

DATA AND ANALYTICS PLAYBOOK

2021 FEDERATED MODEL

3 Accessible formats or communication supports are available upon request. Contact data@york.ca



VISION

Strong, caring, safe communities

MISSION

Working together to serve our thriving communities – today and tomorrow

CORPORATE VALUES

Integrity

Commitment

Accountability

Respect

Excellence

The “York Region - Data and Analytics Master Plan - 2019 to 2023” playbook is the main document that describes the DnA Master Plan, the principles and approach. Please refer to that book before reading this Federated Model playbook. The Federated Model will be reviewed annually.

BEFORE YOU START

Perhaps you are trying to understand “digital”. Maybe you are sitting on a wealth of data and you’re struggling to put it to work across the entire organization. Or you want to go further and faster with less effort by leveraging the thought leadership of over 100 data professionals and the consultancy of PwC.

The Playbook offers ideas you can use now. It outlines an approach incorporating DAMA that organizes the common elements of data and analytics management to define and deliver core services that virtually any large organization can adapt and adopt. And, although some of what we do is “Yorkified”, the approach below is generic.

If you do intend to develop and implement your own data and analytics management strategy, make sure you can answer “yes” to these:

- Do you have senior management support?
- Are you ready to get at it and stick to it?

If so, the Region is happy to help. We can’t sell this idea to your organization for you, but if your organization is already sold and you have a question or would like to discuss, read on, and let us know.

USE

This work is licensed under a [Creative Commons Attribution 3.0 Unported License](#) CC BY-NC-ND. This license allows you to download the work and share with others if you credit York Region, but you can’t change it in any way or use it commercially.

QUESTIONS? CONNECT WITH US!



Connect by phone:
1-877-464-9675
Ext. 7DATA



Connect by email:
data@york.ca



Visit us online:
york.ca/puttingdatatowork

TABLE OF CONTENTS

DATA GOVERNANCE (01)	7	40. ARTIFICIAL INTELLIGENCE & MACHINE LEARNING	107
01. STRATEGIC OBJECTIVES	9	41. DATA VISUALIZATION	110
02. READINESS & PROGRESS.....	12	42. STORYTELLING WITH DATA	113
03. ISSUE RESOLUTION.....	15	DATA LITERACY (05)	117
04. BEST PRACTICES	18	43. AWARENESS	118
05. ENTERPRISE POLICIES & STANDARDS ...	21	44. SKILLS ASSESSMENT	121
06. LOCAL PROCEDURES.....	24	45. LEARNING AND DEVELOPMENT	124
07. STEWARDSHIP.....	27	48. COMMUNITIES OF PRACTICE	127
08. DATA AUDIT.....	30	DATA PARTNERSHIPS (06)	131
09. DATA VALUATION	33	46. PARTNER COORDINATION.....	132
10. PROMOTING DATA CULTURE	36	47. NEW PARTNER NEGOTIATION.....	135
11. COMMUNICATION OF DNA PROGRAM.....	39	49. DATA PURCHASING	138
DATA ARCHITECTURE (02)	43	50. CREATING & NEGOTIATING DATA SHARING AGREEMENTS.....	141
12. DATA MODELLING	44	PREPARATION & INTEGRATION (07)	145
13. DATA FLOWS.....	47	26. ETL AND DATA PREPARATION.....	146
14. DATA ASSET MANAGEMENT	50	27. CLEANSING	149
15. TACTICS FOR INTEGRATION.....	53	28. INTEGRATING & MATCHING TO MASTER & REFERENCE DATA	152
16. DATA MIGRATION PLANNING	56	29. SYSTEM TO SYSTEM INTEGRATION	155
MASTER & METADATA (03)	59	30. INTEGRATION TO PORTAL	158
19. CLASSIFY	60	DATA QUALITY (08)	161
20. METADATA COLLECTION.....	63	23. DATA PROFILING	162
21A. PUBLISHING to CATALOGUE.....	66	24. DATA QUALITY ASSESSMENT.....	165
21B. PUBLISHING TO DATA DICTIONARY	69	25. DATA QUALITY MONITORING.....	168
21C. PUBLISHING TO GLOSSARY	72	SECURITY, ACCESS & PRIVACY (09)	171
22. MASTER & REFERENCE	75	51. OPEN DATA PUBLISHING.....	172
INSIGHTS & REPORTING (04)	79	52. DATA DELIVERIES TO CONSULTANTS... 175	
31. REPORT GENERATION WITH DATA.....	80	TECHNOLOGY (10)	179
32. DASHBOARD GENERATION.....	83	53. REQUIREMENTS GATHERING.....	180
33. ANALYTICS CONSULTING.....	86	54. SOLUTION ARCHITECTURE.....	183
34. SCENARIO-BASED ANALYSIS	89	55. SOLUTION DEPLOYMENT	186
35. ANALYTICS NEEDS DEVELOPMENT	92	56. MAINTAINING DATA SHARING PLATFORM.....	189
36. LOCATION ANALYTICS.....	95	CONTENT MANAGEMENT (11)	193
37. GEODEMOGRAPHICS	98	17. CAPTURE.....	194
38. DESCRIPTIVE & DIAGNOSTIC STATISTICAL ANALYSIS	101	18. STORE AND DISPOSE	197
39. EXPLORATORY DATA ANALYSIS	104		

ACKNOWLEDGEMENTS

Members of the Data and Analytics Steering Committee are dedicated to advancing the practice of data and analytics and work to advance the goals of the entire Region first before any one department. Special thanks to:

- Chin Snelgrove, Susan
- Cummings, Andrew
- Lamb, Jeff
- Lang, Glenn
- Letea, Claudia
- Lucchetta, Kim
- Patel, Uday
- Porretta, Kate
- Purves, Laura
- Rowe, Duncan
- Satterthwaite, Andrew
- Schuller, Kirk
- Sheikh, Ahmad
- Wang, Minnie

eDOCS# 13550263

DATA GOVERNANCE (01)

Ensuring a framework of rules and best practices for data

This knowledge area is responsible for the overall guiding principles, strategic direction, strategic goals, and related policies that govern the management and availability (including security and access) of data and analytics at York Region.

This knowledge area advises and supports data and analytic program areas, throughout the Region, in the implementation of data and analytic initiatives, and delivery of data and analytic services and activities.

We are #puttingdatatowork in York Region. Learn how to leverage our collective data to bring a cross departmental view into our work.

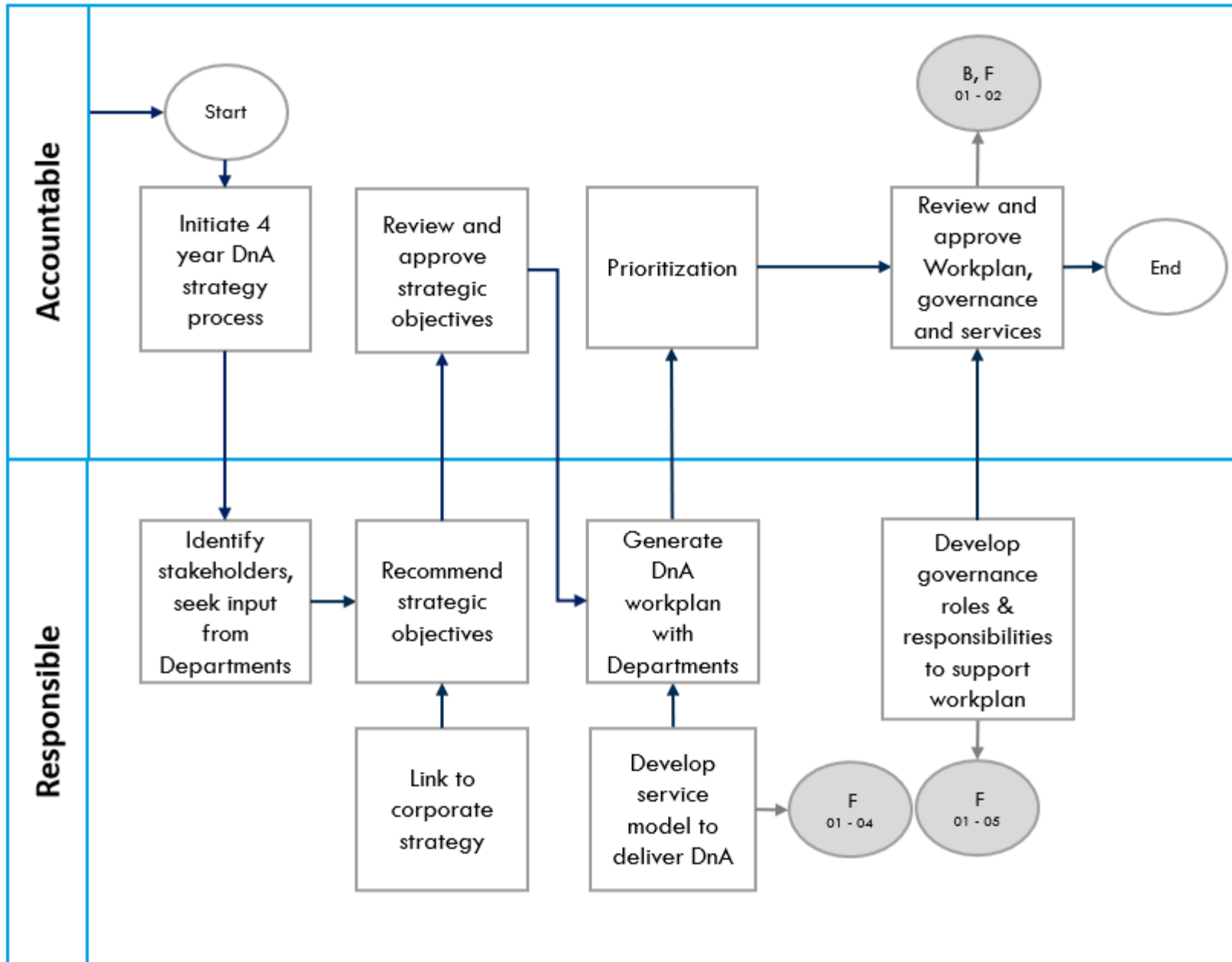


01. STRATEGIC OBJECTIVES

OVERVIEW

The Strategic Objectives service establishes the governance structure, defines the overall strategy, develops the workplan and prioritizes what data and analytics activities will most benefit the Region’s decision-making capacity and its business operations. The governance structure defines roles and responsibilities, how continued and consistent engagement with departments can be maintained and indicates how participants work together to achieve the objectives of the Data and Analytics Master Plan. The strategic objectives in the Data and Analytics Master Plan require an on-going alignment with changing corporate objectives. Work planning involves determining the projects that will improve maturity in the knowledge areas. As corporate priorities evolve, constituent projects and activities need to be responsive, so the “Strategic Objectives” service has an on-going prioritization aspect.

OWNER (2021)	Central Coordination
ACCOUNTABLE	Data and Analytics Master Plan Steering Committee
GOVERNING BODY	Digital Leadership Team, Data and Analytics Master Plan Steering Committee
RELATED SERVICES	<ul style="list-style-type: none">• Best practices• Promoting data culture
EXAMPLE	The DnA Refresh project led by PwC was successfully achieved through the Strategic Objectives service by evaluating the current state, assessing maturity, and proposing a new workplan.



COMPETENCIES

Proficiencies	Competencies	Skill Level
Business Translation	Business Understanding	Expert
	Problem Statement Definition	Expert
	Business Value Articulation	Expert
	Requirements Definition	Expert
Data Identification and Acquisition	Data Source Identification	Basic
	Data Source System(s) Understanding	Basic
	Data Acquisition and Exploration	Basic
Data Evaluation, Processing and Transformation	Critical Data Elements Identification	
	Quality Dimensions Assessment	
	Data Quality Metrics Requirements	
	Data Quality Assessment	
Analytical Solution Deployment and Validation	Solution Creation	
	Solution Testing and Validation	
Results Interpretation	Analysis Interpretation	Intermediate
	Business Implications	Expert
	Client Empowerment	Advanced
	Total Competencies	10
	Highest Level	Expert

Learn how the Data and Analytics Steering Committee tracks maturity across all data service catalogue offerings.

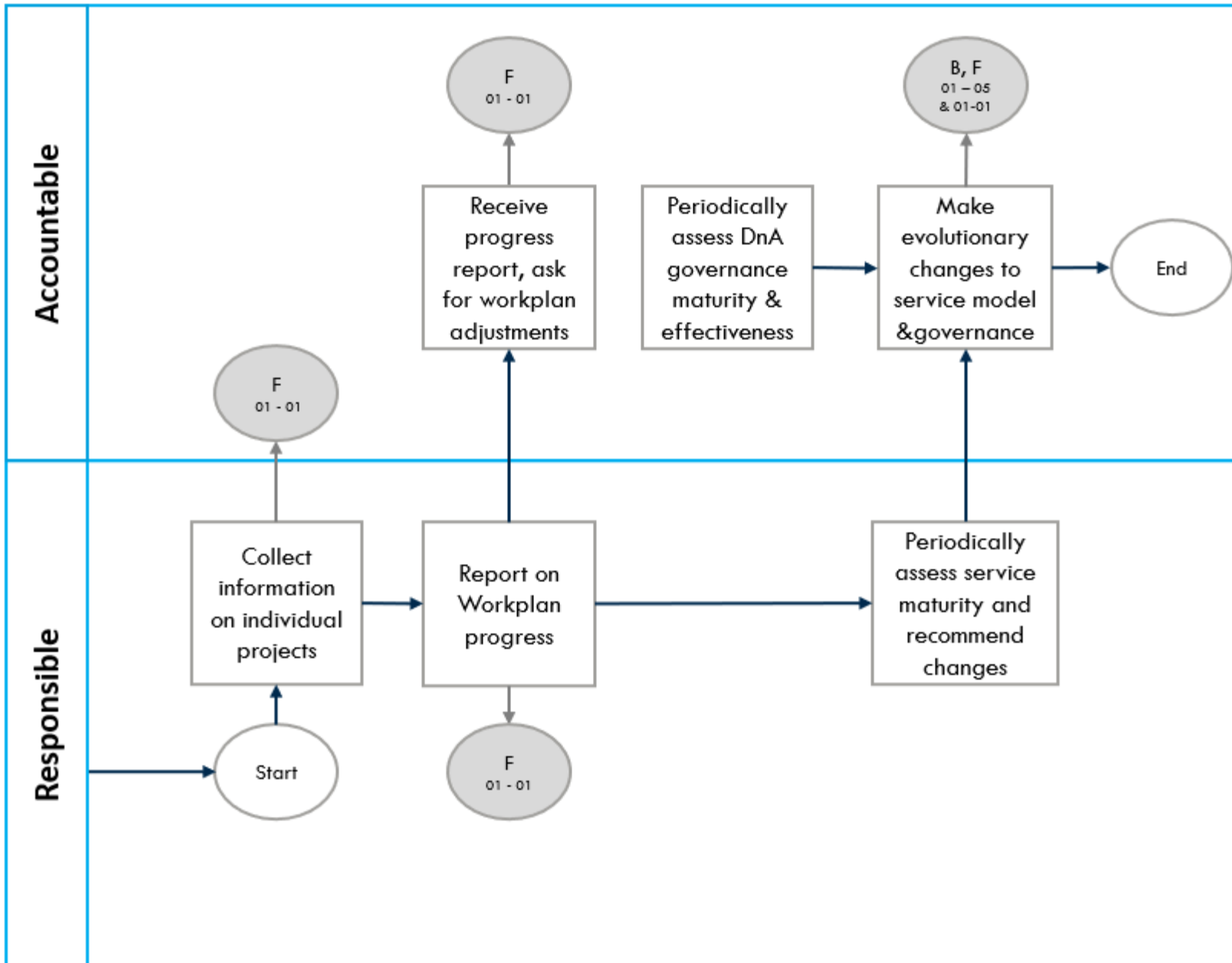


02. READINESS & PROGRESS

OVERVIEW

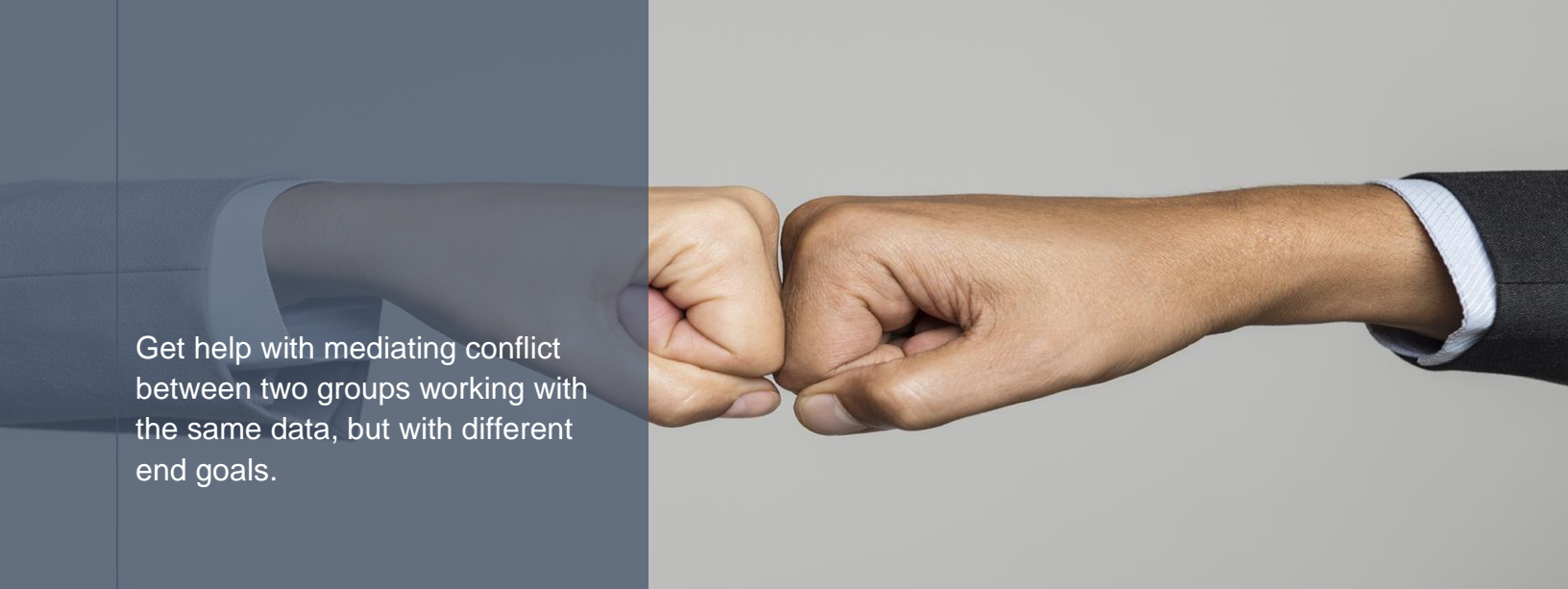
The Monitoring Readiness and Progress service coordinates, monitors, and tracks the progress of projects and initiatives that contribute to the Data and Analytics Master Plan. It includes project portfolio oversight, developing and applying monitoring criteria (i.e., KPI's), and progress reporting.

OWNER (2021)	Central Coordination
ACCOUNTABLE	DAVS
COMMUNITY OF PRACTICE	Digital Leadership Team, Data and Analytics Master Plan Steering Committee
RELATED SERVICES	<ul style="list-style-type: none"> • Strategic Objectives • Communication of DnA Program
EXAMPLE	The Monitoring Readiness and Progress service is enabling the DAVS Branch's Work Planning to be successfully achieved.



COMPETENCIES

Proficiencies	Competencies	Skill Level
Business Translation	Business Understanding	
	Problem Statement Definition	Basic
	Business Value Articulation	
	Requirements Definition	Basic
Data Identification and Acquisition	Data Source Identification	
	Data Source System(s) Understanding	
	Data Acquisition and Exploration	
Data Evaluation, Processing and Transformation	Critical Data Elements Identification	
	Quality Dimensions Assessment	
	Data Quality Metrics Requirements	
	Data Quality Assessment	
Analytical Solution Deployment and Validation	Solution Creation	Basic
	Solution Testing and Validation	
Results Interpretation	Analysis Interpretation	Intermediate
	Business Implications	Intermediate
	Client Empowerment	
	Total Competencies	5
	Highest Level	Intermediate



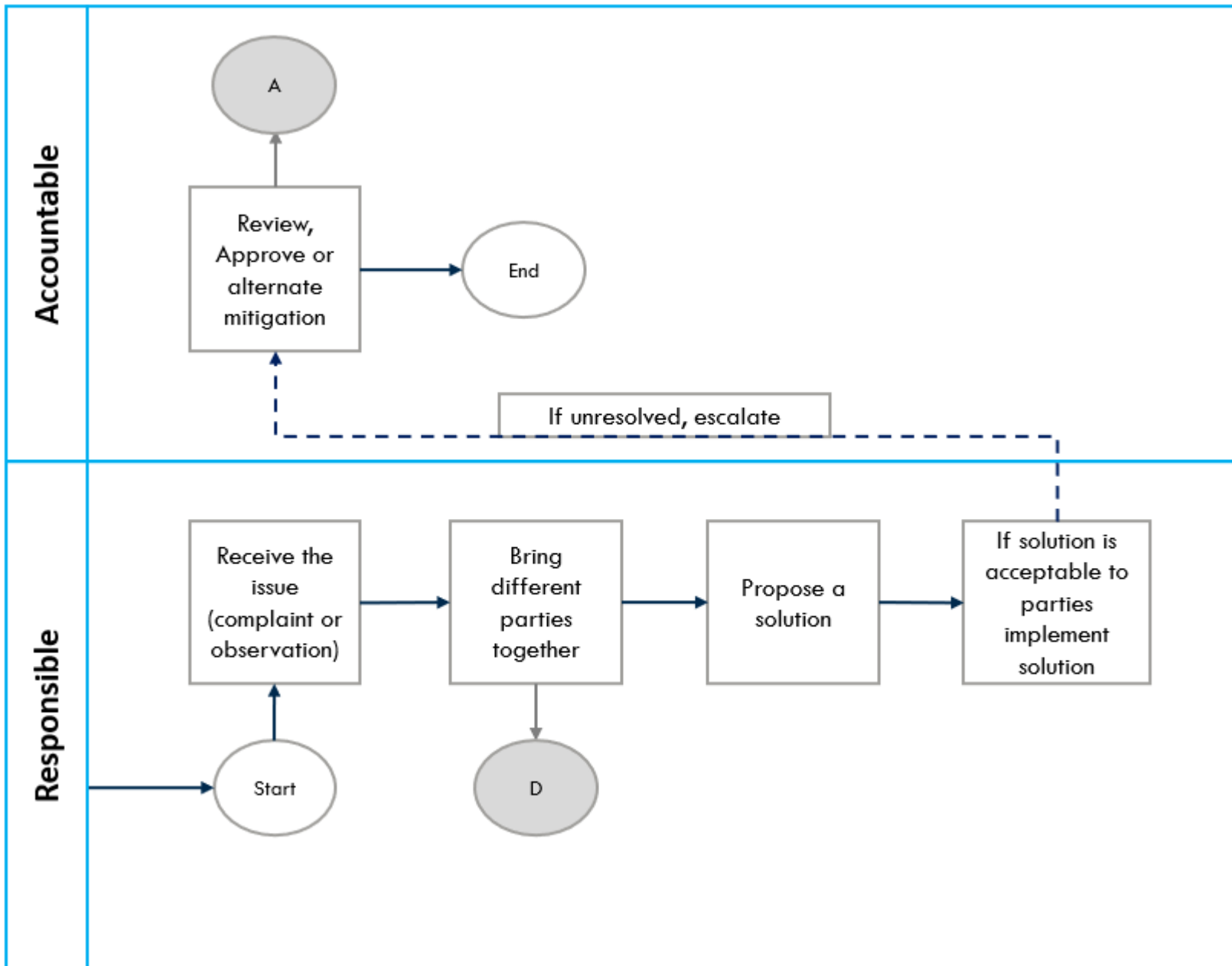
Get help with mediating conflict between two groups working with the same data, but with different end goals.

03. ISSUE RESOLUTION

OVERVIEW

When disagreements or conflicts arise in relation to data and analytics activities, the Issue Resolution service provides an escalating path to resolution. For example, if a downstream business unit would significantly benefit from a change in data capture, but the business unit responsible for data capture does not have the resources to make the change or is otherwise unwilling as there is no immediate benefit to its own business process, this service provides recourse for the business units to get a mediated resolution that might involve reallocation of resources.

OWNER (2021)	Central Coordination
ACCOUNTABLE	Digital Leadership Team
COMMUNITY OF PRACTICE	Digital Leadership Team, Data and Analytics Master Plan Steering Committee
RELATED SERVICES	<ul style="list-style-type: none">• Strategic objectives• Stewardship• Promoting data culture
EXAMPLE	The Digital Leadership Team provides the Issue Resolution service, which was particularly important in determining some of the service interaction diagrams and the accountability for some data services within the Region.



COMPETENCIES

Proficiencies	Competencies	Skill Level
Business Translation	Business Understanding	Advanced
	Problem Statement Definition	Advanced
	Business Value Articulation	Intermediate
	Requirements Definition	Basic
Data Identification and Acquisition	Data Source Identification	
	Data Source System(s) Understanding	
	Data Acquisition and Exploration	
Data Evaluation, Processing and Transformation	Critical Data Elements Identification	
	Quality Dimensions Assessment	
	Data Quality Metrics Requirements	
	Data Quality Assessment	
Analytical Solution Deployment and Validation	Solution Creation	
	Solution Testing and Validation	
Results Interpretation	Analysis Interpretation	
	Business Implications	
	Client Empowerment	
	Total Competencies Highest Level	4 Advanced

Don't waste time reinventing the wheel. Learn to leverage tried-and-true methods and techniques and reap the benefits of our collective knowledge, skills, and experiences!

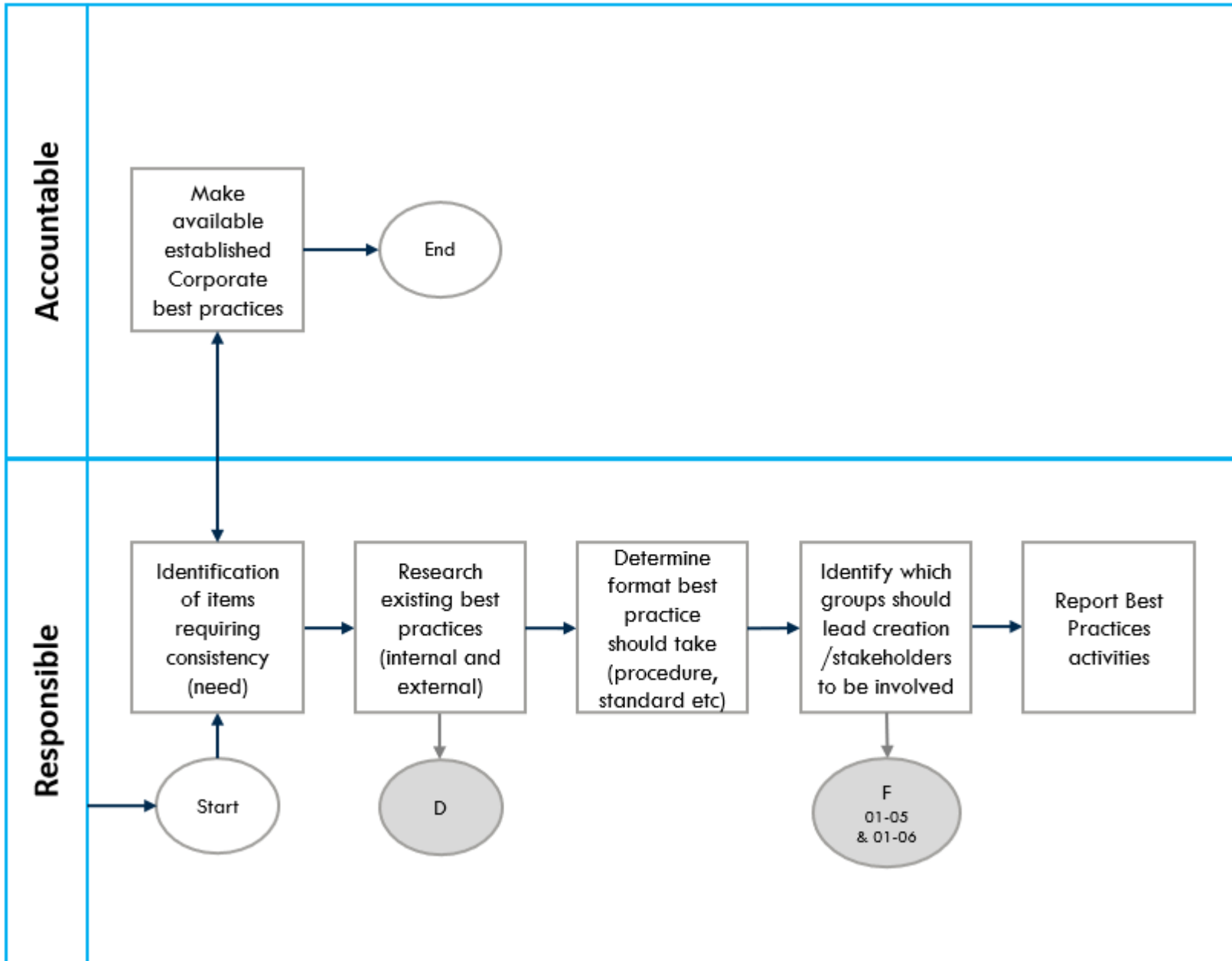


04. BEST PRACTICES

OVERVIEW

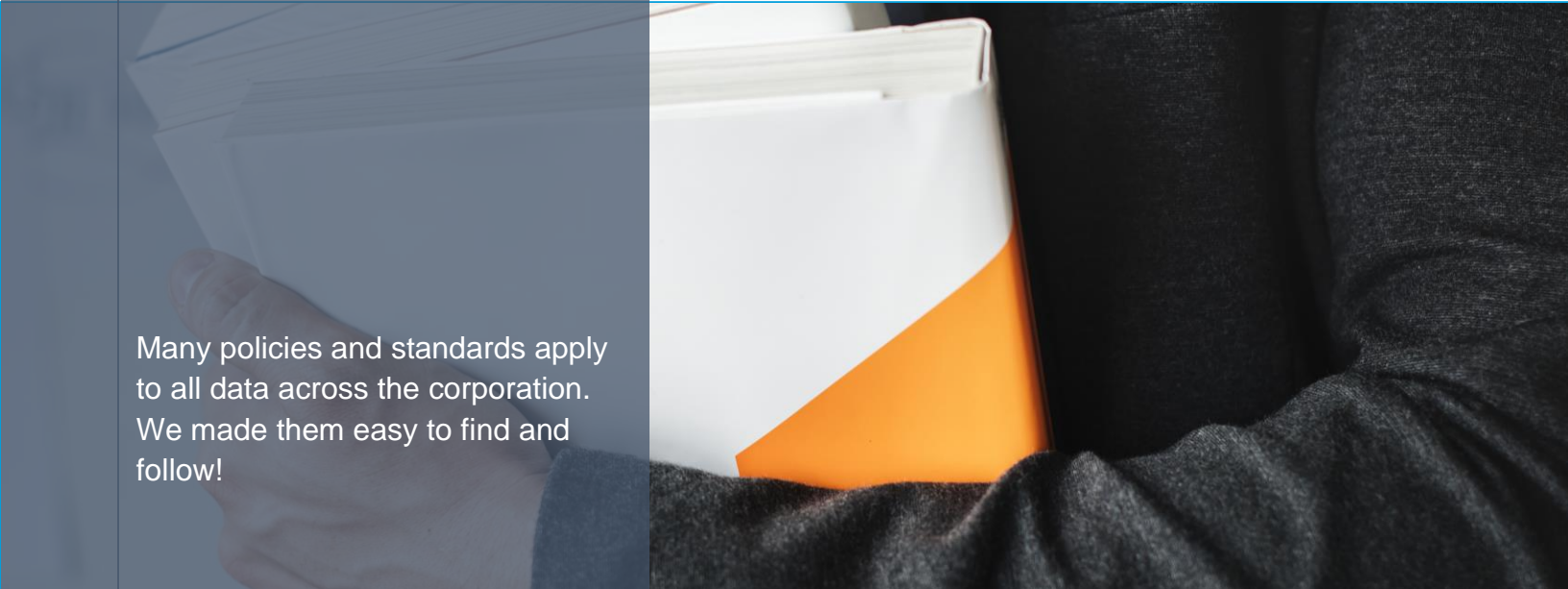
The adoption of best practices provides consistency across an organization and promotes process interoperability by developing staff who can use these new skills in other roles. The Best Practices service identifies a process or procedure in data and analytics activity, either done somewhere within the corporation or externally, and evaluates it for potential adoption and promotion as a best practice across the organization. Best practices may be adopted in relation to any of the data and analytics knowledge areas and associated services. Where appropriate, best practices may be documented as standards and procedures.

OWNER (2021)	Central Coordination
ACCOUNTABLE	Data and Analytics Master Plan Steering Committee
COMMUNITY OF PRACTICE	Data and Analytics Master Plan Steering Committee, Visualization, and related CoPs
RELATED SERVICES	<ul style="list-style-type: none"> • Strategic objectives • Enterprise policies and standards • Stewardship • Communities of practice coordination
EXAMPLE	Power BI dashboards were being created with varying graphical representations. A working group met to create a standardized template that improved cross-departmental intelligibility through consistent presentation and paging formats, incorporating a metadata page in every dashboard.



COMPETENCIES

Proficiencies	Competencies	Skill Level
Business Translation	Business Understanding	Intermediate
	Problem Statement Definition	Basic
	Business Value Articulation	Intermediate
	Requirements Definition	Basic
Data Identification and Acquisition	Data Source Identification	Intermediate
	Data Source System(s) Understanding	Basic
	Data Acquisition and Exploration	Basic
Data Evaluation, Processing and Transformation	Critical Data Elements Identification	Basic
	Quality Dimensions Assessment	Basic
	Data Quality Metrics Requirements	Basic
	Data Quality Assessment	Basic
Analytical Solution Deployment and Validation	Solution Creation	Basic
	Solution Testing and Validation	Basic
Results Interpretation	Analysis Interpretation	
	Business Implications	Basic
	Client Empowerment	Intermediate
	Total Competencies	15
	Highest Level	Intermediate



Many policies and standards apply to all data across the corporation. We made them easy to find and follow!

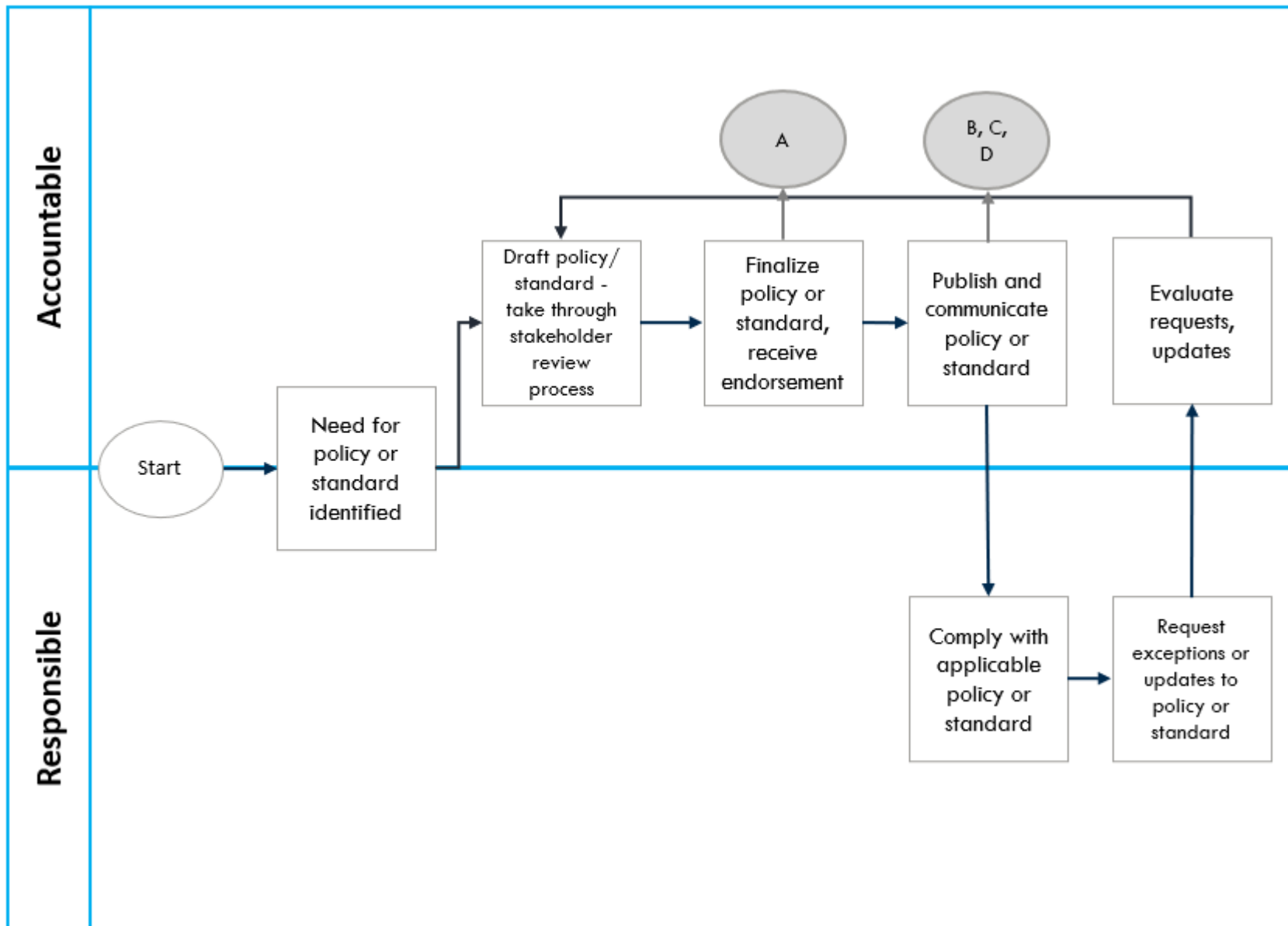
05. ENTERPRISE POLICIES & STANDARDS

OVERVIEW

The Enterprise Policies and Standards service defines, publishes, and maintains policy instruments for data and analytics practices. Policy instruments such as policies, regulations, standards, and procedures provide staff with clarity regarding what is expected of them. At their best, policy instruments remove ambiguity and enable staff to navigate complex situations without worrying about whether they are doing it right.

Policy areas for development are prioritized through other services. As gaps are identified, appropriate policy instruments are modified or created and published as part of an evergreen process. Defining the policy includes documenting the process and developing roles and responsibilities, testing with users, and selecting the appropriate type of policy instruments. Publishing policy instruments means making them accessible to their intended audience and promoting them to that audience. As business processes change, monitoring policy instruments and keeping them relevant is also required.

OWNER (2021)	Central Coordination
ACCOUNTABLE	Clerks
COMMUNITY OF PRACTICE	Digital Leadership Team, Data and Analytics Master Plan Steering Committee
RELATED SERVICES	<ul style="list-style-type: none">• Strategic objectives• Best practices
EXAMPLE	Enterprise Policies and Standards enabled the Information Sharing Policy and the Information Security Classification to be successfully achieved.



COMPETENCIES

Proficiencies	Competencies	Skill Level
Business Translation	Business Understanding	Advanced
	Problem Statement Definition	
	Business Value Articulation	
	Requirements Definition	Basic
Data Identification and Acquisition	Data Source Identification	
	Data Source System(s) Understanding	Basic
	Data Acquisition and Exploration	
Data Evaluation, Processing and Transformation	Critical Data Elements Identification	
	Quality Dimensions Assessment	
	Data Quality Metrics Requirements	
	Data Quality Assessment	
Analytical Solution Deployment and Validation	Solution Creation	
	Solution Testing and Validation	
Results Interpretation	Analysis Interpretation	
	Business Implications	
	Client Empowerment	
	Total Competencies Highest Level	3 Advanced

KNOW THE RULES!

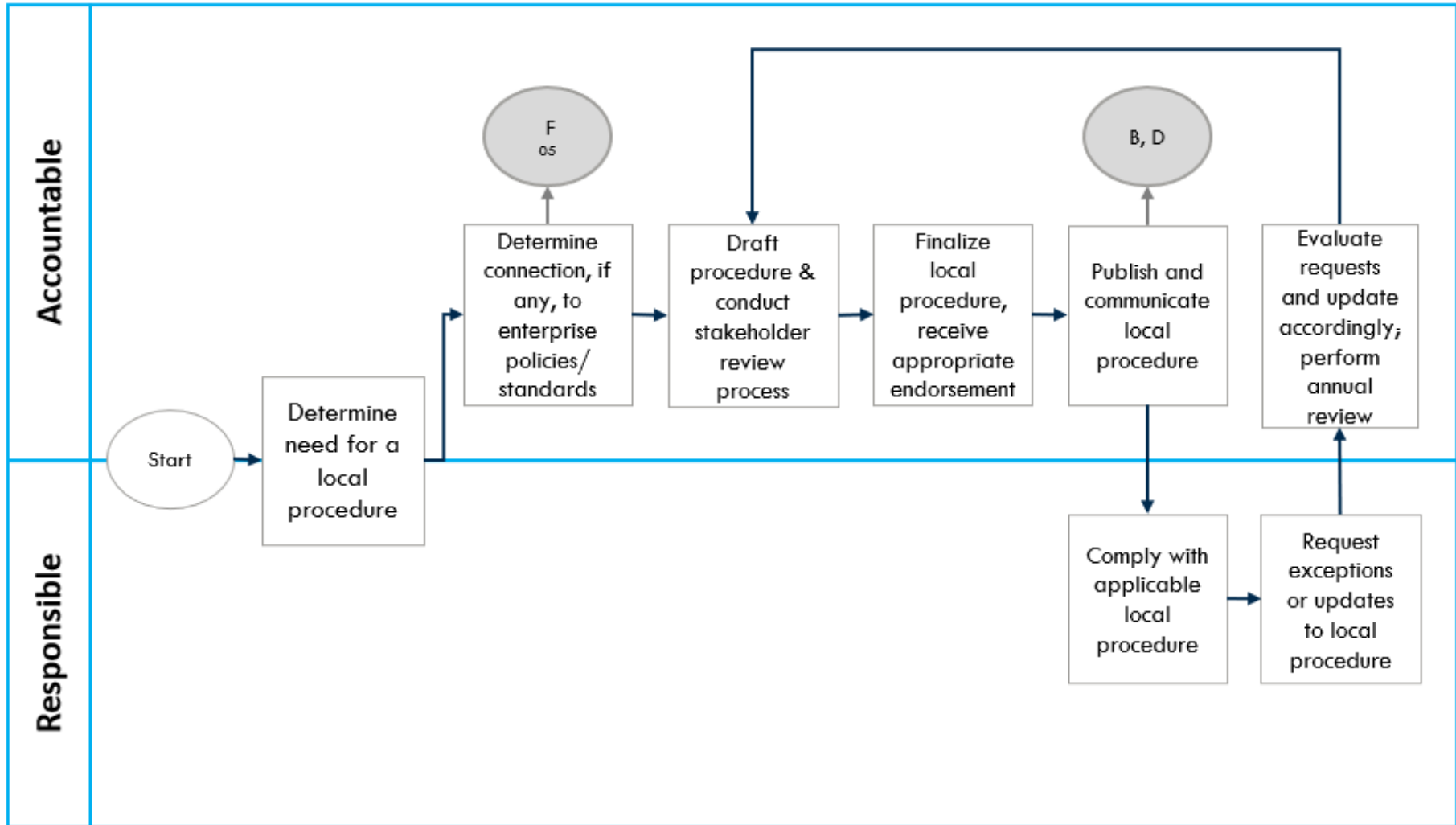
Learn how to create and follow specific data rules to keep your business area or department aligned!

06. LOCAL PROCEDURES

OVERVIEW

The Local Procedures service identifies the local procedures that, although they need to conform to enterprise policies and standards, are specific to a department or business unit because they refer to context-dependent processes. A local procedure should provide staff with clarity about what is expected of them. At its best, a local procedure will remove ambiguity and enable staff to navigate complex situations without worrying about whether they are doing it right or not. For example, a procedure guiding staff in meeting the reporting requirements of a water quality provincial regulation will not have relevance to staff working with transit data.

OWNER (2021)	Departmental Delivery
ACCOUNTABLE	Leader of Dept. Central Group
COMMUNITY OF PRACTICE	Data Stewardship Council
RELATED SERVICES	<ul style="list-style-type: none">• Enterprise policies and standards
EXAMPLE	The Local Procedures service enables departments to develop specific procedures relating to their circumstances that conform to corporate policies and standards. For example, ENV was able to create a departmental data strategy, and develop specific procedures to implement it, under the broader umbrella of the Data and analytics master plan.



