MOONLIGHT

The Smart Economy Workforce.

Employment. Redefined.

A **decentralized platform**, built on the trusted NEO network that will change the way you recruit and scale your workforce.

Wherever they are.

Version 1.0

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Moonlight

Tyler Adams, Alan Fong, Michael De Wal, Chris Birmingham, Travis Lin

Everyone has passion projects...

There are activities and projects that contributors really enjoy working on and wish they could spend more time on. Unfortunately, very few are actively working on them. In many cases, this is due to the ever-changing business needs of their employer. Ultimately, resource availability for a project is limited to a team which may not have the skills to meet project needs.

There are many causes for these conflicts which can have catastrophic effects on the contributors, project, and business, but ultimately, the root cause is resource compartmentalization. Contributors are forced to decide between their passions and job security which can ultimately push them even further away from working on what they enjoy, resulting in engagement issues. Projects are impacted due to the engagement and staffing problems even though the business is required to maintain an idle labor buffer in the event that a project arises which requires a specific knowledge worker's expertise. To counteract this, we spend a lot of time locally optimizing resources at the project, team, organization, and corporate levels.

What if we could identify a global optimum solution which resolves these issues?

1. The Current Workforce Ecosystem

The methods for hiring knowledge workers in the 21st century are heavily reliant on pre-digital mechanics. In the case of the hiring party, they will often publish a listing requesting an ideal skillset. The process can be resource intensive for the employer, and due to long-term changes in corporate initiatives, the employee's skillset may only fulfill short-term organizational needs. This scenario results in product development and resourcing issues [1] due to a lack of on hand, relevant talent, which is unable to fulfill changing corporate needs as well as employee disengagement caused by undesired responsibility changes. A 2016 survey of 1192 companies found that job postings took a 30 day median time to fill at a cost of $2000 per posting. [2] Additionally, there was a median 15% annual employee turnover rate and Industry standard recruitment costs for knowledge workers are 20% of salary. [3]

The problem is exacerbated by the mechanics that support these activities. The current hiring process is heavily reliant on the posting and resume mechanic which is dependent on trust. The employer must trust the honesty of a candidate's resume and the candidate must trust the accuracy of the posting. From the candidate vetting perspective, there have been a few inroads. These generally present themselves as a challenge during the interview process or a professional reference. Unfortunately, multiple studies [4],[5] have shown that performance in challenges during interviews have little correlation to long term performance of a knowledge worker. In software development, as an exception, Github works well if the candidate is working on an open source project (often not the case in a corporate setting). This also requires a secondary investigation. Background checks are also a common mechanic to verify employment history and income, which can be a necessity in a trust-based ecosystem.

In the blockchain space, these issues become particularly evident. There are few qualified candidates and, likewise, very few people able to properly evaluate their skillsets. The recent influx of ICO announcements for new projects brings this to light. There is a lot of time spent by investors identifying whether projects can be trusted, and many projects have issues with successful launches because they are missing critical resources. Moonlight solves these issues by using the blockchain to integrate the fragmented resource management space.

2. The Smart Economy Workforce

The Moonlight platform leverages a number of industry standard concepts as well as those instituted by the City of Zion Foundation to define an ecosystem which globally optimizes employment from both an employee and employer perspective while also improving public confidence in project success. To do this, we use the Neo Blockchain to deploy a network of trustless resumes on the Neo Blockchain to anchor our platform's tools which will initially include a global task match-making service and analytical project management platform. The goal of these tools is to reduce the compartmentalization of resources which has historically encumbered the product development space to build a workforce platform for the smart economy. To describe this new ecosystem, we begin with an overview of a few primary system concepts:

2.1. Organizations

In Moonlight, organizations are the entities that generate content. An organization can be an individual or group of individuals. Organizations can also be made up of other organizations. They have the ability to generate tasks in the ecosystem and also resolve them.

Organizations can act in one of the following roles during task resolution:

- **Issuer:** The organization that creates a task in the system.
- **Resolver:** The organization that fulfills a task in the system.

Moonlight provides a number of mechanisms to track organizational competency:

- **Skills:** Every task completed by an organization is published to the blockchain. The skills required for each completed task are logged to the organization and can be used to represent their domain-specific capabilities.
- **Reviews:** After a task has been completed, the participating organizations (Issuer and Resolver) are prompted to review each other. Organizational reviews are published to the blockchain and represent the holistic experience of interacting with the organization.

- **Bid Accuracy:** When acting as a Resolver, organizations place bids on tasks *(Section 2.7)*. The accuracy of these bids relative to the actual completion duration are also logged as a tool to indicate the organization's bid quality for tasks. The skills associated with the tasks are taken into consideration when evaluating bid accuracy within the system.

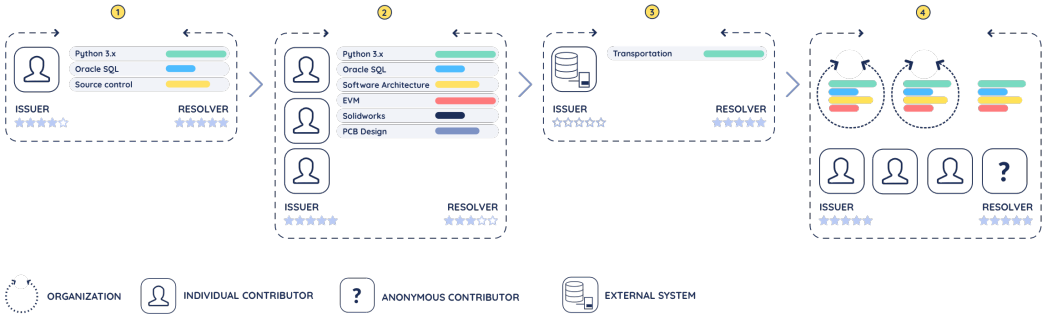

Figure 1: Organizations have flexible structures.

In the figure above, we provide four examples of different organizational structures in Moonlight:

1. **Individual:** In this configuration, a single individual contributor operates as an organization. The competency of the organization represents the individual's capabilities.

2. **Multiple Individuals:** Multiple individuals can also be represented as a single organization. In this case, the skillset of the organization is the sum of the skills of all individuals within the organization (since all the individuals are working as a single entity within the system).

3. **External System:** By interfacing with the Moonlight protocol directly, an external system can interact with the Moonlight platform similarly to an individual contributor. In this example, the organization appears to only operate as a task resolver. This mechanism also provides a level of automation to the ecosystem.

4. **Multiple Organizations and Multiple Individuals:** A single organization can also consist of multiple other organizations and individual

contributors at the same time. This mechanic provides structure to large teams. In this architecture, organizations represent the sum of skillsets for all their children. This example also exposes an anonymous individual within the organization.

2.2. Skillsets

In Moonlight, skills fulfill critical roles in a number of integration points between issuers and resolvers on the platform. They provide an aid for resolvers to identify potential tasks and also help to define the experience of organizations on their trustless resume. As organizations resolve tasks, they accumulate points against skills on their resume which is scaled by a number of criteria including their review and the task's value. This data can then be used for tools in the Moonlight ecosystem.

