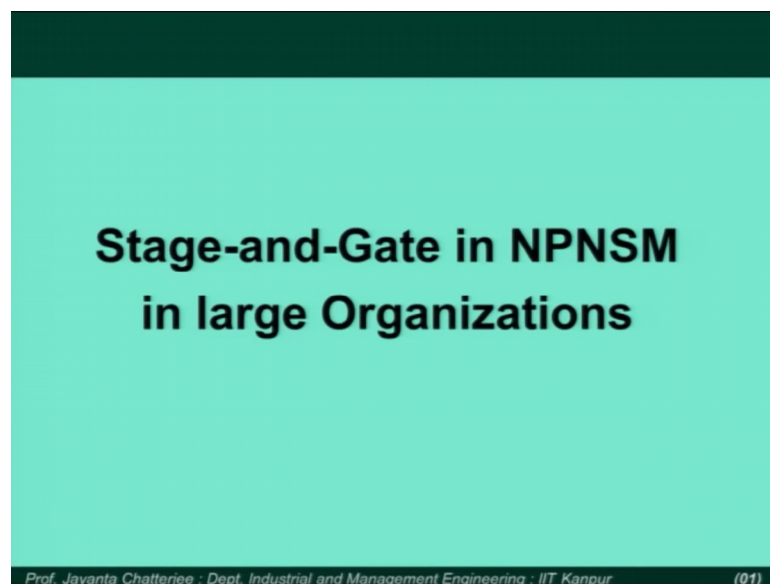


Management of New Products and Services (MNPS)
Prof. Jayanta Chatterjee
Department of Industrial and Management Engineering
Indian Institute of Technology, Kanpur

Lecture – 18
Lecture 1 NPNSM- Introduction to the Stage Gate model

Hello I am Jayanta Chatterjee from IIT Kanpur. We are discussing managing new products, new services.

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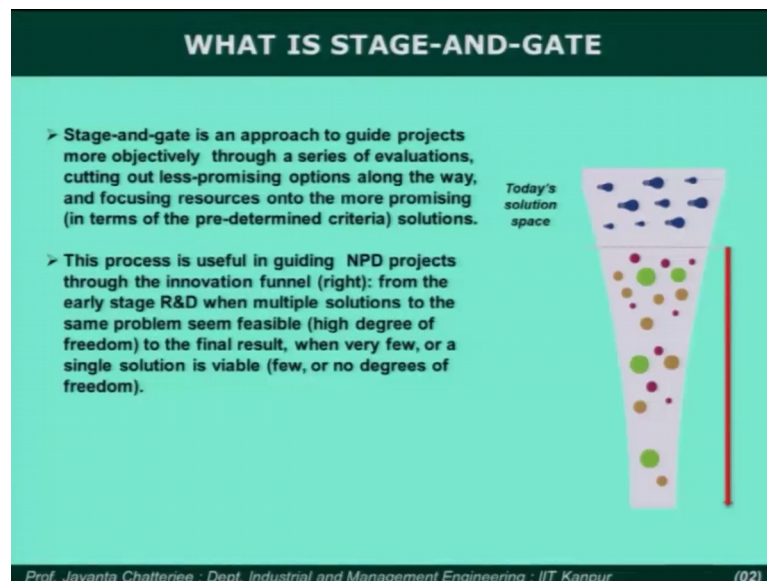
And our topic for today; which will be in continuation of our last session about managing new products, new services inside a large organization. In that continuation today, we are going to discuss about the stage gate model. And this is very popular well used around the world, and particularly relevant for large organizations. Because within a large organization, different divisions, different work units will be fighting for the limited resources that are available for investment in new initiatives.

So, number of new products are often proposed inside the large organization every year, and the funding may be finally, given to 10 projects or for 15 projects or whatever it may be. But it is very important that as they make progress you should actually start giving more resources to those projects which are more likely to succeed. So, therefore, careful monitoring of the progress is important so that a those which are going to finish earlier are given all the resources so that they can take off, and sometimes you may actually also

find that something that was very promising to start with may not be panning out that well due to various reasons.

