Crowd Sourcing

Enabling the Next Generation of Services

Whitepaper by Nokia Global Services

Primary Contact: Russell Laughton (Russell.laughton@nokia.com)
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1. The New Service and Delivery Dynamic

As the traditional Telecommunications services market fast becomes a commoditized business, where all key service providers, such as Nokia, are challenged to both offer new value services, as well as deliver in an environment of falling prices and higher delivery quality expectations set from the Telco Operators, the pressure to innovate new offerings and a new way of delivering these and existing services has become overdue and a necessity to maintain market share in the next following years for traditional market segments as well as entering into new market domains.

2. An Opportunity to Create and Offer New Services

In order to differentiate themselves (or to add unique value towards their customers), service providers look for the next ‘market hungry’ services product that will give them longevity within the market.

For a traditional Telecommunications service provider, this may mean focusing on new markets such as Enterprise, Health, Public Safety, and Security. Or it could be a focus still within the Telco domain though triggered by the change in technology (NFV and Cloud influence).

The challenge or a boundary many face, is the feasibility to gain the skills required to create, design, deliver the new service product, and can influence the decision to launch due to the cost of creating this skill within the company itself. Typically, a core services product, and the criticality and value of it, was deemed to be delivered by resources within the company itself, and on occasion using targeted sub-contracting companies that were in preferred partnering agreements.

3. A Focus on Delivery of Existing Services

Incremental optimization of the current industry standard delivery model for operational services no longer keeps pace with the Telco Operators price and quality expectations.

Automation and process optimization have been, and still will be key levers for delivery model enablement and enhancement, though the organizational resourcing solution is where the next leap of innovation is required.

Distribution of these resources into lower cost delivery regions has been part of the journey, and has achieved a step change historically in the ability to deliver to the price expectations, though this now is getting to be a narrower option as the demand for such region resource profiles starts to create cost uniformity and this differentiation is lost, between the service providers as well as between the service providers and the Telco’s themselves. It also narrows the ability to attract a larger range of skills, both in terms of competence profile and overall scale.

4. The Trend

Looking outside the Telco market domain, we can see the trend immersing with opening up resourcing solutions through the use of free lancing engagement models, where services are provided through a work federator who creates a pool (or Crowd Sourced Workforce) of skilled resources and effectively brokers out resources to the paying client while potentially managing the overall deliverable.

The market breadth of free lancing is very present, with many solutions available for everything from graphic design, document copy writing, through to IT help desk service centers.
Within these, the federator can either play a simple resource brokering role and then effectively step out of the delivery process (as in the case of 1 off pieces of work like graphic design projects), or the federator actively takes part and orchestrates the solution towards the client as well as managing the required outcomes from the Crowd Sourced Workforce environment.

- By 2025, half of the workforce will be millennials
- 53 million Americans are doing some degree of contract work
- $1.1 trillion was earned by independent workers in 2014

Source: Ardent Partners

Source: WorkMarket

Figure 1. Future Evolution of Contractor Market

Market Trends and Drivers
- Time to Commodity shorter and Market evolution on products „Easy to install“
- New disruptive Markets, e.g. IOT Services
- IT Industry is driven by free lancers while complexity of the environment is increasing and access to knowledge is key
- Customer Experience

Issue evolving
- Price Erosion and cost pressure as we are using high skill
- Control Point: as no Services offer to this market to consumer
- Transparency and access to skills and talents
- Service to Consumers

How Crowd Sourcing can help
- Competition of crowd, cost reducing in line with pricing. Leverage the crowd for low complexity tasks.
- NOKIA Crowd aaS (Broker)
- Agile access to talents, leveraging the wisdom of the internal crowd and access to knowledge
- New service offering by NOKIA, access to consumer market and reduce churn for CSPs

Figure 2. Mapping Market Trends to a Crowd Sourcing Solution
5. Addressing the Opportunity / Challenge

Crowd sourcing can give options to access new ranges of skills to offer the new value services, as well as giving efficiency options in the delivery of existing products.

Nokia is establishing its crowd sourcing capability, both in creating an internal and an external crowd to take full advantage of the flexibility of crowd sourcing approach.

