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SCHOOL OF BIO AND CHEMICAL ENGEERING

DEPARTMENT OF CENTRE FOR MOLECULAR AND NANOMEDICALSCIENCES

(INTERNATIONAL RESEARCH CENTRE)

UNIT – I - Project planning – **SMB5455**

SATHYABAMA

INSTITUTE OF SCIENCE AND TECHNOLOGY

Medical Biotechnology and Clinical ResearchBio-Entrepreneurship

(SMB5455)

Course Materials Unit: I Project planning

Project

Once a project is selected for execution, the structural project planning approach prescribes that the project gets planned in detail prior to the actual start of the project.

Project planning consists of two main stages: Risk Management and Project Scheduling.

The goal of the risk management stage is to identify project risks and take the necessary precautions.

The goal of project scheduling is to make a detailed schedule of all the tasks that need to performed, with specific time frames and resource allocations.

Risk Management

In projects, there is always some uncertainty about the schedule, the costs and the quality of the end product.

Project management is to some extent risk management which tries to systematically manage this uncertainty in order to increase the likelihood of meeting project objectives

Risk management deals with uncertainty, which comes in two flavours:

Known unknowns: Identified potential problems. One doesn't know exactly what will happen, but one is aware of the risks and their potential to damage the project. One can prepare for these risks.

Unknown unknowns: These relate to problems that arrive unexpectedly and cannot be anticipated. However, good project managers still expect these to happen.

All project management activities can be considered as managing risk, but the risk management process is a specific set of activities performed consciously to identify and manage risks on the project.

There is a difference between project risk and business risk.

Business risk relates to creating the right project output. Business risk is seldom the responsibility of the project manager, but rather of the project owner.
Project risk relates to making sure the project produces the promised results within budget and on time. This is the responsibility of the project manager.

Risk Management Framework

A possible risk management framework consists of 5 main steps:
Identify Risks: Find all the factors that threaten project objectives.
Analyse and prioritize: Assess each risk in terms of its possible damage and likelihood of occurrence.
Develop a response: Create strategies for reducing the possible damage and/or probability the risk will occur.
Establish reserves: Set aside additional funding for the project that will be used for known risks and unknown risks.
Continuous risk management: Implement strategies and monitor the effects of these changes on the project.

Identify the risks

Organize brainstorm sessions with stakeholders to gather potential risks. Generate a list as big as possible with potential risks. Once you have a list of potential risks, organize them by combining similar risks and order this list by magnitude and probability of the risk.
Another approach to identify risks is by means of interviews, which is a more structuredapproach than brainstorming.
To support the identification of project risks, one could use a risk profile. This is a list of questions that address traditional areas of uncertainty on projects. Creating such a risk profile should be an ongoing process, such that the end of the project, what has been learned will incorporated into the profile.
Another source of risk identification is the other main activity during project planning, i.e. the process of estimating schedules and budgets. Activities and tasks which are hard to estimate often imply a substantial amount of uncertainty. Identifying the cause of this uncertainty will most likely reveal project risks.

Note that the goal of this step is NOT (yet) to identify ways to minimize or eliminate risks. The goal is only to identify risks.

Analyze and prioritize the risks

To identify the importance of risks, one has to take two dimensions into account, i.e. thelikelihood of occurrence and the impact if the risks becomes reality.

After creating an initial list of potential risks, a first step is to quickly eliminate risks from your list which are not worth worrying. Next, one should sort the remaining risks in order of importance. This step should be performed quickly and based on intuition.

A next step could be to concisely describe and analyse the remaining risks by clearly formulating the condition which causes the uncertainty as well as the consequence of this situation in terms of the possible negative outcomes.

Once the risks are defined, the consequences in terms of cost, schedule and damage to the project must be described as well.

Finally, each risk must also receive an estimate of the probability that the risk will actually occur. Providing an exact estimate of both the impact and the probability of occurrence is oftendifficult. This should never be an excuse to skip this step. Instead, when exact estimates are difficult to obtain, one could switch to an ordinal scale with e.g. three categories (from 1 to 3, representing respectively a low, medium or high impact/probability).

Develop Response Plans

A first step is to identify those risks that are within the control of the project team and those that are not.

There are five ways to deal with identified risks:

Accept the risks. This implies that you understand the risk and decide to do nothing about it. This is a common strategy when the impact or the probability are low.

Avoid the risk. You can try to avoid a risk by choosing not do to specific parts of the project or by selecting a lower-risk option for meeting the project goals.

Contingency plans. When you cannot ignore, nor avoid the risk and have no impact on the probability, you can try to reduce the negative impact and have a fall-back plan in place when the risk becomes reality. Note that contingency plans require a continuous monitoring of the risks,

such that you can activate the continuous plans on time. This implies that this strategy can only be efficient if there is a way to detect the risk on time.

Transfer the risk. This strategy typically boils down to paying for insurance. Another approach is setting up a fixed-price contract that will get the work done on time for a fixed price. Note that this could however introduce new risks as more external parties get involved.

Mitigate the risk. This strategy tries to reduce the risk and more particularly the probability that the risk occurs. This often implies taking extra actions.

Establish Contingency and Reserve Funds

Once the strategies are determined, (financial) reserves must be set aside to allow the strategies to be implemented. Such contingency and reserve funds serve the purpose to account for known un-knowns.

Unknown unknowns are never accounted for by such reserves. Instead, management reserves must be used for risks that cannot be anticipated. Risk management only deals with anticipated risks.

Continuous Risk Management

The initial risk plan is based on all known information at the start of the project. However, as the project progresses, more information is gained, also on potential risks. Therefore, risk management should be a continuous effort. This includes:

Monitoring known risks.

Checking for new risks.

Repeating the risk management framework for newly identified risks.

Project Scheduling

A second element of the project planning stage is the development of a detailed project schedule. The classical approach of project management relies heavily on upfront planning. We first plan everything prior to execution.

Developing a project schedule can be broken down in following steps:

Develop a work breakdown structure.

Identify task relationships.

Estimate work packages.

Calculate initial schedule.

Assign and level resources

Work Breakdown Structure

A first step is to break down the work into smaller pieces of work which make it easier to accurately estimate the required time and resources. This is typically achieved by developing the Work Breakdown Structure (WBS) of a project, which is a tool for breaking down a project into its component parts.

The work breakdown structure identifies all the tasks/deliverables in a project and can be set up graphically or as an textual outline. Traditionally, a WBS focussed on tasks, more recently there has been a shift towards deliverables.

Building a WBS helps to:

Provide a detailed illustration of project scope.

Monitor progress. The tasks on the WBS become the basis for monitoring progress, because each is a measurable unit of work.

Create accurate cost and schedule estimates.

Build project teams as it provides clear work assignments to the team members and provides an overview how his or her work fit into the overall effort.

A WBS breaks all the work into separate tasks of which two types exist:

Summary tasks. A summary tasks includes several subordinate tasks and is not actually executed. Its purpose is to summarize more detailed tasks, called work packages.

Work packages. These are the tasks that actually require execution.

E.g. Creating manual can be the summary tasks which consists of the work packages writing content, setting layout, proofreading and printing manual.

Developing a WBS typically follows three steps:

List the major deliverables or high-level tasks.

Name all the tasks required to produce deliverables.

Organize the WBS.

Start from the top

A WBS is typically developed in a top-down approach. You can start from the deliverables mentioned in the statement-of-work and turn them into the major summary tasks.

Identify all tasks required to produce deliverables

The next step is to break down each task into lower-level, more detailed tasks required to produce the deliverable.

This is often the most difficult step in the planning process and requires a good understanding of how to produce the project outcome.

Give each task (work package and summary task) a name that describes an activity which produces some specific output. Therefore, the naming of activities typically follow the "verb- noun" format.

Try to avoid open-ended tasks such as "read literature" as these could go on indefinitely.

Try to avoid tasks that don't clearly describe the action which is required, such as e.g."literature".

To ensure that the work packages are the correct size, following rules can be applied as rule of thumb.

No task should be smaller than 8 labour hours or larger than 80. (These limits might need adjustment depending on the kind of project and availability of non-stop working time).

No task should be longer than the time between two reporting meetings.

Break work packages down to smaller tasks if:

It makes the task easier to estimate.

It makes the task easier to assign.

It makes the task easier to track.

Organize the WBS

Once all the work packages are identified, rearrange them in the most appropriate way.

In this step, one often creates new summary tasks and put work packages in new/other summary packages.

Different ways of organizing work packages emphasizes different aspects of a project.

Make sure that summary tasks are meaningful as their sole purpose is for communication or visibility. These summary tasks communicate what your project is about.

Also make sure that the work packages underneath the summary task add up to the summary task. When one has completed all the work packages, the result automatically be that thesummary task is completed.

Identify task relationships

The sequence in which detailed tasks - work packages - are performed is determined by the relationship between the tasks.

Any time a series of tasks is performed, there will be sequence constraints, i.e. some tasks need to be performed before others.

To visualize these constraints, tasks and sequential constraints can be visualized as a graph.When doing so, two basic rules are important:

Task relationships (arrows) should only be shown between work packages (and not summary tasks).

Task relationships should only reflect sequence constraints between work packages, not resource constraints.

When visualizing task relationships in a graph, it can be useful to identify significant events in the project, as known as milestones. Such milestones are events and have no duration. They serve following purpose:

Milestones are useful anchors. They provide a quick overview how the project progresses. Milestones can be used to mark input from one party to another. It illustrates when the project delivers something to its stakeholders.

Milestone allows visualization of events that aren't represented by a work package or summary task.

The sequential constraints between tasks, visualized by graphs, can further be separated into different categories:

Finish-to-start relationship. The subsequent activity can only start when then preceding activity finished.

Start-to-start relationship. The subsequent activity can already/only start when the preceding activity started.

Finish-to-finish relationship. The subsequent activity can start independently of its predecessor, but cannot finish before the predecessor finishes.

Estimate Work Packages

Now that the project is broken down into smaller, estimable work packages, the goal is to estimate the duration of each work package.

Note that the duration is the time between initiation to completion.

Calculate an Initial Schedule

Now that the work packages and their duration and interdependencies are identified, one can start estimating the duration of the project.

The first step is to perform a forward pass. This will allow you to determine the earliest starting point (ES) and finish time (EF). The EF of a task equals the ES plus its duration. The ES of a task equals the latest EF of all its direct predecessors. The forward pass starts with the first task, whose ES equals the starting time of the project.

The next step is to perform a backward pass. This allows one to determine the latest start time (LS) and latest finish time (LF) of each task. The LS time equals the LF minus its duration. The LF of a task equals the earliest LS of all its direct successors. The backward pass starts with the last task, whose LF equals the project deadline.

Next, it is important to calculate the float of each task. The float of an activity is the difference between its ES and LS (or EF and LF) and represents to what extent the start of an activity can be postponed in relation to its ES. Float provides flexibility in a schedule.

The set of tasks which zero or negative float is the critical path. Any delay in the critical path will automatically result in a delay in the project (unless corrective actions are taken).

Assign and level resources.

Now that the schedule is made, it is time to assign resources to the schedule. It’s goal is to do so in order to optimize the use of people and equipment to the project.

It begins with the assumption that, whenever possible, it is most productive to have consistent, continuous use of the fewest resources possible. In other words, try to avoid repeatedly adding and removing resources time and again throughout the project.

This goal is achieved by the act of resource levelling which focusses only on people and equipment, not materials. The amount materials needed is dictated by the specifications.

Resource levelling follows a four-step process:

Forecast the resource requirements throughout the project for the initial schedule.

Identify the resource peaks.

At each peak, delay non-critical tasks within their float.

Eliminate the remaining peaks by re-evaluating the work package estimates.

