

Ergonomics for Beginners Industrial Design Perspective

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Module No. # 05

Behaviour and Perception

Lecture No. # 23

Communication and cognitive issues


Welcome to this twenty third session of ergonomics for beginners for industrial designs prospective.

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Ergonomics for beginners Industrial design perspective		
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Module 5 Behaviour and perception 5	
Class 23	Communication and cognitive issues
Class 24	Psycho-social behaviour aspects, behavior and stereotype
Class 25	Information processing and perception
Class 26	Cognitive aspects and mental workload
Class 27	Human error and risk perception



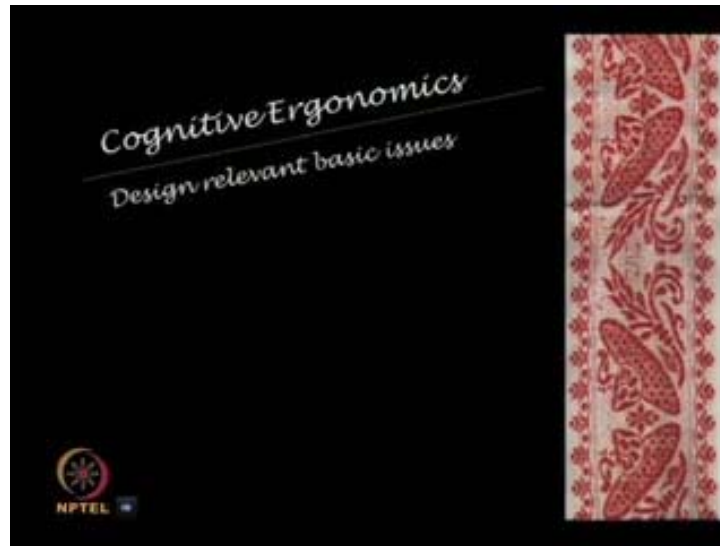
Now, today we are going to start a new module that is behavior and perception; that is the cognitive aspect of ergonomics and its design deliverance. So, it has total 5 sessions; these 5 sessions are: class number twenty third is that communication and cognitive issues, next psychosocial that is behavioral aspects behavior and stereotype, 25th class will be information processing and perception relevance class, 26th cognitive aspect and mental workload class number, 27th and last of this module will be, the human error and risk perception.

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Module 5 Behaviour and perception 5	
Today's session	
✓ Class 23	Communication and cognitive issues
Class 24	Psycho-social behaviour aspects, behavior and stereotype
Class 25	Information processing and perception
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So, today's session is the class number twenty third that is communication and cognitive issues; the cognitive ergonomics the design relevant basic issues. Now, the design aids our life; now, design aids - the human performance, utilizing optimum resources to, it is maximum benefit. Now, this optimum resources is the human resource as well as the natural resources available at it is surroundings.

Now, when we talk about design and task, our daily life activities one fact we must consider, that due to misunderstanding of minute human factors in design - it loses, it is

acceptance or usability value. Why some design or some item people do not like and why some item people prefer to possess.

There is some likingness, this likingness factors depends on his mental status and what he wants actually? Now, what he wants that a series of a psychological issues are involved in it.

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Now, these aspects we will be discussing in this module. So, let us see the user analyses product's attributes through knowing, doing and feeling, it is perceptual-motors skills and emotional skills. Now, in this figure it says that the garment, this girl is wearing, it gives a nice feeling, pleasure feeling; so that she smiles. Now, what are the factors in all those things, is it only the material resource only the body size match and etcetera, only whether it is, that it provides a flexible movement facilities or something else; means, when she wears the knowing, what is the thing doing after using it, the activity and feeling the perceptual motors skills and emotional skill, what type of color, then gravities on it and is all matters.

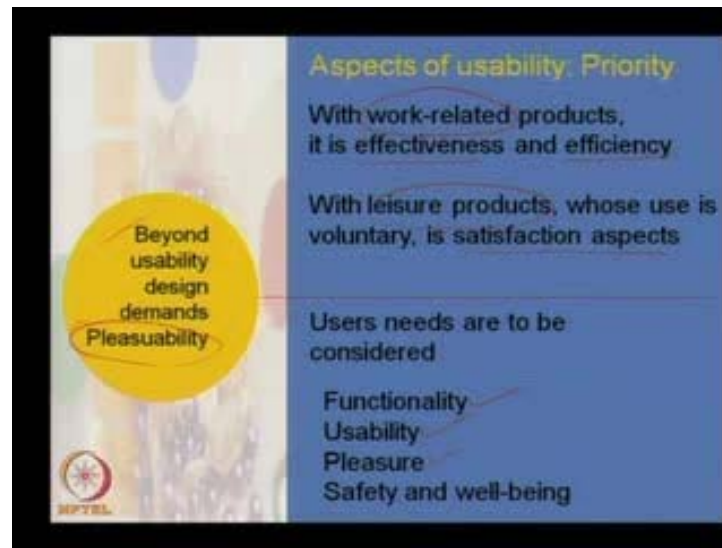
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Now, what are the factors relevant for this decision and its design application that we must need to consider, that is the usability value of a product. Now, usability does not provide success alone, for a product to be successful, unless it is aesthetically pleasing.

