Capacity Maturity and Recommendation

International Civic and Citizenship Education Study (ICPSR 37147)

Simon Chen, Wenjie Tang, Yunwei Zhang, Zecheng Chang
Teachers College, Columbia University
HUDK 4050: Managing Education Data
Professor Amy Nurnberger

May 9, 2022

Abstract

In this article, our group assessed a study done by the International Civic and Citizenship Education Study to examine students' citizenship preparedness with the CMM model (Qin, 2014). We looked over the study's goal and assumptions, data produced, potential challenges, and suggestions, and evaluated the study by each CMM model. Overall, the study records are rather well organized and reusable. The background of the study and the purpose of procedures and variables are well explained. Along with well-recorded questionnaires for all data, the ICCE study got an overall high score between 4 to 5 with our CMM assessment.

Introduction

The International Civic and Citizenship Education Study(2016) is an international assessment aimed to measure to what extent young people from all across the world are prepared to accept their roles and responsibilities when they step into society. Not only did it investigate the study of the students, but it researched and collected the understanding of being a citizen inside a society and students' perspectives and attitudes towards citizenship. For this project, the ICCE study took a look at students from 24 countries on their preparedness for their citizenship. Using civic tests and questionnaires, the assessment is very neatly developed and will be supplemented with lots of information with regards to national and regional information. The researchers looked at data from both the students and teachers to get round perspectives of students' citizenship behaviors in each region. Our team would analyze the project with the CMM model (Qin, 2014) that comes with the instruction and evaluate how much the project fulfills the expectations.

To analyze this study, we would consider our previous reading regarding the Information Security Charter (Information Security Charter, 2014b) and Data Classification (Data Classification, 2014a) when evaluating the study. We would pay attention to the International Association for the Evaluation of Educational Achievement's treatment of sensitive data and confidential data, and how they embedded data security into policies. We would also pay attention to how the organization treats internal and public data, enforces user privacy and data security, and how they corporate with participants to work with data ownership, system ownership, and technical responsibility.

Goal & Assumptions

The study purposes of this project is to address the 4 main questions:

- International Civic and Citizenship Education Study (ICCS) researched students'
 knowledge and understanding of civics and citizenship and the factors associated with
 variations in this civic knowledge. The data was collected by questionnaires and tests to
 give the feedback of a country's overall level.
- 2. It gives students' current and expected future involvements in civic-related activities.

 From these tests, students' perceptions of their capacity to engage in civic activities and their perceptions of the values of attending civic engagement can be measured.
- 3. Researchers want to find out the students' beliefs about civil and civic issues in society.

 Also it will give some feedback of concerns with civic organizations, rules, and basic social principles, like democracy and diversity. The data can also tell the students' perceptions of their local communities and threats to the future.
- 4. It gathers information about the ways of countries organizing civic and citizenship education with focus on the general approaches, the curriculum and its delivery. The processes will benefit the future citizens' civic engagement and interactions in the future.

Based on the four main research questions and goals, the team assembled a document that will analyze the civic projects according to the capability maturity model, and then assess the project with recommendations for potential failures during the process. This project is an international large-scaled assessment, so the process of data collection and processing costs tremendous efforts. We need to make some assumptions that the data collected is true and can

represent the testers' original wills. Also the distribution of the education system is balanced so that the sampling strategies could be effective as expected.

Data Produced

The data was collected with Probability Proportional to Size (PPS) sampling strategies in 2015 - 2016 under the auspices of the International Association for the Evaluation of Educational Achievement (IEA). ICCS collected data from more than 94,000 eighth grade (or equivalent) students in about 3,800 schools from 24 countries. These student data were augmented with data from more than 37,000 teachers in those schools and further contextual data collected from school principals and national research centers.

There are totally 139 datasets with different topics. In the questionnaires, they collected useful survey data:

Datasets 1-24 correspond with the school questionnaire.

Datasets 25-48 correspond with the International Student Achievement Questionnaire.

Datasets 49-63 correspond with the European Module Student Questionnaire.

Datasets 64-87 correspond with the International Student Questionnaire.

Datasets 88-92 correspond with the Latin American Module Student Questionnaire.

Datasets 93-116 correspond with the International Student Reliability Questionnaire.

Datasets 117-138 correspond with the Teacher Questionnaire.

Dataset 139 corresponds with the National Context Questionnaire. (ICPSR37147, 2018)

The public-use data files in this collection are available for access by the general public.

Access does not require affiliation with an ICPSR member institution. ICPSR currently

maintains five copies of its data (and requires that any off-site backup be encrypted): One copy held onsite on network-attached storage (NAS) One copy put on tape once a month onsite, with each copy held for 12 months.

Potential Challenges & Recommendations

The biggest challenge is during the survey designing procedure. Researchers need to describe the relevance and procedure to develop a theoretical framework to undergird such studies. In this case, we recommend that the research team could depict potential major operational challenges in advances, including procedures to integrate state-of-the-art theory, relevance for policies of participating countries, cultural relevance of measures, data comparability and the current expansion of these studies to low- and middle-income countries. (Van de Vijver et al., 2019)

The challenges also exist due to working in multidisciplinary scientific teams and working with stakeholders that have a policy perspective on ILSAs. We recommended that the cooperation protocols and standards need to be set up specifically to clarify the procedures and outcomes.

Legal and Ethical Concerns

The project collects data from eighth-grade students and teachers from 24 countries. Student data, especially for children under certified adult age is considered very sensitive and is expected to be treated with great caution. The legal age for each country, like Korea compared to the rest of the world, could be different. And the legal restrictions on student information access could also vary. Though some of the differences are mentioned like the age difference among

countries, the researchers did not particularly discuss their legal responsibilities when coming up with measures, instead focused more on data accuracy and dropped all the details for collected data and measures.

The lack of explanation could come from the fact that those researchers have had prior working experience with most of the schools during 2009. But we would recommend the researchers share more insights in every project regarding legal and ethical considerations when they come up with measures and variables.

Sampling & Data Collection

As collecting data from 24 countries, sampling and the data collecting process could be a challenge. Different countries, regions, and school districts would be varied in resources and access. Translating questions and responses with accurate meaning in different languages and communicating with the internal group to record the data could be a challenge. The available file types for data collection could also vary in different regions. And being able to randomly select schools and students that best represent each country and culture is nonetheless one of the hardest challenges.

The ICCE study chose to continue working with the schools that they had established prior connections with. Though those schools' selections may not be random, the overall process for data collection may be more cost-efficient and ensure better data quality. The data file used for questionnaires is used as SPSS and SAS. And all the variables, data records sources, questionnaires, and scores evaluations are explained with details on usage and purpose.

Overall, we believe the researchers did a rather good job documenting all the measurements and data records. But we would recommend that they address more details

regarding the data collection process, how raw data was stored and translated into organized data, and how data are passed on from different regions and organized in internal communication. We would like to learn more about the privacy considerations practiced during the data collection process. And whether the community faced any challenges in protecting students' and teachers' data.

Regarding data quality, we believe that the potential for making more diverse and grounded questionnaires to define civic manners based on culture is still apparent. The definition of civic could be varied in culture and in different situations. Using the same set of questionnaires to evaluate both USA and Japanese students' civic behavior could be biased. We are aware that requesting researchers to come out with appropriate questionnaires for each culture could be too ambitious and cost effort. But we still suggest that researchers could keep diversity in mind when selecting questionnaires and translate questions considering their ground environment.

