

## **Social Innovation in Industry 4.0**

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**Lecture-22**

**Cost Estimation in Social Innovation**

Welcome to the second lecture of week 5 where we are discussing the Cost Estimation in Social Innovation. There are certain estimating methods that we will discuss in this lecture. We have discussed about general what is product cost, what is target costing in Social Innovation we have discussed. This is a course on Social Innovation in Industry 4.0 and I am Dr. Amandeep Singh.

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### **Contents**



- Introduction
- Key Components of Cost Estimation
- Cost Estimation Methodologies

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So, this lecture would go through a general Introduction about the Components of the Cost Estimation and some Cost Estimation Methodologies.





terms you should know, one is outcome-based budgeting. Outcome-based budgeting means we set the outcome, we set the goals and allocate resources based upon the likelihood of achieving these goals. So, I would say objectives are set. Then, cost-benefit analysis, this is also one of the analyses that benefit based upon the project cost is determined it is known as benefit-based costing. For example, if you give a product or service to a customer or to a client which helps them to enhance their sale. Let me take the same example of the sale of the milk for the farmers.


Now, the sale of the milk is enhanced. Now, the cost for this is, the benefit that they get, the number of people they are able to approach, and how quickly they are able to get the client. This is the benefit and the cost based upon this benefit, what is the costing that we try to determine accordingly. This is how the benefit-based costing or cost-benefit analysis is taken into account. Then, ROI is a general thing that you know return on investment. In what time payback period your investment would be returned back on investment is the period for return on investment at what time the return on investment is taken after that only the profit add. This is social return on investment. When I say social return, it measures the social impact and calculates the financial return on investment. So, this is social ROI or SROI.

**Financial Sustainability and Impact Measurement**

Financial sustainability refers to the ability of social innovation ventures to maintain their operations and generate sufficient resources in the long term.

Factors that can affect the financial sustainability of a social innovation venture:

- ✓ Cost of the project
- ✓ The revenue model
- ✓ The management team



Source: <https://www.impactlab.org/>

Now, financial sustainability and impact measurement is very important when we talk about financial management in Social Innovation. Financial sustainability refers to the ability of Social Innovation ventures to maintain their operations and generate sufficient resources in the long term. So, this is the keyword.

So, sustainability analysis is one of the terms for which the various models are there, which are mentioned in the previous lecture as well. Various models for sustainability analysis, for stability analysis are there, statistical models are there, which are used to determine whether the system would remain sustainable for the coming decades or not.

The factors that can affect the financial sustainability of Social Innovation ventures could be, number one, cost of the project. That is the project's affordability and operating costs

are part of it. Then, there is a revenue model. Revenue model means what is the necessary revenue that could be generated for the project or what ongoing funding is there.

Then, the management team. The management team involves the people, for example for a start-up. Startup could be a few people, a few students who have just built-up the start-up based upon a certain idea. Technologically they could be great but maybe the market experience finally reaches the people, they might be missing that. In that case mentors are always there. Mentors are people who are well-versed with what are the products of this kind, and how the customers respond to these kinds of innovations.

So, their suggestions are very important. So, from the very amateurs to the experienced people are there in a management team which helps us to have financial sustainability in the Social Innovation and in the impact measurement of Social Innovation.

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**Evaluation of the Social Impact and ROI**

Social impact evaluation aims to assess the positive change created by social innovation projects in addressing societal challenges.

Techniques for measuring social impact include

- ✓ Qualitative methods *Surveys, Interviews*
- ✓ Quantitative methods *Data Analysis*

Return on investment (ROI) analysis helps quantify the financial benefits and social value generated by the project.



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<http://www.impactlab.com/2017/05/25/essential-questions-to-ask-when-evaluating-social-impact/>

Now, evaluation of Social Innovation and ROI. Social impact evaluation aims to assess the positive change created by Social Innovation projects in addressing societal challenges. Techniques for measuring social impact include qualitative methods and quantitative methods both.

When I talk about the qualitative methods, these are generally the methods in which quality information is taken. Whether this product is liked yes or no. So, what are the more inputs to these products, subjective answers could be there. So, this means, this is either generally surveys. Surveys are a very general thing when you have a specific set of the questions to be answered, then it could be one on one interviews as well.

