IPwe

IPwe VALUATION ENGINE

Fall 2018

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IPwe is seeking to work with the patent ecosystem to improve the patent market for all. If you are accounting firms, academics, brokerage firms, law firms, insurance company, patent office, patent owner or other interested party that would like to learn more or participate in the project, please contact us at valuationengine@ipwe.com*.*

Executive Summary

Governments spend billions of dollars regulating patents and innovators spend billions of dollars in obtaining and maintaining patents. An appropriate measure of "return on investment" encompasses factors beyond the number of patents that are commercialized (~5%) or otherwise transact in licensing or acquisition transactions (~2%), but these two factors alone indicate that there are issues related to the patent market that impede commercialization, development, capital and transactions.

The current patent market is highly illiquid and characterized by massive liquidity discounts. Effective price discovery simply does not occur. Based on a review of the academic literature and interviews with patent owners, funds that are likely investors in the patent market and other patent ecosystem intermediaries, IPwe believes that establishing potentially relevant reference ranges for value is a critical step in improving the functioning of the patent market. While a more liquid patent market would benefit larger companies, we believe it would have significant benefit in the SME sector where the SME's would potentially be able to access additional non-dilutive capital.

The IPwe Valuation Engine R&D efforts started in mid 2018 and will extend through 2019. We will be focusing on the following:
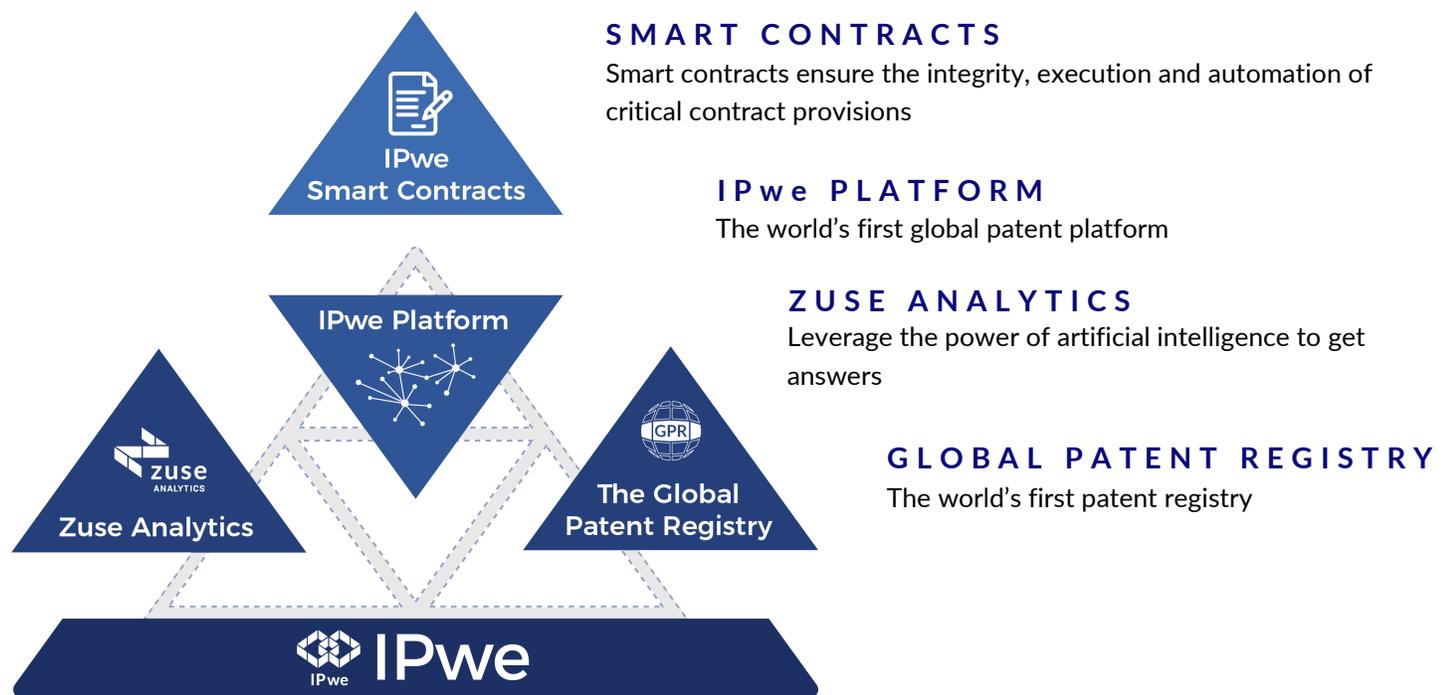
- Identifying, sourcing, cleaning and organizing reliable third-party data regarding historical patent transactions
- Identifying, sourcing, cleaning and organizing other data that may be relevant or predictive of patent transaction pricing
- Encouraging third party experts to express views on valuation
- Enhancing IPwe's existing artificial intelligence tools to create a publicly available version of the IPwe Valuation Engine
- Developing a specific module to handle the valuation of Standard Essential Patents (SEP)
- Engaging third party market participants to contribute to the development of the IPwe Valuation Engine