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UNIT – II - Project monitoring – **SMB5455**

SATHYABAMA

INSTITUTE OF SCIENCE AND TECHNOLOGY

Medical Biotechnology and Clinical Research

Bio-Entrepreneurship (SMB5455)

Course Materials Unit: II Project monitoring

SPECIFIC CONSIDERATIONS FOR PLANNING EVALUATIONS

It is mandatory for UNDP to present an evaluation plan to its Executive Board with each country, regional and global programme document considered for approval. The evaluation plan is a component of the M&E framework and should include those evaluations that can be foreseenat the end of the programme planning stage. The plan should be strategic, including a selection of evaluations that will generate the most critical and useful information for UNDP and its partners in decision making.

The initial evaluation plan should, at a minimum, include all mandatory evaluations. For programme units in UNDP , outcome evaluations and project evaluations required by partnership protocols such as the Global Environment Facility are mandatory. The evaluation plan is not a static document. It should be reviewed as part of the M&E framework and refined as needed during programme implementation. For example, as new projects are designed and the needs for evaluations are identified, these new evaluations should be added to the evaluation plan.

After a country, regional or global programme is approved, the respective programme unit enters the evaluation plan in the Evaluation Resource Centre (ERC) for tracking. As the units exercising oversight responsibility, the regional bureaux use the evaluation plan submitted by theprogramme units as the basis for assessing compliance. The Evaluation Office reports on evaluation compliance directly to the UNDP Executive Board in its Annual Report on Evaluation.

UNDP programme units are required to select and commission evaluations that provide substantive information for decision making. In deciding what to evaluate, the programme units should first determine the purpose of the evaluation and other factors that may influence the relevance and use of proposed evaluations. In general, for accountability purposes, at least 20 percent to 30 percent of the entire programme portfolio should be subject to evaluation.

Evaluations generally require significant resources and time. Therefore, every evaluation must be justified and used in an optimal way. Programme units together with key stakeholders should consider the following points in developing an evaluation plan: Uses, purpose and timing of evaluation—Evaluations should be proposed only when commissioning programme units and stakeholders are clear at the onset about why the evaluation is being conducted (the purpose), what the information needs are (demand for information), who will use the information, and howthe information will be used. Such information can be derived from a shared vision of success, as expressed in the results or outcome model at the planning stage. The intended use determines the timing of an evaluation, its methodological framework, and level and nature of stakeholder participation. The timing of an evaluation should be directly linked to its purpose and use. To ensure the relevance

LANNING FOR MONITORING AND EVALUATION

Evaluation and effective use of evaluation information, the evaluation should be made available in a timely manner so that decisions can be made informed by evaluative evidence. Resources invested—An area (thematic or programmatic area, outcome or project) in which UNDP has invested significant resources may be subject to an evaluation as there may be greater accountability requirements. The likelihood of future initiatives in the same area—Evaluations are an important means of generating recommendations to guide future work. An evaluation enables the programme unit to take stock of whether the outputs have contributed to the outcomeand whether UNDP has crafted an effective partnership strategy. When selecting an initiative to be evaluated, look for one in an area that UNDP will continue to support. Anticipated problems—Evaluations can help prevent problems and provide an independent perspective on existing problems. When selecting an outcome for evaluation, look for those with problems or where complications are likely to arise because the outcome is within a sensitive area with a number of partners. Need for lessons learned—What kinds of lessons are needed to help guide

activities in this country or other countries or regions in the region? Alignment and harmonization—Planned evaluations should be aligned with national, regional and global development priorities and UNDP corporate priorities (for example, the UNDP Strategic Plan), and should be harmonized with evaluations of UN system organizations and other international partners. This ensures that proposed evaluations will generate important information to help UNDP and its partners better manage for results in a changing context. Opportunities for joint evaluations with governments and partners should be actively pursued. Evaluations commissioned by UNDP should be useful for national partners. In determining the timing of an evaluation, UNDP should consider various decision-making points that exist in the partner government, such as budget decision making, development framework or strategy setting, and existing review processes for development programmes and projects. For instance, if the government is undertaking an evaluation of a national development strategy or framework to which UNDP projects are contributing, the UNDP-managed evaluations should enhance complementarities and minimize duplicated efforts.

Once the outcome evaluations are selected, the programme unit identifies the projects that are designed to contribute to the outcome and indicates them as relevant projects for the evaluation plan. This gives notice to the concerned projects and allows them to

When determining the timing of outcome evaluations, it is important to keep in mind that the Evaluation Office is mandated to conduct evaluations of the global and regional programmes and selected country programmes (Assessments of Development Results) before the new programmes are submitted to the Executive Board for approval. The evaluation process normally starts in year four of the programme. Since outcome and project evaluations commissioned by the programme units provide the substantive basis for independent evaluations, they should be completed during the early to middle stages of the programme cycle, before the conduct of the Evaluation Office's independent evaluations.

The same criteria for selecting outcomes should be applied to selecting project evaluations. Some partnership protocols require their related projects to be evaluated. It is strongly recommended that evaluations should be completed for pilot projects before replication or upscaling, projects that are going into a next phase, and projects ongoing for more than five years for accountability

and learning purposes. As part of the regular updating process of the evaluation plan, any newly identified project evaluations should be included in the plan.

In crisis settings, extra time should be allocated to evaluations, as there is a need for flexibility in order to respond to changing situations. This means being flexible when scheduling field visits and interviews and anticipating delays in data collection and last-minute changes in data collection methods if relationships between different groups change. Further, more preparation isrequired when working with vulnerable groups and those affected by conflict, as greater care andethical considerations are required.

RESOURCES FOR MONITORING AND EVALUATION

Inadequate resources lead to poor quality monitoring and evaluation. To ensure effective and quality monitoring and evaluation, it is critical to set aside adequate financial and human resources at the planning stage. The required financial and human resources for monitoring and evaluation should be considered within the overall costs of delivering the agreed results and not as additional costs.

Financial resources for monitoring and evaluation should be estimated realistically at the time of planning for monitoring and evaluation. While it is critical to plan for monitoring and evaluation together, resources for each function should be separate. In practice, each project should have two separate budget lines for its monitoring and evaluation agreed in advance with partners. This will help UNDP and its partners be more realistic in budgeting. It will also reduce the risk of running out of resources for evaluation, which often takes place towards the end of implementation.

Monitoring and evaluation costs associated with projects can be identified relatively easily and be charged directly to the respective project budgets with prior agreement among partnersthrough inclusion in the project budget or Annual Work Plan (AWP) signed by partners.

Sourcing and securing financial resources for monitoring and evaluation of outcomes or programmes can pose additional challenges, as there is not one project where these costs can be directly charged. The most commonly observed financing mechanism is to draw resources together from relevant projects. Some additional possibilities include: Create a separate

monitoring and evaluation fund, facility or project associated with an outcome or a programme to which all the constituent projects would91 contribute through transfer of some project funds. This facility could be located in the same entity that manages the outcome or programme. Mobilize funds from partners directly for an outcome or programme monitoring and evaluation facility. Allocate required funds annually for each outcome on the basis of planned costs of monitoring and evaluation from overall programme budget to the facility or fund.

It is important that partners consider the resources needed for monitoring and evaluation and agree on a practical arrangement to finance the associated activities. Such arrangements should be documented at the beginning of the programme to enable partners to transfer necessary funds in accordance with their procedures, which could take considerable time and effort.

Human resources are critical for effective monitoring and evaluation, even after securing adequate financial resources. For high-quality monitoring and evaluation, there should be: Dedicated staff time—For effective monitoring and evaluation, staff should be dedicated for the function. The practices of deployment of personnel for monitoring vary among organizations. Some UNDP country offices have established monitoring and evaluation units with specificterms of references (ToRs), dedicated skilled staff, work plans and other resources. Skilled personnel—Staff entrusted with monitoring should have required technical expertise in the area. A number of UNDP country offices have a dedicated monitoring and evaluation specialist.Where necessary, skill levels should be augmented to meet the needs and with ongoing investments in developing such capacity within the office as necessary.

Each monitoring and evaluation entity that functions at different levels, for example at the project, programme or outcome level, should have a clear ToR outlining its role and responsibilities. In general, these responsibilities should include: Setting up systematic monitoring frameworks and developing an evaluation plan Meeting regularly with key partners and stakeholders to assess progress towards achieving the results Conducting joint field monitoring and evaluation missions to assess achievements and constraints Identifying any lessons or good practices Reflecting on how well the results being achieved are addressing gender, and the interests and rights of marginalized and vulnerable groups in the society Identifying additional capacity development needs among stakeholders and partners Reporting

regularly to the lead individuals or agencies for the particular result areas and seeking opportunities to influence policy and decision-making processes

Ensuring the quality of monitoring and evaluation work and providing guidance as needed Assessing the relevance of the M&E framework on a regular basis based on emerging development priorities and changing context

SPECIFIC CONSIDERATIONS FOR BUDGETING AND FINANCING FOR EVALUATION

Programme units should estimate and indicate financial requirements and financing means for each evaluation in the evaluation plan. When estimating the cost for an evaluation, the duration and scope of the evaluation should be considered. The duration of an evaluation will be determined by its purpose. An evaluation conducted

Evaluators and external advisers, and expenses related to their duties Evaluation consultants and expert advisory panel members (if any) One evaluator or a team? How many in a team? What is the composition (national or international)? How many days will be required for each consultant and adviser? What would be the daily rate range for each one of them? Any cost associated with hiring? Are the advisory panel members paid (daily fees, honorarium)? Travel requirements What types of travel expenses will be incurred? For example, how many times does the team need to travel to the country or field? What travel requirements exist for briefings in UNDP offices, interviews with stakeholders, data collection activities, stakeholder meetings, etc.? What would be the primary mode of travel (air, project vehicle, etc.)? Is there a need for special modes of transportation due to accessibility and security considerations? For how many days and what are the allowances? Requirements for consultations with stakeholders Are thereregular meetings with the steering committee members to discuss the progress of the evaluation? Will there be a meeting with wider stakeholders to discuss the findings and recommendations of the evaluation? How many and who will be invited? What would be the cost associated with renting venues, and bringing in stakeholders (allowances and travel expenses) and refreshments? Data collection and analysis tools and methods What are methods of data collection? If surveys and/or questionnaires will be used, what is the target population and area to be covered? What resources are required (fees for enumerators, including their travel expenses, etc.)? Is there a

need for researchers to complete a detailed analysis of data collected? Any supplies needed? For example, office supplies, computer software for data analysis, etc. Communication costs What are the phone, Internet and fax usage requirements? If surveys or questionnaires are conducted, how will they be administered (mail, Internet, telephone, etc.)? Publication and dissemination of evaluation reports and other products, including translation costs, if needed.Are there any resources allocated for incidentals? Are there partners for the evaluation? Is this evaluation cost-shared? What would be the cost to UNDP?

Early in implementation, which tends to focus on programme or project design issues, is apt to be less complex and entail a smaller scope, hence requiring less data than would a 'heavier' exercise conducted at the end of the project or the programming cycle. The greater the complexity and scope of an evaluation, the longer time and more detailed work will be neededby the evaluation team to collect required data. This may increase evaluators' total fees. Programme units should be realistic in terms of the scope and complexity of theevaluation vis-à- vis available resources.

In addition, the availability and accessibility of primary and secondary data (monitoring, regular reporting and evaluation) and data collection methods influence the cost of the evaluationexercise. In the absence of reliable data, the evaluators need to spend more time and resources to locate or generate information. The appropriateness of allocated resources should be assessed together with the commissioned external evaluators based on the work programme submitted by them.

If an evaluation is carried out jointly with government or donors in the context of a larger outcome or government evaluation, the programme unit should agree on resourcing modalities with potential donors or government counterparts at the outset. Box 19 outlines the key itemsthat are required for the evaluation. Theprogramme unit responsible for the evaluation should ensure that every item is considered.