So, then you have to be you know not emotional, but at that stage you may have to exit or postpone. All these decisions can be scientifically taken by this method what we call the stage gate method.

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So, the stage gate method finally, is to look at the this what we call the funnel of new product development as a series of stages. And the gate means, that at each important stage, you have a decision-making process by which we decide go or no go, go to the next stage or not go to the next stage block it, postpone it, change the schedule or whatever maybe. That setting the stage how many stages will be there, and the gate which our decision making structures are maybe different slightly different from organization to organization or type of product to the other type of product, but generally the structure is the same; that means, at the early stage when you know there are large number of ideas in response to large number of identified opportunities.

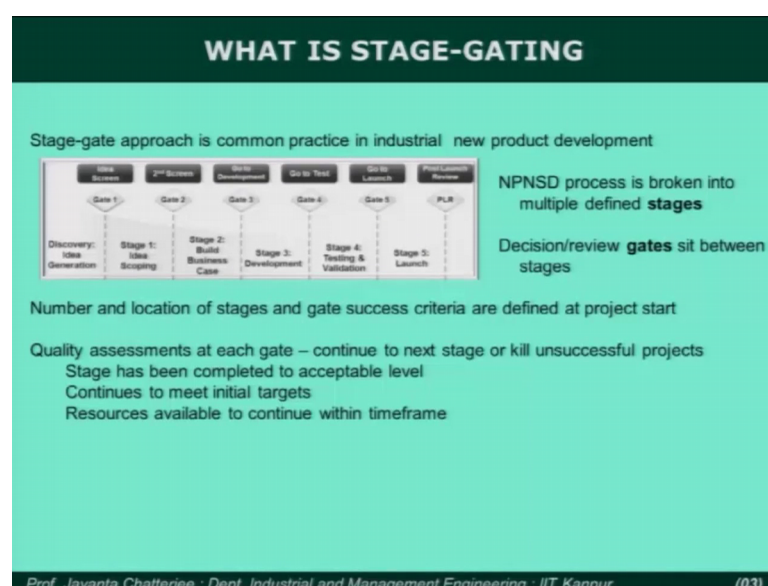
So, at that stage there is a; obviously, a high degree of freedom, and as we have discussed at some earlier session when you are developing this a basket of new ideas, which can then be graduated into opportunities we discussed this difference between idea and opportunity, opportunities which are have the potential to become commercial success.

So, at this stage we are having the idea. So, this is actually, and if we remember we discussed that it is a statistical probability issue here; that means, more the number of ideas that you can generate at the beginning of the funnel, greater is the possibility that you will have few good successes at the end of the funnel. Therefore, there will be as you can see here we have the early stage then this is one, you can say the one gate and then here we have another gate and here we have another gate. So, this is actually a 1, 2, 3 a gate model.

So, the funnel shape, and the number of stages that will be there will may differ. But I think you get the fundamental concept, that you divide the whole series of developments coming from different divisions, different projects their all progressing, initially maybe 10, 15, 20, 50 depending on the situation number of projects will be funded. But then you monitor their progress and you decide which ones to actually postpone, which ones to stop, and which ones to give given more resources so that you have this whole throughput process better calibrated. And you have higher number of successes coming out at the end of the funnel.

The stage gate process is also very popular in managing new products in the b 2 b business or; that means, industrial. So, industrial new product developments usually lend a better framework for use of this stage gate system.

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So, here if you see, we have got gate 1 gate 2 gate 3, 4, 5 gates. The first stage is the discovery of the idea stage. You know, this is the stage as we were see the most important stage because, though only few will go through, you must actually encourage generation of as many ideas as possible. This will also be driven by of course, to what extent the organization, invests in R&D or at least D&D design and development, to what extent is the effort for creating new products is well organized within the organization. There are number of champions, there are number of idea, creators, there are number of sponsors. All creating an ecosystem where there will be a large number of proposals at this stage.

So, you must maximize the number of proposals at this stage for a greater number of successes at the end of the funnel. I cannot stop emphasizing that. The next which is the stage number one; which is actually what we call idea screening or the first hurdle. Now what will be the criteria by which the idea will be screened will be different in different organizations. there will be subtle differences, but; obviously, fundamentally here what we look at is this point about d v and f that is do, we have a definitive understanding of desirability. That are they are people who are really looking for this kind of solution, do people really have the pain to which actually this new type of product will be a solution.