The IPwe team is uniquely positioned and qualified to complete this project as a result of (i) the artificial intelligence and blockchain enabled tools IPwe has already invested millions of dollars in that are available to third parties free of charge (and without tracking or advertising), (ii) the experience and qualification of the IPwe team, including recognized leaders in data science, AI and patents, (iii) the fact that IPwe is committed to open development of the IPwe Valuation engine and making it available without charge to third parties and (iv) the ability of IPwe to continue to develop the IPwe Valuation Engine in the future as part of its core business.

IPwe introduces the **Data Contributor Program** which incentivizes the first transaction parties (licensors and licensees, buyers and sellers, patent owners, law firms and brokers) to contribute their transactional data to teach the Valuation Engine. Under the Data Contributor Program, active participants in this program will receive access to an advanced version of the Valuation Engine that further narrows the valuation range interval.

IPwe

About IPwe

IPwe leverages blockchain and Artificial Intelligence to lower the cost of ownership of patents and offer a fully automated platform to transact patents and patent-related services.

SMART CONTRACTS
Smart contracts ensure the integrity, execution and automation of critical contract provisions

IPwe PLATFORM
The world's first global patent platform

ZUSE ANALYTICS
Leverage the power of artificial intelligence to get answers

GLOBAL PATENT REGISTRY
The world's first patent registry

IPwe's goal is to transform patents into an asset class that benefits the entire patent ecosystem.

The IPwe Team

The IPwe founders have a strong track record in data science, AI, blockchain and patents, with office in Paris, Dublin and the US.

Erich Spangenberg

Previously founder and CEO of IP Navigation Group (Patent Advisory and Licensing) and nXn (Predictive Analytics). In 2015, Intellectual Asset Management (IAM) named Erich Spangenberg as #2 of the top 40 IP "market makers" whose "connections, decisions and actions drive the ever-expanding global IP marketplace." Erich multiple licensing campaigns generated hundreds of millions of USD.

Pascal Asselot

Senior patent licensing executive with more than 15 years of experience.
Pascal Asselot lead the development and licensing group at France Brevets, the first sovereign patent fund in Europe, since its inception in March 2011 until September 2016 and launched licensing campaigns generating tens of millions of USD.

Dan Bork

Dan Bork has been Responsible for ZuseIP Analytics (IPwe patent AI tools) architecture for over 10 years, continuously enhancing ZuseIP. Dan has developed a strong experience in Blockchain and Hyperledger.

George Karypis

George is a distinguished professor of computer science and engineering at the University of Minnesota. George is a globally recognized expert in big data, predictive analytics and AI—all of which are critical to the IPwe Patent Valuation Engine. George is focused on solving new and interesting problems using computerized analytics.

IPwe is a global team of 18 people as of November 2018.

