SubVT
Design Brief

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What This Document Is For

This document contains brief information about SubVT for UX and UI designers. Design examples (including navigation structure) in this document are only a starting point and **should not be taken literally**, and the designers should experiment, come up with alternatives and original ideas where possible.

Basic Information About SubVT

What is SubVT?

SubVT stands for ***Substrate Validator Toolkit***. It's a mobile application for iOS and Android phones, tablets and wearables that's developed for the **validators** of the Substrate-based blockchain networks.

Who are the validators?

Validators are basically the people who run the network. Sort of similar to Bitcoin miners, they run a piece of software called a *validator node* which is able to produce blocks in the blockchain. Validators earn rewards awarded by the network in return for keeping the network up and running. They cover their operational costs with the rewards, and profit after the costs when possible.

Validators are also called ***node operators***.

What is Substrate?

Substrate is a software framework developed by Parity, which helps blockchain developers build their own blockchains. Polkadot, Kusama and many other networks are built on top of Substrate.

What are the Substrate-based networks?

A number of them are as listed below, and there are tens more live or under development:

- Polkadot
- Kusama
- Karura
- Moonriver
- Shiden
- and more

How is SubVT going to help validators?

Node operators (i.e. validators) have to observe their nodes to make sure that they are performing well, also they need to observe the network status, get notified and view past reports.

Node operators currently use a variety of tools to fetch and view the data, and SubVT aims to provide the majority of the data and functionality in a single app and present it through a well-designed UX and UI, leveraging the convenience and speed of the native mobile platforms combined with a very efficient backend for efficient high frequency data flow.

SubVT also notifies the node operators about the network events and events related to their nodes, which is very crucial for node operations.

What's the target audience profile?

Technically-oriented people who are able to run servers and maintain them. Some of us are also able to program, which is an advantage in the current state of things, but it's not necessary.

The user profile may converge towards less technical people in the future as the tooling improves.

Design Assets Required

Documentation

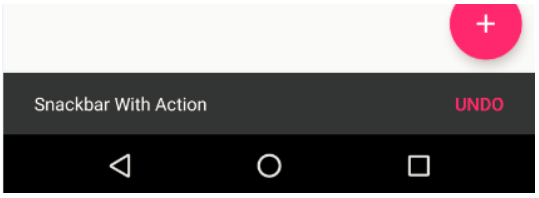
A document in which the UI guides, application logo and icon and other main design decisions are explained, as required by the project proposal.

Feedback

We need a system-wide mechanism for feedback in three states:

1. Information
2. Warning
3. Error

Android Snackbar is a very useful solution that I have applied to a number of past projects. We can go for something similar, or another solution that would apply better to the overall design. Please view the Android Snackbar documentation for it here. Below are two examples with different styling.