Storage and Privacy Concerns

As we mentioned earlier, we encourage the researcher to be more transparent with internal data sharing and communication. The researchers did a very good job recording all the organized data files and keeping readable and reusable data records on ICPSR. The ICPSR download tracking allows the researchers to keep track of the use of their data and provide tracking if the data became misused. But outside of ICPSR, we don't know how the researchers keep the raw data and how all the data are maintained. We would recommend the researchers explain more details about how the data was maintained outside of the ICPSR, how privacy was

considered during internal communication and external data sharing, and saving data backups for possible data loss.

Data Sharing and reusability

The researchers include preferred citations with the record to guide legal citations. Saving the record on ICPSR allows the organization to keep track of download and usage reports for the potential use of the study to stay alert of potentially harmful use of data. Regarding the overall data records, the purpose of the studies, the records of data sources and measures, the purpose of variables and mechanics, and all the questionnaire files are all clearly defined and saved. The overall data records are very well organized making the study very much reusable and sharable. Our only suggestion would be to encourage the research team to communicate with each school community prior to and during the data collection process. Communicating with the data wonder allows the researchers to make sure their plan is practical under local restrictions, and discuss how to make the data sharable and beneficial to the local community.

Project Analysis per Capability Maturity Model

The capability Maturity Model (CMM) is a guideline or framework that can help us to evaluate and assess the data management capability of a project. Since artificial intelligence starts playing a very important role in almost every industry, and along with the tremendous increase in data processing speed, more and more companies and organizations start paying more attention to data management plans, because the data that a company or organization creates is a very valuable asset and resource to them. Just having a Data Management Plan is not enough, we still need to evaluate it in case the data management plan is mature enough to support the project,

and here comes the Capability Maturity Model. There are 5 rubrics within the model and 6 levels for each of the rubrics scored from 0 to 5. Overall, this project is doing very well with its data management plan. They have a technical report that includes a completed data management plan, we are going to evaluate this data management using this 5 rubrics one by one.

1. Data Management in General

For the first rubric, the overall goal is to make sure that the data management plan was designed aiming to collect and maintain high-quality data. There are 15 sub-rubrics we evaluated and this project is doing well in this category. However, this project didn't talk about how they developed and implemented a budget while doing this project. We believe that they must have this information and they just didn't publicize it. So, we mark this sub-rubric as a 0 and others are all 5, and the average ends up with a 4.6 out of 5, which makes this project be classified between quantitatively managed and optimizing for the first rubric.

2. Data acquisition, processing, and quality assurance

The overall goal of this rubric is to check if the data can be reliably captured in a way that facilitates use, preservation, and reuse based on the data management plan. This project is doing extremely well in this rubric. We give each of the sub-rubric a 5 except 2.4.3 Check data integration from other sources because all the data used by this project are collected by themselves and there is no data from other sources are used, so this sub-rubric is not applicable for this project. After all, this project received a 5 out of 5, which makes it achieve the level 5 goal, in this rubric. We want to point out that this data management plan has a very detailed guiding principle that they followed to make sure the data is valid, in addition, they also have a detailed procedure to deal with missing data. We are very impressed and inspired by their plan.

3. Data Description and Representation

The data management plan received another 5 out of 5 in this rubric, and it is doing extremely well here. The overall goal for this rubric is to check if this data management plan describes and represents data to facilitate future discovery and use. Since this project is conducted by this non-profit organization whose goal is to show everyone their research results, so the researcher team compiled a full user guide that listed everything we should know about the data they've collected, including the variables, the variants of all the variables, and even instructions of how to analyze and manipulate the data. The full user guide is about 100 pages long, they have considered every aspect of the problem that a user might encounter.

4. Data Dissemination

The overall goal for this rubric is to make sure that the research has established the policy and technical infrastructures for users to share, discover, obtain, and interact with data. This project, it wins another 5 out of 5 scores. The IEA has a completed agreement or policy for every user who wants to use their data to follow, it detailed all the possible scenarios. However, this part is not included in this particular data mana plan, but IEA has a page to publicize this information individually.

5. Repository Services and Preservation

Last but not least, this rubric is here to make sure that the research has kept the data accessible, even as hardware, software, and storage media change. IEA has published the data on their own website for us to download freely, including the previous version, they also listed another website that has IEA's authentication to download the data. However, we did locate the information about how they exactly store the data and provide the security. But we still believe that they should have this somewhere and they just didn't public it. We think they did this actually for security purposes. Even so, we deducted points from this rubric.

Conclusion

In conclusion, we think that the research did an overall good job fulfilling the expectation of the CMM model with very detailed assessment plans. Not only did it contain a very detailed assessment plan, but it also ended up with relatively fair data which helped data scientists to analyze the students of the different countries as a whole. However, at the same time, we also encourage the researchers to consider more diverse procedures for evaluation, be more transparent regarding data sharing and communicate with the participants about data ownership.

Reference

- International Association for the Evaluation of Educational Achievement. International Civic and Citizenship Education Study, 2016. Inter-university Consortium for Political and Social Research [distributor], 2018-10-24. https://doi.org/10.3886/ICPSR37147.v1
- Teachers College Columbia University. (2014b). Information Security Charter. Teachers College
 Columbia University
- Teachers College Columbia University. (2014a). Data Classification. Teachers College Columbia University.
- Qin, J., Crowston, K., Flynn, C., & Kirkland, A. (2014). A Capability Maturity Model for Research Data Management. wiki. Retrieved June 25, 2014, from http://rdm.ischool.syr.edu/xwiki/bin/view/CMM+for+RDM/1.1
- Van de Vijver, Fons & Jude, Nina & Kuger, Susanne. (2018). Challenges in International Large-Scale Educational Surveys.



	Level 0	Level 1: Initial	Level 2: Managed	Level 3: Defined	Level 4:	Level 5:	
700 VINCOU AND	This process or	Data are	DM process is	DM is	DM is	Focus on	
Process / Practice	practice is not	managed	characterized for	characterized for		process	
1. Data					controlled	imnovement	
Management in Ge	noral						
			04-16-144				
No steps have bee			Stakeholder and e	na user neeas			
Quantitative quality establish organiza		lder and end user n	oods and objectives ha	ve been recorded T	no project follow	e approaches to	
been established r			takeholder policies or sen		objectives hav		
and the second s	have not taken sta			and end user needs		er needs and	
	mant annaamhin		paller her ladicidesal middae			hinativas that	
1.1.1 Identify						X	
1.1.2 Develop						~*	
user.						X	
1.1.3 Establish						X	
quantitative							
objectives for data							
1.1.4 Develop							
communication						X	
Quantitative quality	l v goals have				J.	1	
Structures or plans	• •		been establis	hed regarding	Processes re	garding	
	eps have been taker	to Structures or n		rces such as budge		project includes	
	ctures or plans, train		raining, and resources suc			sources such as	
23 DE 101							
1.2.1 Develop and	affing, or tools have	pians.	training, and resources s	l	as budgets,	as budgets,	
implement a	X						
1.2.2 Staffing for						X	
data management							
1.2.3 Develop						X	
collaborations					0.		
1.2.4 Train						X	
researchers and							
data management							
1.2.5 Develop						X	
1.2.6 Establish a							
PLEDWING CONTROL OF CO						X	
data management	•		0		l		
Workflow manager				uality goals have		garding workflow	
			ng the research process,		and the second s	s approaches to	
been established r		-	cess, such managing the				
	al requirements, wo			ng the research	as managing		
the research proce	The second secon		ments, managing collabo	ration, creating p	rocess, such as	managing	
process, such as r		uirements, managir					
as managing funct			ating actionable plans,		unctional requir		
Process /	Level 0 This process or	Level 1: Initial Data are	Level 2: Managed DM process is	Level 3: Defined DM is		Level 5:	
Practice	practice is not	managed	characterized for	characterized for	DM is	Focus on	
1.3.1 Manage	being observed	intuitively at	projects and often	the	measured and	process	
RDM	being observed	project level	reactive	organization/com	controlled	improvement	
Donnies mante		projectievel	IOGOLIVO	organization/com			
1.3.2 Manage						X	
Collaborations						petry	
1.3.3 Create						$ _{\mathbf{X}}$	
Actionable RDM							
1.3.4 Develop						$ _{\mathbf{X}}$	
Workflows and							
Quantitative quality							
Measurement, ana	lysis, or The	project follows app	proaches to been establis	shed including	Processes	regarding	
No steps have bee	en taken to Measure	ment, analysis, or	verification of the	research process m	easurement, an	alysis, or	
measurement, ana	measurement, analysis, and measurement, analysis, or establish procedures for verification of the research process in						
general have been	recorded for verific	ation of the research	h process verification of th	e research process	verification of t	ne research	

