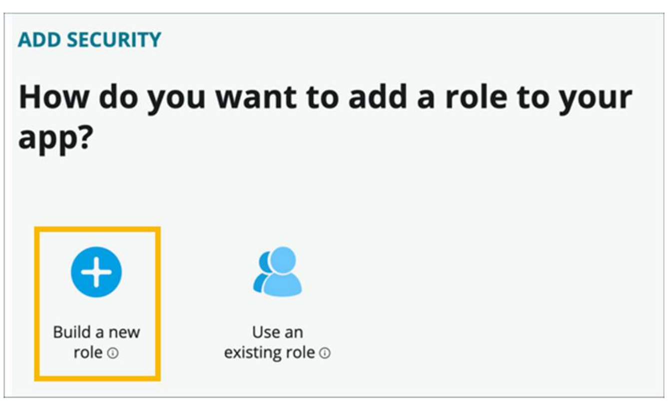
CREATING ROLE

ON THE *APP HOME* TAB, CLICK THE **ADD** ICON IN THE *SECURITY* SECTION.

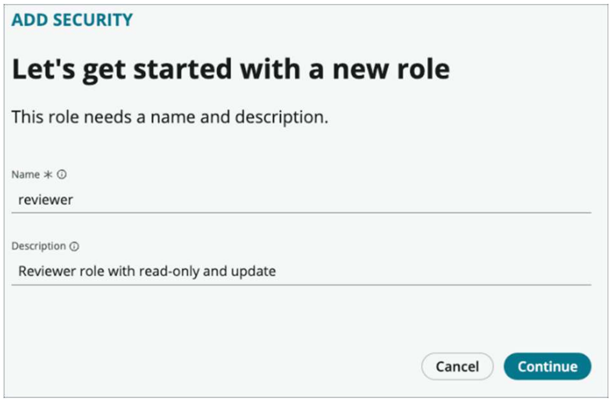


ON THE *HOW DO YOU WANT TO ADD A ROLE TO YOUR APP?* SCREEN, SELECT WHETHER TO CREATE A ROLE OR APPLY AN EXISTING ROLE.

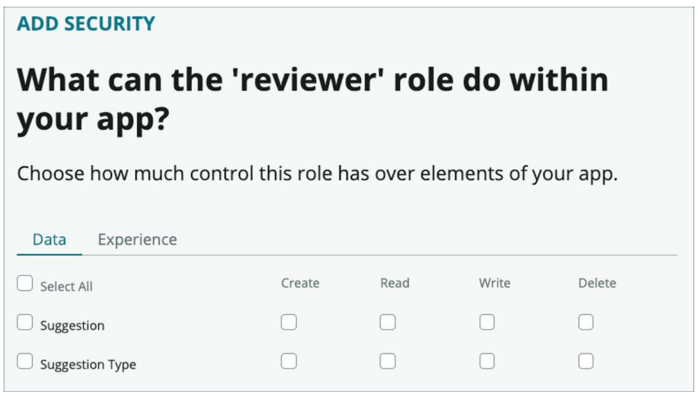
- USE THE *BUILD A NEW ROLE* OPTION WHEN A ROLE IS UNIQUE TO YOUR APP.
- USE THE *USE AN EXISTING ROLE* OPTION WHEN A SUITABLE ROLE ALREADY EXISTS AND HAS BEEN ASSIGNED TO THE SAME SET OF USERS AS THOSE TARGETED BY YOUR APPLICATION.