This will allow Nokia to:

Address new market products through ability to expand the Global Services portfolio:

- Being able to offer new services through the ability to access new skills not available or not to be established in Nokia.
  - Multivendor VNF Cloud Operations and Support
  - Security Operations
  - IOT Eco-System and Solutions
  - End Customer Device Support (Field)
  - Enhanced Operations through End Mobile Device analytics
  - Operations Analytics

Address existing market products more widely across the globe:

- Being able to offer current services to a wider geographic area through the ability to access additional skills through wider resource pool (not present in Nokia).
  - Remote Incident Resolution
  - Performance Management and Reporting
  - Remote Network Configuration
  - Multi-Vendor Operations and support for Juniper, Cisco, Avaya, and other prominent enterprise technology suppliers.
  - Field Fulfillment and Assurance Services (on Site – active and infra).
  - Legacy Network Operations and Support
  - Spares and Hardware Management Services

Address existing market products more efficiently:

- Improving cost of delivery for selected activities.
  - Remote Incident Resolution
  - Performance Management and Reporting
  - Remote Network Configuration
  - Field Fulfillment and Assurance Services (on Site – active and infra).

Nokia is positioning 2 business models to take full advantage of the crowd sourcing capability:
**5.1. Crowd as a Delivery (CrowdaaD)**

This is a business model where Nokia directly uses free-lance crowd participants to deliver selected activities (on site and remote) for project delivery. Nokia would use the crowd sourcing platform to engage, match and assign work to the appropriate registered free-lance crowd participant.

Nokia would manage the crowd participants’ competence profile to ensure fit for purpose capability is matched to the required tasks.

- e.g. Nokia wishes to optimize the cost of field maintenance activities in a particular project and to establish a freelancing crowd community who are skilled and available to perform a set of field maintenance tasks on site in a certain area.

- e.g. Nokia wishes to launch a new services product for the remote support of IOT device aggregation network assurance and configuration and currently does not have the skills ‘in house’ to provide this. Nokia will establish a crowd community with the appropriate IOT based skills to deliver this service.

- e.g. Nokia wishes to expand its capability to operate and support MV legacy network solutions though does not wish to establish permanent employees in house for this given the scale and volume of work. Nokia will establish a crowd community of MV legacy experts to deliver this service.

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<th>Benefit</th>
<th>Crowd as a Delivery model (CaaD)</th>
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<td>- Delivery efficiency improvement</td>
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- Improved utilization of existing resource pools (internal employees and partner SubCon), with future potential to leverage external individual talents.  

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<thead>
<tr>
<th>Scope</th>
<th>Crowd as a Service (CaaS)</th>
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| - Start with Internal Workforce & Partner SubCons  
- In future external individual talents |

<table>
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<th>Population</th>
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| - Int CaaD: Commitment of completion  
- Ext CaaD: SLA adherence, Building the crowd for individuals  
- Documentation SoW for each task, Checklists and Instructions |

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<th>Challenges</th>
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| - Partnership or buy PaaS with external Crowd platform provider.  
- External private individual talents. |

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<tr>
<th>Approach</th>
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| - Partnership with external Crowd platform provider.  
- Building the talent pool  
- Proper legal T&C in place for each country  
- Customer (CSP/ASP) immediate engagement  
- Leverage offer as enabler for Smart Home solution (FN) and complement it with value add products (A&A) |

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<th>Timeline</th>
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| - PoC completed by Q1_2017  
- Extend to other countries (ext.) and to GS (int.) from Q2_2017 |

- New revenue stream
- Improve customer experience and reduce operator Field costs by providing a platform as a service that allows operators and end-users to Leverage the private talent crowd for simple onsite tasks with no liabilities from NOKIA or Operators.

- Partnership with external Crowd platform provider.
- Customer (CSP/ASP) immediate engagement
- Documentation SoW for each task, Checklists and Instructions

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Figure 3. Nokia Business Models
5.2. Crowd as a Service (CrowdaaS)

This is a business model where Nokia sells the crowd sourcing technical capability to a customer who is looking to set up a crowd sourcing solution.

e.g. A Telco Operator wishes to establish a low cost support service for customer in house equipment support (e.g. DSL modem) by identifying and matching free-lance crowd participants with the end customer requirement.

Nokia would provide the platform capability to the Telco Operator for them to enable this service, as well as provide admin type support for the platform.
For Business Model 1, (CrowdaaD), the customer is external and is our Global Services Customer Market, for the existing Nokia products as well as new product offerings enabled by Crowd Operations. Global Services Market Customer Profiles such as:

- Telco Operators
- GEPs Operators
- Enterprise Operators

CrowdaaD business model can be applied internally also, where Nokia employees can be part of an internal crowd community that is available to support requirements wider than their current scope if they possess the right skills. This can also be used in an approach for the person to work on a project to enhance their knowledge and skills and update their experience, while they do not want to change their current job inside Nokia.

It can also be used for non-customer project type work such as creating internal knowledge management collateral for further sharing across Business Units, or running internal analysis activities for business support.

For Business Model 2, (CrowdaaS), the customer is external and has a profile of a service provider in their own right, e.g. a Telco Operator or an Enterprise Operations Centre.

