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Community characteristics & orientation

Name:	DHAVAL BHAILALBHAI PATEL
Community (UN SD goal):	Goal 6 - Clean Water and Sanitation Goal 3 - Good Health and Well being Goal 11 - Sustainable Cities and Communities Goal 17 - Partnerships for the goals
Date:	17 – May 2021

Instructions

Research the community you are most interested in exploring using links from the UN Sustainable Goals website (https://www.un.org/sustainabledevelopment/) and others. In your exhaustive research, answer the following.

Community characteristics

Community life-cycle (current state)

Where is your community in its life-cycle?	What you need to focus on:	Special needs
☒ **Just forming** Need basic tools to connect, but not sure from there	Research and/or discuss the potential of some basic tools with members, explore what ideas it might give them, and see what they might bring in with them.	There is no community apart from government body that focus on solving water issue in Tanzania. Moreover, Tanzania has a low literacy rate and people are not familiar with digital habitats. My idea is to introduce simple tools to address the water issue in Tanzania working with current water infrastructure available. There is no dedicated platform available where people can come together to address water issue in local communities. The goal is to create a platform to check if the water pump is operational or not and predict if installing a new water pump will be functional or not.
☐ **Self-designing** Information stage, but with a strong sense of what it wants to accomplish	Contribute ideas to the design. Analyze systematically the implications of their community design for technology, infrastructure, and technology skills.	
☐ **Growing & restless** Ready to add new functionality to its tool configuration	Try to make this a community reflection and self-design event. Does their restlessness suggest a major change, such as a transition to a new platform?	
☐ **Stable and adapting** Just needing some new tools	How much disruption will the community tolerate? How will the new tools be	

	integrated into or affect existing practices?	

Constitution

Diversity: How diverse is the community?

Topic	Your notes
What are the different types of members and what are their levels of participation?	The members include the people from communities of Tanzania, officials from regime and NGO's who wants to make a donation to improve water infrastructure. The level of participation for the north star customer will be information level [1]. i.e they will be the source of information for requirement gathering and using the tools of digital habitat. The creator's role is managed by agency maintaining the infrastructure. The curator's and consumers role will be played by people of Tanzania using the platform.
How spread apart is it in terms of location and time zones?	The majority of the people in community will be Tanzania. The time zones will be GMT+3.
What language(s) do members speak?	English and Swahili
What other cultural or other diversity aspects may affect your technology choices?	• As around 95% [2] speak English and Swahili. So, the tools that I will design can use English language as it is spoken by 1348 million people [3] worldwide. This will also help me to over come language constraints in my design. • The internet connectivity in remote location can be a major problem for users to use this technology • The design should be easily navigable and ambiguity in tool design should be minimal for it to be user friendly.

Openness: How connected to the outside world is your community?

Topic		Your notes
How much do you want to control the boundaries of your community? Does your community need	☐ To be private/secure ☒ Open boundaries ☐ Both private & public spaces	As the platform will help to create transparency in managing water infrastructure and help communities to discuss water issue in Tanzania. For the initial design idea, I want to keep it as an open boundary system and will include map of current status of pump in Tanzania and a chat forum to reach out to officials and discuss alternative to solve the water crisis. There might be some features that can be developed in future that comes under the domain of private spaces for managing the technician for repairing the non-functional infrastructure.
How does your community need to interact with other communities? Do you need common tools for sharing and learning with them?		In the current releases, the community will interact with other communities [i.e., global world] by leveraging the present social media platforms like Facebook, etc for global exposure as the platform become popular over time. The application will have a dedicated tool to reach out to global community.

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Technology aspirations

Technology savvy, tolerance, & constraints: What are your community's technology interests and skills and patience thereof? What are the constraints imposed by technology factors?