The Current Patent Market and "Patent Value"

According to the World International Patent Organization (a United Nations entity) (WIPO), less than 5% of the worlds patents ever find their way into a commercial product or service and less than 2% transact (licensed/acquired) in any given year. The global transaction market is large—estimated by WIPO at $180 billion per year. The brokered patent market in the US is estimated to exceed $350 million.

The patent market is highly illiquid and characterized by massive liquidity discounts. Effective price discovery simply does not occur. Based on a review of the academic literature and interviews with patent owners, funds that are likely investors in the patent market and other patent ecosystem intermediaries, IPwe believes that establishing potentially relevant reference ranges for value is a critical step in improving the functioning of the patent market. While a more liquid patent market would benefit larger companies, we believe it would have significant benefit in the SME sector where the SME's would potentially be able to access additional non-dilutive capital.

Talk to four different "experts" and you will get four different—and likely widely differing – views on the "value" of a patent or patent portfolio. In part this is due to experts utilizing different methodologies to express a view on value. In part this is due to the subjective factors. When we use the term "value," we mean: What is a particular patent or patent portfolio likely to sell or license for between two willing parties? We, of course, understand that much like the person who has been in the desert without water for a week that would place a higher value on water than a person standing in a super market, a particular seller, buyer, licensor or licensee could be under some compulsion to act that could dramatically impact the price they were willing to accept or pay. We are not focused on those situations.

Our approach is to utilize (i) a large public and growing private database of actual and potentially comparable transactions, (ii) proprietary algorithms, (iii) analytical tools and (iv) human augmentation that takes the form of expert and market input, to establish a reference range for a particular patent or patent portfolio.
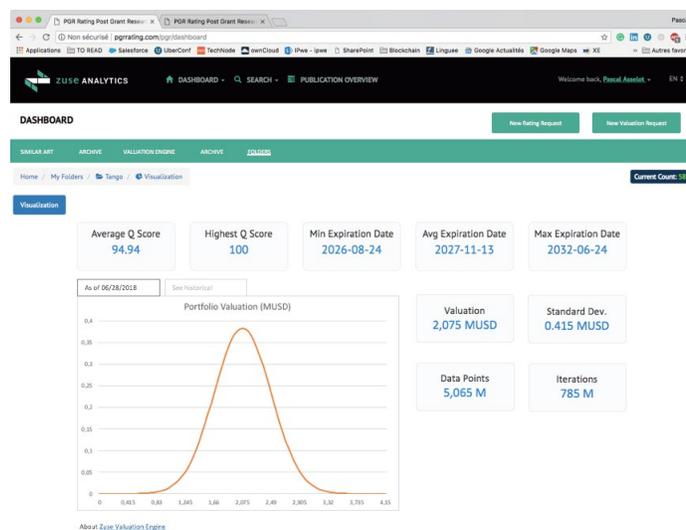
The IPwe Valuation Engine

IPwe develops a novel approach to patent valuation based on:

- An Artificial Intelligence engine that has been trained on patents for the past 10 years, battled tested and contributed to the generation of over $500 MUSD in patent monetization and over $2 BUSD of patent related financings and capital transactions
- The aggregation of historical data from the track records of its founders
- A new method to collect data from industry players, preserving confidentiality and ownership
- Continuous training of the valuation engine

IPwe Valuation Engine leverages an existing AI core trained on patents and will be taught by vast pools of data points.

The IPwe Valuation Engine is not intended to be monetized but will serve as a key enabler for IPwe transaction platform and be available without charge to third parties.

Future transactions will be continuously fed into the system and contribute to the on-going relevance of IPwe Valuation Engine.

The IPwe Valuation Engine uses AI techniques and an unparalleled set of public and private data to value individual patents and patent portfolios.

