YGGIO DIMS

DIGITAL INFRASTRUCTURE MANAGEMENT SYSTEM

Reliable data from **any**thing with simple and stable integration

The lack of standardization in IoT is a problem plaguing several industries. With an enormous number of connected devices implemented everywhere, the need for data quality control and seamless collaboration between those devices has never been greater.

In addition, initiatives pushing for smart cities and buildings, connected grids, efficient water & waste distribution, environmentally friendly agriculture, and the growing integration of massive IoT are slowed down and prevented from reaching their full potential without data quality assurance and interoperability-enabling middleware. **Meet the solution, meet Yggio DiMS.**

SENSATIVE
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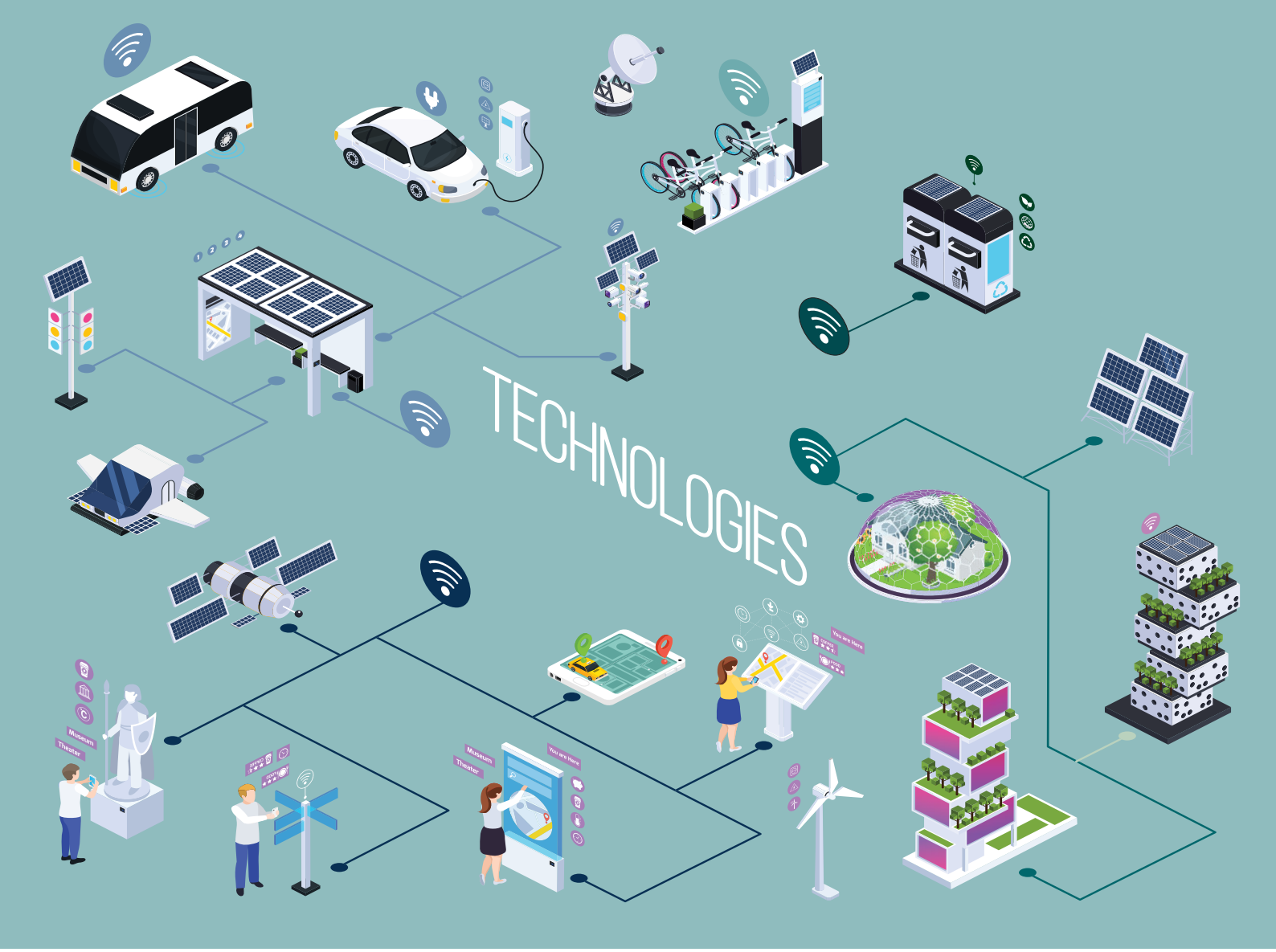