Topic	Your notes
How interested is your community in technology?	There has been steady increase in population being more adaptive to technology although there are some percent who are laggards as well. Looking at the statistics [4] there has been steady increase in population using internet to 15.5 million in 2021.
What is their capacity for learning new tools?	As the people are getting exposure to new technology there is many people who lies under the category of early adaptors and early majority. My goal is to make this transition smoother by designing the platform with simple interface.
What is the range of skills? If their interests and/or skills are diverse, could it cause conflict or distraction?	There can be conflict on the platform in term of censoring the content posted in chat as this can be used by private water distribution firms for promotional purpose or opposition regime to undermine the government efforts to manage the water infrastructure. As the main functionality for the platform is to aid the water infrastructure by predicting the if the water pup is functional or not. So we can isolate the conflict to other non-essential tools and find solutions to minimize its negative impact on community.
How tolerant are members of the adoption of a wide variety of tools?	As community is affected by water crisis it has become important for them to solve the issue and would welcome any efforts to bring change on grass root level with making huge changes to current water infrastructure s
How many technological boundaries are they willing to cross, e.g. sign in to more than one web-based tool, learn to use new tools, or give up old favorites? This helps you understand what level of integration you need.	As there are no tools to predict or monitor the water pump it will be interesting to see how community will react to introduction of a new digital habitat. I am planning to integrate the tools and provide a unified platform but as my core idea is or open community as does not require a sign on I will be creating a single sign on feature make the application user friendly.
What are your members' technology constraints (e.g., bandwidth, operating systems, etc.)?	There constraints for deploying a custom ML model on web interface is not possible via WordPress and I have to use Django for it to be functional. Given the time constraints designing a chart functionality will be exhaustive so I would use WordPress or similar technology to create the chat tool.
How much time are members able to be online and from where (office, home, field)? Some people have limited online time, or are able to be online only in specific locations. Others are always on. Very diverse situations can affect participation	The members can be online and or chat in asynchronous manner on a thread.

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Community orientation

Relevance to community: Use the range from 0 (no relevance) to 5 (high relevance) to determine what matters most to the community. Look at these from the perspectives of the different types of members (under "constitution"). Also discuss the "value-added" to each member group

0	1	2	3	4	5	Orientations	Variants	Key activities/your notes
☐	☐	☐	☒	☐	☐	**Meetings** Many communities place a great emphasis on regular meetings where members engage in shared activities for a specific time. Meetings, and the visible participation of members, assert the community's existence	☐ Face-to-face/blended ☒ Online synchronous ☒ Online asynchronous	Meeting does not play a vital role in my design idea. The portal can be used by agency to make announcement related to water pump. The portal can be used to host events for educating communities on sustainable water consumptions
☐	☐	☐	☒	☐	☐	**Open-ended conversation** Some communities maintain ongoing conversations as their primary vehicles for learning. Open-ended conversations are common when a community is co-located and people keep the conversation going as they "bump" into each other.	☐ Single-stream discussions ☒ Multi-topic conversations ☐ Distributed conversations	The idea is to create single thread of the pump to perform analytics on the pump individually
☐	☐	☐	☐	☐	☒	**Projects** In some communities' members want to focus on particular topics, go deep, and collaborate on projects to solve problems or produce useful artifacts. Learning is not just a matter of sharing knowledge or discussing issues. Members need to do things together in order to develop their practice. Projects usually involve a subgroup within the community	☐ Practice groups ☒ Project teams ☐ Instruction	There might be different teams managing different aspect of the platform. i.e. content team can do sentimental analysis on a particular thread to see how people feel about the service for that water pump, The management can perform job scheduling for the pumps that are non-functional
☐	☐	☐	☐	☐	☒	**Content** Some communities are primarily interested in creating, sharing, and providing access to documents, tools, and other content. Valuable and well-organized content is a useful resource for members	☐ Library ☒ Structured self-publish ☒ Open self-publish ☒ Content integration	As the idea is to create collaborative ways to solve the water crisis. I am planning on making it an open-source platform where material can be posted and also the content can be published by agency so can these can be put under content integration.