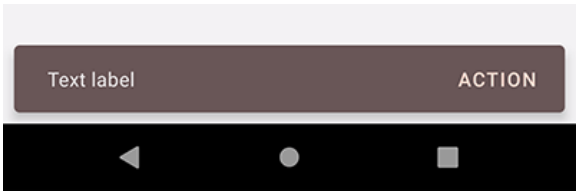
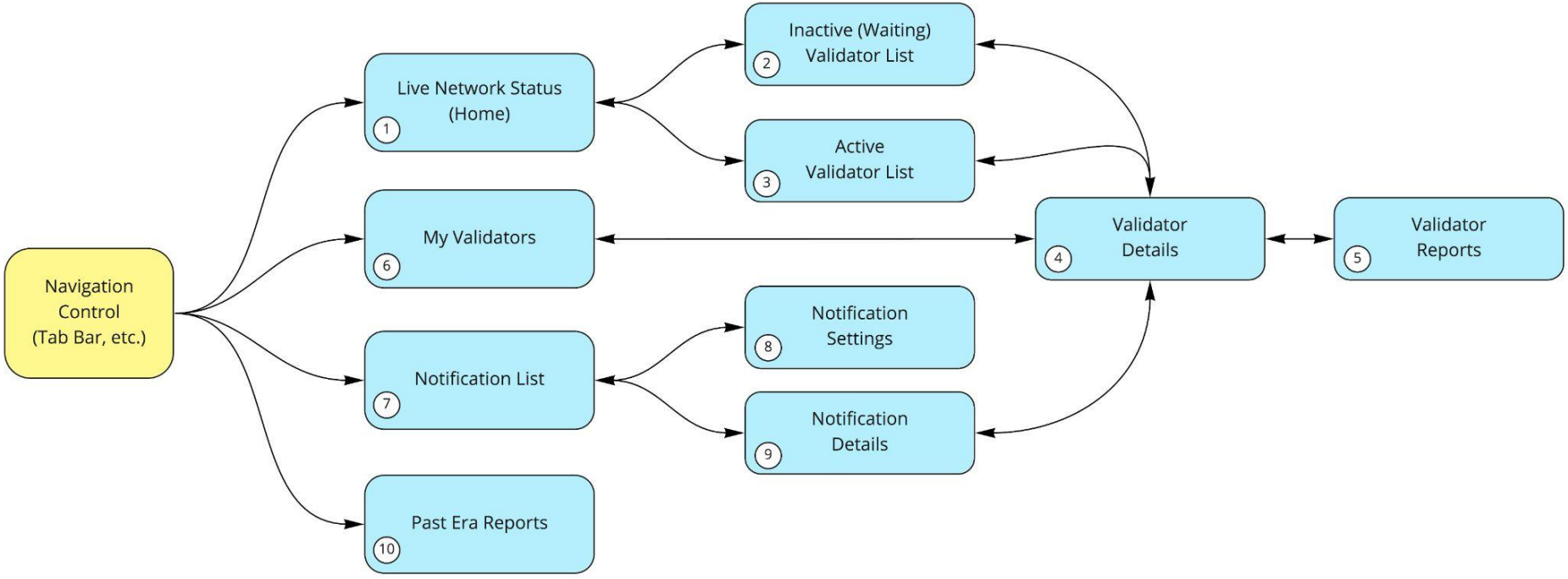


Image Assets

We need multiple sizes for every image asset. Sizes required are as follows for each platform, and they should be delivered with the same name in different folders for different sizes:

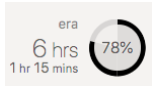
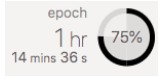
- iOS
  - 2x
  - 3x
- Android
  - 1x (mdpi)
  - 1.5x (hdpi)
  - 2x (xhdpi)
  - 3x (xxhdpi)
  - 4x (xxxhdpi)

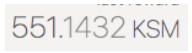
Navigation (Tentative)



Screen #1: Live Network Status (doco) (data example)

- This is the screen where I see the **live** network data.
- Depending on the selected network, it updates at least every **6 seconds**.
- There should be a network selector in this screen, where I pick a Substrate network (Polkadot, Kusama, etc.) from a list of supported networks.
- It's probably the main screen I'd like to see when I first open the app, but let's discuss.

DATA	TYPE	SAMPLE	DESCRIPTION
Selected Network	Selector (drop-down, etc.)		The network whose live status we're viewing.
Best Block Number	Integer (large)	8657943	Number of the block at the tip of the blockchain. Changes every 6 seconds or more.
Finalized Block Number	Integer (large)	8657940	Number of the finalized block in the blockchain. Changes every 6 seconds or more. Always behind the best block number.
Era Index and Time	Progress (circular or linear)		A set of validators are selected for an era, and rewards are distributed at the end of every era. 6 hours for Kusama, 24 hours for Polkadot. Progresses every 6 seconds or more.
Session/Epoch Number and Time	Progress (circular or otherwise)		A subdivision of era. 1 hour on Kusama and 4 hours on Polkadot.
Number of Active Validators	Integer	900	Number of validators that are actively validating in the current session. It's clickable, and links to the active validator list screen.
Number of Inactive/Waiting Validators	Integer	413	Number of validators that are not actively validating, but waiting to do so. It's clickable, and links to the inactive validator list screen.