- Value is indicated in US$ with a confidence interval – what we refer to as a "Reference Range"
- Patent value changes other time, as judicial, technical or market environments evolve
- The standard deviation typically equals 40% of the valuation in most popular technical domains (i.e. there is 68% chance that the actual value falls within +/- 40% of the mean value)

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Key Differentiators of the IPwe Valuation Engine

An Existing AI Core
- Trained on patents for the past 10 years
- Battle tested – contributed to the generation of over $500 MUSD in patent monetization and over $2 BUSD of patent related financings and capital transactions
- Training/updates: system can easily be updated to account for changes in the patent environment (court decisions, new invalidation routes, new litigations venues emerging, new market developments, new technology developments)

Data as a Key Competitive Advantage
- Breadth
  Aggregates data from a very large scope of sources (patent intrinsic data, patent assignments, judgments, NPL, market research)
- Versatility
  Engine is trained on various technical fields
- Transactional Data points
  IPwe Valuation Engine aggregates prior patent transactions (sale and licensing) data from company founders and from major players (large transacting parties and patent brokers)

Number of Transaction Data Points collected		
June 2018	March 2019	Product Launch Mid 2019
12k	100k	500k

A Novel Data Collection Process

  Initial collection

A data collection process that insures validity and maintains ownership and confidentiality.
In order to further collect data points and continuously improve the Valuation Engine, IPwe invites parties involved in patent transactions (companies, research centers, individuals, brokers) to input their data into the Valuation Engine.

The input process is handled by Trusted Entities, independently of IPwe. Those Trusted Entities (law firm or other intermediaries) handle data to give the market comfort that confidentiality is being respected and that the inputs are reliable.

Confidential transaction data points cannot be reverse engineered
If a confidential data point is input in the system (i.e. patent '123 was sold on 06/30/2017 for $1 MUSD), a query on the same patent would not lead to the input value, merely a confidence interval consistent with the input value and subsequent changes in the environment.

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Role of the Trusted Entities: Maintaining trust

The role of the Trusted Entities will entail the validation of data sets (does the patent value come from a valid agreement? Is the patent value clear from any other considerations?). A Trusted Entity also makes sure to validly input data in the system protecting the engine from any bias. Depending on the volume of data to be input, Trusted Entities may charge validation and input fees.

Benefits of contributing transaction data

By contributing transaction data points, transacting parties get access to the highest level of confidence interval.

Building a valuation community and Third-Party valuation services

The IPwe Valuation Engine provides valuation on an *as is* basis. Should a more elaborate valuation exercise be needed, IPwe partners – selected for their relevance in the investigated domain- can be engaged online.

Similarly, IPwe will encourage an environment where experts are encouraged to write research reports on and comment on patent valuation. IPwe has various initiatives underway to make sure these reports and comments are accessible in ways that did not previously exist.

Continuous learning

After the IPwe Valuation Engine launch, data will come from 3 sources:
- Collection model will continue in more verticals to reach higher levels of confidence across industries
- Transactions occurring on IPwe Platform will teach the Valuation Engine
- Informed crowd wisdom

Crowd wisdom:

IPwe Platform will offers patent experts and boutiques the ability to provide their own rating on patents.

The system will rate over time the quality of each contributor:
- Alternative valuations will be shown on IPwe Platform, alongside IPwe Valuation
- Each contributor will have a rating
- Each contributor may use the IPwe Platform to advertise its services

The IPwe Valuation Engine will take into account values given by the best contributors.

The SEP Conundrum

A significant portion of world R&D efforts are centered on standards (communication and broadcasting protocols, media encoding & decoding…). Research entities join development efforts under the lead of Standard Setting Organizations (or SSOs, such as 3GPP for mobile communications) and generally pledge to license the patents covering their contributions under Fair, Reasonable and Non-Discriminatory terms (aka FRAND).

- Stakes are high (for example, the mobile phone market only is close to $500 BUSD and is highly dependent on standards)
- Players are global (from the US and Europe to Japan with Korea and now China as emerging powers)
- Yet, no market valuation mechanism is available outside of the expensive, time consuming judicial system
- The inefficiency of the SEP market is huge deterrent for SMEs to enter the standard driven industries (communications, IoT…)

The Standard Essential Patents or SEPs, are therefore one of the best illustration of the problems caused by the difficulty to properly value patents.