Measurement and 2. Data	1	L		1	1	1
	ssing and quality ass	surance				
Quantitative qualit	y goals have					
Data quality and d	ocumentation Dat	a quality and docur	nentation The project f	follows approaches t	o been establi	shed regarding
	s regarding data quali			been addressed for	this data	quality and
documentation	quality and docume		I documentation are evalu			
No steps have bee	en taken to by indivi	idual team members	s, but project, but have	not taken wider th	at have been d	etined for the
2.1.1 Develop data						X
2.1.2 Develop						
data						X
documentation	ļ.					
Quantitative qualit						
	ure, and training Res		ind training ave been taken to with r	ngards to file formate	been establi	sned for egards to file
	he project provides re		ure, and training with rega			0
quality control pro-			res have structure, a			
2.2.1 Develop						X
2.2.2 Develop				1	 	
data quality						X
control procedures					Control of the Control	
	Level 0 This process or	Level 1: Initial Data are	Level 2: Managed DM process is	Level 3: Defined DM is	Level 4: DM is	Level 5: Focus on
Process / Practice	practice is not	managed	characterized for	characterized for	measured and	process
	plactice is not					
The workflow for co					controlled	imnovement
The workflow for co	l' ollecting and	l	Quantitative	I quality goals have		
documenting data	l' ollecting and	l e project follows app	Quantitative proaches to been estable	I quality goals have	Processes	regarding the
documenting data workflow No steps	l` ollecting and has been The	l e project follows app The workflow for co	Quantitative proaches to been estable	I quality goals have ished regarding the sed for this project, b	Processes ut has the wor	regarding the kflow of collecting
documenting data workflow No steps and workflow 2.3.1 Capture /	l' ollecting and has been The have been taken to	l e project follows app The workflow for co	Quantitative proaches to been establibiliecting and address	I quality goals have ished regarding the sed for this project, b	Processes ut has the wor	regarding the kflow of collecting enting data has
documenting data workflow No steps and workflow 2.3.1 Capture / Acquire data and	l' ollecting and has been The have been taken to	l e project follows app The workflow for co	Quantitative proaches to been establibiliecting and address	I quality goals have ished regarding the sed for this project, b	Processes ut has the wor	regarding the kflow of collecting
documenting data workflow No steps and workflow 2.3.1 Capture / Acquire data and data	l' ollecting and has been The have been taken to of collecting and	l e project follows app The workflow for co	Quantitative proaches to been establibiliecting and address	I quality goals have ished regarding the sed for this project, b	Processes ut has the wor	regarding the kflow of collecting enting data has
documenting data workflow No steps and workflow 2.3.1 Capture / Acquire data and	Collecting and has been The have been taken to vof collecting and you goals have	e project follows app The workflow for co of collecting	Quantitative proaches to been establibiliecting and address	I quality goals have ished regarding the sed for this project, b stablish procedures	Processes ut has the wor	regarding the kflow of collecting enting data has
documenting data workflow No steps and workflow 2.3.1 Capture / Acquire data and data Quantitative qualit Measurement, and	Collecting and has been The have been taken to vof collecting and you goals have	e project follows app The workflow for co of collecting	Quantitative proaches to been estable bilecting and address and documenting data estable proaches to been estable	I quality goals have ished regarding the sed for this project, b stablish procedures	Processes ut has the work for the docume	regarding the kflow of collecting enting data has
documenting data workflow No steps and workflow 2.3.1 Capture / Acquire data and data Quantitative qualit Measurement, and No steps have been measurement, and	ollecting and has been The have been taken to or collecting and y goals have lysis, and The en taken to Measure lysis, and me	a project follows ap; The workflow for confecting of collecting a project follows ap; ament, analysis, and	Quantitative proaches to been establibilecting and address and documenting data establishments to been establid verification of das, and establish procedur	Juquality goals have ished regarding the sed for this project, b stablish procedures ished regarding ta collection and rese for verificat	Processes ut has the work for the document of	regarding the kflow of collecting enting data has X regarding nalysis, and ection and
documenting data workflow No steps and workflow 2.3.1 Capture / Acquire data and data Quantitative qualit Measurement, and No steps have be measurement, and documentation ha	ollecting and has been The have been taken to or collecting and y goals have lysis, and The en taken to Measure lysis, and me	a project follows ap; The workflow for confecting of collecting a project follows ap; ament, analysis, and	Quantitative proaches to been estable bllecting and address and documenting data estable broaches to been estable verification of da	Juquality goals have ished regarding the sed for this project, b stablish procedures ished regarding ta collection and rese for verificat	Processes ut has the work for the document of	regarding the kflow of collecting enting data has X regarding nalysis, and ection and
documenting data workflow No steps and workflow 2.3.1 Capture / Acquire data and data Quantitative qualit Measurement, and No steps have been measurement, and	ollecting and has been The have been taken to or collecting and y goals have lysis, and The en taken to Measure lysis, and me	a project follows ap; The workflow for confecting of collecting a project follows ap; ament, analysis, and	Quantitative proaches to been establibilecting and address and documenting data establishments to been establid verification of das, and establish procedur	Juquality goals have ished regarding the sed for this project, b stablish procedures ished regarding ta collection and rese for verificat	Processes ut has the work for the document of	regarding the kflow of collecting enting data has X regarding nalysis, and ection and
documenting data workflow No steps and workflow 2.3.1 Capture / Acquire data and data Quantitative qualit Measurement, and No steps have been measurement, and documentation ha 2.4.1 Measurement and 2.4.2 Assure data	ollecting and has been The have been taken to or collecting and y goals have lysis, and The en taken to Measure lysis, and me	a project follows ap; The workflow for confecting of collecting a project follows ap; ament, analysis, and	Quantitative proaches to been establibilecting and address and documenting data establishments to been establid verification of das, and establish procedur	Juquality goals have ished regarding the sed for this project, b stablish procedures ished regarding ta collection and rese for verificat	Processes ut has the work for the document of	regarding the kflow of collecting enting data has X Tregarding nalysis, and action and n of data
documenting data workflow No steps and workflow 2.3.1 Capture / Acquire data and data Quantitative qualit Measurement, and documentation ha 2.4.1 Measurement and 2.4.2 Assure data audity. 2.4.3 Check data	Ollecting and has been The have been taken to y of collecting and y goals have an taken to Measure alysis, and the entaken to Measure alysis, and me ye been ver	e project follows ap; The workflow for co of collecting e project follows ap; ement, analysis, and asurement, analysi	Quantitative proaches to been estable bllecting and address and documenting data estable broaches to been estable described verification of das, and establish procedurection and verification	Jupility goals have goals have ished regarding the set for this project, be stablish procedures ished regarding ta collection and rese for verificat of data collection as	Processes ut has the work for the document of	regarding the kflow of collecting enting data has X regarding nalysis, and ection and n of data X
documenting data workflow No steps and workflow 2.3.1 Capture / Acquire data and data Quantitative qualit Measurement, and No steps have bee measurement and 2.4.1 Measurement and 2.4.2 Assure data mostifu. 2.4.3 Check data integration from	ollecting and has been The have been taken to or collecting and y goals have lysis, and The en taken to Measure lysis, and me	a project follows ap; The workflow for confecting of collecting a project follows ap; ament, analysis, and	Quantitative proaches to been establibilecting and address and documenting data establishments to been establid verification of das, and establish procedur	Juquality goals have ished regarding the sed for this project, b stablish procedures ished regarding ta collection and rese for verificat	Processes ut has the work for the document of	regarding the kflow of collecting enting data has X regarding nalysis, and action and X
documenting data workflow No steps and workflow 2.3.1 Capture / Acquire data and data Quantitative qualit Measurement, and No steps have between the consumentation had 2.4.1 Measurement and 2.4.2 Assure data constitution of the consuments of the	Ollecting and has been The have been taken to or of collecting and y goals have allysis, and The antaken to Measure allysis, and me we been ver	e project follows ap; The workflow for co of collecting e project follows ap; ement, analysis, and asurement, analysi	Quantitative proaches to been estable bllecting and address and documenting data estable broaches to been estable described verification of das, and establish procedurection and verification	Jupility goals have goals have ished regarding the set for this project, be stablish procedures ished regarding ta collection and rese for verificat of data collection as	Processes ut has the work for the document of	regarding the kflow of collecting enting data has X regarding nalysis, and ection and n of data X
