**[A. Product](https://kathmanduchallenge.org/mvp/nigraani?destination=/user/229" \l "undefined)**

**Explain the stage that your product/ prototype is in.**

Having completed the idea pitching phase, our product is in the development phase. Prototype of it was displayed in the 16th National Technological Festival, LOCUS, and we received positive reviews about it. We have been trying to incorporate all those suggestions and propositions in the prototype as far as possible.

Currently our product is supported on on desktop platform and we are enhancing it to be accessible through website . The complexity of the  machine learning algorithms and computer vision restricts it to be enabled on various architecture. As our desktop app worked perfectly . Soon we  will be making it available around globe via Website.

**Explain overall features and functionality of your product/ prototype.**

Human life has been totally altered and much bettered with the advancements of science and technology. And large offices with numerous employees can remain no exception. Our idea "NIGRAANI" vows to replace the traditional attendance system including finger print system as well.

**Face and gesture based auto attendance and monitoring with live cloud based data update**

In this system employees need not to finger print for the attendance. As he/she enters in the office, his/her face is recognized and that updates the attendance. This system makes employees and officials accountable to their work as their continuous monitoring system on them.

**IOT based gesture controlled devices**

A large no. of fans, heaters, bulbs, laptops, desktops servers are being run in the office. These all operations of ON and OFF is to be done manually. But in this system, through the use of gestures and mobile phones, these devices shall be turned ON and OFF automatically. This system also detects the presence of person in the cabins or rooms and these devices will act accordingly. Meaning, no person in the room, all gadgets are OFF, you enter the office and they run automatically

#No. of employees prediction on certain day using data from previous days' data

**Central monitoring of various offices status within the entire area or city**

This monitoring system works in hierarchical order. The high level officers shall have access to the camera data of employees working in lower hierarchy thus monitoring their work and providing recommendations when needed.

**Explain technical architecture and framework for your product/ prototype.**

Our  product-service system shall have**hierarchical order** of monitoring system. For this purpose, we shall have**admin management website** for high level official in the office of in the entire city which will be embedded with videos of live CCTV cameras and also the attendance sheet of the organization.

For the employees and officers, their will be**account login system** in which their status as an employee will be recorded.

The technical frameworks we use are **NodeJS** for server hosting, **Python** for machine learning and AI algorithms along with web front end languages like **HTML**,**CSS**, **Bootstrap**, **Javascript** & **JQuery** for the system.

Similarly, the database used under our system is **MongoDB**(NoSQL). In the same manner the feature of IoT is obtained using Raspberry pi coded with python having relay connected to its output pin(s).

**What are the innovative technical features that you have in your product/ prototype ?**

**Computer vision**

Computer vision is an interdisciplinary field that deals with how computers can be made to gain high-level understanding from digital images or videos. From the perspective of engineering, it seeks to automate tasks that the human visual system can do. Computer vision is concerned with the automatic extraction, analysis and understanding of useful information from a single image or a sequence of images. It involves the development of a theoretical and algorithmic basis to achieve automatic visual understanding. As a scientific discipline, computer vision is concerned with the theory behind artificial systems that extract information from images. The image data can take many forms, such as video sequences, views from multiple cameras, or multi-dimensional data from a medical scanner. As a technological discipline, computer vision seeks to apply its theories and models for the construction of computer vision systems.

**Machine learning**

Machine learning is the scientific study of algorithms and statistical models that computer systems use to effectively perform a specific task without using explicit instructions, relying on patterns and inference instead. It is seen as a subset of artificial intelligence. Machine learning algorithms build a mathematical model of sample data, known as "training data", in order to make predictions or decisions without being explicitly programmed to perform the task. Machine learning algorithms are used in the applications of email filtering, detection of network intruders, and computer vision, where it is infeasible to develop an algorithm of specific instructions for performing the task. Machine learning is closely related to computational statistics, which focuses on making predictions using computers.

**Data science**

Data science is a multi-disciplinary field that uses scientific methods, processes, algorithms and systems to extract knowledge and insights from data in various forms, both structured and unstructured.

Data science is a "concept to unify statistics, data analysis, machine learning and their related methods" in order to "understand and analyze actual phenomena" with data.It employs techniques and theories drawn from many fields within the context of mathematics, statistics, information science, and computer science.