The European Commission and various stakeholders have allocated efforts to address the SEP issue[1]. In this space too, IPwe believes that AI-based tools like the IPwe Valuation Engine can improve the efficiency of the patent system.

Providing a proper valuation framework for SEP requires to add another layer to our current ambitions: the assessment of essentiality, i.e. to assess whether a patent is necessarily infringed by a user of the standard specification. This added complexity requires the help of experts in both patent infringement and technical standards. A specific research component has been identified for SEP valuation.

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[1] https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3009039
https://ec.europa.eu/growth/industry/intellectual-property/patents/standards_en

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Competition

IP Boutiques

Patent Valuation has been traditionally included in *ad-hoc* consulting activities.

Examples: Taeus (www.taeus.com), Intracom Group (www.intracomgroup.com), Coller IP (www.collerip.com), ClearViewIP (www.clearviewip.com/), Black Stone IP -now Houlihan Lokey ([www.hl.com) and a number of others. These consulting service models perform an important function, but also have important limitations.](www.hl.com)

> Plus: bespoke approach
>
> Minus: time-consuming, expensive, no consensus, inaccessible

Accounting Firms

Many of the world's accounting firms value intangibles. Examples: Deloitte, EY and many others.

> Plus: patent valuation is consistent with overall intangible valuation
>
> Minus: time-consuming, no real relevance in patents, no consensus, inaccessible

Patent Intelligence software

Patent Intelligence packages have been built around patent search tools and portfolio management tools.

Examples: Innography (www.innography.com), PatSnap (www.patsnap.com), Questel (www.questel.com), Anaqua (www.anaqua.com) and others.

As of today, only PatSnap has released an automated patent valuation tool. Results are surprising (inflated value) with little market relevancy.

> Plus: part of the existing patent tools suite
>
> Minus: pricing

IPwe will have a strategy of partnership and integration with selected players in these three segments. Given our pricing model – free – we anticipate that players in these selected segments may augment the IPwe Valuation Engine with additional customized services and offerings.
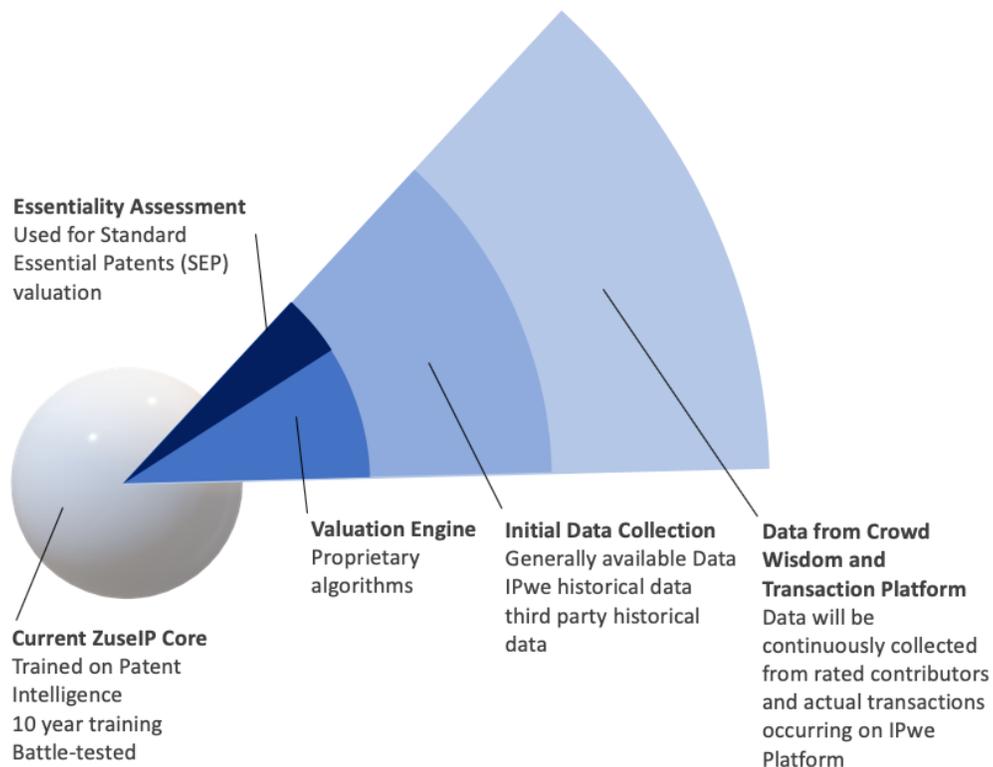
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The R&D Program