ENGAGEMENT OF STAKEHOLDERS IN MONITORING AND EVALUATION

The engagement of stakeholders enlisted during planning and described is to be relevant for monitoring and evaluation stages for the following reasons: The stakeholders, who set the vision and the prioritized results to realize that vision during the planning stage, have the best

ideas on how the results would continue to remain relevant to them. They must therefore be involved in identifying the information or feedback that is needed during implementation, which determines the parameters for monitoring and evaluation. Having set the vision, priority results and initial parameters for monitoring and evaluation, the key stakeholders are best placed to ensure that the programmatic initiatives planned would deliver what was intended and the way it was intended.

Stakeholder participation in monitoring and evaluation can produce effective communication for various other objectives. These include: facilitate communication of 'early wins' to increase support and enlist engagement of those who are not yet engaged, ensure access of early products and services of initiatives for intended beneficiaries, mobilize additional resources to fill resource gaps, and ensure effective use of lessons learned in future decision making.

Stakeholder participation throughout the programming cycle ensures ownership, learning and sustainability of results. Continued stakeholder participation in monitoring and evaluation cannot be assumed. It must be institutionalized. Specific measures have to be built into programme and project management processes to ensure continued and effective involvement of stakeholders. The UNDP practice of institutionalizing stakeholder engagement is summarized in Box 20.

CAPACITY FOR MONITORING AND EVALUATION

In UNDP assisted programmes, national programme partners are jointly responsible with UNDP for carrying out certain planned monitoring and evaluation activities. In line with the principles of MfDR, national ownership and use of country systems, monitoring and evaluation efforts in UNDP should capitalize, be aligned to, and build on existing national monitoring and evaluation systems and capacities whenever feasible (see Box 21). When appropriate, monitoring and evaluation efforts of UNDP

The programme management approach used by UNDP is designed to ensure that: A programme contributes to the achievement of the outcomes covered in the programme; a programme and its projects are coordinated within the national development framework; and agreed outputs are generated through projects and programme funds. This involves three levels:the programme level, which would cover one or more outcomes and provide linkage to overall national results; the sectoral or outcome level; and the project level, which relates to operational level of delivery

of outputs by implementing activities using resources. The responsibilities for monitoring and evaluation are different at each programming level.

The participation of stakeholders is institutionalized in the management arrangements by boards or committees at the programme, sectoral/outcome and project levels. These boards or committees should not duplicate existing mechanisms but instead use existing national structures and mechanisms. If no mechanisms exist, efforts should be made to constitute groups that fulfil such functions. Each board or committee should have representatives of the owners, the beneficiaries and suppliers of technical services.

Sectoral or outcome level: There is a need to coordinate UNDP contributions to outcomes and provide feedback into the overall UNDP programme management. UNDP often participates in national sectoral coordination mechanisms to make explicit the link between UNDP contributions and national priorities. The sectoral or outcome level coordination mechanisms: promote partnerships bringing together all projects concerned within a single shared outcome; ensure synergy and reinforce a common strategy among partners towards results; and monitorthe achievement of outcomes. Also, the UNDP programme manager should ensure that UNDPsupported outputs are coordinated at the outcome level.

Programme and Project Boards: Programme and Project Boards meet at a minimum annually to review annual progress of results, agree on any changes as required, and set new annual targets. These boards are management entities of the UNDP programme and focus on the UNDP contribution to national development results.

Box 20. Stakeholder involvement in monitoring and evaluation: Practice of UNDP

National budgeting process National medium-term or long-term development strategic plan or framework Sector strategy, policy, programme or projects and national coordination bodies tasked to coordinate such activities National M&E systems for national development strategy, plan or framework and a sector strategy, policy, programme or projects.

Examples of alignment with national systems should indicate where the organization’s programmatic support requires further strengthening, including that of national systems. The analytical process and data used for planning provides initial opportunities and insights to

discern future monitoring and evaluation requirements in comparison to existing data sources and quality. This also identifies areas where capacity to monitor and evaluate can be further developed in national partners at their request and when relevant.

At the higher levels of results (national goals, sector goals and outcomes), key stakeholders should typically form sector-wide or inter-agency groups around each major outcome or sector. Whenever there are existing national structures such as sector-wide coordination mechanisms,the United Nations and UNDP should ideally engage them and participate in these rather than setting up parallel systems. Sectoral or outcome-level coordinating mechanisms should not be a United Nations or UNDP management arrangement, but an existing national structure that is already charged with the coordination of the sector from a development perspective within the national context. These groups should have adequate capacity to be responsible for the following: Agree on an M&E framework for the outcomes and oversee their implementation. They ensure continuous outcome assessment and can enhance progress towards results. Promote partnerships and coordination within a single shared outcome. All projects that are generating relevant outputs to the corresponding outcome should be included in the outcome group to ensure inclusive discussions. This gives partners a common vision of the outcome to which different projects or outputs are contributing. Ensure synergy and coordination by reinforcing a common strategy among partners working towards common results. Monitor and evaluate, where appropriate, the achievement of outcomes and their contribution to national development goals. Outcome-level mechanisms are expected to determine who is responsible formonitoring and data collection, how often it will be collected, who will receive it and in what form. The results frameworks and the M&E framework serve as the basis for joint monitoringand evaluation by these groups. Carry out, participate in, and assure the overall quality of project, outcome, thematic and other types of reviews and evaluations and ensure that theprocesses and products meet international standards. Ensure effective use and dissemination of monitoring and evaluation information in future planning and decision making for improvements.

Capacities for monitoring and evaluation, like for most technical areas, exist on three levels: the enabling environment, the organizational level, and the individual level. Capacities at these levels are interdependent and influence each other through complex codependent relationships.

Change in capacity generally occurs across four domains: institutional arrangements, including adequate resources and incentives; leadership; knowledge; and accountability mechanisms. Addressing only one of these levels or domains in a programme or project is unlikely to result in developing sustainable monitoring and evaluation capacities. Therefore, an outcome group needs to take a more holistic view in identifying and addressing the capacities needed to monitor and evaluate the results being pursued.

PLANNING FOR MONITORING AND EVALUATION

The relevant sector-wide or outcome-level coordinating mechanism may begin by undertaking a high-level or preliminary capacity assessment to understand the level of existing and required monitoring and evaluation capacities of a given entity.27 Benchmarks for the three levels and four domains mentioned above are limited. However, the subsections below offer possible lines of questioning for the preliminary assessment. The insights generated by these questions and others may help a programme team formulate a capacity development response.

INSTITUTIONAL ARRANGEMENTS

Is there a documented institutional or sector programme monitoring and evaluation policy that clarifies the mandates of monitoring and evaluation entities and programme or project teams, their responsibilities, and accountability measures for effective data collection and data management of public programmes or projects? Does the institutional and sector policy mandate require: establishing standard tools and templates, aligning organizational data with the national data collection and management, defining standards for monitoring and evaluatingskills, and ensuring proper training? Are sufficient resources, including availability of skilled staff and financial resources, allocated for monitoring and evaluation activities in respective monitoring and evaluation entities? Do monitoring staff have proper statistical and analytical skills to compile and analyse sample and snapshot data? Is there an independent evaluation entity? Is the institution responsible for evaluation truly ‘independent’ from management and subject to evaluation? What is the reporting line of those responsible for carrying out evaluations? What mechanisms are there to safeguard the independence of the evaluation function?

LEADERSHIP Does high-level management support evidence-based decision making throughout the organization?

KNOWLEDGE Can high-quality information be disaggregated by relevant factors (such as gender, age and geography) to assess progress and analyse performance? Do the respective monitoring and evaluation entities have access to all relevant programme or project information to be gathered? Do the stakeholders have access to data collected and analysed (for example through the Internet)? Do the monitoring and evaluation entities have easy-to-understand formats for data collection and reporting? Is there a systematic and documented process of ensuring data quality control at all levels of collection, analysis and aggregation? Is there sufficient evaluation technical expertise in the national system? Are there national professional evaluation associations?

ACCOUNTABILITY

Can the information from the monitoring and evaluation entities be provided to decision makers and other relevant stakeholders in a timely manner to enable evidence-based decision making?

Based on the above considerations and the insights generated from a high-level capacity assessment, one of four broad approaches would be selected to meet the monitoring and evaluation requirements of the results being pursued (see Figure 12). This high-level capacity assessment may also lead to more in-depth capacity assessments for particular areas.

It may be important for the sector-wide or outcome group to document the analysis. This matrix can help determine what monitoring and evaluation facilities exist in national partner institutions that can be used and identify gaps. The last column could be used to indicate how capacity development efforts—including detailed capacity assessments— may be addressed through other UNDP programmatic support, when relevant national demand and need arise.

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UNIT – III - Fundamentals of Entrepreneurship – SMB5455

SATHYABAMA

INSTITUTE OF SCIENCE AND TECHNOLOGY

Medical Biotechnology and Clinical Research Bio-Entrepreneurship (SMB5455)

Course Materials

Unit: III Fundamentals of Entrepreneurship

The center of any economic activity is an entrepreneur. Any new product or service is no doubt motivated by consumer needs but initiated, designed, developed, promoted and placed by an entrepreneur only. It is the thirst of entrepreneur who gives birth to a new product. Sometimes new trends are settled by entrepreneur. So they play a role of a Trend Setter as well. The development, prosperity, lifestyle of any economy is basically brainchild of entrepreneurs belong to the same community.

An entrepreneur is having some specialty that the others don‟t possess that‟s why researchers are always interested in finding what motivates a person to become an entrepreneur? What are the special attributes or characteristics an entrepreneur has?

The word „entrepreneur‟ is derived from the French verb „enterprendre. It means “to undertake”. This term first appeared in the French Dictionary "Dictionnaire Universal de Commerce" of Jacques des Bruslons published in 17231. According to A.P.Ushar function of an entrepreneur is not more than a managerial function.

On studying the history of Indian Mythology in Ancient literature like Manusmriti has provided a clear idea about entrepreneurial class of people during ancient period (pre-Vedic). According to Manusmriti, “people belonging to Vaisya caste were regarded as entrepreneurs who are specialized to maintain livestock, to give charity, perform sacrifices, study scriptures and undertake business and banking.” Hence, Vaisyas were the specialized class of people carrying entrepreneurial activities in these days. At that time, the basic sources of the occupations were Agriculture, crafts and handicrafts. The occupational development during this period comprised ownership of land pasture grounds, trees, forests, water reservoirs; mine, etc. with the

introduction of entrepreneurship, the towns and cities developed. If the history of western countries is studied, then Marko Polo was one of the oldest entrepreneurs in 13th century and in 19th century Thomas Edison having more than thousand patented products in his basket. To invent something and to encash the invention they both are separate attributes. Invention needs creativity while encashment needs business sense. Edison was having this rare combination. He can be truly considered as an entrepreneur.

Meaning

In simple terms it can be said as a person who undertakes business activities is termed as an entrepreneur. The classical economists like Adam Smith, Alfred Marshall never made use of the word entrepreneur instead they have used the words like employer, undertaker or merchant. The first person who introduced the term entrepreneur is an Irish economist Richard Contillon in 18th century.

1) Richard Contillon :

”An agent who buys factors of production at certain prices in order to combine them into a product with a view to reselling it uncertain price in future.2”

2) Leon Walrus:

” Entrepreneur is the co-coordinator of basic factors of production. It is the fourth factors of production who combines other factors such as land, labour and capital.”

3) Jean Baptise say:

”An entrepreneur is one who combines the land of one, the labour of another and capital of yet another and thus produces a product. By selling the produce in the market, he pays interest on capital, rent on land, wages to labourers and what remain are his profits.”