COMPETENCIES

Proficiencies	Competencies	Skill Level
Business Translation	Business Understanding	Intermediate
	Problem Statement Definition	
	Business Value Articulation	
	Requirements Definition	Basic
Data Identification and Acquisition	Data Source Identification	
	Data Source System(s) Understanding	Basic
	Data Acquisition and Exploration	
Data Evaluation, Processing and Transformation	Critical Data Elements Identification	
	Quality Dimensions Assessment	
	Data Quality Metrics Requirements	
	Data Quality Assessment	
Analytical Solution Deployment and Validation	Solution Creation	
	Solution Testing and Validation	
Results Interpretation	Analysis Interpretation	
	Business Implications	
	Client Empowerment	
	Total Competencies Highest Level	3 Intermediate

We know people need data to do their jobs, but data also needs people to manage it. Learn how data stewardship can help sustain your data operations.



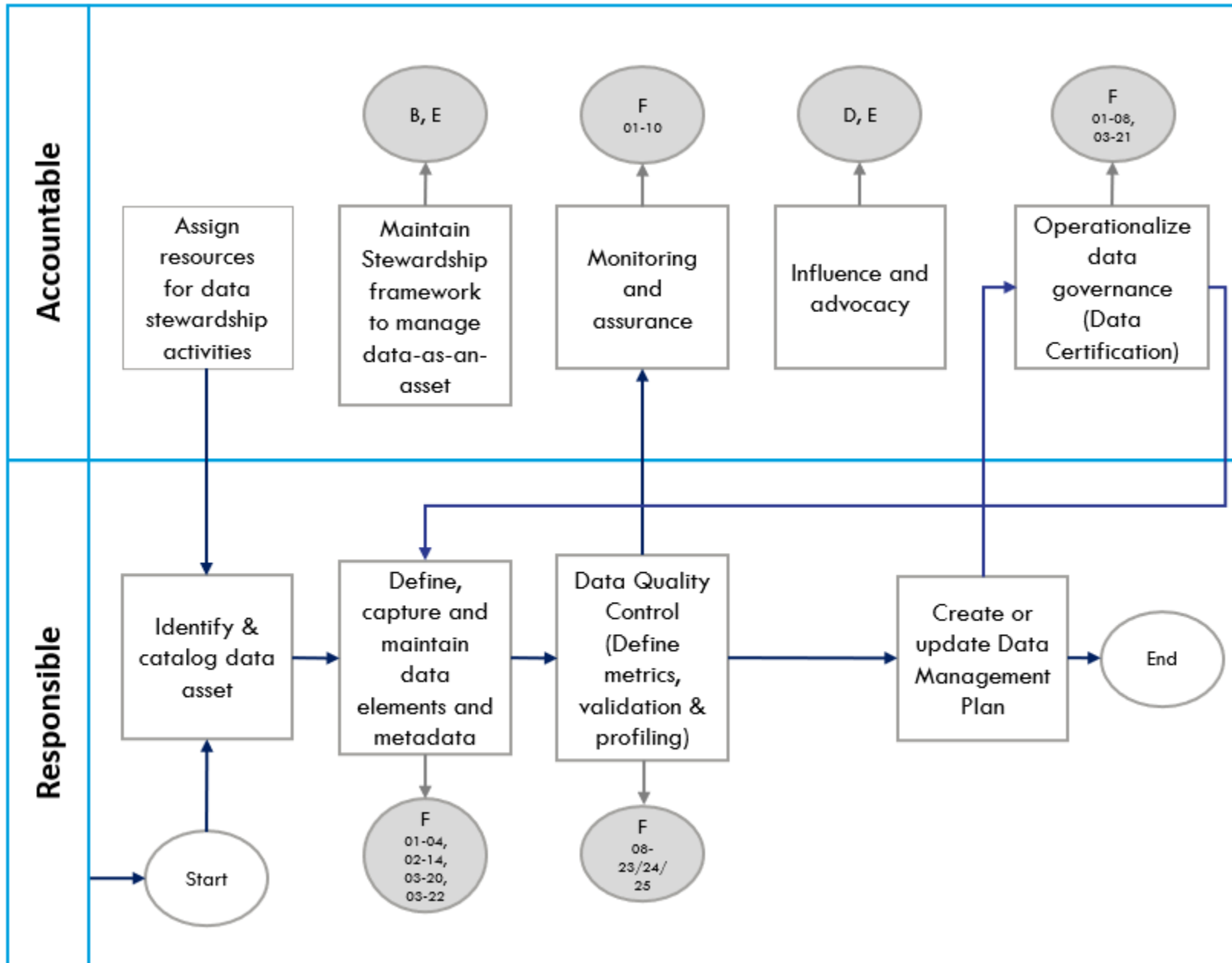
07. STEWARDSHIP

OVERVIEW

Data stewardship is about formalizing responsibility for data management activity throughout the data lifecycle, including data capture, maintenance, disposition, and data quality. The Stewardship service organizes and coordinates data stewardship, including establishing the formal stewardship of specific data resources (business process level), stewardship between data resources (branch and department level), and strategic stewardship (corporate level).

The Stewardship service goal is to improve trust in data through an initial emphasis on data quality and structured data management activity so that the greatest value can be extracted from datasets used across the organization. For example, if by adding a new field to the employment survey with defined quality parameters it becomes an important and trusted resource for health inspections or transit planners, new value is created.

OWNER (2021)	Departmental Delivery
ACCOUNTABLE	Leader of Dept. Central Group
COMMUNITY OF PRACTICE	Data Stewardship Council
RELATED SERVICES	<ul style="list-style-type: none"> • Data quality services • Data preparation and integration services • Learning and development
EXAMPLE	The Stewardship service is reflected in the YorkTrax initiative. YorkTrax is a corporate application spanning multiple business areas within the Region, and it has specific “YorkTrax Data Stewards” who regularly check the data quality to ensure the data is reliable.



COMPETENCIES

Proficiencies	Competencies	Skill Level
Business Translation	Business Understanding	Intermediate
	Problem Statement Definition	
	Business Value Articulation	
	Requirements Definition	
Data Identification and Acquisition	Data Source Identification	Intermediate
	Data Source System(s) Understanding	Intermediate
	Data Acquisition and Exploration	Basic
Data Evaluation, Processing and Transformation	Critical Data Elements Identification	Advanced
	Quality Dimensions Assessment	Intermediate
	Data Quality Metrics Requirements	Intermediate
	Data Quality Assessment	Basic
Analytical Solution Deployment and Validation	Solution Creation	
	Solution Testing and Validation	
Results Interpretation	Analysis Interpretation	
	Business Implications	
	Client Empowerment	
	Total Competencies Highest Level	8 Advanced

Audits are sometimes necessary to ensure best practices and data standards are being followed. If an audit is required for your data, let us know and we can help.

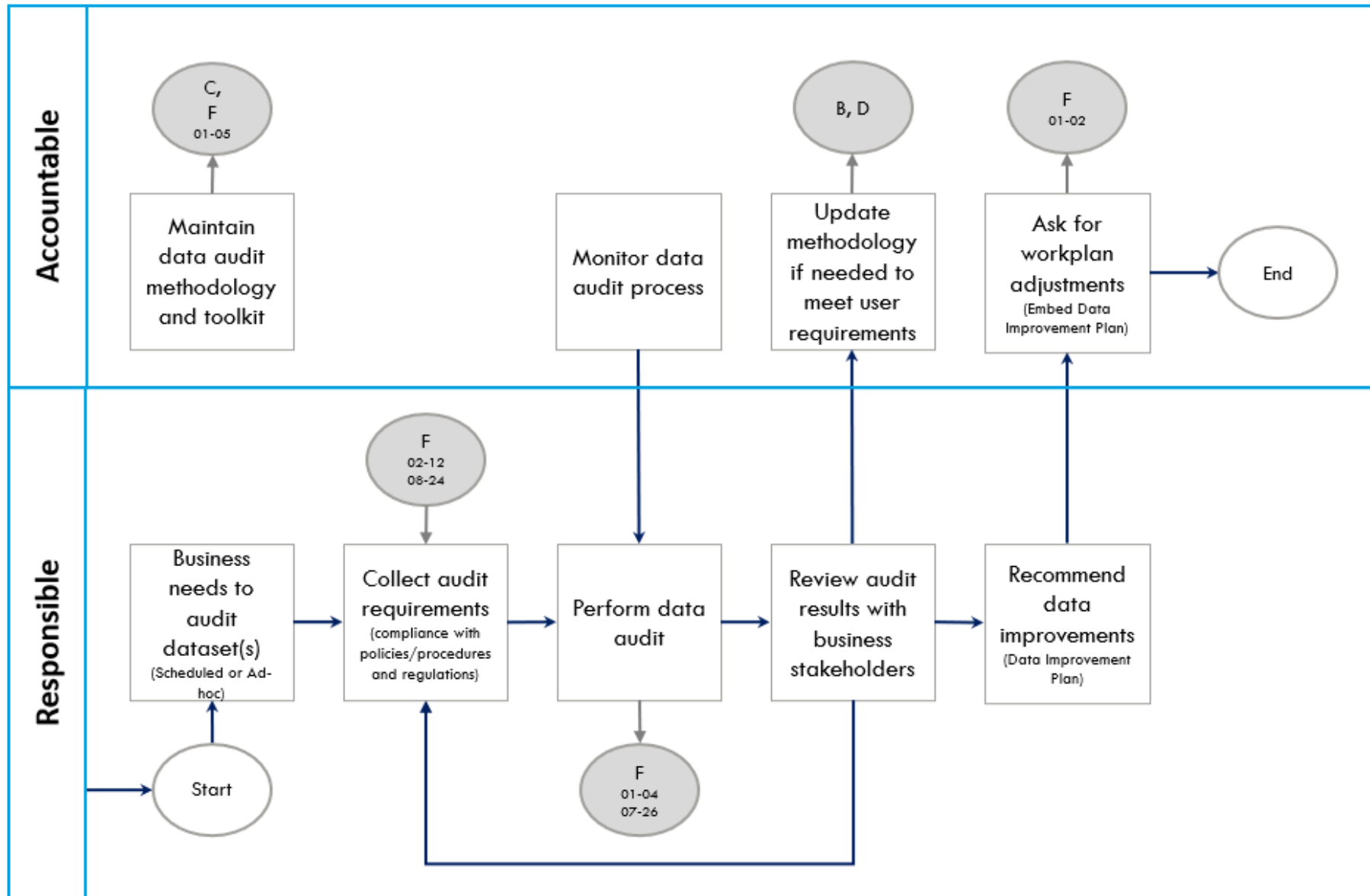


08. DATA AUDIT

OVERVIEW


The level of compliance with data standards and defined corporate best practices are measures of a mature data and analytics organization. The Data Audit (Standards Compliance) service monitors to check whether data management practices for a dataset are up to date, and asks: “has the appropriate metadata been defined to allow discovery and use, has it been authored and published, have data quality monitoring queries been run regularly, are data disposition rules clearly understood?”

OWNER (2021)	Departmental Delivery
ACCOUNTABLE	Leader of Dept. Central Group
COMMUNITY OF PRACTICE	Data Stewardship Council, Continuous Improvement
RELATED SERVICES	<ul style="list-style-type: none"> • Enterprise policies and standards • Monitoring readiness and progress • All other service areas
EXAMPLE	The Data Audit (Standards Compliance) service is led through the departments to ensure data management practices adhere to data standards and corporate best practices.



COMPETENCIES

Proficiencies	Competencies	Skill Level
Business Translation	Business Understanding	Intermediate
	Problem Statement Definition	
	Business Value Articulation	
	Requirements Definition	
Data Identification and Acquisition	Data Source Identification	
	Data Source System(s) Understanding	Intermediate
	Data Acquisition and Exploration	
Data Evaluation, Processing and Transformation	Critical Data Elements Identification	Intermediate
	Quality Dimensions Assessment	Intermediate
	Data Quality Metrics Requirements	Intermediate
	Data Quality Assessment	Intermediate
Analytical Solution Deployment and Validation	Solution Creation	
	Solution Testing and Validation	
Results Interpretation	Analysis Interpretation	
	Business Implications	
	Client Empowerment	Intermediate
	Total Competencies Highest Level	7 Intermediate



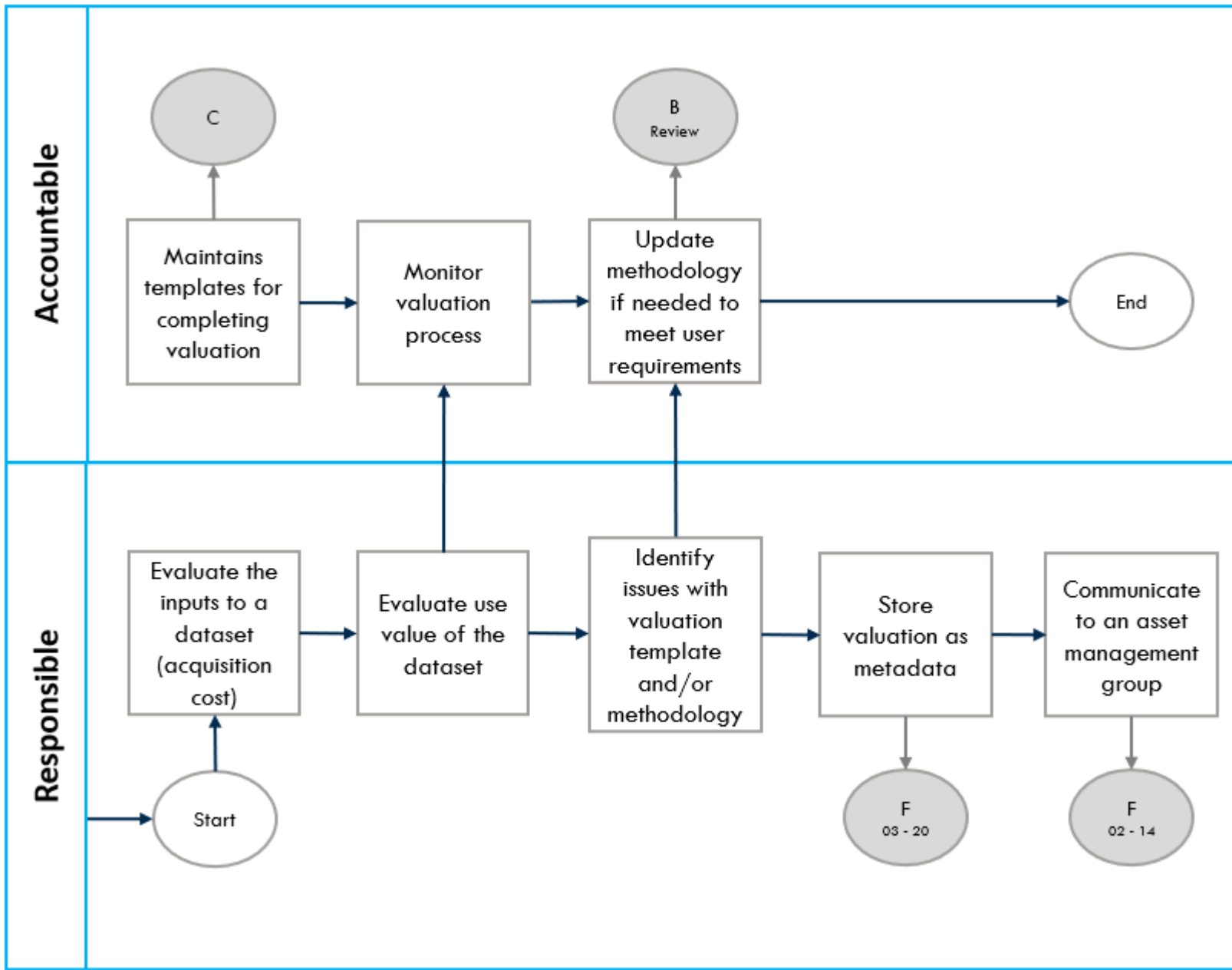
Get help quantifying the value of your data! Data is a corporate asset and has a tangible value.

09. DATA VALUATION

OVERVIEW

The Data Valuation service provides quantifiable measures of value for datasets to help plan how we manage our data assets and guide future data investments. Data has a measurable *acquisition* cost which is its purchase / contract value if it's externally sourced, or, if it's internal, the valuation can be based on the staff time collecting the data and the cost of the collection system. Data also has a *use* value. This is a function of how often and for what purposes it is accessed and used and is more difficult to quantify. The relation between acquisition cost and use-value provides insight on return on investment.

OWNER (2021)	Central Coordination
ACCOUNTABLE	DAVS
COMMUNITY OF PRACTICE	Corporate Asset Management
RELATED SERVICES	<ul style="list-style-type: none">• Classify
EXAMPLE	The Data Valuation service will help understand the value of data assets, and guide investment.



COMPETENCIES

Proficiencies	Competencies	Skill Level
Business Translation	Business Understanding	Advanced
	Problem Statement Definition	
	Business Value Articulation	Advanced
	Requirements Definition	
Data Identification and Acquisition	Data Source Identification	
	Data Source System(s) Understanding	
	Data Acquisition and Exploration	
Data Evaluation, Processing and Transformation	Critical Data Elements Identification	Advanced
	Quality Dimensions Assessment	
	Data Quality Metrics Requirements	
	Data Quality Assessment	Basic
Analytical Solution Deployment and Validation	Solution Creation	
	Solution Testing and Validation	
Results Interpretation	Analysis Interpretation	
	Business Implications	Intermediate
	Client Empowerment	
	Total Competencies Highest Level	5 Advanced

Have a great message you want to share? Learn how you can contribute to building a data informed culture at York Region!



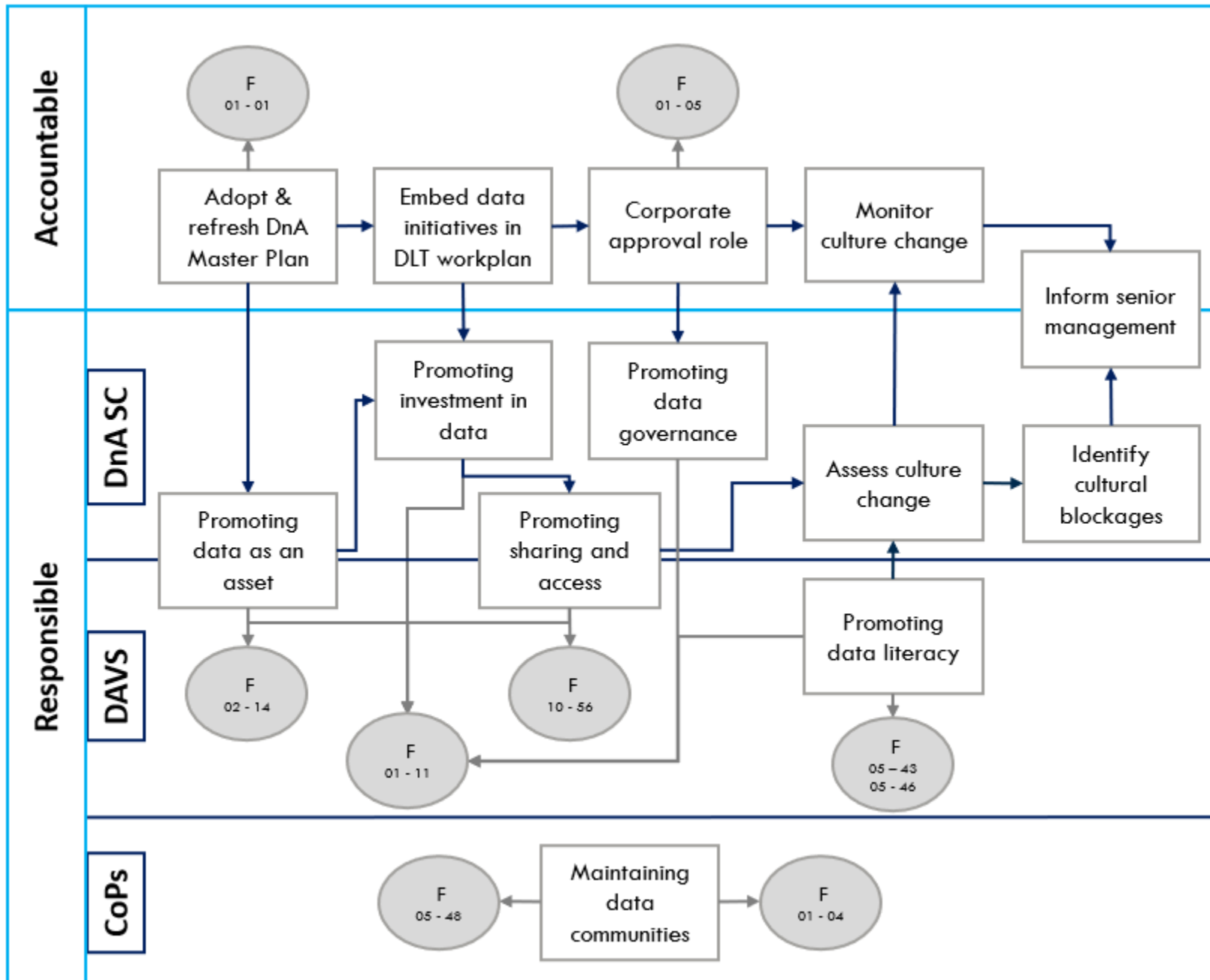
10. PROMOTING DATA CULTURE

OVERVIEW

A central idea of the Data and Analytics Master Plan is the culture of the organization must reflect the aspiration of data-informed decision making. Creating a Data Informed Culture is a pillar of the Plan. This means developing the understanding among staff about how to manage data, how to manipulate it to produce meaningful reports, and how to interpret it, while developing a stewardship ethos so that everyone cares about data quality.


The Promoting Data Culture service is about leadership in the culture and perspective change needed from staff and promoting data literacy. It requires alignment, so staff don't get mixed messages; mentoring and training; and on-going and consistent promotion.

OWNER (2021)	Central Coordination
ACCOUNTABLE	DAVS
COMMUNITY OF PRACTICE	Digital Leadership Team, Data and Analytics Master Plan Steering Committee
RELATED SERVICES	<ul style="list-style-type: none"> • Communication of DnA program • Data literacy services • Stewardship
EXAMPLE	The Promoting Data Culture service is reflected through the Data Heroes initiative in which staff who are “more than stewards” are recognized in an article about them and their work and highlighted through posters.



COMPETENCIES

Proficiencies	Competencies	Skill Level
Business Translation	Business Understanding	Advanced
	Problem Statement Definition	Basic
	Business Value Articulation	Advanced
	Requirements Definition	
Data Identification and Acquisition	Data Source Identification	
	Data Source System(s) Understanding	
	Data Acquisition and Exploration	
Data Evaluation, Processing and Transformation	Critical Data Elements Identification	
	Quality Dimensions Assessment	
	Data Quality Metrics Requirements	
	Data Quality Assessment	
Analytical Solution Deployment and Validation	Solution Creation	
	Solution Testing and Validation	
Results Interpretation	Analysis Interpretation	
	Business Implications	Advanced
	Client Empowerment	Advanced
	Total Competencies	5
	Highest Level	Advanced



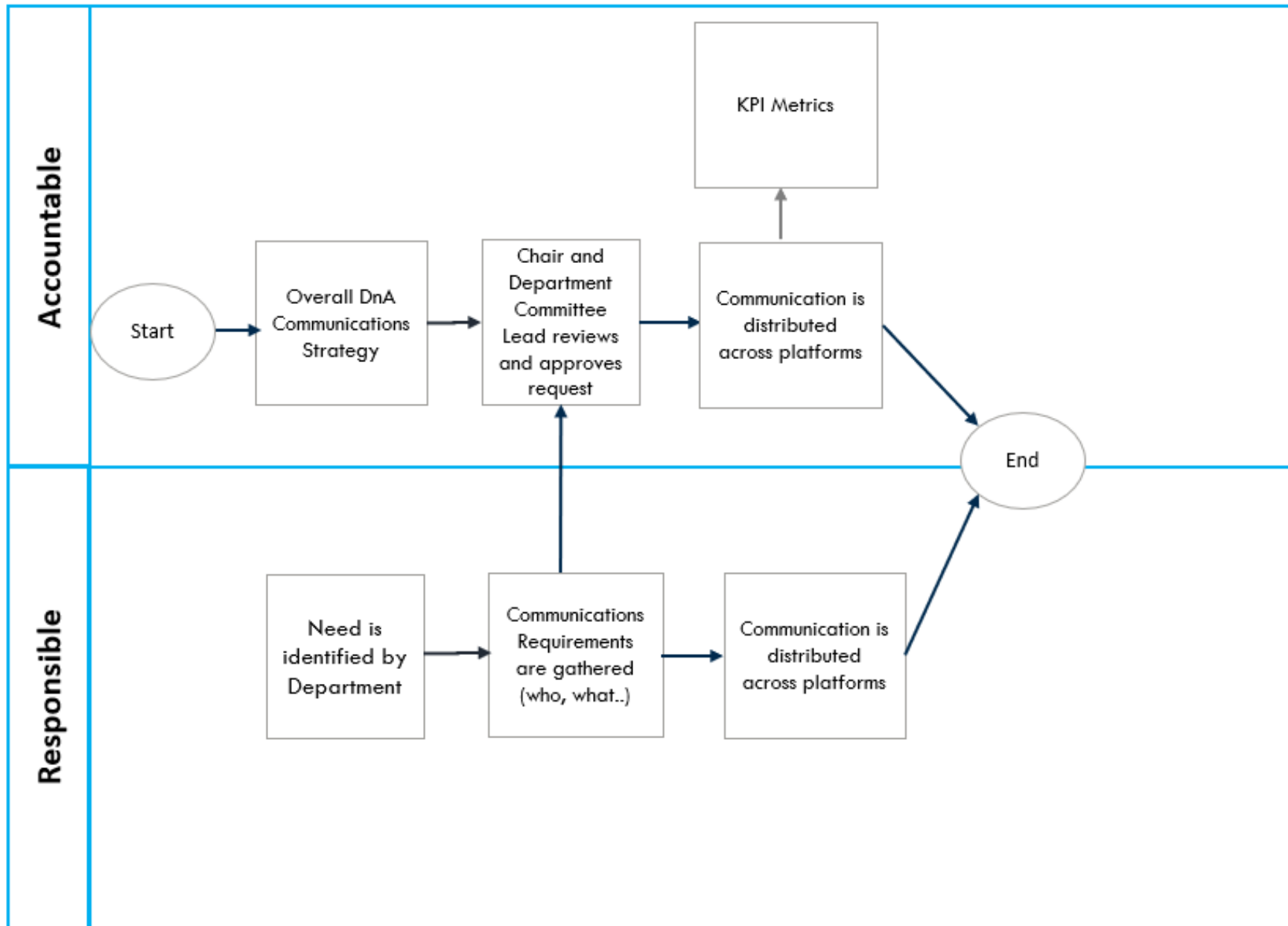
Have a great message you want to share? Learn how you can contribute to building a data informed culture at York Region!

11. COMMUNICATION OF DnA PROGRAM

OVERVIEW

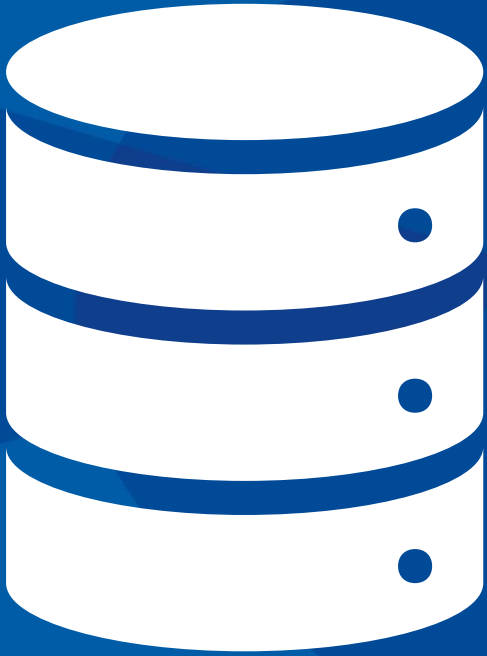
The Communication of DnA Program service provides staff across the corporation an overall view of the Data and Analytics Master Plan, and insight into its constituent projects. It should help influence the culture of the organization but is not intended to be the sole vehicle for cultural change. The service should answer questions, invite inquiries, stimulate interest, and dispel any myths that may develop.

OWNER (2021)	Central Coordination
ACCOUNTABLE	DAVS
COMMUNITY OF PRACTICE	Digital Leadership Team, Data and Analytics Master Plan Steering Committee, Communicators
RELATED SERVICES	<ul style="list-style-type: none">• Strategic objectives• Monitoring readiness and progress
EXAMPLE	The Communication of DnA Program service is reflected through the Region's internal, online DATATALK magazine.



COMPETENCIES

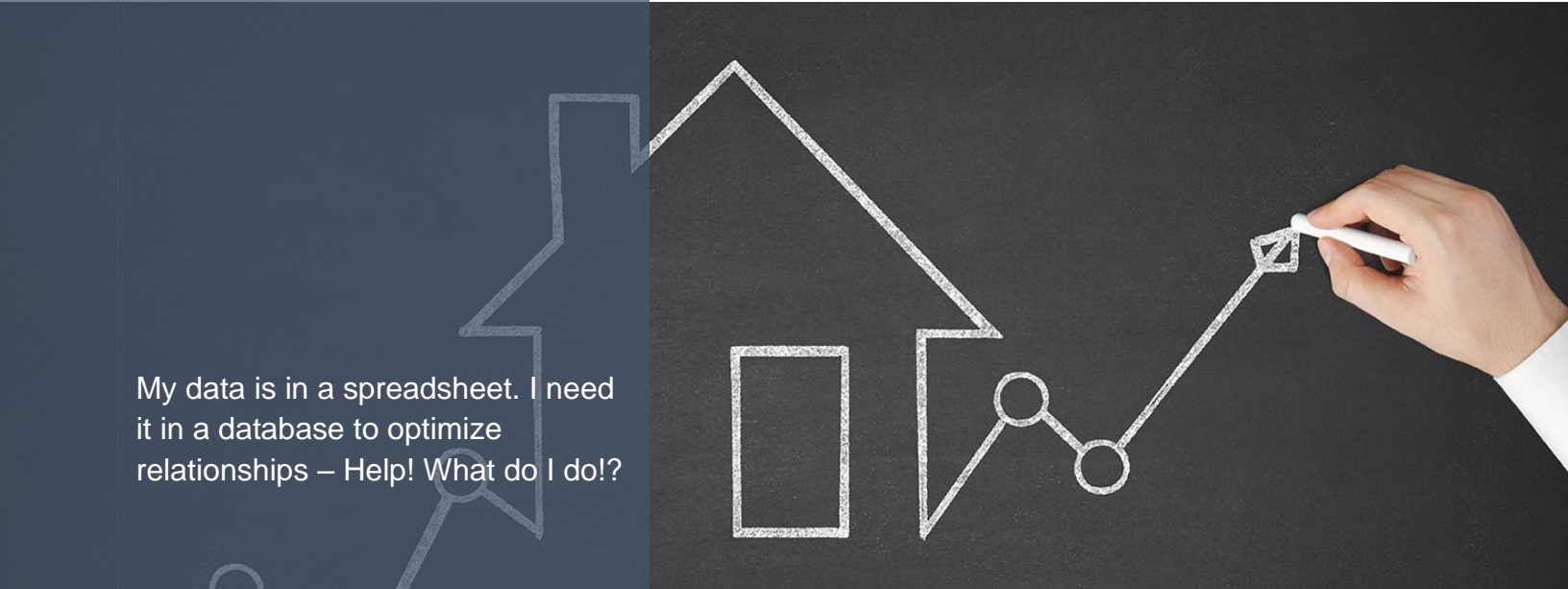
Proficiencies	Competencies	Skill Level
Business Translation	Business Understanding	Advanced
	Problem Statement Definition	Basic
	Business Value Articulation	
	Requirements Definition	
Data Identification and Acquisition	Data Source Identification	
	Data Source System(s) Understanding	
	Data Acquisition and Exploration	
Data Evaluation, Processing and Transformation	Critical Data Elements Identification	
	Quality Dimensions Assessment	
	Data Quality Metrics Requirements	
	Data Quality Assessment	
Analytical Solution Deployment and Validation	Solution Creation	
	Solution Testing and Validation	
Results Interpretation	Analysis Interpretation	
	Business Implications	Advanced
	Client Empowerment	Advanced
	Total Competencies	4
	Highest Level	Advanced



DATA ARCHITECTURE (02)

Modelling data to extract its greatest value

This knowledge area leverages a set of technologies to connect disparate applications and data sources to answer a business question.



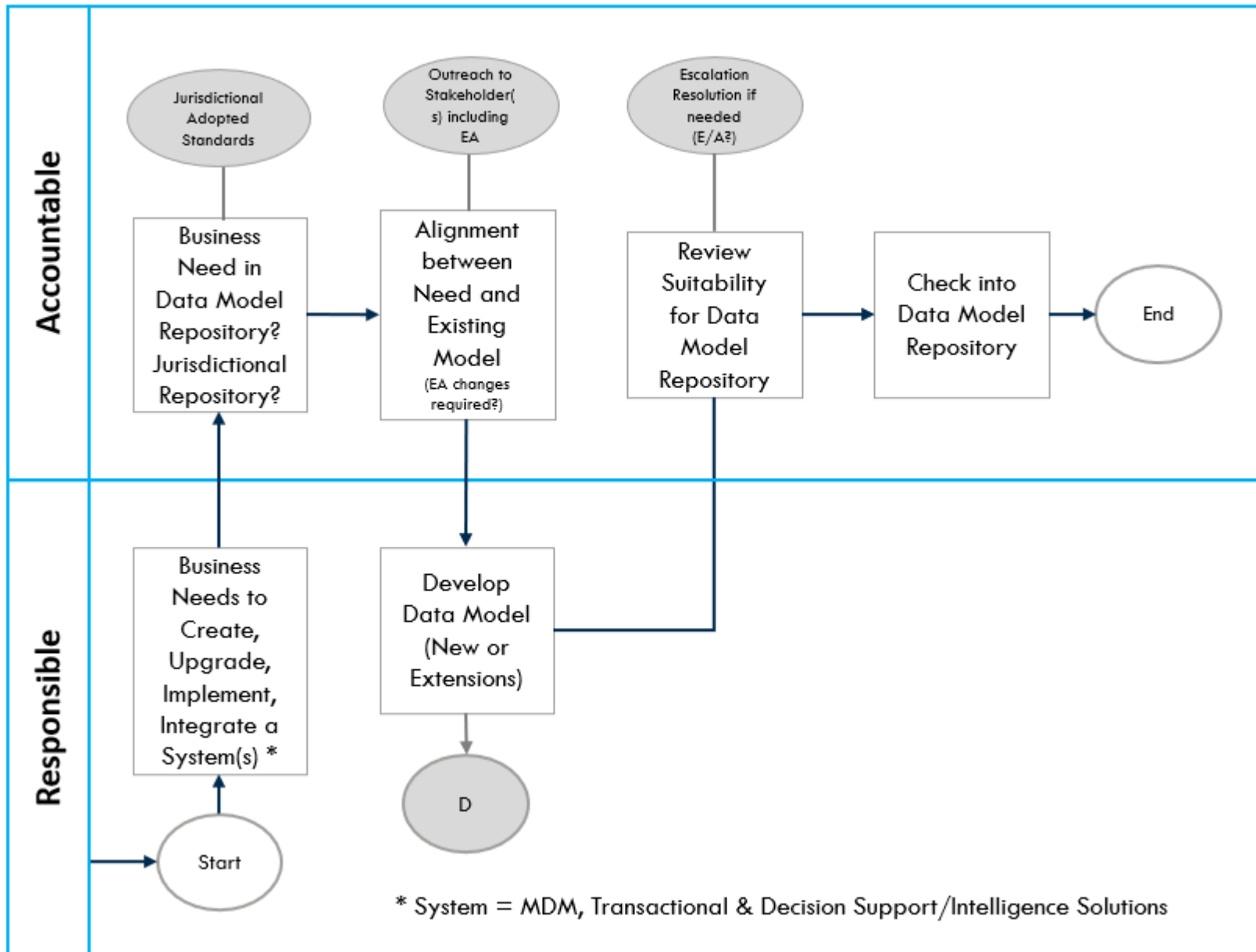
My data is in a spreadsheet. I need it in a database to optimize relationships – Help! What do I do?!

12. DATA MODELLING

OVERVIEW

Data modelling ensures that the business function is effectively supported by well-organized data. The Data Modelling service provides conceptual, logical, and physical models of database designs, showing relationships between data entities independent of the technology. At the project level, data modelling ensures the data design will support the business function. At the enterprise level it shows relationships between different databases and supports broad data management practices and master data management initiatives.

OWNER (2021)	Central Coordination
ACCOUNTABLE	DAVS
COMMUNITY OF PRACTICE	Architectural Review Board
RELATED SERVICES	<ul style="list-style-type: none">• Data security, access, and privacy services
EXAMPLE	The Data Modelling service supported the successful Healthy Data, Healthy Response initiative which is enabling the Region to effectively respond to the complex, often urgent, and critical needs of COVID-19.



COMPETENCIES

Proficiencies	Competencies	Skill Level
Business Translation	Business Understanding	Advanced
	Problem Statement Definition	Advanced
	Business Value Articulation	Advanced
	Requirements Definition	Advanced
Data Identification and Acquisition	Data Source Identification	Advanced/Expert
	Data Source System(s) Understanding	Advanced/Expert
	Data Acquisition and Exploration	Basic
Data Evaluation, Processing and Transformation	Critical Data Elements Identification	Advanced
	Quality Dimensions Assessment	Intermediate
	Data Quality Metrics Requirements	Intermediate
	Data Quality Assessment	Intermediate
Analytical Solution Deployment and Validation	Solution Creation	Intermediate
	Solution Testing and Validation	Intermediate
Results Interpretation	Analysis Interpretation	
	Business Implications	Advanced
	Client Empowerment	Intermediate
	Total Competencies Highest Level	15 Expert

DIAGRAMMING DATA FLOW

Get help tracing the life cycle of your data, from collection to reporting, and everything in between!

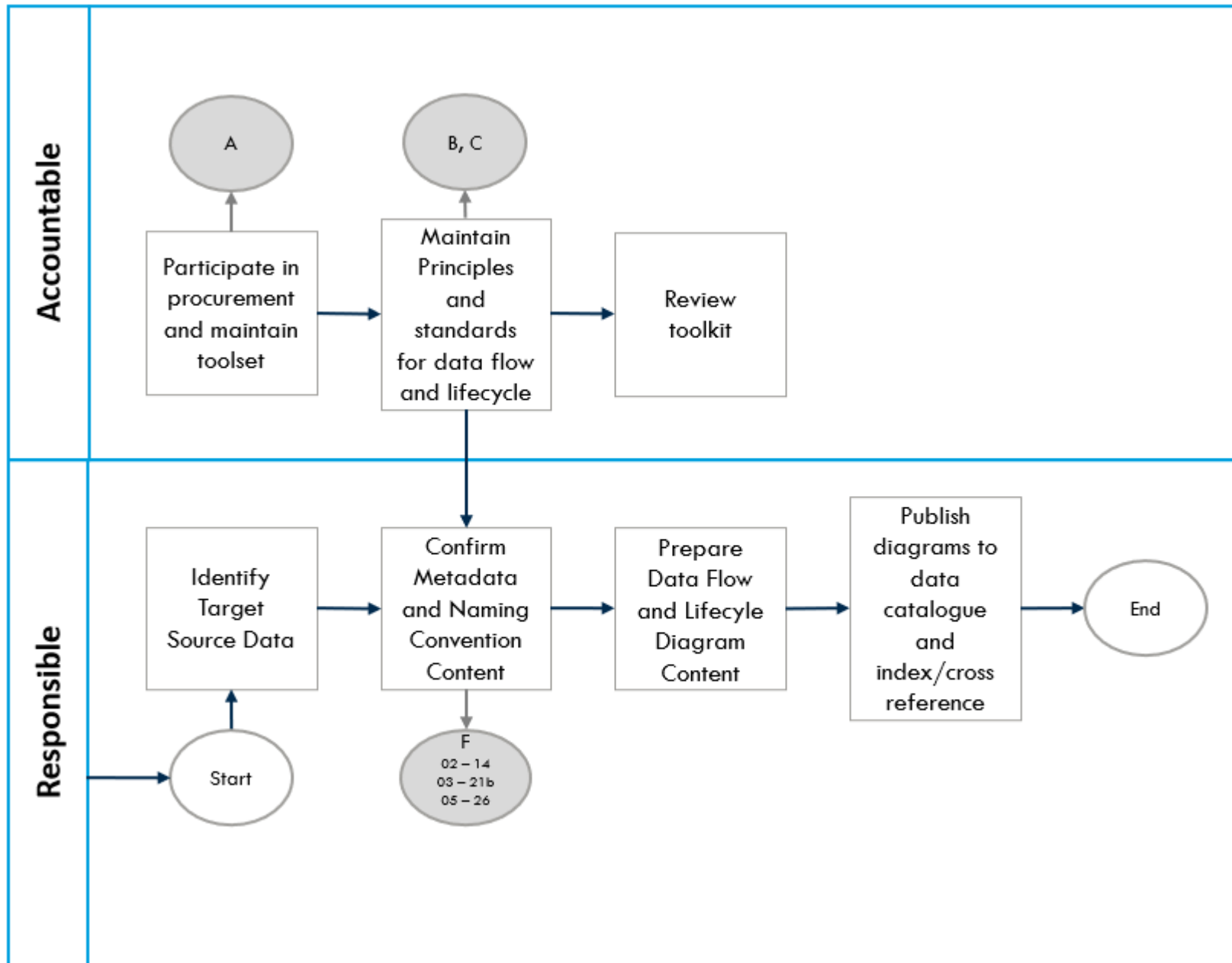


13. DATA FLOWS

OVERVIEW

Key artifacts of data architecture are data flow diagrams and data lifecycle diagrams. The Data Flows service maps the route of data as it moves from capture to use in reports and for decision-making.

OWNER (2021)	Departmental Delivery
ACCOUNTABLE	Leader of Dept. Central Group
COMMUNITY OF PRACTICE	Data Warehousing Community of Practice
RELATED SERVICES	<ul style="list-style-type: none">• ETL
EXAMPLE	The Data Flows service supported the successful development of the FindHelp 211 integration, enabling the use and sharing of social services agency programs and information between FindHelp and the Region.



COMPETENCIES

Proficiencies	Competencies	Skill Level
Business Translation	Business Understanding	Basic
	Problem Statement Definition	
	Business Value Articulation	
	Requirements Definition	Basic
Data Identification and Acquisition	Data Source Identification	Advanced
	Data Source System(s) Understanding	Advanced
	Data Acquisition and Exploration	
Data Evaluation, Processing and Transformation	Critical Data Elements Identification	
	Quality Dimensions Assessment	
	Data Quality Metrics Requirements	
	Data Quality Assessment	
Analytical Solution Deployment and Validation	Solution Creation	
	Solution Testing and Validation	
Results Interpretation	Analysis Interpretation	
	Business Implications	
	Client Empowerment	
	Total Competencies Highest Level	4 Advanced

Are you using the correct data in your business processes? We can help you identify the data you need!

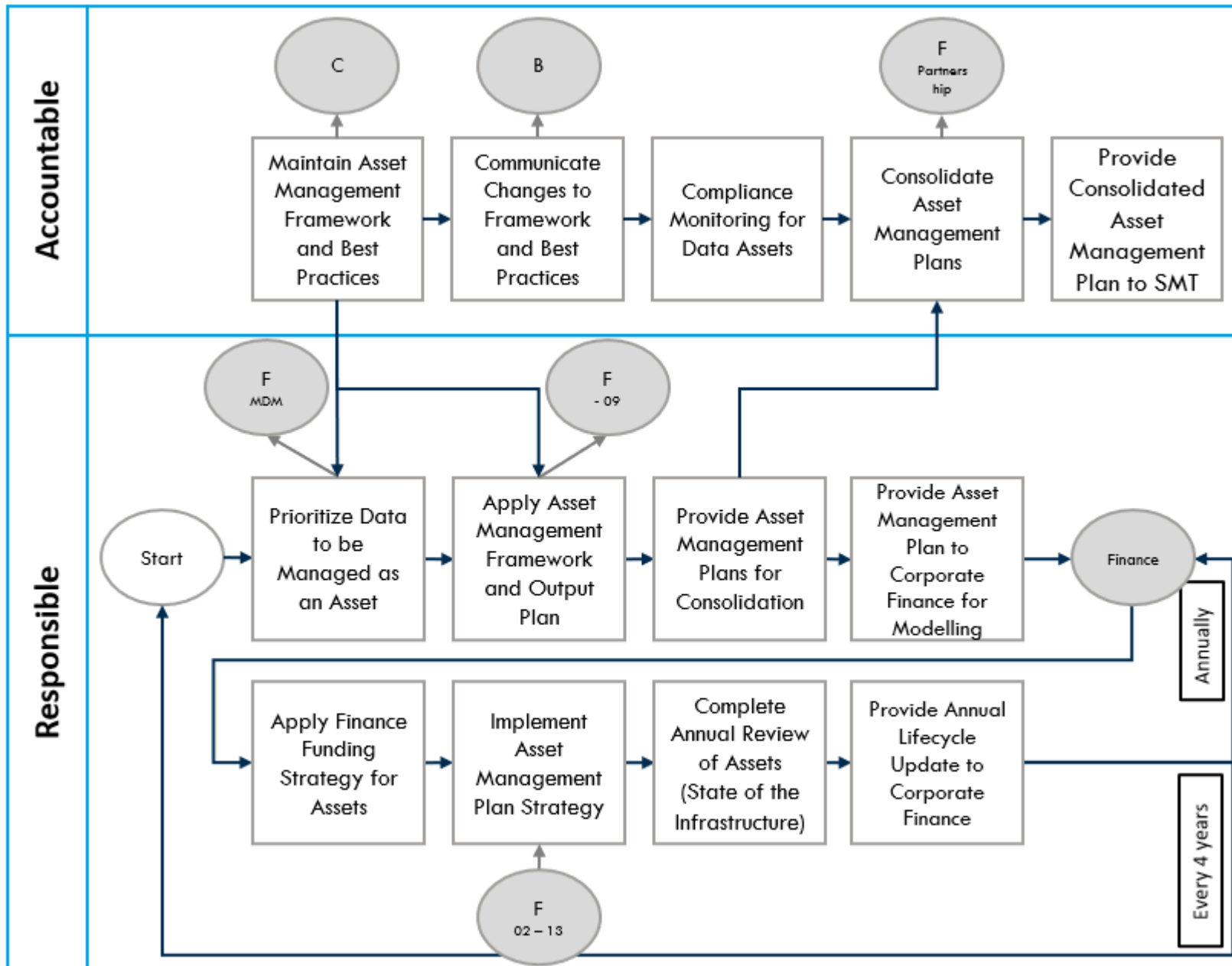


14. DATA ASSET MANAGEMENT

OVERVIEW


Are there data elements missing that would improve operations? Is there data with relatively little value being captured with legacy technologies? This service takes a strategic look at data assets and determines if they are suitable for the enterprise. It involves prioritizing data acquisitions based on their importance.