Quantitative methods are the data analysis methods in which various techniques are used. These techniques are generally statistical techniques when secondary data is available. Qualitative method when I am mentioning I am talking about surveys and interviews where primary data is generated. When data is available and only we need to employ or use this data to have a forecast upon what our financial plans for the future should be. These

forecasting methods, these methods of regression, these methods of correlating to the past, outputs, or outputs for the similar products, maybe for the same products in a similar kind of environment, maybe for the same products in a different country, then these are all calculated using quantitative methods, and some of the methods we will also discuss in this lecture.

ROI helps us to analyze or quantify the financial benefits and social value generated by the project. Now, this is the return on investment in general that we are talking about and we are also trying to connect into social impact.

**Metrics and Frameworks for Measuring and Communicating Social Impact**

- Social Impact Measurement Frameworks:
  - Social Return on Investment (SROI)
  - Impact Reporting and Investment Standards (IRIS) *Financial Control*
- Indicators for Measuring Social Impact:
  - Changes in quality of life
  - Environmental outcomes *PP*
  - Community engagement
- Communicating Social Impact:
  - Enhances transparency
  - Builds credibility
  - Engages stakeholders

*Diagram annotations:*

- A bracket groups the three indicators under the heading "S&P".
- A bracket groups the three communication points under the heading "Engagement".
- A bracket groups "Reduced Pollution", "Reduced Energy consumption", and "Reduced Material consumption" under the heading "S&P".
- A bracket groups "Responsible Energy use?" and "Biodegradable material?" under the heading "S&P".

So, when we are trying to connect it to social impact this is known as Social ROI. Social ROI is nothing but social value generated by an organization or project relative to the resources which are invested. In this case also Impact Reporting and Investment Standards (IRIS) plays an important role because it also helps us to have a financial control strategy.

So, it helps us to fix a specific target and try to work upon it. There are certain indicators which are important when we are talking about the measurement of social impact, that is what changes in quality of life, is it bringing. This is something that is qualitative but we can convert the qualitative data also into quantitative form.

If we put that in maybe using a Likert scale, like for example, in Amazon if an innovation is there they ask the people, do you like this innovation, like and dislike could be extremes, then partially like, partially dislike, neutral they could be 5 point scale in that. So, in this way we can convert the qualitative data like and dislike using a 5 point, or 7 point, or maybe 9 point scale to the quantitative data.

So, this is how changes in quality of life are taken into account also certain other methods like interviews, surveys are always there to understand what is the social impact of the product that we have introduced.

Environmental outcomes, whenever we talk about sustainability of a product now in this case the word sustainability I am talking about ecology. The word sustainability, in general, is how well is your system able to retain in future as well whether financially would it be able to sustain or not. Otherwise, if I talk about the word sustainability nowadays, it is used from the green manufacturing viewpoint, it is used from the environmental viewpoint, it is used from the ecology viewpoint.

From that impact, one of the major inputs in sustainability analysis is environmental outcomes. Always when we say 3 P's of sustainability, it is people, profit and planet. Planet means we have many fixed numbers of resources within your earth, within your planet, keeping the resources intact not to use them in a way, so that the future generations are not able to use them with the same form that we are able to do.

So, this is sustainable analysis, that means environmental impact has to be positive, it should not be negative, or if not positive it should be neutral. So, environmental outcomes, that are have we reduced the pollution, or have we reduced the energy consumption, or have we reduced the material consumption? These 3, energy, pollution, and materials, are the major factors of it. If not these, what is the extent of the renewable energy that we are using?

Then, what is the extent of the biodegradable material that we are using? These are all questions which come into the environmental outcomes viewpoint. Community engagement, what is the employment that you are generating? Employment index majorly, if I talk about the word happiness that is the keyword for societal impact. Happiness, how people are happy to have their community engaged in the system? So, these are the major indicators. We can have indicators in different forms at different scales to have these indicators to have finally an assessment of what sustainable impact is this, all could be taken into account.


Then, communicating social impact, that is also important which includes enhancing the transparency because we are talking about the people, we are talking for the people, we are talking for the benefit of the society.

Transparency helps the people to understand what we are doing and how it is benefiting them, there are multiple websites whatever the Social Innovations are there, those are showcased in a proper way. So, as it reaches maximum people and people appreciate them, if there are certain drawbacks or certain loopholes in them. People do report them which are tried to be covered in the forthcoming versions of the product. So, that is why transparency is very important when we have transparency with the clients, with all the stakeholders, within your internal customers. Internal customers are your own employees itself, then it builds credibility.