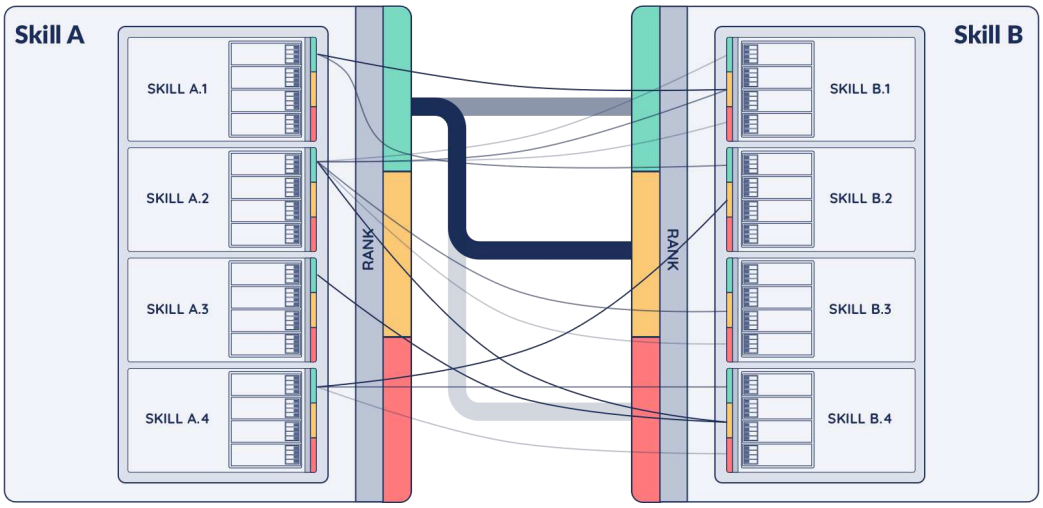

Figure 2: A simplified diagram depicting a ranked hierarchical network for skills.

To support system needs, the global population of skills are configured into a Ranked Hierarchical Network. Skill hierarchy in the network represents a scoped relationship between skills (with nested skills having a narrower scope). Edges in the network are reinforced through the publishing and completion of tasks to build a relational model between all the skills represented in the system and are sensitive to the skill-level of the resolver. These

edges are critical for providing accurate task duration estimates in the system because they improve the size of the dataset which can be drawn from. A simplified diagram depicting these relationships is presented in *Figure 2*

2.3. Tasks

A task is an atomic unit of work in the Moonlight ecosystem. Tasks have a value assigned to them (either in currency or terms of remittance) which is dependent on their value to the issuer. A task can be comprised of any combination of activities or tasks.

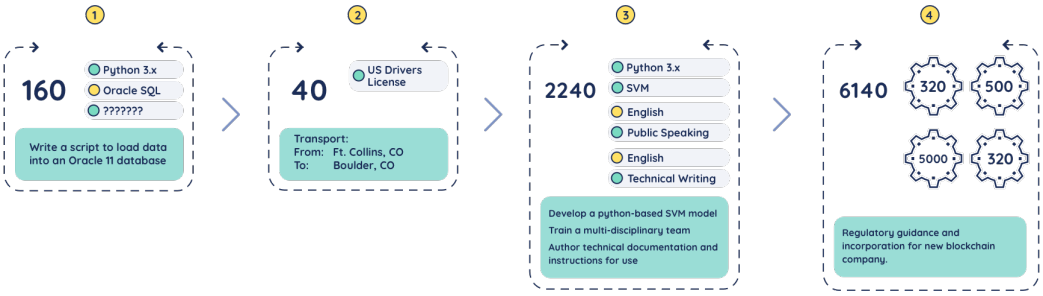

Figure 3: Tasks support complex hierarchies including recursion.

1. **Single Activity:** In this example, a task is used to represent a single activity in the system. Required skills for the task are provided as well as a level of competence in each. A value (160 Lux) is assigned to this particular task.

2. **Single Activity:** *See (1)*

3. **Multiple Activities:** Multiple activities can also be represented by a single task. In this example, the user must complete multiple activities, which requires five unique skills in order to be awarded the value of the task.

4. **Multiple Tasks:** In this example, multiple tasks (each with their own value) are grouped together under another task. This mechanic facilitates larger projects. In this scenario, the total value of the task is the sum of the values of its child tasks. The resolver is awarded the value for completion of each individual task as they are resolved to the issuers satisfaction allowing contributors renumeration to be paid throughout the life of a project.

Note *It is recommended that issuers follow conventional project management practice when determining the scope of an individual task. By increasing the task size, issuers introduce uncertainty into their projects due to currency volatility and estimation accuracy (which generally degrades with task size).*

2.4. The Marketplace

The marketplace is a scoped task backlog which provides a match-making service for issuers and resolvers. When publishing a task to the marketplace, issuers can choose the scope at which to make the task available. There are a few distinct backlog scopes available in the system:

- **Global:** Globally scoping a task makes it available to all resolvers on both mainnet and privatenets. This level provides the most potential resolvers at the expense of information security since potential resolvers must be able to review a task prior to a bid.
- **Local:** Locally scoping a task presents it to resolvers on the same network as the issuer. This scoping is particularly useful in a corporate setting where the platform is deployed on a privatenet for security.
- **Organizational:** A task scoped at an organization level accepts bids from organizations explicitly selected by the issuer. By repeatedly issuing tasks to the same organization, issuers can take advantage of tribal knowledge resulting from historical activities on similar tasks. This is particularly beneficial on larger tasks or in a field requiring highly specialized skills.

2.5. Matchmaking

In Moonlight, issuers create tasks and identify skills that are required for completion. Additionally, issuers may assign a level of competency to the skill to further define desired qualifications. Like the required skills, segments of the task definition may also be censored from public view.

Note *Organizations can be incentivized with Lux, the Moonlight system token, to audit the tasks of others and can recommend additional skills, improvements to the task definition, and modifications to the value.*

A matchmaking algorithm is built into the Smart Contract to provide resolvers with task recommendations based on skillset. Access to the Smart

Contract version of the matchmaking protocol will be publicly defined and available. Core Moonlight applications (such as the marketplace) will use an off-chain version of the algorithm for performance. Developers wishing to interface with the ecosystem will have access to the matchmaking algorithm through the public API. While an on-chain matchmaking algorithm will also be available, use of the off-chain version is generally recommended unless access is being made via another smart contract.

Upon task completion, the issuer and resolver must provide a review of the other in a manner that is dependent on the task remittance strategy. An organization's experience gain has a scalar applied to it which is correlated to the review they received and the value of the task completed. Once the review is completed, the resolver's record in the system is updated to represent the skills required to complete the task. Reviews (in addition to the skills) are stored on the blockchain for verification and reference by others. In the case of an organization with multiple contributors, we use resource channeling to allocate experience to the team members.

2.6. Resource Channeling

When an organization consisting of multiple other organizations completes a task, we use resource channeling to distribute the skill points and remittance acquired from the completion event. This mechanic can take a number of different forms depending on the organizational settings and includes the following:

- **Admin Assignment:** An administrator in the organization can directly allocate the skills and funds to the other members in the organization.
- **Voting:** Members of an organization who have been granted the ability to vote will be capable of voting on the distribution of skills and funds to each child organization.

Because organizations are recursive, these methods are effective at distributing skills and funds within very complication organizational structures.

2.7. Bidding

Once matched, resolvers may bid on the task. In Moonlight, bidding is different from conventional contract-hire mechanics where bids are in terms of

value. Instead of bidding with a price, resolvers bid with a task duration. The issuer is then able to make the final selection for who will become the resolver using these duration estimates. This mechanic is more aligned with conventional project management techniques. Unlike conventional systems, this is the 'real' time to complete task instead of the traditional FTE (Full Time Employee) hours which is more effective on a platform which cannot assume an organization is fully allocated to its tasks.