OWNER (2021)	Central Coordination
ACCOUNTABLE	DAVS
COMMUNITY OF PRACTICE	Architectural Review Board, Corporate Asset Management
RELATED SERVICES	<ul style="list-style-type: none"> • Data modelling • Data flows • Governance services • Data valuation • Partnership services (5)
EXAMPLE	The Data Asset Management service is key to the establishment of a framework for data asset management lifecycle analysis. Taking an enterprise strategic look at data assets and determining if they are the correct assets for the enterprise like the efforts TRN is undertaking to establish support for investment and operational requirements.



COMPETENCIES

Proficiencies	Competencies	Skill Level
Business Translation	Business Understanding	Advanced
	Problem Statement Definition	
	Business Value Articulation	Advanced
	Requirements Definition	Advanced
Data Identification and Acquisition	Data Source Identification	Expert
	Data Source System(s) Understanding	Intermediate
	Data Acquisition and Exploration	Expert
Data Evaluation, Processing and Transformation	Critical Data Elements Identification	Advanced
	Quality Dimensions Assessment	Intermediate
	Data Quality Metrics Requirements	Intermediate
	Data Quality Assessment	Intermediate
Analytical Solution Deployment and Validation	Solution Creation	
	Solution Testing and Validation	
Results Interpretation	Analysis Interpretation	
	Business Implications	Advanced
	Client Empowerment	Intermediate
	Total Competencies Highest Level	12 Expert



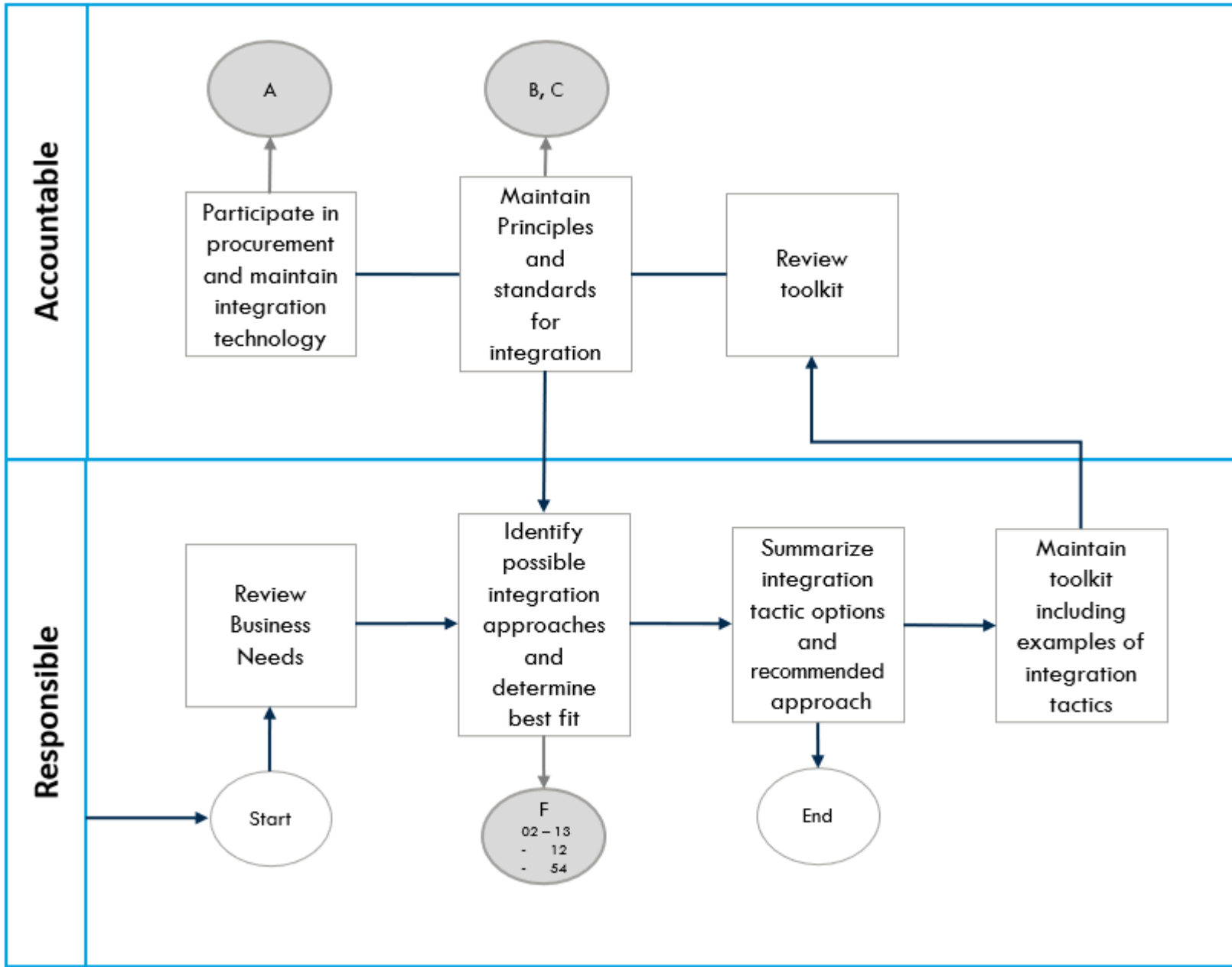
Data makes systems communicate.
Learn how to integrate regional data
assets into your system!

15. TACTICS FOR INTEGRATION

OVERVIEW

The Tactics for Integration service looks at the Region's data assets and their host systems and develops recommendations for integrating datasets for more efficient management.

OWNER (2021)	Central Coordination
ACCOUNTABLE	ITS
COMMUNITY OF PRACTICE	Architectural Review Board
RELATED SERVICES	<ul style="list-style-type: none">• Data modelling• Data flows• Master and reference data management
EXAMPLE	The Tactics for Integration service supported the successful City Works / Salesforce integration , enabling the City works data to have broader access and use within the community of asset managers in the Region.



COMPETENCIES

Proficiencies	Competencies	Skill Level
Business Translation	Business Understanding	Expert
	Problem Statement Definition	Advanced
	Business Value Articulation	Advanced
	Requirements Definition	Expert
Data Identification and Acquisition	Data Source Identification	Advanced
	Data Source System(s) Understanding	Expert
	Data Acquisition and Exploration	
Data Evaluation, Processing and Transformation	Critical Data Elements Identification	Advanced
	Quality Dimensions Assessment	
	Data Quality Metrics Requirements	
	Data Quality Assessment	
Analytical Solution Deployment and Validation	Solution Creation	
	Solution Testing and Validation	
Results Interpretation	Analysis Interpretation	
	Business Implications	
	Client Empowerment	
	Total Competencies Highest Level	7 Expert

Is your data moving to a new system? As systems are retired, data must pack its boxes and move over to new systems, while keeping its integrity.

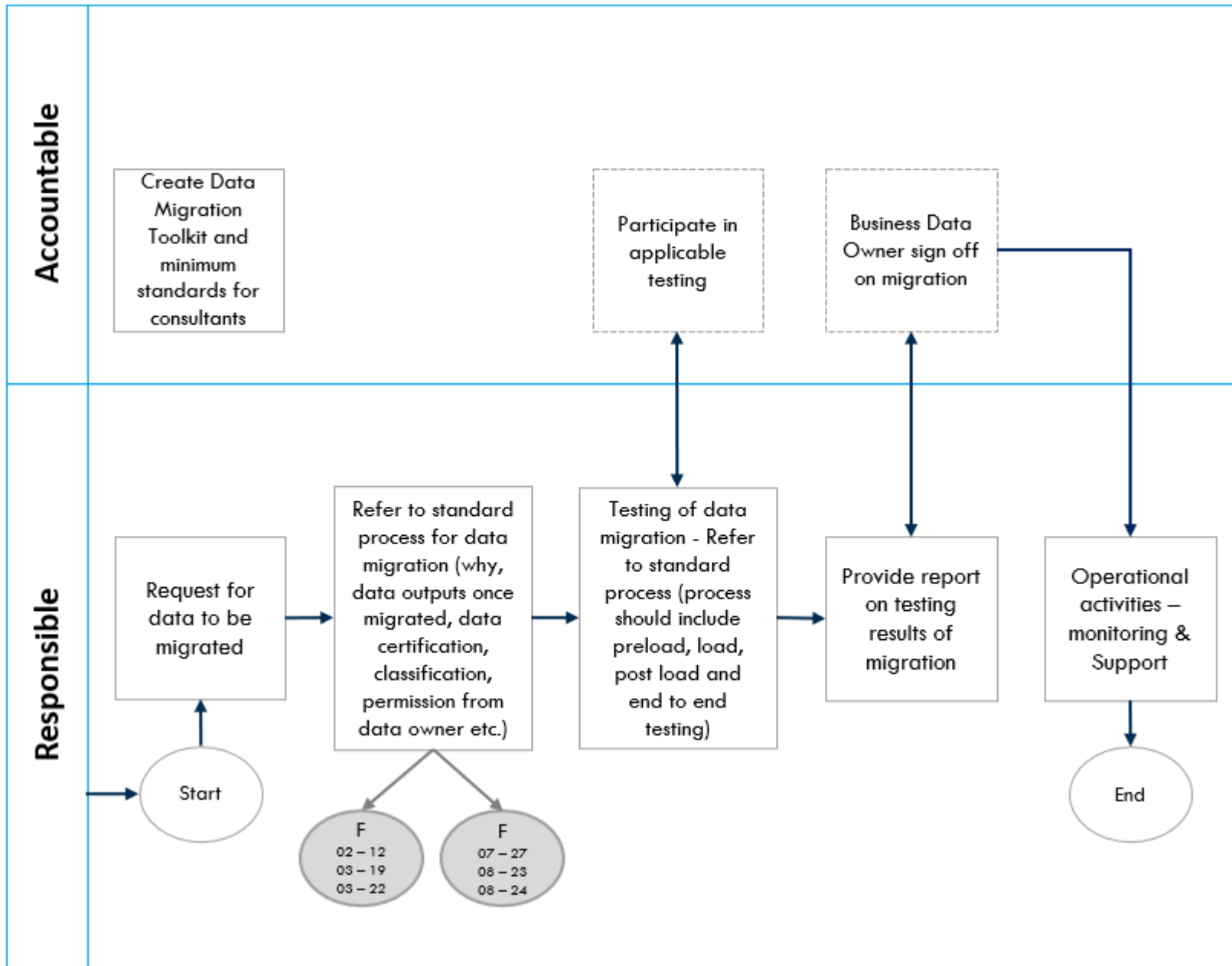


16. DATA MIGRATION PLANNING

OVERVIEW

The Data Migration Planning service is a technical service that plans the permanent movement of data from one system to another through upgrades or system replacement and consolidation.

OWNER (2021)	Departmental Delivery
ACCOUNTABLE	DAVS
COMMUNITY OF PRACTICE	Data Warehousing Advisory Board
RELATED SERVICES	<ul style="list-style-type: none"> • ETL and data preparation • Master and reference data management
EXAMPLE	The Data Migration Planning service is instrumental in the successful implementation of the Finance Forward initiative. Finance Forward is establishing a data warehouse by introducing data from multiple systems which will make it possible for financial staff throughout the Region to use the data more easily.



COMPETENCIES


Proficiencies	Competencies	Skill Level
Business Translation	Business Understanding	Advanced
	Problem Statement Definition	Advanced
	Business Value Articulation	Intermediate
	Requirements Definition	Advanced
Data Identification and Acquisition	Data Source Identification	Advanced
	Data Source System(s) Understanding	Advanced
	Data Acquisition and Exploration	Advanced
Data Evaluation, Processing and Transformation	Critical Data Elements Identification	Advanced
	Quality Dimensions Assessment	
	Data Quality Metrics Requirements	
	Data Quality Assessment	
Analytical Solution Deployment and Validation	Solution Creation	
	Solution Testing and Validation	
Results Interpretation	Analysis Interpretation	
	Business Implications	
	Client Empowerment	Advanced
	Total Competencies Highest Level	9 Advanced



MASTER & METADATA (03)

Helping staff find the right data

This knowledge area provides organization to collections of data to make it intelligible, searchable, accessible, and useful for users. Master data enables a whole-of-enterprise view of critical datasets shared across multiple business functions.



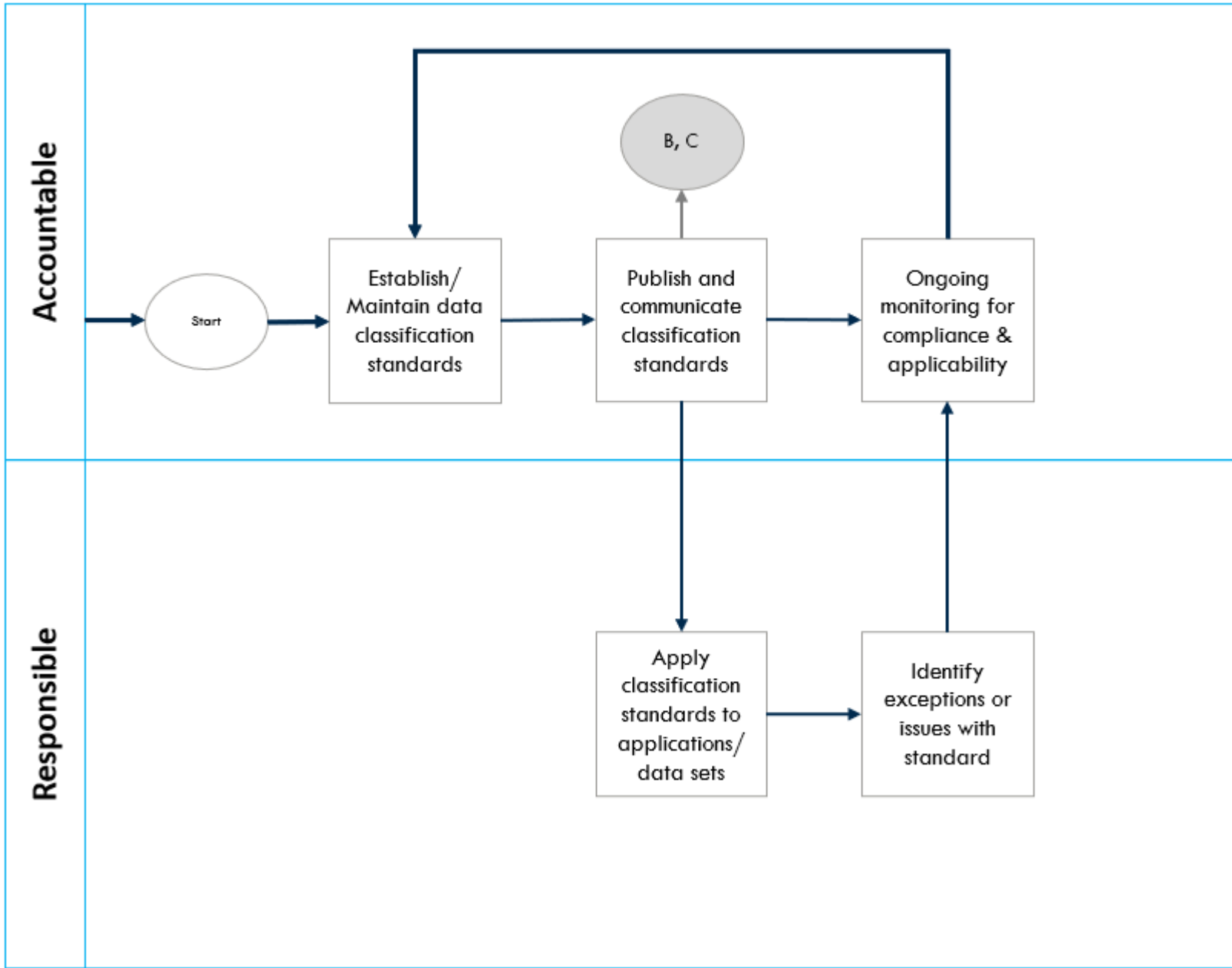
Categorize your data by value and risk, so it gets the attention it deserves!

19. CLASSIFY

OVERVIEW

Not every dataset needs the same investment in managing its quality or its security, nor does every dataset have the same value. The Classify service classifies datasets in terms of their quality requirements, security requirements and their value enables the appropriate levels of effort and resources to be applied for their management.

OWNER (2021)	Central Coordination
ACCOUNTABLE	Clerks
COMMUNITY OF PRACTICE	Data Stewardship Council
RELATED SERVICES	<ul style="list-style-type: none"> • Data catalogue • Enterprise policies and standards • Data valuation
EXAMPLE	The Classify service supported the development of the Region's Information Security Classification Standard which sets out four levels of information sensitivity (public, low, medium, high) and recommends security controls and safeguards required for each level so that all information and data can be classified.



COMPETENCIES

Proficiencies	Competencies	Skill Level
Business Translation	Business Understanding	Basic
	Problem Statement Definition	
	Business Value Articulation	
	Requirements Definition	
Data Identification and Acquisition	Data Source Identification	Advanced
	Data Source System(s) Understanding	Intermediate
	Data Acquisition and Exploration	
Data Evaluation, Processing and Transformation	Critical Data Elements Identification	Basic
	Quality Dimensions Assessment	
	Data Quality Metrics Requirements	Basic
	Data Quality Assessment	Basic
Analytical Solution Deployment and Validation	Solution Creation	
	Solution Testing and Validation	
Results Interpretation	Analysis Interpretation	
	Business Implications	
	Client Empowerment	
	Total Competencies Highest Level	6 Advanced

Need help creating or collecting information to describe your data? We are here to help you.

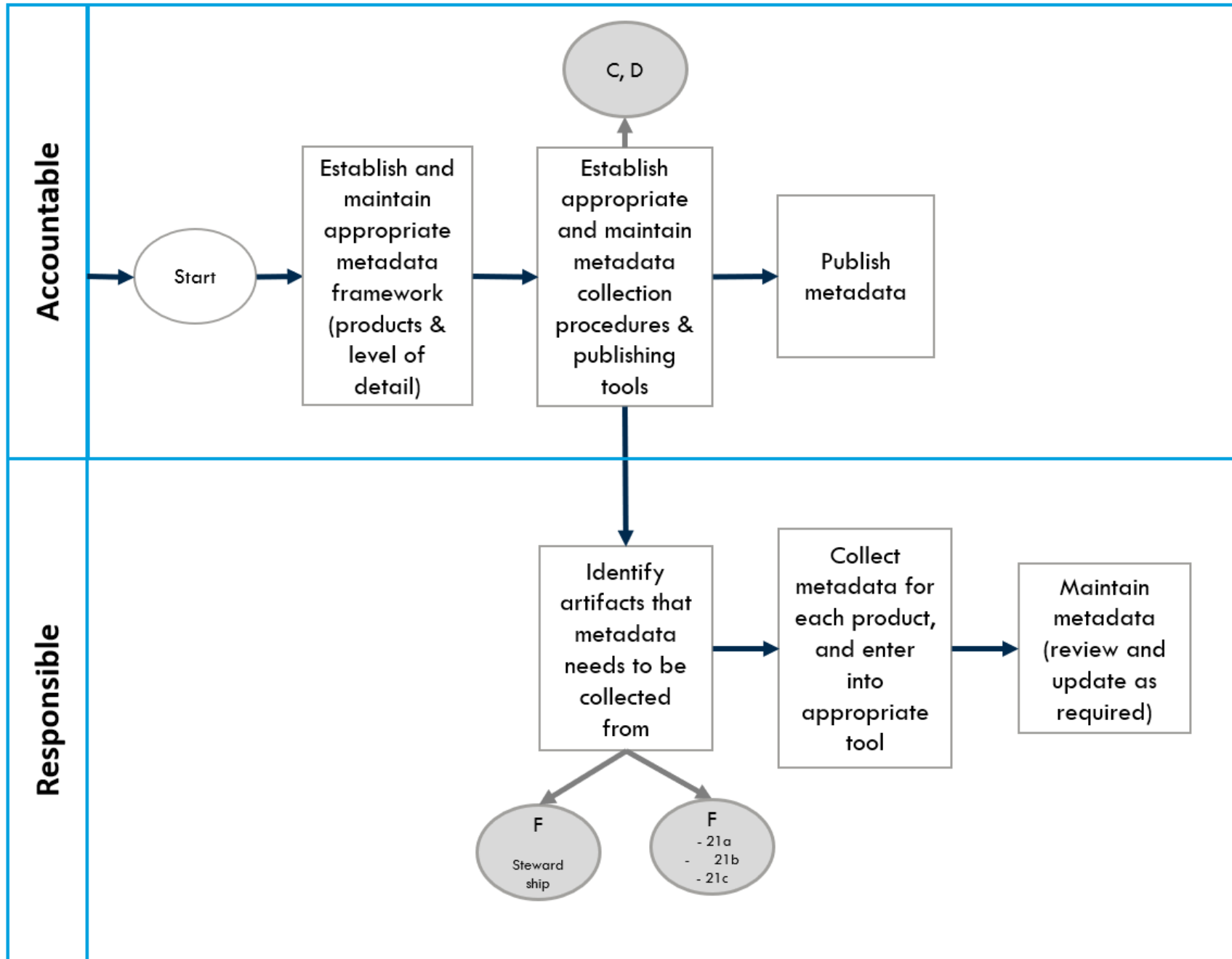


20. METADATA COLLECTION

OVERVIEW

The Metadata Collection service creates and captures information (by automated routines and/or manual entry) so that datasets can be more easily and effectively discovered and used. Descriptive and analytic metadata are collected for the dataset and data elements. Technical metadata is collected about where / how a dataset is stored. The related data dictionary and business glossary provide a detailed business context with which to interpret the metadata and the dataset. Glossary terms are negotiated to remove any ambiguity within the organization.

OWNER (2021)	Departmental Delivery
ACCOUNTABLE	DAVS
COMMUNITY OF PRACTICE	Data Stewardship Council
RELATED SERVICES	<ul style="list-style-type: none"> • Security, Privacy, and access services • Classify • Enterprise policies and standards
EXAMPLE	The Metadata Collection service is essential for success for the capturing and cataloguing of descriptive and technical information about datasets that allow for the discovery and use.



COMPETENCIES

Proficiencies	Competencies	Skill Level
Business Translation	Business Understanding	Advanced
	Problem Statement Definition	
	Business Value Articulation	Intermediate
	Requirements Definition	Intermediate
Data Identification and Acquisition	Data Source Identification	Expert
	Data Source System(s) Understanding	Intermediate
	Data Acquisition and Exploration	Basic
Data Evaluation, Processing and Transformation	Critical Data Elements Identification	Basic
	Quality Dimensions Assessment	Basic
	Data Quality Metrics Requirements	
	Data Quality Assessment	
Analytical Solution Deployment and Validation	Solution Creation	
	Solution Testing and Validation	
Results Interpretation	Analysis Interpretation	
	Business Implications	
	Client Empowerment	Intermediate
	Total Competencies	9
	Highest Level	Expert



Metadata

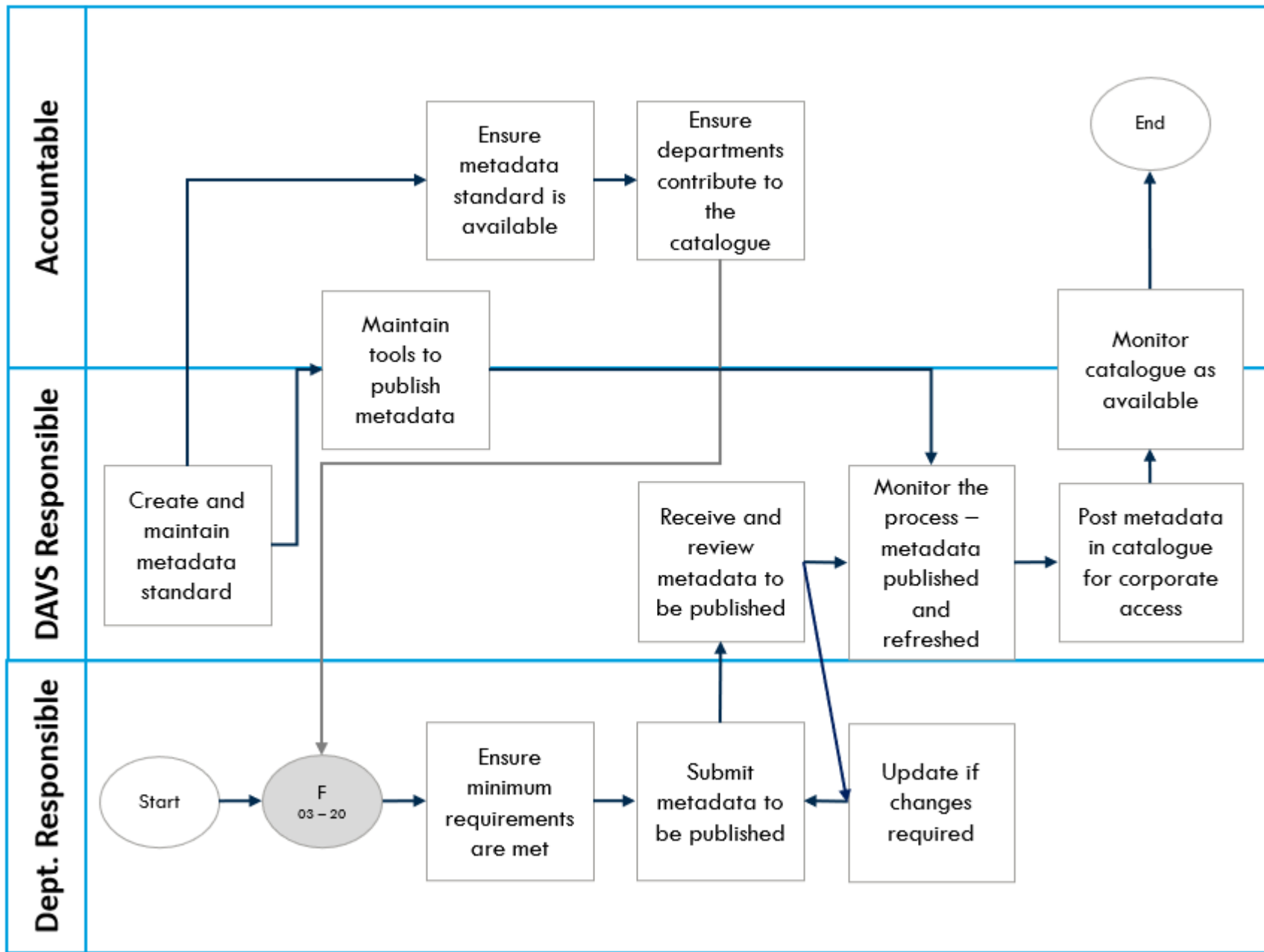
Is your data ready to be found?
Publish your metadata so other
users can find it in the Data
Catalogue.

21A. PUBLISHING TO CATALOGUE

OVERVIEW

Metadata publishing has three related products and services: data catalogue, data dictionary, and business glossary. Together they allow data to be discovered, interpreted, and used in context. The Metadata Publishing to Catalogue service provides on-line access to metadata resources for end users to use to discover, access and use data appropriately.

OWNER (2021)	Central Coordination
ACCOUNTABLE	DAVS
COMMUNITY OF PRACTICE	Data Stewardship Council
RELATED SERVICES	<ul style="list-style-type: none">• Metadata collection• Data literacy awareness
EXAMPLE	The Metadata Publishing to Catalogue service lets staff know what data is available for access, with metadata on each piece of data. This is available through the Data Catalogue and the Dashboard Catalogue.



COMPETENCIES

Proficiencies	Competencies	Skill Level
Business Translation	Business Understanding	Basic
	Problem Statement Definition	
	Business Value Articulation	
	Requirements Definition	
Data Identification and Acquisition	Data Source Identification	Intermediate
	Data Source System(s) Understanding	Intermediate
	Data Acquisition and Exploration	Basic
Data Evaluation, Processing and Transformation	Critical Data Elements Identification	
	Quality Dimensions Assessment	
	Data Quality Metrics Requirements	
	Data Quality Assessment	
Analytical Solution Deployment and Validation	Solution Creation	
	Solution Testing and Validation	
Results Interpretation	Analysis Interpretation	
	Business Implications	
	Client Empowerment	
	Total Competencies	4
	Highest Level	Intermediate



Metadata

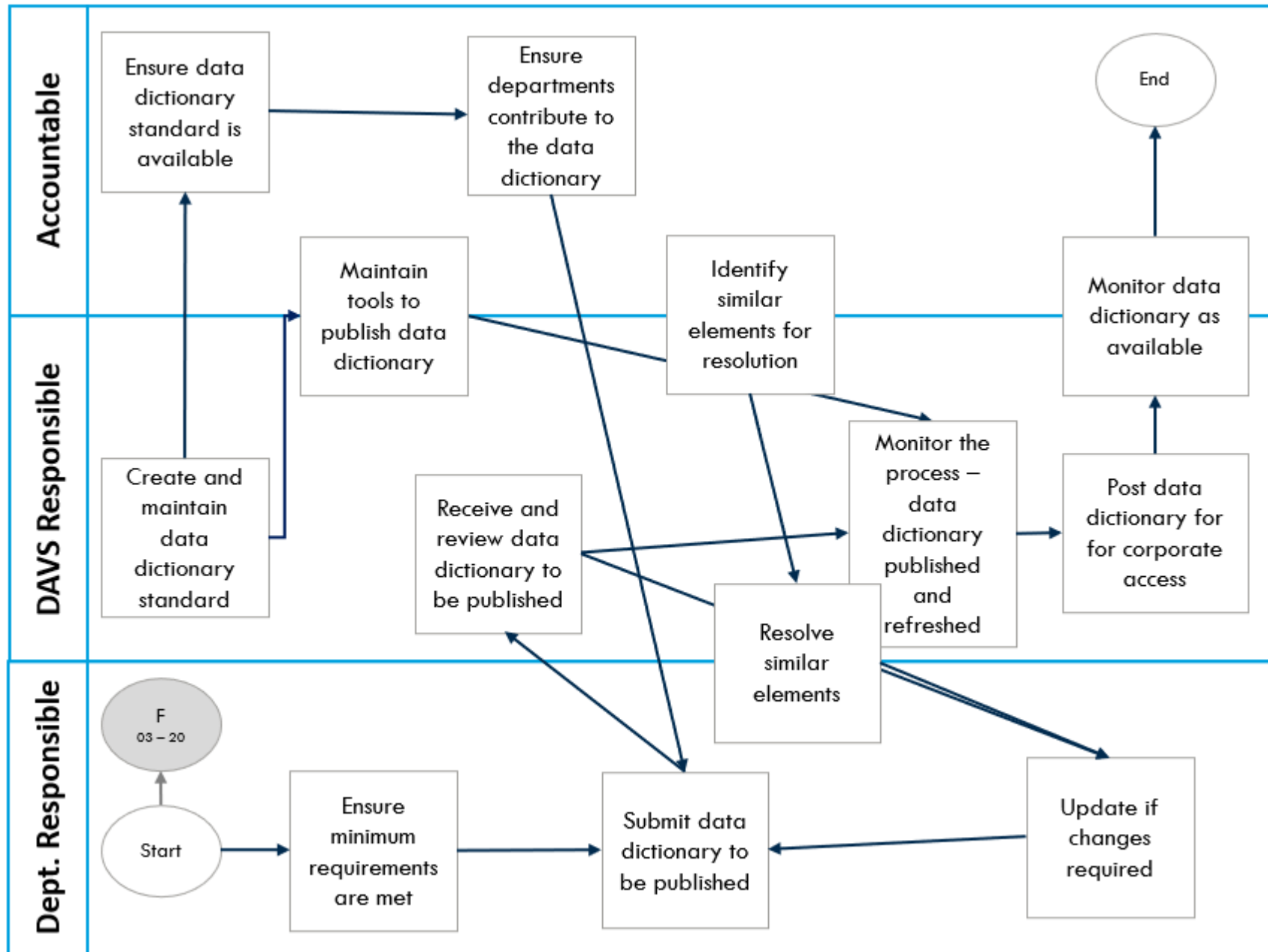
Is your data ready to be found?
Publish your metadata so other
users can find it in the Data
Catalogue.

21B. PUBLISHING TO DATA DICTIONARY

OVERVIEW

Metadata publishing has three related products and services: data catalogue, data dictionary, and business glossary. Together they allow data to be discovered, interpreted, and used in context. The metadata publishing service along with the metadata collection service is foundational to efficient analytics. The Metadata Publishing to Data Dictionary service makes the metadata more understandable and usable to end users through on-line resources so that data can be discoverable and used appropriately.

OWNER (2021)	Central Coordination
ACCOUNTABLE	DAVS
COMMUNITY OF PRACTICE	Data Stewardship Council
RELATED SERVICES	<ul style="list-style-type: none">• Metadata collection• Data literacy awareness
EXAMPLE	The Metadata Publishing to Data Dictionary service is key to help data users better understand field level data and where this data is used. The Region is currently establishing the data dictionary.



COMPETENCIES

Proficiencies	Competencies	Skill Level
Business Translation	Business Understanding	Basic
	Problem Statement Definition	
	Business Value Articulation	
	Requirements Definition	
Data Identification and Acquisition	Data Source Identification	Advanced
	Data Source System(s) Understanding	Intermediate
	Data Acquisition and Exploration	
Data Evaluation, Processing and Transformation	Critical Data Elements Identification	
	Quality Dimensions Assessment	
	Data Quality Metrics Requirements	
	Data Quality Assessment	
Analytical Solution Deployment and Validation	Solution Creation	
	Solution Testing and Validation	
Results Interpretation	Analysis Interpretation	
	Business Implications	
	Client Empowerment	
	Total Competencies Highest Level	3 Advanced



Metadata

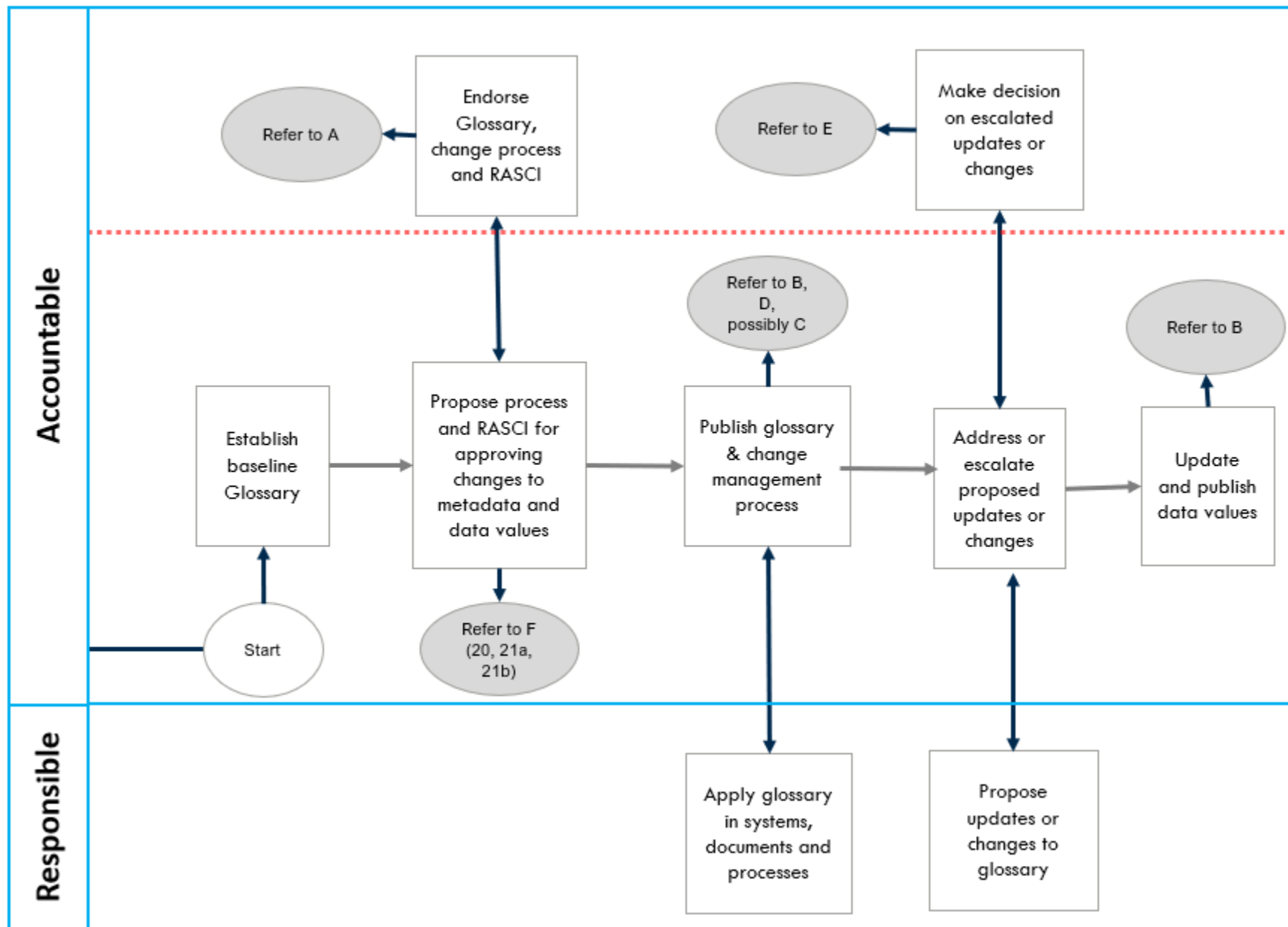
Is your data ready to be found?
Publish your metadata so other
users can find it in the Data
Catalogue.

21C. PUBLISHING TO GLOSSARY

OVERVIEW

Metadata publishing has three related products, that together allow the data to be discovered, interpreted, and used in context: data catalogue, data dictionary, and business glossary. This, with metadata collection, is a basic service required for efficient analytics. The Metadata Publishing to Glossary service makes metadata and the data to which it refers more understandable and therefore easier for users to discover, access and use.

OWNER (2021)	Central Coordination
ACCOUNTABLE	DAVS
COMMUNITY OF PRACTICE	Data Stewardship Council
RELATED SERVICES	<ul style="list-style-type: none">• Metadata collection• Data literacy awareness
EXAMPLE	The Metadata Publishing to Glossary service defines business and data terms. We are currently establishing the baseline Glossary metadata.



COMPETENCIES

Proficiencies	Competencies	Skill Level
Business Translation	Business Understanding	Intermediate
	Problem Statement Definition	
	Business Value Articulation	
	Requirements Definition	
Data Identification and Acquisition	Data Source Identification	
	Data Source System(s) Understanding	
	Data Acquisition and Exploration	
Data Evaluation, Processing and Transformation	Critical Data Elements Identification	Intermediate
	Quality Dimensions Assessment	
	Data Quality Metrics Requirements	
	Data Quality Assessment	
Analytical Solution Deployment and Validation	Solution Creation	
	Solution Testing and Validation	
Results Interpretation	Analysis Interpretation	
	Business Implications	
	Client Empowerment	
	Total Competencies Highest Level	2 Intermediate

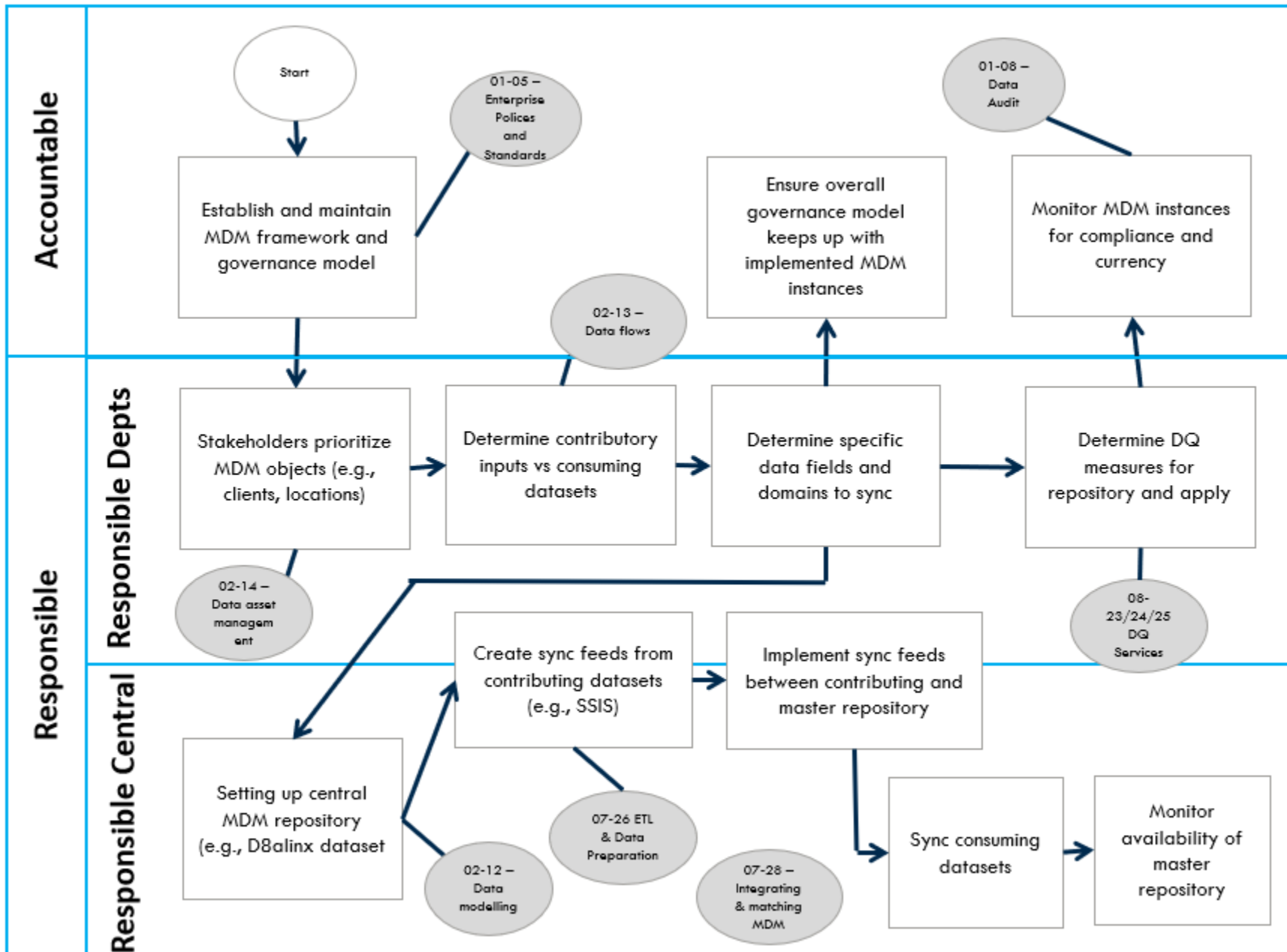
Ready for your data to be York Region's official data source? Get help integrating your data into systems region-wide!

22. MASTER & REFERENCE

OVERVIEW

The Master & Reference Data Management (MDM) service cleans, rationalizes, and integrates data into an enterprise-wide “system of record” for core business activities. MDM helps solve data duplication, lack of standardization, process disharmony, and difficulty in integrating similar data from disparate sources. MDM seeks to establish a “single source of truth” for core business data elements, such as “address”, “customer”, “asset”, “employee” that can be used with confidence by different systems and processes. The Master & Reference Data Management (MDM) service involves identifying those core business data elements, determining the best source(s) for maintaining a master dataset, architecting, and implementing the master data store and its update routines, and identifying all the datasets that should link to it.