**IoT**

The Internet of things  is the network of devices such as vehicles, and home appliances that contain electronics, software, sensors, actuators, and connectivity which allows these things to connect, interact and exchange data.

The IoT involves extending Internet connectivity beyond standard devices, such as desktops, laptops, smartphones and tablets, to any range of traditionally dumb or non-internet-enabled physical devices and everyday objects. Embedded with technology, these devices can communicate and interact over the Internet, and they can be remotely monitored and controlled.

**What technical feature of your product/ prototype will ensure that your target audience finds it usable and relevant?**

* No need of **thumb print** for the attendance in the office,
* Automatic electrical, electronic gadgets control; replaces manual process of turning them ON and OFF, detects person in the cabins or office, if nobody, everything is OFF, if somebody enters, ON as required, **Energy Save**
* Close look monitoring of the employees, laziness, **frauds** will be rightly reported to the higher level officials
* Cross **inspection** need not be done going right into the office, Eg. the Chief District Officer can monitor the behaves of Municipality officer sitting right in his office.
* Various **corruption** related bad deeds happening in the office hours can be monitored. For eg. if we provide the monitoring system to the branch head office of Commission for Investigation Of Abuse of Authority of all government offices of that area, corruption minded officer or client will surely hesitate.
* It helps in **time management**of the staffs and visitors providing real time data scenario
* At last, a teacher enters inside the classroom, scans once through the entire class and the reading it gives is the total **number of students present.**

This system if properly implemented will make all employees accountable to their work and thus increases the administrative efficiency.

**If your product/ prototype also has technology, explain how it works.**

We will be using open source library, **OpenCV** for the purpose of image recognition in our product

Similarly, we will be using Amazon Web Services(**AWS**) platform for deploying all of our product's parts and architecture.

**Explain how will you scale up your product to support huge user base.**

We will use cloud based architecture, i.e.**AWS Lambda** feature in order to tend it towards cloud infrastructure. Similarly features like**Amazon Timestream** along with Amazon IoT Core under AWS platform can be used to scale up our IoT work. In same manner, later we may use Deep learning based**Amazon Rekognizer** feature when we launch it as a product that is really accurate that any modules we use.

**Is your idea similar to any users solutions? If yes, what is it?**

CCTV monitoring system may have been implemented but it does not provide any real time data worth considering. We reckon this as the most scientific and modern approach of administrative management.

**File Upload (Use this field to upload any relevant files and documents like flowcharts, technical specifications.)**

**Visit to Ministry of communication and information technology.**

Current attendance system: E-attendance (By **Thumb**)

![](data:application/octet-stream;base64,)

**Description:**

**-**Attendance through thumb

**-**Done when you enter in department and when you leave department.Hence thumb attendance takes more time and is tideous.

- In the interval during entry and exit no monitoring.

![](data:application/octet-stream;base64,)

* This existing system can be replaced by our project for enhancement of e-attendance

**Discussion about our project with:**

**Computer officer :Indra Prasad Mainali**

![](data:application/octet-stream;base64,)

[**B. Business Model**](https://kathmanduchallenge.org/mvp/nigraani?destination=/user/229#undefined)

**What opportunity are your product/ prototypeing in?**

Basically, our idea is a product-service compromised system. This is a new and innovative approach incorporating the latest technologies that assure us of the cent percent safety. The following points will highlight the standing out of our product-system.

* There is no such system as effective monitoring in various public and private administrative offices.
* The present system like thumb print is time basis, and also some defects such as      have been found in recent world,but our system is fully automatic and eliminates such defects.
* Our system being IOT based, saves manual labour, energy.
* Increases security at security concerned areas like parliament , president house, embassies, and so on

**How does market/environmental factors support your business model?**

Today's world is the world of effective administration. Organizations and government offices failing to do so, circulates negative impact of them and public raise question on those ineffective conduction of the duty.

In the earlier days, attendance system on register were supposed to be traditional. However if we think about future, thumb print system is also bound to be obsolete.

An officer, mostly prevalent in governmental sectors, may be deceiving from higher level officials about work. This system keeps eye upon them and all and will be rightly caught for their misdeeds.