For example: *Alex indicates that a task will take 3 days to close out and begins the task on a Monday. His 3 day estimate implies that the task will be completed at the end of Wednesday.*

There are various methods for task duration (or value) estimates and bids across the conventional project management space. [6],[7] Unfortunately, bid accuracy is relatively volatile and is highly correlated to subject matter expertise and task duration, which can provide a substantial challenge for project tracking. A common countermeasure is to make a 3 point duration estimate (high, low, expected) for use in scheduling. This data can then be used to calculate a 'project buffer' and a "project manager buffer" to account for schedule volatility due to estimation inaccuracy. [8] In Moonlight, we still recommend a buffer, but propose that it be minimized due to a reduction in the error associated with estimation accuracy that our system provides.

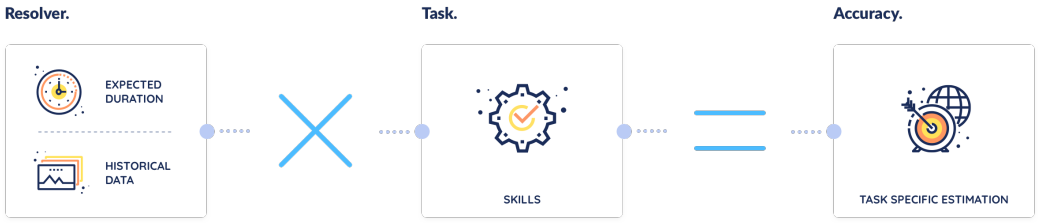

Figure 4: To reduce the estimation error, we leverage the historical task data that organizations have accumulated on the blockchain.

2.8. Bid Economics

By increasing the value of a task, the issuer is able to incentivize more organizations to bid. The increase in bid competition promotes more competitive

bids (lower durations), which implies the organization will assign priority to the task. The organizational competency mechanics, specifically the reviews and bid accuracy, provide controls against organizations presenting unrealistic bids.

Note: *Being a match for a task is not required to place a bid on a task.*

The Moonlight economy is built on the concept of task values and task bids. Fidelity in these two attributes can provide both an entry point for incumbent resolvers as well as a competitive marketplace for seasoned ones. We define a few of these mechanics below:

- By applying an elevated value to a task, issuers can entice additional bids from resolvers. These bids allow the issuer more options when optimizing their project. Additionally, a higher value may provoke bids from more experienced resolvers in addition to yielding more aggressive bid durations (implying a greater time allocation from the resolver).
- By providing a low value on a task, an issuer may receive fewer bids, but can focus on minimizing the project cost. Assigning a low value to a task does not imply that a experienced organizations won't place a bid. An experienced resolver may bid on multiple low-value tasks and only spend a fraction of their available time on each. When doing this, they are incentivized to provide an accurate bid representing when the task will be completed, which would be longer than if they were fully allocated. This provides an opportunity for less experienced organizations to provide more competitive bids to the task.

Bid Accuracy Distributions and User Reviews act as controls to regulate unreasonable bidding in the marketplace. Resolvers can very quickly destroy their reputation in the system by repeatedly presenting unrealistic bids and being unable to deliver.

Note: *Prior to task assignment to a resolver, issuers are free to manipulate task values at their discretion.*

2.9. Crashing tasks

In Moonlight, users have the ability to view the task bids of other users in the ecosystem. This provides task competition. We borrow a term from the

conventional project management lexicon: 'crashing', to define the act of a resolver rebidding on a task with a more competitive estimate (which would imply greater resource allocation).

2.10. Resolver Selection

Selection of the resolver's bid by the issuer represents an agreement between the two organizations to complete work defined in the task for the defined compensation. Selection of a resolver can be done manually or automated.

- **Manual Selection:** Manual selection of a resolver allows the issuer the ability to review a resolver's bid prior to awarding the task. This provides some benefits over the alternative mechanism, particularly with critical (or high value) tasks.
- **Automated Selection:** Automated selection is also provided to the issuer as a means of resolver selection. This system allows the issuer to select skill and bid thresholds as conditions for automated selection of a reviewer. If a bid and its resolver meets the thresholds, the task will immediately be awarded.

  Note: *When using automated selection criteria, the task can still be manually awarded.*

2.11. Resumes

Moonlight resumes consist of two primary components:

- **Conventional:** Support for conventional resume features is available for population by each organization. Additional integration points for external unverified experience sources are provided for strategic partners. The conventional resume is of critical importance to new organizations as a way to define experience and skillsets prior to accumulating trustless resume data in the system.
- **Trustless:** Each task resolved in Moonlight is published to the blockchain to build up an organization's trustless resume. Task completion information is structured for use in the system applications and is considered a cleaner dataset than conventional resumes due to its means of nucleation. Integration points to other verified sources will provide a valuable entry point for new organizations.

2.12. Remittance

For a platform to scale in the space that Moonlight exists, it must provide a reliable method for currency exchange as well as multiple distinct remittance strategies. The Moonlight project will be integrated with its City of Zion sibling project, the Neon Exchange, as a primary means of currency exchange in the scenario where the currency preferences differ between issuer and resolver. Five remittance methods have been identified as features for the initial release with hybrids between the mechanisms also being supported:

- **Postpay:** Postpay is the default payment strategy implemented by the system. When selected as the payment mechanism for a task, remittance will be handled after the task has been completed and the first of two review rounds have occurred. The value of a task is defined prior to assignment of the task to a resolver. Avoidance of review submission as a strategy to forgo remittance by the issuer is controlled by the phased review process which will impact the organizations reputation on the platform. Objectively, the data can reveal this situation when evaluating the task estimation accuracies for issued tasks across all resolvers as well as the accuracies of resolvers against a specific issuer when blocking by resolver.

- **Prepay:** The prepay remittance strategy executes when a task is awarded to a resolver, immediately releasing payment. This is particularly useful if funds are required to complete the task or if the task is initiating a new project. Avoidance of task completion is regulated using the same mechanic as Postpay.

- **Staked:** Occasionally, the method of payment for work completed on a task may be contingent on the completion of other tasks. An example is a task which includes an ICO where the payment is in the form of the issued coin. In this scenario, the task issuer may stake the project with another form of payment. If the project is successful, the payment in the issued tokens is received by the resolver. If the project fails to issue tokens within a time-frame defined by the staking process, the staked currency is used for payment instead. This mechanism provides a level of insurance to resolvers and entices contributions on new ventures.

  By supporting this functionality, the Moonlight system provides a mechanism for effectively crowdfunding projects and minimizing the risk to resolvers while also providing a high degree of project visibility.

Figure 5: Issuers have the ability to stake tasks as a mechanism for providing insurance on tasks which have funding risks.

- **Flex:** The Flex mechanic is similar to Postpay with the exception that the compensation amount is undefined until after the task has been completed. As a requirement (and incentive to receive bids on the task), issuers will need to provide details on the compensation criteria. Examples of use include hourly pay, bonuses for quality deliverables, and payment by word-count on an authored blog articles.
- **Periodic:** Periodic payment is similar to the salary mechanic of industry. When actively assigned a task on the platform, remittance will occur at a regular interval on terms which have been defined by the issuer prior to task assignment. In all cases, assignment to a task represents an agreement between the issuer and resolver for the completion of work on defined terms of compensation.

2.13. Data Sensitivity:

Both resource management and project management involve a lot of sensitive information. We provide a number of solutions to these issues which are currently unavailable in both the freelance and corporate environments.

- **Identity Management:** Bias in hiring and advancement is a perpetual risk in industry. Ethnicity, Age, Sex, and Academic Merit (to list a few examples) are constant sources of friction which cause problems for companies as well as individual contributors. Whether intentional or not, bias is commonly exhibited in the professional space. Because of the open marketplace, Moonlight is able to provide resolvers with the option of obfuscating personal information from the task issuer at an attribute-level. Additionally, issuers may choose to obfuscate select attributes about all resolvers bidding on their tasks. This mechanic allows issuers to guarantee objectivity in resolver selection while also providing resolvers the option of disclosing only selected data to the issuer.