OWNER (2021)	Central Coordination
ACCOUNTABLE	DAVS
COMMUNITY OF PRACTICE	Digital Leadership Team, Data and Analytics Master Plan Steering Committee
RELATED SERVICES	<ul style="list-style-type: none"> • Integrating and matching to master data • Data asset management • Data modelling • Data quality services
EXAMPLE	The Master & Reference Data Management (MDM) service is key to establish a single source of truth that is used across multiple systems. Currently developing an MDM framework using Employee ID to implement throughout the organization.



COMPETENCIES

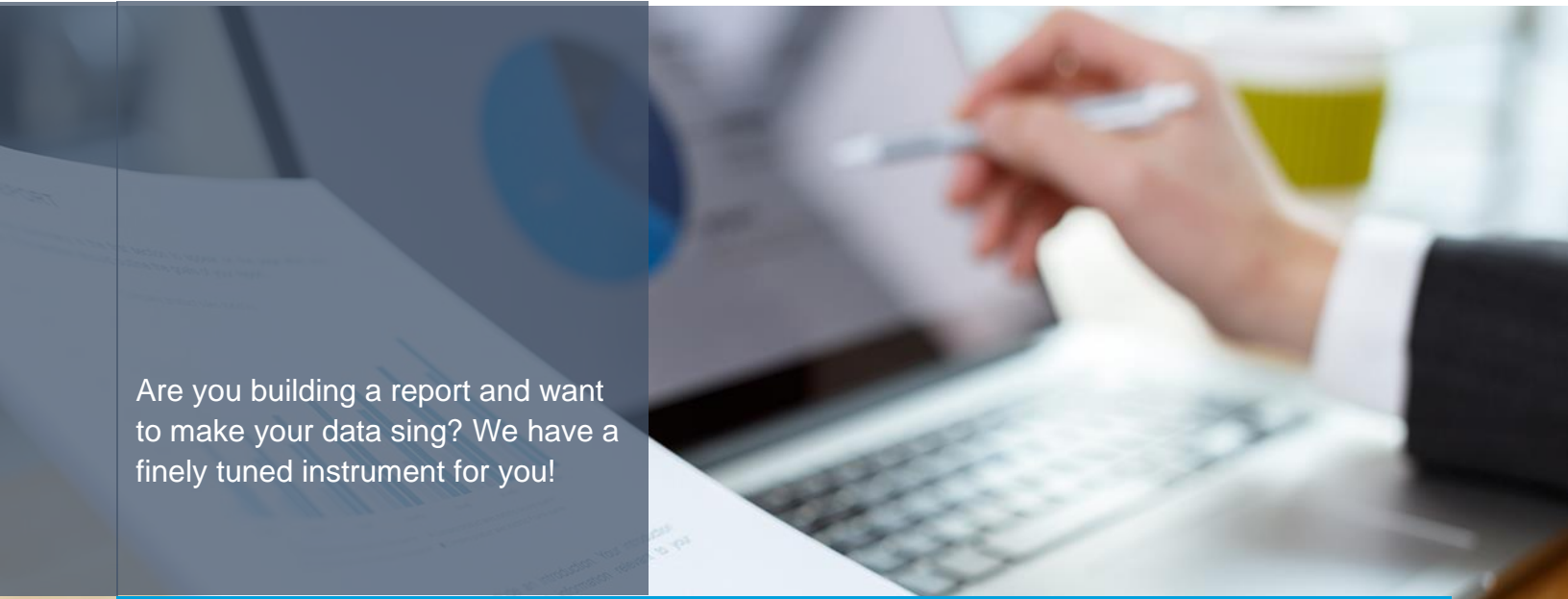
Proficiencies	Competencies	Skill Level
Business Translation	Business Understanding	Expert
	Problem Statement Definition	
	Business Value Articulation	
	Requirements Definition	Advanced
Data Identification and Acquisition	Data Source Identification	Expert
	Data Source System(s) Understanding	Expert
	Data Acquisition and Exploration	Advanced
Data Evaluation, Processing and Transformation	Critical Data Elements Identification	Expert
	Quality Dimensions Assessment	
	Data Quality Metrics Requirements	
	Data Quality Assessment	
Analytical Solution Deployment and Validation	Solution Creation	
	Solution Testing and Validation	
Results Interpretation	Analysis Interpretation	
	Business Implications	
	Client Empowerment	
	Total Competencies Highest Level	6 Expert



INSIGHTS & REPORTING (04)

Using data to tell a compelling narrative

This knowledge area provides the management, promotion and creation of guidelines, analytical approaches, and outputs to deliver insights, tell stories and foster business knowledge from data that engages users to increase their desire to use data to support decision making.



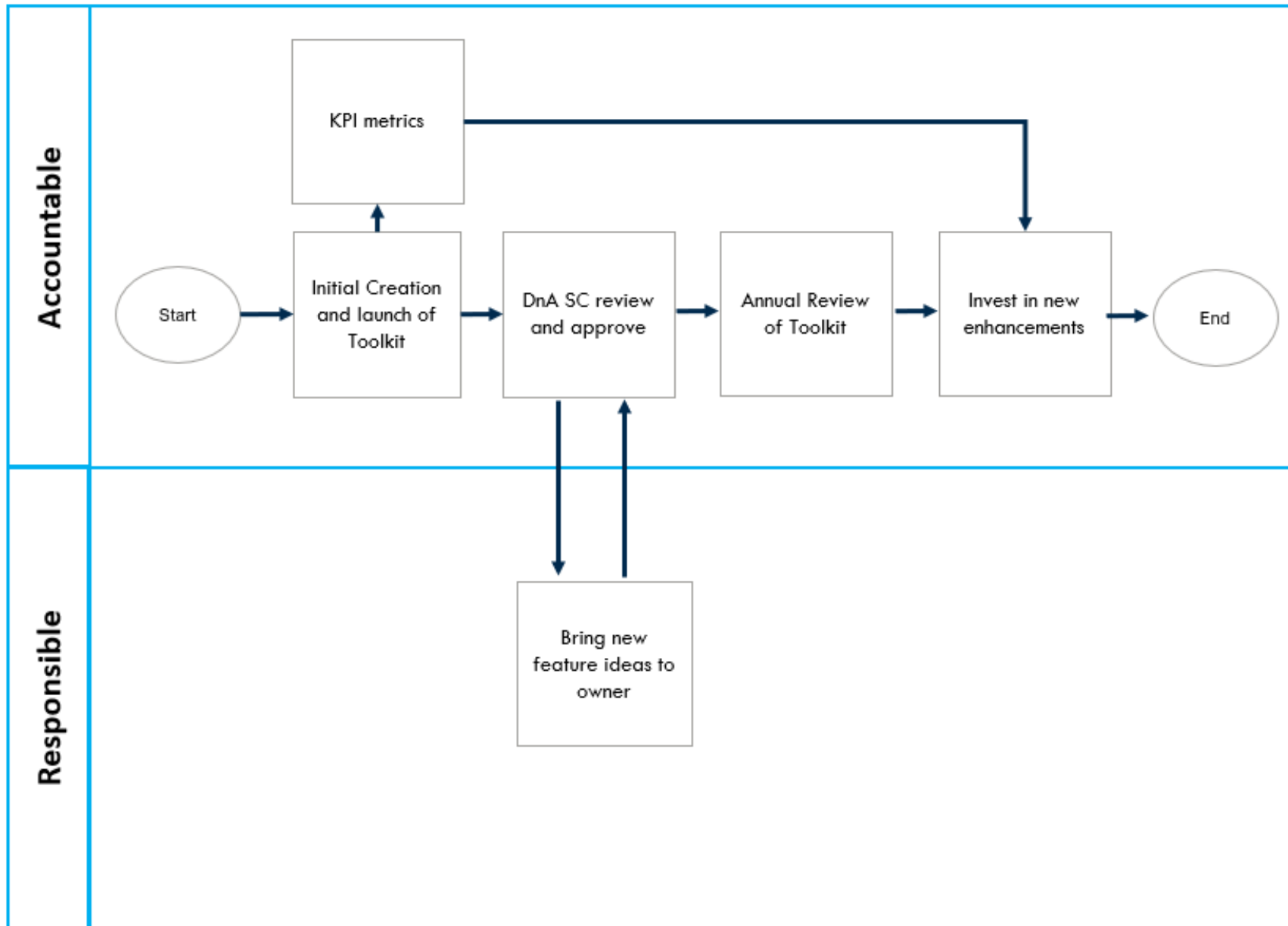
Are you building a report and want to make your data sing? We have a finely tuned instrument for you!

31. REPORT GENERATION WITH DATA

OVERVIEW

The Report Generation with Data Toolkit service provides users with tools and templates to create standardized data-driven outputs like formatted data tables and maps that can be re-run repeatedly against a dataset or combination of datasets. Self-serve resources available through a web portal would include report generation tools, templates, design samples and training materials, as well as contacts for support. Implementing the service requires a web portal to be built and maintained enabling users to access and maintain the resources within the portal. In some cases, the service would require specific reports to be customized for branches that don't have the skills or resources to use the self-service tools and templates.

OWNER (2021)	Central Coordination
ACCOUNTABLE	DAVS
COMMUNITY OF PRACTICE	Visual Analytics Advisory Board
RELATED SERVICES	<ul style="list-style-type: none">• ETL and data preparation• Cleansing• Metadata publishing
EXAMPLE	This toolkit helped Transportation Services develop paginated reports for many programs including Fleet Management with year-end reporting.



COMPETENCIES

Proficiencies	Competencies	Skill Level
Business Translation	Business Understanding	Intermediate
	Problem Statement Definition	Intermediate
	Business Value Articulation	
	Requirements Definition	Basic
Data Identification and Acquisition	Data Source Identification	Intermediate
	Data Source System(s) Understanding	Advanced
	Data Acquisition and Exploration	
Data Evaluation, Processing and Transformation	Critical Data Elements Identification	
	Quality Dimensions Assessment	
	Data Quality Metrics Requirements	
	Data Quality Assessment	
Analytical Solution Deployment and Validation	Solution Creation	Advanced
	Solution Testing and Validation	Intermediate
Results Interpretation	Analysis Interpretation	
	Business Implications	Basic
	Client Empowerment	Intermediate
	Total Competencies Highest Level	9 Advanced

Are you building a dashboard and want to make your data dance? We have tap shoes ready.



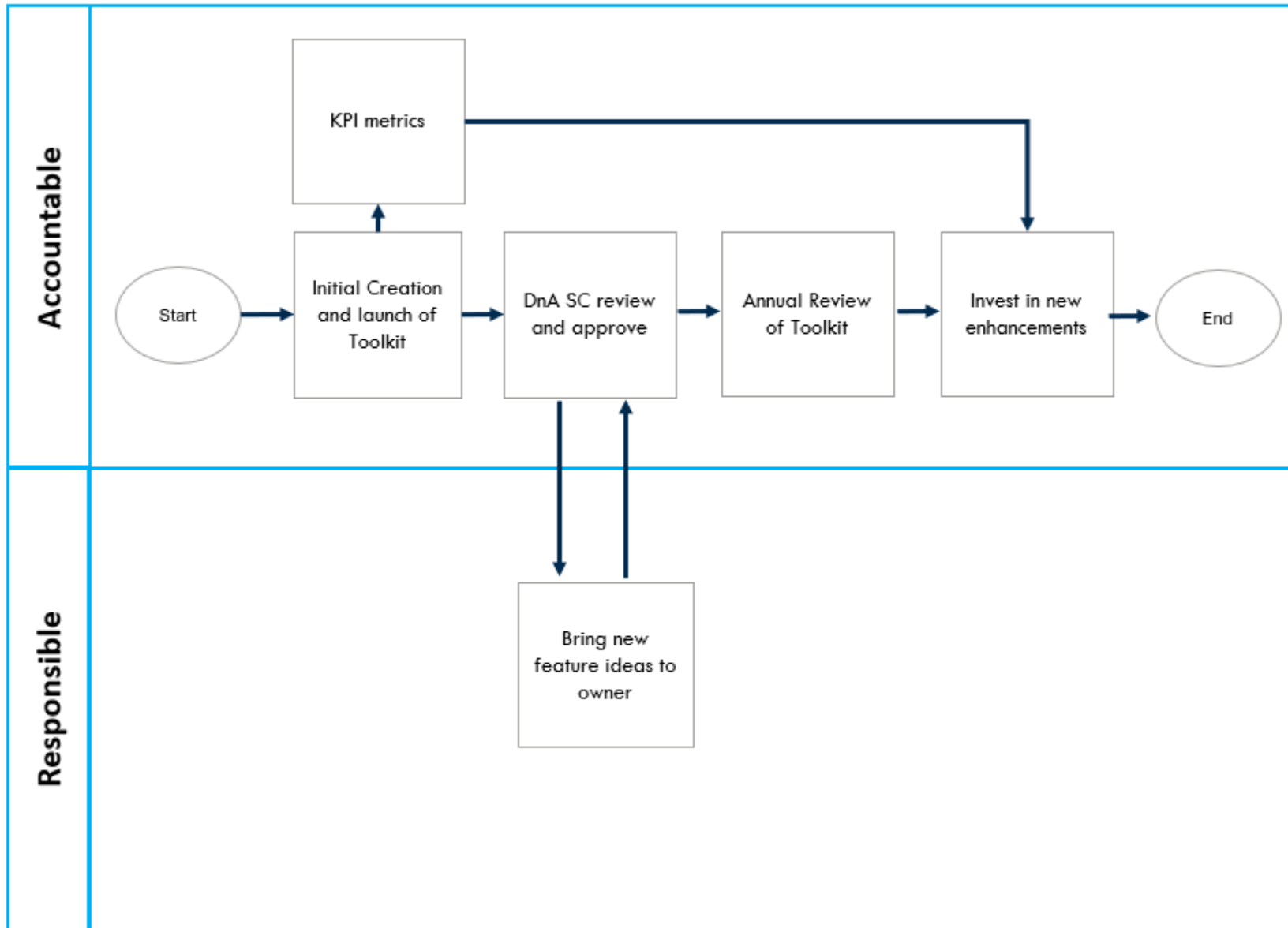
32. DASHBOARD GENERATION

OVERVIEW

The Dashboard Generation Toolkit service enables users to construct information dashboards within software like PowerBI, Tableau or ArcGIS Insights. Staff use the toolkit through a web portal that includes dashboard generation tools, templates, design samples and training materials, as well as contacts for support.

Implementing the service requires building and maintaining a web-portal and maintaining the self-serve resources within the portal. In some cases, the service would need specific dashboards to be customized for branches that don't have the skills or resources to take advantage of the self-service tools and templates.

OWNER (2021)	Central Coordination
ACCOUNTABLE	DAVS
COMMUNITY OF PRACTICE	Visual Analytics Advisory Board
RELATED SERVICES	<ul style="list-style-type: none"> • ETL and data preparation • Cleansing • Metadata publishing
EXAMPLE	This toolkit helped the Procurement Office develop a Bid Lifecycle Dashboard leveraging the template and guide available



COMPETENCIES

Proficiencies	Competencies	Skill Level
Business Translation	Business Understanding	Basic
	Problem Statement Definition	Advanced
	Business Value Articulation	Intermediate
	Requirements Definition	Intermediate
Data Identification and Acquisition	Data Source Identification	Advanced
	Data Source System(s) Understanding	Advanced
	Data Acquisition and Exploration	Advanced
Data Evaluation, Processing and Transformation	Critical Data Elements Identification	Intermediate
	Quality Dimensions Assessment	Advanced
	Data Quality Metrics Requirements	Intermediate
	Data Quality Assessment	Basic
Analytical Solution Deployment and Validation	Solution Creation	Advanced
	Solution Testing and Validation	Intermediate
Results Interpretation	Analysis Interpretation	Advanced
	Business Implications	Basic
	Client Empowerment	Basic
	Total Competencies Highest Level	16 Advanced



Data makes systems communicate.
Learn how to integrate regional data
assets into your system!

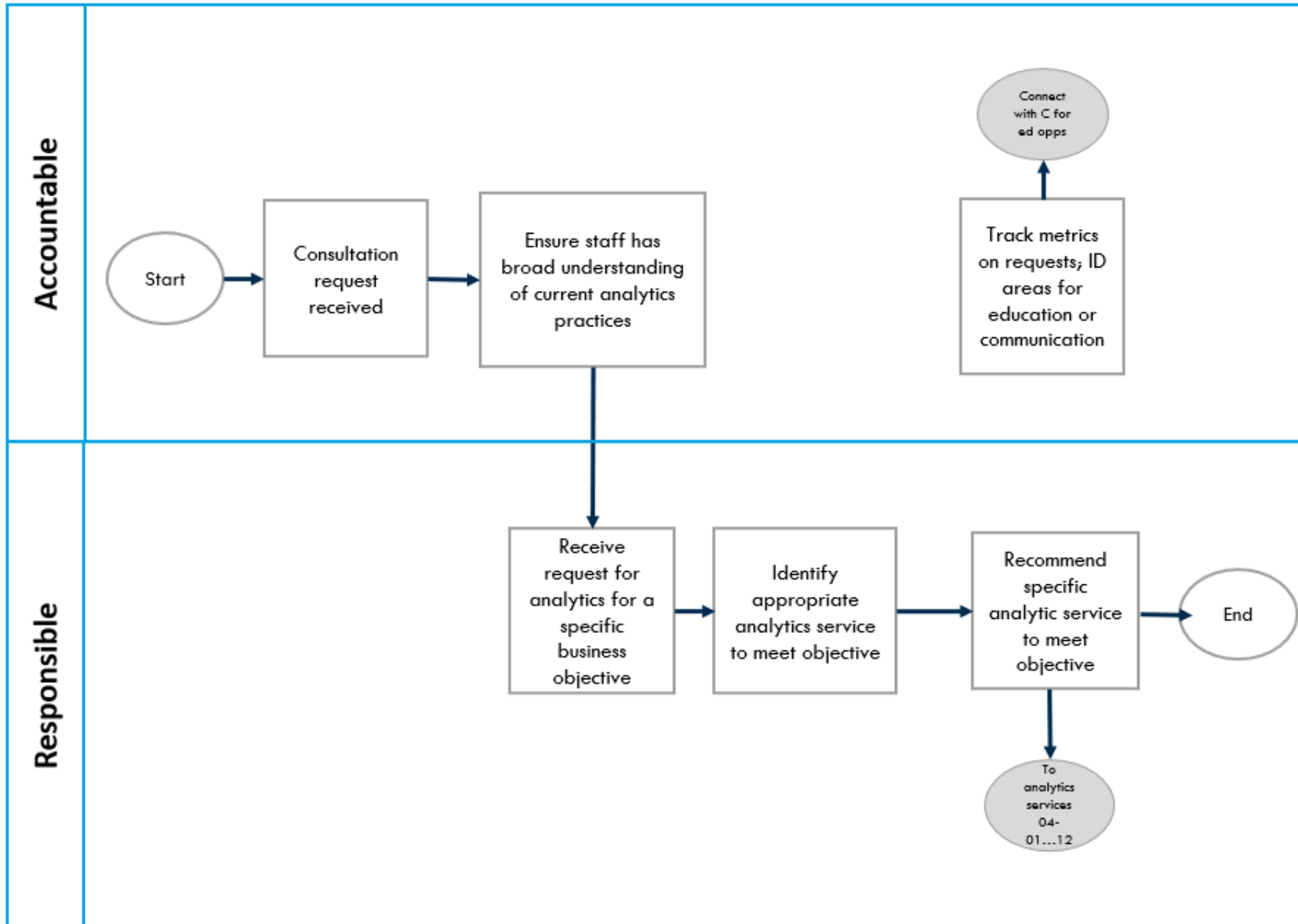
CONSULTING

33. ANALYTICS CONSULTING

OVERVIEW

The Analytics Consulting service is designed for analytics users who don't know what they want, or which analytics tools / methods will best meet their needs, or what is possible. This is a gateway to the range of services within the Insights and Reporting knowledge area. Other insights and reporting services would be responsible for performing the analysis. Consulting would also provide reviews of analytics work.

OWNER (2021)	Departmental Delivery
ACCOUNTABLE	Leader of Dept. Central Group
COMMUNITY OF PRACTICE	Visual Analytics Advisory Board
RELATED SERVICES	<ul style="list-style-type: none"> • Communities of practice coordination • Business needs development • Metadata publishing
EXAMPLE	The Analytics Consulting service was used to improve the reporting of IT services desk. This commando analytics project was created from a need of “our service desk is drowning in call volumes.” By integrating data from systems across the Region we were able to provide greater insight, identifying mitigation strategies and inform plans.



COMPETENCIES

Proficiencies	Competencies	Skill Level
Business Translation	Business Understanding	Intermediate
	Problem Statement Definition	Advanced
	Business Value Articulation	Advanced
	Requirements Definition	Intermediate
Data Identification and Acquisition	Data Source Identification	Advanced
	Data Source System(s) Understanding	
	Data Acquisition and Exploration	Advanced
Data Evaluation, Processing and Transformation	Critical Data Elements Identification	Intermediate
	Quality Dimensions Assessment	
	Data Quality Metrics Requirements	
	Data Quality Assessment	
Analytical Solution Deployment and Validation	Solution Creation	Basic
	Solution Testing and Validation	Basic
Results Interpretation	Analysis Interpretation	Advanced
	Business Implications	Advanced
	Client Empowerment	Intermediate
	Total Competencies Highest Level	12 Advanced

Have "What-If" scenarios you need to evaluate? Let us help you plan your analysis so you can make informed decisions.

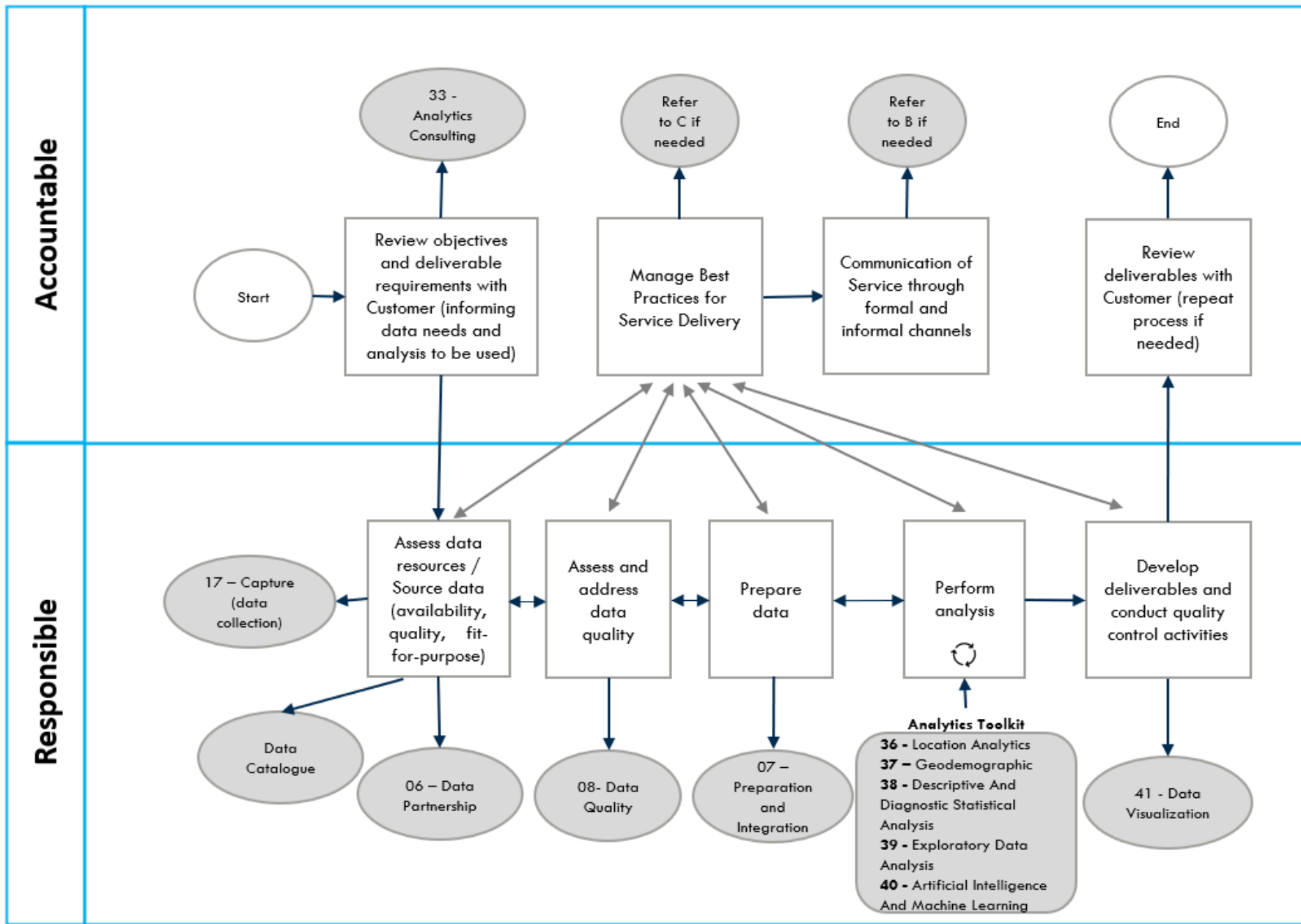


34. SCENARIO-BASED ANALYSIS

OVERVIEW


The Scenario-based Analysis service is an analytics service that provides a path to a decision where different options are being compared. By weighting various parameters, the best scenario can be identified.

OWNER (2021)	Departmental Delivery
ACCOUNTABLE	Leader of Dept. Central Group
COMMUNITY OF PRACTICE	Visual Analytics Advisory Board
RELATED SERVICES	<ul style="list-style-type: none"> • Analytics consulting • ETL and data preparation
EXAMPLE	This service was used to help understand water purchasing options in Environmental Services, as well as York Regional council with options for council representation.



COMPETENCIES

Proficiencies	Competencies	Skill Level
Business Translation	Business Understanding	Basic
	Problem Statement Definition	Intermediate
	Business Value Articulation	Basic
	Requirements Definition	Intermediate
Data Identification and Acquisition	Data Source Identification	Intermediate
	Data Source System(s) Understanding	Intermediate
	Data Acquisition and Exploration	Intermediate
Data Evaluation, Processing and Transformation	Critical Data Elements Identification	Intermediate
	Quality Dimensions Assessment	
	Data Quality Metrics Requirements	
	Data Quality Assessment	Basic
Analytical Solution Deployment and Validation	Solution Creation	Intermediate
	Solution Testing and Validation	Basic
Results Interpretation	Analysis Interpretation	Intermediate
	Business Implications	
	Client Empowerment	Intermediate
	Total Competencies Highest Level	13 Intermediate



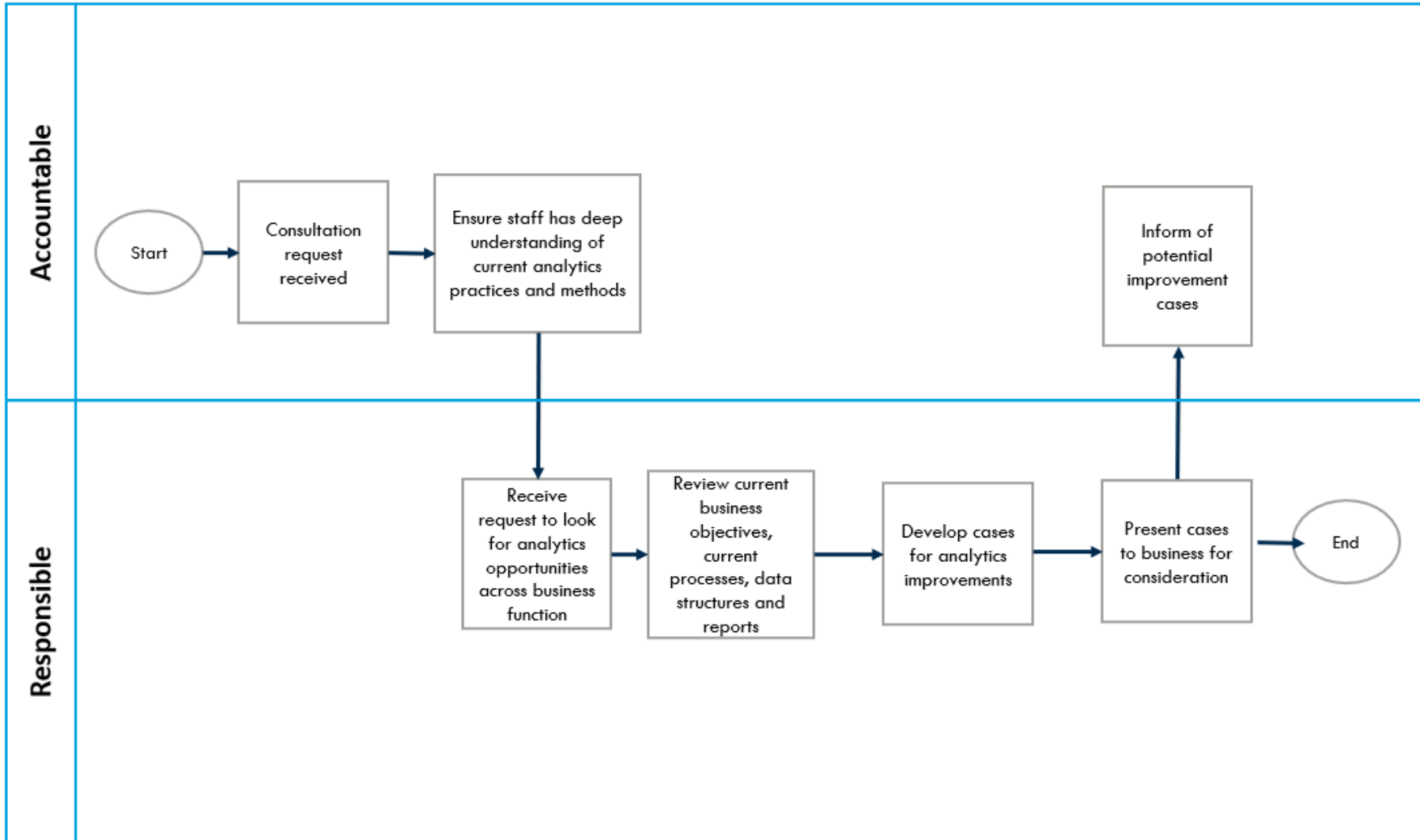
Ready to supercharge your analytics work? Let us help you bring in machine learning, artificial intelligence and more!

35. ANALYTICS NEEDS DEVELOPMENT

OVERVIEW

The Analytics Needs Development service takes a deeper look at the business processes to discover opportunities for applying location analytics, artificial intelligence routines through algorithm development, or machine learning for processes like unstructured data analysis.

OWNER (2021)	Departmental Delivery
ACCOUNTABLE	Leader of Dept. Central Group
COMMUNITY OF PRACTICE	Visual Analytics Advisory Board
RELATED SERVICES	<ul style="list-style-type: none">• Analytics consulting• Metadata publishing• Data flows
EXAMPLE	This service was employed by Corporate Finance-Risk to develop a Pothole Claim Decision Support System proof-of-concept.



COMPETENCIES

Proficiencies	Competencies	Skill Level
Business Translation	Business Understanding	Intermediate
	Problem Statement Definition	Advanced
	Business Value Articulation	Advanced
	Requirements Definition	Advanced
Data Identification and Acquisition	Data Source Identification	Advanced
	Data Source System(s) Understanding	Advanced
	Data Acquisition and Exploration	Advanced
Data Evaluation, Processing and Transformation	Critical Data Elements Identification	Advanced
	Quality Dimensions Assessment	Intermediate
	Data Quality Metrics Requirements	Intermediate
	Data Quality Assessment	Basic
Analytical Solution Deployment and Validation	Solution Creation	Advanced
	Solution Testing and Validation	
Results Interpretation	Analysis Interpretation	Basic
	Business Implications	Advanced
	Client Empowerment	Advanced
	Total Competencies Highest Level	15 Advanced



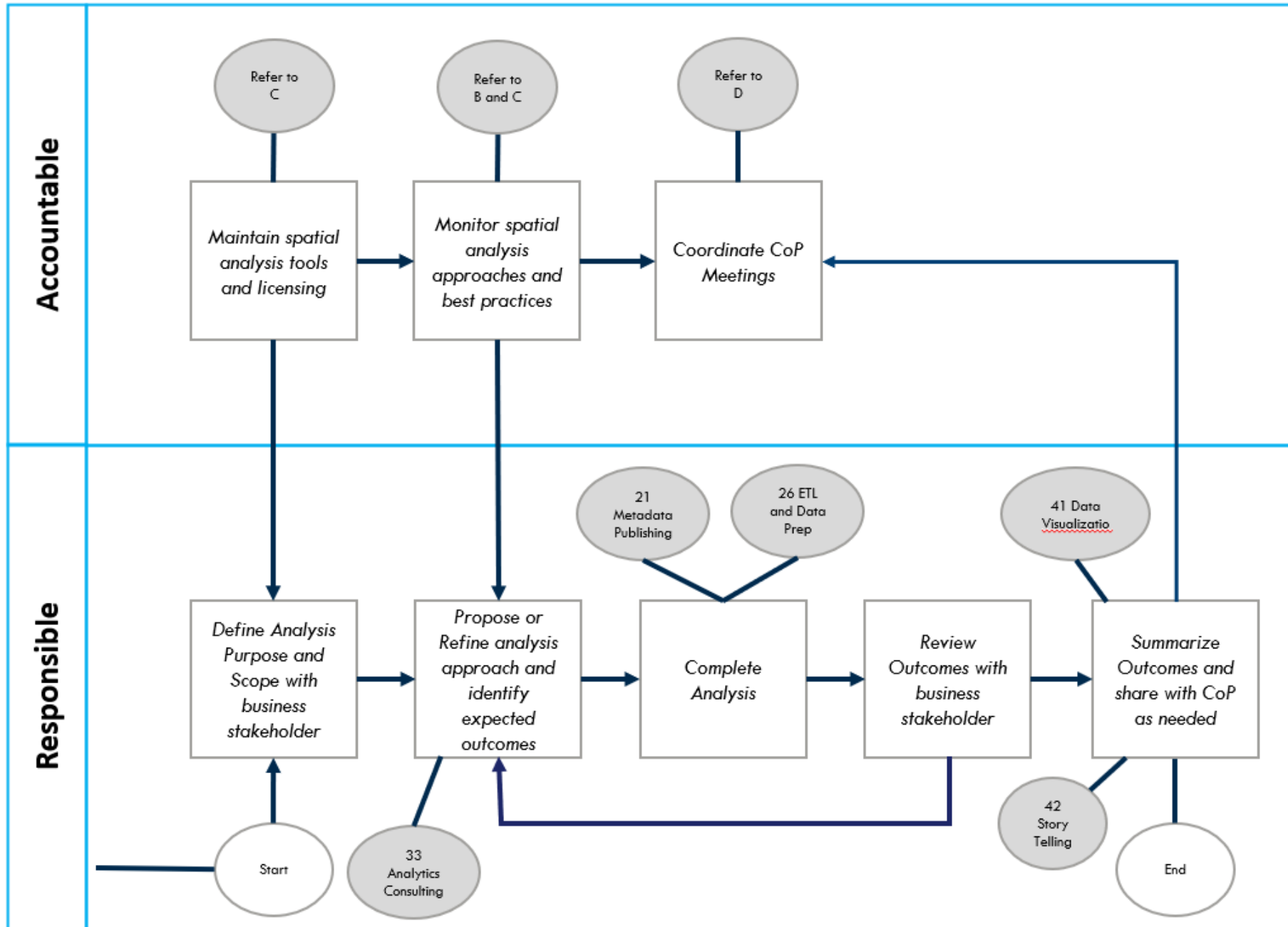
Need help finding optimal locations for a new service or hotspots to identify geographic patterns? We're here for you!

36. LOCATION ANALYTICS

OVERVIEW

The Location Analytics service combines business and physical sensor data with geographic and demographic data to develop spatial models. These can be used for analysis such as the optimal placement of assets (people, facilities, materials, and information), routing, hot spot and proximity analysis, physical land change and flood analysis.

OWNER (2021)	Departmental Delivery
ACCOUNTABLE	Leader of Dept. Central Group
COMMUNITY OF PRACTICE	Visual Analytics Advisory Board, GIS Advisory Board
RELATED SERVICES	<ul style="list-style-type: none"> • Analytics consulting • Metadata publishing • ETL and data preparation • Data visualization
EXAMPLE	The Location Analytics service has been used for many years within the Region to provide deeper understanding and insights into business problems. Recent examples include the development of a report outlining the Region's " 15-minute neighbourhoods " for the CAO's office; ongoing analysis associated with source water protection being done by Environmental Services Department; and a study outlining the impact of transit bus routes by the Transportation and Roads Department.



COMPETENCIES

Proficiencies	Competencies	Skill Level
Business Translation	Business Understanding	Intermediate
	Problem Statement Definition	Advanced
	Business Value Articulation	Intermediate
	Requirements Definition	Advanced
Data Identification and Acquisition	Data Source Identification	Advanced
	Data Source System(s) Understanding	Advanced
	Data Acquisition and Exploration	Advanced
Data Evaluation, Processing and Transformation	Critical Data Elements Identification	Advanced
	Quality Dimensions Assessment	Intermediate
	Data Quality Metrics Requirements	Intermediate
	Data Quality Assessment	Advanced
Analytical Solution Deployment and Validation	Solution Creation	Advanced
	Solution Testing and Validation	Intermediate
Results Interpretation	Analysis Interpretation	Advanced
	Business Implications	Intermediate
	Client Empowerment	Advanced
	Total Competencies Highest Level	16 Advanced

Using demographics data in your project? We're here to help analyze population characteristics!

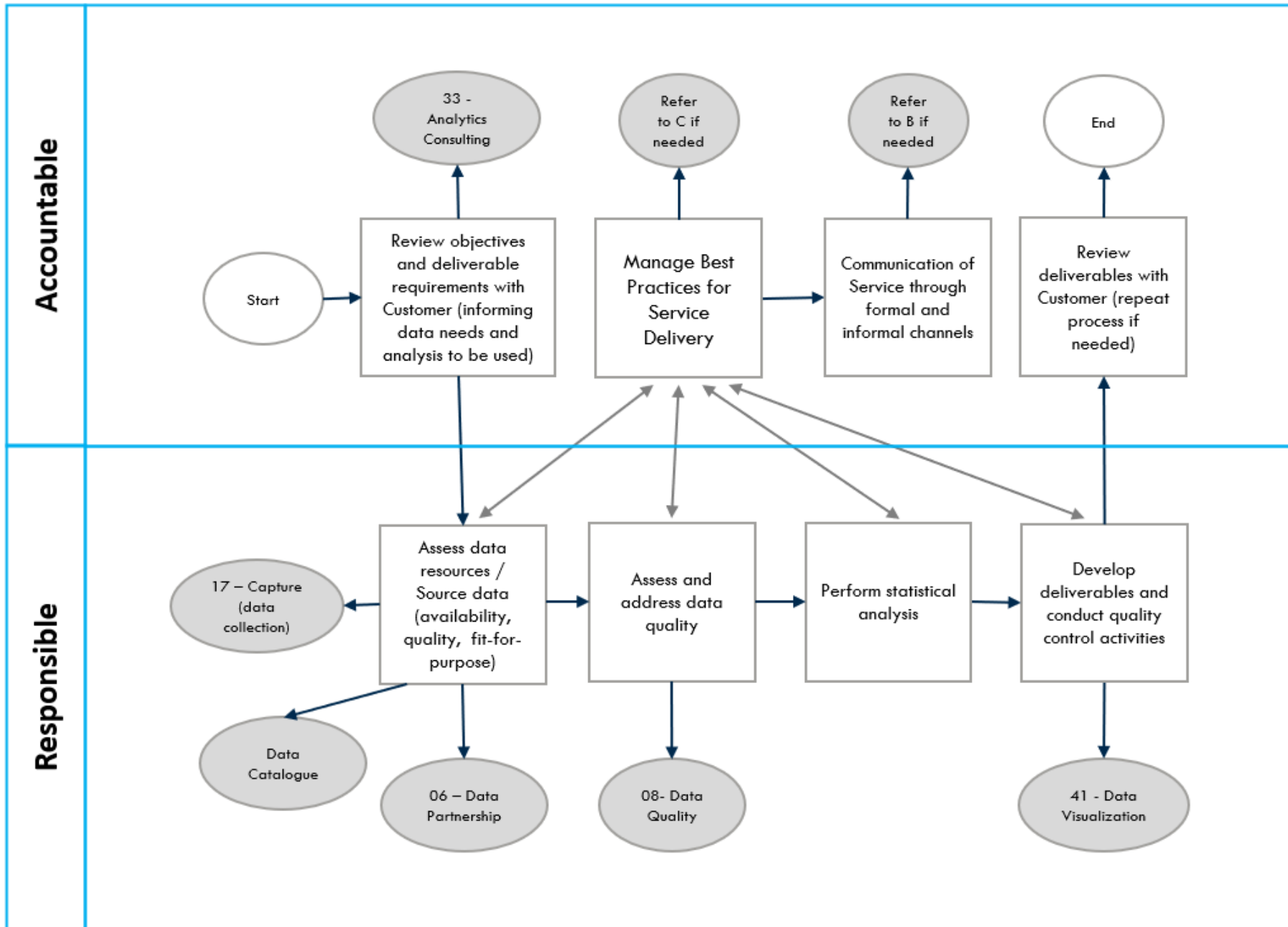


37. GEODEMOGRAPHICS

OVERVIEW

The Geodemographics service uses demographic profile data to understand populations and their characteristics and to analyze likely population behaviours and reactions. Geodemographic data about the Region's residents is multifaceted and can support planning, inform policy development, and target program delivery for the greatest impact. This service can save money, increase engagement with residents, and increase the personalization of services. This service helps ensure resources are used most effectively.

OWNER (2021)	Departmental Delivery
ACCOUNTABLE	Leader of Dept. Central Group
COMMUNITY OF PRACTICE	Geodemographics Community of Practice
RELATED SERVICES	<ul style="list-style-type: none"> • Analytics consulting • Metadata publishing • ETL and data preparation
EXAMPLE	The Geodemographics service used census data from Statistics Canada and subscription data from Environics Analytics to help the Community and Health Services Department to better understand seniors' needs for programs and services , and their tolerance for service digitalization.



COMPETENCIES

Proficiencies	Competencies	Skill Level
Business Translation	Business Understanding	Intermediate
	Problem Statement Definition	Advanced
	Business Value Articulation	Advanced
	Requirements Definition	Advanced
Data Identification and Acquisition	Data Source Identification	Expert
	Data Source System(s) Understanding	Advanced
	Data Acquisition and Exploration	Advanced
Data Evaluation, Processing and Transformation	Critical Data Elements Identification	Advanced
	Quality Dimensions Assessment	Intermediate
	Data Quality Metrics Requirements	Intermediate
	Data Quality Assessment	Advanced
Analytical Solution Deployment and Validation	Solution Creation	Advanced
	Solution Testing and Validation	Intermediate
Results Interpretation	Analysis Interpretation	Advanced
	Business Implications	Expert
	Client Empowerment	Advanced
	Total Competencies	16
	Highest Level	Expert



Statistics

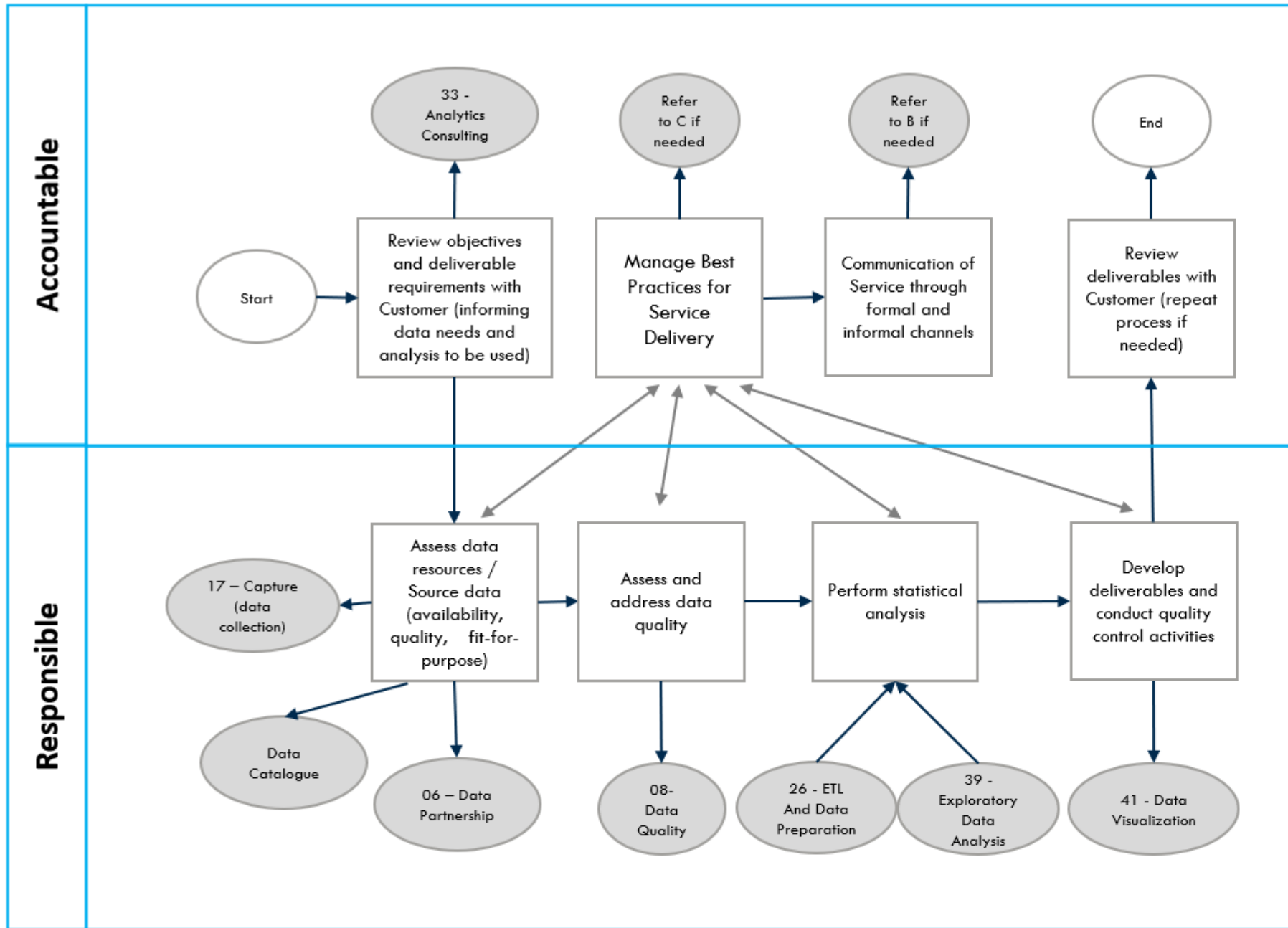
Need to understand what happened and why? We're here to help you analyze your data to find answers to those burning business questions.

