



BLOCKCHAIN PRACTICES

#BLING #UseCase #procurement



Using Blockchain in the 'Smart 'Procurement Tool'

*City of Antwerp
Digipolis*

Introducing Digipolis

Digipolis is responsible for IT systems and services for the Belgian City of Antwerp. Digipolis' 2015 'Buy from Start-ups' project aimed to stimulate the procurement of innovative IT solutions and services from smaller, creative entrepreneurs. The project aimed to combine supporting innovation with the development of a 'lean and mean' procurement process. Although the project has been successful, it was hampered by the program's reliance on the Belgian Federal eProcurement portal as the place where requests for quotations and supplier offers had to be submitted.

With the Smart Procurement Tool project, Digipolis wanted the e-submission and e-awarding part of the innovative procurement process - the part that is currently managed in the eProcurement portal - to be replaced by an innovative, more user-friendly, more intuitive, and future-oriented application that better

matched the needs and nature of our target group of suppliers and which provided a one-stop solution for applicants.

Digipolis developed a blockchain-based application which combined the publication of requests for proposals and the submissions of tenders from vendors. The publication and submission of offers is done via a dedicated user interface, which connects to the Smart Procurement Tool. The metadata of the submissions - including timestamps - are uploaded to our private blockchain, providing assurance that they have not been tampered with.

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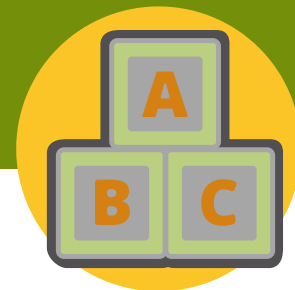
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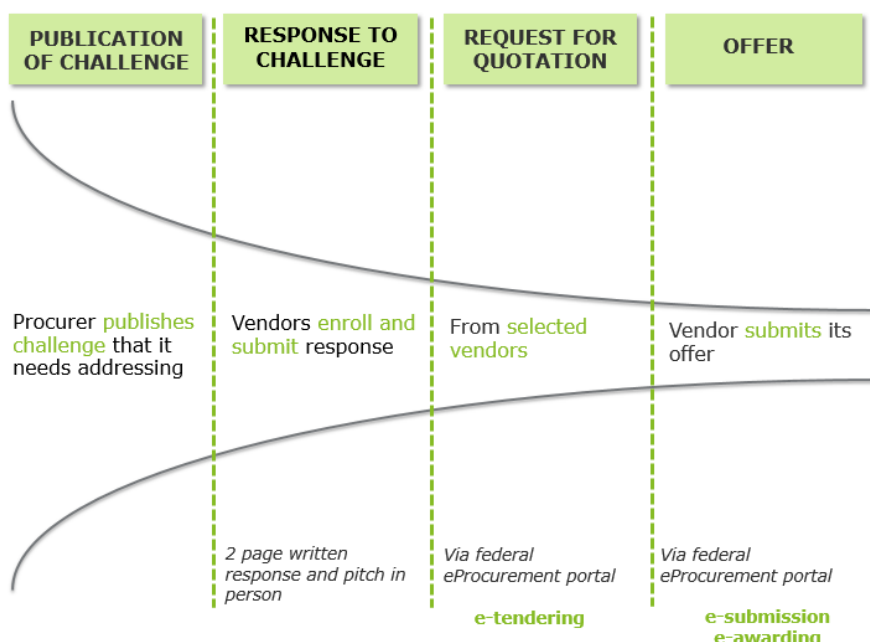
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Simplifying eProcurement

In order to encourage the participation of smaller companies in tenders, Digipolis' "Buy from Start-ups" programme aimed to provide a 'lean and mean' and straightforward procurement procedure for smaller-scale and start-up companies. This program covers contracts worth less than €144,000 (contracts not requiring publication in the OJEU). We have a four-stage procurement process:

- **Publication of challenge** – The procurer publishes a "challenge" that it wants addressed, rather than a list of detailed specifications, and requests potential solutions from vendors;
- **Response to challenge** – Interested vendors enroll [through this link](#). They submit a concise proposal outlining how they would approach the challenge, and pitch their approach in a 30-minute face-to-face meeting;
- **Selection and request for quotation** – The procurer selects a limited number of vendors and requests a quotation from them;
- **Offer submission** – The vendor submits their complete offer.



While the first stage of this process is conducted on the [Digipolis Antwerp website](#), with the vendor enrolling and submitting their initial response to the challenge on this website, the later stages are not. The publication of the request for quotation and the offers from the vendor were both **done via the federal government eProcurement portal**.

Switching between two platforms in one eProcurement tool is **not very user-friendly** for the applicants, and was putting off the small companies that the 'Buy from Startups' program wanted to attract.

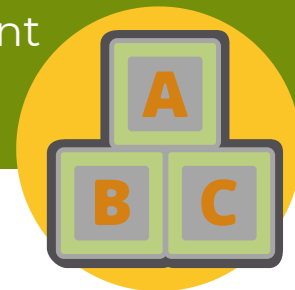
Digipolis wanted to **create its own eProcurement portal** that would publish requests for quotations and receive submissions from companies applying under the Buy from Startups procurement procedure. We had three objectives for this portal:

- Provide a **user-friendly experience**: with a simple and intuitive workflow.
- Be **fraud-proof**, providing a secure and transparent method for the submission of offers.
- Be compatible with the **ACPaaS principles** (i.e. using modular, reusable components).