documenting data workflow No steps and workflow 2.3.1 Capture / Acquire data and data Quantitative qualit Measurement, and No steps have been measurement, and documentation ha 2.4.1 Measurement and 2.4.2 Assure data unality. 2.4.3 Check data integration from 3. Data Description and R	Ollecting and has been The have been taken to very goals have on taken to Measure allysis, and the properties of the hard taken to Measure allysis, and the properties of the hard taken to Measure allysis, and the properties of the hard taken to Measure allysis, and the properties of the hard taken to Measure allysis, and the properties of the hard taken to Measure allysis, and the properties of the hard taken to Measure all t	e project follows app The workflow for co of collecting e project follows app ement, analysis, and asurement, analysi iffication of data col	Quantitative proaches to been estable bllecting and address and documenting data estable to been estable destable to verification of data, and establish procedurection and verification when the control of the control	upuality goals have ished regarding the sed for this project, b stablish procedures ished regarding ta collection and rese for verificat of data collection a	Processes ut has the worf for the document of	regarding the kflow of collecting enting data has X regarding nalysis, and ection and n of data X X N.A
documenting data workflow No steps and workflow 2.3.1 Capture / Acquire data and data Quantitative qualit Measurement, and No steps have been measurement, and documentation ha 2.4.1 Measurement and 2.4.2 Assure data auditus. 2.4.3 Check data integration from 3. Data Description and R Metadata develop	Ollecting and has been The have been taken to Measure allysis, and The entaken to Measure allysis, and me we been ver	a project follows app The workflow for co of collecting a project follows app ament, analysis, and asurement, analysi iffication of data col	Quantitative proaches to been estable blecting and address and documenting data estable described verification of dass, and establish procedurection and verification N.A	upuality goals have ished regarding the set for this project, b stablish procedures ished regarding ta collection and rese for verificat of data collection a	Processes ut has the world for the document of	regarding the kflow of collecting enting data has X regarding nalysis, and ection and n of data X N.A
documenting data workflow No steps and workflow 2.3.1 Capture / Acquire data and data Quantitative qualit Measurement, and documentation ha 2.4.1 Measurement and 2.4.2 Assure data and the control of th	Ollecting and has been The have been taken to Measure allysis, and The entaken to Measure allysis, and me we been ver	a project follows app The workflow for co of collecting a project follows app ment, analysis, and assurement, analysi fication of data col	Quantitative proaches to been estable bllecting and address and documenting data estable to been estable destable to verification of data, and establish procedurection and verification when the control of the control	quality goals have ished regarding the sed for this project, be stablish procedures ished regarding to collection and rese for verificat of data collection and N.A.	Processes ut has the work for the document of	regarding the kflow of collecting enting data has X regarding nalysis, and ection and n of data X X N.A
documenting data workflow No steps and workflow 2.3.1 Capture / Acquire data and data Quantitative qualit Measurement, and documentation ha 2.4.1 Measurement and 2.4.2 Assure data integration from 3. Data Description and R Metadata develop metadata No step that have been	I collecting and has been The have been taken to vor collecting and leave the state of the state	a project follows app The workflow for co of collecting a project follows app ment, analysis, and assurement, analysi jfication of data col N.A a project follows app of Metadata develop developm	Quantitative proaches to been estable bilecting and address and documenting data establed verification of data stables and destablish procedure to been establed verification of data stables and verification and verification when the proaches to Quantitative proaches to Q	quality goals have ished regarding the sed for this project, be stablish procedures ished regarding to collection and rese for verificat of data collection and N.A.	Processes ut has the work for the document of	regarding the kflow of collecting enting data has X regarding nalysis, and section and n of data X N.A regarding ata development
documenting data workflow No steps and workflow 2.3.1 Capture / Acquire data and data Quantitative qualit Measurement, and No steps have been measurement, and documentation ha 2.4.1 Measurement and 2.4.2 Assure data audity. 2.4.3 Check data integration and R Metadata develop metadata No step hat have been individual projec codified in policie	ollecting and has been The have been taken to y of collecting and y goals have allysis, and The antaken to Measure allysis, and me we been ver the shave been taken to the shave been taken to the shave been taken to established regarding t, but have not taken	e project follows ap; The workflow for co of collecting e project follows ap; ment, analysis, an asurement, analysi fication of data col N.A e project follows ap; of developm wider been define team members,	Quantitative proaches to been estable blecting and address and documenting data estable deciries and verification of data, and establish procedure ection and verification where the proaches to Quantitative proaches to Quantitative proment has been have been the are evaluated on a estable for the entire probut nothing has commented the process of the entire probut nothing has commented the process of the entire probut nothing has commented the process of the entire probut nothing has commented the process of the	quality goals have ished regarding the sed for this project, be stablish procedures ished regarding ta collection and rese for verificat of data collection a N.A.	Processes ut has the work for the document of	regarding the kflow of collecting enting data has X regarding nalysis, and section and nof data X N.A regarding tata development ered minimally by egular basis, as
documenting data workflow No steps and workflow 2.3.1 Capture / Acquire data and data Quantitative qualit Measurement, and documentation ha 2.4.1 Measurement and 2.4.2 Assure data integration from 3. Data Description and R Metadata develop metadata No step that have been individual projec	ollecting and has been The have been taken to y of collecting and y goals have allysis, and The antaken to Measure allysis, and me we been ver the shave been taken to the shave been taken to the shave been taken to established regarding t, but have not taken	a project follows app The workflow for co of collecting a project follows app ment, analysis, and assurement, analysi gification of data col N.A b project follows app of Metadata develop developm wider been define	Quantitative proaches to been estable billecting and address and documenting data estable to verification of dass, and establish procedure lection and verification when the proaches to Quantitative proaches to Quantitative proment has been have the entilled and the proaches to Quantitative proment has been have the entilled and the proaches to Quantitative proment has been have the entilled and the proaches to Quantitative proaches to Quantit	quality goals have ished regarding the sed for this project, be stablish procedures ished regarding ta collection and rese for verificat of data collection a N.A.	Processes ut has the work for the document of	regarding the kflow of collecting enting data has X regarding nalysis, and section and nof data X N.A regarding tata development ered minimally by egular basis, as
documenting data workflow No steps and workflow 2.3.1 Capture / Acquire data and data Quantitative qualit Measurement, and documentation ha 2.4.1 Measurement and 2.4.2 Assure data integration from 3. Data Description and R Metadata develop metadata No step that have been individual projec codified in policic institution.	ollecting and has been The have been taken to of collecting and by goals have an taken to Measure allysis, and The en taken to Measure allysis, and me we been ver the shave been taken to the shave been taken to established regarding to the taken to so resenior	e project follows ap; The workflow for co of collecting e project follows ap; ment, analysis, an asurement, analysi fication of data col N.A e project follows ap; of developm wider been define team members,	Quantitative proaches to been estable blecting and address and documenting data establish proaches to been estable verification of data s, and establish procedure ection and verification. N.A. Droaches to Quantitative proment has been have been are evaluated on a estable for the entire robut nothing has committed.	quality goals have ished regarding the sed for this project, be stablish procedures ished regarding ta collection and rese for verificat of data collection a N.A.	Processes ut has the work for the document of	regarding the kflow of collecting enting data has X regarding nalysis, and ection and n of data X N.A regarding ata development ered minimally by egular basis, as nunity or
documenting data workflow No steps and workflow 2.3.1 Capture / Acquire data and data Quantitative qualit Measurement, and documentation ha 2.4.1 Measurement and 2.4.2 Assure data and data development and 2.4.3 Check data integration from 3. Data Description and R Metadata developmetadata No step that have been individual project codified in policies and in the state of the state	ollecting and has been The have been taken to of collecting and y goals have allysis, and The antaken to Measure allysis, and me we been ver the shave been taken to established regarding t, but have not taken to so renior	a project follows app The workflow for co of collecting a project follows app ment, analysis, and assurement, analysis api fication of data col N.A a project follows app Metadata develop developm wider been define team members,	Quantitative proaches to been estable blecting and address and documenting data establish proaches to been estable verification of data s, and establish procedure ection and verification. N.A. Droaches to Quantitative proment has been have been are evaluated on a estable for the entire robut nothing has committed.	quality goals have ished regarding the sed for this project, be stablish procedures ished regarding ta collection and rese for verificat of data collection a N.A.	Processes ut has the work for the document of	regarding the kflow of collecting enting data has X regarding nalysis, and section and n of data X N.A regarding ata development ered minimally by sigular basis, as nunity or