Credibility of the product when it is built, then people are willing to pay for that, willing to pay maybe out of their pocket they are even willing to pay extra for that as well, if they understand that this is something that would benefit the society, that would benefit them, that would benefit their future generations, that would benefit the nation, the global index, the global picture, in the overall. It engage the stakeholders majorly whom so our investors are. Though, engaging stakeholders means all the stakeholders as I talked about internal clients, the customers, the investors. Investors majorly the goal of the investors is to have the profit. Though, sometimes the funds to come from the CSR that is Corporate Social Responsibility funds, in which they only invest to enhance some societal benefits. Now, though they are still concerned, the stakeholders would invest into the products which they think are transparent which have credibility in the mind of the clients, that is why they come into the business and they try to introduce, or they try to get more involved into the product.

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**Financial Sustainability Strategies**



Financial Sustainability Strategies in Successful Social Innovation Initiatives:

- ✓ Diversification of funding sources *Mix of grants, donations, impact investments, earned income*
- ✓ Earned income streams *Sales, servicing, licensing*
- ✓ Collaboration and partnerships *Synergies*
- ✓ Sustainable business models

These strategies promote financial sustainability, enabling social innovation initiatives to achieve long-term impact and resilience.

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Now, financial sustainability strategies could be many. In a successful Social Innovation initiative, diversification of fund resources is important, that is mix of grants, donations, because in case one of the stakeholders, or one of the investors, or one of the good perfect investors if they may be back step or they stop funding you, you might have, you should have some other sources of income from different resources.

Then, we have impact investments here, then we have earned income. Earned income streams which is also put as a separate initiative for financial sustainability of the system which means generating revenue through sales, servicing, and suppose, if one of the products is quite successful in the city of Kanpur itself, I am able to reach the people within UP. I can be less sensitive to some other person who is in Bihar, who is in Punjab, who is in Maharashtra. So, licensing of the product is also important, or one of the ways to have the income streams here.


Collaborations and partnerships, because one and one makes eleven, we might be well-versed with the technology that we have developed, with the innovation that we have created, but there are certain people who have big name in the society through them if we



go collaborations would help us to reach more people or we might be someone who might have a different connects, for example, IIT Kanpur has different connects to their own illuminae, CSR people to come us for different funding, then we need to have collaborations with the certain start-ups. Start-ups who have innovative ideas, so collaborating them together into one pain and try to have something that is known as synergy, so that the different partners have shared costs and shared benefits. Sustainable business models that means integrating social and financial goals for self sustainability. So, these strategies promote financial sustainability, enabling Social Innovation initiatives to achieve long-term impact and resilience.

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**Costing Considerations in  
Social Impact Assessment (SIA)**



Costing considerations play a crucial role in assessing the social impact and value for money of social innovation projects.

Understanding and analyzing the costs incurred in delivering social impact helps in evaluating the project's -

- ✓ Effectiveness
- ✓ Efficiency

Costing considerations enable a comprehensive assessment of the

- ✓ Resources invested
- ✓ Outcomes achieved

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Now, costing considerations play a crucial role in assessing the social impact value for money and Social Innovation projects, so this is where we are going to just shed a quick light over Social Impact Assessments.

Social Impact Assessment means understanding and analyzing the cost incurred in delivering social impact which helps in evaluating the projects effectiveness and efficiency. What is effectiveness and what is efficiency? These two terms seem to be very similar where they have different meanings, we will try to discuss about that in the coming lecture where effectiveness is something how effective how many people are willing to use your product. Efficiency is something, what is the efficiency of the product in the terms of the quantified output, what is the efficiency of your product, or what is the percentage of income that is increased, what is the number of, maybe if it is sustainability or ecological viewpoint of the product what is the amount of pollution or percentage of pollution it has reduced in this area. So, this is all efficiency. Effectiveness is to what probability, to what

extent is this successful, that is effectiveness. The costing considerations enable a comprehensive assessment of resources invested and outcomes achieved.

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**Factors Influencing Cost Estimation in Social Innovation**

Cost estimation in project management is the process of forecasting the financial and other resources needed to complete a project within a defined scope.

Cost estimation accounts for each element required for the project — from materials to labor — and calculates a total amount that determines a project's budget.




Image source: <https://images.pexels.com/photos/1411411/pexels-photo-1411411.jpeg>

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Now, next we need to discuss about the factors that influence the cost estimation in Social Innovation. Cost estimation in project management is a process of forecasting the financial and other resources needed to complete a project within defined scope which means the costing is within a scope.

The scope means the scope is the time frame within which the product is completed, that scope is the budget within which the project is to be completed within the area where you are working, everything comes under scope. Cost estimation accounts for each element required for the project. Each element, from materials to labor, can create a total amount that determines a projects budget.