In summary:

### CaaD - Nokia Sells a Service Outcome to the Customer, enabled by Nokia Crowd Sourcing Capability

- Customers are purchasing an expected outcome from Nokia.
- Nokia are accountable for supplying the outcome to the Customer.
- The Customer has no direct interaction with the crowd community or Nokia resources used to deliver the outcome.
- Examples of use of business model are:
  - Customer requests 1 off project work (complex and non complex)
  - Customer requests function execution (ongoing work execution)

### CaaS - Nokia Sells its Crowd Sourcing Capability to the Customer, for the Customer to Use Directly

- Customers are purchasing the right to use Nokia Crowd Sourcing Platform and eco system.
- The Customer ‘self orchestrates’ the sourcing of the required resource themselves through use of the Nokia platform.
- Nokia are not involved in the transaction or the outcome required by the customer.
- Examples of use of business model are:
  - Customer requires a specific resource competence to produce a report.
  - Customer requires a specific resource to send to a client premise for support.
6. Value

With the adoption and inclusion of Crowd Operations as an enabler within Nokia Global Services portfolio, flexibility and availability of the addressable workforce is drastically improved. This in turn allows Global Services to expand its portfolio offering through the ability to source a wider range of skills not previously available, creating additional value to our customers in the terms of a wider range of services offered.

It also allows Global Services to ‘mix and match’ delivery resourcing solutions with the in scope activities to be delivered, giving both an improved cost of delivery profile as well providing an added range of service levels through increased resource flexibility / availability.

As customers become more confident and trusting of this resourcing approach, they will expect the same service flexibility and cost optimization offerings in higher value services, and within the more complex services industry market, such as the Telco and Enterprise services market.

It is also important to understand how CSaaD model is positioned with our customers and how the benefits are reflected to them.

‘Crowd Sourcing ≠ Less Cost Delivery’ and we must manage this expectation of customers.

In fact, crowd sourcing is a way of sourcing highly valued skills and competence that bring additional benefit to customers, such as engagement and availability of technical support skills for legacy and rare technologies customers are still running.

In some cases, where the activity that is crowd sourced is of low value to both the customer and Nokia, customers may expect a ‘passed through’ price discount from the use of a Crowd Sourcing approach, and in some cases this may be relevant though not to the detriment of Nokia’s benefit and profitability for adopting the delivery mechanism.

Adopting Crowd Operations will mean Nokia can be first to market in offering its services through leveraging the Crowd Operations model.

Being first will mean we will have the greatest impact in terms of attracting the needed freelancing crowd community and thus gaining the most crowd community scale and in turn providing Nokia’s customers with the most flexibility and cost optimization.

7. Model Applicability

It is envisaged that the Crowd Sourced Workforce sourcing model will not be applicable for all scenarios, and factors of network element scope and criticality, legal boundary analysis, and customer position will all influence what final scope of activities are deemed for Crowd Sourced Workforce sourcing.

In another dimension, Crowd Sourced Workforce sourcing can be used from a transaction volume management point of view also, creating a resource pool to handle peaks of transaction volumes for in scope activities.

As Crowd Operations is a solution that will bring value across many of the business groups within Global Services, internal collaboration is key driver to ensure all requirements are understood, and that a solution (capability and surrounding eco system) will deliver to all stakeholders.
8. Use Cases Examples

The following represent crowd sourced enabled use cases that could be delivered within the Nokia Managed Services portfolio:

### New Product Use Cases:

#### 3P VNF Cloud Operation - Use Case Detail

| Use Case Descriptions | 1. Perform testing and integration services of 3P VNF application into customer Cloud environment.  
2. Provide ongoing technical support for 3P VNF applications present in a customers cloud solution. |
|-----------------------|--------------------------------------------------------------------------------------------------|
| In Scope Devices      | • VNF – vIMS 3P Product  
• VNF – vCPE 3P Product  
• VNF – vEPC 3P Product  
• VNF – vHLS 3P Product |
| Target Market         | • Telco Cloud  
• GEPs Cloud |
| Business Model Options| • Nokia Sells a Service Outcome to the Customer, enabled by Nokia Crowd Sourcing Capability. |
| Crowd Required        | • Specific 3rd Party technical specialists. (internal and external) |

#### Managed Security - Use Case Detail

| Use Case Descriptions | 1. Carry out intrusion and vulnerability testing.  
2. Perform security risk audits with recommendation reports. |
|-----------------------|--------------------------------------------------------------------------------------------------|
| In Scope Devices      | • Mobile Telecommunications Networks  
• Wireline Telecommunications Networks  
• WAN / LAN / VPN Solutions  
• Cloud / Hosted Networks |
| Target Market         | • Telco  
• GEPs |
| Business Model Options| • Nokia Sells a Service Outcome to the Customer, enabled by Nokia Crowd Sourcing Capability:  
  ‒ By nature, customers would typically expect Nokia to take accountability for such activities as to ensure competent delivery of the outcome. |
| Crowd Required        | • Qualified Security Experts. (internal and external) |
## Client IOT Device Support - Use Case Detail

### Use Case Descriptions
1. Install IOT devices in client environment.
2. Remote diagnose IOT devices.
3. Repair / Replace IOT devices in client environment.