  In some cases, issuers may require identity information from the resolver. A resolver choosing to self-censor their information may not be eligible for these tasks.

- **Censored Skillsets:** In some situations, the descriptor for a skillset may contain sensitive information. For these scenarios, the issuer may choose to censor (through encryption) the label of task skills. In this scenario, resolvers are unaware of the skills attributed to the task and their resume (even if they have completed the task). Instead, by using the hierarchal nature of skills on the platform, the closest parent skillset with which the resolver has access to will be displayed.

- **Private Networks:** In the situation where there is an extreme concern for data breach, an organization may choose to run their own private network to guarantee the security. This solution supports the Moonlight platform running on the private network with a cross-chain service being required to resolve any external applications. A off-chain service is provided for directionally controlled selective synchronization of data between the public mainnet and all privatenets running the Moonlight suite. This mechanism allows secure control of data within corporate entities while providing both the ability to selectively collaborate with other privatenets as well as an integration point with the global data pool for talent identification. Any data sent to the public mainnet is write-only and bares a designator to indicate the network type of origination to prevent misrepresentation of experience or contamination/exploitation of the dataset.

2.14. Task Quality

Task quality is important in a resource bidding ecosystem. The platform provides subjective enforcement of task quality by providing publicly available issuer reviews. Moonlight also provides a number of other features to guarantee task definition quality.

- **Recommendations:** Historical data can provide issuers with expectations of their tasks prior to presenting them for bid in the marketplace. By referencing the skills and content of the task, Moonlight can yield recommendations for the value to assign a task as well as the expected results. These estimates are highly dependent on proper task definition and may not be available for all tasks.

- **Review Bounties:** In Moonlight, issuers have the opportunity to stake a review bounty on tasks. If a bounty is staked on a task, other organizations are allowed to review and propose enhancements to the task (through enhanced documentation, clarification requests, value modifications, and required skill-set changes) in return for a portion of the bounty. Reviews can take a number of different forms including public requests or a direct review request from a specific organization.

3. Leveraging the Platform

There are a number of different tools that can be developed for The Smart Economy Workforce. In this section we outline a few of them and define an interface for external platforms.

3.1. Public API

Two public interfaces will be available on the Moonlight platform to support ecosystem growth:

- **Smart Contract API:** A publicly defined interface for the Moonlight smart contracts will be available for use by external applications. This interface will support core application functionality (like matchmaking, bidding, and task issuance) as well as supplemental methods which will be provided for ecosystem standardization. It is designed to enhance the utility of other smart contracts operating on the Neo Blockchain.

- **Web API:** Alongside the smart contract interfaces, an externally accessible web API will will also be available to external applications which will provision both core and extended platform support.

Note: *The smart contract and web APIs may present different results due to constraints on each environment.*

3.2. Project Tracking and Utilization

In Moonlight, issuers have the ability to assign task dependencies which allows for complex task structures. Remember that each individual task can be made up of other tasks. The combination of these two task properties provides both scalability and range in degrees of detail on a project. For example, a project owner may have three tasks with dependencies, within which, a number of other tasks are defined.

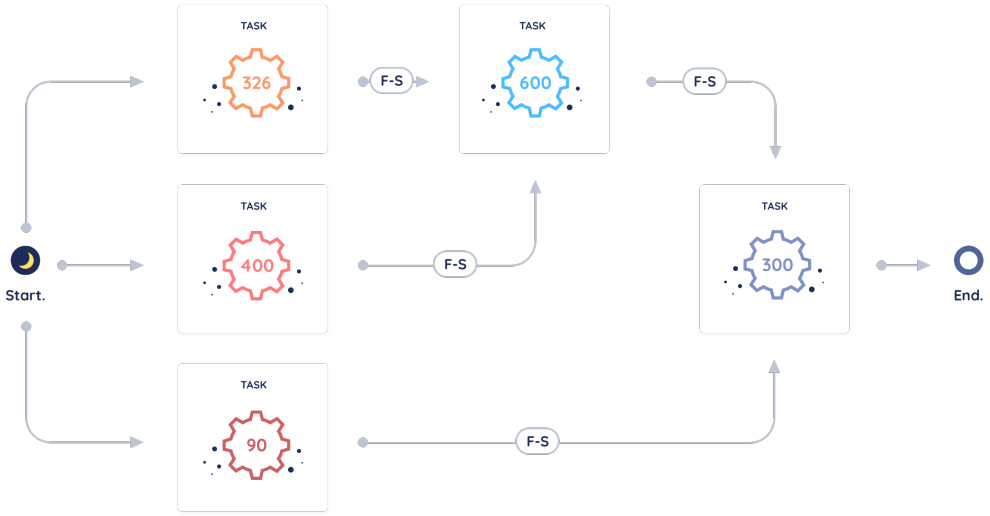

Figure 6: Tasks defined in Moonlight can optionally be assigned relationships to other tasks to form a network diagram.

As bids are received from resolvers, organization specific task completion data is mapped onto the bids. This results in a 'corrected' expectation of task duration for the issuer to use when tracking task progress. If multiple bids are received on an individual task, the issuer may review each bid to select the most appropriate for their project needs.

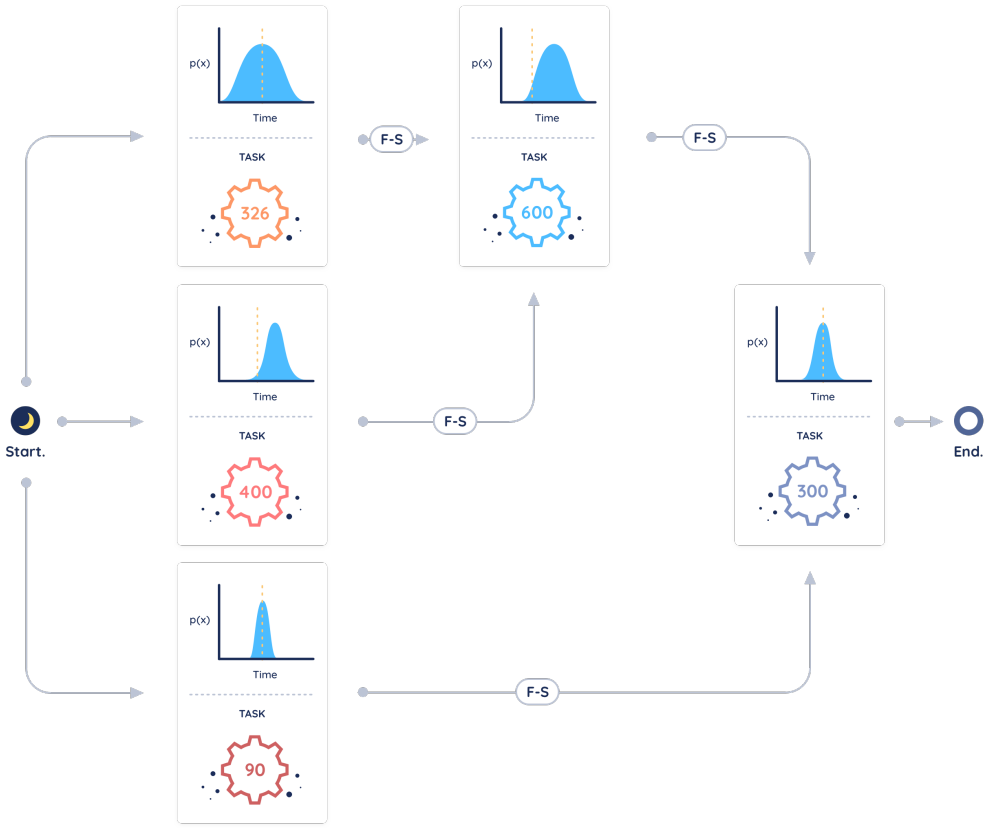

Figure 7: Bidding occurs on the defined tasks through the marketplace. As bids are made on tasks, the bid accuracy is mapped onto the bid to provide the issuer with a model of their project for tracking purposes.