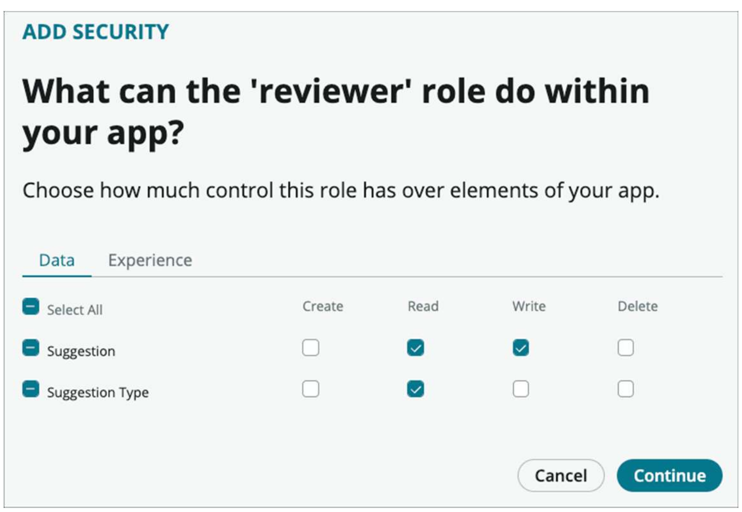
ON THE *LET'S GET STARTED WITH A NEW ROLE* SCREEN, PROVIDE A *NAME* AND A *DESCRIPTION* FOR THE ROLE, THEN CLICK THE **CONTINUE** BUTTON.



IN THE *WHAT CAN THE '<ROLE_NAME>' ROLE DO WITHIN YOUR APP?.* SCREEN, APPLICATION CREATORS GRANT OR DENY THE ROLE ACCESS TO TABLE RECORDS AND TO EXPERIENCES.



USE THE *DATA* TAB TO SPECIFY WHICH TABLE RECORDS AND DATABASE OPERATIONS ARE GRANTED TO THE ROLE. A CHECK MARK MEANS ACCESS IS GRANTED TO THE ROLE. IN THE EXAMPLE, THE *REVIEWER* ROLE HAS BEEN GRANTED ACCESS TO SELECTED DATABASE OPERATIONS ON THE TABLES.



CLICK THE **CONTINUE** BUTTON.

USERS AND GROUPS

ROLES DO NOT PROTECT DATA UNTIL THEY ARE ASSIGNED TO SPECIFIC USERS OR GROUPS. CREATORS TYPICALLY WORK WITH A SYSTEM ADMINISTRATOR TO ASSIGN AND MANAGE ROLES.

EVERY USER WHO LOGS IN TO SERVICENOW HAS A *USER* RECORD THAT INCLUDES INFORMATION SUCH AS:

- *USERNAME*
- *FIRST NAME*
- *LAST NAME*
- *PASSWORD*
- *EMAIL ADDRESS*

THE *USER* RECORD ALSO INCLUDES A LIST OF ROLES THAT ARE ASSIGNED TO THE USER. TO SEE A *USER* RECORD, IN THE MAIN SERVICENOW BROWSER TAB, USE THE *ALL* MENU TO OPEN **USER ADMINISTRATION > USERS**.

SYSTEM ADMINISTRATORS CAN ADD ROLES TO *USER* RECORDS. IF A ROLE IS APPLIED TO A SMALL NUMBER OF USERS, ADDING THE ROLE TO *USER* RECORDS IS EASILY DONE. IF A ROLE NEEDS TO BE APPLIED TO THOUSANDS OF *USER* RECORDS, IT CAN BE CHALLENGING TO COMPLETE THE PROCESS MANUALLY. RATHER THAN ASSIGN ROLES TO USERS DIRECTLY, SYSTEM ADMINISTRATORS CREATE GROUPS. GROUPS ARE COLLECTIONS OF USERS WHO NEED THE SAME PERMISSIONS AND ARE A SHORTCUT WAY OF ASSIGNING ROLES TO USERS.

IMPERSONATING USERS

BEFORE PUTTING AN APPLICATION INTO PRODUCTION, TEST THE APPLICATION'S USER PERMISSIONS TO ENSURE THEY ARE WORKING AS DESIGNED. YOU WILL NEED TO WORK WITH YOUR SYSTEM ADMINISTRATOR TO TEST PERMISSIONS. SYSTEM ADMINISTRATORS HAVE SUPERPOWER CALLED IMPERSONATION. IMPERSONATION ALLOWS SYSTEM ADMINISTRATORS TO TEMPORARILY BECOME ANOTHER AUTHENTICATED USER FOR TESTING PURPOSES. IMPERSONATION DOES NOT REQUIRE KNOWING ANOTHER USER'S PASSWORD. WHEN IMPERSONATING A USER, THE *ADMIN* USER CAN SEE AND DO EXACTLY WHAT THE IMPERSONATED USER CAN DO.