IPwe Valuation Engine Economics

The IPwe Valuation Engine is not intended to generate revenues – It will be accessible without charge to anyone interested.

The IPwe Platform is the only patent marketplace that offers transaction capabilities (patent transactions can actually be executed through the platform, similarly a third party provider can be engaged through the platform). We are able to provide AI, valuation and other services without charge given our unique business model that focuses on fees only when a transaction is completed.

R&D Efforts

The IPwe Valuation Engine is built on top of the current Zuse Analytics Engine.

Essentiality Assessment
Used for Standard
Essential Patents (SEP)
valuation

Valuation Engine
Proprietary
algorithms

Initial Data Collection
Generally available Data
IPwe historical data
third party historical
data

**Data from Crowd
Wisdom and
Transaction Platform**
Data will be
continuously collected
from rated contributors
and actual transactions
occurring on IPwe
Platform

Current ZuseIP Core
Trained on Patent
Intelligence
10 year training
Battle-tested

R&D Resources

The R&D efforts are made under the lead of Dan Bork, IPwe's Chief Technological Officer and the Technological Vision by Georges Karypis, IPwe's Chief Scientist Officer.

The main R&D resources are based in Paris, France and benefit from French and EU incentives and support.

R&D team is split into two groups:
- Algorithm development
- Data Collection and Aggregation

The Algorithm Development group focuses on the AI techniques needed to value patents while the Data Collection and Aggregation group gathers generally available data (market research, patent, industry trends, litigation data) and historical transactional data points from:
- IPwe Data
- Brokers, other IP intermediaries and transacting parties

The recruitment process of Trusted Entities has already started.

Partners

IPwe is seeking to work with a number of third parties in connection with the development of the IPwe Valuation Engine, including: accounting firms, academics, brokerage firms, law firms, insurance companies, patent offices, patent owners and other interested third parties.

The first group of partners that IPwe seeks engagement with are parties involved in patent transactions: licensors and licensees, sellers and buyers, brokers through the Data Contributor Program.

The Data Contributor Program

IPwe invites parties in patent transactions (**licensors and licensees, sellers and buyers, brokers)** to input data points relating to patents transactions into the Valuation Engine.

The input process has been designed to maintain the ownership of the data as well as any confidentiality provisions of the transaction agreement encumbering the disclosing of information.

A legal opinion is available to the Program Members that acknowledges the capability of the Valuation Engine to maintain both ownership and confidentiality. In particular, no IPwe employee or affiliate has access to the data points.

Once in agreement, Program Members are invited to submit any transaction agreements to one of the Trusted Entities.

The Trusted Entity will review the agreements, validate that those are legitimate agreements and extract data points.