By running a simulation on the network model which represents the task, we are able to project a distribution for the expected completion time of critical task milestones as well as the expected task completion time.

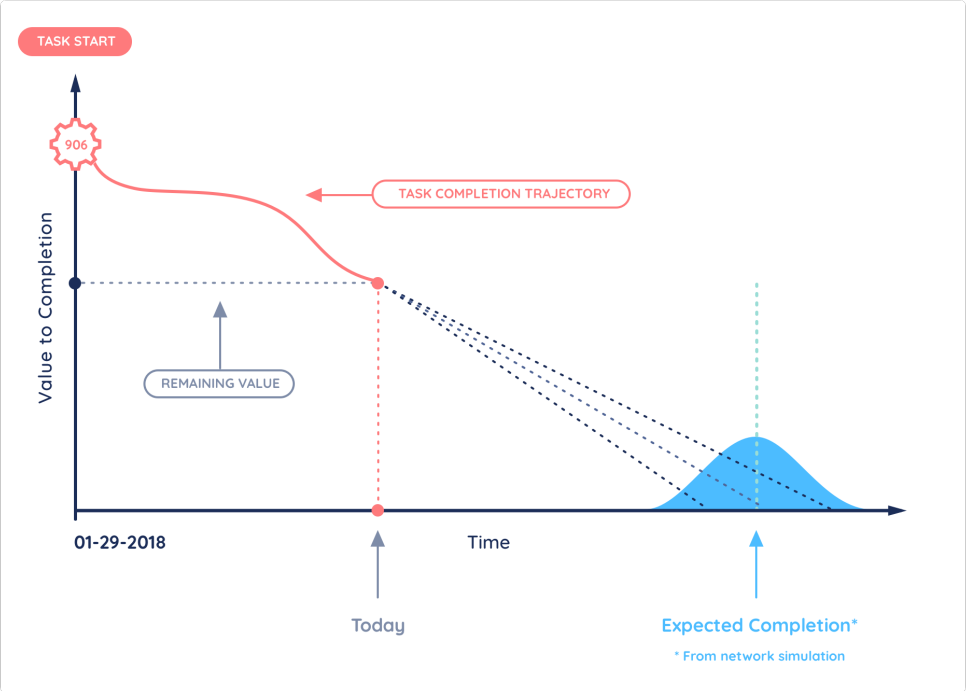

Figure 8: A burndown plot depicting the historical progress on a network of tasks (in red) as well as a the results of a simulation, predicting when the tasks will be completed.

3.3. Platform Agility

Multiple bids provide the platform with some fidelity to optimize projects based on organizational preferences. For example, an organization may wish to minimize the expected duration at an increased cost, reduced precision of the completion date, and quality of results. Because individual task assignments are not locked until assigned to a resolver, the issuer is free to continuously optimize their tasks as external factors change.

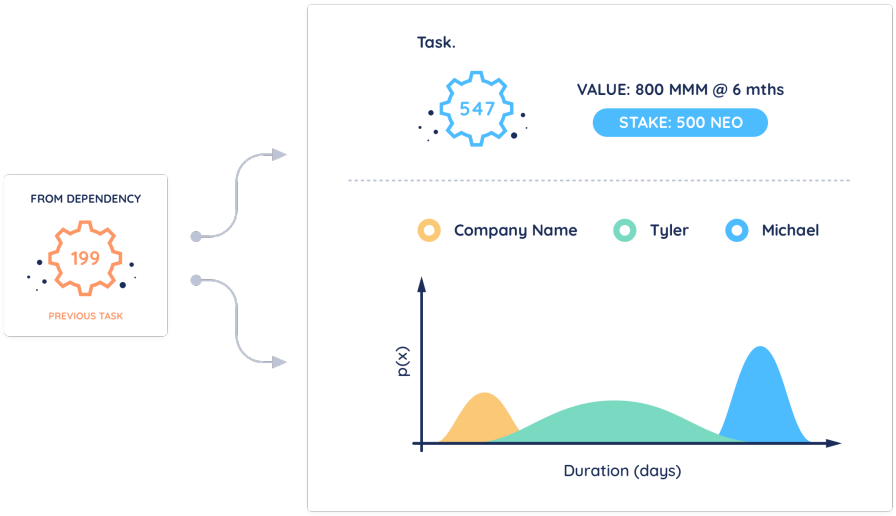

Figure 9: Multiple bids provide the resolver with options regarding task staffing.

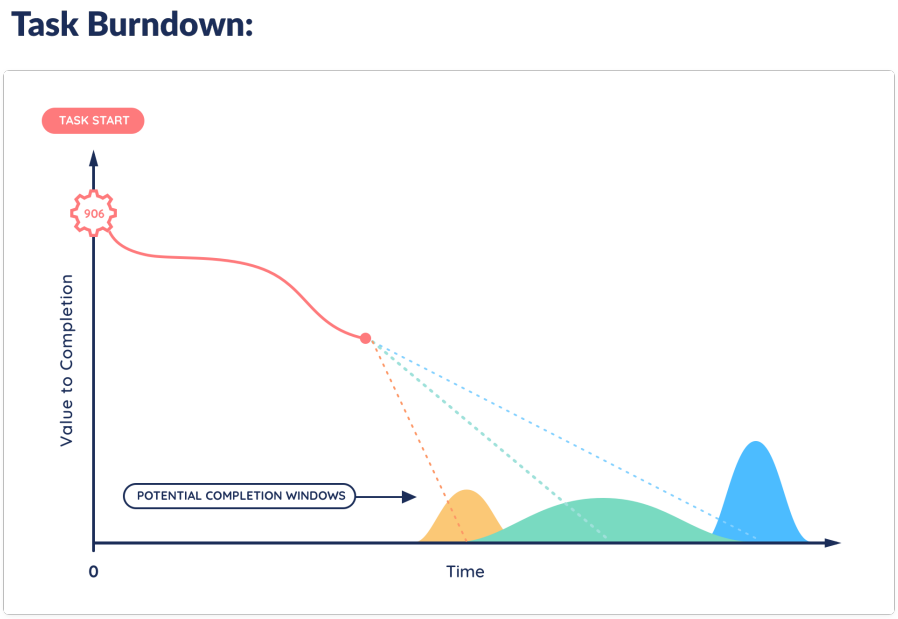

Figure 10: Multiple task bids allow the resolver to evaluate the impact the the task schedule as a response to their selection of a resolver.

By building dashboard applications on top of this data, we can yield support for numerous project management strategies to meet the needs of teams across many different industries. Additionally, by leveraging the public API, users are able to develop their own project tracking applications which leverage the Moonlight dataset.

3.4. Organizational Metrics

The Moonlight platform provides a number of ways to review and improve the health of an organization for both issuers and resolvers. For resolvers, resource allocation is an important feature for organizations to monitor. Allocation to too many tasks can result in schedule slip which will impact the organizations estimation accuracy (as well as their reviews for those tasks). Because of the complexity of the scheduling and matchmaking systems, Moonlight provides tools to simplify the monitoring of allocation for resolvers into an easily digestible format. This functionality is also exposed in the marketplace where resolvers are presented with tasks that meet their search criteria as well as how a bid on those tasks will impact their utilization within the system.