DiMS

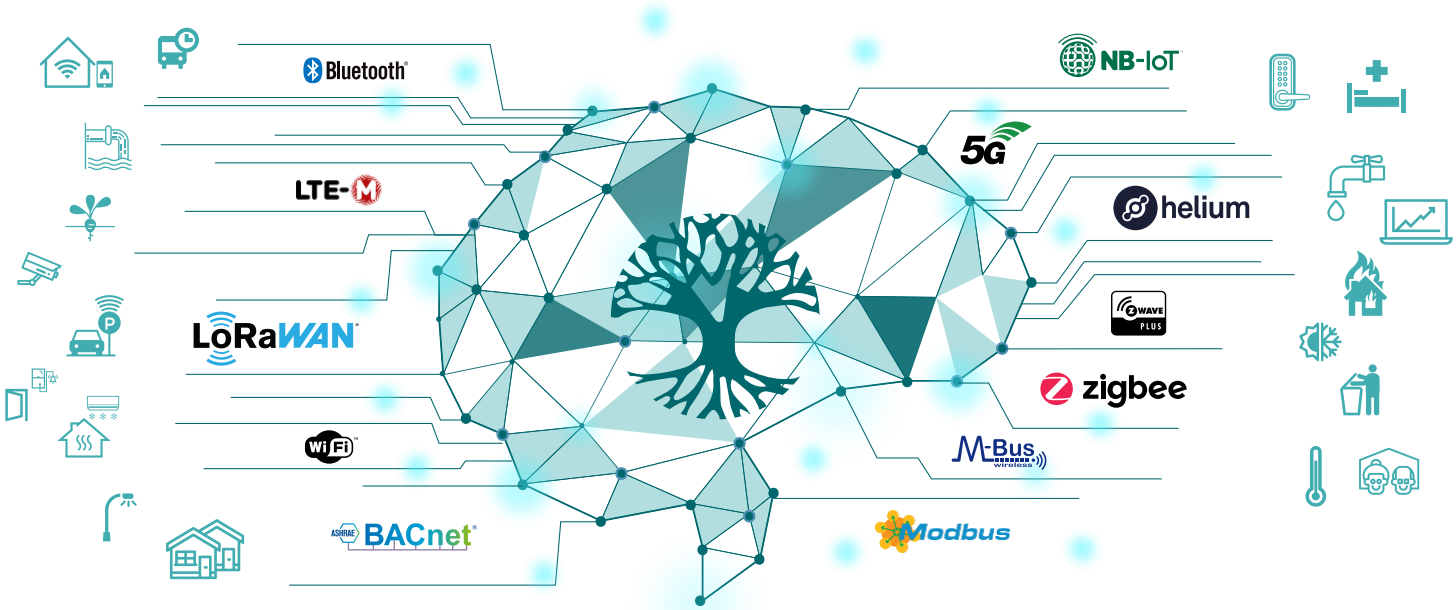
Organizations are going through transformation. Like the music industry or the financial systems before, a shift towards a data driven mindset is inevitable. The supporting IT landscape is shifting to an open and API-based architecture, where access to and sharing of data and control systems is crucial. In the era of digitalization, establishing capabilities within various tech domains requires modular components that can interact and empower business development.

The analog infrastructure of the physical world is turning digital. Internet of Things enables a shift from reactive or scheduled activities to a just-in-time or a full automation approach. Insights of the status of the physical world enable a business transformation that lowers the cost of operations and reduces risk.

The infrastructure is becoming digital. The enabling technology of YGGIO provides the right toolbox for your organization to manage this infrastructure and harvest the benefits of IoT. That is why we position YGGIO as a **DIMS - Digital Infrastructure Management System**.

As a DIMS, YGGIO is capable of managing millions of connected devices and systems in a secure and scalable way, enabling business transformation for any given organization.

This whitepaper gives a short introduction to YGGIO. For further information please check out sensative.com or contact us at sales@sensative.com.



YGGIO

As a DIMS, Yggio is a modern container-based piece of software that adds the IoT-capability to the existing IT-landscape. It is agnostic to what kind of infrastructure it connects to, as well as open for any application on top of Yggio. With Yggio, we simply add the IoT capability, without interference with other already existing systems or capabilities.

Yggio can be used stand-alone, without interaction with other components. For a smaller single use case, it might be out of scope to spend resources on integrations, you can just use Yggio as-is and connect your IoT-devices and act on the data collected.