38. DESCRIPTIVE & DIAGNOSTIC STATISTICAL ANALYSIS

OVERVIEW

The Descriptive & Diagnostic Statistical Analysis service analyses data to answer business questions about what happened and why.

OWNER (2021)	Departmental Delivery
ACCOUNTABLE	Leader of Dept. Central Group
COMMUNITY OF PRACTICE	Visual Analytics Advisory Board
RELATED SERVICES	<ul style="list-style-type: none">• Analytics consulting• Metadata publishing• ETL and data preparation• Data visualization
EXAMPLE	<p>The Descriptive & Diagnostic Statistical Analysis service was used to do a temporal analysis of bus boarding to determine peak travel times.</p> <p>The service is also used to do root cause analysis to determine why the demand for health services spikes each November.</p>



COMPETENCIES

Proficiencies	Competencies	Skill Level
Business Translation	Business Understanding	Advanced
	Problem Statement Definition	Expert
	Business Value Articulation	Advanced
	Requirements Definition	Advanced
Data Identification and Acquisition	Data Source Identification	Expert
	Data Source System(s) Understanding	Expert
	Data Acquisition and Exploration	Expert
Data Evaluation, Processing and Transformation	Critical Data Elements Identification	Advanced
	Quality Dimensions Assessment	Intermediate
	Data Quality Metrics Requirements	Intermediate
	Data Quality Assessment	Advanced
Analytical Solution Deployment and Validation	Solution Creation	Expert
	Solution Testing and Validation	Advanced
Results Interpretation	Analysis Interpretation	Expert
	Business Implications	Advanced
	Client Empowerment	Advanced
	Total Competencies	16
	Highest Level	Expert

Learn how to find trends and hidden patterns in business data to gain insights! We can help turn you into a data explorer.

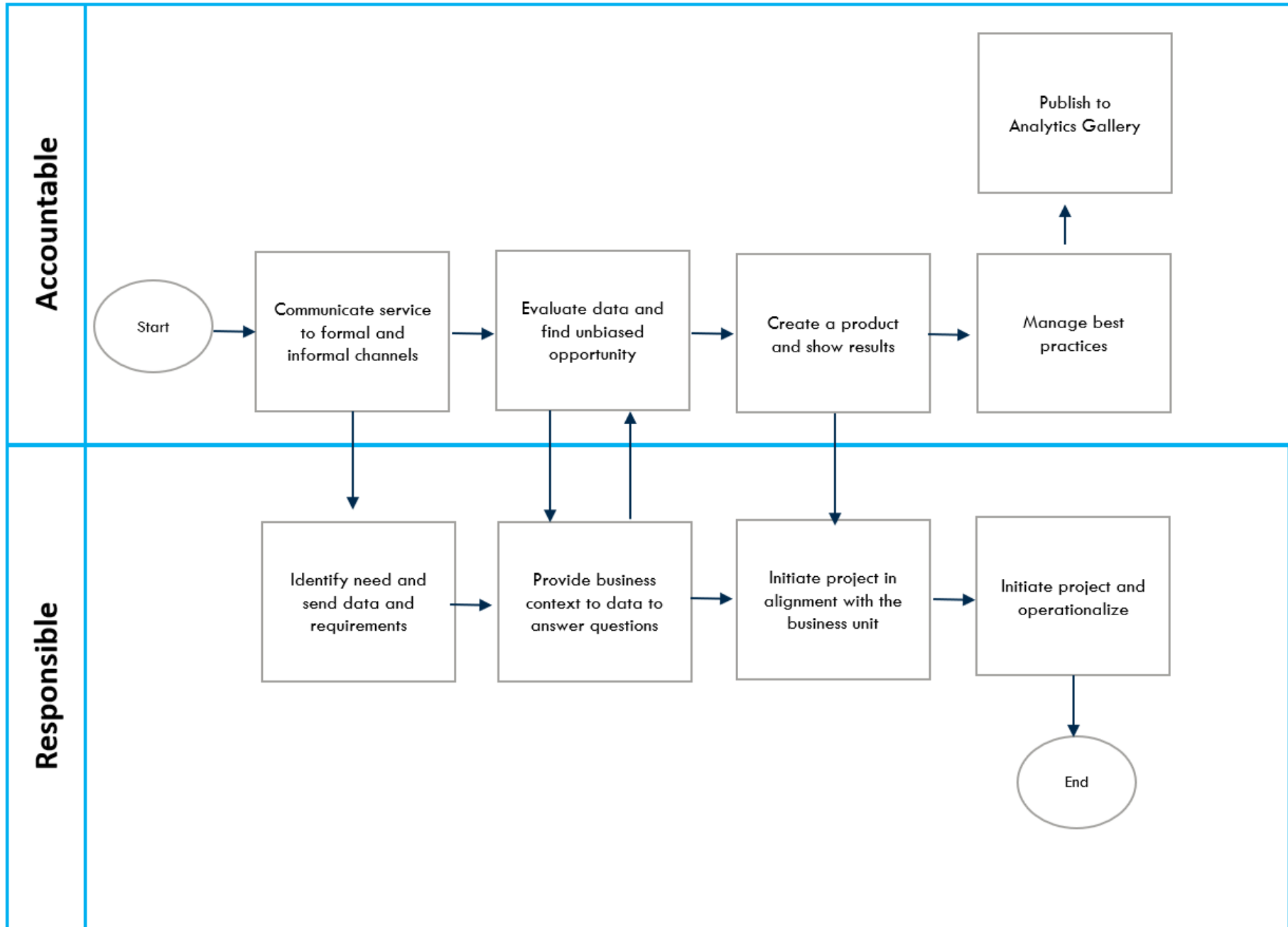


39. EXPLORATORY DATA ANALYSIS

OVERVIEW

The Exploratory Data Analysis service looks for trends and hidden patterns in business data to gain insights. Data discovery combines data from different sources in an exploratory manner to seek correlations that might not otherwise be obvious because the data sets are too large to easily spot trends. The results of a data discovery will require a business interpretation for actionable information.

OWNER (2021)	Central Coordination
ACCOUNTABLE	DAVS
COMMUNITY OF PRACTICE	Visual Analytics Advisory Board
RELATED SERVICES	<ul style="list-style-type: none"> • Analytics consulting • Metadata publishing • ETL and data preparation • Data visualization
EXAMPLE	This service was used to uncover insights about usage of the IT Service Desk resulting in new processes to reduce the burden



COMPETENCIES

Proficiencies	Competencies	Skill Level
Business Translation	Business Understanding	Intermediate
	Problem Statement Definition	Expert
	Business Value Articulation	Advanced
	Requirements Definition	Advanced
Data Identification and Acquisition	Data Source Identification	Advanced
	Data Source System(s) Understanding	Advanced
	Data Acquisition and Exploration	Expert
Data Evaluation, Processing and Transformation	Critical Data Elements Identification	Advanced
	Quality Dimensions Assessment	Intermediate
	Data Quality Metrics Requirements	Intermediate
	Data Quality Assessment	Advanced
Analytical Solution Deployment and Validation	Solution Creation	Expert
	Solution Testing and Validation	Expert
Results Interpretation	Analysis Interpretation	Advanced
	Business Implications	Intermediate
	Client Empowerment	Advanced
	Total Competencies	16
	Highest Level	Expert

How can I help you?

Curious to see if there are opportunities to automate repetitive tasks using AI and ML in your project? We're here to help you get started!



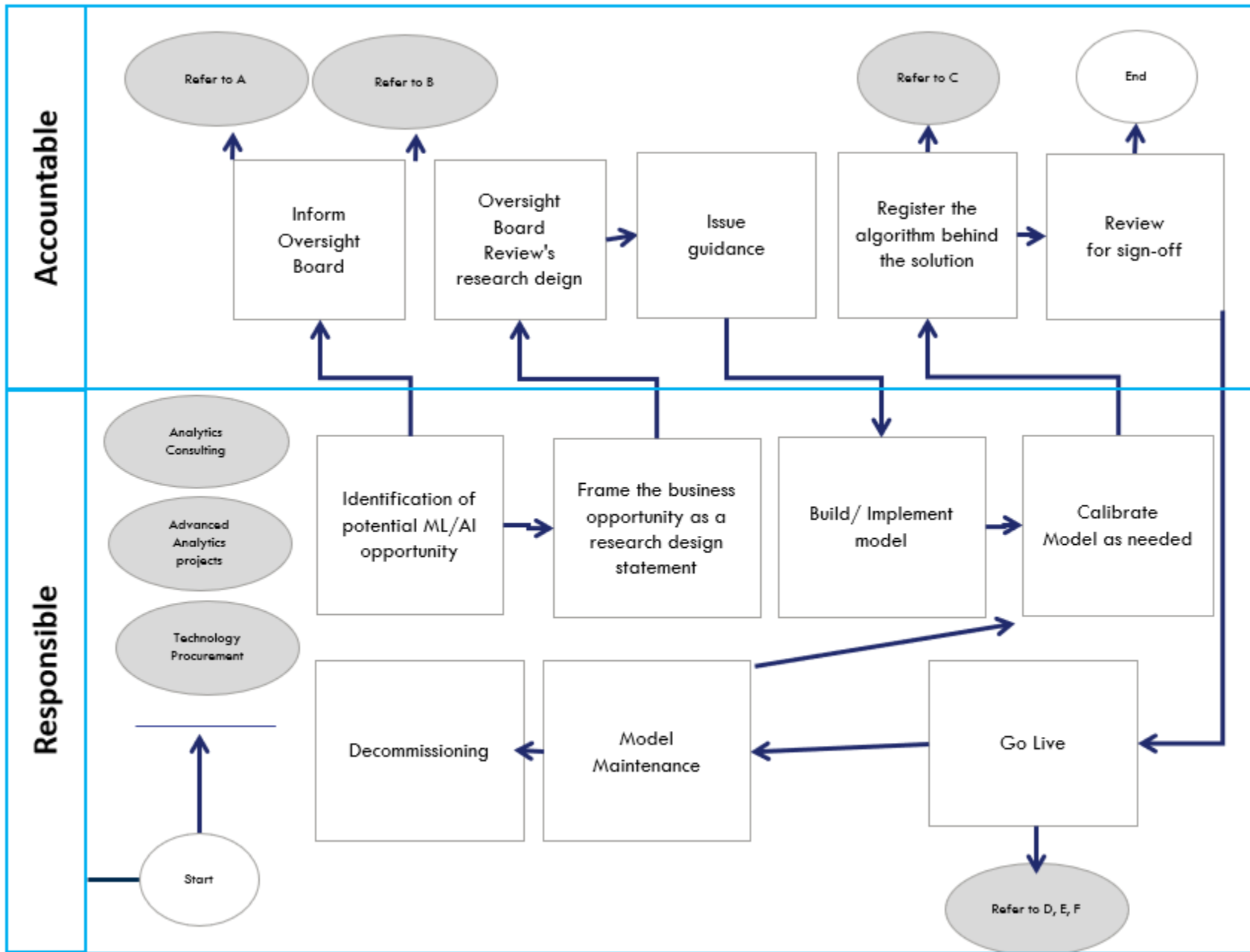
40. ARTIFICIAL INTELLIGENCE & MACHINE LEARNING

OVERVIEW

Artificial intelligence (AI) is about developing algorithms against business information to enable self-correction, and to establish rules for interpreting data to reach actionable conclusions. For example, based on the information submitted on an application for funding form, the AI service may recommend accepting or rejecting it. It can also involve creating processes to collect information automatically and act based on the information collected.

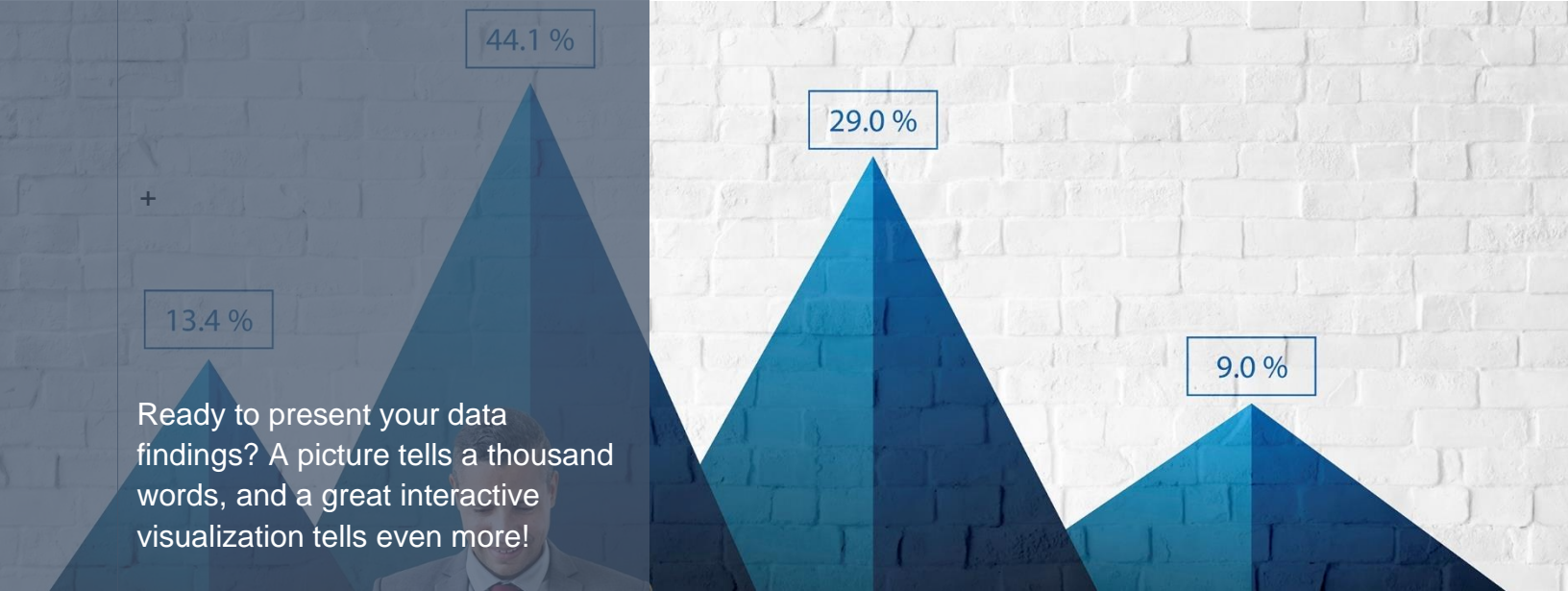
Machine learning uses pattern inferences against training data to enable a system to repeat a task without explicit instructions. For example, detecting building footprints in aerial photography. Pattern inferencing can also be used to make predictions, so machine learning is used in predictive analytics (forecasting) and prescriptive analytics where the system provides recommendations for future actions. The Artificial Intelligence and Machine Learning service is about developing algorithms for artificial intelligence and setting up machine learning data training sets to automate repetitive tasks.

OWNER (2021)	Central Coordination
ACCOUNTABLE	DAVS
COMMUNITY OF PRACTICE	Visual Analytics Advisory Board
RELATED SERVICES	<ul style="list-style-type: none">• Analytics needs development• Exploratory data analysis• Metadata publishing• Technology Services (3)
EXAMPLE	This service is being used to model the impact of storm events the wastewater system due to Inflow and Infiltration.



COMPETENCIES

Proficiencies	Competencies	Skill Level
Business Translation	Business Understanding	Intermediate
	Problem Statement Definition	Advanced
	Business Value Articulation	Intermediate
	Requirements Definition	Advanced
Data Identification and Acquisition	Data Source Identification	Advanced
	Data Source System(s) Understanding	Advanced
	Data Acquisition and Exploration	Expert
Data Evaluation, Processing and Transformation	Critical Data Elements Identification	Advanced
	Quality Dimensions Assessment	Intermediate
	Data Quality Metrics Requirements	Intermediate
	Data Quality Assessment	Advanced
Analytical Solution Deployment and Validation	Solution Creation	Expert
	Solution Testing and Validation	Advanced
Results Interpretation	Analysis Interpretation	Advanced
	Business Implications	Intermediate
	Client Empowerment	Advanced
	Total Competencies	16
	Highest Level	Expert



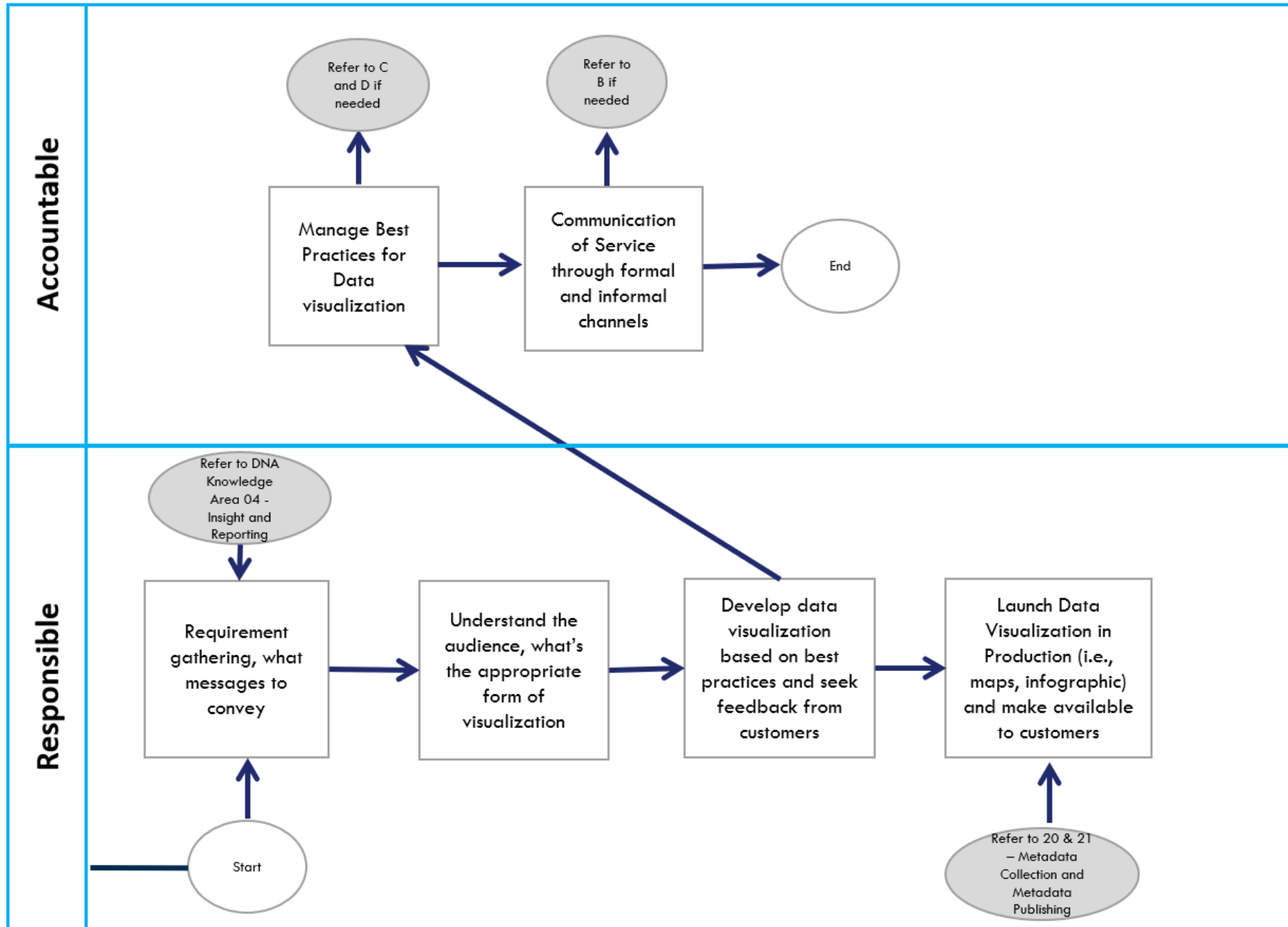
Ready to present your data findings? A picture tells a thousand words, and a great interactive visualization tells even more!

41. DATA VISUALIZATION

OVERVIEW

Data visualization is the graphic representation of data through images, maps, graphics, and charts. Effective visualization helps users understand data and can provide cognitive access to complex datasets and data relationships. Data visualization combines aesthetic and statistical techniques to communicate. Complex data analyses can become understandable to people unfamiliar with the statistical operations behind them. The Data Visualization service creates graphics and outputs to communicate with specific audiences.

OWNER (2021)	Central Coordination
ACCOUNTABLE	Leader of Dept. Central Group
COMMUNITY OF PRACTICE	Visual Analytics Advisory Board
RELATED SERVICES	<ul style="list-style-type: none"> • Analytics consulting • Scenario-based analysis • Descriptive and diagnostics statistical analysis • Location analytics • Exploratory data analysis
EXAMPLE	This service was used to develop an interactive data visualization on the 'Makeup of York Region's Business Community' using the 2017 Business Directory



COMPETENCIES

Proficiencies	Competencies	Skill Level
Business Translation	Business Understanding	Intermediate
	Problem Statement Definition	Advanced
	Business Value Articulation	Intermediate
	Requirements Definition	Intermediate
Data Identification and Acquisition	Data Source Identification	Advanced
	Data Source System(s) Understanding	Intermediate
	Data Acquisition and Exploration	Intermediate
Data Evaluation, Processing and Transformation	Critical Data Elements Identification	Basic
	Quality Dimensions Assessment	Basic
	Data Quality Metrics Requirements	Basic
	Data Quality Assessment	Basic
Analytical Solution Deployment and Validation	Solution Creation	Intermediate
	Solution Testing and Validation	
Results Interpretation	Analysis Interpretation	Intermediate
	Business Implications	Intermediate
	Client Empowerment	Intermediate
	Total Competencies	15
	Highest Level	Advanced

Ready to create a persuasive story based on your data? We have all the tools you need to get started!

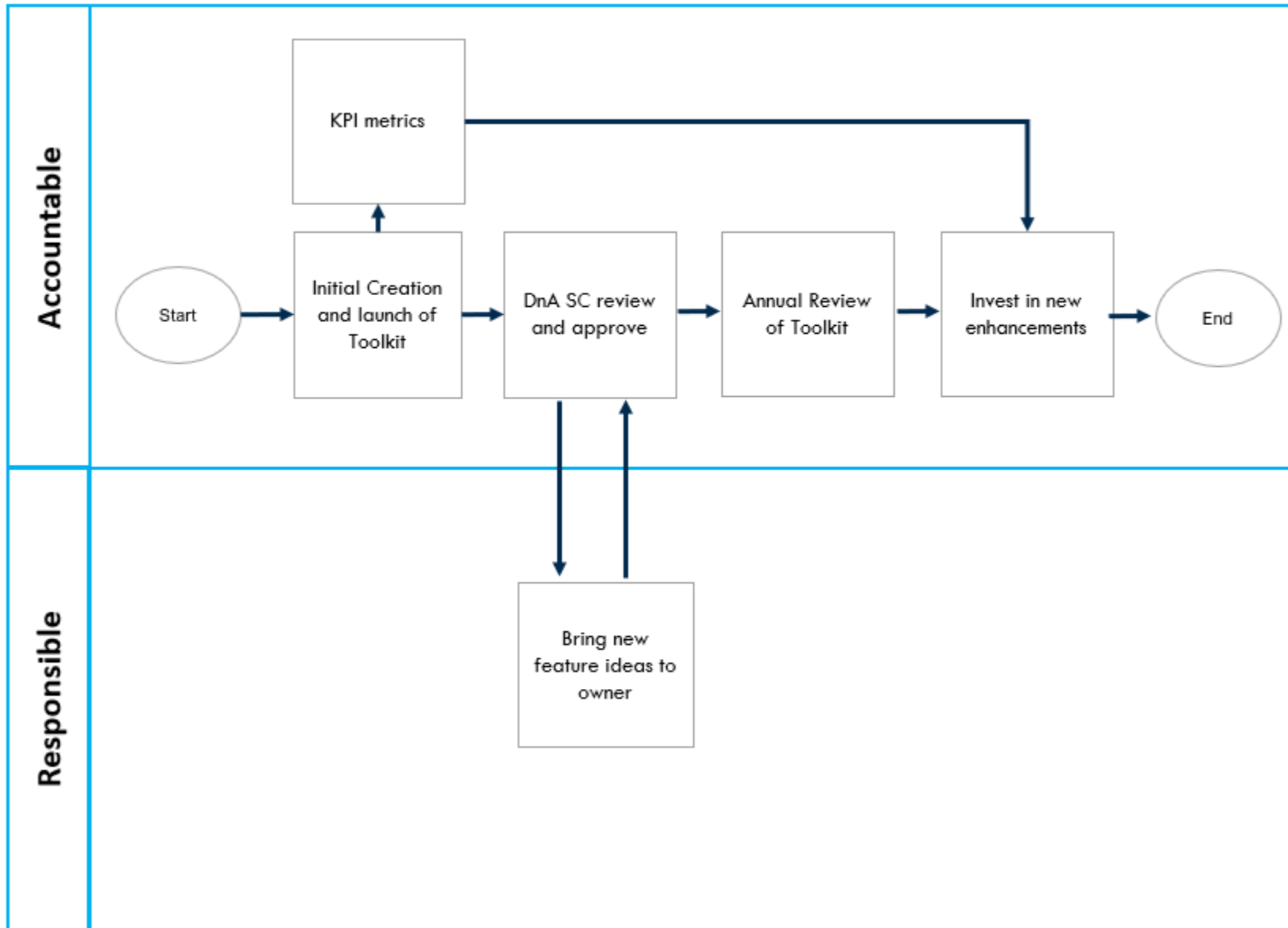
42. STORYTELLING WITH DATA

OVERVIEW

The “Storytelling with Data” Toolkit service provides users with a set of tools and templates to create persuasive data-informed stories including formatted data tables and maps that create a persuasive story leading to a business decision. The toolkit concept means resources for self-service would be available to users through a web portal with data visualization tools, templates, design samples and training materials, as well as contacts for support.

The service needs a web portal and these resources for users to be built and maintained. In some cases, the service would also mean that specific data-informed stories be customized for branches that don’t have the skills or resources to take advantage of the self-service tools and templates.

OWNER (2021)	Central Coordination	
ACCOUNTABLE	DAVS	
COMMUNITY OF PRACTICE	Visual Analytics Advisory Board	
RELATED SERVICES	<ul style="list-style-type: none"> • ETL and data preparation • Cleansing • Metadata publishing • Scenario-based analysis 	<ul style="list-style-type: none"> • Descriptive and diagnostics statistical analysis • Location analytics • Exploratory data analysis
EXAMPLE	This service was used to tell the story of York Region as part of the National Canada Day 150 celebration. It was also used to tell the story of the Region’s changing demographics from the 2016 census data.	



COMPETENCIES

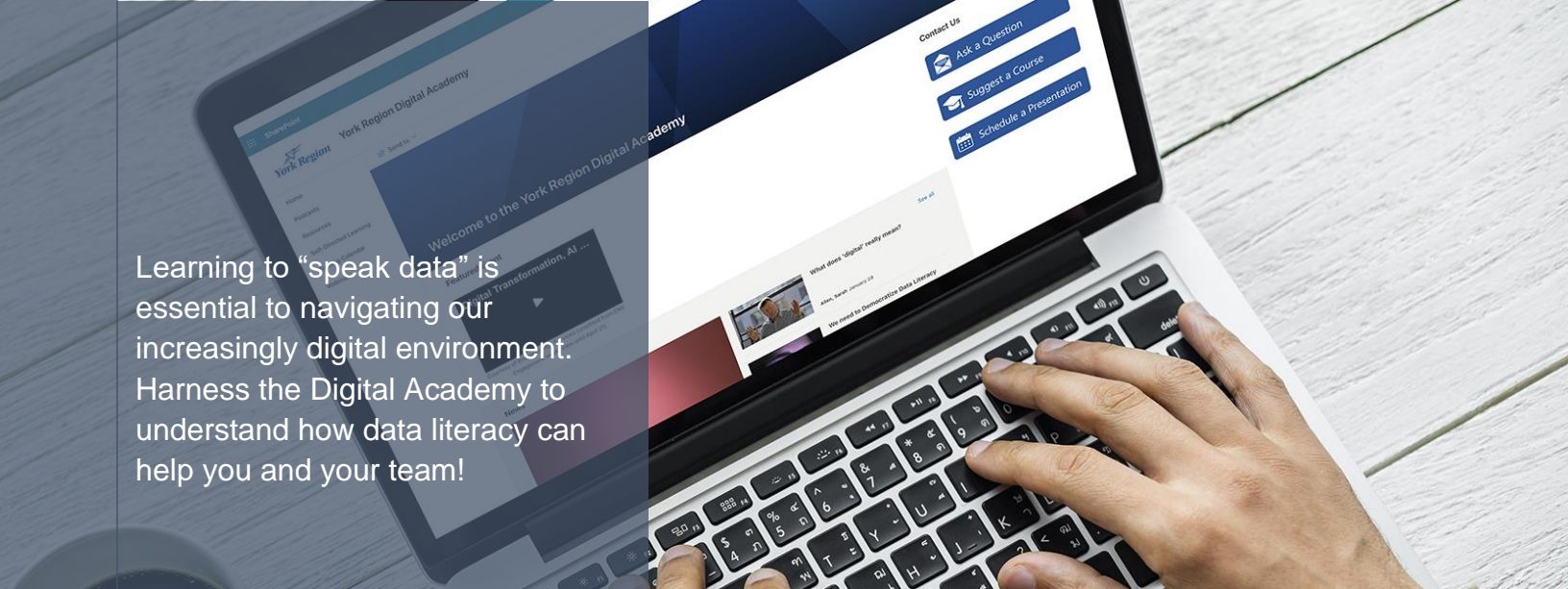
Proficiencies	Competencies	Skill Level
Business Translation	Business Understanding	Advanced
	Problem Statement Definition	Intermediate
	Business Value Articulation	Advanced
	Requirements Definition	Advanced
Data Identification and Acquisition	Data Source Identification	Advanced
	Data Source System(s) Understanding	Basic
	Data Acquisition and Exploration	
Data Evaluation, Processing and Transformation	Critical Data Elements Identification	Basic
	Quality Dimensions Assessment	
	Data Quality Metrics Requirements	
	Data Quality Assessment	
Analytical Solution Deployment and Validation	Solution Creation	Intermediate
	Solution Testing and Validation	Intermediate
Results Interpretation	Analysis Interpretation	Expert
	Business Implications	Expert
	Client Empowerment	Advanced
	Total Competencies	12
	Highest Level	Expert



DATA LITERACY (05)

Learning to care for, understand and use data

This knowledge area strengthens capacity in the workforce to care for, understand, and use data.



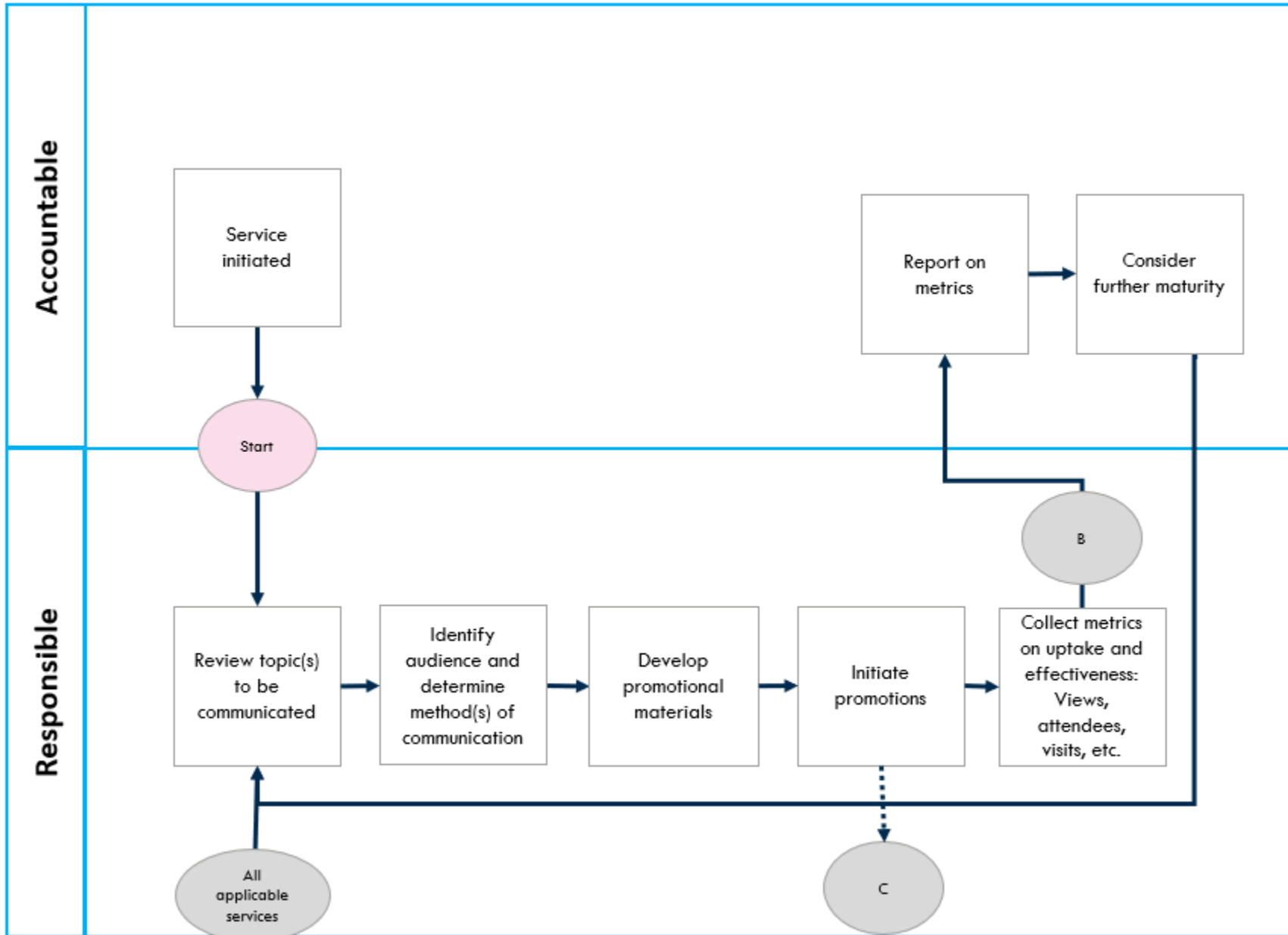
Learning to “speak data” is essential to navigating our increasingly digital environment. Harness the Digital Academy to understand how data literacy can help you and your team!

43. AWARENESS

OVERVIEW

The Awareness service helps staff understand the need for data literacy and their increasingly digital environment. Data literacy happens at the individual employee level, so the Awareness service is key to changing the corporate culture around data management and analytics practices. Awareness can be achieved through promotional campaigns and learning directives that are supported by senior management. Promotion should aim to build a consistency of understanding across the corporation, giving everyone a common cultural lexicon in relation to data management and analytics.

OWNER (2021)	Central Coordination
ACCOUNTABLE	DAVS
COMMUNITY OF PRACTICE	Data Literacy Advisory Board
RELATED SERVICES	<ul style="list-style-type: none"> • Skills assessment • Communication of DnA program
EXAMPLE	The Awareness service, like the Communication of DnA Program service, is delivered through the Region’s internal, online DATATALK magazine by providing a consistent and corporate message to everyone.



COMPETENCIES

Proficiencies	Competencies	Skill Level
Business Translation	Business Understanding	Advanced
	Problem Statement Definition	
	Business Value Articulation	
	Requirements Definition	
Data Identification and Acquisition	Data Source Identification	
	Data Source System(s) Understanding	
	Data Acquisition and Exploration	
Data Evaluation, Processing and Transformation	Critical Data Elements Identification	
	Quality Dimensions Assessment	
	Data Quality Metrics Requirements	
	Data Quality Assessment	
Analytical Solution Deployment and Validation	Solution Creation	
	Solution Testing and Validation	
Results Interpretation	Analysis Interpretation	
	Business Implications	
	Client Empowerment	Expert
	Total Competencies	2
	Highest Level	Expert

Are you ready to have your data skills assessed? It's helpful to assess your current state of literacy so we can tailor a learning plan for you.

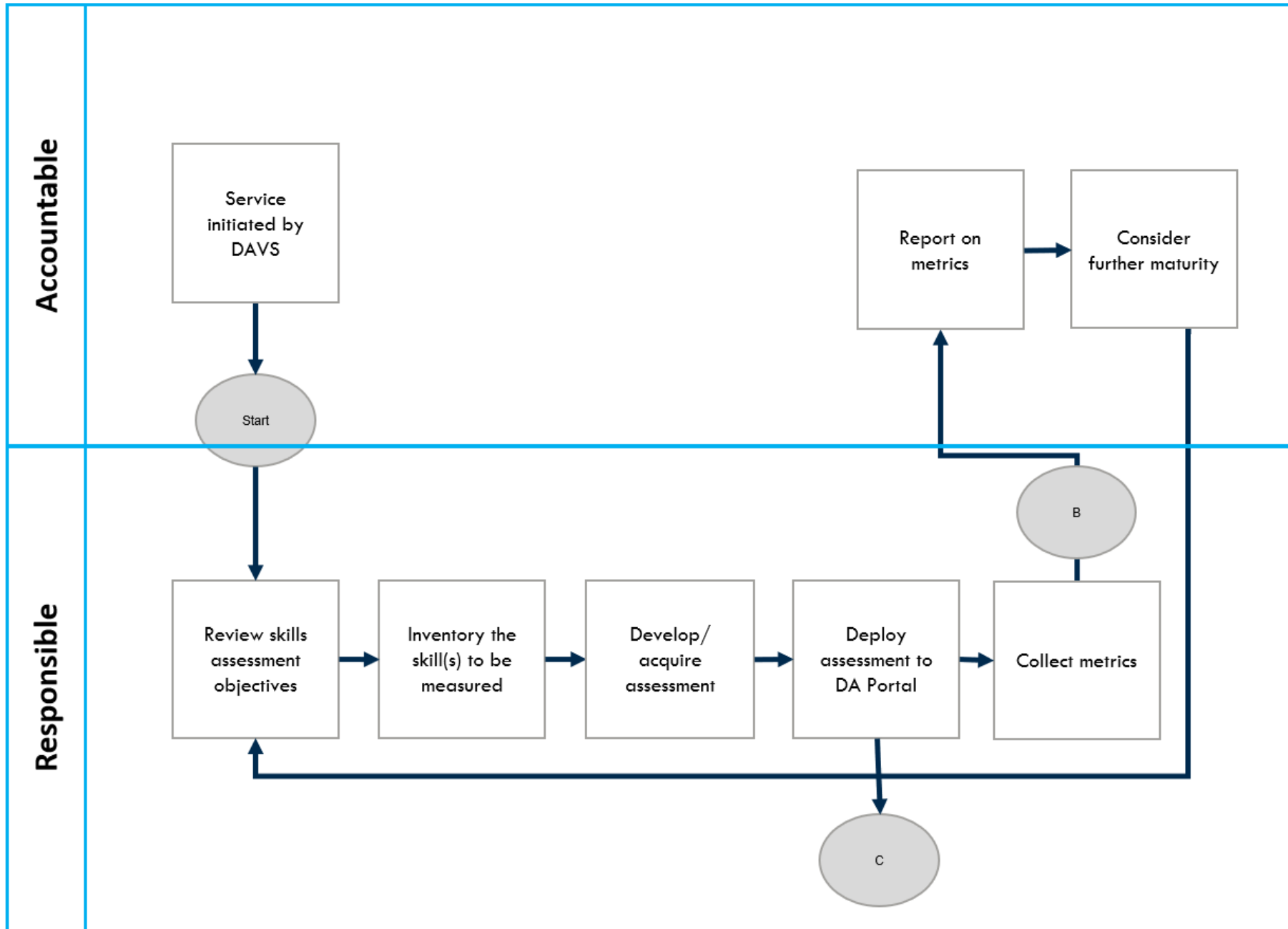


44. SKILLS ASSESSMENT

OVERVIEW

The Skills Assessment service enables management and staff to determine whether they have the data and analytics skills appropriate to their roles and tasks. Although not yet fully developed, it will likely take the form of a personalized and confidential self-assessment tool. Because the data and analytics landscape evolves quickly and residents' expectations to access services digitally continue to rise, staff will appreciate being able to self-assess their skill levels so they can understand their gaps in understanding and take advantage of available training opportunities. Data and analytics competencies for different levels learning paths should be established for data and analytics job families.

OWNER (2021)	Central Coordination
ACCOUNTABLE	DAVS
COMMUNITY OF PRACTICE	Data Literacy Advisory Board
RELATED SERVICES	<ul style="list-style-type: none"> • Awareness • Learning and development
EXAMPLE	The Skills Assessment service is available for staff to use, should they choose, to assess their knowledge against the competencies.



COMPETENCIES

Proficiencies	Competencies	Skill Level
Business Translation	Business Understanding	Basic
	Problem Statement Definition	
	Business Value Articulation	
	Requirements Definition	Intermediate
Data Identification and Acquisition	Data Source Identification	
	Data Source System(s) Understanding	
	Data Acquisition and Exploration	
Data Evaluation, Processing and Transformation	Critical Data Elements Identification	
	Quality Dimensions Assessment	
	Data Quality Metrics Requirements	
	Data Quality Assessment	
Analytical Solution Deployment and Validation	Solution Creation	Basic
	Solution Testing and Validation	Basic
Results Interpretation	Analysis Interpretation	Intermediate
	Business Implications	Intermediate
	Client Empowerment	Advanced
	Total Competencies Highest Level	7 Advanced

Ready to go back to school? We have training opportunities for all staff to improve data management, analytics, and literacy skills!