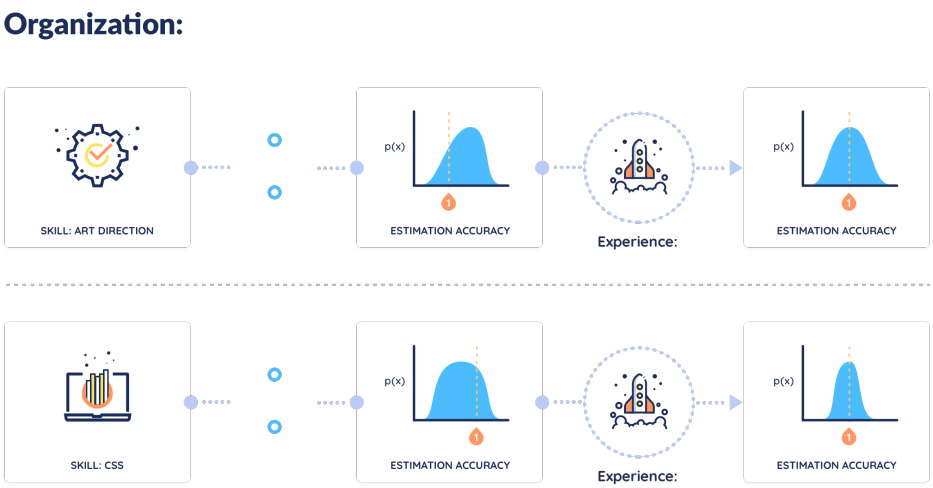

Figure 11: Organizations can review their skill-specific estimation accuracies as a mechanism for self-improvement over time.

By reviewing their profile, organizations are able to review their performance using the numerous objective and subjective metrics that are collected. As users complete tasks and build up their dataset, reviewing this information can provide a number of benefits. Some examples include:

- Subjective reviews can provide insight into interpersonal improvements
- Awarded bids and historical trends can provide estimates for revenue streams from specific skillsets as well as the resolvers future labor burden for awarded tasks.
- Bid accuracy on issued tasks (when normalized) can identify areas of improvement for task definition by the resolver.
- Bid accuracy by the resolver can provide improvements to future bid accuracy which may improve the probability of being awarded tasks.
- Organizational investment by skill and time can provide insight into issuer resource allocation as well as resolver income and skill growth.

3.5. Project Crowd-Funding

The Moonlight platform provides a mechanism to improve project accountability and transparency to stakeholders by using using the organization, issuer-resolver, and remittance mechanics built into the system.
To crowd-fund:

- An organization is created for the issuers. In this application, the issuers represent project stakeholders (both investors and developers).
- Tasks are created by the organization owners to represent 'maturity gates' which a project must complete to unlock funding via the remittance mechanic. As members are added to the organization, they can stake the maturity gates with currency. Depending on task configuration, this system also provides the option for contributors to stake specific tasks/gates they view as important to the project.
- As the project matures to meet the maturity gates defined in the tasks, stakeholders are able to vote on their completion to release funds to the resolvers. Use of other remittance mechanisms also provides different funding strategies for projects to use.

4. Revenue Streams

Three primary revenue streams have been identified for the products outlined in this document. Additional revenue streams have been identified and will be formalized as the project matures.

1. **Remittance:** This revenue stream operates in a similar manner to a currency exchange with the exception that currency is exchanged for resolver utility. In this context, a fee is charged on task completion (or periodic remittance) by the system that is proportional to the value of the transaction. A fraction of these fees are also used to cover exchange fees in the event that the issuers payment is not in the preferred currency of the resolver. The fees imposed are dependent on the currency used for the transaction. For example, the Lux and Gas bare a reduced system fee to support their use. The table below provides a reference for planned fees. Fees are maintained at a currency level to allow the system to present an accurate representation of task values irrespective of variable network transaction fees. Additional static fees may apply and are currency dependent.

Currency	**Base Fee**
Lux	1.00%
Gas	1.00%
Other	2.50%

Table 1: System fees.

The fees defined in the table above are paired (issuer and resolver) to determine the system fee.

- **Example 1:** An issuer creates a task paying in Lux and the task resolver accepts Lux. The total fees would be 2% (1% coming from the issuer side and 1% from the resolver side).
- **Example 2:** An issuer creates a task paying in Lux and the resolver accepts USD. The total fees would be 3.5%.

Note: *Task values presented in the marketplace describe the post-issuer-fee burdened value. The resolver's fee burden is calculated from this value.*

2. **Platform Contracts (Seats):** Moonlight will additionally provide subscription products which grant users with unlimited access to the platform and its applications. This product is designed to support active contributors or corporate entities who wish to use the platform either running on mainnet or an internal privatenet.

3. **Platform as a Service (PaaS):** A product offering will be available to provide hardware and administration of privatenets running the Moonlight platform in the case where data security is critical. In this scenario, all data read and written to the platform is controlled by the service owner.

5. Project Risks

A number of project risks have been identified during planning activities. They are covered here along with some countermeausres.

5.1. Scaling Risks

Technical scaling risks are minimized by implementing a modular architecture (see 6.3 for example). By strictly managing module interfaces and implementing a robust test infrastructure, we can substantially reduce any technical scalability risks on the platform.

The larger risk is a failure to scale the user base. To minimize this risk, project funding will be allocated to subsidize the use the the platform during product infancy. This will guarantee that we receive enough user feedback to develop an exceptional product. A portion of the project funding will also be used to stake a considerable number of tasks on the platform itself (for the realization of new Moonlight applications) to incentivize use. Strategic partnerships with companies in both the blockchain and conventional space are also expected to yield growth in the user base.

5.2. Resume Manipulation

One significant system risk within any ecosystem driven by peer reviews (including Moonlight) is false bolstering of account credentials. In Moonlight, this can occur if an organization publishes fake tasks and resolves them internally, then uses the task value to republish tasks. By doing this, the

organization acquires the task's skills on their resume without actually having the proficiency outlined by the task. This can also occur at a lesser level through the addition of skills on a task which are not representative of the actual work required.

Be aware that there will always be the risk of hiring an unqualified resolver who has exploited the ecosystem. The platform employs a number of countermeasures to reduce this risk as far as reasonably possible:

- Skill growth in the system is a function of the task values (a higher value task generates more 'skill' points on the resume). This mechanic deters the use of free tasks to inflate a resume.
- The system fee mechanic (generated at time of task completion) is designed to deincentivize the use of high value tasks to 'mine' skills on the platform. However, this mechanism does not resolve the 'pay-to-win' scenario.
- Moonlight will be implementing a series of fraud detection algorithms to identify and protect users from fraudulent organizations. Similar systems have been implemented with great performance on other financial platforms.
- User reviews become a powerful tool in combination with (3) when handling fraud. Ultimately, 'pay-to-win' is not a viable strategy to use in a system where the demonstration of competency (through task completion) is required to receive payment. Poor user reviews and reporting when a fraudulent user acquires a real task will ultimately filter out these users at the expense of the schedule slip of a single task.

Similar mitigations are also effective at controlling the temporary addition of a highly skilled resolver to an organization as a means of improving the organization's apparent skillset.

5.3. New User Match-Making

Users looking for tasks without any experience in the desired skill-set will have difficulty using the task marketplace without accommodation by the system. Moonlight will handle this situation (which all incoming users will experience) using a number of different mechanisms:

- The marketplace will not prevent users from finding and placing bids on tasks for which they do not have the required skills. This deregulation allows resolvers to place extremely competitive bids on tasks as a mechanism to offset a lack in experience.
- Moonlight will support unvalidated (off-chain) resume content to represent experience which occurred outside of our ecosystem.
- The Moonlight project will form strategic partnerships with external qualification verification platforms to allow users the ability to build their validated qualifications without prior experience in the Moonlight ecosystem.