☐	☐	☐	☐	☒	☐	**Access to expertise** Some communities create value by providing focused and timely access to expertise in the community's domain, whether internally or externally. Communities with this orientation focus on answering questions, fulfilling requests for advice, or engaging in collaborative, just-in-time problem solving	☒ Questions & requests ☐ Access to experts ☒ Shared problem solving ☐ Knowledge validation ☐ Apprenticeship & mentoring	People can discuss the problem and find solution to solve water crisis.
☐	☐	☐	☐	☐	☒	**Relationships** Some communities focus on relationship building among members as the basis for both ongoing learning and being available to each other. This orientation emphasizes the interpersonal aspect of learning together. Communities with this orientation place a high value on knowing each other personally, emphasizing networking, trust building, and mutual discovery	☒ Connecting ☐ Knowing about people ☒ Interacting informally	The idea is to connect people to solve water crisis through chat forum where the interaction can be informal
☐	☐	☐	☒	☐	☐	**Individual participation** Learning together happens in the context of a group, but it is realized in the experience of individuals. People bring different backgrounds, communication styles, and aspirations to their participation in a community. People have different levels of commitment, they take on different roles, and they use tools differently	☒ Levels of participation ☐ Personalization ☐ Individual development ☐ Multi-membership	The level of participations on various thread will be different based on the locality and as the problem is affecting the community so it will include various levels of participations to solve the problem.
☐	☐	☐	☐	☐	☒	**Community cultivation** Some communities are happy with loose self-organization and unplanned evolution, while others thrive on attention to community cultivation. They have a need to reflect on the effectiveness and health of the community to make things better, joined with a willingness to work on it	☒ Democratic governance ☒ Strong core group ☐ Internal coordination ☐ External facilitation	There will be officials on the platform answering the questions leading to strong core group but platform can be used as a space to discuss the problem like water quality, etc for a particular thread leading to democratic governance
☐	☐	☐	☐	☐	☒	**Service context** In some cases, serving a specific context becomes central to the	☐ Organization as context	There might be other communities that might be interested in this solution to

						community's identity and the ways it operates. They may live inside an organization, whose charter their practice needs to serve. They may have a mission to provide learning resources to the world or to recruit members widely. Or they may seek interactions with other communities whose domain complements their own	☐ Cross-organizational ☒ Other related communities ☐ Public mission	solve water problem in their regions

Scratchpad (other interesting insights, questions/answers, etc.)

References

[1] PQ-HIV. www.pq-hiv.de/en/chapter/levels-participation. Accessed 17 May 2021.

[2] Wikipedia. Languages of Tanzania. en.wikipedia.org/wiki/Languages_of_Tanzania. Accessed 18 May 2021.

[3] Statista. www.statista.com/statistics/266808/the-most-spoken-languages-worldwide/. Accessed 18 May 2021.

[4] Data Portal. datareportal.com/reports/digital-2021 tanzania#:~:text=Social%20media%20statistics%20for%20Tanzania,total%20population%20in%20January%202021.. Accessed 18 May 2021.

The ideas might evolve when implementing the application based on constraints

Technology configuration inventory

Name:	DHAVAL BHAILALBHAI PATEL
Community (UN SD goal):	Goal 6 - Clean Water and Sanitation Goal 3 - Good Health and Well being Goal 11 - Sustainable Cities and Communities Goal 17 - Partnerships for the goals
Date:	17 – May 2021

Instructions

It is useful to inventory the current technology configuration of the community, i.e., the current technology that the people working, learning, advancing knowledge (etc.) in the specific area you are engineering software for are using, as a way to understand the community better and what matters to them better. If yours is a new community, it may not have any specific technology yet, but even for brand new communities, the current configuration may not be empty, for instance if general tools like email or phone are going to be used. You can use a version of the table on the next page to inventory and analyze the current configuration of your community:

1. Get the big picture. Research the area and make a list of all the platforms and stand-alone tools in your community's configuration as best you can
2. For each platform, list the tools and check the ones that are being used. Why are some not being used? Are there duplicates? Are there issues around integration between tools?
3. To the left, make a note of which community activities/orientations the tools currently support in your community
4. To the right, identify the key features of tools. Are some of these features commonly or rarely used? What are the reasons for that?
5. Assess actual tool use if you can. Identify which are dominant and which are only used by smaller groups and individuals.