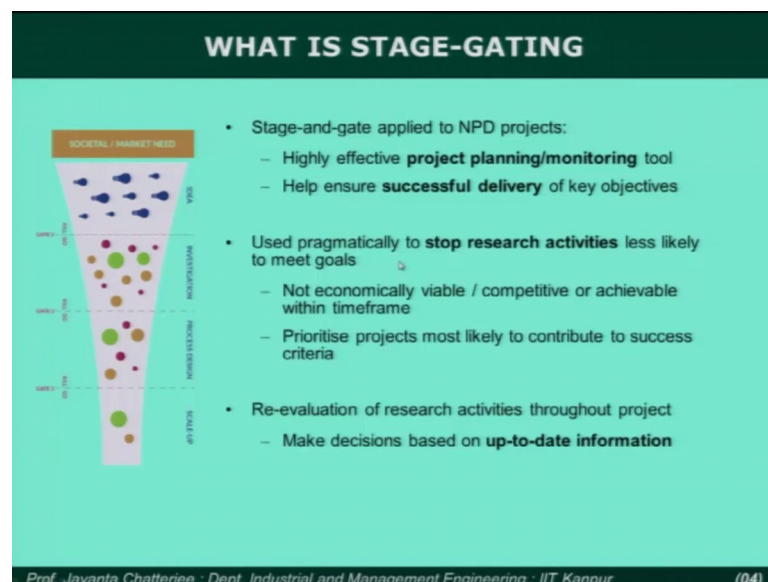
So, this need finding from the customer. This is that does not change. Even though this is an internal process, you are not driven by the discovery or the new development in the lab. You have to validate at this idea screening stage in terms of customer real requirement. Those 4 fundamental questions which I have repeated few times earlier; that means, asking will anybody buy this product, why will they buy this product? Why will they buy this product from us? And why will they continue to buy from us? These 4 questions must be asked at this screening stage.

So, this that is a reality check that does market exists, do we have definitive understanding of the type of buyers and their characteristics and so on. In the next stage, we actually look for a business case. Now remember as I said this is a very typical depiction, in some cases we may actually ask for a business case we may combine the stage 1 and stage 2 in some organizations that is demanded; that means, you actually present a business plan based on the identification of customer segments, their requirements and the feedback from them on the basis of some prototype evaluation etcetera.

So, you may actually collapse this stage 1 and stage 2; that means, we are looking for screening of the idea based on viability feasibility and desirability, viability, feasibility and desirability. Desirability is the most important; that means, is there a customer is there are there number of people who desire this kind of solution, because they are facing that pain. Through which this is going to become a gainful alternative solution. But along with that you have to see whether it is feasible within your organization, and it is commercially viable technically feasible etcetera will have to be tested.

The following stages are actually more detailed stages, and we will see those a little bit more in. So, stage and gate is applied to new product development projects in almost all large organizations, because they are very good for managing the project mode.

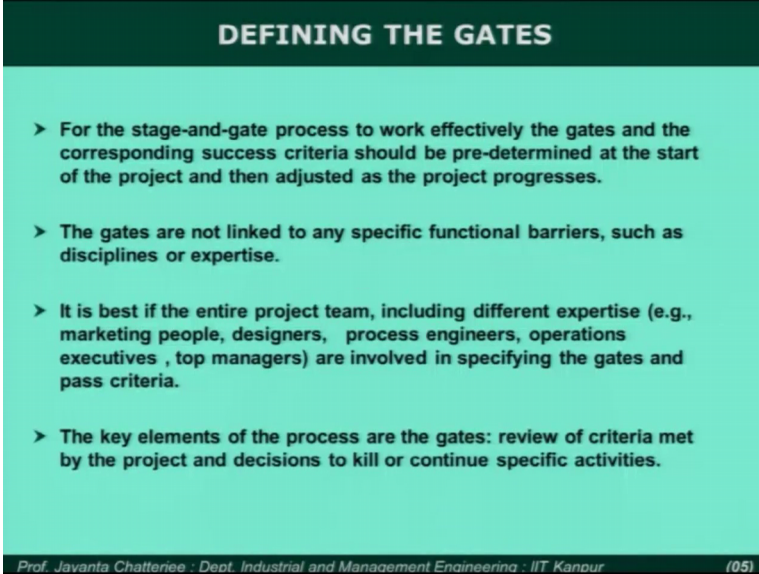
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And monitoring the project mode and you have sort of programmed approaches that you will stopped activity if it is found to be economically no longer viable, or not all technologies are available or not all kinds of machines or requirements that are coming up as you progress with the building of the prototype testing of the prototype the next prototype and so on.