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**Factors Influencing Cost Estimation in Social Innovation**

In cost estimation for social innovation projects, several factors significantly influence the overall financial assessment.

Understanding and considering these factors are essential to ensure accurate and effective cost estimation. These factors include:

- Project Scale
  - Size, scope, and impact magnitude
  - Resource requirements and staffing implications
- Project Complexity
  - Intricacy of activities and technical challenges
  - Coordination costs for multi-stakeholder projects

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In cost estimation for Social Innovation projects, several factors significantly influence the overall financial assessment. There are certain factors which we will discuss in this lecture. For understanding and considering these factors, it is essential to ensure accurate and effective cost estimation methods. These factors include the project scale. When we talk about project scale, it is the size of the project, scope of the project, magnitude of the impact

that we are trying to put here. Then, we have resource requirements and staffing implications. Resource requirements means what are the materials required, what is the land that is required. For example, if you are trying to introduce a product where you will have to just collect the waste, maybe segregate waste into different components biodegradable and non-biodegradable, then you try to landfill the non-biodegradable waste into the waste landfill sites.

The biodegradable waste is converted into the biodegradable form, maybe the fuel is used to develop agarbatti. These kinds of innovations do come into play and what are the total resources. And, staffing implications if it is a website or so if it is a staff intensive project. For example, if more number of people are required to reach people, then staffing implications are always there.

This is the project scale, on what is the total number or total size of the project that you are trying to develop. Complexity of the project is also one of the important factors which is to be always thought of, when we are trying to talk about the cost estimation. Intricacy of activities and technical challenges, that is the nuances of the activities. Activities, if those involve some data from the neighboring countries or if involve some data from the people, maybe some private data from the people, maybe, for example if you have developed a vaccine for aids, you need to see the people who are hit by this disease. People sometimes are not willing to disclose those.

So, what is the intricacy of the activities and technical challenges? If you have developed an application, or if you have developed a software which is used by the farmers, the farmers who are working for many years in their traditional process, how willing are they, technically how educated are they to understand? Okay, this is a green button on your android app, this is a red button on your android app, you reach them. Then, languages are given to them. Hindi language, may be Marathi language in Maharashtra, may be Tamil in Tamil Nadu. So, different kinds of languages are to be put there. So, these technical challenges are always there. Coordination costs for multi stakeholder projects is always there, so that the project cost estimation is taken efficiently.

#### Factors Influencing Cost Estimation in Social Innovation



- Target Beneficiaries
  - Diverse needs and resource allocation variations
  - Inclusivity efforts for marginalized communities
- Geographical Location
  - Regional cost disparities and factors
  - Logistics and operational considerations
- Duration and Timeline
  - Time frame's impact on costs
  - Adjustments for inflation or currency fluctuations
- Risk Assessment
  - Contingency reserves for potential risks
  - Mitigation planning for uncertainties

Now, target beneficiaries are also one of the important factors when we talk about the project that means diverse needs and resource allocation variations as I just mentioned the language requirements for the different communities in different parts of the country, so those are there. Inclusivity efforts for marginalized communities, inclusivity means inclusive development.

When the people who are difficult to reach, or the unserved areas, or the underserved areas, or the underserved categories, those are all targeted mid-award. I mean those are targeted to the marginal communities, how well are they served using the application or using the product that we have developed this becomes one of the cost estimation or the factors that influence the cost estimation. Geographical location, there is a certain geographical location.

For example, in Kashmir in the chilling areas there are certain requirements therefore may be a Social Innovation there, that a person has developed a shoe with a heating sole using battery. This heating sole shoe would be used only in the areas where the temperature is less than minus 20 degrees, so there reaching to the people or making the people aware of this product is there, or making the product reach them is a challenge, or maybe in the areas of Himachal Pradesh even when the hilly area are there, or maybe in the remote areas may be in the south where we are quite remote, or maybe tribal populations are there, so those areas are sometimes difficult to reach. So, regional cost disparities and factors do come into play for this.

In this case the people who are marginalized, or who are already there in the remote areas, the costing for the product might have to be discounted for them and the people who are in urban areas if they are using the similar product the costing strategy, or the costing method could be different. Now, logistics and operational considerations. Logistics, when we talk about the location, logistics that is the travel, to transportation, even the communication.