Last Era Total Rewards	Currency display		Total coins distributed as rewards for the last era.
Minimum, Average and Maximum Validator Backings	Currency display - 3 values		Self-explanatory.
Total Era Points So Far	Integer	1024	Era points earned by the validators in the current era so far.
My Total Era Points So Far	Integer	102	Era points earned by **my validators** (if any) in the current era so far. Not displayed if I have no validators added yet.
Number of Blocks Produced So Far	Integer	2001	Total number of blocks produced by the active validators in the era so far.
My Number of Blocks Produced So Far	Integer	4	Total number of blocks produced by **my validators** (if any) in the era so far. Not displayed if I have no validators added yet.

Screen #2: Inactive (Waiting) Validator List (doco) (data example)

- This is the list of validators that are waiting to be included in the active set.
- A list of all the validators that are live and running, which are outside the active validator list.
- Tabular data.

DATA	TYPE	SAMPLE	DESCRIPTION
Address / Identity	Text	Address: FkQ5QU…Y8tvcW Identity: PINEAPPLEXPRESS	Displays the validator address in hexadecimal format if the validator doesn't have an identity, or the name if they have one.
Commission	Percentage	5.00%	Validator's commission percentage.
Nomination Count	Integer	42	Total number of nominators backing the validator.
Nomination Total	Currency display	20384.0000 KSM	Nominators' total stake amount.
Programme-Specific Data	Mixed	N/A	There are validator incentive programmes for some networks, 1KV for Kusama is one. This field(s) contains programme-specific data if the validator is enrolled in one.
Active Next Session	Image indicator		Indicates whether the validator is going to be in the active set for the next session.
Oversubscribed	Image indicator		Indicates whether the validator is over-nominated.
Slashed	Image indicator		Indicates whether the validator was slashed previously.
Blocks Nominations	Image indicator		Indicates whether the validator is not accepting nominations.

Screen #3: Active Validator List (doco) (data example)

- List of validators that are currently in the active set, i.e. producing blocks for the blockchain.
- **Includes all data fields from Screen #2**, and fields listed here on top.
- Tabular data.

DATA	TYPE	SAMPLE	DESCRIPTION
Produced Blocks So Far	Integer	5	Number of blocks that were produced by this validator in the current era so far.
Return Rate	Percentage	5.00%	Validator's percentage of return on investment for its backers.
Parachain Validator	Image Indicator		Indicates whether the validator is validating a parallel chain in this session.
Era Points So Far	Integer	143	Era points earned by the validator so far.
Active Stake Amount	Currency display	5042.4252 KSM	Active stake amount on the validator for the era.
Online Message Sent	Image indicator		Indicates whether the validator has sent the `ImOnline` message in the session.
Active and Inactive Nominator Count	Text	5 / 4	Number of active and inactive backers for the validator for the current era.

Screen #4: Validator Details (doco)

- Where I view the details of any validator (active or inactive), including my own validators.
- **I should be able to add a validator here to my validator list.**

DATA	TYPE	SAMPLE	DESCRIPTION
Address / Identity	Text	Address: FkQ5QU…Y8tvcW Identity: PINEAPPLEXPRESS	Displays the validator address in hexadecimal format if the validator doesn't have an identity, or the name if they have one.
Controller Address	Text	FkQ5QU…Y8tvcW	Validator controller address in hexadecimal format.
Account Age	Text	3 months 24 days	Time elapsed since the creation of the validator account.
Self Stake	Currency display	102.3245 KSM	Validator's self stake amount in native currency.
Commission	Percentage	5.00%	Validator's commission percentage.
Reward Destination	Text	FkQ5QU…Y8tvcW	The address of the account to which the validator's rewards are paid to.
Active	Image indicator	N/A	Indicates whether the validator is currently in the active set, producing blocks.
Active Next Session	Image indicator		Indicates whether the validator is going to be in the active set for the next session.
Inclusion Rate	Percentage	21.20%	Percentage of the eras that the validator was included in the last fixed number of eras.
Faults	Integer	2	Number of offline faults committed by the validator.