So, therefore, you may be able to prioritize some projects more likely to contribute to success criteria, focus your resources there. And reevaluate the research activities throughout the project based on updated information.

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DEFINING THE GATES

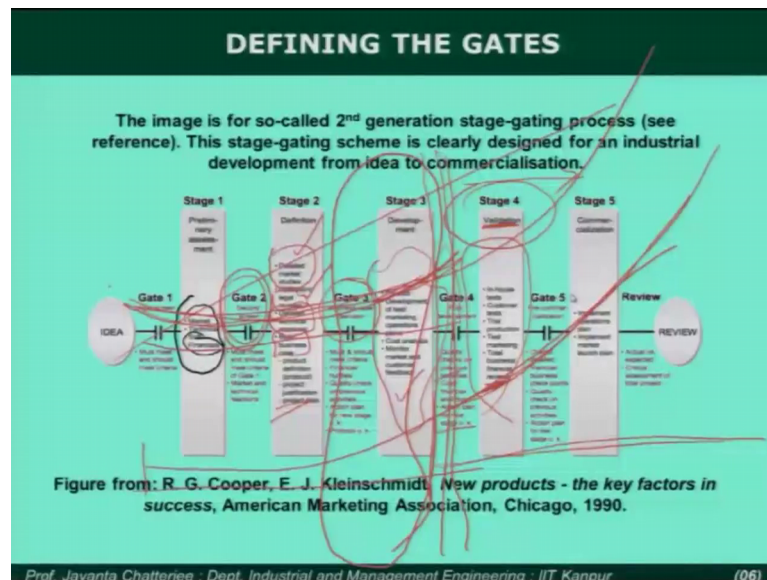
- For the stage-and-gate process to work effectively the gates and the corresponding success criteria should be pre-determined at the start of the project and then adjusted as the project progresses.
- The gates are not linked to any specific functional barriers, such as disciplines or expertise.
- It is best if the entire project team, including different expertise (e.g., marketing people, designers, process engineers, operations executives, top managers) are involved in specifying the gates and pass criteria.
- The key elements of the process are the gates: review of criteria met by the project and decisions to kill or continue specific activities.

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The gates are not linked to any specific functional barrier such as you know mechanical engineering or your ability of nanotechnology and so on. It is actually based on a multiple issues, because sometimes you may be able to outsource what you do not have sometimes there may be no outsourcing available you may have to invest in it, because it is really very critical for the intellectual property protection of that particular new type of product.

So, it is best that a good project team multifunctional multidisciplinary project team is created. Including different expertise like marketing designers, process engineer's operations executive top management. They are all actually involved together. So, that the gate and what will allow the crossing through the gate those criteria are decided. This is the principle, and as I said it will vary from industry to industry or the type of product to type of product. This is the kind of a this is borrowed from the book by RJ Cooper.

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They actually run this stage gate foundation they have a very good website. Lot of material will be given their how to manage the stage gate process, for the new product this is actually taken from their 1990 book that has been updated many times. But this particular diagram remains. So, that book is called the new products the key factors to success.

A lot of material will be available with this stage gate foundation website, and I highly recommend you go there so that the details of each stage how do you decide the particular decision making criteria for each stage of filtering. Because these gates are nothing but filters. This is the gate 1; the gate 2 is usually the feasibility viability-oriented filter. The gate 3 will be based on some test marketing data and so on, and the gate 4. So, this is something that you need to you can alter this list, but and you can sometimes actually combine as I said. But you definitely have to take care of these various factors that are mentioned here.