### In Scope Devices
- Cameras
- Sensors (sound / light / smell)
- Activation devices
- IOT Aggregation points

### Target Market
- Smart Cities
- Healthcare
- Agriculture

### Business Model Options
Both Options are available:
- Nokia Sells its Crowd Sourcing Capability to the Customer, for the Customer to Use Directly
- Nokia Sells a Service Outcome to the Customer, enabled by Nokia Crowd Sourcing Capability

### Crowd Required
- Field engineers with experience in in-situation IOT device installation and maintenance. (external)

## End Customer Access Device Support - Use Case Detail

### Use Case Descriptions
1. Install End Customer Access and CPE devices in the field, including in customer premise.
3. Repair / Replace End Customer Access and CPE devices in the field, including in customer premise.

### In Scope Devices
- CPE including BB Modems / STB’s
- Small Cells / Pico Cells
- FEMTO

### Target Market
- Telco
- GEPs

### Business Model Options
Both Options are available:
- Nokia Sells its Crowd Sourcing Capability to the Customer, for the Customer to Use Directly
- Nokia Sells a Service Outcome to the Customer, enabled by Nokia Crowd Sourcing Capability

### Crowd Required
- Field engineers with experience in in-situation CPE device installation and maintenance. (external)
## Existing Product Use Cases:

### Legacy Network Operations - Use Case Detail

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<tr>
<th>Use Case Descriptions</th>
<th>1. Provide remote expert technical support for legacy Nokia network equipment.</th>
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| In Scope Devices       | • Legacy Nokia Mobile Telecommunications Networks  
                          • Legacy Nokia Wireline Telecommunications Networks |
| Target Market          | • Telco  
                          • GEPs |
| Crowd Required         | • Technical engineers qualified in operational support and troubleshooting of a particular Nokia legacy technology. (internal and external) |

### Multi Vendor Network Support- Use Case Detail

| Use Case Descriptions | 1. Provide remote expert technical support for trouble shooting and issue resolution of Multi Vendor / 3rd Party network equipment.  
                          2. Provide on site expert technical support for hardware diagnosis and replacement of Multi Vendor / 3rd Party network equipment. |
|------------------------|----------------------------------------------------------------------------------------------------------------------------------|
| In Scope Devices       | • Multi Vendor Mobile Telecommunications Networks  
                          • Multi Vendor Wireline Telecommunications Networks |
| Target Market          | • Telco  
                          • GEPs |
| Crowd Required         | • Technical engineers qualified in operational support and troubleshooting of a particular Multi Vendor product. (internal and external) |

### Field Operations Infra Support- Use Case Detail

| Use Case Descriptions | 1. Provide in field maintenance, repair, or replacement for infrastructure power, heating and lighting environment.  
                          2. Provide in field maintenance, repair, or replacement for site environment up keep. |
|------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| In Scope Devices       | • Physical Site Maintenance including:  
                          - Cleaning  
                          - Minor building repair  
                          - Power, heating, lighting |
| Target Market          | • Telco  
                          • GEPs |
| Crowd Required         | • Field engineers qualified in physical site maintenance activities (electricians, cleaners) - External |
9. Conclusion

Crowdsourcing models are being considered by many service providers across multiple markets, and it will become a reality within the Telco services market in the very near future because of the pressures to innovate delivery and the need to explore new service products to differentiate service providers.

All Service Providers must examine their products, current and future, and set strategic direction into how a crowd sourcing model may support these going forward.

Nokia are on the journey to embrace crowd sourcing as another part of how it enables products, old and new.

Business model options are formed and applied determined on what best makes business sense for the end customer, for Nokia, and for the crowd (internal or external).

Crowd sourcing is being treated as both a way to access competence to drive quality and efficiency in the delivery of existing products, and as a catalyst solution to launch new products that may have been previously ‘out of reach’.

Nokia are well on their way to take full advantage of such a crowd sourcing model to future proof its value to its customers in both the existing markets and new emerging markets.