Unclaimed Eras	Text	2042, 2043, 2045	List of eras for which the validator rewards has not been claimed yet.
Era Points Total and Average	Text	20321 / 234	Total era points collected by the validator, and the average per era.
Next Session Keys	Text	0x012968...e0869d	Session keys of the validator for the next session.

For Inactive Validators:

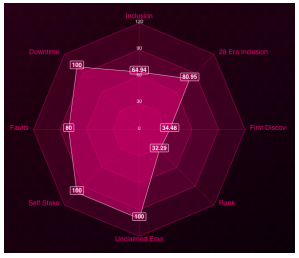
DATA	TYPE	SAMPLE	DESCRIPTION
Nominators	Text	N/A	List of nominators and their total stake amounts.

For Active Validators:

DATA	TYPE	SAMPLE	DESCRIPTION
Parachain Validator	Image Indicator		Indicates whether the validator is validating a parallel chain in this session.
Era Points So Far	Integer	143	Era points earned by the validator so far.
Number of Blocks Produced So Far	Integer	4	Total number of blocks produced by this active validator so far in the current era.
Active Nominations	Text	N/A	Active nominations: nominator addresses and stake amounts.
Inactive Nominations	Text	N/A	Inactive nominations: nominator addresses and total stake amounts for each.
Return Rate	Percentage	16.73%	Validator’s percentage of return on investment for its backers.

Online Message Sent	Image indicator		Indicates whether the validator has sent the `ImOnline` message in the session.

For Thousand Validators (1KV) Programme on Polkadot and Kusama:

DATA	TYPE	SAMPLE	DESCRIPTION
First Discovered	Date and Time	Dec 12th, 2011 13:42	The date and time on which the validator was first accepted into the programme.
Rank	Integer	73	Rank of the validator in the programme.
Validity	Image indicator		Whether the validator is a valid 1KV validator.
Score & Details	Spider Chart		Spider chart for the validator score. Example here.

For Validators with Telemetry Configured:

DATA	TYPE	SAMPLE	DESCRIPTION
Sync Status	Image indicator	N/A	Whether the node is in sync with the network.
Best Block Number	Integer	8657943	Number of the block at the tip of the node's blockchain.

Finalized Block Number	Integer	8657940	Number of the finalized block in the node’s blockchain.
Up-to-Date	Image Indicator	N/A	Shows something like a checkmark if the node binary is up-to-date, and a negative image if not.
Binary Version	Text	0.9.9-1	The version of the node software that the validator is running.
Peer Count	Integer	49	Number of other nodes that the validator is currently connected to.
Uptime	Duration	3d 14hr 32s	For how long the node has been online.
Download Bandwidth	Text	212kB/s	Download bandwidth of the validator node.
Upload Bandwidth	Text	107kB/s	Upload bandwidth of the validator node.

Screen #5: Validator Reports (doco)

- This is where I view the past reports for a single validator.
- A report can be for a single era, or over a selected number of eras.
- A report for a single era displays only in numbers, and if a range of eras is selected then the report should display as a graph.

Single-Era Report Content:

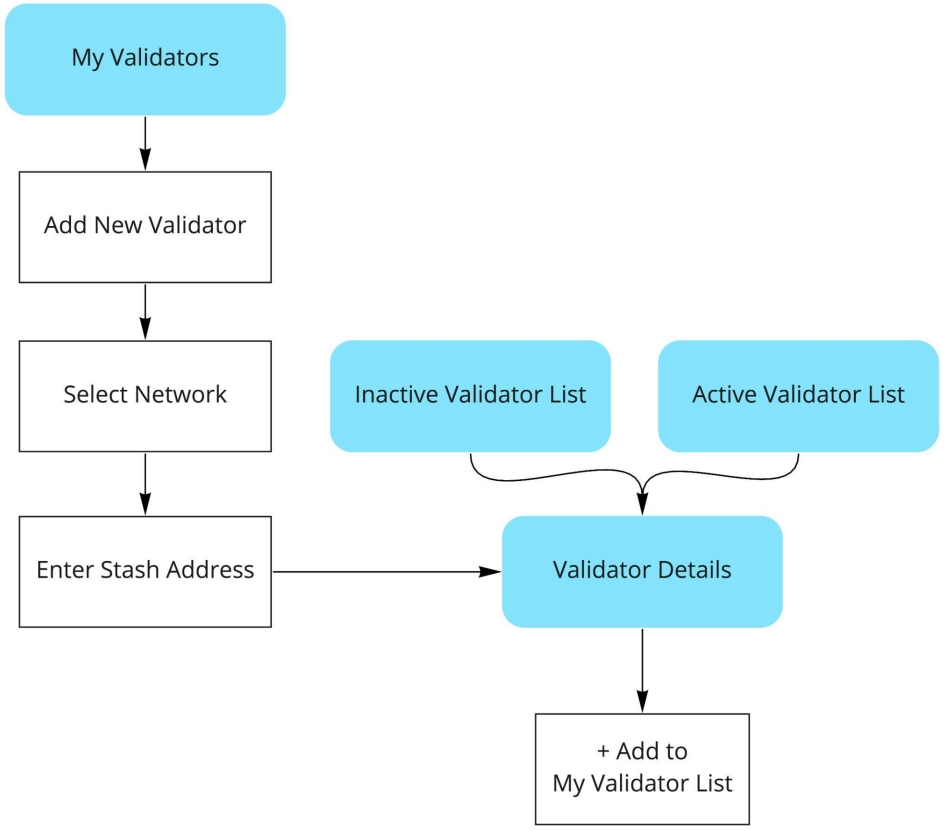
DATA	TYPE	SAMPLE	DESCRIPTION
Active	Image indicator	N/A	Whether the validator was active in the era.
Era Points	Integer	752	Points collected by the validator in the era.
Elected Stake	Currency display	4321.1234 KSM	Stake backing the validator in the era.
Total Income	Currency display	0.1423 KSM	Income of the validator for the era.
Total Rewards Distributed	Currency display	1.7762 KSM	Rewards distributed to the nominators of the validator.
Produced Blocks	Integer	8	Number of blocks produced by the validator in the era.
Commission	Percentage	1.99%	Validator's commission rate for the era.
Fault	Image indicator	N/A	Display an icon if an offline offence was committed by the validator in the era.
Slashed	Image indicator	N/A	Display an icon if the validator got slashed in the era.
Chilling	Image indicator	N/A	Display an icon if the validator got chilled involuntarily in the era.
Programme-Specific Data	Mixed	N/A	Programme-specific data (e.g. rate and score for 1KV).

Multi-Era Report Content:

GRAPH	TYPE	DESCRIPTION
Inclusion	Line Graph	Inclusion rate over time.
Era Points	Vertical Bar Graph	Era points over time.
Income	Vertical Bar Graph	Validator income over time.
Rewards Distributed	Vertical Bar Graph	Rewards distributed to nominators by the validator over time.
Blocks Produced	Vertical Bar Graph	Number of blocks produced by the validator over eras.
Commission	Line Graph	Validator commission rate over time.
Faults	Vertical Bar Graph	Offline faults committed by the validator over eras.
Slashes	Vertical Bar Graph	Slashes for the validator over eras.
Chillings	Vertical Bar Graph	Voluntary or involuntary chilling for the validator over eras.
Return Rate	Vertical Bar Graph	Validator APR over time.
Programme-Specific Data	Mixed	Programme-specific data (e.g. rate and score for 1KV).

Screen #6: My Validators (doco)

- In this screen I view a list of the validators that I added to my validator list.
- I should be able to add my validator for any network in this screen too.
- I should be able to remove a validator from the list, which would also remove the notifications defined for the validator.