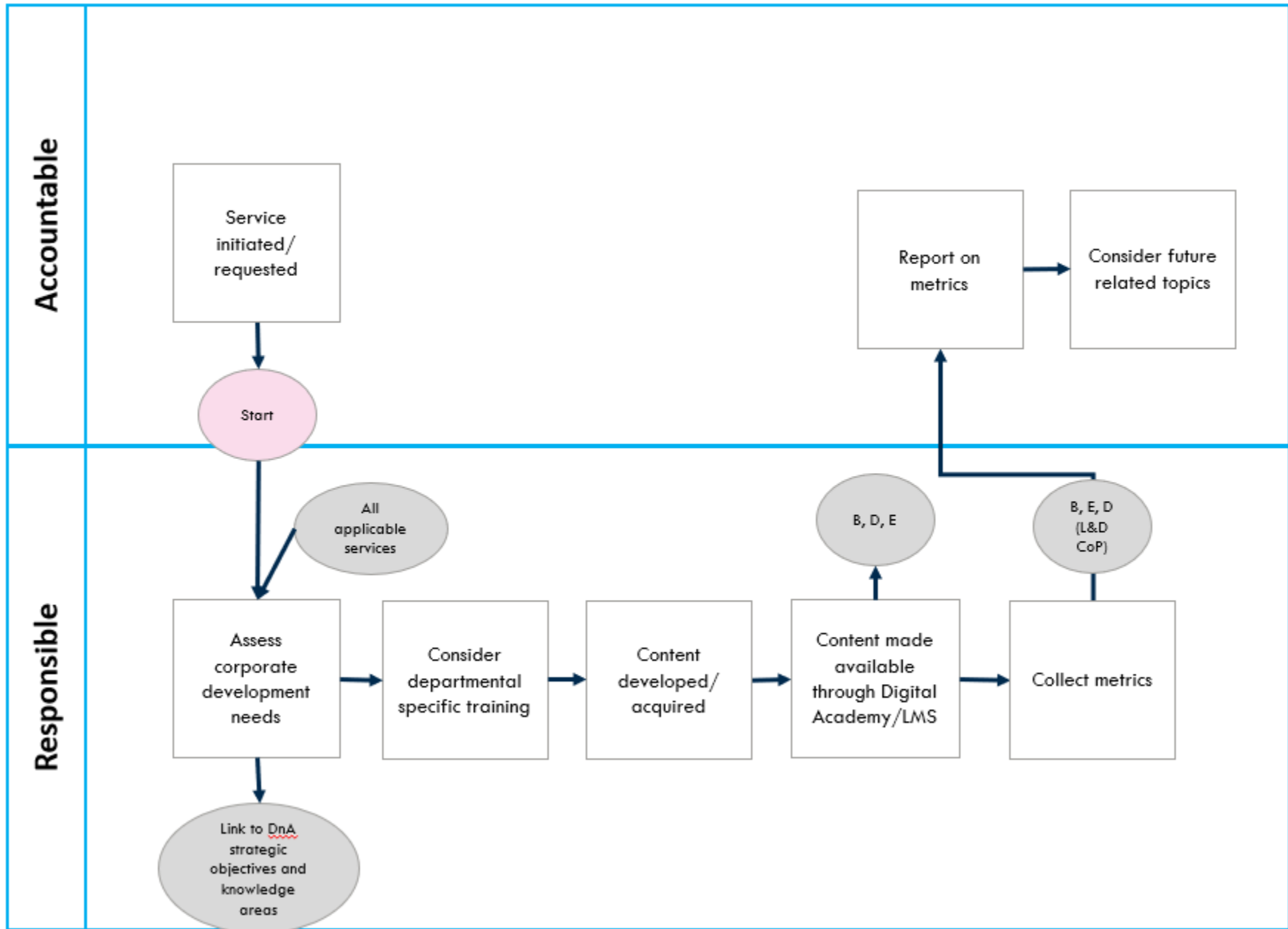


45. LEARNING AND DEVELOPMENT

OVERVIEW

The Learning and Development service provides training opportunities for staff to improve their data and digital literacy. Training can be general or specialized to job categories. Training opportunities can include formal classroom learning, workshops, podcasts, and more.

OWNER (2021)	Central Coordination
ACCOUNTABLE	DAVS
COMMUNITY OF PRACTICE	Learning and Development (HR), Data Literacy Advisory Board
RELATED SERVICES	<ul style="list-style-type: none"> • Awareness • Skills Assessment • Coordinating Communities of Practice
EXAMPLE	The Learning and Development service is delivered through the Region's Digital Academy with a focus on data management, data quality, data interpretation, data analytics and effective storytelling, and the use of specific data and analytics tools.



COMPETENCIES

Proficiencies	Competencies	Skill Level
Business Translation	Business Understanding	Intermediate
	Problem Statement Definition	
	Business Value Articulation	Intermediate
	Requirements Definition	Basic
Data Identification and Acquisition	Data Source Identification	
	Data Source System(s) Understanding	
	Data Acquisition and Exploration	
Data Evaluation, Processing and Transformation	Critical Data Elements Identification	
	Quality Dimensions Assessment	
	Data Quality Metrics Requirements	
	Data Quality Assessment	
Analytical Solution Deployment and Validation	Solution Creation	
	Solution Testing and Validation	
Results Interpretation	Analysis Interpretation	
	Business Implications	Intermediate
	Client Empowerment	Expert
	Total Competencies	5
	Highest Level	Expert

Looking to find like-minded people across the Region to learn and share best practices in a social setting?

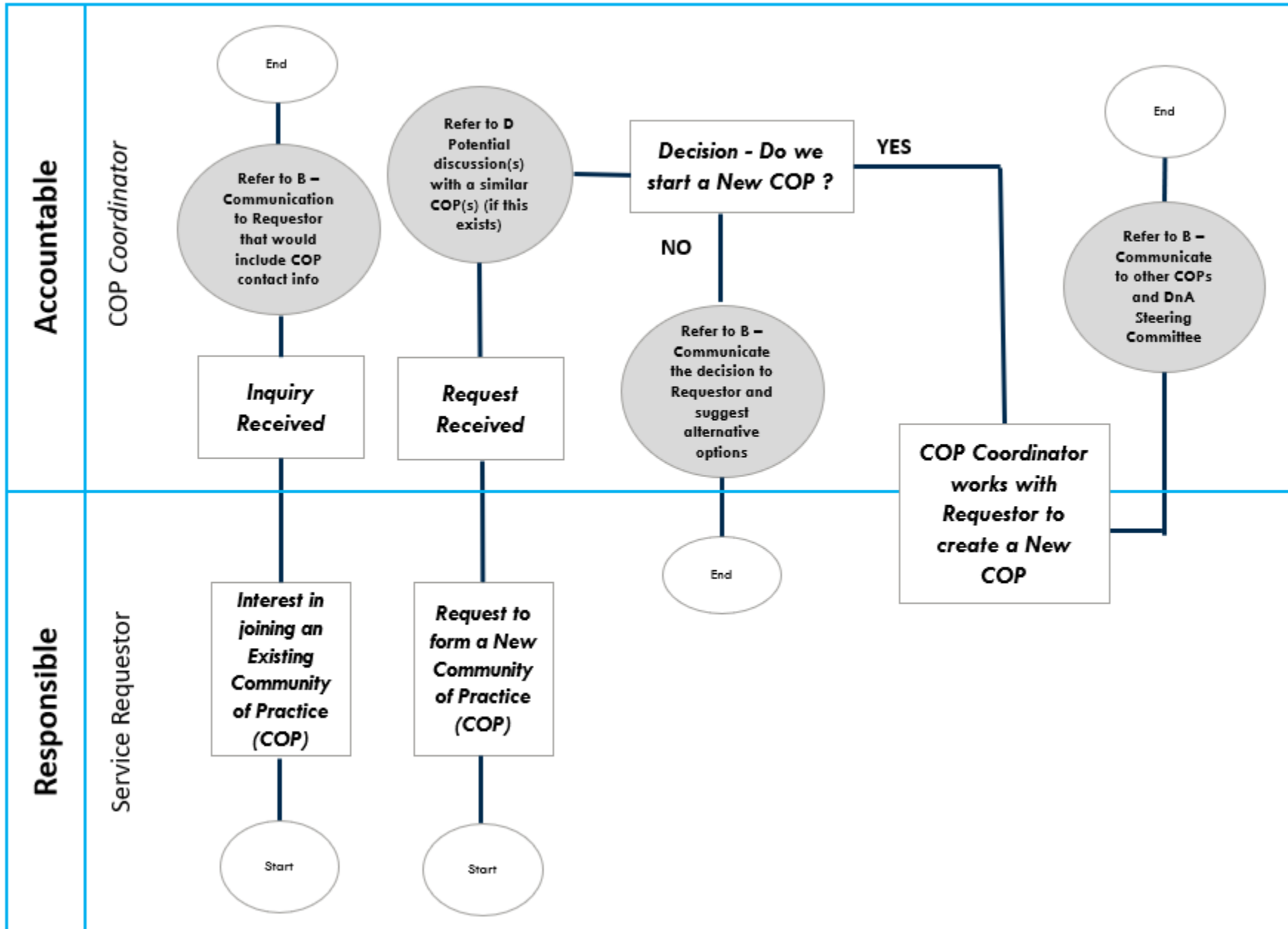
48. COMMUNITIES OF PRACTICE

OVERVIEW

Communities of Practice (CoP's) are recognized at York Region both as service delivery mechanisms and as knowledge sharing mechanisms.

The Communities of Practice service efficiently connects staff requesting services that can be delivered by CoP's with the specific CoP members who deliver the service. This requires a triage process and an evaluation of the fit between the task and the CoP's skills and experience. This service also includes the periodic review of each CoP mandate.

OWNER (2021)	Central Coordination
ACCOUNTABLE	DAVS
COMMUNITY OF PRACTICE	Data and Analytics Master Plan Steering Committee
RELATED SERVICES	<ul style="list-style-type: none"> • Analytics consulting • Scenario-based analysis • Analytics needs development • Location analysis • Descriptive and diagnostic statistical analysis • Data visualization
EXAMPLE	The Communities of Practice service is realized by trained practitioners in the Continuous Improvement and Journey Mapping CoP who provide facilitation services. GIS and Analytics CoP members learn from each other's experiences and occasionally use the CoP as a vehicle to enable project collaboration.



COMPETENCIES

Proficiencies	Competencies	Skill Level
Business Translation	Business Understanding	Advanced
	Problem Statement Definition	Intermediate
	Business Value Articulation	Advanced
	Requirements Definition	
Data Identification and Acquisition	Data Source Identification	Basic
	Data Source System(s) Understanding	
	Data Acquisition and Exploration	
Data Evaluation, Processing and Transformation	Critical Data Elements Identification	
	Quality Dimensions Assessment	
	Data Quality Metrics Requirements	
	Data Quality Assessment	
Analytical Solution Deployment and Validation	Solution Creation	Basic
	Solution Testing and Validation	
Results Interpretation	Analysis Interpretation	Intermediate
	Business Implications	Basic
	Client Empowerment	Intermediate/Advanced
	Total Competencies Highest Level	8 Advanced



DATA PARTNERSHIPS (06)

Learning, building, and sharing together.

This knowledge area provides the fostering of data and analytics-oriented partnerships, internally and externally, with the goal of increasing access to data, acquiring new data and sharing knowledge.

Wondering which data partnerships exist and who to contact? Many mutually beneficial partnerships exist between the Region and various stakeholders.

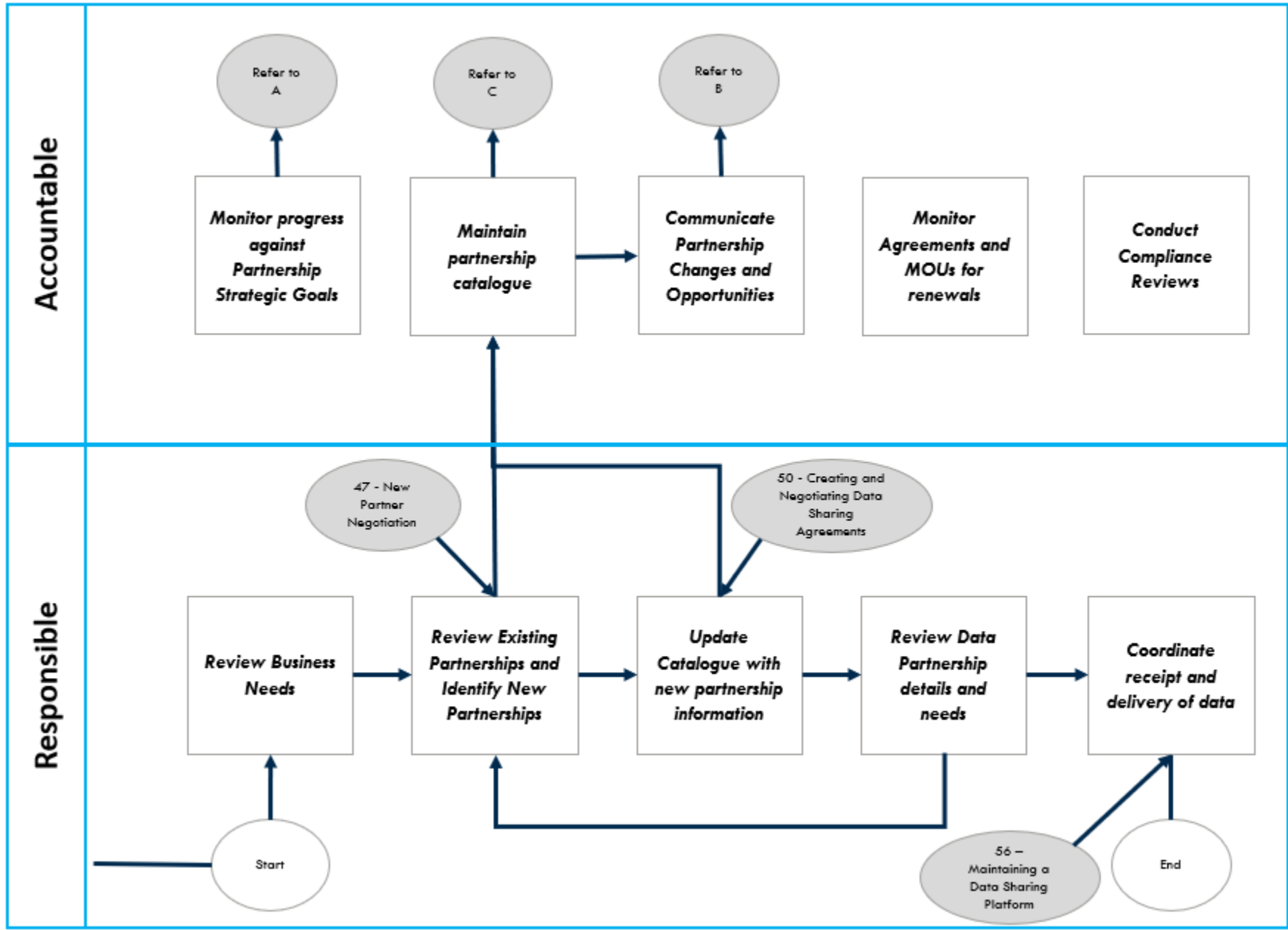


46. PARTNER COORDINATION

OVERVIEW

The Partner Coordination service maximizes the mutual benefit from formal data-oriented partnerships the Region forms with other organizations. Partnering can include data sharing, tool sharing, and project collaboration. Partner coordination supports knowledge exchange at different levels, using partner channels to disseminate new data, new methods, and dashboards that disseminate insights. Partnerships break silos, help others collect data more efficiently, and build understanding about how others use data. Partner Coordination also maintains a list or registry of partner contacts and protocols for interaction.

OWNER (2021)	Departmental Delivery
ACCOUNTABLE	Leader of Dept. Central Group
COMMUNITY OF PRACTICE	Data Partnerships Advisory Board
RELATED SERVICES	<ul style="list-style-type: none"> • Creating and negotiating data sharing agreements • Maintaining sharing platform
EXAMPLE	The Partner Coordination service supports several partnerships such as the YorkInfo Partnership between the Region, local municipalities, schoolboards, and conservation authorities enabling the broad sharing of data and information, training opportunities, and collaborative purchasing arrangements for data and software licenses. Similarly, it supports the York Region Data Coalition between the Region, health facilities and NGOs in the health and social services sector tied into a national Community Data Program.



COMPETENCIES

Proficiencies	Competencies	Skill Level
Business Translation	Business Understanding	Advanced
	Problem Statement Definition	Advanced
	Business Value Articulation	Advanced
	Requirements Definition	
Data Identification and Acquisition	Data Source Identification	
	Data Source System(s) Understanding	Intermediate
	Data Acquisition and Exploration	Intermediate
Data Evaluation, Processing and Transformation	Critical Data Elements Identification	Basic
	Quality Dimensions Assessment	
	Data Quality Metrics Requirements	
	Data Quality Assessment	
Analytical Solution Deployment and Validation	Solution Creation	
	Solution Testing and Validation	
Results Interpretation	Analysis Interpretation	
	Business Implications	Expert
	Client Empowerment	Expert
	Total Competencies Highest Level	8 Expert

Interested in formalizing a data partnership with a new stakeholder? We have processes in place to speed up the negotiation and relationship building.

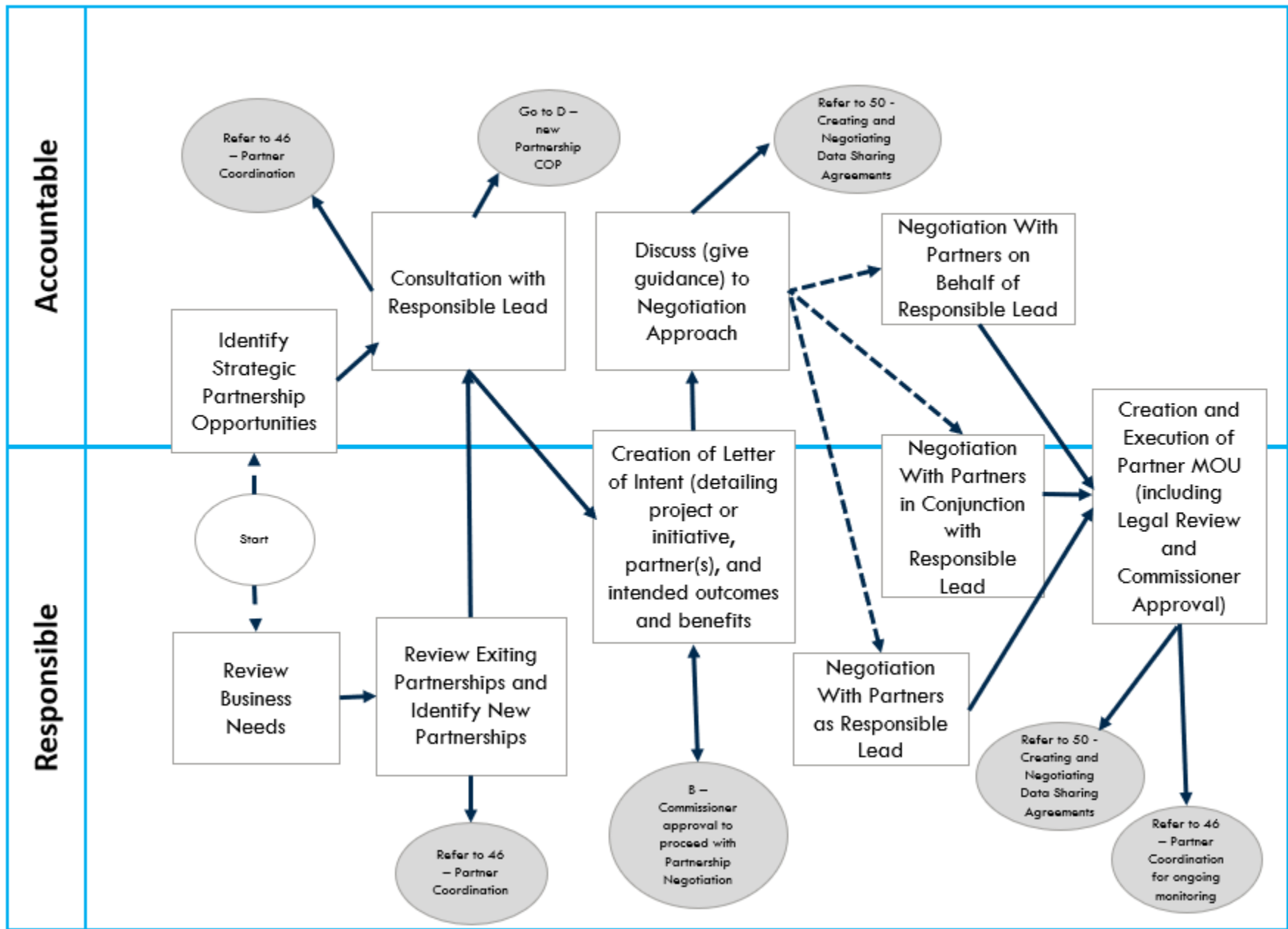


47. NEW PARTNER NEGOTIATION

OVERVIEW

The New Partner Negotiation service identifies organizations for which there is a mutual benefit in data sharing and negotiates the terms and governance of a future partnership either as part of an existing partnership or as a stand-alone partnership model. Utilities, hospitals, governmental, civic non-governmental organizations, and even commercial operations have data that could support York Region activities and would likewise likely benefit from the Region's data. The partnership negotiation would identify contributions from each partner. Renewed negotiations can expand a partnership. The WAZE partnership, for example, might explore getting and sharing new data to support water-main break detection. The New Partner Negotiation service can also mean that staff needing data not available through an existing partnership might be able to use this service rather than purchasing data.

OWNER (2021)	Departmental Delivery
ACCOUNTABLE	Leader of Dept. Central Group
COMMUNITY OF PRACTICE	Data Partnerships Advisory Board
RELATED SERVICES	<ul style="list-style-type: none"> • Partner coordination • Data asset management • Creating and negotiating data sharing agreements
EXAMPLE	The New Partner Negotiation service was first developed in 1996 with the creation of the YorkInfo Partnership. This partnership is responsible for core spatial data management sharing and data acquisition to support planning projects. Now 14 members strong, this partnership is ready to expand to include other entities.



COMPETENCIES

Proficiencies	Competencies	Skill Level
Business Translation	Business Understanding	Expert
	Problem Statement Definition	Advanced/Expert
	Business Value Articulation	Advanced
	Requirements Definition	Advanced
Data Identification and Acquisition	Data Source Identification	Basic
	Data Source System(s) Understanding	Intermediate
	Data Acquisition and Exploration	
Data Evaluation, Processing and Transformation	Critical Data Elements Identification	Basic
	Quality Dimensions Assessment	
	Data Quality Metrics Requirements	
	Data Quality Assessment	
Analytical Solution Deployment and Validation	Solution Creation	
	Solution Testing and Validation	
Results Interpretation	Analysis Interpretation	
	Business Implications	Intermediate
	Client Empowerment	Basic
	Total Competencies Highest Level	9 Expert

Before you buy that data, are you sure we don't already have it? On the flip side, can you share purchased data to save others from buying it?

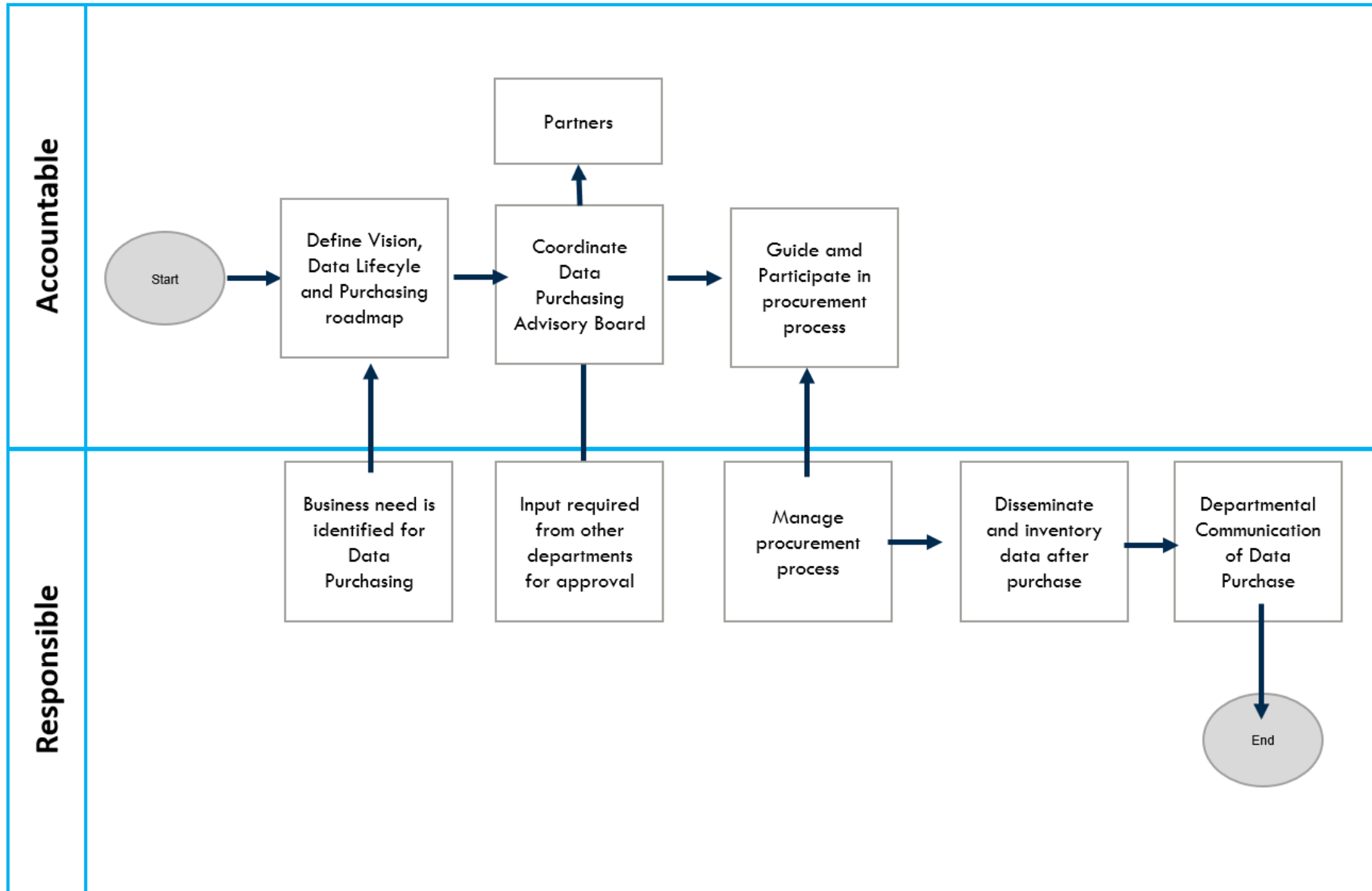


49. DATA PURCHASING

OVERVIEW

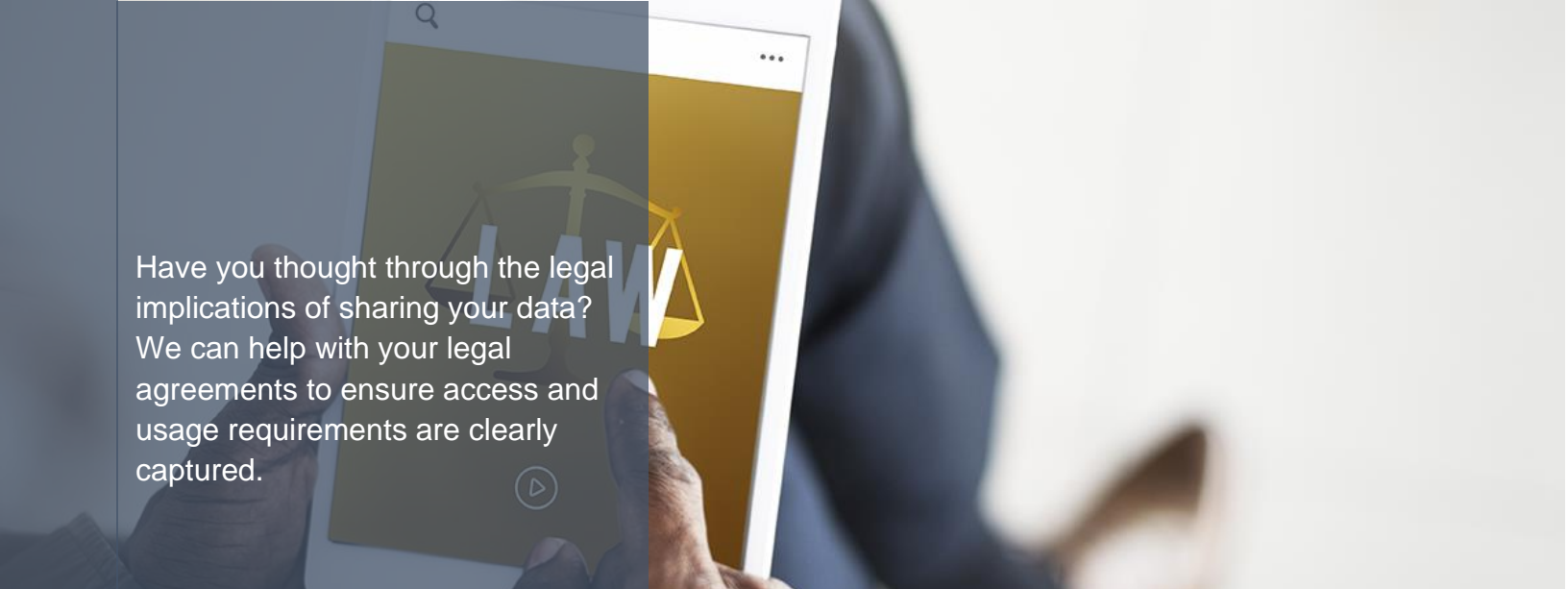
The Data Purchasing service coordinates York Region's data acquisitions to maximize the benefits from money spent. The service ensures the interests of all departments are considered and leverages the expertise of staff experienced in intellectual property rights and data ownership because these are often not transferred in a data purchase and may unacceptably constrain use of the data. The service also facilitates cost-sharing with other organizations. Using the service also helps ensure that the data is properly inventoried and stored for broad access. It also helps avoid duplication. For example, many business units use Statistics Canada data and staff purchasing it need to understand the requirements of each business unit to work with Statistics Canada on the best way to meet the purchase objectives.

OWNER (2021)	Central Coordination
ACCOUNTABLE	DAVS
COMMUNITY OF PRACTICE	Corporate Asset Management
RELATED SERVICES	<ul style="list-style-type: none"> • Capture • Data asset management • Issue resolution • Stewardship • Data valuation • Partner coordination
EXAMPLE	The Data Purchasing service means that the costs associated with region-wide coverage for orthophotography data and LiDAR data are split with YorkInfo Partnership members and negotiated rates are available to local municipalities.



COMPETENCIES

Proficiencies	Competencies	Skill Level
Business Translation	Business Understanding	Advanced
	Problem Statement Definition	Intermediate/Advanced
	Business Value Articulation	Intermediate
	Requirements Definition	Advanced
Data Identification and Acquisition	Data Source Identification	Intermediate
	Data Source System(s) Understanding	Intermediate
	Data Acquisition and Exploration	Advanced
Data Evaluation, Processing and Transformation	Critical Data Elements Identification	Intermediate
	Quality Dimensions Assessment	Basic
	Data Quality Metrics Requirements	Basic
	Data Quality Assessment	Basic
Analytical Solution Deployment and Validation	Solution Creation	Basic
	Solution Testing and Validation	
Results Interpretation	Analysis Interpretation	
	Business Implications	
	Client Empowerment	Basic
	Total Competencies Highest Level	13 Advanced



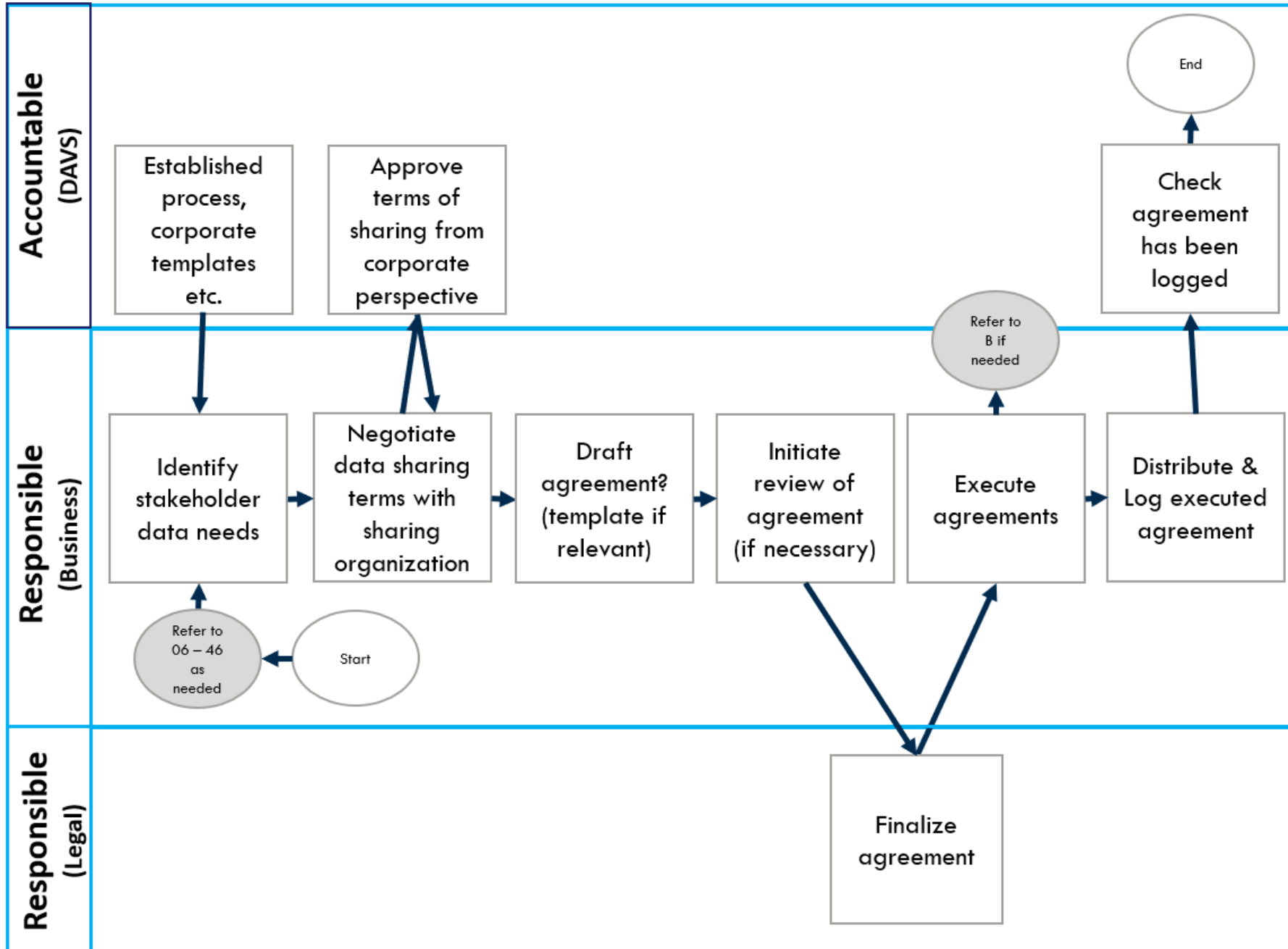
Have you thought through the legal implications of sharing your data? We can help with your legal agreements to ensure access and usage requirements are clearly captured.

50. CREATING & NEGOTIATING DATA SHARING AGREEMENTS

OVERVIEW

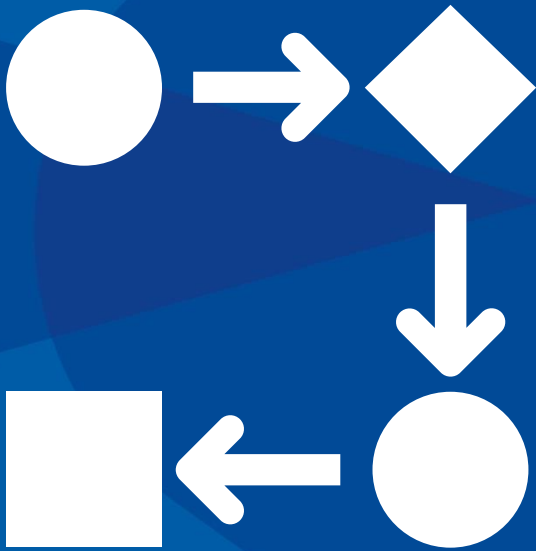
The Creating & Negotiating Data Sharing Agreements service negotiates, writes, and administers legal agreements between organizations about who can access and use the data being shared. Examples of such agreements include those covering general data sharing between the Region and local municipalities, data used by consultants for the Region's benefit as part of contracted work, and the sharing of transit data feeds from the Region used by third party applications.

OWNER (2021)	Central Coordination
ACCOUNTABLE	DAVS
COMMUNITY OF PRACTICE	Corporate Asset Management
RELATED SERVICES	<ul style="list-style-type: none"> • Partnership coordination • Security access and privacy services • Capture
EXAMPLE	The Creating & Negotiating Data Sharing Agreements service has helped put in place real-time access to York Region transit data feeds by Google and WAZE for use in their online applications.



COMPETENCIES

Proficiencies	Competencies	Skill Level
Business Translation	Business Understanding	Intermediate
	Problem Statement Definition	
	Business Value Articulation	Intermediate
	Requirements Definition	Basic
Data Identification and Acquisition	Data Source Identification	Basic
	Data Source System(s) Understanding	Intermediate
	Data Acquisition and Exploration	
Data Evaluation, Processing and Transformation	Critical Data Elements Identification	
	Quality Dimensions Assessment	
	Data Quality Metrics Requirements	
	Data Quality Assessment	
Analytical Solution Deployment and Validation	Solution Creation	
	Solution Testing and Validation	
Results Interpretation	Analysis Interpretation	
	Business Implications	
	Client Empowerment	Basic
	Total Competencies	6
	Highest Level	Intermediate



PREPARATION & INTEGRATION (07)

Getting data into the Region's systems

This knowledge area involves the movement of data between various sources and preparing data for users to conduct analysis.

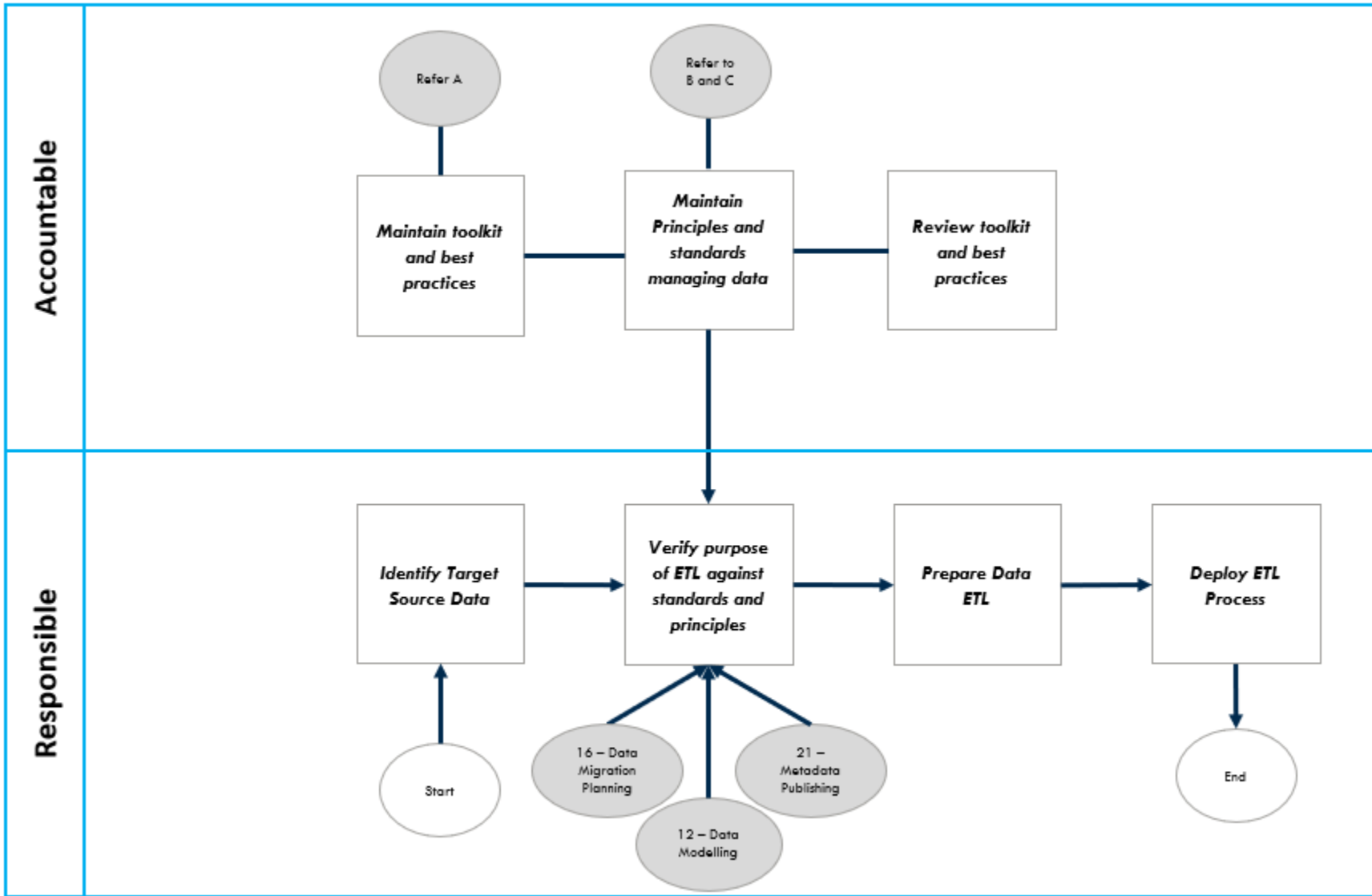
Data makes systems communicate. Learn how to integrate regional data assets into your system!

26. ETL AND DATA PREPARATION

OVERVIEW

The ETL and Data Preparation service makes data available to users in the format and timeframe they require. Extraction Transformation, and Loading (ETL) of data within and between data stores and systems makes source data compatible with the format and data structure of the target system. Moving data from a local system to an enterprise warehouse can make data accessible to a broader audience, and available for integration with other datasets. ETL helps ingest data from external source, such as the daily feed of Teranet property ownership data. ETL can also be used as part of archiving, retirement, and disposal processes. ETL processes can be run in real-time or off-peak times to avoid affecting the operations.

OWNER (2021)	Departmental Delivery	
ACCOUNTABLE	ITS	
COMMUNITY OF PRACTICE	Data Warehousing Advisory Board	
RELATED SERVICES	<ul style="list-style-type: none"> • Local procedures • Data modelling • Data flows • Data migration planning • Capture 	<ul style="list-style-type: none"> • Store and dispose • Metadata collection • Profiling • Security access and privacy services
EXAMPLE	<p>ETL and Data Preparation services are core to the success of the All-Pipes application. Data associated with the water / wastewater infrastructure for the municipalities across York Region are shared within the All-Pipes system, however, the host systems and data standards are not identical across the Region. The ETL and Data Preparation service is used to modify the data as required into a common standard / format for use within All Pipes.</p>	



COMPETENCIES

Proficiencies	Competencies	Skill Level
Business Translation	Business Understanding	Advanced
	Problem Statement Definition	
	Business Value Articulation	Advanced
	Requirements Definition	Intermediate
Data Identification and Acquisition	Data Source Identification	Advanced
	Data Source System(s) Understanding	Advanced
	Data Acquisition and Exploration	Advanced
Data Evaluation, Processing and Transformation	Critical Data Elements Identification	Advanced
	Quality Dimensions Assessment	
	Data Quality Metrics Requirements	
	Data Quality Assessment	
Analytical Solution Deployment and Validation	Solution Creation	Intermediate
	Solution Testing and Validation	
Results Interpretation	Analysis Interpretation	Intermediate
	Business Implications	
	Client Empowerment	Advanced
	Total Competencies Highest Level	10 Advanced

It's time for a data spring cleaning!
We have tools, templates, and
methods for improving your data!

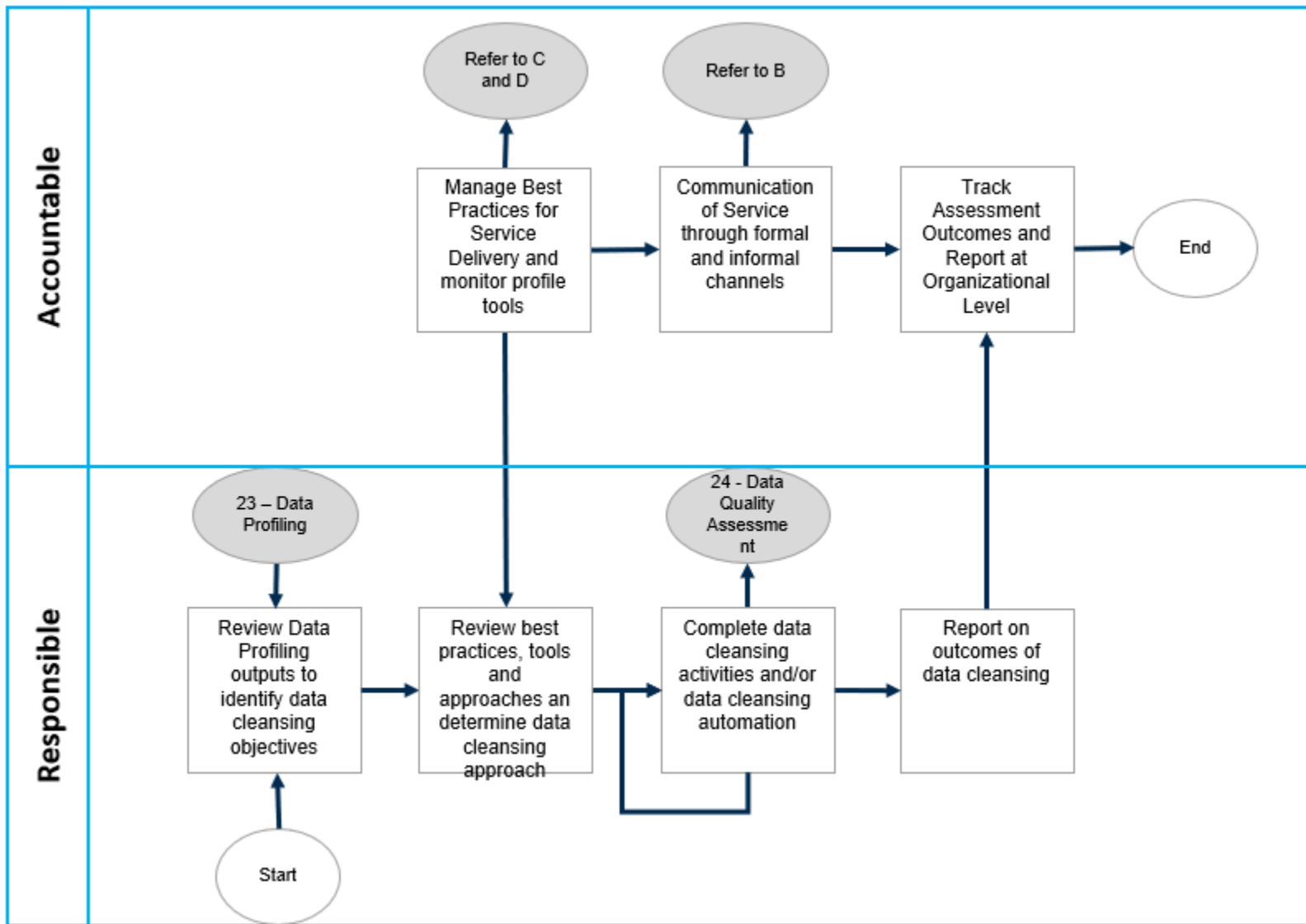


27. CLEANSING

OVERVIEW

The Cleansing service provides users with a toolkit(s) with tools, templates, and methods for detecting and correcting errors in data to bring data quality to an acceptable level for the immediate purpose. Data cleansing is not, however, a substitute for sustained data quality processes. The toolkits' resources will make it possible for self-service and will be available to users through a web portal. The components will include report generation tools, templates, design samples and training materials, as well as contacts for support. Cleansing activities may be used as part of a data quality improvement project.