O

NOTE: Add new rows as needed below. Please know your search should be as exhaustive as possible given the area you are researching

Platform	**Platform type or name**		
Supported activities	**Tools**	**Key features**	**Usage notes**
Prediction of functional and non-functional water pump and plot map of active water pump	Water pump monitor and predictor platform	Can be used by community member to see the water pump is functional or not	Can be used by individual member or community to view current status of pump and make predictions of newly installed water pump

Stand-alone tool	Tool type or name		
Supported activities	**Tool**	**Key features**	**Usage notes**
Map of water pump and their current status	Spatial Map plot	This will inform communities on current status of the active water pump in the region of Tanzania.	Can be used by individuals and community to monitor status of pump

Stand-alone tool	Tool type or name		
Supported activities	**Tool**	**Key features**	**Usage notes**
Predict if the installed water pump is operational or not based on input parameters	Prediction tool for water pump	This will predict if the water pump is operational or not	Can be used by individuals and community to make predictions

Platform	Platform type or name		
Supported activities	**Tools**	**Key features**	**Usage notes**
Support discussions between community members on various threads	chat forum	Used by community to discuss ideas to solve water crisis in their community by publishing the thread and commenting on current thread	Can be used by individual member or community to discuss water crisis.

Stand-alone tool	Tool type or name		
Supported activities	**Tool**	**Key features**	**Usage notes**
Serves as a home page for the chat forum will include important content.	Home page	Used to display important events and resources. menu to navigate chat forum and other pages	Used by users to navigate chat forum

Stand-alone tool	Tool type or name		
Supported activities	**Tool**	**Key features**	**Usage notes**
Discussion forum to discuss the issue	Chat forum threads page	Used by community member to share idea and discuss the solution for particular water pump	Used by users for discussion o particular thread

Drafting an emerging picture

Name:	DHAVAL BHAILALBHAI PATEL
Community (UN SD goal):	Goal 6 - Clean Water and Sanitation Goal 3 - Good Health and Well being Goal 11 - Sustainable Cities and Communities Goal 17 - Partnerships for the goals
Date:	17 – May 2021

Instructions:
Using your researched information fill out the flowing comparing the current state of the art with what you think new (software) innovations could bring to the community

Covering the orientations	
Compare the left-hand column of the document "Technology configuration inventory" table with the right-hand column of the document "Community characteristics & orientation" table. What do you notice about the match (or mismatch) between your dominant community orientations and the current configuration of tools?	
How well does the technology inventory cover the orientations? What themes emerged from both the community orientations and the technology configuration from your colleagues' notes	The technology inventory has covered the community orientation as they would require to know if the water pump is operational r not also thy want a common platform were they can discuss the water crisis within their communities.
☒ Are you almost there? ☐ Are there big gaps?	I was able to put big pieces for my idea and now have t find ways to tweak the idea with minor changes as I progress with technology inventory implementation
What is the range of skills? If their interests and/or skills are diverse, could it cause conflict or distraction?	There is no skill barriers o overcome as I am planning to create a simple user-friendly UI which can be used by community members with minimal knowledge.
Achieving integration	
Look at all the pieces of your configuration	
What level of integration and interoperability has been achieved?	As there are tools designed to create specific tasks and tools with similar technology are paired to form a platform. The configuration will have two platforms each operating independently with water pump ID at their uniquely identifying the pump.
Where are there big gaps	The gap might be identifying both platform as a single digital habitat by the user but this can be easily overcome as the project progress and both platforms can be integrated using the same piece of technology for better user experience.