So, typically at this stage 1, you will look for the market data. The main technical challenges and advantages; and some early what we call soft financials at this stage ok? So, then the next point that is important is to see that this gate 2; that means, market initial data, technical features and benefits offered, the soft financials or early forecasts based on some good market research will lead to the stage 2; where usually the decision makers will be looking for detailed market studies. They also would at that stage want to

have some kind of a legal review with respect to intellectual properties, whether we need to license some intellectual property, whether we have protected our own developments well, and to what extent patents can be taken or copyrights can be used all these. We will discuss this a little bit all these different kinds of intellectual property protection stages in a later session.

But here at this moment therefore, suffice it to say, that you need to look at all the legal aspects. Then just as we want here detail market studies. We also want to have detailed technical appraisal at this stage; that means, from the early stage we might have just given an outline of the technical technology. But here we will like to have much more detail assessment with respect to competing technologies existing technology versus this new technology cost benefits etcetera.

So, what we say here is we need to build a proper business case at this stage. And also, at the stage the decision makers usually you will look for some kind of a project plan; that means, what will happen in the following 9 months 12 months till the product is launched, what kind of achievements will be demonstrated after what period of time. The gate 3 is normally focused on financial hurdles; that means, rate of return on assets and return on investments, what kind of new machines or new types of suppliers, or new types of technical and resource requirements will be there. Also at this stage we will like to see what we call detail product protocol; that means, you know how that product will be structured what will be the product platform strategy which will be product portfolio strategy, what are the elements that will be out sourced what elements will be in sourced, all that will be at this stage requested for. And that quickly goes to this stage, where we will actually like to see some performance reports of the product in the marketplace.

So, usually that is done with prototypes or early models. This is where actually we may even look for feedback from beta customers. we may actually try to see reports coming from the customer advisory board; that means, customers who are involved with you as score developers. We may want to have detailed market research reports market survey reports coming at that stage. Based on that we must have much more detail cost and financial analysis, which has to be then presented to, this stage this is the stage up to this point is what we call development stage. From this point onwards, it is a commercialization stage. Stage 4 we call it validation.

So, validation will be in house test reports will be asked for customer test and trial reports will be asked for the total business and financial reviews will be asked for. And the on that basis, as you can see here the investment requirements kind of actually does not go up like this, but actually the investor requirement will be going up like this. So, that means, up to this point the investment is kind of limited, because this is your still dealing with prototypes.

So, if I draw it correct clearly, you are looking at a an investment profile like this. So, up to this point you are dealing with prototypes, you are dealing with small limited experiments. You are dealing with pilot runs at the most. But this point onwards there will be exponential rise in the investments that will be needed. And that is why at you now all projects cannot be given this high level of resources that are needed from to transit to get 4 and get 5. Therefore, often we actually take the resources away from some projects at stage 3, and feed that into the most promising cases in stage 4.

There are some criticisms to this stage gate process. Because they say that only safe vets are given preference in this stage gate method, or very definitive projects and normally therefore, the incremental innovations get better funded in the stage gate process. To compensate that there are organizations which are now they are they are complementing the stage gate process for the mainstream developments with as we discussed in the last session idea incubation or internal venture funds, where some little bit of long range bets the new product ideas which have a longer gestation period, or may have to go through more trial and error or maybe riskier. Those are they do not actually get neglected totally they also get funded.