This all comes into play when we are talking about the operational considerations of the innovation that we have developed. Duration and timeline, time frames impact on cost is very important. If you run out of time the product sometimes loses its overall essence. So, maybe the similar product would come by a competitor, or maybe people may not even appreciate the product that is not able to give them specific output within a specific time.

The same example, I am coming to time and again for example, this milk distribution application, if there are certain loopholes or certain changes which are required in that app. Those should be rectified within a day, or within 2-3 days because if 4-5 times the farmers are not able to find finally the other thing effective, they will stop using it. So, time frame or impact cost are very important. Adjustments for inflation or currency fluctuations, if you are working across nations. So, then, converting the dollar into rupees, or maybe rupees

into euros, or so, or maybe into yen. It depends upon how the currency fluctuations are effective and what kind of products you are trying to post there in different parts of the world.

Risk assessment, that is the contingency reserves for potential risk. That is why, always risk cost, the contingency cost are always there, when you try to even apply for grants for donations or so, the contingency part is always there. Mitigation planning for uncertainties, uncertainties are always there and what we are trying to understand overall in this course is to deal with uncertainties majorly. Social Innovations is something that people are doing, developing something that is of societal benefit is okay, but because it is an innovation, innovation is something people sometimes do not understand on the first hand. So, they are to be aware of what kind of uncertainties could be there. So, mitigation planning for the seen uncertainties should be there.

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#### Factors Influencing Cost Estimation in Social Innovation



- Technology and Innovation
  - Upfront expenses vs. long-term efficiencies
  - Strategic investments for sustainability and scalability

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Last point here is Technology and innovation. That is where we have Industry 4.0 as in the title of this course the upfront expenses and long-term efficiencies, if you are using a technology which is using a 4G internet that can use Industry 4.0. 5G internet is also coming into play. If this technology is to be used in the remote areas in Kashmir they still only have the 2G and 3G internet to be used in the remote areas in Kashmir. They still only have the 2G and 3G network. So, it has to be planned, it has to be designed accordingly.

Now, upfront expenses and long-term efficiencies. The way that technology is changing, the way even social websites are changing, each 6 months the previous technology is outdated. So, long-term efficiencies using cloud computing, using storage of data on cloud, using retrieval of data at any point, any place, that is very important. That is why, technological intervention for Social Innovation is of utmost importance nowadays. Strategic investments for sustainability and scalability.

Scalability means you have a product that has reached the market today. It could be a subset of the bigger market today. It could be a subset of the bigger market, it could be for

the subset of a complete country which can globally go later. So, scalability of the product, so something that is now 50, could turn into 500, could turn into 5000, could turn into 50000 so on, that is important.

Whenever you design a product, the product has to be designed. In such a way, it is not only for the few people, it is for the masses of the people and it should be transferable into different parts of the country of the world. That is how the systems are designed. That is where the technological intervention Industry 4.0 plays a big role. Now, having talked about the Factors Influencing the Cost Estimation in Social Innovation. There are certain challenges to these innovations or these considerations that we are talking about.

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### Challenges and Considerations in Cost Estimation for Social Innovation



The cost estimation process has to face numerous challenges and consideration like:

- Uncertain Outcomes
  - Changing Stakeholder Needs
  - Limited Historical Data
  - Ethical Considerations
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If I talk about the challenges, the first challenge is Uncertain Outcomes. When I say uncertain, as I talk about uncertainty, it requires innovative measurement methods for non-mentory impacts.

If you have developed an app to reduce the cost of a product or reach the client, the client refuses to take the milk. He says the milk is stale, this is a non-mentory impact, that is not even determined prior. So, there could be uncertain outcomes as well. Changing stakeholder needs. For example, evolving requirements, necessity set, continuous engagement to adjust cost estimates throughout the project. Stakeholders might also require additional information on that okay, along with milk, I would also like to sell my small products out of my small farm. I would like to sell sugar, I would like to sell haldi, I would like to sell maybe jaggery.

So, these things could be an additional part of it. Limited historical data when lack of extensive past cost data is there for novel solutions but we need to rely on the analogous projects or external sources of the data. The ethical considerations, though we are trying to put something for the benefit of the people but there are sometimes certain sensitive issues which includes the ethical cost allocation as well, that is, we need to respect the privacy, the consent of the people, the cultural norms everything is to be taken care of. So ethical

considerations play a very important role and this is also a challenge when we talk about the Social Innovation Cost Estimation.

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### Challenges and Considerations in Cost Estimation for Social Innovation



- Resource Constraints
- Multiple Metrics for Success
- Adaptability and Flexibility

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Then, comes the resource constraints. Resource constraints means balancing impact aspirations with limited budgets. Calls for innovative cost effectiveness strategies.