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Balancing the polarities (Current state)	
How is the configuration balanced with respect to each polarity?	
Synchronous >> …Synchronous tools? In person community gathering. No tools available	<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<< **Asynchronous** …Asynchronous tools? Few NGO provides point of contact through websites like https://water.org/our-impact/where-we-work/tanzania/
Participation >> …Participation tools? No dedicated space available only through social media platform like Facebook, etc https://www.facebook.com/mecetz/videos/demand-for-water-and-sanitation-in-developing-countries-like-tanzania-is-very-hi/488561728378398/	<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<< **Reification** …Reification tools? No tools available
Group >>> …Group tools? Community activities without any outside help	<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<< **Individual** …Individual tools? No tools available
How well does this balance fit your community?	
Solution seeking	
In the new configuration, do you want your choice of tools to affect the polarities of your community in ways that differ from the current configuration? Which way?	
Synchronous >> …New synchronous tools? discussion on active thread	<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<< **Asynchronous** …New asynchronous tools? Chat forum to discuss the water crisis
Participation >> …New participation tools? Various forms of participations like community leaders can use prediction tool to see if the water pump is functional or not Lurkers can follow development in the community to solve water problems.	<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<< **Reification** …New reification tools? Platform will provide means to provide a space to discuss water crisis with the community and place where people can raise their voice for a change.
Group >>> …New group tools?	<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<< **Individual** …New individual tools?

Chat forum on pump threads	Chat on water pump concreted with local community
MVP notes	
My MVP will comprise of the 1] Water pump monitor and predictor platform 2] Discussion forum	

Business case

Name:	DHAVAL BHAILALBHAI PATEL
Community (UN SD goal):	Goal 6 - Clean Water and Sanitation Goal 3 - Good Health and Well being Goal 11 - Sustainable Cities and Communities Goal 17 - Partnerships for the goals
Date:	17th May 2021

Proposed Project	Water pump status prediction system and discussion forum
Date Produced	17th May 2021
Background	According to UN reports, 3 billion people does not have safe drinking water, some countries have funding gap of 61% to develop their infrastructure to provide safe drinking water. According to UNESCO, ground water is the primary source of clean water for 50% of world population. Many 3rd world countries and remote location around the world does not have a clean supply of drinking water. Most of these locations rely on ground water for their daily needs. This has led to tremendous strain on the ground water levels. Communities highly rely on these water pumps to extract the ground water. If the water pump is not operational communities have to pay for alternative options like water tanker which cannot be available instantaneously and this will put additional strain on people with low income. Additional personal research has shown that there were not substantial tools available for communities of Tanzania to interact on common space to solve their water crisis problem.
Business Need/ Opportunity	My main objective for this project is to predict if the water pump is operational or not. This can help agency to sent out a technician to repair it in advance. This will also show the status of the pumps for information of the communities of Tanzania. This will also introduce a platform where people can participate in discussion to sole water crisis problem in Tanzania.
Options	I will try to implement they key feature that will comprise majority of the software requirement for my MVP • I will deploy predictive model using Django • I will deploy chat forum using WordPress. • I will try to improve the accuracy of model also add new features that will help my digital habitat to be more livable to the community

Cost-Benefit Analysis

The time can be an important factor governing the development of functionality and tools for the digital habitat. I am going to use open-source software for my project. This can help me to speed up the development process with community collaboration and code reusability. But given the nature of the problem it may take time to customize the available resource for the proposed problem.
It will be my first-time using WordPress thus there might be additional cost of plugins for getting the desired functionality.Also future migration of transferring the forum from wordpress to Django to form a unified configuration might add overhead to the total cost of the project.

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Recommendation

The recommendation for cost cutting would be to develop a platform on a single language but given the time constraints and my knowledge on the subject it would be a difficult task to achieve in give time.

Stakeholder analysis

Name: DHAVAL BHAILALBHAI PATEL

Community (UN SD goal): Goal 6 - Clean Water and Sanitation
Goal 3 - Good Health and Well being
Goal 11 - Sustainable Cities and Communities
Goal 17 - Partnerships for the goals

Date: 17th May 2021

Project Name	[This section contains the project name that should appear consistently on all project documents. Organizations often have project naming conventions.]