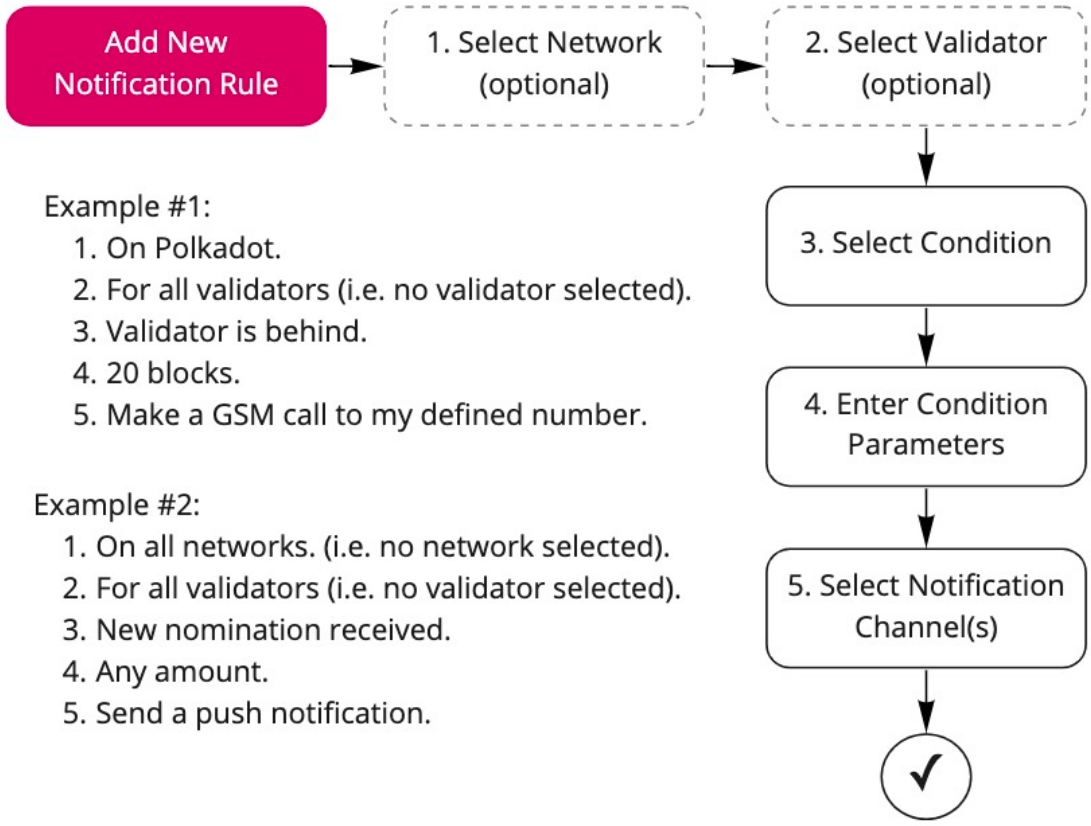


Screen #7: Notification List (doco)

- This is where I view a scrollable list of my past notifications.
- Every notification in the list should contain:
    - Validator for which the notification was sent.
    - Notification time.
    - Notification channel (push notification, email, SMS, phone).
- I can go to the notification details if I click on a notification in the list.

Screen #8: Notification Settings (doco)

- This is where I configure my notifications.
- It's rule-based configuration that we need to detail, but it's roughly explained in the chart below.



Screen #9: Notification Details (doco)

- This screen is where I view the details for a notification selected from the notification list.
- It displays:
    - Network name.
    - Validator address/identity/name.
    - Event date and time.
    - Event name.
    - Event parameters (conditions).
    - Notification channel (push notification, email, SMS, phone call).

Screen #10: Era Reports (doco)

- This is where I view data for a selected era and network.

DATA	TYPE	SAMPLE	DESCRIPTION
Total Era Points	Integer	13452	Total era points earned by validators through the selected era.
Total Rewards	Currency Display	872.7853 KSM	Total rewards distributed for the era.
Era Validators	List	N/A	List of active validators for the era. Displays blocks produced and rewards per validator.