5.4. Wind-Up

When bidding on a task, a resolver is estimating the time to completion of the task. If a historical dataset is limited or disagrees, there will be issues with projecting the expected completion time of the task. In this scenario, the platform may choose to provide the bid as a pass-through estimate for the duration of the task with a notification to the issuer that there is not enough data to provide an improved estimate. Another option for an issuer to use is a derived accuracy using skills that are similar to the one being bid on. This option will be available on the system, but issuers should be aware that it may not be representative of the skillset required for the task that is being bid on.

5.5. Estimation Drift

As resolvers work within the system, the estimation accuracy dataset becomes a mechanism for personal improvement. Resolvers are able to review their estimation accuracy data when bidding on tasks as a mechanism to improve the accuracy of their bids. This introduces a bias into the estimates which allows resolvers to self-correct for their bid inaccuracy. Fortunately, this bias can be reduced by accounting for transient changes in the estimates. As drift occurs in estimation accuracy, we can use transient filtering to guarantee that bid corrections track with the current accuracy of the resolver.

Users of the system are expected to have their estimation accuracy distributions asymptotically approach an expected value of 1 for skills which they are actively developing. Error associated with estimate precision is never

expected to be removed from the system, but can be substantially reduced by clear task definition by the issuer.

5.6. Project Roadmap

The Moonlight team is currently tracking three project swimlanes seen in *Figure 12* with dated milestones.

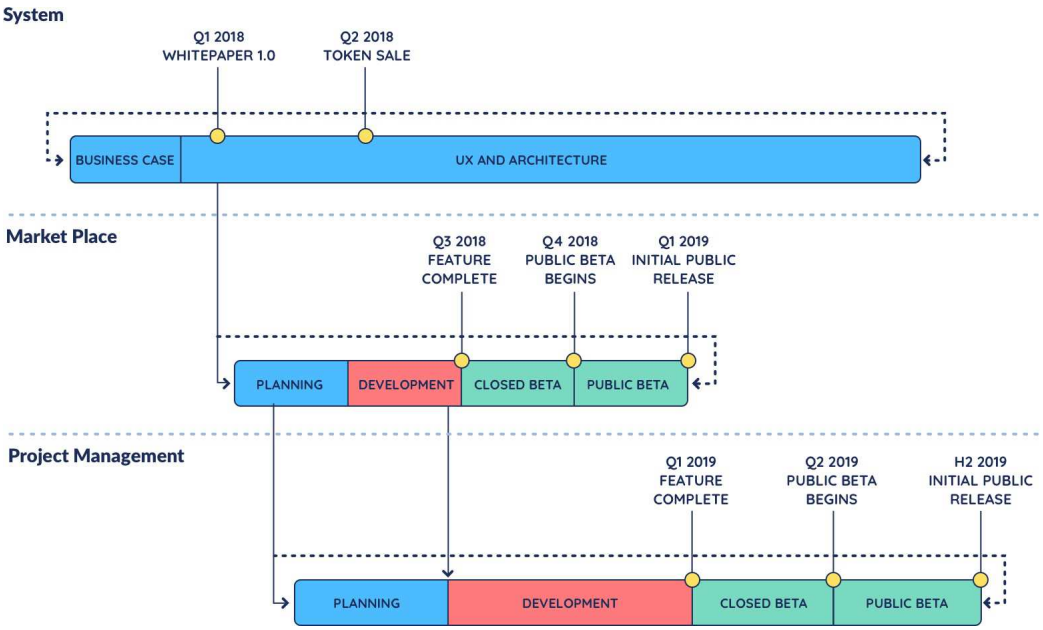

Figure 12: The Moonlight project roadmap.

1. The Business Case and UX/Architecture for the platform will be continuously evaluated and refined to meet changing market needs (defined in the **System** swimlane) which may change the number,scope, and timeline for defined and future product releases.

2. The **Marketplace** swimlane is scoped to include the content defined in *Section 2.0*.

3. The **Project Management** swimlane will include the first set of applications designed to leverage the Moonlight dataset *(Section 3.0)*. Development of this release will utilize the content introduced in the **Marketplace** release to manage task issuance, staffing, and remittance.

6. The Lux Token

Moonlight will introduce a divisible, high supply NEP-5.1 system token called **Lux**. The Lux token will use a similar, multi-token UTXO operating mechanic to Neo and Neon Exchange (NEX) to provide value to token holders. Addresses holding Lux will periodically be awarded GAS proportional to their Lux holdings. The amount of Gas awarded to Lux holders is proportional to the fees collected by the Moonlight project. Additionally, the Lux token will have a utility within the ecosystem. By using the token for remittance, resolvers and issuers will be charged reduced system fees.

By using this token model, we hope to further define a standard for Gas as the primary currency on the Neo platform. Other considered token mechanics (Including the 'growing stable token' proposed in Moonlight Announcement 1) introduce currency competition on the blockchain which is not beneficial to the ecosystem as a whole.

6.1. Contract Overview

The Moonlight platform uses a modular contract architecture as a means of supporting scalability and maintainability. Each contract adds distinct value to the platform and integrates with the other contracts as well as the off-chain systems. To deliver on the **Marketplace** swimlane, we define the first five contracts of the platform:

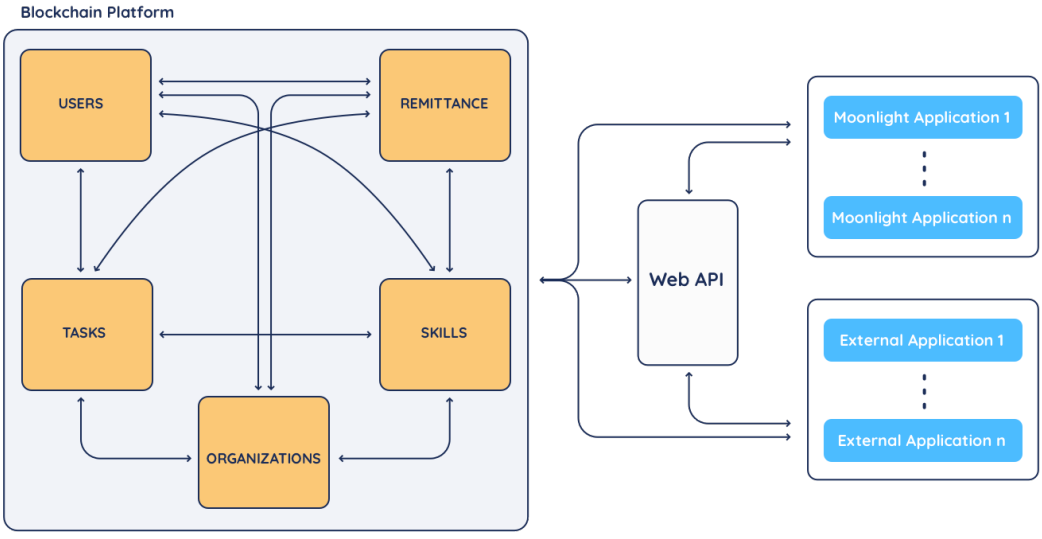

Figure 13: The Moonlight platform implements a modular contract architecture.

- **Users:** The user account contract is responsible for storing information related to Moonlight users such as their profile data and skill associations. Users will have some level of control regarding the visibility of their information to the public and therefore any publicly identifiable information will be encrypted, using a private Moonlight key, and only available via the Moonlight API pending verification of the account owner's preferences.