3.2.1 Develop or	1			1		x
adopt metadata						
specifications						
3.2.2 Select and						X
acquire tools	Level 0	Level 1: Initial	Level 2: Managed	Level 3: Defined	Level 4:	Level 5:
	This process or	Data are	DM process is	DM is	Level 4: DM is	Focus on
Process / Practice	practice is not	managed	characterized for	characterized for	measured and	process
3.2.3 Develop					controlled	improvement 37
strategies for						X
generating						
metadata based						
on community						
practices • 3.2.4						
Integrate						
3.2.5 Arrange						
staffing for						X
3.2.6 Provide						v
						X
training for						
3.2.7 Assess						X
community data						0.0
and metadata						
Workflow manager	ment for		Quantitative q	uality goals have		
Workflow manager	ment for met	adata creation durin	ng the The project fo	llows approaches to	been establis	hed regarding
Processes regardi	ng workflow for No st	eps have been take	en for metadata creation d	uring the rese	arch process ha	is been
workflow for metad	ata creation work	kflow for metadata o	reation metadata crea	tion during the man	aging the workfl	ow of
research process I	nas been rec	orded for this project	t, but has during the re	search process as	during the re	search process,
3.3.1 Generate		50. 50.				X
metadata						
according to						
3.3.1.1 Document						X
variables						Λ
3.3.1.2 Document						X
3.3.1.3 Document						x
the etudy					l	ΙΔ
Quantitative qualit						
Measurement, ana	lysis, or		been establis		Processes re	
No steps have bee	en taken to Measure			sure quality and T		/ 100
measurement, ana			s, or establish procedures		n to ensure qual	
compliance with m		asurement, analysis		ensure quality and		o ensure quality
3.4.1 Measuring	analysis or com	nliance with metad	pta etandarde has	a haan recorded fo	Verification to	oneum quality
ACRES CARRES						X
and Verifying						10000
3.4.2 Ensure						
compliance to		1				IX I
						4,000
3.4.3 Ensure						X
3.4.3 Ensure interoperability						4,000
3.4.3 Ensure						4,000
3.4.3 Ensure interoperability	Level 0	Level 1: Initial	Level 2: Managed	Level 3: Defined	Level 4:	X Level 5:
3.4.3 Ensure interoperability with data and	This process or	Level 1: Initial Data are	Level 2: Managed DM process is	Level 3: Defined DM is	Level 4: DM is	X Level 5: Focus on
3.4.3 Ensure interoperability with data and	This process or				measured and	X Level 5: Focus on process
3.4.3 Ensure interoperability with data and Process / Practice	This process or	Data are	DM process is	DM is		X Level 5: Focus on
3.4.3 Ensure interoperability	This process or	Data are	DM process is	DM is	measured and	X Level 5: Focus on process
3.4.3 Ensure interoperability with data and Process / Practice 4. Data	This process or practice is not	Data are	DM process is	DM is	measured and	X Level 5: Focus on process
3.4.3 Ensure interoperability with data and Process / Practice 4. Data	This process or practice is not haring or	Data are managed	DM process is	DM is characterized for	measured and	X Level 5: Focus on process
3.4.3 Ensure interoperability with data and Process / Practice 4. Data Policies for data s Data sharing or co	This process or practice is not haring or nfidentiality has confidentiality has	Data are managed	DM process is characterized for	DM is characterized for ollows approaches	measured and	X Level 5: Focus on process
3.4.3 Ensure interoperability with data and Process / Practice 4. Data Dissemination Policies for data s Data sharing or co have Process	This process or practice is not having or nfidentiality has cores regarding data sha	Data are managed nfidentiality have be aring No steps have	DM process is characterized for seen recorded. The project for seen taken to been con-	DM is characterized for ollows approaches	measured and controlled to Quantitative y for this p	X Level 5: Focus on process improvement quality goals project, but have
3.4.3 Ensure interoperability with data and Process / Practice 4. Data Dissemination Policies for data s Data sharing or co have Process not taken data sh	This process or practice is not having or nfidentiality has cores regarding data sharing or confidentiali	Data are managed Infidentiality have be aring No steps have ty that been estab	DM process is characterized for seen recorded. The project for the been taken to been contained in the distribution of the project for the pro	DM is characterized for ollows approaches sidered minimally be confidentiality are	measured and controlled to Quantitative y for this p	X Level 5: Focus on process improvement quality goals project, but have stablish
3.4.3 Ensure interoperability with data and Process / Practice 4. Data Dissemination Policies for data s Data sharing or cohave Process not taken data shorganizational	This process or practice is not having or nfidentiality has cores regarding data shuaring or confidentiali individual team m	Data are managed Infidentiality have be aring No steps have ty that been estab	DM process is characterized for seen recorded. The project for seen taken to been contished regarding data of dider community needs or	DM is characterized for ollows approaches sidered minimally be confidentiality are	measured and controlled to Quantitative y for this pevaluated on esdefined for the e	X Level 5: Focus on process improvement quality goals project, but have stablish
3.4.3 Ensure interoperability with data and Process / Practice 4. Data Dissemination Policies for data s Data sharing or co have Process not taken data sh	This process or practice is not having or nfidentiality has cores regarding data shuaring or confidentiali individual team m	Data are managed infidentiality have be aring No steps have ty that been estab embers, but w	DM process is characterized for seen recorded. The project for seen taken to been contished regarding data of dider community needs or	DM is characterized for collows approaches sidered minimally be confidentiality are have been	measured and controlled to Quantitative y for this pevaluated on esdefined for the e	X Level 5: Focus on process improvement quality goals roject, but have tablish ntire sharing or