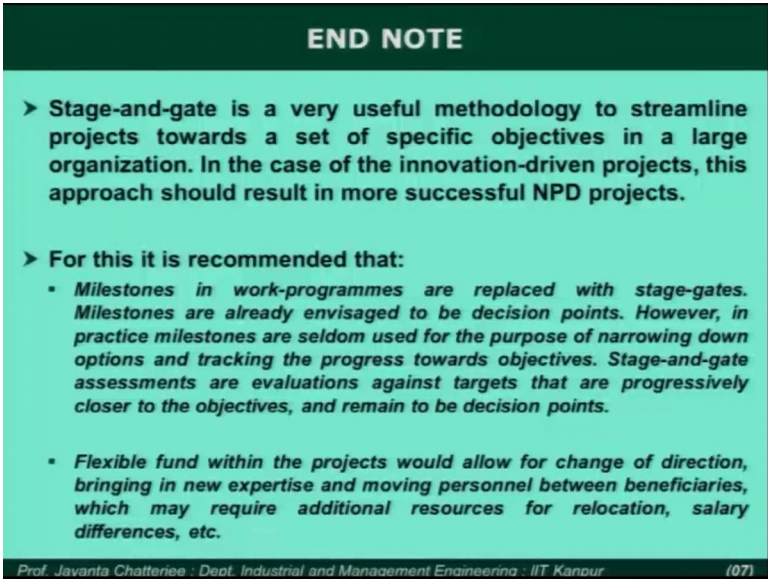
So, sometimes therefore, you may actually create a complimentary separate stream of investment. So, sometimes a product may be withdrawn from here, from this particular stage gate process, but may be actually transferred to some kind of incubation activity or other skunkworks and so on. Because some people are still championing or some top management sees a long vision that know that product may be needed 5 years from now. So, that is what will be asked for at that stage.

Another point to be made here is that a new approach often errs also taken; it is called the real option approach where the projects which are found to be not suitable to go from gate 3 stages 3 to stage 4. You actually do not completely choke them, or do not actually

a abandon them. You provide them some minimal funding either through the venture funding mode, or some kind of internal divisional funds. So, that they are certain skeletal facilities and activities go on, and they may be brought back in the next year cycle. because by that time some more data might have been collected.

So, that means, you keep the main bets following this stage gate, the main bets follow this stage gate going from stage 1 to 3, and then 4 and 5 are the one where you need a lot of resources.

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END NOTE

- Stage-and-gate is a very useful methodology to streamline projects towards a set of specific objectives in a large organization. In the case of the innovation-driven projects, this approach should result in more successful NPD projects.
- For this it is recommended that:
 - Milestones in work-programmes are replaced with stage-gates. Milestones are already envisaged to be decision points. However, in practice milestones are seldom used for the purpose of narrowing down options and tracking the progress towards objectives. Stage-and-gate assessments are evaluations against targets that are progressively closer to the objectives, and remain to be decision points.
 - Flexible fund within the projects would allow for change of direction, bringing in new expertise and moving personnel between beneficiaries, which may require additional resources for relocation, salary differences, etc.

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But some side bets, or what we call hedging bets may be made on some products, some technologies which may take a little longer, a little bit more work for to come through. So, to conclude the stage gate method is very useful for particularly for large organizations, where there are a number of competing proposals and there are a number of in new product development projects that are being brought up by the different business units. And it is better than the sort of so called Mul milestone method, because the stage gate method can be made a lot more dynamic and it can actually create a lot more intense interaction between the decision makers and the idea champions and the idea sponsors.

And the stage gate method also allows us to manage flexible funding a across the funnel. So, the different pace can be maintained. And also, you know sometimes some companies use these terminologies, that there are some bets some product developments

which are these; that means, absolutely needed for today's business, usually incremental project. Then there are what they call pace projects; that means, these are developments which will accelerate a product across its lifecycle will allow the product to leap from early majority to late majority and so on.

So, those are pacing technologies investment in pacing technologies. And then of course, there is the third type which is the blue-sky type, the racing ones which may need much longer vision and bigger funding. So, thereby you also can hear uptick the stage gate method allows you to build a portfolio of investment profiles in new product development. And that is the power of this model. And as I mentioned please do go to the website of the stage gate foundation, and they have number of interesting video lectures there, and PowerPoint presentations and pdf documents; which you can use to design the new product development.

New service development process within your organization. And with that we end today's session, and we are going to discuss coming we will come back to the new product development processes in startups, that is what we discussed in the first couple of weeks in much more detail, and after discussing in the last few sessions about new product development in large organizations. I will come back to some interesting concepts which are today finding favor with many high tech startups. Very popular in Silicon Valley another places, and the concept of pivoting.

Thank you.