So, when impact aspirations are high but the budgets are limited, then resource constraints are always there. Multiple metrics for success, so when we incorporate dawares indicators beyond the financial returns even it requires a comprehensive or detailed understanding of the project goals. So, multiple metrics of success are there which can be reduced. For example, if you have developed and you have found that there are maybe 20 variables which contribute to the product, then using a factor analysis we can maybe transfer them into six factors.

Six factors, this is known as Factor Analysis means. For each of the variables, the common factor would be taken out of them and this 20 is going to be fixed. So, multiple metrics of success are always there. So, which should be taken into consideration in the beginning but later for the calculation we cannot calculate in a regression model, or maybe in a deterministic model, all the 20 variables sometimes. So, we need to have six significant variables, or the six variables which are representative of all the 20 variables used. Adaptability and flexibility which means, cost estimation must accommodate changing circumstances and it could be revisable as new information arises at each point.

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## Key Components of Cost Estimation- Personnel Costs and Salaries



### Estimating Personnel Costs and Salaries

Personnel costs play a vital role in the budgeting and cost estimation process for social innovation projects.

Properly estimating salaries, benefits, and volunteer management is essential to-

- ensure efficient resource allocation
- successful project implementation

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The Key Components of the Cost Estimation, when we talk about the Personnel Cost and Salaries. So, estimating personnel cost and salaries include the budgeting and cost estimation for Social Innovation projects which is we try to estimate the salaries, benefits and volunteer management in order to have efficient resource allocation and successful project implementation.

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### Estimating Personnel Costs and Salaries



1. Salaries
  - Determine roles, responsibilities, and expertise for appropriate salary estimation.
2. Benefits
  - Include health insurance, retirement plans, and allowances in cost estimation.
3. Volunteer
  - Cost of providing them with training and support

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In this case, when we talk about the salaries and the personal cost, what are salaries? It determines the roles, responsibilities and expertise for appropriate salary estimation. For example, a coder could be one person, then a programmer could be another person, then the administrator, system analyst could be another person, then at the top the financial manager could be another person, then CEO of the company could be another person.

So, one person could even take two roles, coder and programmer, could be the same person or be the system analyst and the programmer could be the same person. So, sometimes these roles are given to different persons and accordingly the salaries are given. Then, comes benefits, benefits which include health insurance, retirement plans, allowances in cost estimation, all these are taken. These are considering the impact on an employee satisfaction and retention. Maybe some awards are to be given, some gratitude is to be



given to the employees, though the salaries are basically determined by their roles, their qualification, their experience or so but benefits are also something people do get attracted to when they need to join a company.

Then, volunteer the cost of providing them with training and support that is training on the projects goals, projects objectives, the overall companies objectives. The procedure and support like access to mentors, training material, resources, their recognition all of them are to be considered when we try to have a volunteer costing in this case.

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**Key Components of Cost Estimation-  
Material and Equipment Costs**



Material and equipment costs are essential components of cost estimation for successful project implementation.

Properly estimating these expenses ensures that necessary resources are available to achieve project objectives effectively.

Process of estimating material and equipment costs for social innovation projects includes:

- Identify Required Materials
- Price Research for equipment/materials
- Quantity Assessment
- Cost-Benefit Analysis

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Now, Key Components of Cost Estimation, that is the Material and Equipment Cost. Material and equipment cost are essential components of cost estimation for successful project implementation. Properly estimating these expenses ensure that necessary sources are available to achieve project objectives effectively. Process of estimating material and equipment cost for Social Innovation includes, number one to identify required materials, number two price research for equipment and materials, quantity assessment and cost benefit analysis.

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## Key Components of Cost Estimation- Material and Equipment Costs



1. Identify Required Materials
    - Create a comprehensive list of materials, including consumables and non-consumables.
  2. Price Research for equipment/materials
    - Obtain multiple vendor quotations and conduct market research for price and quality comparison.
  3. Quantity Assessment
    - Determine required quantity, considering contingencies to avoid underestimation.
  4. Cost-Benefit Analysis
    - Evaluate cost-effectiveness, balancing quality and price.
- 

Number one is identify required materials which means to create a comprehensive list of materials including consumables, non-consumables, number of computers, the kind of the computer, the RAM required for that, if you are trying to develop an app, if you are trying to develop a product maybe a product that has more biodegradable power may be you need to develop a pencil which has maybe a seed at the end if you saw this pencil or throw this pencil later upon then wherever it goes this seed may be a Tulsi seed or some other seeds are put into there which grows into a plant. To manufacture this pencil, you need a machine, the cost of that machine, material for the manufacture of the pencil, all those things are put into the list.