4.1.2 Develop						X
policies for data						
rights and rules				,		
4.1.3 Develop						X
data						
confidentiality	l	l	Į.		I.	I.
Quantitative qualit			b	6 - d	B	
Structures or plans		. t- Ctt	been establis		Processes re	
	teps have been taker			rces for enabling		project includes
	uctures or plans, train		raining, and resources for			urces for enabling
technologies for d	ata snamng or pia	ns, training, and res				hnologies for data
4.2.1 Manage	Training Tachnolo	alde for hara enann	A CONTINUENT NO.	a haan maaamaa aa	aniina taannaiz	X
enabling						
technologies for						
access and						
Workflow manage	ment for data	I.	Quantitative of	uality goals have	Processes re	garding workflow
	been taken for Work	flow management for		including sharing,		lows approaches
to been establish		_	n, including managing the		semination, incl	
	ation, has been wo			data dissemination		covery, and
			ation, has been recorde			ια sharinα.
4.3.1 Identify and	Timaton: moraama		l loon loon loon loon loon loon loon lo	l ioi tillo bioloct. bu	l nao moraan	SALANS PAGE SALANS
manage data						X
4.3.2 Encourage						X
sharing						Λ
4.3.3 Enable data						X
4.3.4 Distribute						X
4.3.5 Ensure data						X
citation						
	Level 0	Level 1: Initial	Level 2: Managed	Level 3: Defined	Level 4: DM is	Level 5: Focus on
	This process or	Data are	DM process is	DM is	DIVI 13	i ocus on
Process / Practice		12-20-3	CONTRACTOR OF THE CONTRACTOR O	Control of the Contro	measured and	process
Process / Practice	practice is not	managed	characterized for	characterized for	measured and	process
Process / Practice Quantitative qualit	practice is not	managed	characterized for	characterized for	measured and	process
	practice is not ty goals have	managed	characterized for Measurement, ana			28
Quantitative qualit	practice is not ty goals have en taken to				controlled	28
Quantitative qualit No steps have been been established	practice is not ty goals have en taken to including Pr	ocesses regarding	Measurement, ana	l lysis, or Measurement, a	controlled	verification
Quantitative qualit No steps have been been established to ensure accessi	practice is not ty goals have en taken to including Pr bility The project fol	ocesses regarding of	Measurement, ana establish procedures for	lysis, or Measurement, a and measur	analysis, or	verification
Quantitative qualit No steps have been been established to ensure accessi measurement. and 4.4.1	practice is not ty goals have en taken to including Pr bility The project fol	ocesses regarding of	Measurement, ana establish procedures for measurement, analysis,	lysis, or Measurement, a and measur	analysis, or ement, analysis	verification s, or analysis. or
Quantitative qualit No steps have been been established to ensure accessi measurement. and	practice is not ty goals have en taken to including Pr bility The project fol	ocesses regarding of	Measurement, ana establish procedures for measurement, analysis,	lysis, or Measurement, a and measur	analysis, or ement, analysis	verification
Quantitative qualit No steps have been been established to ensure accessi measurement. and 4.4.1	practice is not ty goals have en taken to including Pr bility The project fol	ocesses regarding of	Measurement, ana establish procedures for measurement, analysis,	lysis, or Measurement, a and measur	analysis, or ement, analysis	verification s, or X
Quantitative qualiting No steps have been established to ensure accession measurement, and 4.4.1 Measurement and 4.4.2 Verifying Implementation	practice is not ty goals have en taken to including Pr bility The project fol	ocesses regarding of	Measurement, ana establish procedures for measurement, analysis,	lysis, or Measurement, a and measur	analysis, or ement, analysis	verification s, or analysis. or
Quantitative qualiting No steps have been established to ensure accession measurement, and 4.4.1 Measurement and 4.4.2 Verifying London Steps No. 100	practice is not ty goals have en taken to including Pr bility The project fol lysis. or verificat	ocesses regarding of	Measurement, ana establish procedures for measurement, analysis,	lysis, or Measurement, a and measur	analysis, or ement, analysis	verification , or nallysis. or
Quantitative qualiting No steps have been established to ensure accession measurement, and 4.4.1 Measurement and 4.4.2 Verifying Implementation 5. Repository Services and Pres	practice is not y goals have en taken to including Pr bility The project fol alvsis. or verificat	ocesses regarding of	Measurement, ana establish procedures for measurement, analysis, sibility and security of d	lysis, or Measurement, a and measur lata have been	analysis, or ement, analysis measurement. a	verification s, or nalvsis. or X
Quantitative qualiting No steps have been established to ensure accession measurement, and 4.4.1 Measurement and 4.4.2 Verifying Implementation 5. Repository Services and Preservation, Data preservation,	practice is not ty goals have en taken to including Pn bility The project fol alvsis. or verificat servation curation, and	ocesses regarding of lows approaches to ion to ensure acces	Measurement, ana establish procedures for measurement, analysis, sibility and security of c	lysis, or Measurement, a and measur lata have been	analysis, or ement, analysis measurement. a	verification , or nalvsis. or X
Quantitative qualiting No steps have been established to ensure accession measurement, and 4.4.1 Measurement and 4.4.2 Verifying Implementation S. Repository Services and Preservation, Data preservation, Data preservation,	practice is not ty goals have en taken to including Pn bility The project fol alvsis. or verificat servation curation, and bac	ocesses regarding of lows approaches to ion to ensure acces	Measurement, ana establish procedures for measurement, analysis, sibility and security of d	lysis, or Measurement, a and measur lata have been	analysis, or ement, analysis measurement. a	verification s, or nalvsis. or X
Quantitative qualit No steps have been established to ensure accessi measurement. and 4.4.1 Measurement and 4.4.2 Verifying Implementation 5. Repository Services and Pres Data preservation, Data preservation, data preservation, data	practice is not y goals have en taken to including Pr bility The project fol elvsis. or verificat servation curation, and curation, and bac on, curation, and	ocesses regarding of lows approaches to jon to ensure acces	Measurement, ana establish procedures for measurement, analysis, sibility and security of o	lysis, or Measurement, a and measur ata have been guality goals have billows approaches t	analysis, or ement, analysis measurement. a Processes ru to been establi	verification t, or nalvsis. or X X egarding data shed regarding
Quantitative qualities No steps have been established to ensure accession measurement. And 4.4.1 Measurement and 4.4.2 Verifying Implementation 5. Repository Services and Preservation, Data preservation, data preservation to steps have been seen as the property of the preservation of t	practice is not by goals have an taken to including Pr bility The project fol alvisis. or verificat servation curation, and curation, and bac on, curation, and an taken to backups	ocesses regarding of lows approaches to jon to ensure access the lowest state of the l	Measurement, ana establish procedures for measurement, analysis, sibility and security of of Quantitative of didressed for The project for each of this project, but he	lysis, or Measurement, a and measur lata have been uuality goals have bllows approaches t ave not taken da	analysis, or ement, analysis measurement. analysis measurement. analysis measurement of the control of the cont	verification o, or analysis. or X X agarding data shed regarding o, curation, and
Quantitative qualiting No steps have been established to ensure accession measurement. And 4.4.1 Measurement and 4.4.2 Verifying Implementation 5. Repository Services and Preservation, data preservation, data preservation, cura	practice is not y goals have en taken to including Pr bility The project fol alysis. or verificat servation curation, and curation, and bac on, curation, and ban on, curation, and en taken to backups tion, and bac	cesses regarding of lows approaches to jon to ensure acces kups have been ad thave been conside kups are evaluated	Measurement, ana establish procedures for measurement, analysis, sibility and security of of a Quantitative of didressed for The project for this project, but he on a establish organization	lysis, or Measurement, a and measur lata have been uuality goals have billows approaches t ave not taken di anal minimally	processes responses to been establicate preservation by individual t	verification o, or analysis. or X X garding data shed regarding o, curation, and eam wider
Quantitative qualities No steps have been established to ensure accession measurement. And 4.4.1 Measurement and 4.4.2 Verifying Implementation 5. Repository Services and Preservation, Data preservation, data preservation to steps have been seen as the property of the preservation of t	practice is not y goals have en taken to including Pr bility The project fol alysis. or verificat servation curation, and curation, and bac on, curation, and ban on, curation, and en taken to backups tion, and bac	ocesses regarding of lows approaches to jon to ensure access the lowest state of the l	Measurement, ana establish procedures for measurement, analysis, sibility and security of of a Quantitative of didressed for The project for this project, but he on a establish organization	lysis, or Measurement, a and measur lata have been uuality goals have billows approaches t ave not taken di anal minimally	analysis, or ement, analysis measurement. analysis measurement. analysis measurement of the control of the cont	verification o, or analysis. or X X garding data shed regarding o, curation, and eam wider
Quantitative qualiting No steps have been established to ensure accession measurement. And 4.4.1 Measurement and 4.4.2 Verifying Implementation 5. Repository Services and Preservation, data preservation, data preservation, cura	practice is not y goals have en taken to including Pr bility The project fol alysis. or verificat servation curation, and curation, and bac on, curation, and ban on, curation, and en taken to backups tion, and bac	cocesses regarding of lows approaches to jon to ensure acces ekups have been ad thave been conside kups are evaluated that have been defi	Measurement, ana establish procedures for measurement, analysis, sibility and security of of a Quantitative of didressed for The project for this project, but he on a establish organization	lysis, or Measurement, a and measur lata have been uuality goals have billows approaches t ave not taken di anal minimally	processes responses to been establicate preservation by individual t	verification o, or analysis. or X X sparding data shed regarding o, curation, and eam wider