Secondly, a man, a peon , a guard or even the officer may forget to turn off the lights, fans, heaters, coolers, computers. This causes waste of energy. Our system detects the presence of man/woman in the office and those gadgets act accordingly.

**Market Size and Growth potential.**

Our product is a service system, service system that increases administrative efficiency. Initially we have targeted 50 private organizations and all 32 ward offices(if permitted). This is a scientific approach and is bound to succeed. As it succeeds, we will shortlist the offices eager to increase administrative efficiency and provide maximum quality service to their customers and then implement the system.we also planned to implement it in parliament and president house for monitoring various entries and exits. In addition with security alert feature for guards

**Competition or probability of competition in future?**

Strictly saying,there is no such thing as competition in context of our idea; our idea being a system to enhance administrative efficiency of a organization. However, we can't write off any idea or a team that may come up with the better solution to this one.

CCTV cameras, thumb print system, manual control of electronic gadgets are prevalent system. We intend to substitute those with more holistic approach.

Private organisations like Google amazon

**Value Proposition**

Basically, its a feature of an organization for the employees to abide by the rules and regulations. The employees need to be accountable to their work and be responsible towards their duties. Similiarly, the manual task of operating electronic devices is solved by this product service system.

**Target market variables**

Our target market variable is the demographics of organizations, no. of employees present in those organizations and security.

**Mission, Vision of your business/venture**

"Automatic" and "Time saving" is what humans have always wanted. And our system incorporates those issues along with Energy saving.

Our product-service system "NIGRAANI", is the venture of modern scientific methods and tools. It uses Computer Vision, Internet of Things(IOT), Data Science, Machine Learning, Cloud based server, etc. which are modern science elements. There is also open road to modifying changes according to the need of future.

**SWOT analysis of your idea/business model/team**

Our strength is our modern technology.

Our weakness lies in the implementation hindrances.

This system having used up- to- date technology, there are great opportunities of flourishing.

**Marketing plan**

We can incorporate the following marketing strategies.

* Word of mouth
* Social media marketing
* Visual marketing
* Paid search advertising

**Revenue Structure**

Our main source of income will be the sale of our system on contract basis to the governmental and private organizations.

Also,from organisations who will product like database charge.

**Cost structure**

Cloud-600 per GB

Software-30,000

IoT devices-3000

**How do you plan to retain customer and build good customer relationship?**

Our customers are the organizations where large large no of employees work. The effectiveness of our product service automatically uplifts the good relationship between we vendors and our customers. However timely update of the system addresses their increasing demand and we have the capability to do that.Also, we can demonstrate the no of customers satisfied with the organizations' work rate and how it has affected the peoples life.

**Sustainability**

Our product-service is based on the latest technology that determines to substitute the outdated methodologies of administrative management. Also it has the features of expandibility that make it dynamic with time.

[**C. Operation Plan**](https://kathmanduchallenge.org/mvp/nigraani?destination=/user/229#undefined)

**Where do you intend to use your product/ prototype primarily?**

We would like to use this product in the organizations where there is high chance of irregularities in the attendance of the employees or attendees like CDO office, metropolitan office, constituent assembly and any other governmental or private organizations.

It can also be used in the educational institutions like schools and colleges for the monitoring of attendance and activities of students and staffs too.

**Do you think that your product/ prototype can be scaled in any other locations? If yes, where?**

Definitely, our product can be scaled in other locations. We can use this product in any other organizations where security and punctuality is a prime concern.

**What are the key processes/ activities involved in your business ?**

Our proposed system is more of a service than business. Nevertheless, our group will do several activities in order to maximize its expansion as wide as possible. Firstly, we will get proposed from organizations for implementing this monitoring system in their offices. Then we will analyse their office regarding structure, layout of cabins, no. of employees, capacity of office then install the required components. After the successful installation, we will perform acceptance testing for them and describe the guidelines and specifications. We also provide timely maintainence and upgrading of the system.

**What are your estimated timeframe for scaling up?**

Currently, we are in the prototype phase, or say developing phase. As it grows up to be a product, we will definitely like to expand it. The scale up time may be estimated as per the features required and resources available.

**Explain your organizational structure and job description in brief about each key members in organization**

We are a bunch of students working for this project to make it take the best shape it can.

