# SUNBIRD BUILDING BLOCKS

## What are Building Blocks?

A building block enables users to do something specific in different contexts. Building blocks can be used by themselves or can be combined to create something larger or more complex.

Sunbird building blocks are digital assets of four types - **specifications, software code, platform, or applications.** They have four key characteristics - they are *autonomous* and *interoperable,* and they have *generic capabilities* that can evolve over time.

- **Autonomous:** Provides standalone capabilities.
- **Interoperability:** C an be combined easily with other building blocks to offer compounded value.
- **Generic capabilities:** Offer capabilities that are relevant across use cases and are pluggable into existing systems.
- **Evolvability:** Can be improved, even while being used as part of solutions.

### Sunbird Assisted Language Learning (Coming soon!)

Software

Sunbird Assisted Language Learning aims to use AI technologies to enable assisted language learning for various Indian languages.

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### Sunbird Anuvaad (https://anuvaad.sunbird.org/)

Software

Sunbird Anuvaad provides digital document translation capabilities for nine Indian languages. While models are trained for Indic languages, it is built to allow many more non-Indic languages to be brought in for global use. It provides pre-trained models which can be fine-tuned for domain-specific needs, datasets, and reference utilities.

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### Sunbird coKreat (https://cokreat.sunbird.org/)

Software

Sunbird coKreat can be used to engage contributors to collect, curate, publish, monitor, and reward their contributions. Sourcing of assets can be done through crowdsourcing and bulk uploads. It provides a reference web app and microservices that can be used for creating and sourcing a variety of assets like videos, documents, questions, and interactive content in more than 30 languages.

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## Sunbird cQube (https://cqube.sunbird.org)

Software

Sunbird cQube can be leveraged to integrate and analyze data from different sources to generate actionable insights, develop standardized reports, and create various types of data visualizations. It provides a web portal with role based user access, admin portal to set up users, schedule platform data processing services, access data files and errors, and microservices for data ingestion, processing, visualization, error logging, etc.

## Sunbird DSEP (https://dsep.sunbird.org/)

Specifications

Sunbird Decentralized Skills & Education Protocol (D$EP) is an open interoperable specification to enable an ecosystem of solutions for seamless discovery of opportunities along with trust in transactions allowing a frictionless exchange for skill development, deployment & associated supply-chain and enabling services. Adopters can create decentralized skills and education networks. It is an adaption of beckn protocol core specification with added taxonomies and sample network policies for the skills and education sector.

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## Sunbird ED (https://ed.sunbird.org/learn/master)

Software

Sunbird ED can be leveraged to deploy scale-ready learning, capacity building, and professional development solutions. For example - adopters can implement targeted training, self-driven learning through courses, where users can be issued digitally verifiable credentials of their learning. Sunbird ED allows adopters to configure and instantiate a ready to use platform with reference applications. The reference applications - mobile app, desktop app, and a web portal allow user engagement on different types of devices, in both online and offline modes.

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## Sunbird inQuiry (https://inquiry.sunbird.org/)

Software

Sunbird inQuiry can be used to create question banks to power practice materials like worksheets, conduct assessments like quizzes, and data collection tools like surveys. It provides an editor to create questions and question sets, a player through which users can attempt these question sets with configurable behaviour like randomizing questions, limiting the number of attempts, timed testing, etc. and APIs/services to manage the lifecycle (creation, review, and publishing) of question sets.

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## Sunbird Knowlg (https://knowlg.sunbird.org/)

Software

Sunbird Knowlg can be used to manage large volumes of assets through a flexible hierarchical organizational structure. Assets can be tagged on multiple frameworks, resulting in rich metadata for each asset, that aids in the easy discovery of the assets based on user preferences. For example - Assets can be linked to QR codes that enable the discovery of digital assets from physical material by a simple QR scan. Sunbird Knowlg provides pluggable tools and microservices that can be used to manage the lifecycle of an asset (creation, review, and publication) and roll out programs and projects.