Quantitative qualit No steps have bee been established to ensure accessi measurement. ana 4.4.1 Measurement and 4.4.2 Verifying Implementation 5. Repository Services and Preservation, data preservation, data preservation, cura community needs	practice is not y goals have en taken to including Pr bility The project fol alysis. or verificat servation curation, and curation, and bac on, curation, and ban on, curation, and en taken to backups tion, and bac	cesses regarding of lows approaches to jon to ensure acces kups have been ad thave been conside kups are evaluated	Measurement, ana establish procedures for measurement, analysis, sibility and security of of a Quantitative of didressed for The project for this project, but he on a establish organization	lysis, or Measurement, a and measur lata have been uuality goals have billows approaches t ave not taken di anal minimally	processes responses to been establicate preservation by individual t	verification o, or analysis. or X X garding data shed regarding o, curation, and eam wider
Quantitative qualit No steps have been established to ensure accessi measurement. and 4.4.1 Measurement and 4.4.2 Verifying Implementation 5. Repository Services and Pres Data preservation, Data preservation, data preservation, cura community needs 5.1.1 Develop data preservation of the preservation of th	practice is not y goals have en taken to including Pr bility The project fol alysis. or verificat servation curation, and curation, and bac on, curation, and ban on, curation, and en taken to backups tion, and bac	cocesses regarding of lows approaches to jon to ensure accession to ensure accessions to ensure accessions and the law ensure ensurements and the law ensurements are evaluated that have been defi	Measurement, ana establish procedures for measurement, analysis, sibility and security of of a Quantitative of didressed for The project for this project, but he on a establish organization	lysis, or Measurement, a and measur lata have been uuality goals have billows approaches t ave not taken di anal minimally	processes responses to been establicate preservation by individual t	verification o, or analysis. or X X garding data shed regarding o, curation, and eam wider
Quantitative qualit No steps have bee been established to ensure accessi measurement. ana 4.4.1 Measurement and 4.4.2 Verifying Implementation 5. Repository Services and Pres Data preservation, data preservation, cura community needs 5.1.1 Develop data preservation data preservation data preservation consumers and pr	practice is not y goals have en taken to including Pr bility The project fol alysis. or verificat servation curation, and curation, and bac on, curation, and ban on, curation, and en taken to backups tion, and bac	cocesses regarding of lows approaches to jon to ensure acces ekups have been ad thave been conside kups are evaluated that have been defi	Measurement, ana establish procedures for measurement, analysis, sibility and security of of a Quantitative of didressed for The project for this project, but he on a establish organization	lysis, or Measurement, a and measur lata have been uuality goals have billows approaches t ave not taken di anal minimally	processes responses to been establicate preservation by individual t	verification o, or analysis. or X X garding data shed regarding o, curation, and eam wider
Quantitative qualities No steps have bee been established to ensure accession measurement. And 4.4.1 Measurement and 4.4.2 Verifying Implementation 5. Repository Services and Preservation, data preservation, data preservation, cura community needs 5.1.1 Develop data preservation of the	practice is not y goals have en taken to including Pr bility The project fol alysis. or verificat servation curation, and curation, and bac on, curation, and ban on, curation, and en taken to backups tion, and bac	cocesses regarding of lows approaches to jon to ensure accession to ensure accessions to ensure accessions and the law ensure ensurements and the law ensurements are evaluated that have been defi	Measurement, ana establish procedures for measurement, analysis, sibility and security of of a Quantitative of didressed for The project for this project, but he on a establish organization	lysis, or Measurement, a and measur lata have been uuality goals have billows approaches t ave not taken di anal minimally	processes responses to been establicate preservation by individual t	verification o, or analysis, or X X sparding data shed regarding o, curation, and eam wider codified in
Quantitative qualit No steps have bee been established to ensure accessi measurement. ana 4.4.1 Measurement and 4.4.2 Verifying Implementation 5. Repository Services and Pres Data preservation, data preservation, cura community needs 5.1.1 Develop data preservation data preservation data preservation consumers and pr	practice is not y goals have en taken to including Pr bility The project fol alysis. or verificat servation curation, and curation, and bac on, curation, and ban on, curation, and en taken to backups tion, and bac	cocesses regarding of lows approaches to jon to ensure accession to ensure accessions to ensure accessions and the law ensure ensurements and the law ensurements are evaluated that have been defi	Measurement, ana establish procedures for measurement, analysis, sibility and security of of a Quantitative of didressed for The project for this project, but he on a establish organization	lysis, or Measurement, a and measur lata have been uuality goals have billows approaches t ave not taken di anal minimally	processes responses to been establicate preservation by individual t	verification o, or analysis. or X X garding data shed regarding o, curation, and eam wider
Quantitative qualit No steps have been established to ensure accessi measurement. and 4.4.1 Measurement and 4.4.2 Verifying Implementation 5. Repository Services and Pres Data preservation, data preservation, data preservation, cura community needs 5.1.1 Develop data preservation on 1.2 Develop data preservation on 1.2 Develop data curation data preservation on 1.2 Develop data deckup on 1.3 Develop data curation	practice is not y goals have en taken to including Pn bility The project fol alysis. or verificat servation curation, and curation, and bac on, curation, and bac on, curation, and bac on backups	cocesses regarding of lows approaches to jon to ensure accession to ensure accessions to ensure accessions and the law ensure ensurements and the law ensurements are evaluated that have been defi	Measurement, ana establish procedures for measurement, analysis, sibility and security of of a Quantitative of didressed for The project for this project, but he on a establish organization	lysis, or Measurement, a and measur lata have been uuality goals have billows approaches t ave not taken di anal minimally	processes responses to been establicate preservation by individual t	verification o, or analysis. or X X ggarding data shed regarding o, curation, and eam wider codified in
Quantitative qualit No steps have been established to ensure accessi measurement. and 4.4.1 Measurement and 4.4.2 Verifying Implementation 5. Repository Services and Pres Data preservation, Data preservation, data preservation, cura community needs 5.1.1 Develop data backup 5.1.3 Develop data backup 5.1.3 Develop data curation data constitution of the constitution	practice is not y goals have en taken to including Pn bility The project fol alvsis. or verificat servation curation, and curation, and bac on, curation, and bac or backups by goals have	cocesses regarding of lows approaches to jon to ensure accession to ensure accessions to ensure accessions and the law ensure ensurements and the law ensurements are evaluated that have been defi	Measurement, ana establish procedures for measurement, analysis, sibility and security of of the control of the	lysis, or Measurement, a and measur lata have been uuality goals have billows approaches t ave not taken di anal minimally	processes responses to been establicate preservation by individual t	verification o, or analysis. or X X X egarding data shed regarding o, curation, and eam wider codified in
Quantitative qualit No steps have bee been established to ensure accessi measurement. ana 4.4.1 Measurement and 4.4.2 Verifying Implementation 5. Repository Services and Pres Data preservation, Data preservation, data preservation, cura community needs 5.1.1 Develop data preservation data preservation cura community needs 5.1.1 Develop data preservation data curation 3.1.2 Develop data backup 3.1.3 Develop data curation 3.1.3 Develop data curation 3.1.4 Develop data curation 3.1.5 Develop	practice is not ty goals have en taken to including Pn bility The project fol alvsis. or verificat en taken to curation, and curation, and bac on, curation, and beat taken to backups tion, and backups or backups	cocesses regarding of lows approaches to jon to ensure access the skups have been additionable that have been defiled.	Measurement, ana establish procedures for measurement, analysis, sibility and security of of the control of the	lysis, or Measurement, a and measur lata have been uality goals have bllows approaches t ave not taken di anal minimally odified in reg	Processes representation of the processes representation of th	verification o, or analysis. or X X X egarding data shed regarding o, curation, and eam wider codified in
Quantitative qualit No steps have been established to ensure accessi measurement. and 4.4.1 Measurement and 4.4.2 Verifying Implementation 5. Repository Services and Pres Data preservation, data preservation, data preservation, cura community needs 5.1.1 Develop data preservation of 1.2 Develop data curation of 1.2 Develop data curation of 1.3 Develop data curat	practice is not ty goals have en taken to including Pn bility The project fol alvsis. or verificat servation curation, and curation, and bacon, curation, and en taken to backups to backups or backups ty goals have ure, and training ps have been taken te	cocesses regarding of lows approaches to jon to ensure access the lower seven and the	Measurement, ana establish procedures for measurement, analysis, sibility and security of of a control of the c	lysis, or Measurement, a and measur jata have been juality goals have allows approaches to ave not taken di anal minimally judified in reg	Processes re	verification o, or analysis, or X X sparding data shed regarding o, curation, and eam wider codified in
Quantitative qualit No steps have been established to ensure accessi measurement. and 4.4.1 Measurement and 4.4.2 Verifying Implementation 5. Repository Services and Pres Data preservation, data preservation, data preservation, cura community needs 5.1.1 Develop data preservation 5.1.2 Develop data backup 3.1.3 Develop data curation 5.1.2 Develop data curation 5.1.4 Resources, structuresources, structures	practice is not ty goals have en taken to including Pn bility The project fol alvsis. or verificat servation curation, and curation, and en taken to backups tion, and bac or backups ty goals have ure, and training ps have been taken t	cocesses regarding of lows approaches to jon to ensure access the company of the	Measurement, ana establish procedures for measurement, analysis, sibility and security of or a control of the c	lysis, or Measurement, a and measur plata have been quality goals have been may enot taken di mainimally bedified in reg hed for resources, pards to enabling le for resources,	Processes re	verification to, or analysis. or X X ggarding data shed regarding to, curation, and eam wider codified in X ggarding oject provides to enabling

