



Community characteristics & orientation

Name:

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Community & UN SDG(s):

SaskTel network engineers and architects

UN SDG(s):

- SDG#7: Affordable and clean energy
- SDG#11: Sustainable cities and communities
- SDG#12: Responsible consumption and production
- SDG#13: Climate action

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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
<input type="checkbox"/> 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.	
<input type="checkbox"/> 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.	
<input type="checkbox"/> 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?	
<input checked="" type="checkbox"/> 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?	Integration with existing systems, minimizing disruption, and demonstrating clear benefits in terms of availability, sustainability, and potentially operational efficiency. The focus will be on enhancing and optimizing, not replacing, their current infrastructure.
Constitution		



Diversity: How diverse is the community?

Topic	Your notes
What are the different types of members and what are their levels of participation?	<p>The community consists of various roles within SaskTel's network engineering and architecture teams. This includes:</p> <ul style="list-style-type: none"> • Network Engineers: Responsible for the day-to-day operation and maintenance of the network. Their participation would be focused on using the tools and methods developed in the project to improve their daily workflows. • Network Architects: Responsible for designing and planning the network infrastructure. Their participation would be focused on evaluating the long-term benefits of the project and integrating it into the overall network architecture. • Network Operations Managers: Responsible for overseeing the network operations and ensuring service level agreements are met. They would be interested in the project's impact on availability, performance, and cost. • Specialists: (e.g., energy efficiency specialists, security specialists) who have a more focused role related to specific aspects of the project. <p>Participation levels are expected to vary. Architects might be heavily involved in the initial evaluation and integration, while engineers might be the primary users of the resulting tools. Managers would have an oversight and approval role.</p>
How spread apart is it in terms of location and time zones?	<p>The community is primarily located in Saskatchewan, Canada, operating within the Central Time Zone (CST/CDT). While some individuals might work remotely, the core team responsible for network operations and architecture would be concentrated in Regina and Saskatoon. This relatively low geographical spread simplifies coordination and communication.</p>
What language(s) do members speak?	<p>The primary language of the community is English. While Saskatchewan has a diverse population, English is the dominant language in the professional context, particularly within a large corporation like SaskTel.</p>
What other cultural or other diversity aspects may affect your technology choices?	<p>SaskTel, as a Crown corporation, has a strong emphasis on corporate social responsibility and sustainability. This aligns well with the project's goals. The team has a mix of experience levels, from junior engineers to senior architects. There may be varying levels of familiarity with advanced optimization techniques and simulation tools.</p> <p>The organizational culture within SaskTel (e.g., hierarchical vs. collaborative, risk-averse vs. innovative) could influence the adoption and acceptance of the project.</p>

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

Topic	Your notes
<p>How much do you want to control the boundaries of your community? Does your community need</p> <p> <input type="checkbox"/> To be private/secure <input type="checkbox"/> Open boundaries <input checked="" type="checkbox"/> Both private & public spaces </p>	<p>The community needs both private & public spaces.</p> <ul style="list-style-type: none"> • Private/Secure (Predominantly): Network infrastructure management is inherently security sensitive. Discussions, data, and tools related to internal network configurations, vulnerabilities, and performance metrics must be kept private and secure.



		<ul style="list-style-type: none"> • Public (Limited): SaskTel, as a public-facing entity, might have some interest in sharing high-level results or collaborating with external researchers on specific aspects, but this would be carefully controlled.
How does your community need to interact with other communities? Do you need common tools for sharing and learning with them?		SaskTel interacts with other telecommunications companies (e.g., through industry forums, partnerships), equipment vendors (e.g., Cisco, Juniper), and potentially research institutions (e.g., University of Regina). However, direct sharing of internal network details would be limited. The project would facilitate some controlled interaction with the research community by providing a framework for evaluating new technologies without exposing sensitive internal data.