However, we have developed Yggio to manage many use cases and millions of devices and systems, connecting to your identity- and access management systems as well as any other business systems or applications of choice.

Both from a business model perspective and a technical standpoint, our approach with Yggio is that it should be easy to start with a single use case and then scale. And scale massively. We have invested more than 200 man-years in developing Yggio, so you don't have to.

YGGIO is an IoT integration and data sharing middleware, with data management and automation capabilities. Yggio is based on a Zero Trust architecture, where security and compliance are in focus.

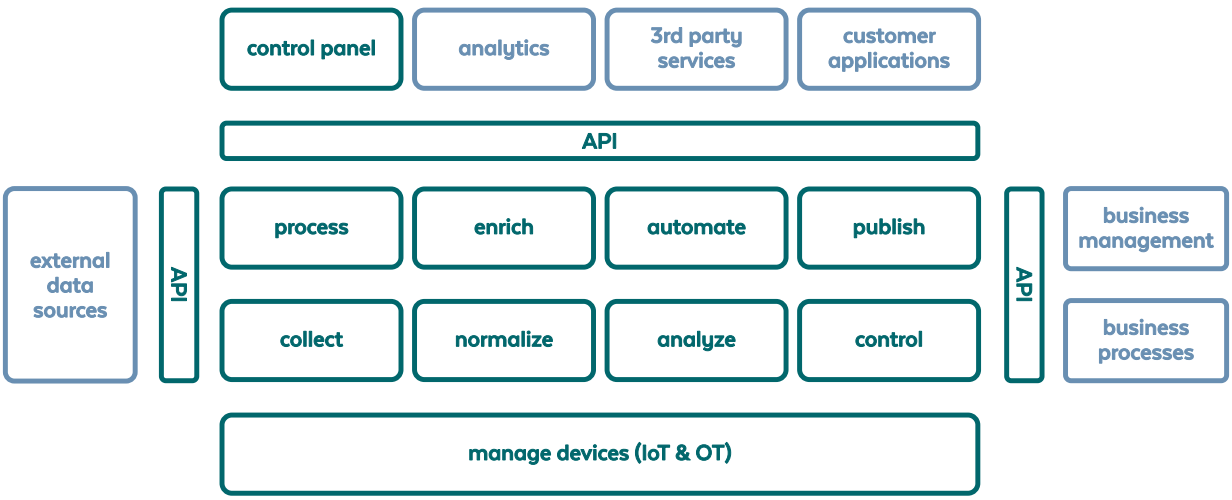
YGGIO is agnostic in terms of what types of connectivity or protocols being used and can connect to whatever device, system or webservice is required to fulfil each use case.

YGGIO is similarly agnostic in terms of what applications or services are being used. Designed to work with any business application, end-user app, BI or analytics services, Yggio provides data and functionality through our API.

The YGGIO API are standards based and compatible with the NGSIv2 standard, with additional features provided by our REST based YGGIO API.