OWNER (2021)	Central Coordination
ACCOUNTABLE	DAVS
COMMUNITY OF PRACTICE	Data Warehousing Advisory Board Stewardship
RELATED SERVICES	<ul style="list-style-type: none"> • Stewardship • Profiling • Metadata collection • ETL and data preparation
EXAMPLE	The data cleansing service was used to interpret missing rain gauge services when they were offline during a storm even. Data was required to estimate the inflow and infiltration however offline rain gauges created an unclean dataset that resulted in the models being inaccurate. This was corrected.



COMPETENCIES

Proficiencies	Competencies	Skill Level
Business Translation	Business Understanding	Intermediate
	Problem Statement Definition	Advanced
	Business Value Articulation	Advanced
	Requirements Definition	Advanced
Data Identification and Acquisition	Data Source Identification	Intermediate
	Data Source System(s) Understanding	Intermediate
	Data Acquisition and Exploration	
Data Evaluation, Processing and Transformation	Critical Data Elements Identification	Intermediate
	Quality Dimensions Assessment	
	Data Quality Metrics Requirements	
	Data Quality Assessment	
Analytical Solution Deployment and Validation	Solution Creation	
	Solution Testing and Validation	
Results Interpretation	Analysis Interpretation	Intermediate
	Business Implications	Basic
	Client Empowerment	
	Total Competencies	9
	Highest Level	Advanced

Make sure the data you're using lines up with the authoritative data sources available region-wide!

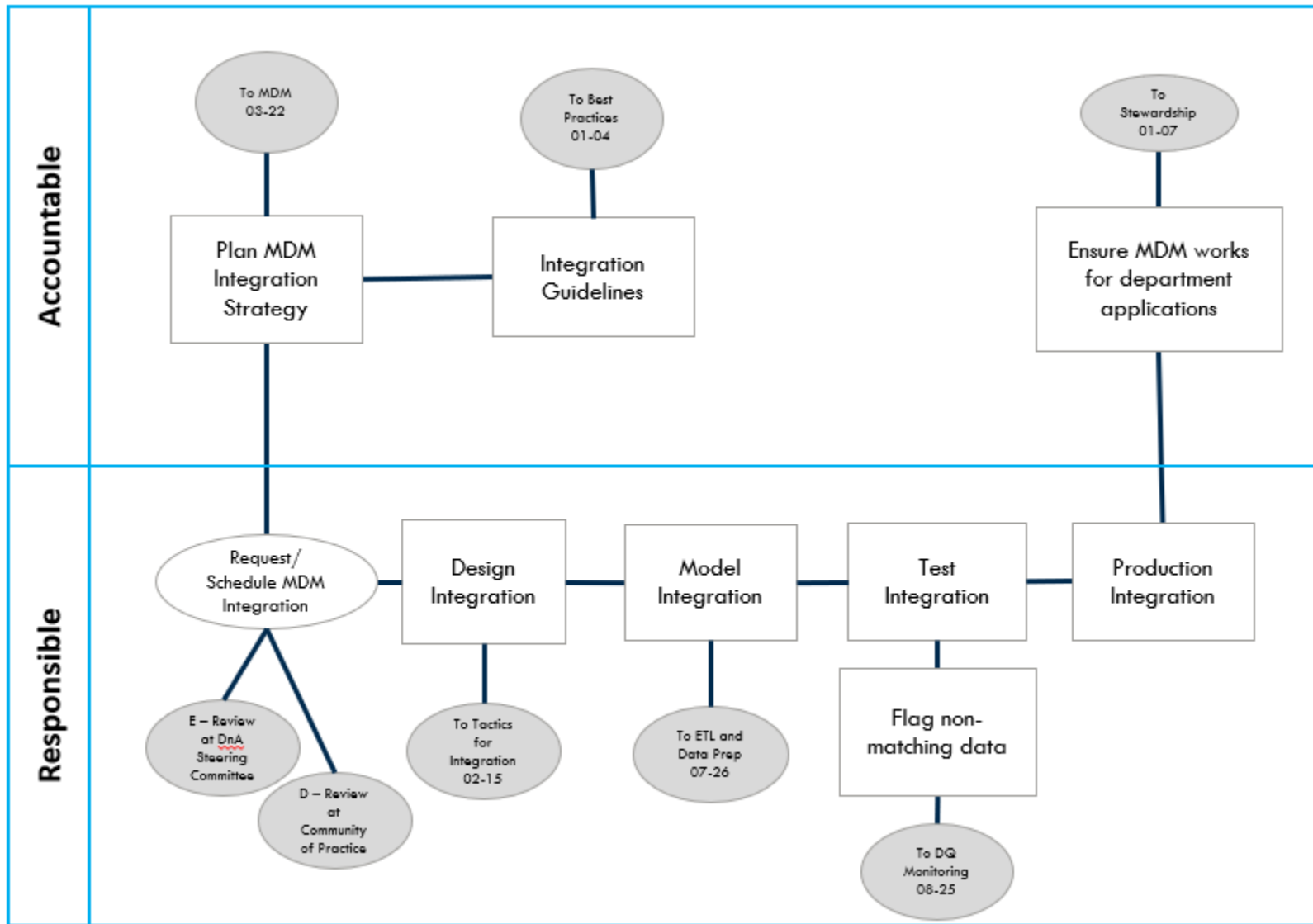


28. INTEGRATING & MATCHING TO MASTER & REFERENCE DATA

OVERVIEW

The Integrating and Matching to Master and Reference Data service creates a validation process between an operational data application and one or more enterprise master or reference data stores so that the application's data are consistent with all other applications using the same data entities.

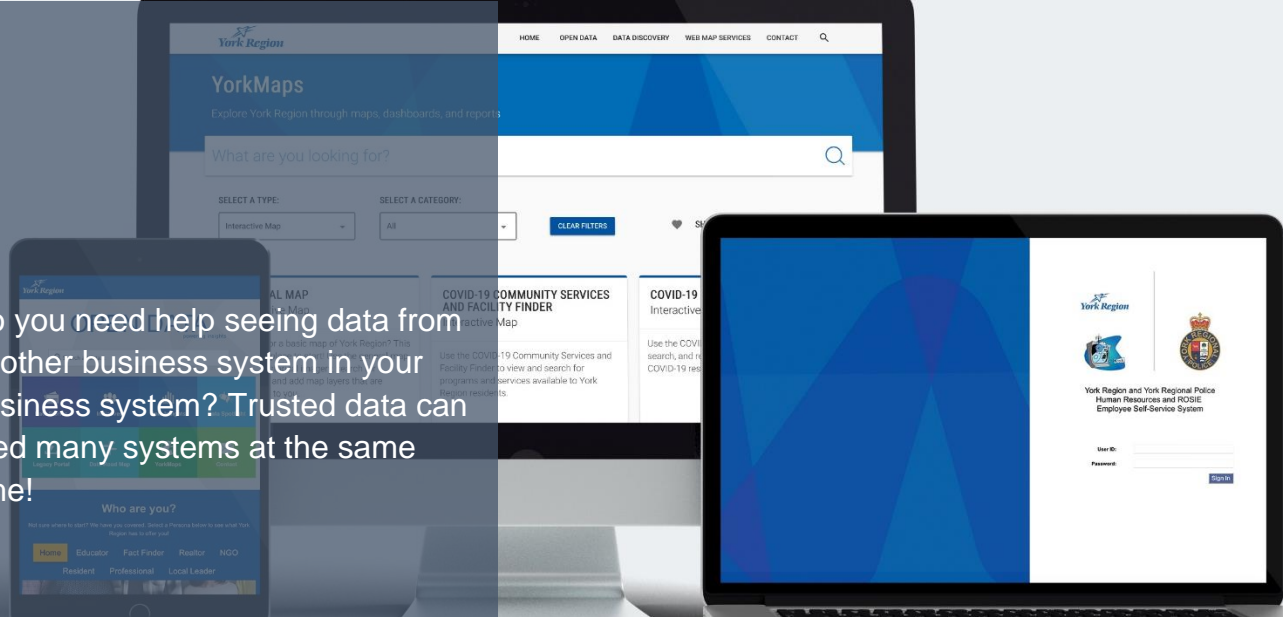
OWNER (2021)	Central Coordination
ACCOUNTABLE	ITS
COMMUNITY OF PRACTICE	Data Warehousing Advisory Board
RELATED SERVICES	<ul style="list-style-type: none"> • Master and reference data • Data modelling • Technology services
EXAMPLE	The Integrating and Matching to Master and Reference Data service can be used to ensure the GL codes for fees collected and recorded by the YorkTrax development tracking system reflect the active reference GL code list in the corporate ERP system.



COMPETENCIES

Proficiencies	Competencies	Skill Level
Business Translation	Business Understanding	Advanced
	Problem Statement Definition	Expert
	Business Value Articulation	Advanced
	Requirements Definition	Advanced
Data Identification and Acquisition	Data Source Identification	
	Data Source System(s) Understanding	Expert
	Data Acquisition and Exploration	
Data Evaluation, Processing and Transformation	Critical Data Elements Identification	Intermediate
	Quality Dimensions Assessment	
	Data Quality Metrics Requirements	
	Data Quality Assessment	
Analytical Solution Deployment and Validation	Solution Creation	Advanced/Expert
	Solution Testing and Validation	Intermediate
Results Interpretation	Analysis Interpretation	
	Business Implications	Basic
	Client Empowerment	
	Total Competencies	9
	Highest Level	Expert

Do you need help seeing data from another business system in your business system? Trusted data can feed many systems at the same time!



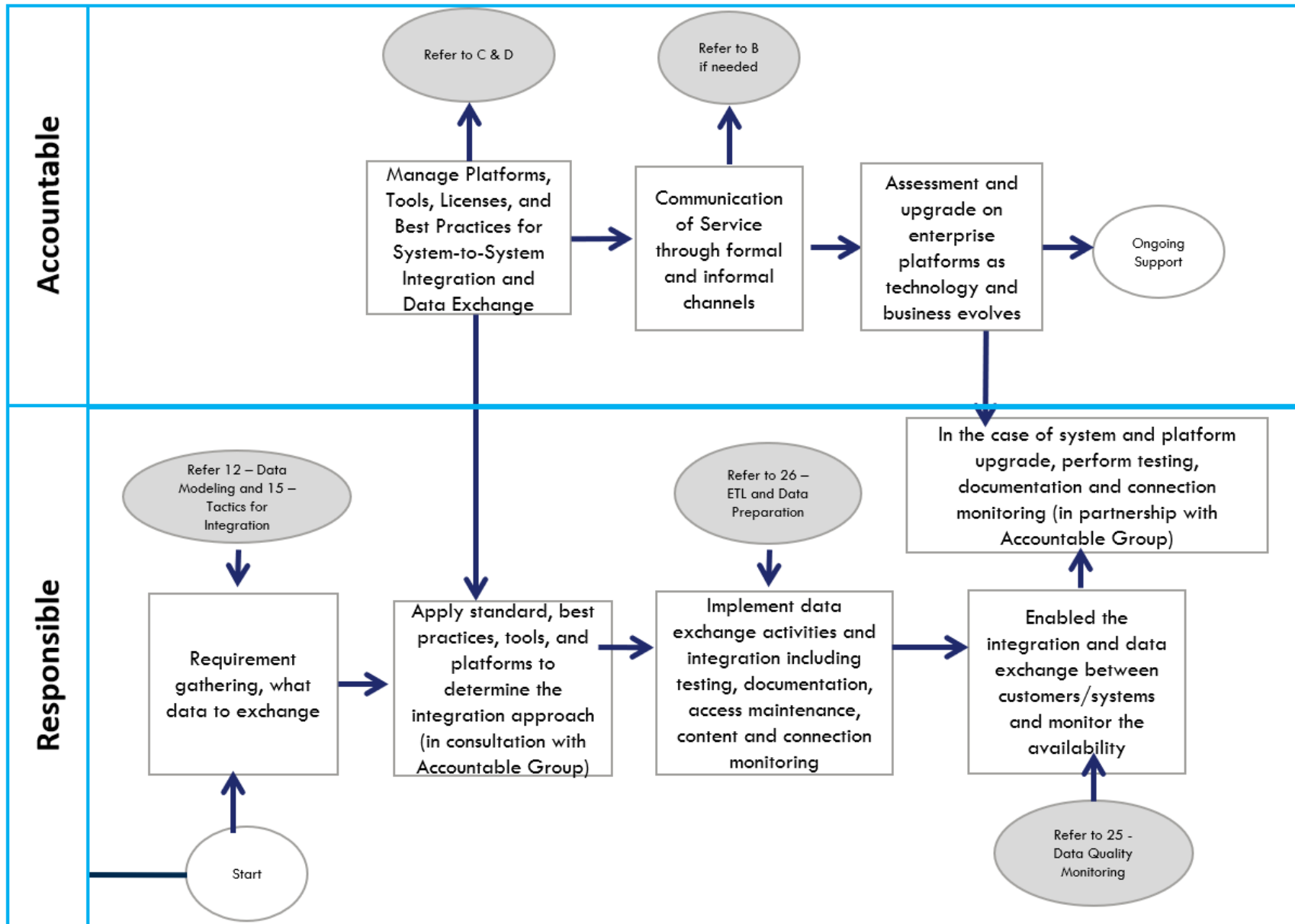
29. SYSTEM TO SYSTEM INTEGRATION

OVERVIEW

The System-to-System Integration service enables different systems to exchange data. The systems may be internal, enabling a system in one department to incorporate data maintained in a system maintained by another department. They may also be external, enabling the Region’s data to be used by another organization’s system or vice versa. The integration could also be with a cloud-based system.

As the number of system-to-system integrations within an organization increases, there is a need to rationalize how the integrations are managed. Established data exchange specifications should be used wherever applicable.

OWNER (2021)	Departmental Delivery
ACCOUNTABLE	ITS
COMMUNITY OF PRACTICE	IT, Architecture Review Board
RELATED SERVICES	<ul style="list-style-type: none"> • Tactics for integration • Data modelling • ETL and data preparation • Technology services
EXAMPLE	The System-to-System Integration service is enabling YorkMaps to publish Internet-accessible data with REST endpoints which can be incorporated into other applications and viewers. This is enabling local municipal applications to have direct access to York Region data.



COMPETENCIES

Proficiencies	Competencies	Skill Level
Business Translation	Business Understanding	Advanced
	Problem Statement Definition	
	Business Value Articulation	Advanced
	Requirements Definition	Expert
Data Identification and Acquisition	Data Source Identification	Basic
	Data Source System(s) Understanding	Advanced
	Data Acquisition and Exploration	
Data Evaluation, Processing and Transformation	Critical Data Elements Identification	
	Quality Dimensions Assessment	
	Data Quality Metrics Requirements	
	Data Quality Assessment	
Analytical Solution Deployment and Validation	Solution Creation	Advanced/Expert
	Solution Testing and Validation	Advanced
Results Interpretation	Analysis Interpretation	
	Business Implications	Basic
	Client Empowerment	
	Total Competencies	8
	Highest Level	Expert

Data makes systems communicate.
Learn how to integrate regional data
assets into your system!

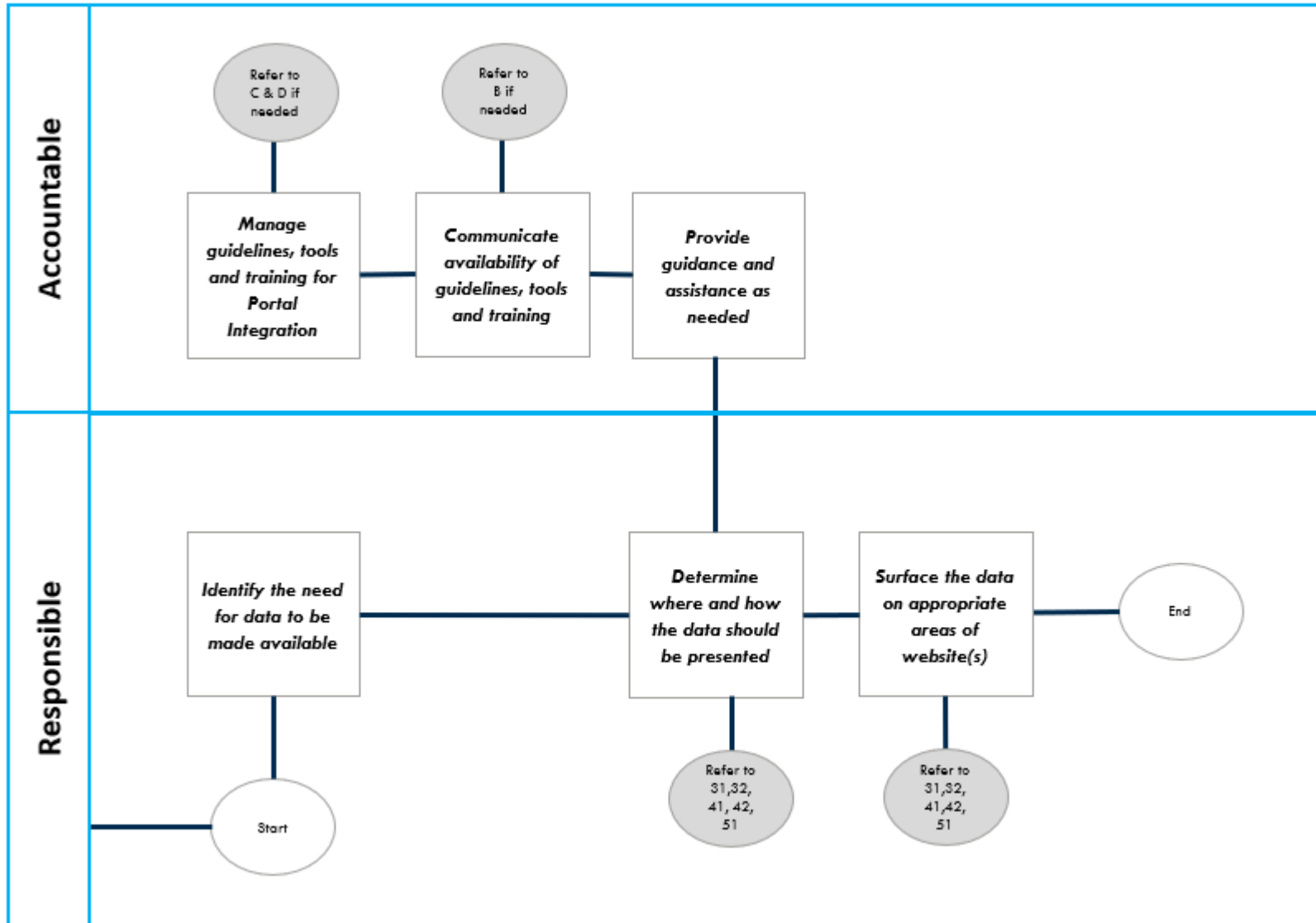


30. INTEGRATION TO PORTAL

OVERVIEW

The Integration to Portal service enables up-to-date data from operational systems and data stores including the enterprise data and analytics (D8alinx) warehouse to be displayed on portal sites on the Internet, Intranet, or an extranet.

OWNER (2021)	Central Coordination
ACCOUNTABLE	ITS
COMMUNITY OF PRACTICE	Web coordinators, User experience
RELATED SERVICES	<ul style="list-style-type: none"> • Data modelling • ETL and data preparation • Report generation with data toolkit • Dashboard generation & maintenance toolkit • Data visualization • Open data publishing
EXAMPLE	The Integration to Portal service was instrumental in enabling the Region's pandemic information and data to be published and shared externally on the York.ca website through the COVID dashboard . See: COVID-19 in York Region



COMPETENCIES

Proficiencies	Competencies	Skill Level
Business Translation	Business Understanding	Basic
	Problem Statement Definition	
	Business Value Articulation	Intermediate
	Requirements Definition	Basic
Data Identification and Acquisition	Data Source Identification	Basic
	Data Source System(s) Understanding	Intermediate
	Data Acquisition and Exploration	
Data Evaluation, Processing and Transformation	Critical Data Elements Identification	
	Quality Dimensions Assessment	
	Data Quality Metrics Requirements	
	Data Quality Assessment	
Analytical Solution Deployment and Validation	Solution Creation	
	Solution Testing and Validation	
Results Interpretation	Analysis Interpretation	
	Business Implications	
	Client Empowerment	Basic
	Total Competencies	6
	Highest Level	Intermediate



DATA QUALITY (08)

Getting the right data, the first time

This knowledge area applies to the planning, implementation and control of activities that apply quality management techniques to data to assure it is fit for consumption and meets the needs of data consumers.

Want to know your data better?
 Data profiling gives you statistical insights about your data and is a great first step to #puttingdatatowork!

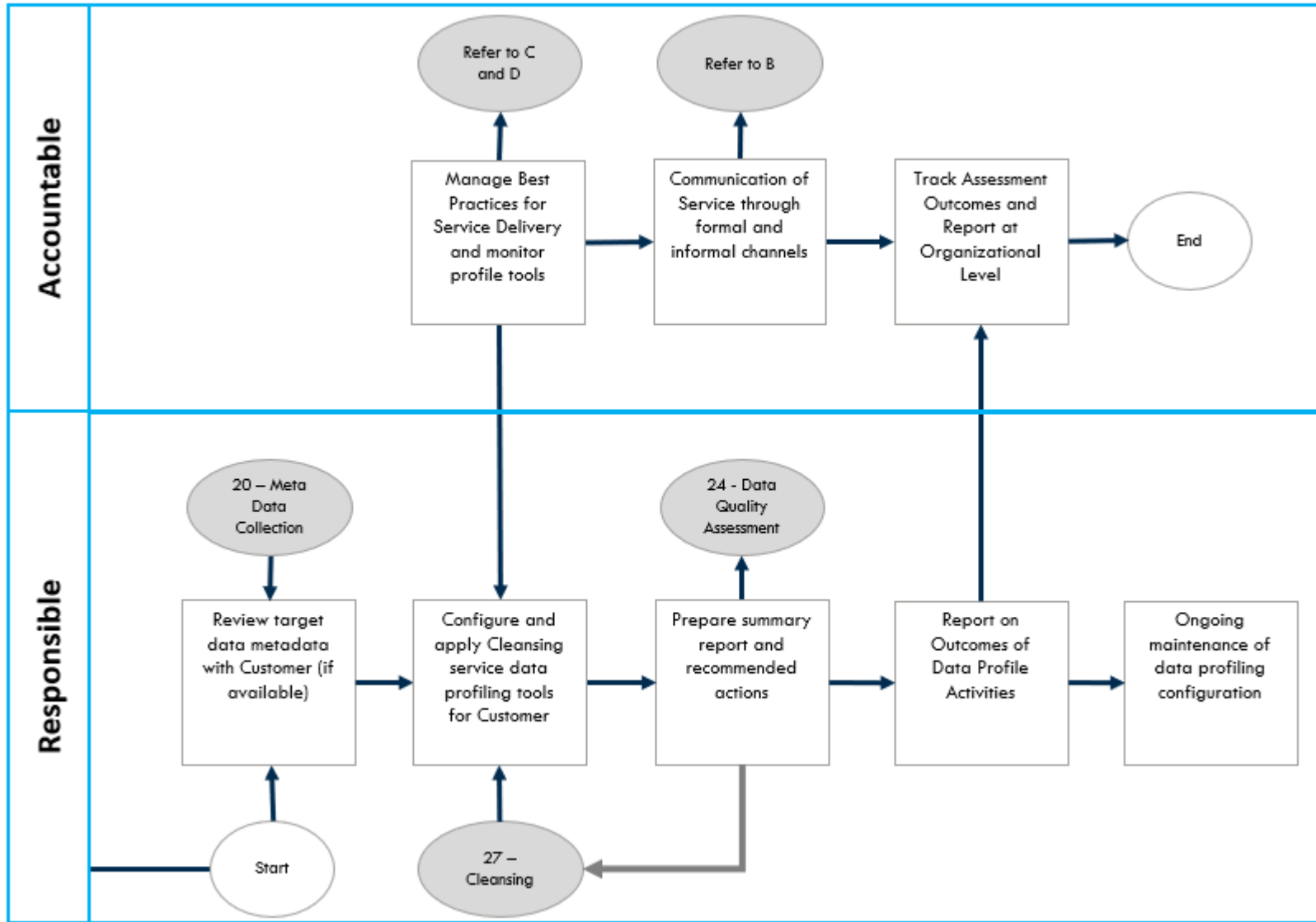


23. DATA PROFILING

OVERVIEW

Data profiling involves running statistical operations to get a characterization of the data elements or fields that give a view of the data’s condition (e.g., number of missing values, mean values, value clusters, outliers, standard deviations, etc.). This service provides an initial characterization of the data prior to data quality assessment.

OWNER (2021)	Departmental Delivery
ACCOUNTABLE	Leader of Dept. Central Group
COMMUNITY OF PRACTICE	Data Stewardship Council
RELATED SERVICES	<ul style="list-style-type: none"> • Data security, access, and privacy services
EXAMPLE	The Data Profiling service provides a baseline of the condition of data in a system. Profiling was used to find value ranges in the YorkTrax development tracking system before data cleansing.



COMPETENCIES

Proficiencies	Competencies	Skill Level
Business Translation	Business Understanding	
	Problem Statement Definition	
	Business Value Articulation	
	Requirements Definition	
Data Identification and Acquisition	Data Source Identification	
	Data Source System(s) Understanding	
	Data Acquisition and Exploration	
Data Evaluation, Processing and Transformation	Critical Data Elements Identification	Advanced
	Quality Dimensions Assessment	Advanced
	Data Quality Metrics Requirements	
	Data Quality Assessment	
Analytical Solution Deployment and Validation	Solution Creation	
	Solution Testing and Validation	
Results Interpretation	Analysis Interpretation	
	Business Implications	
	Client Empowerment	
	Total Competencies Highest Level	2 Advanced

Once your data has been profiled, it's time to assess whether the data meets your business needs and if any improvements are required.

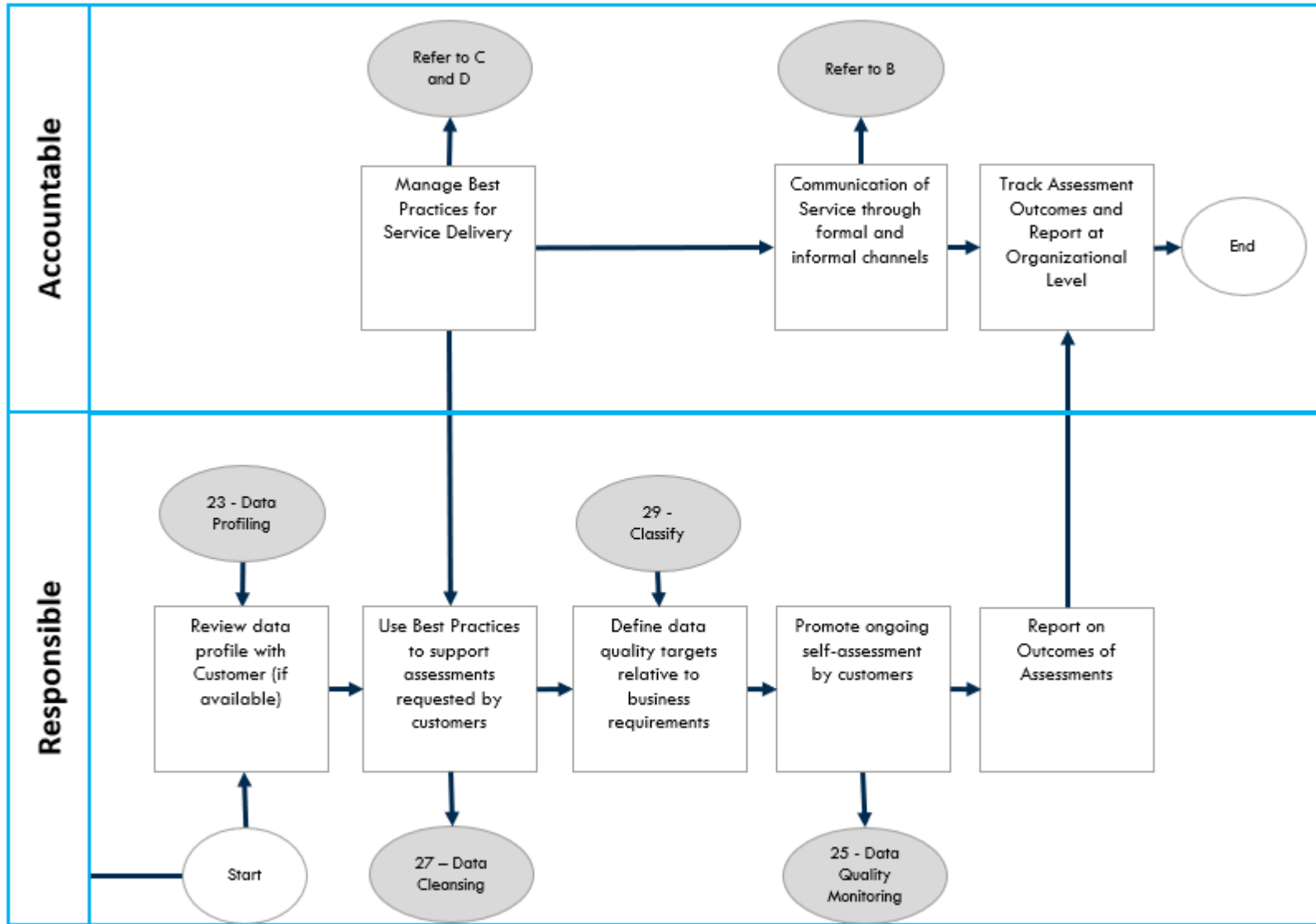


24. DATA QUALITY ASSESSMENT

OVERVIEW

The Data Quality Assessment service establishes quality targets with data users. The quality of a dataset is defined by how it is used and the tolerance for a specified level of errors against several quality dimensions. This service establishes a set of measurable data quality targets for critical fields within a dataset by engaging with data users.

OWNER (2021)	Departmental Delivery
ACCOUNTABLE	Leader of Dept. Central Group
COMMUNITY OF PRACTICE	Data Stewardship Council
RELATED SERVICES	<ul style="list-style-type: none"> • Profiling • ETL and data preparation
EXAMPLE	The Data Quality Assessment service sets data quality targets with data users to ensure the data is fit for the intended uses. Different aspects of roads data were assessed with Police dispatch and Roads operations staff to determine how complete and timely the data needed to be.



COMPETENCIES

Proficiencies	Competencies	Skill Level
Business Translation	Business Understanding	Intermediate
	Problem Statement Definition	
	Business Value Articulation	
	Requirements Definition	
Data Identification and Acquisition	Data Source Identification	
	Data Source System(s) Understanding	
	Data Acquisition and Exploration	
Data Evaluation, Processing and Transformation	Critical Data Elements Identification	
	Quality Dimensions Assessment	
	Data Quality Metrics Requirements	Advanced
	Data Quality Assessment	Advanced
Analytical Solution Deployment and Validation	Solution Creation	
	Solution Testing and Validation	
Results Interpretation	Analysis Interpretation	
	Business Implications	
	Client Empowerment	
	Total Competencies Highest Level	3 Advanced

ASSURANCE



ANALYZE

To study or examine something in detail for an explanation



To make something better in a particular way



EVALUATE

To determine or estimate the significance, quality, or value of assessment



PLANNING

A detail or a process of thinking and organizing step by step to achieve a desired goal



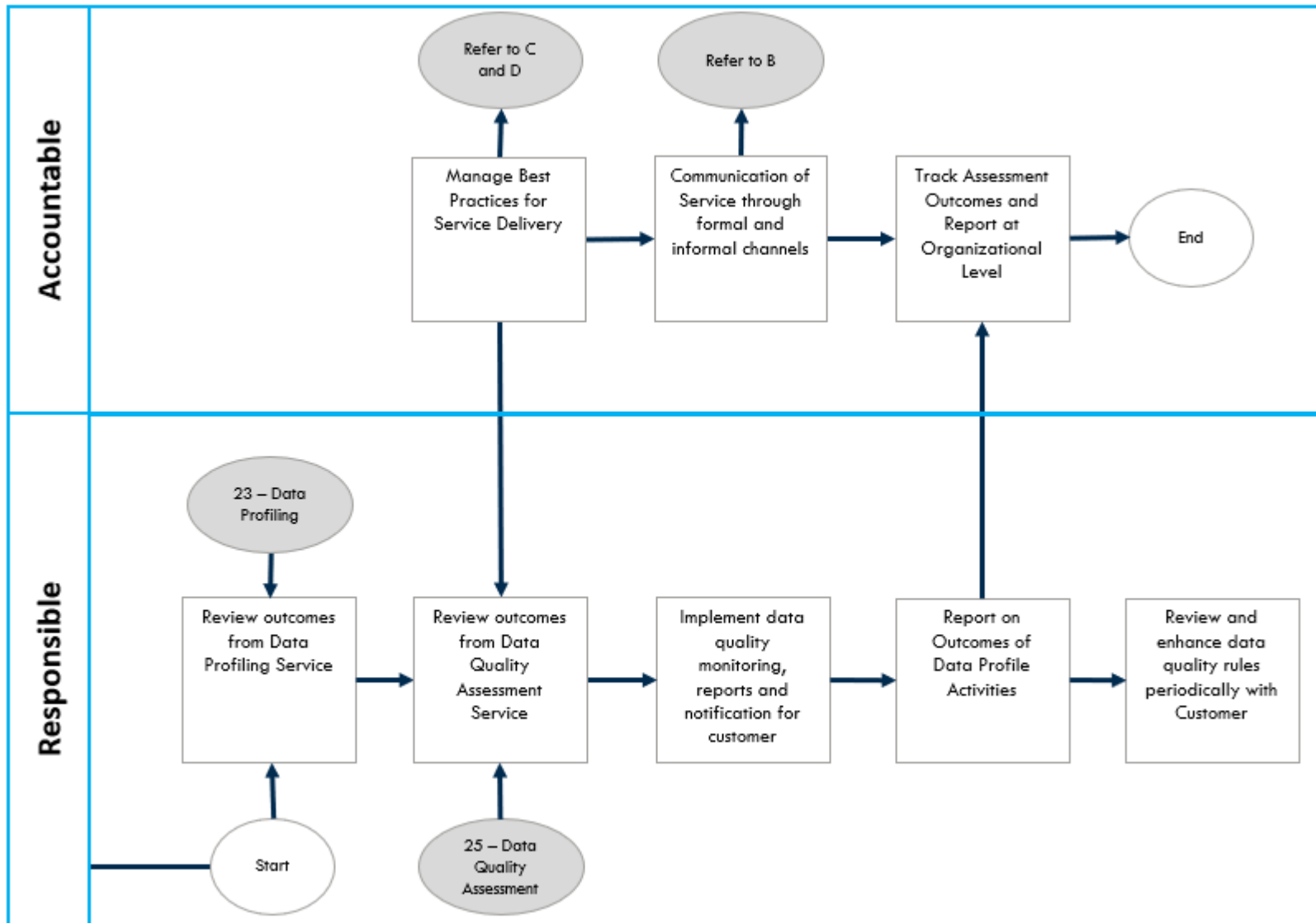
You've spent countless hours cleaning your data. We're here to help you implement tools to keep it clean!

25. DATA QUALITY MONITORING

OVERVIEW

The Data Quality Monitoring service provides the on-going monitoring of data quality to indicate whether established data quality targets are being met. Typically, the monitoring results are delivered as standardized reports that can be compared against data quality targets on a regular basis to see if the achieved quality level deviates from the target level. The data steward responsible for monitoring will trigger remedial action if the targets are not being met.

OWNER (2021)	Departmental Delivery
ACCOUNTABLE	Leader of Dept. Central Group
COMMUNITY OF PRACTICE	Data Stewardship Council
RELATED SERVICES	<ul style="list-style-type: none">• Data profiling• Data quality assessment• Stewardship• Dashboard generation and maintenance toolkit
EXAMPLE	The Data Quality Monitoring service ensures the agreed upon data quality targets are being met. Quality dashboards help monitor data quality for Transit inspection stations, minimum maintenance standards to repair an asset, and servicing of pumping stations.



COMPETENCIES

Proficiencies	Competencies	Skill Level
Business Translation	Business Understanding	Basic
	Problem Statement Definition	
	Business Value Articulation	
	Requirements Definition	
Data Identification and Acquisition	Data Source Identification	
	Data Source System(s) Understanding	
	Data Acquisition and Exploration	
Data Evaluation, Processing and Transformation	Critical Data Elements Identification	
	Quality Dimensions Assessment	
	Data Quality Metrics Requirements	Advanced
	Data Quality Assessment	
Analytical Solution Deployment and Validation	Solution Creation	
	Solution Testing and Validation	
Results Interpretation	Analysis Interpretation	Advanced
	Business Implications	
	Client Empowerment	
	Total Competencies Highest Level	3 Advanced



SECURITY, ACCESS & PRIVACY (09)

Keeping data safe and secure

This knowledge area applies to the definition, planning, development and execution of security & privacy policies and procedures to ensure proper authentication, authorization, access, monitoring, and auditing of data/information.



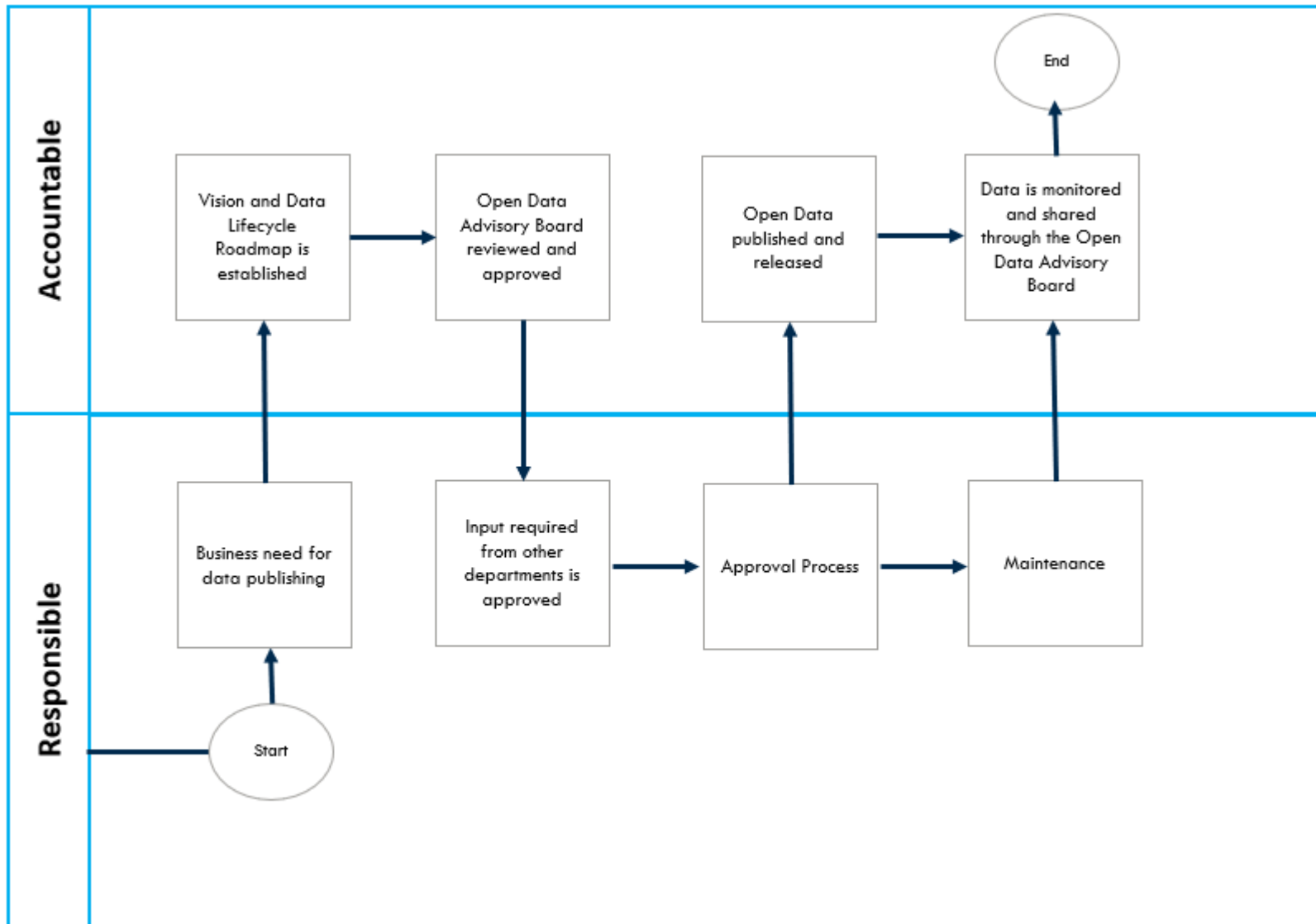
Can your data make a difference in the wider community? Learn how to share it openly so everyone benefits!

51. OPEN DATA PUBLISHING

OVERVIEW

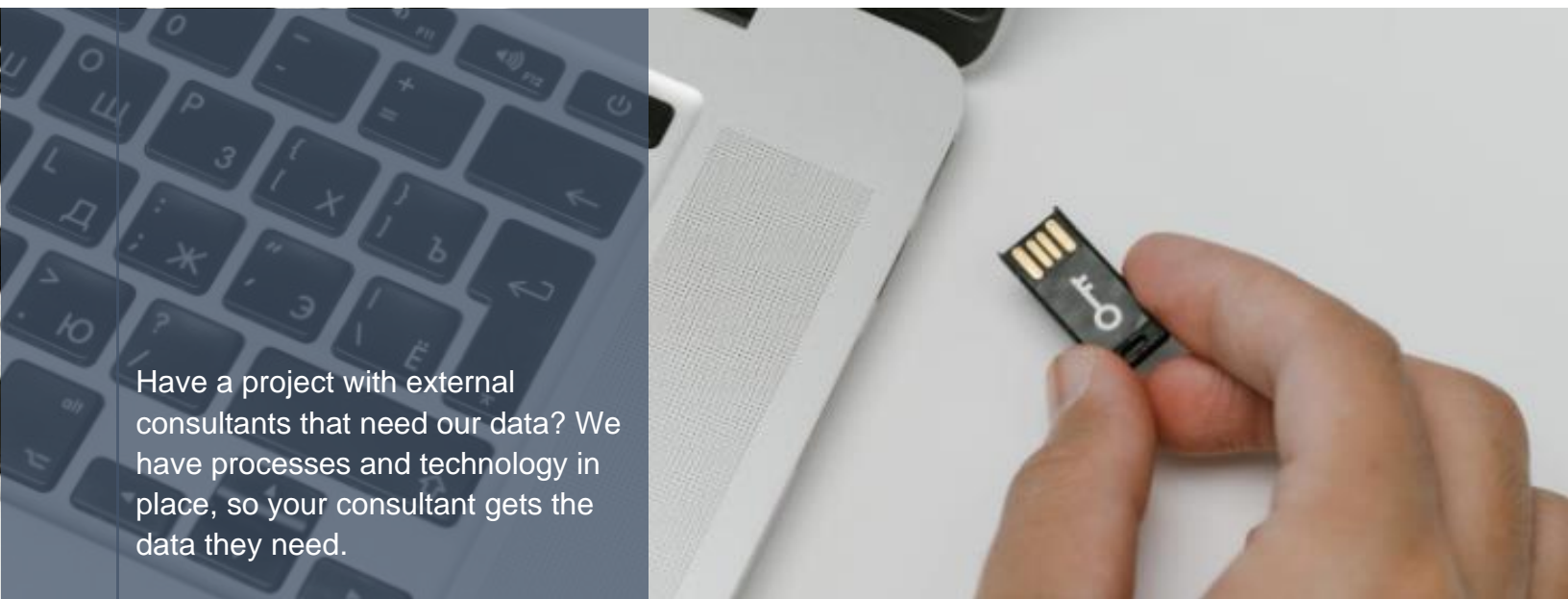
The Open Data Publishing service makes York Region data accessible to the public – either via download through a web interface or by other means, such as providing a meaningful visual representation of the data. Before publication, the Open Data Advisory Board identifies and vets the data to ensure its suitability for public consumption. Data in the Open Data program are refreshed on a regular basis.