Then, price research for equipment and materials from where the equipment is to be taken, the quotations are to be taken from different vendors or we need to conduct a market research for that and also quality comparison is important. Quantity assessment, what is the quantity required for the specific material or equipment considering contingencies to avoid underestimation, overestimation is also not allowed because if you spend more money which is not even required. If we have 10 computers purchased and only 6 of them are in operation, 4 computers are invested upon and this investment is going to waste. Though, the return on investment is there to be calculated for all the investment for the 10 computers that you have done. So, overestimation and underestimation should both be avoided. Cost benefit analysis means, evaluating the cost effectiveness and balancing the quality and price of the product.

## Key Components of Cost Estimation - Research and Data Collection



Research and data collection are integral to evidence-based decision-making in social innovation projects.

Estimating the costs associated with these activities is essential to ensure reliable and accurate project outcomes.

Process of estimating research and data collection costs for social innovation initiatives includes:

- Research methodology used
- Sample size and target population
- Data Collection Tools and Technology
- Research Personnel

Then, comes the research and data collection. Research and data collection are integral to evidence based decision-making. That means, an educated or knowledgeable decision is to be taken whether to come up with this invention and who are the target customers, what is the target number of this kind of the innovation that we have. Estimating the cost associated with these activities is essential to ensure reliable and accurate project outcomes. Process of estimating research and data collection cost for Social Innovation includes research methodology that is being used, sample size and target population, data collection tools and technology, and research personnel. Let us try to see each of them in this slide.

## Estimating Research and Data Collection Costs



1. Research Methodology
  - Define objectives and select suitable methodologies.
  - Consider complexity and expertise required.
2. Sample Size and Target Population
  - Determine statistically significant sample size.
  - Account for target population characteristics.
3. Data Collection Tools and Technology
  - Evaluate costs of data collection tools and software.
  - Consider specialized technology needs.
4. Research Personnel
  - Estimate hiring or agency expenses.
  - Include training and logistical costs.

Research methodology, it means, the objectives and suitable methodologies to research what is the requirement of the client, what is the time for the research, what are the total resources in research that we are trying to inculcate here. Consider complexity and expertise required, that means whether the researcher has to be a person who is well-versed with the overall use of the product or only the final use phase is one the person should be able to be aware of. Sample size and target population, it means the number of people whom you need to reach.

We cannot do this census kind of survey all of the time. The census survey is 100% population. If we need to reach the target population, when I say the word the number of clients you need to reach is 5000, you might have to pick maybe 50 people whom you need to interview to understand what product or what research is required in this product to be developed.

So, to determine the statistically significant sample size, there are certain methods to determine the sample size. So it is noted by small n, the sample size the population size is capital N when we talk about the statistical notations here. These account for target population characteristics. Data collection tools and technology in Industry 4.0.

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### Key Components of Cost Estimation - Infrastructure and Facility Costs



Infrastructure and facility costs are the costs associated with the physical space and equipment that will be needed to operate a social innovation project.

Infrastructure and facilities are critical elements in the successful implementation of social innovation projects.

Estimating the costs associated with acquiring and maintaining these assets is essential to ensure smooth project operations.

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Big Data Analytics plays a vital role nowadays. In Decision Support Systems, when we have Big Data, the data is available in multiple forms. We need to put the data in the proper form and we need to have the informed decisions. The data, certain models are there, certain analytics models are there, the predictive models help us to understand what the data is, what is the mean, median or forecast of the model. Then, we have deterministic models, then we have the prescriptive models as well where the prescriptions come, okay for this data, these kinds of the things could come, the hypotheses are designed or laid down and those are tested upon. So, data collection tools are to be taken, certain tools and softwares with which the GUI should be understood by the people who are using them.

GUI is Graphic User Interface. Consider specialized technology needs which are there. Research personnel, so we need to estimate the hiring or agency expenses. If we need the research personnel, we cannot sometimes find the person who could be retained for some time. The hiring agencies have a lot of people with them, so in the loop or in the pool that they have they give you the people as per your requirement. So, their expenses are also there, so we need to consider all of them. Then, we need to include the training and logistical costs also in this.