5.2.1 Appraise	1	ľ	1	Ī	1	Ī
and select						X
enabling						1
5.2.3 Develop						
business models						X
5.2.4 Develop						
backup		X				
procedures and						
	Level 0	Level 1: Initial	Level 2: Managed	Level 3: Defined	Level 4:	Level 5:
	This process or	Data are	DM process is	DM is	DM is	Focus on
Process / Practice	practice is not	managed	characterized for	characterized for	measured and	process
The workflow of da	ta preservation.	L	Quantitative	e quality goals have	controlled	improvement
		e project follows a	pproaches to been esta		Processes	regarding the
			ata preservation, control			flow of data
	kflow of data preserv		preservation, including e			0
			uding storage, security,			
5.3.1 Store data		ľx	ptml and minmtion has	hpan nat talian wi	das a amanını iti	1
5.3.2 Provide		X				
lata		A				
5.3.3 Control						37
changes to data						X
5.3.4 Backup data		X				
5.3.5 Curate data				+		X
3.3.6 Perform data		X			276	
 Quantitative qualit	l v qoals have		<u>-</u>	1	1	J
Measurement, ana	lvsis and Th	e project follows an	proaches to been estat	blished regarding	Processes r	egarding
	n taken to Measure				neasurement, ar	
measurement, ana			is, and establish proced	•	ion of data stora	2011 7 01 122 12 12 12 12 12
	•	ification of data sto				•
backups have bee 5.4.1	n recorded for Ver	rication of data sto	rade and ventication	of data storage and	Verification of	of data storage
Measurement and		X				
5.4.2 Validate		v				
data		X				
5.4.3 Validate		X				
hackune		Λ				