The above definitions make it clear that an entrepreneur is the fourth factor of production that combines and coordinates the other factors. Pays them reward from the produce of the combination. It is speculative process that involves risk and uncertainty. The definitions which highlight the risk and uncertainty can be explained below.

4) Encyclopedia of Britannica:

“An individual who bears the risk of operating a business in the face of uncertainty about the future conditions.3”

5) F.H.Knight :

“Entrepreneurs are a specialized group of persons who bears risk and uncertainty.”

6) Noah Webster:

“Entrepreneur is one who assumes the responsibility of the risk and management of the business.”

7) Free dictionary.com:

“A person who organizes, operates, and assumes the risk for a business venture.4”

8) Linda Pinson:

“An entrepreneur as a person who starts a business to follow a vision, to make money, and to be the master of his/her own soul (both financially and spiritually). Inherent in the venture is the risk of what the future may bring. Therefore, an essential key to success is that the entrepreneur also be an "educated" risk taker. "

9) 1961: David McClelland:

“An entrepreneur is a person with a high need for achievement. He is energetic and a moderate risk taker.”

10) 1975: Albert Shapero:

“Entrepreneurs take initiative, accept risk of failure and have an internal locus of control.”

The above definitions of entrepreneur focus on basic attributes of any business man are to manage a business under risk and uncertainty. The basic difference between an employee and an entrepreneur is facing risk and uncertainty.

11) J.A.Schumpeter :

”A person who introduces innovative changes is an entrepreneur and he is an integral part of economic growth.5”

12) Frank Young:

”Entrepreneur is a change agent.”

13) Dewing:

”The function of entrepreneur is one that promotes ideas into business.”

14) Peter Drucker:

”Entrepreneur is one who always searches for change, responds to it and exploits as an opportunity. Innovation is a specific tool of entrepreneurs, the means by which they exploit change as an opportunity for different business or services.”

15) 1985: W.B. Gartner:

Entrepreneur is a person who started a new business where there was none before.

16) E.E.Haggen:

“An entrepreneur is an economic man who tries to maximize his profits by innovations. Innovations involve problem-solving and entrepreneur gets satisfaction from using his capabilities in attacking problems.”

The above definitions focus on innovation as one of the essential attributes of an entrepreneur. Inventing something new and giving a new lifestyle to the society is possible by a visionary entrepreneur only.

17) Business Dictionary.com:

“Someone who exercises initiative by organizing a venture to take benefit of an opportunity and, as the decision maker, decides what, how, and how much of a good or service will be produced.6”

18) Robert Nelson:

“A person who is able to look at the environment identifies opportunities to improve the environment, Marshall Resources and implement action to maximize opportunities.”

19) International Labour Organisations (ILO):

“Entrepreneurs are those people who have the ability to see and evaluate business opportunities, together with the necessary resources to take advantage of them and to initiate appropriate action to ensure success.”

20) Vasant Desai:

“An entrepreneur is described as a capitalist employer seeking profit; a risk taker, a monopolist, a coordinator, an innovator and an organizer of means of production. A person of all these attributes in operation may be termed as entrepreneur.7”

The above definitions can be considered as comprehensive definition considering almost all the important aspects of an entrepreneur. It considers him as an opportunity seeker, innovator, organizer, decision maker, capitalist etc.

Emergence of Entrepreneurial Class Emergence and development of entrepreneurial class can be divided into two parts….

Development of entrepreneurial class in other developed countries

Development of entrepreneurial class in India 1.3.1 Development of entrepreneurial class in other developed countries In developed countries like England, Japan, USA, Russia etc., what are the situations which have developed a new class of entrepreneurs? It is interesting to note that in the past these countries considered as developed today, considered as underdeveloped at that time. In Britain in 17th and 18th century Industrial Revolution has taken place. Because of this production at a large scale was possible but what about selling? This has given birth to the new class of entrepreneurs who undertake the risk and sell the product in the market. So in England it can be said that new product development has played very important role in shaping entrepreneurial characteristics. Following the footsteps of industrial revolution in UK, in the other neighbor countries like France and Germany also industrial revolution took place after 1870. And a new class of entrepreneurs developed there also.

While Japan till 1868 was an isolated country, but afterwards in governance of prince Meigie, who was just 16 years old, some revolutionary steps were taken. As private sector was lacking initiative, government started industries at state level just to encourage the private sector entrepreneurs. After establishing them successfully they were handed over to private sectors. An appreciable step was taken by a young and dynamic government thinker. The entrepreneurs benefited a lot. It is a learnable lesson for any government to inculcate entrepreneurship. Till 1914 it continued and image of Industrial country was established in the world.

Till 1861 there was rule of autocratic in Russia. They exploited all three sectors of economy badly. There was no remarkable progress before this period. Over exploitation by the autocrat Czar compelled him to frame the law of liberty in 1861. This has given opportunities to farmers and industrialist to open their wings and fly freely. During this period industrialists were given financial assistance for export and also tax liberalized policy that motivates industries. Development of a new entrepreneurial class took place. Till First World War it continued.

In US after civil war from 1860 industrial revolution took place. Before that it was known as an agriculture country. Government support in form of patent policy motivated entrepreneurs to innovate and market. From 1929 to 1933, great depression played role of great ruin of any economy. America was also not an exceptional case. Newly appointed president Roosevelt adopted price rise policy of industrial products. The purpose was to increase the profit margin and thereby increasing income and demand of the economy. This has motivated entrepreneurial class to start a new venture.

Development of entrepreneurial class in India

On studying the history of ancient India, it can be seen that India had become victims of foreign attacks in a series. Mohammad Gazani, Mughals, Britishers, French, Dutch etc. have ruled over India. The reason was to acquire wealth and prosperity. Basically the image of Indian economy was of an Industrial Country. It was famous for their art, craft and industrial products. Not only this, but India was the exporter of this products. Dhaka, Ahemedabad, Kashmir were famous for their unique fabric quality in the world. While Hyderabad and Banaras were famous for copperbrass vessels and Rajasthan was famous for sculpture and art. In the time of Kingdom business men, artists were having their special place in the kingdom. Kings were fond of using artistic products so they admire art and culture a lot. That was also one of the reasons for the development of such activity as business activity. So basically India was considered as an Industrial country in the ancient period of time. In the ancient period there used to be „Varn Vyavastha“ in practice. Means according

to aptitude people used to engage in any economic or daily activity. Brahmans were learned men who had assisted the Kshatriyas (rulers) in the administration, Vaishyas have performed trading and industrial productive activities and Shudras engaged in an agricultural occupation8. A class called „Vaishy‟ (Trader) treated as entrepreneur at that time. But later on different castes have jumped in to various types of business and economic activity. Certain castes named Marwadi, Vanik, Khoja, Parsi were famous for their venturesome nature to undertake any business activity. But gradually that rigidity has decreased.

In the time of British rule, it was their policy to ruin Indian economy and to develop British economy. They misused their power like anything, made the Indian artists handicap so that they cannot create any art. India was the biggest supplier in the world has merely remained as consumer. Indian products due to negative tax systems of Britishers‟ become costlier than UK products. That has demolished our industries. In these adversities also entrepreneurs from Parsi, Marwadi and Gujarati could sustain and found their way. They could establish their plants in the field textile, iron and steel, cement industry. After independence government has taken certain special steps for the development of entrepreneurship which are discussed in the other part of the same chapter. 1.4 Types of Entrepreneurs The entrepreneurs can be classified on the basis of various grounds. The basis of their classification can be explained as follows. 1.4.1 A Chart showing Types of Entrepreneurs

Types of Business

•i) Trading Entrepreneurs •ii) Industrial Entrepreneurs •iii) Service Entrepreneurss •iv) Agriculture Entrepreneurs •v) Others

Use of technology

•i) Technical Entrepreneurs •ii) Non technical Entrepreneurs •iii) Professional Entrepreneurs

1.4.3 Stages of Development :

•i) Inherited Entrepreneurs •ii) First Generation Entrepreneurs

The detail can be explained as follows… Area

•i) Rural Entrepreneurs •ii) Urban Entrepreneurs •iii) Local Entrepreneurs •iv) National Entrepreneur •v) Global Entrepreneurs

1.4.5 Form of Organiastion

•i) Individual Entrepreneurs •ii) Group Entrepreneurs •iii) Corporate Entrepreneurs According to Gender and Age : •i) Men Entrepreneurs •i) Women Entrepreneurs

According to Gender and Age : •i) Young Entrepreneurs •ii) Old Entrepreneurs • iii) Middle aged Entrepreneurs

According to Growth:

•i) Growth Entrepreneurs •ii) Super Growth Entrepreneurs •iii) Lifestyle Entrepreneurs According to Motivation:

•i) Pure Entrepreneurs •ii) Induced Entrepreneurs •iii) Motivated Entrepreneurs •iv) Spontaneous Entrepreneurs •v) Accidental Entrepreneurs

Type of Business:

According to types of business Entrepreneurs classified like this….

i) Trading Entrepreneurs: It includes all those entrepreneurs who are engaged in trading activities. Whole sellers, Retailer, Mall Trader, Exporter, Importer, Stock Trader etc.

ii) Industrial Entrepreneurs: It includes entrepreneurs engaged in manufacturing activities. They can be even classified in form of tiny sector, Medium scale and large scale sector.

iii) Service Entrepreneurs: It includes entrepreneurs of service sectors like repairs, engineering, Beauty Parlour etc.

iv) Agriculture Entrepreneurs : Entrepreneurs engaged in different activities related to agriculture say, Plantation, Horticulture, Dairy, Forestry, Floriculture, Animal Husbandry, Poultry, seeds etc.

v) Others: other Entrepreneurs includes Re engineering Entrepreneurs, Health Entrepreneurs etc.

Use of Technology:

According to use of technology made by Entrepreneurs, they can be classified as

i) Technical Entrepreneurs

ii) Non-technical Entrepreneurs

iii) Professional Entrepreneurs Let us understand them.

i) Technical Entrepreneurs

These are the entrepreneurs who apply technical knowledge and advanced technology in doing their business activities or they are doing business of such high technological products or machinery business. According to intensity of the technology they use they can be classified as

a) High Tech Entrepreneurs b) Low tech Entrepreneurs

ii) Non-technical Entrepreneurs

Where technical skill is not a prime need such types of entrepreneurs may fall in this category. They may be dealing in trading at a large scale level.

iii) Professional Entrepreneurs

These are the entrepreneurs who sell their skill as a professional body and earn. According to selling of their skill set they can be classified as

a) Business Process outsourcing Entrepreneurs b) Knowledge process outsourcing Entrepreneurs c) Legal process outsourcing Entrepreneurs d) IT Entrepreneurs e) E-Entrepreneurs

Stages of Development:

According to stages of development, Entrepreneurs can be classified as…

i) Inherited Entrepreneurs

ii) First Generation Entrepreneurs Understanding them in detail…..

i) Inherited Entrepreneurs

The person who starts a new venture belongs to a business class family background can be defined as Inherited entrepreneur. It is believed that he may possess some hereditary attributes of entrepreneurs.

ii) First Generation Entrepreneurs

The person who starts the new venture belongs to other than business background can be defined as a First generation entrepreneur.

According to Area:

According to area in which they are located Entrepreneurs can be classified as..

i) Rural Entrepreneurs ii) Urban Entrepreneurs

iii) Local Entrepreneurs iv) National entrepreneur

v) Global Entrepreneurs Understanding them in detail…..

i) Rural Entrepreneurs

The person whose business activity is limited in rural area as well as their customers also reside in rural area can be defined as Rural entrepreneur.

ii) Urban Entrepreneurs

A person who starts his business activity from urban area and whose customers also belong to urban area can be defined as Urban entrepreneur.

iii) Local Entrepreneurs

A person whose business activity is limited up to one city or district can be said as a local entrepreneur.

iv) National entrepreneur

A person whose business activity is limited up to national level, may be spread over in more than one states can be said as a National leveled entrepreneur.

v) Global Entrepreneurs

A person whose business activity is not limited up to national level and spread over more than one country can be said as a Global entrepreneur. Such entrepreneur may form their business organization into corporate form.