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## Sunbird Lern (https://lern.sunbird.org/)

Software

Sunbird Lern can be leveraged to create and manage users' learning journeys by grouping learners into cohorts/batches and tracking their learning progress, and enable opportunities for collaboration and engagement through features like discussion forums, events, and notifications. In addition, Sunbird Lern provides microservices for user (and organization) account creation, login, management of roles, location and other master data.

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## Sunbird Obsrv

Software

Sunbird Obsrv can be leveraged to observe actions and activities, thus helping adopters to better understand their users' behaviour and preferences. Sunbird Obsrv provides microservices and data products to capture metrics and perform analytics using telemetry data emitted by Sunbird building blocks and a reports configurator tool to create custom dashboards.

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## Sunbird QuML

Specification

Sunbird QuML (Question Markup Language) is a specification for storing, rendering, and distributing questions, making them interoperable and reusable across systems, independent of the authoring tool used to create them.

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## Sunbird RC

Software

Sunbird RC (Registry and Credential) can be leveraged to rapidly build and deploy next-generation electronic registries by providing a low-code framework, microservices, and reference tools. Electronic registres are trusted systems that enable consented actors (who are in the registry) to enroll and avail 3rd party services built on top of it using registry APIs. Adopters can rapidly build core electronic registries through configurable schemas and workflows. It automatically creates necessary APIs, workflows, and a default UX for all key stakeholders of the registry. Sunbird RC provides microservices to issue portable standard schema-based W3C VC complaint credentials with attestation and verification flows. These credentials are instantly verifiable, can be in multiple languages, are usable offline, and printable with QR codes.

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## Sunbird Saral

Software

Sunbird Saral provides optical character recognition (OCR) capabilities that also understands the structure of the physical inputs. This can be leveraged for handwriting recognition and digitisation of physical documents in predefined formats. For example - digitisation of test scores from offline printed tests. It also provides a reference app and backend to configure app formats, master data setup and storage of digital data captured by the app.

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## Sunbird Serve

Software

Sunbird Serve building blocks can enable efficient volunteer interactions that add significant value to society and overall human development. It enables relevant actors to crowdsource volunteers for their needs and participate in interactions towards the realisation of value.

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## Sunbird Telemetry

Specification

It includes Reference Solution, Volunteering Registries, and Volunteer Service to enable Request, Assignment, Nominations and Management of Needs & Deliverables. It defines specs for Needs and Volunteers to enable interoperability.

Sunbird Telemetry is a specification for collecting real-time data from digital apps & platforms.

The word 'Telemetry' is derived from its Greek etymological roots, tele - remote and metron - measure.

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In today's connected world, Telemetry is a term used for technologies that automatically record and measure statistical data from real-world use and forward it to IT systems in a remote location for further analysis and study. Telemetry is used in a myriad of industries from tracking spacecraft, medical monitoring, tracking wildlife, and so on.

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## Sunbird UCI (https://uci.sunbird.org/)

Software

Sunbird UCI (Unified Communications Interface) can be used to create and manage pre-defined logic-based conversations, on a variety of channels such as WhatsApp, Telegram, SMS, and email by providing microservices and reference apps. This can be used to conduct assessments and surveys on apps and set up helplines, grievances redressal mechanisms, and automated alerts.

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## Sunbird Vakyansh open-speech-ekstep.github.io/)

Software

Sunbird Vakyansh can be leveraged for automatic speech recognition in 9 Indian languages to develop voice-activated applications. It provides pre-trained models which can be fine-tuned for domain specific needs, datasets, and reference utilities.

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## Sunbird VC Specs (https://github.com/VC-Specs/vc-specs)

Specification

Sunbird specs (schemas) for **Verifiable Credentials** in various domains such as skilling, education, etc. Sunbird VC implementation fully leverages *W3C VC* specs and whenever possible reuses globally available schemas.

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