OWNER (2021)	Central Coordination
ACCOUNTABLE	DAVS
COMMUNITY OF PRACTICE	Open Data Advisory Board
RELATED SERVICES	<ul style="list-style-type: none"> • Metadata publishing • ETL and data preparation • Data visualization • Communities of practice coordination • Maintaining sharing platform
EXAMPLE	The Open Data Publishing service is enabling the content within the Region’s widely recognized Insights Platform which adds significant intelligence and support to a user’s search for data.



COMPETENCIES

Proficiencies	Competencies	Skill Level
Business Translation	Business Understanding	Basic
	Problem Statement Definition	
	Business Value Articulation	Intermediate
	Requirements Definition	
Data Identification and Acquisition	Data Source Identification	
	Data Source System(s) Understanding	Intermediate
	Data Acquisition and Exploration	
Data Evaluation, Processing and Transformation	Critical Data Elements Identification	
	Quality Dimensions Assessment	
	Data Quality Metrics Requirements	
	Data Quality Assessment	
Analytical Solution Deployment and Validation	Solution Creation	Basic
	Solution Testing and Validation	Basic
Results Interpretation	Analysis Interpretation	
	Business Implications	
	Client Empowerment	
	Total Competencies	5
	Highest Level	Intermediate



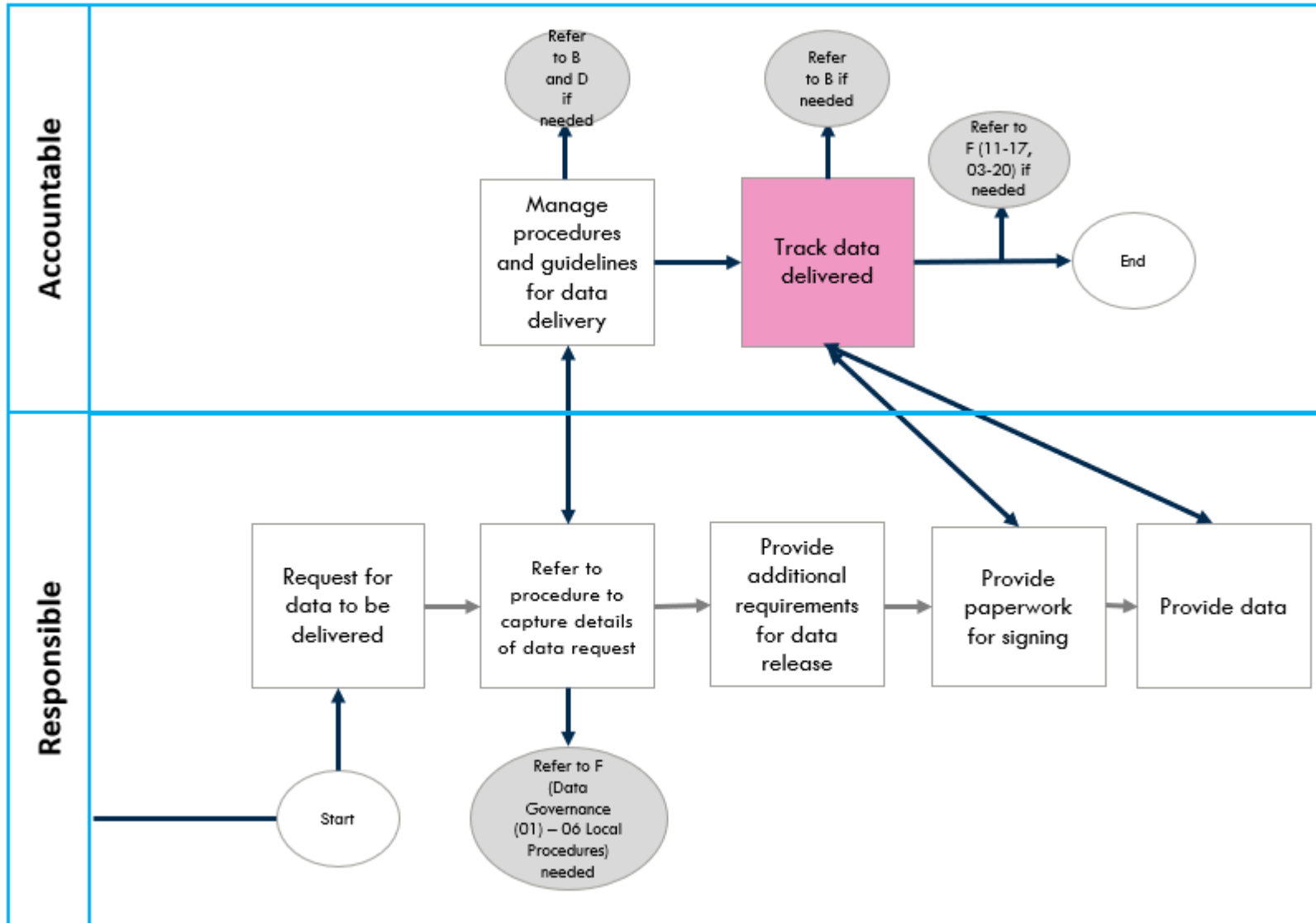
Have a project with external consultants that need our data? We have processes and technology in place, so your consultant gets the data they need.

52. DATA DELIVERIES TO CONSULTANTS

OVERVIEW

The Data Deliveries to Consultants service ensures consultants and contractors working on behalf of the Region can get York Region data from regional staff easily and effectively to plan and complete their work. To get non-public (“open”) York Region data, they must sign data license agreements that indicate any limitations on using the data. This service manages license agreements, data handling and clips geographic data to the areas the consultants or contractors require.

OWNER (2021)	Central Coordination
ACCOUNTABLE	DAVS
COMMUNITY OF PRACTICE	Data Stewardship Council
RELATED SERVICES	<ul style="list-style-type: none"> • Metadata publishing • ETL and data preparation • Creating and negotiating data sharing agreements • Open data publishing • Maintaining sharing platform
EXAMPLE	The Data Deliveries to Consultants service is largely delivered through the award-winning Self Serve Data Depot , a York Region web service that handles the various elements of this service (license agreements, data handling and geographic clipping) and allows the consultant or contractor to find, define and download the data relevant to their project.



COMPETENCIES

Proficiencies	Competencies	Skill Level
Business Translation	Business Understanding	Advanced
	Problem Statement Definition	
	Business Value Articulation	
	Requirements Definition	Intermediate
Data Identification and Acquisition	Data Source Identification	Advanced
	Data Source System(s) Understanding	Advanced
	Data Acquisition and Exploration	
Data Evaluation, Processing and Transformation	Critical Data Elements Identification	Basic
	Quality Dimensions Assessment	
	Data Quality Metrics Requirements	
	Data Quality Assessment	
Analytical Solution Deployment and Validation	Solution Creation	
	Solution Testing and Validation	
Results Interpretation	Analysis Interpretation	
	Business Implications	
	Client Empowerment	Intermediate
	Total Competencies	6
	Highest Level	Advanced



TECHNOLOGY (10)

Building an environment for data to thrive

This knowledge area applies to the organizing and managing software designs, technology support and procurement, as well as application inventory, including the provisioning to the access of technology.

Building tools and systems means understanding the system and business requirements. We have many techniques to help you engage all aspects of your business!

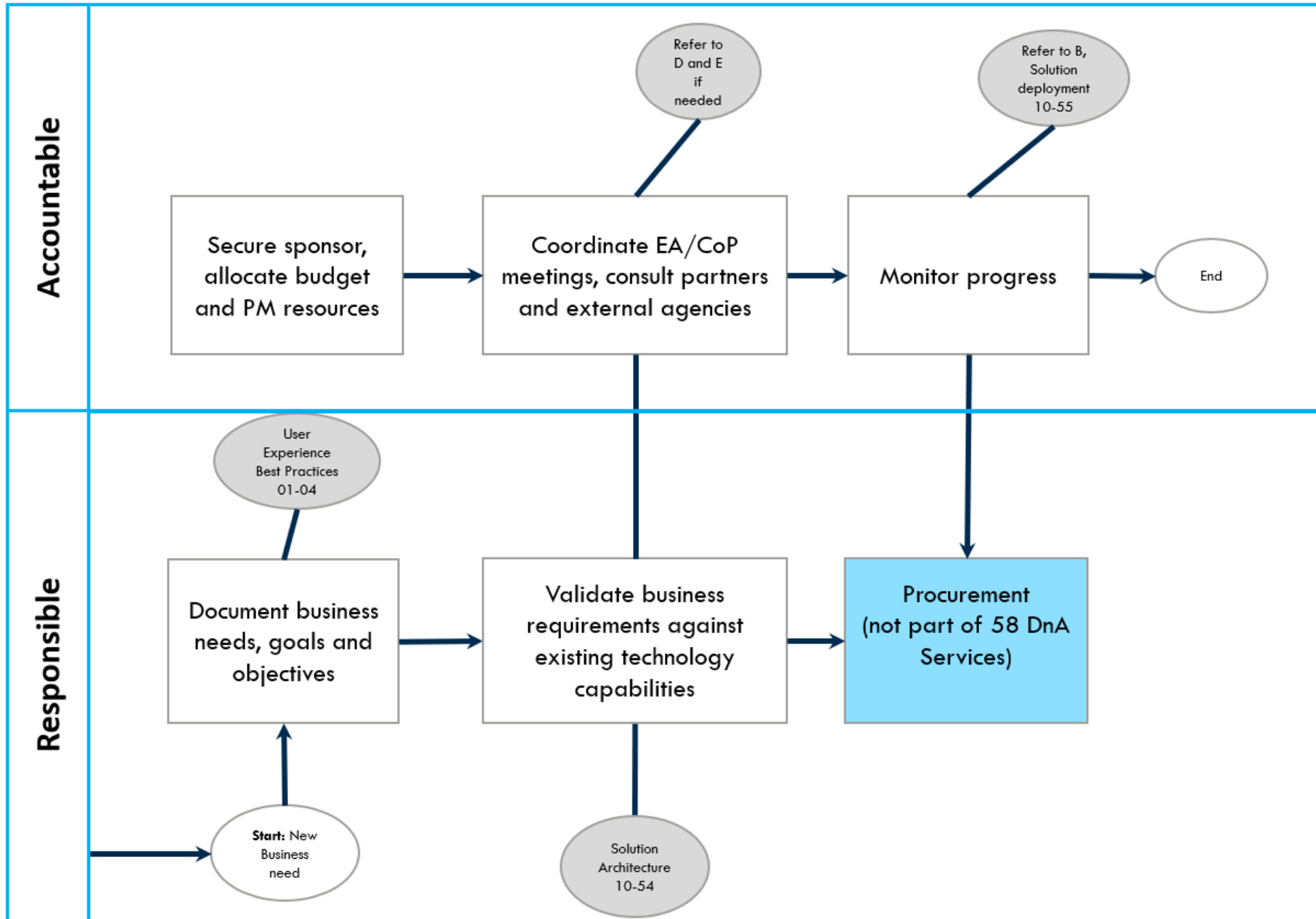


53. REQUIREMENTS GATHERING

OVERVIEW

The Requirements Gathering service is about eliciting the system requirements for data and analytics tools, GIS desktop and internet-based tools, and/or web-based mapping. Stakeholders (system users, maintainers, providers, and vendors) are asked about their system needs through interviews, questionnaires, user observation, workshops, use cases and prototyping. The service may involve business process analysis, especially in situations where the client group is unsure about their needs, or there is ambiguity about how a proposed system will be incorporated into the business process. This service includes assessing system upgrade and replacement requirements in response to changes in vendor system offerings.

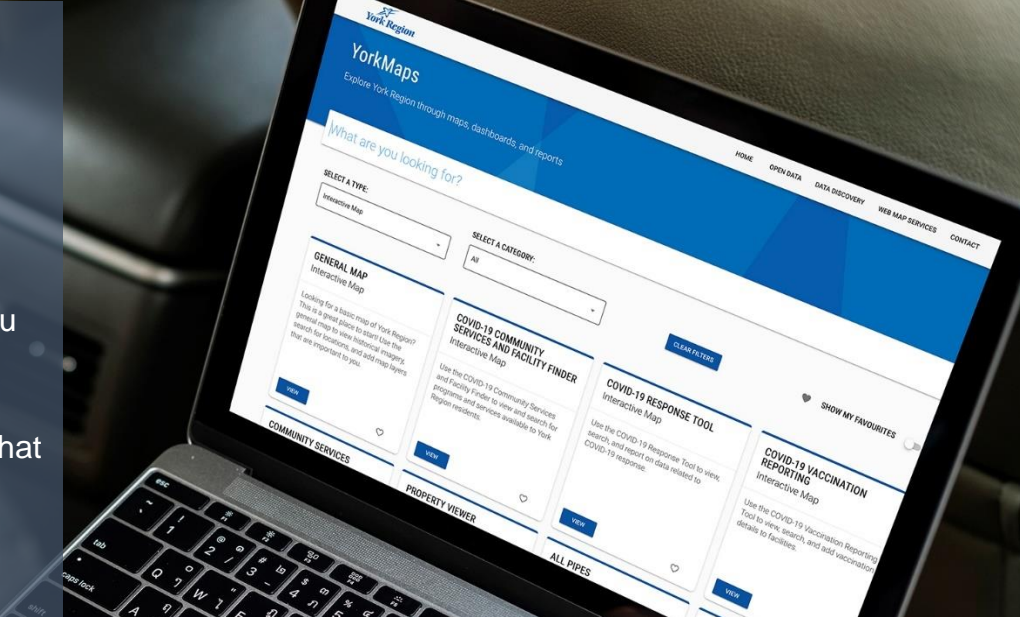
OWNER (2021)	Departmental Delivery
ACCOUNTABLE	Leader of Dept. Central Group
COMMUNITY OF PRACTICE	GIS Community of Practice
RELATED SERVICES	<ul style="list-style-type: none"> • System to system integration • Integration to portal • Analytics needs development • Solution architecture
EXAMPLE	The Requirements Gathering service is best reflected in Healthy Data, Healthy Response (HDHR) projects where a variety of iterative methods have been used to collect and validate requirements such as interviews, blueprinting, user stories, visual modeling, and wireframes.



COMPETENCIES

Proficiencies	Competencies	Skill Level
Business Translation	Business Understanding	Intermediate
	Problem Statement Definition	Expert
	Business Value Articulation	Advanced
	Requirements Definition	Advanced
Data Identification and Acquisition	Data Source Identification	Intermediate
	Data Source System(s) Understanding	Intermediate
	Data Acquisition and Exploration	Basic
Data Evaluation, Processing and Transformation	Critical Data Elements Identification	Advanced
	Quality Dimensions Assessment	Intermediate
	Data Quality Metrics Requirements	Intermediate
	Data Quality Assessment	Basic
Analytical Solution Deployment and Validation	Solution Creation	Basic
	Solution Testing and Validation	
Results Interpretation	Analysis Interpretation	Basic
	Business Implications	
	Client Empowerment	
	Total Competencies Highest Level	13 Expert

Need systems thinking to help you identify design options for a new solution? We take a holistic approach to designing solutions that will meet all your requirements!

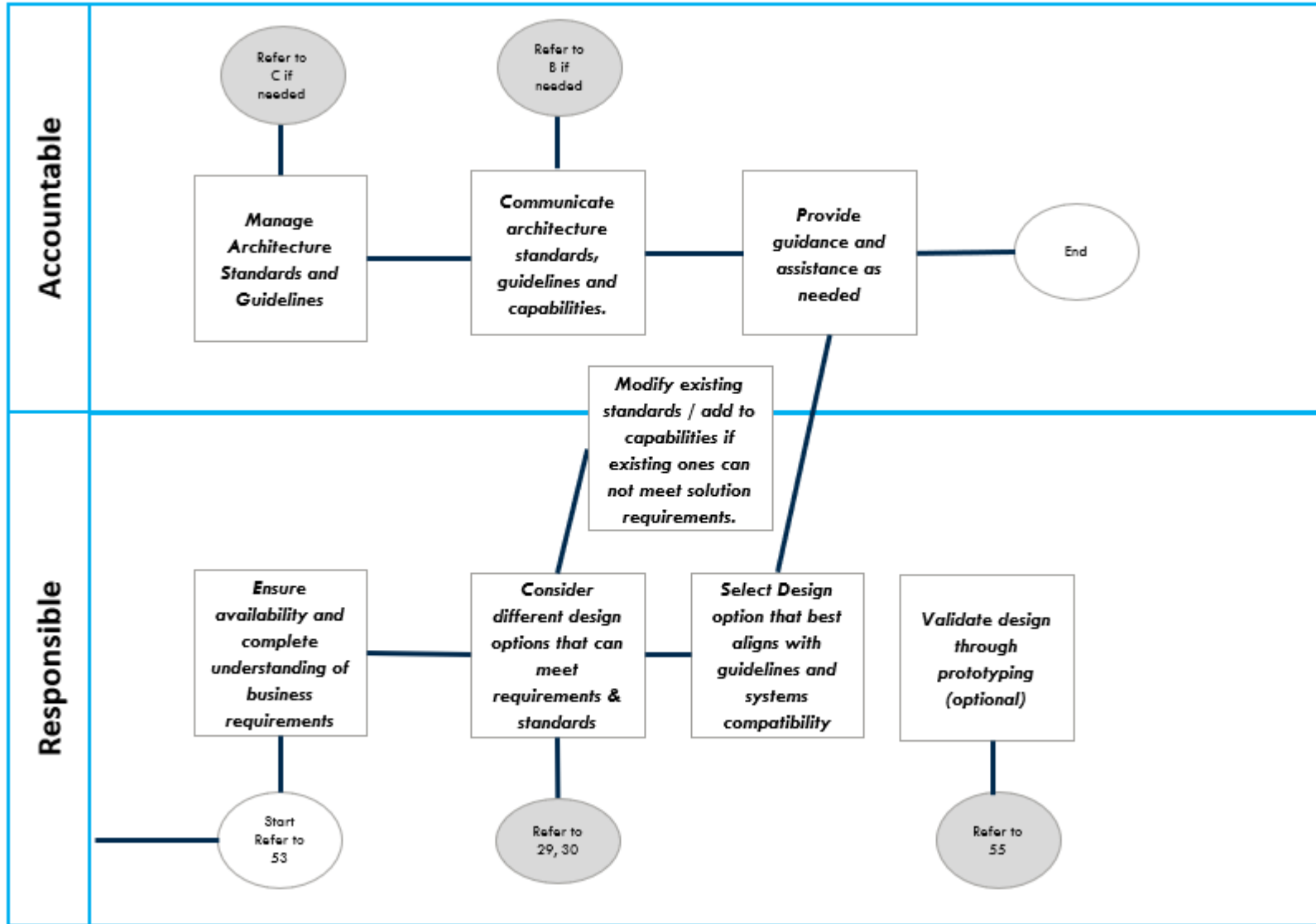


54. SOLUTION ARCHITECTURE

OVERVIEW

The Solution Architecture service develops system design options for data and analytics tools, GIS desktop and internet-based tools, and / or web-based mapping, and identifies a preferred option for implementation. The option meets the business requirements and considers the server infrastructure to ensure compatibility with other systems. Testing and evaluating the options may involve prototyping or pilot implementation.

OWNER (2021)	Departmental Delivery
ACCOUNTABLE	Leader of Dept. Central Group
COMMUNITY OF PRACTICE	GIS Advisory Board
RELATED SERVICES	<ul style="list-style-type: none"> • Data migration planning • System to system integration • Integration to portal • Analytics needs development • Requirements gathering • Solution deployment
EXAMPLE	The Solution Architecture service is essential to the successful development of any significant business application at York Region, whether it is Healthy Data Healthy Response, YorkMaps and Property Viewer, ensuring the business needs, sustainability and robust security are met.



COMPETENCIES

Proficiencies	Competencies	Skill Level
Business Translation	Business Understanding	Advanced
	Problem Statement Definition	Intermediate
	Business Value Articulation	Basic
	Requirements Definition	Advanced
Data Identification and Acquisition	Data Source Identification	Advanced
	Data Source System(s) Understanding	Advanced
	Data Acquisition and Exploration	Basic
Data Evaluation, Processing and Transformation	Critical Data Elements Identification	Basic
	Quality Dimensions Assessment	Basic
	Data Quality Metrics Requirements	Basic
	Data Quality Assessment	Basic
Analytical Solution Deployment and Validation	Solution Creation	Advanced
	Solution Testing and Validation	Advanced
Results Interpretation	Analysis Interpretation	
	Business Implications	Intermediate
	Client Empowerment	Advanced
	Total Competencies Highest Level	15 Advanced

Need help implementing your data tool? Our experts can help with everything from installation, to testing, to troubleshooting!

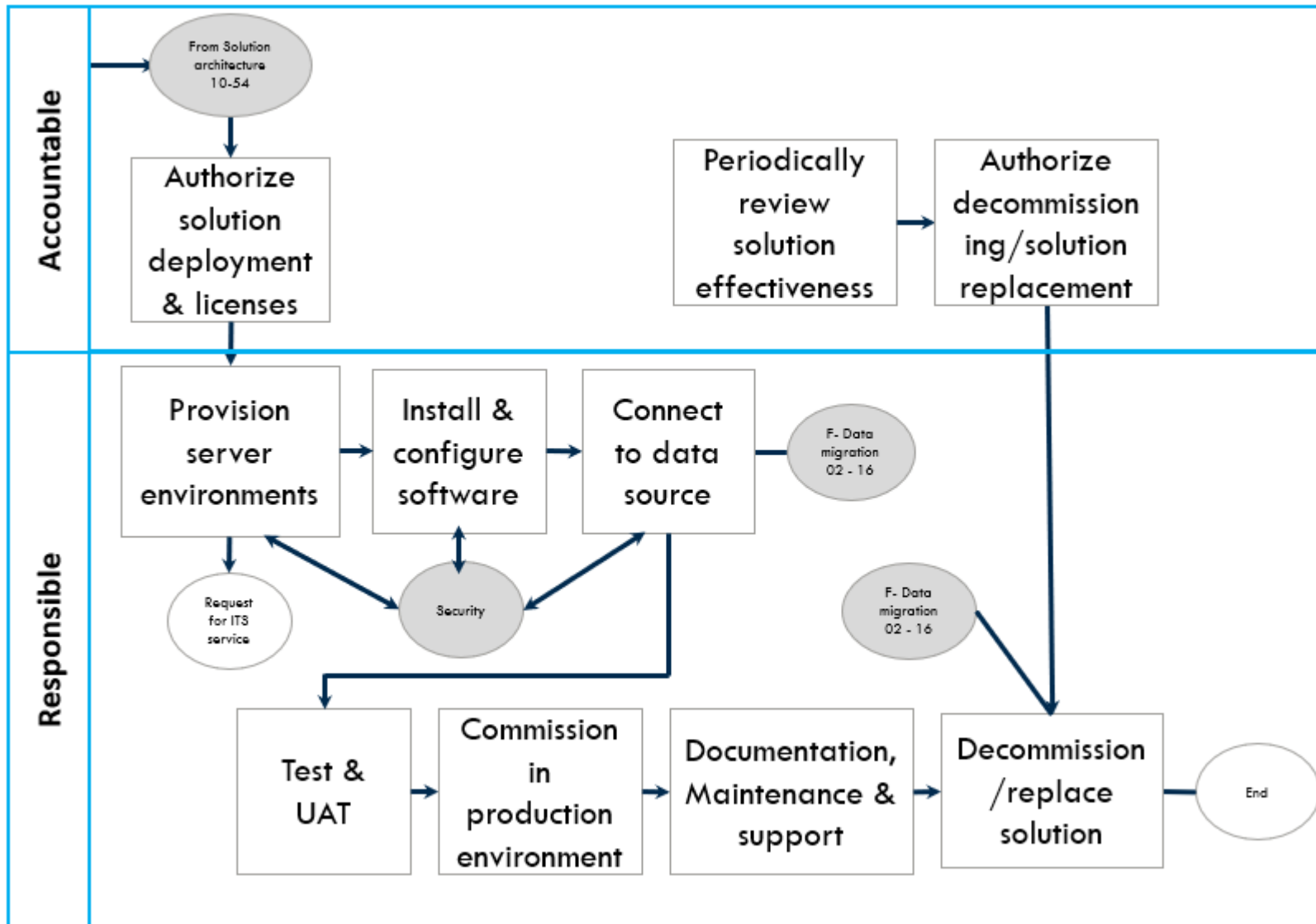


55. SOLUTION DEPLOYMENT

OVERVIEW

The Solution Deployment service implements tools for delivering data and analytics, GIS desktop and internet-based applications, and/or web-based mapping. The service involves preparing the environment, coding, and installing the system, testing the system, undertaking user acceptance testing, commissioning the system (go-live), and providing on-going system maintenance and troubleshooting.

OWNER (2021)	Central Coordination
ACCOUNTABLE	DAVS
COMMUNITY OF PRACTICE	GIS Advisory Board
RELATED SERVICES	<ul style="list-style-type: none"> • ETL and data preparation • Integrating and matching to master and reference data • System to system integration • Integration to portal • Requirements gathering • Solution deployment
EXAMPLE	The Solution Deployment service is essential to the success of any data and analytics solution implementation at York Region. YorkTrax and YorkMaps solutions are shining/ standing out in these areas, leveraging great methods of building, testing, tuning, and implementing new functionalities.



COMPETENCIES

Proficiencies	Competencies	Skill Level
Business Translation	Business Understanding	Intermediate
	Problem Statement Definition	Basic
	Business Value Articulation	Basic
	Requirements Definition	Advanced
Data Identification and Acquisition	Data Source Identification	Advanced
	Data Source System(s) Understanding	Advanced
	Data Acquisition and Exploration	Basic
Data Evaluation, Processing and Transformation	Critical Data Elements Identification	Basic
	Quality Dimensions Assessment	Basic
	Data Quality Metrics Requirements	Basic
	Data Quality Assessment	Basic
Analytical Solution Deployment and Validation	Solution Creation	Advanced
	Solution Testing and Validation	Advanced
Results Interpretation	Analysis Interpretation	
	Business Implications	Intermediate
	Client Empowerment	Intermediate
	Total Competencies Highest Level	15 Advanced

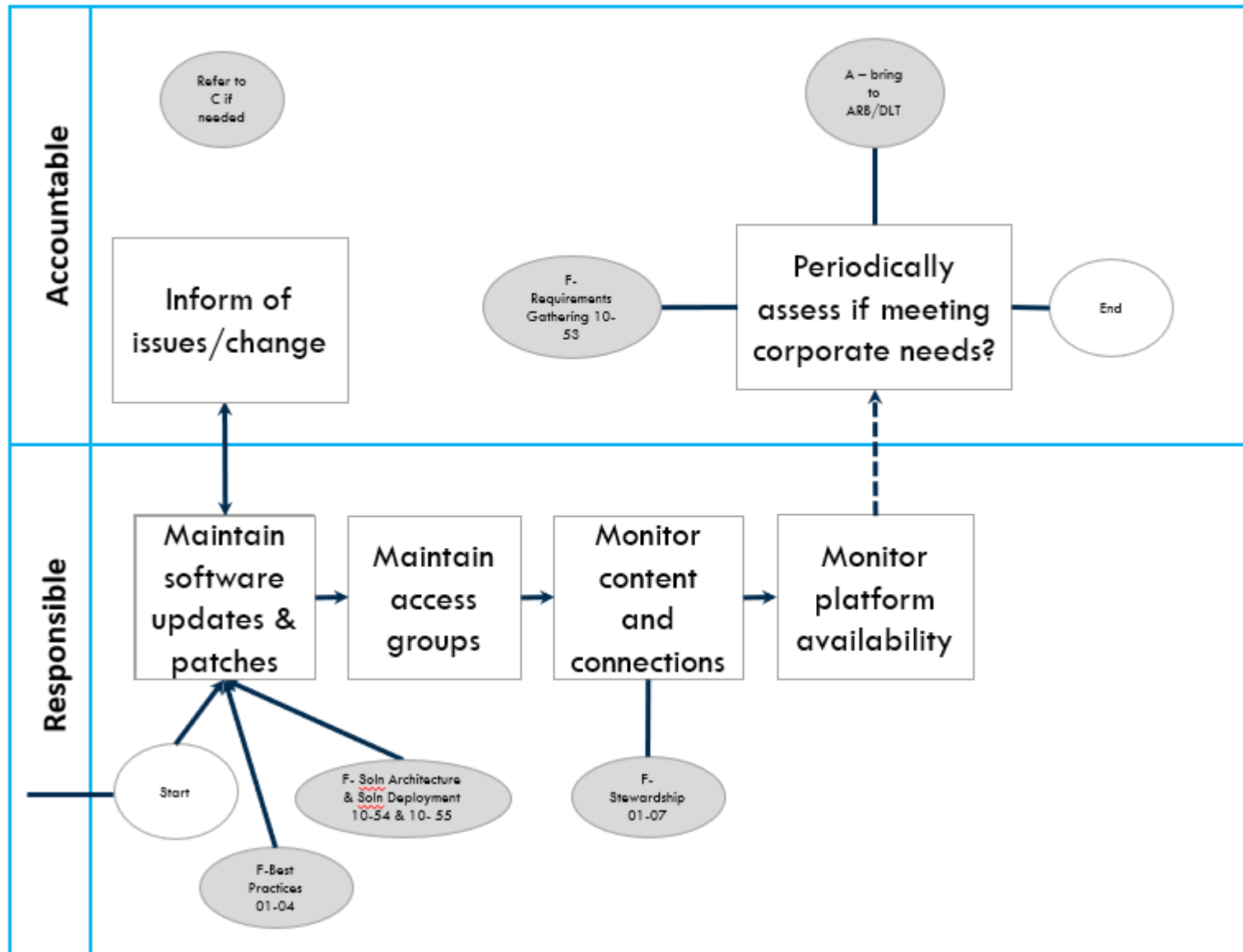
The Region operates many platforms for sharing data. Learn more about them here.

56. MAINTAINING DATA SHARING PLATFORM

OVERVIEW

York Region has many data sharing applications such as a metadata catalogue, a spatial data warehouse (SDW), data download utility, geographic clipping utility, inter-agency data sharing, and Open Data visualization and download utility. The Maintaining Data Sharing Platform service maintains and curates York Region's data sharing applications so that users and applications can access the data, without undue or unplanned interruptions.

OWNER (2021)	Central Coordination
ACCOUNTABLE	DAVS
COMMUNITY OF PRACTICE	GIS Advisory Board
RELATED SERVICES	<ul style="list-style-type: none"> • Store and dispose • Metadata publishing • ETL and data preparation • System to system integration • Integration to portal • Solution deployment
EXAMPLE	The Maintaining Data Sharing Platform service is being realized within the Data Co-op whose basic purpose and therefore its architecture and infrastructure is set up to enable the sharing of data, apps, and code among the members of the YorkInfo Partnership.



COMPETENCIES

Proficiencies	Competencies	Skill Level
Business Translation	Business Understanding	
	Problem Statement Definition	
	Business Value Articulation	
	Requirements Definition	Basic
Data Identification and Acquisition	Data Source Identification	Intermediate
	Data Source System(s) Understanding	Advanced
	Data Acquisition and Exploration	
Data Evaluation, Processing and Transformation	Critical Data Elements Identification	
	Quality Dimensions Assessment	
	Data Quality Metrics Requirements	
	Data Quality Assessment	
Analytical Solution Deployment and Validation	Solution Creation	Basic
	Solution Testing and Validation	Intermediate
Results Interpretation	Analysis Interpretation	Basic
	Business Implications	
	Client Empowerment	Intermediate
	Total Competencies Highest Level	7 Advanced



CONTENT MANAGEMENT (11)

Ensuring integration between data and content

This knowledge area provides consistent approaches to collection, storage and disposal of data, and integration with unstructured forms of information.

Need help creating or collecting new data? We support a variety of solutions to get you started!

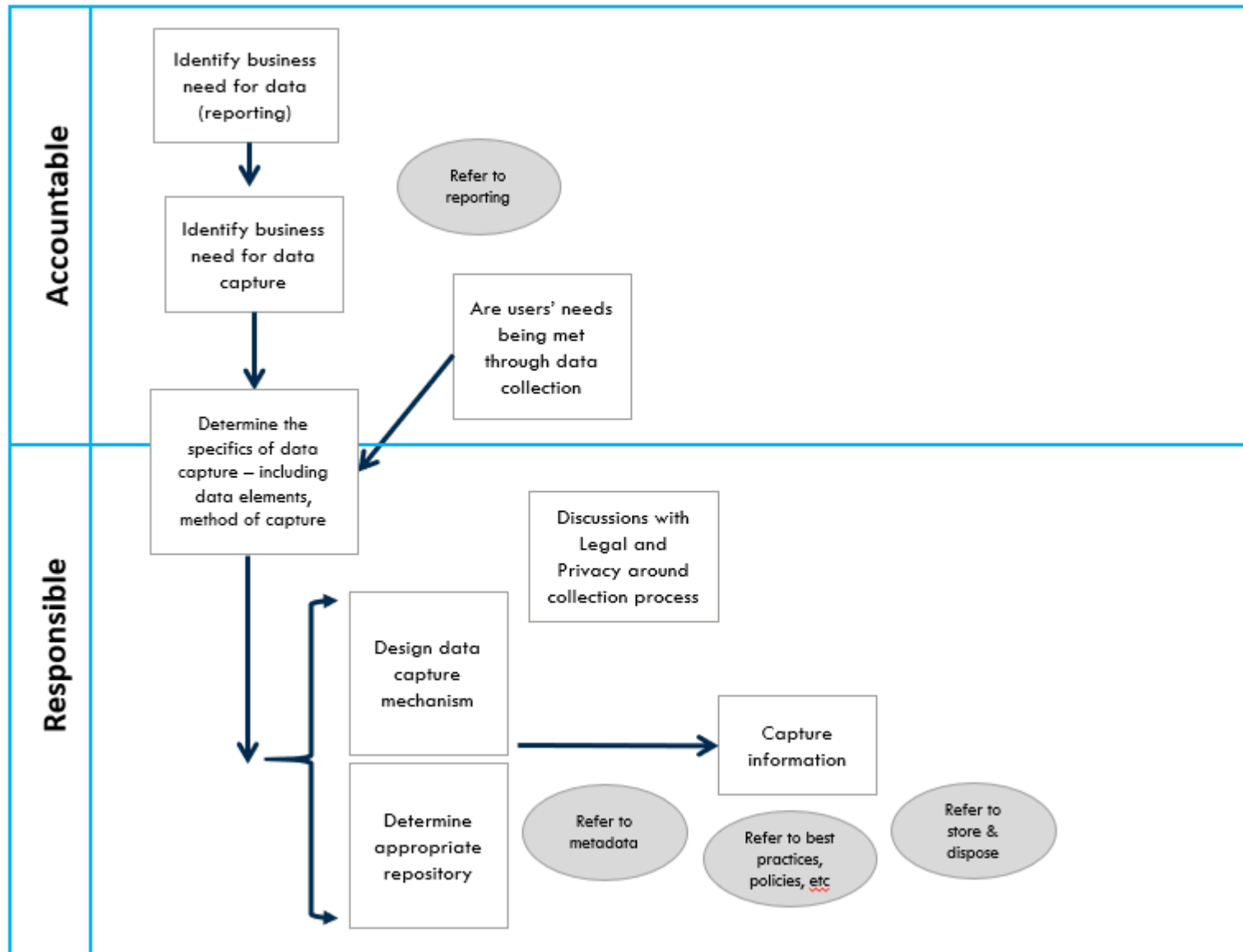


17. CAPTURE

OVERVIEW


The Capture service creates new business records either through the automated input of measurements from sensors or through the manual input of data on a form or through an application interface.

OWNER (2021)	Departmental Delivery
ACCOUNTABLE	Leader of Dept. Central Group
COMMUNITY OF PRACTICE	Data Warehousing Advisory Board
RELATED SERVICES	<ul style="list-style-type: none">• Data purchasing• Creating and negotiating data sharing agreements• Data modelling• Data quality assessment• Enterprise policies and standards
EXAMPLE	The Capture service is key to automated collection of data and enables staff to perform analytics against data that would otherwise be difficult to work with. Currently, some of the projects underway are D8talinx platform capturing source data from various systems using ETL tools, third party data providers to capture source data on behalf of the Region, scripting languages such as Python and R studio, etc.



COMPETENCIES

Proficiencies	Competencies	Skill Level
Business Translation	Business Understanding	Basic
	Problem Statement Definition	Basic
	Business Value Articulation	Basic
	Requirements Definition	Basic
Data Identification and Acquisition	Data Source Identification	Basic
	Data Source System(s) Understanding	Basic
	Data Acquisition and Exploration	Basic
Data Evaluation, Processing and Transformation	Critical Data Elements Identification	Basic
	Quality Dimensions Assessment	Basic
	Data Quality Metrics Requirements	Basic
	Data Quality Assessment	Basic
Analytical Solution Deployment and Validation	Solution Creation	Basic
	Solution Testing and Validation	Basic
Results Interpretation	Analysis Interpretation	Basic
	Business Implications	Basic
	Client Empowerment	Basic
	Total Competencies Highest Level	16 Basic



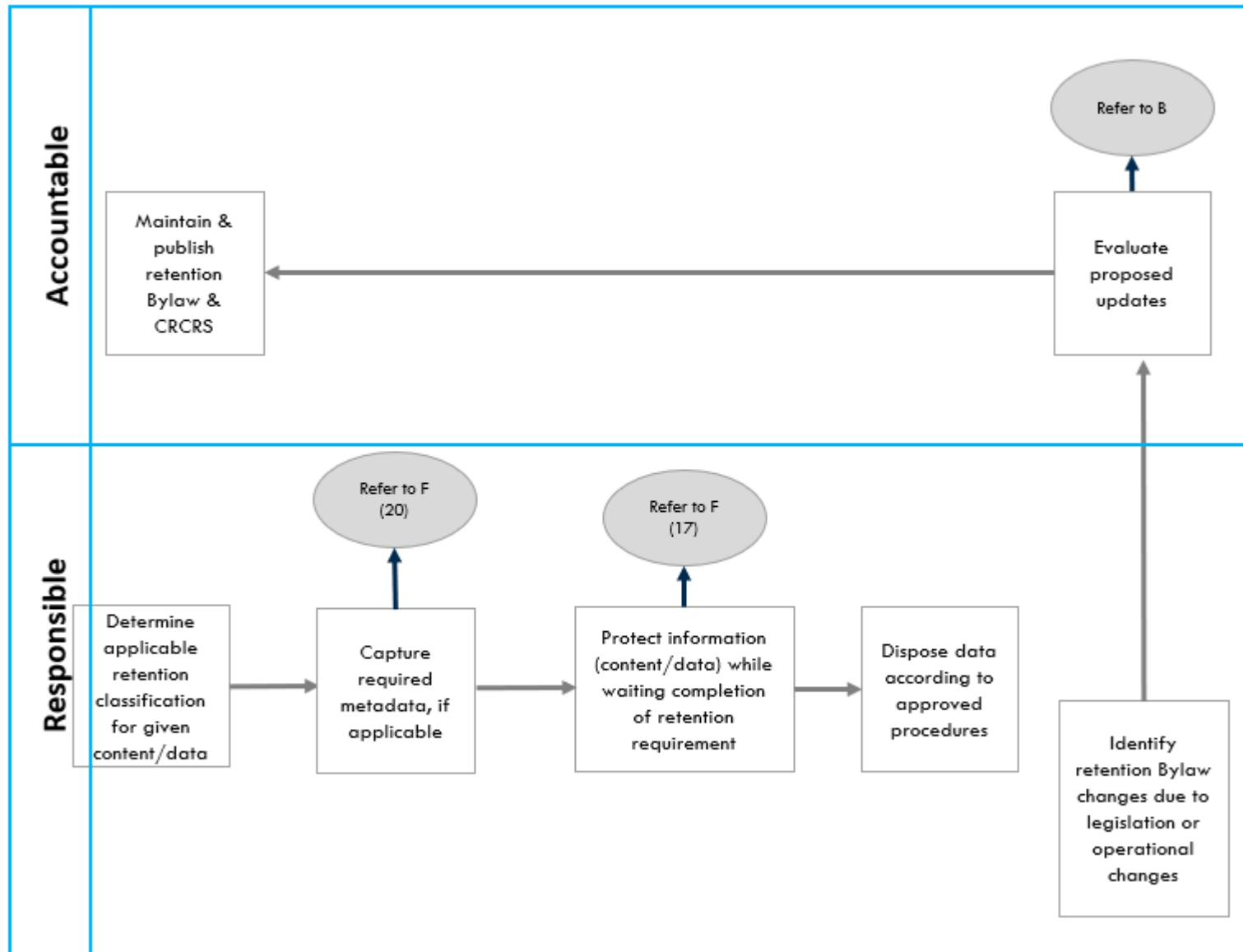
Whether your data needs a home to be safe and secure or if it needs a proper burial as it nears end-of-life, we have cradle-to-grave solutions we can discuss.

18. STORE AND DISPOSE

OVERVIEW

The Store and Dispose services support two key aspects of the data lifecycle: capture, store, use, and dispose. Storing data requires keeping the data - typically in a database - and making it available for use. Disposing data may involve purging specific records, moving active data to an historical repository, or deleting an entire dataset.

OWNER (2021)	Central Coordination
ACCOUNTABLE	Clerks
COMMUNITY OF PRACTICE	Data Stewardship Council
RELATED SERVICES	<ul style="list-style-type: none">• Preparation and integration services• Privacy, access, and security services• Data flow modelling
EXAMPLE	The Store and Dispose service is essential to the data lifecycle and along with the Retention Bylaw assists with storage and archiving.



COMPETENCIES

Proficiencies	Competencies	Skill Level
Business Translation	Business Understanding	Intermediate
	Problem Statement Definition	Intermediate
	Business Value Articulation	Intermediate
	Requirements Definition	Intermediate
Data Identification and Acquisition	Data Source Identification	
	Data Source System(s) Understanding	Intermediate
	Data Acquisition and Exploration	
Data Evaluation, Processing and Transformation	Critical Data Elements Identification	Intermediate
	Quality Dimensions Assessment	
	Data Quality Metrics Requirements	
	Data Quality Assessment	
Analytical Solution Deployment and Validation	Solution Creation	
	Solution Testing and Validation	
Results Interpretation	Analysis Interpretation	
	Business Implications	
	Client Empowerment	
	Total Competencies Highest Level	6 Intermediate

WHAT STAFF HAVE TOLD US...

*As a Program Manager, the DnA Plan is **absolutely critical to my role** and helps me provide value to our business. Without it, **our team would not be as far in our analytics journey***

*“Our data supports **good decision making. It’s that simple**”*

*“With **support and in collaboration** with DnA, I was able to build a program around data sharing with an external partner. Internal support was garnered from the business case and from alignment with a Corporate Plan”*

*“Healthy Data Healthy Response has made my work in Public Health **infinitely better**”*

*“**Awareness of data value** has grown in the organization. We have learned who is **passionate** about **data**”*

*“I’ve watched the organization mature in this area over the last decade. There is a **lot more focus on data and analytics** which is great to see. We need to continue to create learning opportunities and allocating resources to advance it”*

*“[it enabled] **culture change, siloes breaking down, and greater value placed on our DnA resources** by management”*

*“We increased the awareness that **data is everyone’s responsibility**, not just a DAVS Branch responsibility”*

*“Digital Academy courses have **expanded my understanding** of how to better present data and how to **turn that into valuable insights**”*

*“The plan has **brought departments together**. It has made it easier to work with business areas [because of the] **trust** we have in the infrastructure and processes in place.”*

*“Without the DnA Master Plan, it **would not have been possible** for my team to build our public dashboards for COVID. This investment in **data directly affected our ability to offer transparency** to York Region residents, companies, and organizations”*

*“We have **improved collaboration across the Region**”*

*“In Transportation we have used **D8aLinx** for many different use cases... We have used D8aLinx to create a **trusted source of the truth and have improved the quality**”*

*“The **D8aLinx** initiative has **effectively supported the COVID response**. The tools / methods deployed as part of D8aLinx initiative were critical for the HEOC/HDHR project”*

*“By making all dashboards discoverable it can **reduce duplicated effort** with multiple groups making similar dashboards to display the same data”*

*“The Dashboard Catalogue **inspires programs** to make data available through dashboards”*



Accessible formats or communication supports are available upon request. Contact data@york.ca