Modules/Functions

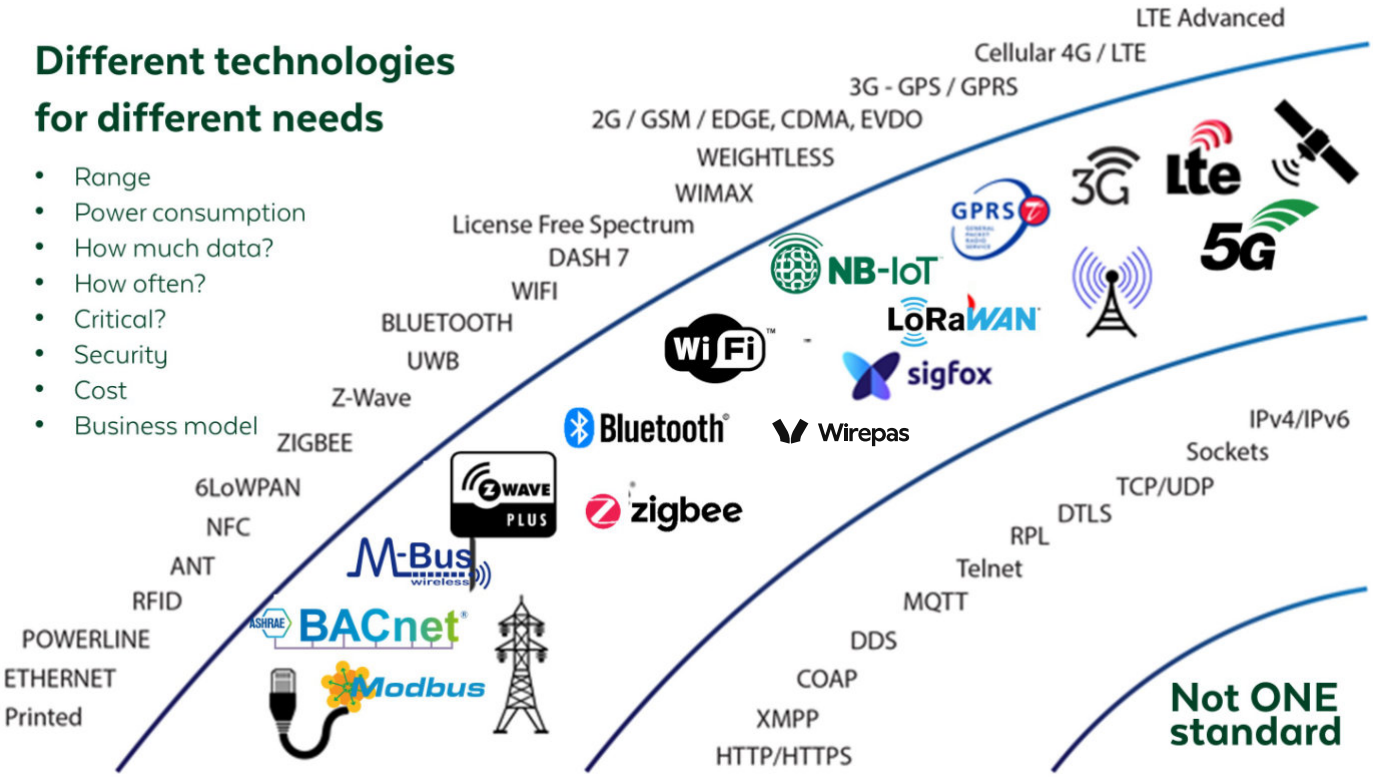
Module/function	Interface	Description
Translators	API	Connection between devices and YGGIO. Done through API, open for partners & customers to develop their own translators. Data normalization. Advanced chained translators with applied arithmetic.
Device/services management	Device Manager	Provisioning, configuration & anomaly handling of connected devices and services. Bulk handling (provisioning, configure). Pushing data to other systems. Alarm configuration. Retention policies.
Automation	Rule Engine	”IFTTT (If This Then That)” type of rule engine inside YGGIO. Powerful with states and possibility to chain rules based on conditions. Automate your processes.
Visualization	Location Manager	Map-based generic application to show devices and services in a map, with live data on screen. Graphs and icons are configurable for customized and personalized views.
Data sharing	Organization Manager	Enterprise grade authorization structure, with reversed inherited rights, enabling IoT operations to co-work with business units and have business reps in control of their own data and devices. Sharing is easy. Security is easy.
Reporting	Report Manager	Simple reports for business or IT users, giving info on selected data. Automated reports through email.
Security & IAM	KeyCloak	Connecting YGGIO to already existing authentication services, ensuring enterprise policy.
Access	API: NGSIv2 API: YGGIO API	Standard FIWARE API (NGSIv2), combined with YGGIO API. All data and functionality through API.
Administration	Sensative web applications	YGGIO interfaces include the mentioned admin UI's. All apps are developed in modules and shared as open source, ready to be re-used.
Documentation	YGGIO Docs	For each instance of YGGIO, an updated and current documentation of the specific release, is provided online covering all features and how-to's.



YGGIO functional architecture

Connectivity

YGGIO is ready for any kind of connectivity, may it be older standards and protocols or more modern new technologies. YGGIO is designed for fast integrations, open for any partner, customer, or 3rd party developer to create their own translators and integrations. New protocols and devices are added continuously on par with customer and use cases demands.



Type	Protocols/Connectivity	Typical use
IP-based	WiFi, ethernet	WIFI connected devices like cameras and more advanced devices, high-power devices
Cellular	NB-IoT, LTE, 5G	Medium powered devices, out-of-coverage for LoRaWAN or WIFI, logistics/mobility, critical infrastructure
Wireless long reach	LoRaWAN	Low bandwidth, low power. 70% of traffic through YGGIO today. Over 150 current types of devices.
OT	BACnet, Modbus, M-bus, Wireless Mbus	Already installed Operation Tech in buildings and industrial environments.
Local	Z-wave, ZigBee, Matter, Bluetooth	Smart home or elderly care. Fair priced gateways, low-cost devices.
Web services	API access over Internet	Weather services, spot market prices info, etc. Easy and fast integration.