1.4.5 According to Form of Organisation:

According to form of organization Entrepreneurs can be classified as…

i) Individual Entrepreneurs:

Mostly engaged in sole proprietorship form of business.

ii) Group Entrepreneurs:

Mostly engaged in partnership form of business.

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UNIT – IV - Industrial R&D and product development **– SMB5455**

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INSTITUTE OF SCIENCE AND TECHNOLOGY

Medical Biotechnology and Clinical Research Bio-Entrepreneurship (SMB5455)

Course Materials

Unit: IV Industrial R&D and product development

Introduction

Product development and project management in Agri, Pharma, Health and other biotech industries. Overview of issues and techniques involved in conducting & outcome of research. The multidisciplinary nature of outcomes research: research design and methods, data collection measurement instruments and clinical endpoints, quality of life issues, behavior change, and cost-effectiveness. Analysis Transition from R&D to business units. Product development, market learning and transition from R&D. Management of radical innovation technologies vs. stage gate approach in product development.

Case studies

In order to compete in today's hyper-competitive marketplace, manufacturing organizations are forced to focus on a series of factors that may influence their profitability. The extant literature identifies the three most important factors as quality, cost and delivery of products and services. Moreover, both practitioners and managers recognize that only few organizations can compete for long without successful new product (or service) development and supply chain management (Patil et al., 2002). Thus, improved management of these two processes should allow companies to create greater customer value, achieve higher market share, as well as enjoy improved profits. NPD refers to the process of bringing a new product or service to the market and involves several steps, namely idea generation, product design, product engineering, market research and marketing analysis, etc. Companies typically see NPD as the first stage in generating and commercializing new products within the overall strategic process of product life cycle management. In today's environments, NPD is regarded as a key factor, mainly due to three reasons: first, the increasing international competition; second, the fragmenting and demanding

markets; third the diverse and changing technologies (Bigliardi et al., 2010). Therefore, greater focus has been placed on NPD and organizations have been forced to embrace NPD as an integral part of their corporate strategy, as well as on offering products that are adapted to the needs of target customers in order to create a sustainable competitive advantage and to stay ahead of the competition (Calantone et al., 1995; Damanpour and Gopalakrishnan, 2001; Scarborough, 2010). Proficiency in NPD is thus recognized to contribute to the success of many companies (Sun and Wing, 2004). During the last decades, companies have been forced to focus more on product quality than on internal efficiency, and to quickly identify changing customers' needs, to develop more complex products to satisfy those needs, and to provide higher level of customer supports and service (Sheperd and Ahmed, 2000).

SCM describes the discipline of optimizing the delivery of goods, services and related information from supplier to customer (Gibson et al., 2005). It is concerned with the effectiveness of dealing with final customer's demand by the parties engaged in the provision of the product as a whole (Cooper et al., 1997). An efficient supply chain includes a firm's internal functions (that is, all transformation processes), but also its upstream suppliers, and its downstream distribution channels reaching the end customers (that is, distributors and retailers). Thus, since NPD involves collaborating with organizations within and outside the primary manufacturing company at all stages of the process, interaction between NPD and SCM is now understood to be a crucial success factor (Ken et al., 2007).

On the basis of the premises above, the aim of this paper is to explore the relationship between NPD and SCM in the context of the Italian mechanical industry, and specifically to develop a model that describes the NPD process in mechanical companies. The choice of this specific industry was motivated by the fact that it is a primary industrial sector of Europe, as demonstrated by the high level of employment and the turnover generated (European Commission, 2011). Europe, in fact, is the world's largest producer and exporter of machineries. The competitiveness of the industry relies, inter alia, on excellent, innovative products, know- how and skills and the ability to comply with customers' wishes. Mechanical engineering is a very wide and diverse sector, covering machinery and equipment; machinery for the production and use of mechanical power, except aircraft, vehicle and cycle engines; agricultural and forestry

machinery; machine tools and special purpose machinery. Moreover, the mechanical industry represents the second sector for importance in the Emilia Romagna region, where the study has been conducted.

The paper is structured as follows: section 2 reviews the literature on NPD in general and on the interaction of NPD and SCM.

Section 3 details the research methodology adopted and reports the preliminary NPD framework for the mechanical industry as emerged from the literature review phase. Section 4 presents the results from the case studies, while section 5 presents a summary of the results and proposes the final NPD process as emerged from the results from the case studies. Finally, section 6 concludes the paper discussing the main results derived from the study as well as the main limitations and future research.

NPD is a broad field of the management literature dealing with the design, creation, and marketing of new products, mainly focused on developing systematic methods for guiding all the processes involved in getting a new product to market (Cohen et al., 2000; Hilletofth and Eriksson, 2010). Companies typically see NPD as the first stage in generating and commercializing new products within the overall strategic process of product life cycle management (Cooper et al., 2002).

The design of the NPD process has evolved throughout the years, and various NPD frameworks have been proposed, both normative and descriptive. Specifically, identify three main generations of NPD models can be identified. A first generation (up to the 1980s) refers to the "sequential models": here, NPD process was seen as a series of phases to be conducted sequentially, in order to simplify innovation activities. Klompmaker et al. (1976) and Hanan (1970), proposed a 27-steps

model of NPD and a 24-activities flow diagram suitable for non- industrial goods respectively, while McGuire (1973) proposed a similar model for industrial goods. Lately, during the first half of the 1990s, the "concurrent engineering approach" was proposed: according to this approach, the NPD steps were carried out in parallel or simultaneously (Clark and Fujimoto, 1991). Cooper (1990, 1994), proposed a third generation of NPD models, and described this process as a model for moving a new product from idea to launch mainly integrating discipline into a process, thus allowing the improvement of

effectiveness and efficiency. The stage-gate process consists of a series of stages, where essential activities are carried out, that are complemented by gates, where interim achievements are evaluated and that function as stop/go and prioritization points where decisions for the future of the project are made. As per the previous generation of NPD models, stages are typically cross- functional and each activity is undertaken in parallel with others so as to enhance speed to market. A further characteristic of this model is the role of cross-functional groups of

senior managers, called gatekeepers, who manage the gates and evaluate projects on the basis of quality of execution, business rationale, and quality of the action plan. Today, researchers observe the adoption of the so-called "stage-gate NPD process" as a methodology that is recognized and widely embraced in companies all over the world (Gronlund et al., 2010).

As regards the phases to be carried out within the NPD, it emerges from the extant literature that not all steps are common to all NPD projects, nor those steps are necessarily undertaken with the same relative emphasis. Booz et al. (1965) proposed a NPD model composed by six steps, namely: (1) exploration, (2) screening, (3) business analysis, (4) development, (5) testing, and (6) commercialization.

Kotler and Armstrong (1991) proposed a sequential eight-phase NPD process, that starts from the (1) idea generation and through the (2) idea screening, (3) concept development and testing,

(4) marketing strategy development, (5) business analysis, (6) product development, (7) test marketing, concludes with the (8) commercialization of the product developed.

Graf and Saguy (1991), by analyzing the NPD in the food industry, proposed the subdivision of the NPD process in 5 steps, as

listed below:

(1) screening;

(2) feasibility;

(3) development;

(4) commercialization;

(5) maintenance.

Urban and Hauser (1993) proposed in their study a sequential and proactive NPD process, composed of 5 steps: (1) opportunity

identification, (2) design, (3) testing, (4) introduction, and (5) life-cycle management. In 1994,

MacFie proposed a 7-step NPD

process, stressing the importance of time as key factor in the NPD. The steps are:

(1) concept generation;

(2) concept screening;

(3) product development;

(4) product testing;

(5) packaging development (including advertising material);

(6) first production run;

(7) launch.

A similar process was proposed by Fuller (1994), including the following 6 steps: (1) getting ideas (based on the company's

objectives and consumer needs), (2) screening of ideas (financial review/feasibility), (3) development, (4) production, (5)

consumer trials, and (6) test market. Pitta (2007), stressed the importance of the concept screening and economic analysis steps in

the traditional NPD process: (1) concept generation, (2) concept screening, (3) economic analysis, (4) development, (5) test

marketing, and (6) commercialization. More recently, Bigliardi et al. (2010), according to the findings obtained from a case study,

propose a 7-step NPD process, including:

(1) identification of the market need and generation of the “idea” of the product;

(2) development of the technological solution;

(3) pre-testing of the product with selected customers;

(4) innovation protection through Italian patents;

(5) innovation protection through international patents;

(6) product manufacturing and launch in the food packaging market;

(7) expansion in different markets.

As emerged from the literature review reported above, a general model of NPD process has not been developed yet. However, most of the models proposed in literature agree in the identification of a series of phases. In the early stages, activities generally focus on discovering opportunities and generating ideas, while the later stages focus on concept development, testing, and commercialization. A summary of the results from the literature review is reported in Table Table 1. The main phases of the NPD process.

Objective Step Main references Discovering opportunities and generating idea

(1) exploration, (2) screening Booz et al. (1965)

(1) idea generation, (2) idea

screening, Kotler and Armstrong (1991)

(1) screening Graf and Saguy (1991)

(1) opportunity identification Urban and Hauser (1993)

(1) concept generation, (2) concept screening MacFie (1994)

(1) getting idea, (2) screening of ideas Fuller (1994)

(1) concept generation, (2) concept screening Pitta (2007)

(1) identification of the market need and generation of the "idea" of the product

Bigliardi et al. (2010)

Economic and strategic evaluation (3) business analysis Booz et al. (1965)

(2) feasibility Graf and Saguy (1991)

(3) economic analysis Pitta (2007)

Table 1 (cont'd). The main phases of the NPD process. Objective Step Main references

Development and testing of the

product concept and/or of the final product

(4) development, (5) testing Booz et al. (1965)

(3) concept development and testing Kotler and Armstrong (1991)

(3) development Graf and Saguy (1991)

(2) design, (3) testing Urban and Hauser (1993)

(3) product development, (4) product

testing, (5) packaging development MacFie (1994)

(3) development Fuller (1994)

(4) development Pitta (2007)

(2) development of the technological solution, (3) pre-testing of the product with selected customers Bigliardi et al. (2010)

Development of the marketing strategy

(4) marketing strategy development,

(5) business analysis Kotler and Armstrong (1991)

(5) test marketing, Pitta (2007)

(3) pre-testing of the product with selected customers, (4) innovation protection

Bigliardi et al. (2010) Product launch and commercialization

(6) commercialization Booz et al. (1965)

(6) product development, (7) test marketing, (8) commercialization of the product developed

Kotler and Armstrong (1991)

(4) commercialization, (5) maintenance Graf and Saguy (1991)

(4) introduction, (5) life-cycle

management Urban and Hauser (1993)

(6) first production run, (7) launch MacFie (1994)

(4) production, (5) consumer trials,

(6) test market Fuller (1994)

(6) commercialization Pitta (2007)

(6) product manufacturing and launch in the food packaging market, (7) expansion in different markets

Numerous studies have investigated the factors that may influence the results of the NPD process. These factors are various, but among others, the involvement of supply chain players in the NPD process starts to attract relevant attention in both NPD and SCM fields. Collaboration between two or more companies has been identified as a way of achieving benefits in the NPD process, in terms of reduced costs and decreased risk of failure (Parker, 2000). In particular, literature on these matters suggests that a company will perform better if it collaborates with suppliers and customers (Lau, 2011; Lin et al., 2010). Thus, the role of suppliers and customers and their involvement in the NPD process has been investigated both researchers and practitioners. In literature, various definitions of supplier and customer involvement in the NPD process have been proposed. Handfield et al. (1999) and more recently van Echtelt (2008) defined supplier involvement as the resources (i.e., capabilities, investments, information, knowledge, ideas) that suppliers provide, the tasks they carry out and the responsibilities they assume regarding the development of a part, process or service for the benefit of a buyer's current or future product development projects. Suppliers, due to their greater expertise and knowledge regarding the specifications, parts and components, may provide companies with different benefits: first, suppliers involvement can help firms incorporate the expertise and their different perspective to improve solutions or create new methods for product development. Second, suppliers involvement also allows firms to identify potential technical problems and speed up the NPD process (Sun et al., 2010). As far as customers' involvement is concerned, its importance is particularly recognized in the early stages of NPD process (Tan and Tracey, 2007). The involvement of customers in the NPD

process may lead to better firm performance and new product success (Gruner and Homburg, 2000), as well as to also speed up the process of adoption necessary for success (Johnson and Filippini, 2009).