Name	**Project Role**	**Power**	**Interest**	**Level of Support**
[Name of the person or group.]	[Project role/title or the reason that they are a stakeholder.]	[High/ Low]	[High/ Low]	[Supportive/ Neutral/ Unsupportive]
Dhaval Patel	Responsible for developing the platform	High	High	Supportive
Communities of Tanzania	Providing feedback and interact with platform via chat forum and participate in articulating the water crisis in Tanzania	High	High	Supportive/Neutral based on participation of individuals
Pump infrastructure management agency	Providing the data to develop predictive model. Make announcement on the forum regarding the water crisis in community due to water pump malfunction.	Moderate	High	Supportive
Local NGO's	Platform to reach out to communities facing water crisis for support	Low	High	Supportive
International NGO's	Provide aids and support to communities facing water crisis	Low	Low	Neutral

Project scope

Name:	DHAVAL BHAILALBHAI PATEL
Community (UN SD goal):	Goal 6 - Clean Water and Sanitation Goal 3 - Good Health and Well being Goal 11 - Sustainable Cities and Communities Goal 17 - Partnerships for the goals
Date:	17th May 2021

Project Name	Solving water crisis in Tanzania – project Poseidon
Project Deliverables	
Spatial plot of the water pump status	This will display the total water pump I he region of Tanzania and their current status. This will help the users to visualize and identify the non-operational pumps
Prediction of status of newly proposed water pumps	This feature will help to predict if the proposed idea for the water pump will be viable for the community or not
Home page	The home page will provide important announcements and link to various resources and tread for chat forum discussion
Chat forum	This is where the discussion of topics will take place by community members.
Other features	If the time permits, I will work on additional features that can be updated later in this document
Project Exclusions	
Merging of platforms is something I would like to exclude from this project scope.	

Project requirements

Name:	DHAVAL BHAILALBHAI PATEL
Community (UN SD goal):	Goal 6 - Clean Water and Sanitation Goal 3 - Good Health and Well being Goal 11 - Sustainable Cities and Communities Goal 17 - Partnerships for the goals
Date:	17th May 2021

Project Name	Solving water crisis in Tanzania – project Poseidon

Functional Requirements

- The ability to predict if the water pump is functional or not
- Able to view the spatial plot of all the water pump
- User can login into chat forum or anonymous chat option
- Home page to group important content
- Chat forum to provide platform for discussion on water crisis

Technical/Performance Requirements

- Python + Django for creating the prediction platform
- WordPress for creating discussion forum
- The chat can be asynchronous – database required
- Prediction tool should provide low latency and predicted results should be reasonable accurate

Activity-based schedule (Kanban/User Story Mapping)

Name: DHAVAL BHAILALBHAI PATEL

Community (UN SD goal): Goal 6 - Clean Water and Sanitation
Goal 3 - Good Health and Well being
Goal 11 - Sustainable Cities and Communities
Goal 17 - Partnerships for the goals

Date: 17th May 2021

Project Name	Solving water crisis in Tanzania – project Poseidon		
Activity	**Duration**	**Start Date**	**End Date**
MVP 1			
Prediction Package	[11 days]	[20-May-2021]	[30-May-2021]

Data preprocessing

In this step I have to cleanse the data and preprocess it using various techniques to make it suitable to apply a machine learning algorithm on the data set

Training the model

In this I have to develop a machine learning algorithm to train the model on the processed dataset

Packaging and deploying the model

In this I have to deploy the model on Django framework

Crafting the UI for making prediction

I have to create interface to input data field on Django and feed the data into model for it to predict the results and display the results.

Plot map of the water pumps

I have to plot the data points in Django for the given data set

MVP 2			
Forum Package	[7 days]	[31-May-2021]	[6-june-2021]

Home Page

This page displays the key component of the chat forum and link to various important resources like prediction page and hot threads. Include announcement from organization involved with the project and many more feature.

Announcement Page:

This page will act as the notice board for important announcement by agency regarding the water crisis.

MVP 3			
Forum Package	[6 Days]	[7-june-2021]	[13-june-2021]

Chat forum

A space to generate threads and create discussion.

Admin Panel

Admin can moderate the conversation so that community can move towards positive way. This can also help to remove the malicious content that is fake and can cause negative impact on the communities.

…	…	…	…