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?	High. As network engineers and architects, technology is central to their profession. They are highly interested in new technologies that can improve network performance, efficiency, and reliability.
What is their capacity for learning new tools?	Moderate to High. They are professionals with technical backgrounds, so they have the capacity to learn. However, their time is valuable, and they will prioritize learning tools that directly address their needs and integrate well with their existing workflows. Practical, hands-on training and clear documentation would be essential.
What is the range of skills? If their interests and/or skills are diverse, could it cause conflict or distraction?	The range of skills is broad , spanning from junior engineers with basic networking knowledge to senior architects with deep expertise in specific areas (e.g., routing, switching, optical networks, virtualization). There might be a smaller subset with experience in optimization techniques or simulation modeling. Our project considers this range, providing accessible outputs and documentation for those less familiar with the underlying algorithms.
How tolerant are members of the adoption of a wide variety of tools?	Moderate. While they use a variety of tools already (network monitoring, configuration management, etc.), they would prefer a solution that integrates well with their existing ecosystem rather than adding another completely separate tool. The fewer "silos," the better.
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.	Moderate. They will be willing to learn new tools, <i>if</i> the benefits are clear and the learning curve is reasonable. They are more willing to adopt new tools within a familiar environment (e.g., a plugin for an existing network management system) than to switch to a completely new platform. They would be hesitant to give up well-established tools and practices without strong justification.
What are your members' technology constraints (e.g., bandwidth, operating systems, etc.)?	Following are some of the constraints: <ul style="list-style-type: none"> • Bandwidth: While SaskTel has high-bandwidth infrastructure, specific locations (particularly in rural areas) might have limitations. This should be considered in the simulation modelling.



	<ul style="list-style-type: none"> • Operating Systems: A mix of Windows and Linux environments. The simulation framework should ideally be platform-independent or support both. • Existing Infrastructure: The biggest constraint is the need to integrate with their existing network hardware and software. • Budget: While SaskTel is a large organization, they still operate within budget constraints. Cost-effectiveness is a key consideration. • Security: Must comply with security protocols.
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	Network engineers and architects have significant online time during work hours, primarily from their offices. Some might also have remote access capabilities for after-hours monitoring and troubleshooting. The nature of their work requires constant connectivity and access to network management tools.

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
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	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	<input checked="" type="checkbox"/> Face-to-face/blended <input checked="" type="checkbox"/> Online synchronous <input checked="" type="checkbox"/> Online asynchronous	Regular meetings are common within network engineering teams for planning, troubleshooting, and knowledge sharing. Asynchronous communication (email, project management tools) is also used extensively. Value-Added: The project would improve the effectiveness of these meetings by providing data-driven insights into network performance and optimization opportunities. The simulation results could be used to inform decisions about network upgrades, capacity planning, and troubleshooting. It doesn't <i>directly</i> facilitate the meetings themselves, hence the moderate relevance.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Open-ended conversation	<input checked="" type="checkbox"/> Single-stream discussions	Open-ended conversations occur within teams, but they are not the <i>primary</i> mode of



						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.	<input type="checkbox"/> Multi-topic conversations <input type="checkbox"/> Distributed conversations	<p>operation. Structured communication around specific tasks and projects is more common.</p> <p>Value-Added: The project's outputs would inform and stimulate these conversations, providing data to support discussions about network optimization and sustainability.</p>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<p>Projects</p> <p>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</p>	<input type="checkbox"/> Practice groups <input checked="" type="checkbox"/> Project teams <input checked="" type="checkbox"/> Instruction	<p>Network engineering and architecture are inherently project-based. Deploying new services, upgrading infrastructure, and troubleshooting issues all involve projects.</p> <p>Value-Added: The project <i>directly</i> supports project-based work by providing a tool for optimizing network design and deployment, leading to more efficient and sustainable projects. This is a core alignment.</p>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<p>Content</p> <p>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</p>	<input checked="" type="checkbox"/> Library <input type="checkbox"/> Structured self-publish <input type="checkbox"/> Open self-publish <input checked="" type="checkbox"/> Content integration	<p>Documentation, network diagrams, configuration files, and performance reports are all essential content for network engineers. Access to this content is crucial.</p> <p>Value-Added: The project would generate valuable content in the form of simulation results, optimization recommendations, and performance reports. The project itself could be seen as adding to their "library" of knowledge about their network.</p>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<p>Access to expertise</p> <p>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</p>	<input checked="" type="checkbox"/> Questions & requests <input checked="" type="checkbox"/> Access to experts <input checked="" type="checkbox"/> Shared problem solving <input checked="" type="checkbox"/> Knowledge validation	<p>Access to expertise (both within the team and from external vendors) is crucial for troubleshooting and resolving complex network issues.</p> <p>Value-Added: The project would provide a form of "simulated expertise" by allowing engineers to test different</p>