Systems integrations

End user interfaces is typically either the Sensative web applications or, more common, customer existing business systems including BI solutions. The long term approach is that customers should use the application of choice that fits the specific use case, and access to YGGIO is based on the YGGIO API. Sensative, together with customers and partners, is constantly adding integrations to various business systems and applications. Below is a sample list of done integrations.

What	Application/System	Abstract
Location Manager	YGGIO UI	"My first IoT application". Used by many customers, since it is 'good enough' as a starter application.
Desigo CC	BMS, Siemens	Real Estate Building Management system provided by Siemens. YGGIO provides with real-time as well as historic data to enhance.
Grafana	Visualization	Open Source BI-system. Easy creation of great looking visualizations.
Power BI	Visualization	Microsoft BI-solution. Easy creation of great looking visualizations and analytics.
FAST API	Swedish administrative real estate systems (Momentum, Vitec, Fast2) std API access.	Ready-to-go integration from YGGIO to the most common administrative systems for real estate owners (in Sweden).
GIS ESRI	Maps and map-related visualization tool incl digital twin	Several customers use YGGIO API to pull data for visualizations of real time, or near real time, data into GIS-solutions.

Architectural properties

Property	Abstract	Description
Modular	Containerized architecture	Use of Docker Compose and Kubernetes in a microservices architecture, provides YGGIO with ever ongoing development, where obsolete modules can be replaced with newer and better suited modules
ZTA - Zero Trust Architecture	Security awareness in development	YGGIO is developed with a ZTA approach, where all messages and requests are based on an authenticated and authorized token, that allows for access to data and functionality. And vice versa.
Open Source	Re-use components when possible	Sensative code in YGGIO is approx 50% of the modules/ functions. The rest is based on open-source components that has already been developed in a suitable way. Samples include KeyCloak, Mongo DB, Influx, Rabbit MQ.
Open standards	Choose and work with open standards as far as possible.	Good for our customers and partners. Do not invent yet another 'standard' ; re-use what's out there. YGGIO is FIWARE based with the Ratatosk context broker and NGSIv2 API.
Data model freedom	Enable structure of data according to customer requirements	YGGIO have the capability of transforming data into a format that fits the receiving business system, in order to make life simple.
SDK	Provide with code to developers	Sensative applications on top of YGGIO is ready for use by partners and customers, to support rapid development of applications.
Web services	API access over Internet	Weather services, spot market prices info, etc. Easy and fast integration.
Data is not owned by Sensative	Customer always owns their data.	We put the digitalization freedom in the hands of our partners and customers. We will never charge for the payloads and the actual data that our customers use - it's always our customers'.

Delivery and Business Models

YGGIO can be delivered and consumed as a standard cloud service, ready to be put to work within minutes. A separate instance of YGGIO can be setup, ensuring a siloed environment for our customer. If so required, YGGIO can also be installed in whatever datacenter the partner or customer wants, just as long as we can get a Linux/Docker Compose environment. So, delivery of YGGIO is either cloud based or so called 'on-prem'.

Sensative charges a license fee for use of YGGIO. The business model scales with usage. The core metric is the number of datanodes in use. It's a low entry fee, and the cost gets lower per datanode as the usage grows.

In addition, Sensative can provide hardware in form of sensors and gateways. Sensative do produce and sell world class sensors ourselves with over 200 k sold units. But we also sell 3rd party sensors for supporting our customer´s.

We have a black belt in IoT and all things 'smart'. Consultancy services typically goes together with Yggio. Directly from Sensative or from any of our partners.

Sensative can also put you as a customer or partner in contact with other organizations just like yours, to share and inform each other on how to leverage on YGGIO in the best way. The Yggio eco-system is growing fast.

YGGIO - "any use case"

YGGIO have had over 100 use cases running. There is no lock-in to specific devices, set use cases, specific technologies or similar. YGGIO opens up for innovation and a constant flow of new applications and ways of using IoT and YGGIO.

Some examples: Energy optimization, temp/hum/CO2, ground temp prognoses, water levels, water temp, water usage, water leakage, people counters, traffic counters, parking spots usage, Smart Home, elderly care, lights control, connected ship, IoT in education, automated trouble ticketing, watering of golf courses, soil moisture levels in agriculture, ev charger monitoring, energy grid monitoring, office space occupancy, car trap (auto speedbump) monitoring, fire security, open/closed windows/doors.

SENSATIVE
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