Then, comes the infrastructure and facility costs. Infrastructure and facility costs are associated with physical space and equipment that will be needed to operate the Social Innovation project. Infrastructure and facilities are critical elements in the successful implementation of Social Innovation projects. Estimating the cost associated with acquiring and maintaining these assets is essential to ensure smooth operations of the project.

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**Estimating Infrastructure and Facility Expenses**



Process of estimating infrastructure and facility costs for social innovation initiatives:

1. Identifying Required Infrastructure
2. Construction and Acquisition Costs
3. Renovation and Adaptation
4. Maintenance and Repairs
5. Utilities and Operating Costs

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In this, certain factors that play a role are Identifying Required Infrastructure, that is we need to determine the necessary structures, the equipment, the technology which is required to develop the product or the innovation that we have.

Construction and Acquisition costs, that is estimate the expenses for building or acquiring infrastructure. Finally, acquisition cost or the construction cost is a major cost that is there for the infrastructure. Then Renovation and Adaptation if we have taken an existing facility. Then, renovation of this facility to the structure that we require or adaptation of this facility to our own specific requirements, that is always a cost that is included in. Maintenance and Repair, that is ongoing maintenance expenses, or if you have hired a facility, or if you are using an existing facility maintenance and repairs of that facility plays an important role that means these are the part of the costing or the expenses.

Then, comes Utilities and Operating costs. Utility and operating cost means the

washrooms, kitchen, the pantry, the electricity overheads, maybe a restroom, so all these parts are part of the utility and operation costs here.

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### Key Components of Cost Estimation - Communication and Outreach Expenses



Communication and outreach expenses are the costs associated with communicating with stakeholders and raising awareness of a social innovation project.

Estimating the costs associated with communication efforts

- Ensures effective dissemination of project information
- Fosters meaningful connections with target audiences

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Then, come the Communication and Outreach expenses. Communication and Outreach expenses are the costs associated with communicating with stakeholders and raising awareness of Social Innovation projects. Estimating the cost associated with communication efforts ensures effective dissemination of project information. It fosters meaningful connections with target audiences.

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### Estimating Communication and Outreach Costs



1. Stakeholder Engagement Strategies
  2. Marketing and Promotional Materials
  3. Digital Marketing
  4. Events and Workshops
  5. Public Relations and Media Relations
  6. Digital Tools and Communication Platforms
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There are certain factors. Stakeholders engagement strategies are there, marketing promotional materials are there, digital marketing is there when we are talking about communication and outreach, audience and workshops are there, public relations and media relations are there, digital tools and communication platforms are there. In

stakeholder engagement strategies, the tailored communication for the target audience is always there. Tailored communication. Then, marketing and promotional materials that means designing and producing these materials also include cost.

Digital marketing means online platforms and using these online platforms the social media marketing also plays at the cost of the people who are working in the social media marketing and when you are using the social platform sometimes, you might have to pay them a license fee or a use fee. Then, events and workshops, to organize these events and workshops to maintain the social media marketing.

To organize these events and workshops to make people aware of to maybe create a voice for your product the gatherings, community sessions are to be organized. These also include cost. Public relations and media relations to engage PR firms, to engage the media outreach firms which helps you to portray your products into the media, that is also a cost included.

Then, digital tools and communication platforms that means the software and tools for effective communications which are there nowadays certain tools are used. For example, WhatsApp is free. There is software such as Slack, there is software such as Asana which helps you to communicate with people through different platforms. There are certain software which helps you with a premium version of them. You can have more access to them, maybe linked in itself. So, digital tools and communication platforms also have cost implications.

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### Summary



- Cost estimation is a critical process that involves predicting the financial requirements of a project.
- Understanding the scope, objectives, and potential risks is essential for successful cost estimation.
- Key Components of Cost Estimation:
  - Personnel Costs and Salaries;
  - Material and Equipment Costs;
  - Research and Data Collection;
  - Infrastructure and Facility Costs;
  - Communication and Outreach Expenses.

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To summarize this lecture we have discussed cost estimation is a critical process that involves predicting the financial requirements of a project. Understanding the scope, objectives, potential risks is essential for successful cost estimation. The key components

of Cost Estimation which are discussed in this lecture are Personal and Salaries cost, Material and Equipment Cost and what are the factors which influence or what are the components of these costs these are discussed. Research and Data Collection cost, Infrastructure and Facility cost, Communication and Outreach Expenses.

With this, lecture two of week five is completed. We will meet in the next lecture, we will try to discuss the Methodologies for Cost Estimation in Social Innovation. Thank you.