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Our blockchain-enabled service

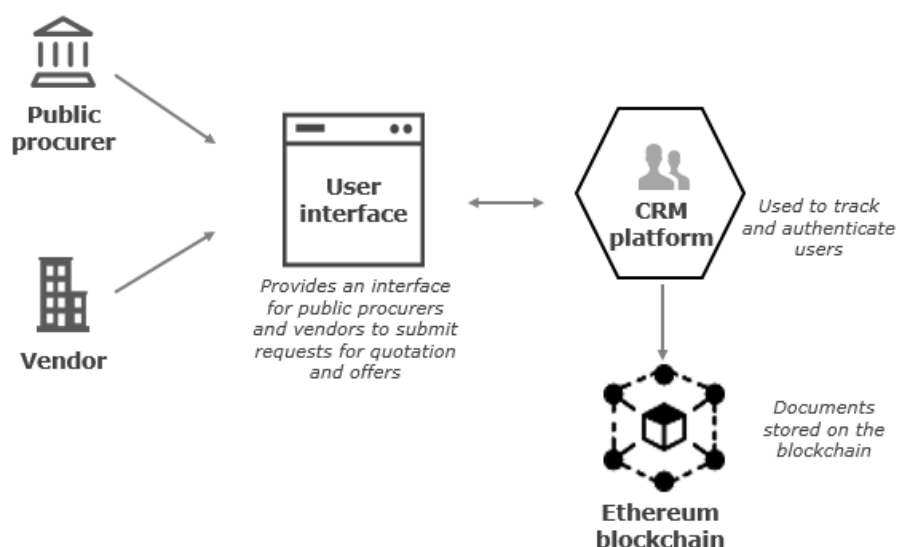
To meet these objectives, Digipolis has developed a blockchain-based smart procurement tool which enables procurers to publish a request for quotations and vendors to submit their offers.

The smart component tool consists of:

- **A user interface** - which the procurer uses to publish the request for quotations and the vendor uses to submit their proposals. User authentication is enabled via our CRM solution.

- **Customer Relationship Management (CRM) solution** – enabling user authentication (for potential suppliers).

- **Blockchain component** – the posted requests and the offers we receive are added to the blockchain, providing guarantees that the documents have not been tampered with.



The revised process has eight steps that move from the publication of requests for quotations, through the submission of vendor offers, to the contract award.

1. The procurer publishes a request for quotation via the user interface.
2. A smart contract with this request is uploaded on the blockchain.
3. Vendors submit their offers via the user interface.
4. The offers are uploaded to the blockchain.
5. The procurer closes the process.
6. The procurer assesses the offers and awards a contract.
7. A trigger is sent to the smart contract which generates an event recording the result.
8. The procurer enters the result of the award in the Digipolis CRM system, which automatically sends award and non-award letters to the respective vendors by email.





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The smart procurement tool has been designed with a combination of both blockchain-based and non-blockchain-based components. This was done to ensure compliance with public procurement rules. Vendors do not directly write their offers onto the blockchain, but instead submit their offers to a Digipolis file server. Only metadata, including a time stamp, is added to the blockchain.

Vendors do not have direct access to the blockchain, which ensures that they cannot see any details of any other submissions from other vendors (including how many submissions have been received). In accordance with public procurement law, the final outcome of the procurement (the contract award) is communicated to all participating vendors once the review procedure is completed.

The use of blockchain as one of the technological components of the solution adds a significant level of reliability and transparency to the process. The documents submitted by both the procurer and the vendor are added to the blockchain, together with their time stamps, providing system-level assurance that they have not been - and cannot be - tampered with.

Blockchain configuration

Ethereum is the blockchain technology we used, and we created a private, permissioned blockchain - this means that only a limited number of users are able to write or read the data on the blockchain. This configuration choice makes it possible to switch to a public Ethereum blockchain in the future, if that is required or stakeholders feel it is desirable. The blockchain operates using a proof of authority to validate the data once it is added.

At this point there are only two nodes to the blockchain hosted by Digipolis, and one node hosted by BOSA (the Belgian Federal Government Procurement Organization). Talks with the Port of Antwerp to add a node are currently being finalized. A blockchain with more nodes expands the value



proposition of blockchain technology:

- there is increased trust, as nodes are no longer hosted by a single partner;
- there is increased transparency and increased vigilance;
- there is increased security and increased availability (as we have eliminated the risk of a single-point-of-failure).

Managing risks when adopting new technologies

Digipolis felt that the overall risks for the project were quite limited, and the team was confident that it could drive it to a successful conclusion. That said, there were some risks associated with the use of a new technology that the in-house team did not have experience with.



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While the team was aware of the potential of the revised Smart Procurement Tool to improve their procurement process, when an emerging technology is being adopted by an operational system there is always some fear, doubt or reluctance. Will it be as stable as expected? Will it be as safe/secure as promised? Will it be flexible? Luckily it became clear very quickly that the new system was solid enough to support our procurement process. These risks were also reduced by the relatively small, exploratory nature of the project. The team had a fallback solution - reverting to the federal eProcurement portal (the solution they were previously using) - if the Smart Procurement Tool project did not turn out to be a success.

Since its launch, Digipolis has used the system for 52 calls for proposals, has received 130 submissions, and 34 contracts have been awarded. Overall, the project was relatively technically straightforward, and one that could be easily implemented by many other public authorities around Europe. A key lesson from the pilot project for us was that public authorities should not be put off by the unfamiliarity of emerging technologies such as blockchain - in some cases these technologies can actually be implemented quite easily. An important success factor when adopting these technologies is that user input must be gathered to ensure that the tool is properly tailored to their needs.