From the above discussion, it may be argued that the NPD process on the one hand enables management to coordinate the flow of new products efficiently, on the other hand it allows to assist in the ramp-up of supply processes and other related activities (such as for example marketing and sales), supporting the commercialization of the product (Carillo and Franza, 2006). Thus, companies have to coordinate and address these issues in parallel to enhance profitability (Van Hoek and Chapman, 2006; 2007), and this can be done by involving SCM from the beginning of product development (Gerwin and Barrowman, 2002; Morgan et al.,2001). However, the lack of research addressing NPD and SCM coordination is remarkable (Carillo and Franza, 2006; van Hoek and

Chapman, 2007). For instance, recently, research by van Hoek and Chapman (2006, 2007) reviewed the misalignment between NPD and SCM, and argued that there is a need to improve the alignment between these activities in order to leverage supply chain capabilities and improve product launch effectiveness. They highlighted the lack of research examining how the different NPD and SCM activities influence each other, how they can be coordinated, what benefits that can be obtained by coordinating them, and

what the requirements are to succeed with the coordination. This means that there is a need for research aiming to fill this gap in the literature and to increase the understanding of the whys and hows of NPD and SCM coordination.

Research methodology

The research methodology adopted in this study consists of three steps, namely:

1. a preliminary analysis of the literature related to NPD and SCM, and the development of a draft of NPD process for the mechanical industry, composed by a number of phases (e.g., idea exploration and generation, idea screening, development of the product concept, etc);

2. the design of a questionnaire, including the steps of the NPD process previously obtained from the literature, to be used as a guideline for the following step;

3. the development of 7 case studies, involving as many companies from the mechanical industry, aimed at exploring the way the NPD process is carried out in real scenarios, as well as at identifying different phases to be included in the

framework or those to be deleted, and at investigating the relationships between NPD and SCM in terms of resource consumption. From the analysis of the case studies, a preliminary picture of the NPD framework that the mechanical companies use to adopt was derived, together with some useful guidelines for companies wishing to perform better in terms of NPD.

A detailed description of the research steps is provided in the subsections below.

Research step 1 – The preliminary NPD process

The first phase of the research was a detailed analysis of the literature related to NPD and SCM, including specific studies in the field of the mechanical industry. The purpose of this research step was to elaborate an NPD framework suitable to be adopted by mechanical companies. From the literature analysis, as well as from findings provide in Table 1, we built a preliminary NPD process, whose structure is shown in Figure 1. The framework consists of eight steps, ranging from “idea exploration and generation” to “product launch”; a brief description of the NPD process steps is proposed below.

Step 1. Idea exploration and generation. This step basically aims at discovering opportunities for NPD (cf. Table 1), and is a systematic search for useful new product ideas, which have potentials to generate business opportunities. The main activity is thus the collection of detailed pieces of information about potential new products; this can be performed by applying different

techniques (e.g., market research, brainstorming, or focus groups). Moreover, the identification of the critical customer’s needs is one of the main elements of this phase: it is thus necessary that a company shows good communications skills with their customers during the idea exploration. Step

2. Idea screening. Many authors suggest that the idea generation should be followed by a phase of "screening" (e.g., Booz et al., 1965; Kotler and Armstrong, 1991; Fuller, 1994; MacFie, 1994). Idea screening consists in evaluating and selecting the best ideas generated in the previous step, i.e. the business ideas which show the highest probability of being successful. As a result, during this phase unsatisfactory ideas will be eliminated. To judge the suitability of an idea, some specific criteria can be applied, such as, for instance (Booz et al., 1965; Graf and Saguy, 1991; Pitta, 2007):

- the feasibility and engineering of the idea into a product design (engineering criterion);
- the suitability of the idea to generate a product which will be required by the targeted market and will meet the business needs

(marketing criterion);

- the consistency of the idea with the business objectives and economic feasibility (management criterion).

As a result of this step, the company's top management will be sure that only the appropriate ideas will be chosen for further exploration and elaboration. In fact, the main risk of this step is the possibility of choosing ideas that miss one of the above criteria (e.g., they are technically feasible but unattractive to the market). The role of the company's top management is to identify a balance between what has potential to be desirable by the customer and what is technically feasible. However, at this stage of the NPD process, it is often difficult to get precise information about the potential responses of the market to the new product, as well as on the technical requirements of the product (and thus on its technical feasibility). Hence, the company's managers may alsorely on their personal intuition when judging new product ideas. This is why the ideas that do not meet the criteria mentioned above are not properly removed; rather, they are temporarily kept aside: at this time, such ideas will not be explored further, but it would be possible to wait for more favorable conditions to develop them.

Step 3. Conceptual development of the product. Conceptual development consists in the definition of the product structure and its main parameters (Graf and Saguy, 1991; Kotler and Armstrong, 1991). The goal is to convert the business opportunities into a feasible solution that meets the needs of external and internal customers. The product idea is sketched by means of a picture or a verbal description, which should also include some preliminary ideas about materials and technologies that could be used during manufacturing. This phase is supported by marketing research, as well as by engineering, research and development and management business functions, who will work together to develop a preliminary model of the product.

Step 4. Test of the product concept. During this step, the conceptual product is tested on a sample of potential consumers (Urban and Hauser, 1993, Booz et al., 1965). By collecting and interpreting the reactions of the customers to the product, the company will be able to understand whether or not the product concept has a potential market attractiveness, so as to justify the subsequent development of the product.

Step 5. Development of the marketing strategy. During this phase, the company will first perform some detailed analyses of technical solutions, finance and market opportunities. On the basis of the outcomes from such analyses, the company will decide whether or not to continue with the product manufacturing phase. This step involves the exhaustive evaluation of several aspects of the market opportunities identified, including (Kotler and Armstrong, 1991; Pitta, 2007; Bigliardi et al. 2010):

- the definition of the targeted market, market position, market share and distribution channels;

- the available technological and financial solutions (e.g., materials, human resources, technical capabilities and manufacturing plants) and the related cost; - the analysis of the market risks.

The above criteria aim at determining whether the product will reach the sales volume and profit margin targeted by the company's management. This step is completed by the development of a business plan for the product and manufacturing activities.

Step 6. Product manufacturing. This phase involves the design and manufacturing of the physical prototype of the product, and can be supported by external co-makers (Fuller, 1994; Bigliardi et al., 2010). Prototyping is a main part of the NPD process, and aims at reproducing the real manufacturing process, as well as the final product. The final goal of prototyping is identifying possible design errors and removing them when the product is still in the early stages of manufacturing, meaning that only a limited amount of resources has been exploited. Prototyping activities bring relevant benefits to a company, including lead time reduction, cost reduction and quality improvement.

Step 7. Product testing on the market. During this step, the company's top management must ensure that the product (or prototype) has been developed according to the defined technical settings (Fuller, 1994). Appropriate criteria that can be adopted for this evaluation refer to product quality and performance. Moreover, the company's top management should assess whether the efforts required for product development is consonant with the resource allocation plan of the whole NPD process. At this stage, the product (or prototype) is evaluated and tested by means of:

- instrumental tests, to determine whether the product meets the targeted technical and manufacturing requirements;- market test of the prototype on a sample of potential customers, with the purpose of assessing their reactions to the new product.

In the case of a positive result of those tests, the company's top management will proceed with the launch of the product on the market, while in the case the product fails one of the above tests, the manufacturing phase will be revisited and modified.

Step 8. Product launch. During this step, the new product is launched on the market (MacFie, 1994; Booz et al., 1965; Pitta, 2007). After the launch, the company's top management will evaluate whether the new product meets the customer's expectations,

and will identify potential gaps between product characteristics and market expectations, to remove them. The sales volume of the product is also monitored by collecting direct data.

The NPD process steps described above are often consecutive; nonetheless, some loops can be introduced in the process in the case a step does not return the desired outcomes (cf. Figure 1).

3.2 Research step 2 - Questionnaire design

In the second step of the research, we designed a specific questionnaire, with the purpose of testing the NPD process steps previously described and to collect further details about those steps. It is articulated into 2 sections. The first one includes questions related to the various stages of the NPD process; for each step, some specific questions are elaborated with the purpose of investigating how

the NPD process is accomplished in a real scenario. Specifically, the following questions are asked for the different steps:

Step 1. Idea exploration and generation. In the questionnaire we asked companies about the tools and techniques used to gather information about the potential customers, as well as about the opportunity of collecting similar pieces of information about

the competitors. For example, companies were asked if they carry out market research, focus groups, brainstorming or exploit other techniques.

Step 2. Idea screening. We asked companies about the involvement of different business functions (e.g., marketing, engineering and design department, research & development, top management, etc.) in this phase of the NPD process.

Step 3. Conceptual development of the product. We investigated the possibility of establishing partnerships with one or more suppliers during the conceptual development of the product, with the purpose of designing and developing specific components of

the product.

Step 4. Test of the product concept. Questions related to step 4 were mainly aimed at investigating whether the company uses to involve its potential customers in the phase of product testing.

Step 5. Development of the marketing strategy. During the case studies we tried to understand whether mechanical companies carry out any specific analyses, such as risk analysis or feasibility studies, to evaluate the product and assess its

characteristics.

Figure 1. Preliminary NPD process resulting from the literature analysis

Step 6. Product manufacturing. At this stage of NPD process, during the case studies we asked companies about the

opportunity of manufacturing directly the product prototypes or, alternatively, of exploiting external supplies during manufacturing.

Step 7. Product testing on the market. Companies were asked about the implementation of some specific tests on the product, as well as about the involvement of potential customers during those tests.

Step 8. Product launch. During the case studies, we tried to investigate whether the companies investigated undertake any specific monitoring activities (e.g., on the sales volume) after the launch of the new product.

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UNIT – V - Rights and responsibilities of business under the Indian Constitutional system. – SMB5455

SATHYABAMA

INSTITUTE OF SCIENCE AND TECHNOLOGY

Medical Biotechnology and Clinical Research Bio-Entrepreneurship (SMB5455)

Course Materials

Unit: V Rights and responsibilities of business under the Indian Constitutional system.

Description

The Fundamental Rights, Directive Principles of State Policy and Fundamental Duties are sections of the Constitution of India that prescribe the fundamental obligations of the states to its citizens and the duties and the rights of the citizens to the State. These sections comprise a constitutional bill of rights for government policy-making and the behaviour and conduct of citizens. These sections are considered vital elements of the constitution, which was developed between 1947 and 1949 by the Constituent Assembly of India.