						engaging in collaborative, just-in-time problem solving	<input type="checkbox"/> Apprenticeship & mentoring	configurations and scenarios before implementing them in the live network. This would reduce the risk of errors and improve decision-making. The project outputs would aid in knowledge validation.
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	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	<input checked="" type="checkbox"/> Connecting <input type="checkbox"/> Knowing about people <input type="checkbox"/> Interacting informally	While important for team cohesion, relationship building is not the <i>primary</i> focus of this professional community. Their main goal is to ensure network performance and reliability. Value-Added: The project has minimal direct impact on relationship building.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	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	<input type="checkbox"/> Levels of participation <input type="checkbox"/> Personalization <input checked="" type="checkbox"/> Individual development <input type="checkbox"/> Multi-membership	Different team members will have different levels of involvement with our project, depending on their roles and responsibilities. Value-Added: The project would contribute to individual development by providing engineers with a new tool and skillset for network optimization.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	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	<input type="checkbox"/> Democratic governance <input type="checkbox"/> Strong core group <input checked="" type="checkbox"/> Internal coordination <input type="checkbox"/> External facilitation	Internal coordination is essential for effective network management. Value-Added: The project would support community cultivation by providing a common framework and data-driven insights for decision-making, improving team collaboration.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Service context In some cases, serving a specific context becomes central to the community's identity and the ways it operates. They may live inside an organization, whose charter their practice needs to	<input checked="" type="checkbox"/> Organization as context <input type="checkbox"/> Cross-organizational <input type="checkbox"/> Other related communities	SaskTel, as a Crown corporation, has a strong service context. Their primary mission is to provide reliable and affordable telecommunications services to the people of Saskatchewan. Value-Added: The project



						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	<input type="checkbox"/> Public mission	directly supports this service context by improving network availability and sustainability, ultimately benefiting SaskTel's customers.
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Scratchpad (other interesting insights, questions/answers, etc.)

Here are some valuable thoughts, questions and insights:

- **Potential Adoption Barriers:**

- **Question:** What are the potential barriers to adoption of the project's solution by SaskTel network engineers?
- **Possible Answers/Insights:**
 - **Complexity:** The algorithms and simulation framework might be perceived as too complex or difficult to understand.
 - **Integration Challenges:** Integrating the solution with existing network management systems could be challenging.
 - **Trust:** Engineers might be hesitant to trust a new tool, especially one that makes automated decisions about network configuration.
 - **Time Constraints:** Engineers might not have the time to learn and use a new tool, even if it offers potential benefits.
 - **Lack of direct control:** Engineers might resist a tool that seems to take decision-making power away from them.

- **Key Performance Indicators (KPIs):**

- **Question:** Beyond availability and carbon footprint, what other KPIs are important to SaskTel network engineers?
- **Possible Answers/Insights:**
 - **Latency:** End-to-end delay for different types of traffic.
 - **Packet Loss:** Percentage of packets that are lost during transmission.
 - **Jitter:** Variation in latency.
 - **Throughput:** Data transfer rate.
 - **Resource Utilization:** CPU, memory, and bandwidth usage of network devices.
 - **Operational Costs:** Costs associated with running the network (e.g., energy costs, maintenance costs).

- **Competitive Landscape:**

- **Question:** What other commercial or open-source solutions exist for network optimization and management? How does the project differentiate itself?
- **Possible Answer:** Research existing solutions from vendors like Cisco, Juniper, and open-source projects related to SDN and NFV. Highlight the *unique* aspect of the project: the joint optimization of availability *and* sustainability.

- **User Interface Considerations:**

- **Insight:** Even though a full GUI is out of scope, consider how the simulation results will be presented to the users (engineers). Clear, concise, and actionable information is key.