- **Skills:** The skills contract will define any skill that a user can have within the Moonlight system. These will contain skills defined by Moonlight and arbitrary skills defined by organizations within the system. Skills can belong to another skill allowing the creation of a hierarchy or categorization system. Organizations will have the ability to define the visibility of their custom skills.

- **Organizations:** The organization contract is responsible for the definition of all things related to an organization. This includes the organizational hierarchy, employees and their roles, default payment structure for a contract and public visibility. An organization will have a rating defined by the sum XP of all of its users.

- **Tasks:** The projects contract is responsible for the creation and curation of any task within the Moonlight system. Tasks can belong to another task allowing for the creation of a workflow or a project hierarchy. A task definition includes the type of bidding process, task funding and payout criteria, a progression and completion mechanism and links to the resolvers interacting with the task.

- **Remittance:** The remittance contract allows issuers and resolvers to define, and agree upon, the payout criteria and payment structure for tasks they are involved with.

6.2. Token Allocation

The Moonlight Project will be minting a total supply of 1 Billion Lux tokens as part of contract deployment. No additional Lux tokens will be minted for use on the platform. There will be no bonus provided during the pre-sale event to dissuade exploitative investing habits. Tokens will be exchanged at the following rates during the token sale:

Token	**Exchange Rate**
Neo	2000 Lux/Neo
Gas	800 Lux/Gas
Eth	15000 Lux/Eth

Table 2: The Lux token sale exchange rate.

Allocation of the tokens will be as follows:

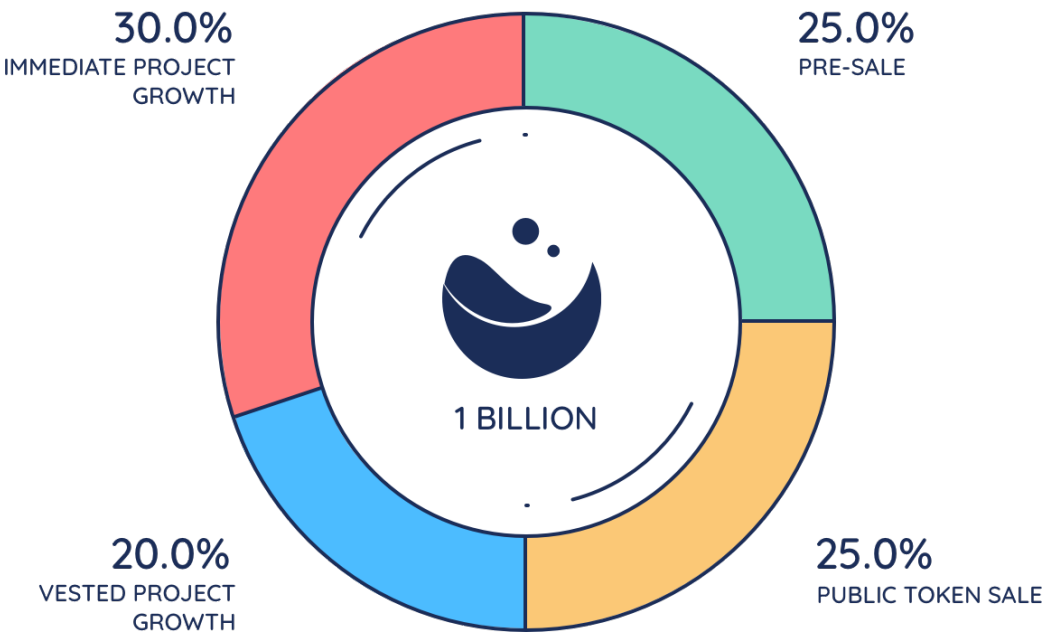

Figure 14: The Lux token allocation.

- **30% Immediate Project Growth:** This allocation of the tokens will be available to the project for immediate growth. The tokens will be used for the following:
  - Strategic Partnerships
  - Core Developer Incentives
  - Advisory and Business Needs
  - Use on the Moonlight Platform to Compensate the Smart Economy Workforce
- **20% Vested Project Growth:** This allocation will be locked in the smart contract for 24 months and will be used to accelerate new project initiatives.
- **25% Pre-Sale:** A token allocation has been made for pre-sale as a means of guaranteeing investors a means of becoming involved in the project. More information about the pre-sale is available on our website.
- **25% Public Token Sale:** A quarter of the tokens have been allocated for a public token sale which will occur in early Q2 2018.

6.3. Distribution Mechanism

The Lux token will be fully NEP-5.1 compliant and will make use of the NEX ICO Template as a means of guaranteeing support for the Neon wallet, the Neon Exchange project, and other interoperability/scalability needs supported by the standard.

- The pre-sale event will accept NEO, GAS, and ETH. Current exchange ratios are available on the website.
- The public token sale will accept both NEO and GAS.

During pre-sale and public-sale, there will be a maximum token supply for which an individual may acquire to guarantee token entropy in the ecosystem. This amount will be published on *moonlight.io*

All information regarding project architecture, project status, and token sale will be available on the Moonlight website. Other resources for this information should be treated as a secondary sources with reference back to the original content provided on the website.

6.4. Vesting

Two sets of tokens will be vested in the system:

- **Pre-Sale/Public Sale Tokens:** Tokens distributed to the community will use a tiered vesting mechanism. This mechanic is designed to dissuade exploitation of the token sale for fast returns which is unhealthy for the ecosystem and leads to extreme value fluctuations on initial exchange availability. This mechanic also prevents exploitation of public sale participants by those who have contributed to the presale.

Token Sale Quantity	**Vesting Schedule**
0 - 250,000 Lux	Immediately
250,001 - 5,000,000 Lux	Token Sale End + 3 Months
5,000,001+ Lux	Token Sale End + 6 Months

Table 3: Lux tokens acquired during the token sale are waterfall vested.

  - As defined in the table above, the first 250,000 Lux acquired during the token sale will be immediately available for use by the purchaser.
  - After 3 months, any tokens in excess of 250,000 Lux, but less than 5,000,001 Lux will be vested and available for use by the purchaser.
  - Six months after the token sale, any remaining Lux will be vested and available.

  Note: *The table above represents the planned mechanism. Community members interested in the token sale should visit moonlight.io to verify the most current information prior to participating.*

- **Vested Project Growth:** A fraction of the project growth tokens will become available to the project team as a means to fund project growth at 24 months.

7. User Needs

- **UN001** - The system shall provide a fair and public marketplace for the creation and staffing of projects.
- **UN002** - The system shall provide tools to facilitate match-making activities between projects and contributors.
- **UN003** - The system shall provide project definition tools which clearly define expectations to contributors.
- **UN004** - The system shall provide a mechanic for project owners to evaluate the impact of crashing a project.
- **UN005** - The system shall provide a mechanic for projects to compensate contributors in a verifiable manner prior to the commencement of works.
- **UN006** - The system shall track project contributions and provide them, optionally, as public ledger for proof of experience by the contributor.
- **UN007** - The system shall support integration with major project coordination and staffing platforms.
- **UN008** - The system shall incentivize usage of in-system assets.
- **UN009** - The system shall leverage the NEO blockchain as a public ledger.
- **UN010** - The system shall implement measures to protect project owners and contributors from dishonest practices.
- **UN011** - The system will give contributors the ability to form an organization that can bid and quote on projects.
- **UN012** - The system will have a reputation / rating mechanism to indicate the experience / trust that a project creator or contributor has.
- **UN013** - The system will provide a safe means of communication between project owners and contributors.

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