The Fundamental Rights are defined as the basic human rights of all citizens. These rights, defined in Part III of the Constitution, applied irrespective of race, place of birth, religion, caste, creed, or gender. They are enforceable by the courts, subject to specific restrictions. The Directive Principles of State Policy are guidelines for the framing of laws by the government. These provisions, set out in Part IV of the Constitution, are not enforceable by the courts, but the principles on which they are based are fundamental guidelines for governance that the State is expected to apply in framing policies and passing laws.

The Fundamental Duties' are defined as the moral obligations of all citizens to help promote a spirit of patriotism and to uphold the unity of India. These duties set out in Part IV–A of the Constitution, concern individuals and the nation. Like the Directive Principles, they are not enforceable by courts unless otherwise made enforceable by parliamentary law.

The Fundamental Rights, embodied in Part III of the Constitution, guarantee civil rights to all Indians, and prevent the State from encroaching an individual's liberty while simultaneously placing upon it an obligation to protect the citizens' rights from encroachment by society. Seven fundamental rights were originally provided by the Constitution – the right to equality, right to

freedom, right against exploitation, right to freedom of religion, cultural and educational rights, right to property and right to constitutional remedies. However, the right to property was removed from Part III of the Constitution by the 44th Amendment in 1978.

The purpose of the Fundamental Rights is to preserve individual liberty and democratic principles based on equality of all members of society. Dr Ambedkar said that the responsibility of the legislature is not just to provide fundamental rights but also and rather, more importantly, to safeguard them.

They act as limitations on the powers of the legislature and executive, under Article 13and in case of any violation of these rights the Supreme Court of India and the High Courts of the states have

the power to declare such legislative or executive action as unconstitutional and void.These rights are largely enforceable against the State, which as per the wide definition provided in Article 12, includes not only the legislative and executive wings of the federal and state governments, but also local administrative authorities and other agencies and institutions which discharge public functions or are of a governmental character. However, there are certain rights – such as those in Articles 15, 17, 18, 23, 24 – that are also available against private individuals.[26] Further, certain Fundamental Rights – including those under Articles 14, 20, 21, 25 – apply to persons of any nationality upon Indian soil, while others – such as those under Articles 15, 16, 19, 30 – are applicable only to citizens of India.

Rights

Theoretical distinctions

Claim rights and liberty rights Individual and group rights Natural rights and legal rights Negative and positive rights

Human rights

Civil and political Economic, social and cultural Three generations

Rights by beneficiary

The Fundamental Rights are not absolute and are subject to reasonable restrictions as necessary for the protection of public interest. In the Kesavananda Bharati v. State of Kerala case in 1973, the Supreme Court, overruling a previous decision of 1967, held that the Fundamental Rights could be amended, subject to judicial review in case such an amendment violated the basic structure of the Constitution. The Fundamental Rights can be enhanced, removed or otherwise altered through a constitutional amendment, passed by a two-thirds majority of each House of Parliament. The imposition of a state of emergency may lead to a temporary suspension any of the Fundamental Rights, excluding Articles 20 and 21, by order of the President. The President may, by order, suspend the right to constitutional remedies as well, thereby barring citizens from approaching the Supreme Court for the enforcement of any of the Fundamental Rights, except Articles 20 and 21, during the period of the emergency. Parliament may also restrict the application of the Fundamental Rights to members of the Indian Armed Forces and the police, in order to ensure proper discharge of their duties and the maintenance of discipline, by a law made under Article 33.

The Right to Equality is one of the chief guarantees of the Constitution. It is embodied in Articles 14–18, which collectively encompass the general principles of equality before law and non-discrimination and there is no any other power given to any cast wise e.g., son of king didn't become who is qualify the quality of king is become a king and Articles 17–18 which collectively encompass further the philosophy of social equality. Article 14 guarantees equality before law as well as equal protection of the law to all persons within the territory of India. This includes the equal subjection of all persons to the authority of law, as well as equal treatment of persons in similar circumstances. The latter permits the State to classify persons for legitimate purposes, provided there is a reasonable basis for the same, meaning that the classification is required to be non-arbitrary, based on a method of intelligible differentiation among those sought to be classified, as well as have a rational relation to the object sought to be achieved by the classification.

Article 15 prohibits discrimination on the grounds only of religion, race, caste, sex, place of birth, or any of them. This right can be enforced against the State as well as private individuals, with regard to free access to places of public entertainment or places of public resort maintained partly

or wholly out of State funds.[38] However, the State is not precluded from making special provisions for women and children or any socially and educationally backward classes of citizens, including the Scheduled Castes and Scheduled Tribes. This exception has been provided

since the classes of people mentioned therein are considered deprived and in need of special protection.

Article 16 guarantees equality of opportunity in matters of public employment and prevents the State from discriminating against anyone in matters of employment on the grounds only of religion, race, caste, sex, descent, place of birth, place of residence or any of them. It creates exceptions for the implementation of measures of affirmative action for the benefit of any backward class of citizens in order to ensure adequate representation in public service, as well as reservation of an office of any religious institution for a person professing that particular religion.

The practice of un-touchability has been declared an offence punishable by law under Article 17, and the Protection of Civil Rights Act, 1955 has been enacted by the Parliament to further this objective.

Article 18 prohibits the State from conferring any titles other than military or academic distinctions, and the citizens of India cannot accept titles from a foreign state. Thus, Indian aristocratic titles and title of nobility conferred by the British have been abolished. However, awards such as the Bharat Ratna have been held to be valid by the Supreme Court on the ground that they are merely decorations and cannot be used by the recipient as a title.

The Right to Freedom is covered in Articles 19 to article 22, with the view of guaranteeing individual rights that were considered vital by the framers of the Constitution, and these Articles also include certain restrictions that may be imposed by the State on individual liberty under specified conditions.

Article 19 guarantees six freedoms in the nature of civil rights, which are available only to citizens of India. These include the freedom of speech and expression, freedom of assembly without arms, freedom of association, freedom of movement throughout the territory of our country, freedom to reside and settle in any part of the country of India and the freedom to practice any profession. All these freedoms are subject to reasonable restrictions that may be imposed on them by the State, listed under Article 19 itself. The grounds for imposing these restrictions vary according to the freedom sought to be restricted and include national security, public order, decency and morality, contempt of court, incitement to offences a&defamation. The

State is also empowered, in the interests of the general public to nationalize any trade, industry or service to the exclusion of the citizens.

The freedoms guaranteed by Article 19 are further sought to be protected by Articles 20–22. The scope of these articles, particularly with respect to the doctrine of due process, was heavily debated by the Constituent Assembly. It was argued, especially by Benegal Narsing Rau, that the incorporation of such a clause would hamper social legislation and cause procedural difficulties in maintaining order, and therefore it ought to be excluded from the Constitution altogether.[48] The Constituent Assembly in 1948 eventually omitted the phrase "due process" in favor of "procedure established by law". As a result, Article 21, which prevents the encroachment of life or personal liberty by the State except in accordance with the procedure established by law,[note 6] was, until 1978, construed narrowly as being restricted to executive action. However, in 1978, the Supreme Court in the case of Maneka Gandhi v. Union of India extended the protection of Article 21 to legislative action, holding that any law laying down a procedure must be just, fair and reasonable,

and effectively reading durocess into Article 21. In the same case, the Supreme Court also ruled that "life" under Article 21 meant more than a mere "animal existence"; it would include the right to live with human dignity and all other aspects which made life "meaningful, complete and worth living". Subsequent judicial interpretation has broadened the scope of Article 21 to include within it a number of rights including those to livelihood, good health, clean environment, water, speedy trial and humanitarian treatment while imprisoned. The right to education at elementary level has been made one of the Fundamental Rights under Article 21A by the 86th Constitutional amendment of 2002.

Article 20 provides protection from conviction for offences in certain respects, including the rights against ex post facto laws, double jeopardy and freedom from self-incrimination.

Article 22 provides specific rights to arrested and detained persons, in particular the rights to be informed of the grounds of arrest, consult a lawyer of one's own choice, be produced before a magistrate within 24 hours of the arrest, and the freedom not to be detained beyond that period without an order of the magistrate. The Constitution also authorizes the State to make laws providing for preventive detention, subject to certain other safeguards present in Article 22.The provisions pertaining to preventive detention were discussed with scepticism and misgivings by the Constituent Assembly, and were reluctantly approved after a few amendments in

1949.Article 22 provides that when a person is detained under any law of preventive detention, the State can detain such person without trial for only three months, and any detention for a longer period must be authorised by an Advisory Board. The person being detained also has the right to be informed about the grounds of detention, and be permitted to make a representation against it, at the earliest opportunity.

The Right against Exploitation, contained in Articles 23–24, lays down certain provisions to prevent exploitation of the weaker sections of the society by individuals or the State.[64] Article 23 prohibits human trafficking, making it an offence punishable by law, and also prohibits forced labour or any act of compelling a person to work without wages where he was legally entitled not to work or to receive remuneration for it. However, it permits the State to impose compulsory service for public purposes, including conscription and community service.[65][66] The Bonded Labour System (Abolition) Act, 1976, has been enacted by Parliament to give effect to this Article.[67] Article 24 prohibits the employment of children below the age of 14 years in factories, mines and other hazardous jobs. Parliament has enacted the Child Labour (Prohibition and Regulation) Act, 1986, providing regulations for the abolition of, and penalties for employing, child labour, as well as provisions for rehabilitation of former child labourers.[68]

Right to Freedom of Religion

The Right to Freedom of Religion, covered in Articles 25–28, provides religious freedom to all citizens and ensures a secular state in India. According to the Constitution, there is no official State religion, and the State is required to treat all religions impartially and neutrally.

Article 25 guarantees all persons the freedom of conscience and the right to preach, practice and propagate any religion of their choice. This right is, however, subject to public order, morality and health, and the power of the State to take measures for social welfare and reform. The right to propagate, however, does not include the right to convert another individual, since it would amount to an infringement of the other's right to freedom of conscience.

Article 26 guarantees all religious denominations and sects, subject to public order, morality and health, to manage their own affairs in matters of religion, set up institutions of their own for

charitable or religious purposes, and own, acquire and manage a property in accordance with law. These provisions do not derogate from the State's power to acquire property belonging to a

religious denomination. The State is also empowered to regulate any economic, political or other secular activity associated with religious practice.

Article 27 guarantees that no person can be compelled to pay taxes for the promotion of any particular religion or religious institution.

Article 28 prohibits religious instruction in a wholly State-funded educational institution, and educational institutions receiving aid from the State cannot compel any of their members to receive religious instruction or attend religious worship without their (or their guardian's) consent.

Right to Education and Culture

The Cultural and Educational rights, given in Articles 29 and 30, are measures to protect the rights of cultural, linguistic and religious minorities, by enabling them to conserve their heritage and protecting them against discrimination. Article 29 grants any section of citizens having a distinct language, script culture of its own, the right to conserve and develop the same, and thus safeguards the rights of minorities by preventing the State from imposing any external culture on them. It also prohibits discrimination against any citizen for admission into any educational institutions maintained or aided by the State, on the grounds only of religion, race, caste, language or any of them. However, this is subject to reservation of a reasonable number of seats by the State for socially and educationally backward classes, as well as reservation of up to, 50 percent of seats in any educational institution run by a minority community for citizens belonging to that community.

Article 30 confers upon all religious and linguistic minorities the right to set up and administer educational institutions of their choice in order to preserve and develop their own culture, and prohibits the State, while granting aid, from discriminating against any institution on the basis of the fact that it is administered by a religious or cultural minority. The term "minority", while not defined in the Constitution, has been interpreted by the Supreme Court to mean any community which numerically forms less than 50% of the population of the state in which it seeks to avail the right under Article 30. In order to claim the right, it is essential that the educational institution must have been established as well as administered by a religious or linguistic minority. Further, the right under Article 30 can be availed of even if the educational institution

established does not confine itself to the teaching of the religion or language of the minority concerned, or a majority of students in that institution do not belong to such minority. This right is subject to the power of the State to impose reasonable regulations regarding educational standards, conditions of service of employees, fee structure, and the utilisation of any aid granted by it.