Data points are typically:
- type of transactions (patent sale, licensing agreement, exclusive licensing agreement, covenant not to sue…),
- identification of the involved patents,
- considerations,
- encumbrances impairing the value of the transaction (e.g. a list of already licensed companies in case of patent sale)

Based on data points economics, a contribution score will be assigned to the Program Member measuring the marginal value of the data points for the education of the Valuation Engine. Data points economics include:
- number of data points,
- number of patents involved in each transaction,
- whether the Engine has already a lot of data points in the same domain,
- …

The contribution score will determine the incentive granted to the Program Member**. For obvious reasons, the same set of agreements will be assigned a higher score early in the process than later -when numerous data points would have been contributed in the domain.**

The Trusted Entity will input data points directly in the Valuation Engine.

Incentive for the Program Member

By contributing transaction data points, transacting parties get access to the highest level of confidence interval for an amount of time depending on their contribution score.

Typically, 10 data points in a new domain involving individual patents will be assigned a contribution score of 50 (out of 100) and allow the contributor to access the Valuation Engine with a confidence interval equal to 1 standard deviation -instead of 2 standard deviations for the standard user- during a period of one year.
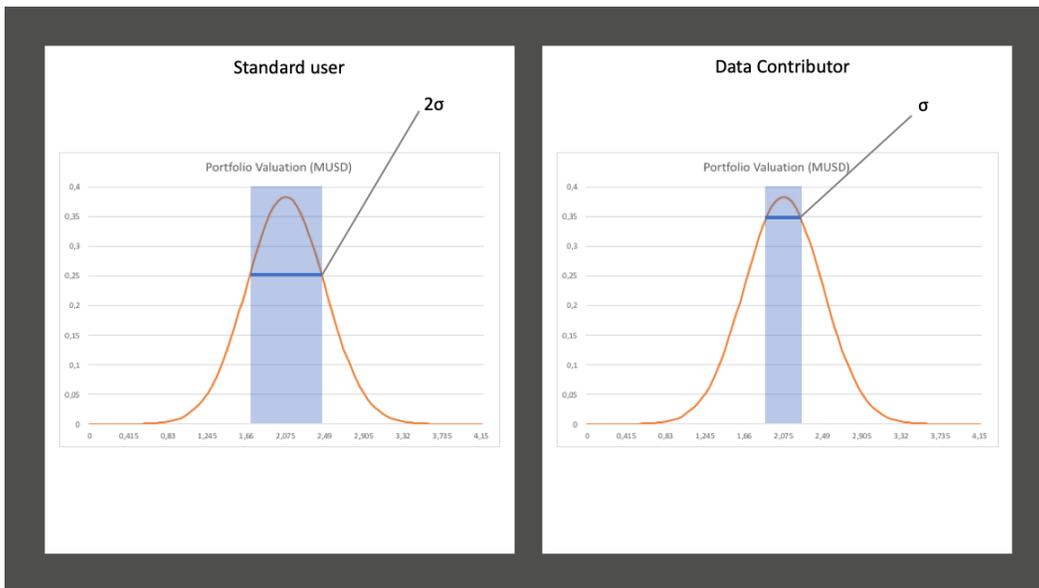
Input and Query Processes overview
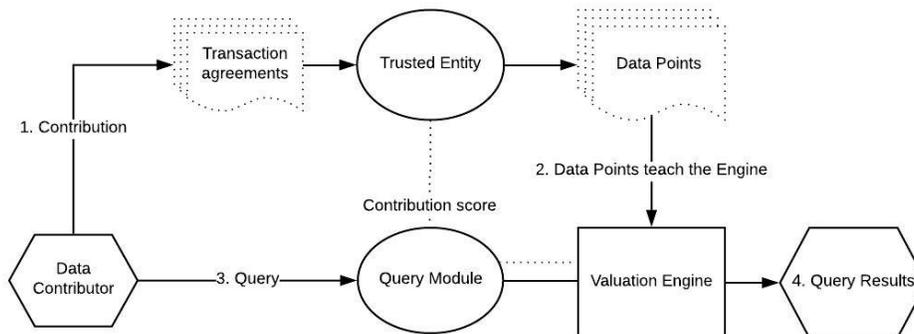
Next step If you are interested in learning more, contact IPwe at valuationengine@ipwe.com