As a student, we have the energy to learn everything that comes along the way and make this product better. The work has been divided among the team members. Works of Machine Learning and Computer Vision, Web Development, IOT and Research and Law has been assigned to each key members and every individual has understood their role and has been handling their respective area so good so far. The coordination among the team members has also been fantastic. We might be good as an individual but we are definitely better as a team.

**What is your plan of taking market feedback and refining your business model in medium term?**

We would always like to listen to the feedbacks of the product. They are the things that help us grow. The feedbacks and reviews will let us know where we might have gone wrong and where we should be focusing to make a better product out of it. We will be filtering the bugs and also adding the new features if that is necessary.

[**D. Legal and Institutional Setting**](https://kathmanduchallenge.org/mvp/nigraani?destination=/user/229#undefined)

**Is there any existing state/ provincial or local legal provision to support your idea ?**

Yes, there are existing state legal provision that supports our idea i.e

   ● Electronic transaction act,2063

   ● Right to information act,2064

   ● Telecommunication act,2053

   ●  Constitution of Nepal,2072;Part-3,Article-27(Right to information)

   ●  Good Governance act,2064

**If there doesn't exist any legal provision in Nepal, which other countries in the world has it ?**

Totally legal

**Do you know about the statutory requirements before taking this to the market ?**

Government permission is required to take our project to the market.

**Which organization do you think is most likely to own your idea in Nepal ?**

The governmental organizations which have adapted E-attendance or attendance system,like

  ●  National Information Technology center,  Ministry of Federal Affairs and General administration,Financial controller  general office,ministry of defense, ministry of communication and information technology,High security alter area and many more.

  ●  Nepal Administrative staff college

  ●  CG Electronics

  ●  Different Educational Institutions:School,colleges

[**E. Cross-cutting Issues**](https://kathmanduchallenge.org/mvp/nigraani?destination=/user/229#undefined)

**Does your idea facilitate to the children, women, differently able or marginalized community of the society ?**

yes, when we are  in any government service ,There has been special provision for disable person (5% of total vacant post).so it can be helpful to them by:

* Gesture based IOT system
* Facial recognition attendance
* People from the far-flung areas of the country have different expectations from government and our system will help in managing community expectation from them.
* Manage antagonism in administration
* Create discipline,conduct,ethics and professional standards in the civil service.
* Itcan also be used in the educational institutions like schools and colleges for the monitoring of attendance and activities of students and staffs too.

**Does your idea attract IEE or EIA before implementation ?**

 yes,

    ●  It gives procedure to pick up best alternatives.

    ●  Provide real perspective and environment  friendly project

    ●  Monitor and Collects data

**How does your idea help to enhancing the transparency and good governance at local government ?**

●  For any government action to be transparent,it needs to be: visible,predictable and understandable.and our system totally support these action.

  ●  It is accessible, affordable, relevant and easy.

  ●  Bureaucracy is under an increasing pressure and demand for more transparency and more openness, our system is helpful for it.

  ●  For transparency,with auto attendance system every employee record is kept for which there is a clear view regarding the employees works and duties.unless the information regarding the work of employee is not transparent.No any activities regarding good governance and strong administration system can be achieved.

  ●  Helps to generate commitment and motivation of the employees

  ●  Build a stronger relationship with management,administration and other stakeholders giving the customized access to the system.

  ●  Supports e-governance model(Comparative Analysis Model)

  ●  It can also work in the area where there is no internet access.

**In what way KMC gets benefited by your idea ?**

●  Improves governments record management system.

  ●  Maintaining Good Governance.

  ●  Provide e-governance with **SMART** facilities i.e

       S=simple, M=Moral, A=Accountable, R=Reliable T=Technological

  ●  Help to achieve result based management.

  ●  Helps to determine compensation to civil servant i.e  salary or pay, rewards or incentives and supplementary benefits.

  ●  Make employees responsible towards their work

  ●  Save time cost and increase productivity

  ●  Effective and efficient utilization of resource

  ●  Check the punctuality of employee, selection of employee who have done best work,,work performance evaluation  that is  performance appraisal

  ●  Achieve performance based management system

[**F. Any Other Information**](https://kathmanduchallenge.org/mvp/nigraani?destination=/user/229#undefined)

<https://nigrani.herokuapp.com/>