Right to Constitutional Remedies

The Right to Constitutional Remedies empowers citizens to approach the Supreme Court of India to seek enforcement, or protection against infringement, of their Fundamental Rights.

Article 32 provides a guaranteed remedy, in the form of a Fundamental Right itself, for enforcement of all the other Fundamental Rights, and the Supreme Court is designated as the protector of these rights by the Constitution. The Supreme Court has been empowered to issue writs, namely habeas corpus, mandamus, prohibition, certiorari and quo warranto, for the enforcement of the

Fundamental Rights, while the High Courts have been empowered under Article 226 – which is not a Fundamental Right in itself – to issue these prerogative writs even in cases not involving the violation of Fundamental Rights. The Supreme Court has the jurisdiction to enforce the Fundamental Rights even against private bodies, and in case of any violation, award compensation as well to the affected individual. Exercise of jurisdiction by the Supreme Court can also be suo motu or on the basis of a public interest litigation. This right cannot be suspended, except under the provisions of Article 359 when a state of emergency is declared, right to privacy Right to privacy is the latest right of our country being recently approved by the supreme court of india. According to this right we are liable to keep our material private and without our permission no one can interfere in our private matter.it applies to all our private mateial also.

Please Note- Right to Property was removed from the Indian Constitution in 1978. Now it is not counted as a Fundamental Right.

The Directive Principles of State Policy, embodied in Part IV of the Constitution, are directions given to the state to guide the establishment of an economic and social democracy, as proposed

by the Preamble. They set forth the humanitarian and socialist instructions that were the aim of social revolution envisaged in India by the Constituent Assembly. The state is expected to keep these principles in mind while framing laws and policies, even though they are non-justiciable in nature. The Directive Principles may be classified under the following categories: ideals that the state ought to strive towards achieving; directions for the exercise of legislative and executive power; and rights of the citizens which the State must aim towards securing.

Despite being non-justiciable, the Directive Principles act as a check on the state; theorised as a yardstick in the hands of the electorate and the opposition to measure the performance of a government at the time of an election. Article 37, while stating that the Directive Principles are not enforceable in any court of law, declares them to be "fundamental to the governance of the country" and imposes an obligation on the State to apply them in matters of legislation. Thus, they serve to emphasise the welfare state model of the Constitution and emphasise the positive duty of the state to promote the welfare of the people by affirming social, economic and political justice, as well as to fight income inequality and ensure individual dignity, as mandated

Article 39 lays down certain principles of policy to be followed by the State, including providing an adequate means of livelihood for all citizens, equal pay for equal work for men and women, proper working conditions, reduction of the concentration of wealth and means of production from the hands of a few, and distribution of community resources to "subserve the common good".These clauses highlight the Constitutional objectives of building an egalitarian social order and establishing a welfare state, by bringing about a social revolution assisted by the State, and have been used to support the nationalisation of mineral resources as well as public utilities.[Further, several legislation pertaining to agrarian reform and land tenure have been enacted by the federal and state governments, in order to ensure equitable distribution of land resources.

Articles 41–43 mandate the State to endeavour to secure to all citizens the right to work, a living wage, social security, maternity relief, and a decent standard of living. These provisions aim at establishing a socialist state as envisaged in the Preamble. Article 43 also places upon the State the responsibility of promoting cottage industries, and the federal government has, in furtherance of this, established several Boards for the promotion of khadi, handlooms etc., in coordination with the state governments.Article 39A requires the State to provide free legal aid to ensure that opportunities for securing justice are available to all citizens irrespective of economic or other

disabilities. Article 43A mandates the State to work towards securing the participation of workers in the management of industries. The State, under Article 46, is also mandated to promote the interests of and work for the economic uplift of the scheduled castes and scheduled tribes and protect them from discrimination and exploitation. Several enactments, including two Constitutional amendments, have been passed to give effect to this provision.

Article 44 encourages the State to secure a uniform civil code for all citizens, by eliminating discrepancies between various personal laws currently in force in the country. However, this has remained a "dead letter" despite numerous reminders from the Supreme Court to implement the provision. Article 45 originally mandated the State to provide free and compulsory education to children between the ages of six and fourteen years, but after the 86th Amendment in 2002, this has been converted into a Fundamental Right and replaced by an obligation upon the State to secure childhood care to all children below the age of six.[Article 47 commits the State to raise the standard of living and improve public health, and prohibit the consumption of intoxicating drinks and drugs injurious to health. As a consequence, partial or total prohibition has been introduced in several states, but financial constraints have prevented its full-fledged application. The State is also mandated by Article 48 to organise agriculture and animal husbandry on modern and scientific lines by improving breeds and prohibiting slaughter of cattle.[98] Article 48A mandates the State to protect the environment and safeguard the forests and wildlife of the country, while Article 49 places an obligation upon the State to ensure the preservation of monuments and objects of national importance. Article 50 requires the State to ensure the separation of judiciary from executive in public services, in order to ensure judicial independence, and federal legislation has been enacted to achieve this objective. The State, according to Article 51, must also strive for the promotion of international peace and security, and Parliament has been empowered under Article 253 to make laws giving effect to international treaties.

The fundamental duties of citizens were added to the constitution by the 42nd Amendment in 1976, upon the recommendations of the Swaran Singh Committee that was constituted by the government earlier that year. Originally ten in number, the fundamental duties were increased to eleven by the 86th Amendment in 2002, which added a duty on every parent or guardian to ensure that their child or ward was provided opportunities for education between the ages of six

and fourteen years. The other fundamental duties obligate all citizens to respect the national symbols of India, including the constitution, to cherish its heritage, preserve its composite culture and assist in its defence. They also obligate all Indians to promote the spirit of common brotherhood, protect the environment and public property, develop scientific temper, abjure violence, and strive towards excellence in all spheres of life. In case of violation of fundamental duties enshrined in the constitution by a citizen including President, Vice President, Speaker, parliament members, state legislative members, etc., it amounts to contempt of the constitution which is punishable under Prevention of Insults to National Honour Act, 1971. Supreme court has ruled that these fundamental duties can also help the court to decide the constitutionality of a law passed by the legislature. There is reference to such duties in international instruments such as the Universal Declaration of Human Rights and International Covenant on Civil and Political Rights, and Article 51A brings the Indian constitution into conformity with these treaties.

The fundamental duties noted in the constitution are as follows:

It shall be the duty of every citizen of India —

To abide by the Constitution and respect its ideals and institutions, the National Flag and the National Anthem;

To cherish and follow the noble ideals which inspired our national struggle for freedom; To uphold and protect the sovereignty, unity and integrity of India;

To defend the country and render national service when called upon to do so;

To promote harmony and the spirit of common brotherhood amongst all the people of India transcending religious, linguistic and regional or sectional diversities; to renounce practices derogatory to the dignity of women;

To value and preserve the rich heritage of our composite culture;

To protect and improve the natural environment including forests, lakes, rivers, wildlife and to have compassion for living creatures;

To develop the scientific temper, humanism and the spirit of inquiry and reform;

To safeguard public property and to abjure violence;

To strive towards excellence in all spheres of individual and collective activity so that the nation constantly rises to higher levels of endeavour and achievement;

Who is a parent or guardian, to provide opportunities for education to his child, or as the case may be, ward between the age of six to fourteen years.

Criticism and analysis

Main article: Directive Principles

Fewer children are now employed in hazardous environments, but their employment in non-hazardous jobs, prevalently as domestic help, violates the spirit of the constitution in the eyes of many critics and human rights advocates. More than 16.5 million children are in employment India was ranked 88 out of 159 countries in 2005, according to the degree to which corruption is perceived to exist among public officials and politicians. The year 1990–1991 was declared as the "Year of Social Justice" in the memory of B.R. Ambedkar. The government provides free textbooks to students belonging to scheduled castes and tribes pursuing medicine and engineering courses. During 2002–2003, a sum of Rs. 4.77 crore (47.7 million) was released for this purpose. In order to protect scheduled castes and tribes from discrimination, the government enacted the Scheduled Caste and Scheduled Tribe (Prevention of Atrocities) Act, 1989, prescribing severe punishments for such actions.

The Minimum Wages Act of 1948 empowers government to fix minimum wages for people working across the economic spectrum. The Consumer Protection Act of 1986 provides for the better protection of consumers. The Equal Remuneration Act of 1976 provides for equal pay for equal work for both men and women. The Sampoorna Grameen Rozgar Yojana (Universal Rural Employment Program) was launched in 2001 to attain the objective of providing gainful employment for the rural poor. The program was implemented through the Panchayati Raj institutions.

A system of elected village councils, known as Panchayati Raj covers almost all states and territories

of India. One-third of the total of number of seats have been reserved for women in Panchayats at every level; and in the case of Bihar, half the seats have been reserved for women.

The judiciary has been separated from the executive "in all the states and territories except Jammu and Kashmir and Nagaland." India's foreign policy has been influenced by the Directive Principles. India supported the United Nations in peace-keeping activities, with the Indian Army having participated in 37 UN peace-keeping operations.

The implementation of a uniform civil code for all citizens has not been achieved owing to widespread opposition from various religious groups and political parties. The Shah Bano case (1985–86) provoked a political firestorm in India when the Supreme Court ruled that Shah Bano, a Muslim woman who had been divorced by her husband in 1978 was entitled to receive alimony from her former husband under Indian law applicable for all Indian women. This decision evoked outrage in the Muslim community, which sought the application of the Muslim personal law and in response the Parliament passed the Muslim Women (Protection of Rights on Divorce) Act, 1986 overturning the Supreme Court's verdict. This act provoked further outrage, as jurists, critics and politicians alleged that the fundamental right of equality for all citizens irrespective of religion or gender was being jettisoned to preserve the interests of distinct religious communities. The verdict and the legislation remain a source of heated debate, with many citing the issue as a prime example of the poor implementation of Fundamental Rights.

Per Article 38 (1), prompt rendering of the justice by courts is part of animating judiciary. Rendering prompt justice is the foremost purpose of the constitution as enshrined in the Preamble to the constitution also. However the judiciary is failing dismally in this respect by causing inordinate delay considering time of rendering justice in a case arbitrarily is its constitutional liberty.

Relationship between the Fundamental Rights, Directive Principles and Fundamental Duties

The Directive Principles have been used to uphold the Constitutional validity of legislations in case of a conflict with the Fundamental Rights. Article 31C, added by the 25th Amendment in 1971, provided that any law made to give effect to the Directive Principles in Article 39(b)–(c) would not be invalid on the grounds that they derogated from the Fundamental Rights conferred by Articles 14, 19 and 21. The application of this article was sought to be extended to all the Directive Principles by the 42nd Amendment in 1976, but the Supreme Court struck down the

extension as void on the ground that it violated the basic structure of the Constitution. The Fundamental Rights and Directive Principles have also been used together in forming the basis of legislation for social welfare. The Supreme Court, after the judgement in the Kesavananda Bharati case, has adopted the view of the Fundamental Rights and Directive Principles being complementary to each other, each supplementing the other's role in aiming at the same goal of establishing a welfare state by means of social revolution. Similarly, the Supreme Court has used the Fundamental Duties to uphold the Constitutional validity of statutes which seeks to promote the objects laid out in the Fundamental Duties. These Duties have also been held to be obligatory for all citizens, subject to the State enforcing the same by means of a valid law. The Supreme Court has also issued directions to the State in this regard, with a view towards making the provisions effective and enabling a citizens to properly perform their duties.