Now, only aesthetic pleasing if it does not have the usability value that also will not succeed, it will not accept it as a reliable product. So, the design, the design as a whole provides a total trust; means, the feeling good, it should assist into perform some task, and it is the product should be reliable, it should not cause any accident due to misunderstanding of some information presented; in that form design itself, if we do not recognize that, then some accident or mishap may take place. So, all this, it is a total trust we need to consider, and in these chapter in of this discussion, we will discuss the mental conditions or mental factors behind this.

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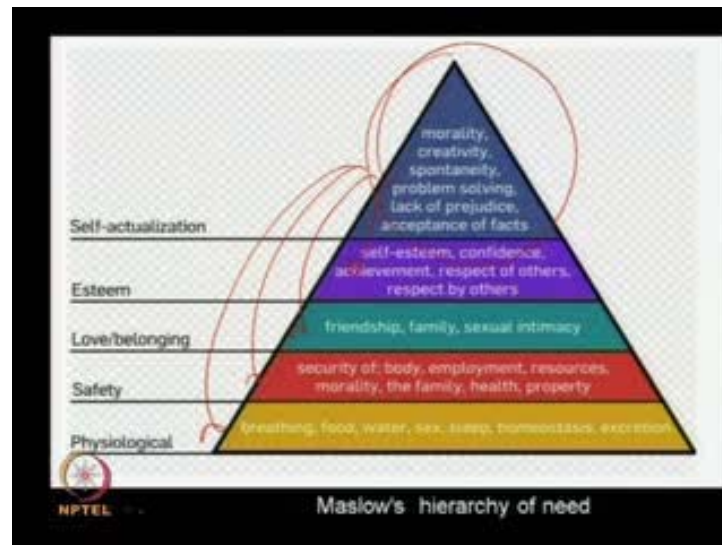
The aspects of usability, the priority factors which on we should consider; with the work-related products, that needs for to do certain task, it is effectiveness and efficiency it matters. With leisure products, not for task, it is for leisure products, whose use is voluntary, is the satisfaction aspects.

Now, the products success, that is beyond usability the design demands pleasure ability: users needs are to be considered through: functionality, usability, pleasure, and safety and well-being.

Functionality, how it functions, it should performs, its function at the best. Usability: how the user uses that with is its satisfaction? The usability has two aspects; one is that to understand the product how to use it? How much learning time is requires? If the learning time is less, then we can say that its usability value is better.

Second is the reusability: reusability aspect is that once I learnt how to operate or use the product or the design? After certain period of gap, if we want reuse that product how fast we can retrieve it all the inputs? That requires operating that product. Based on that thing are a reusability factors, then pleasurability and safety and well being.

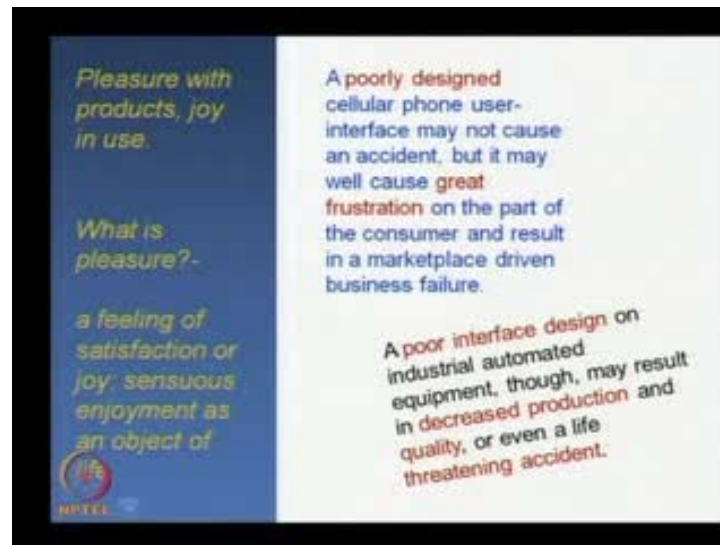
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Now, will see some of the factors, here how it depends. Now, if we see the Maslow's hierarchy of need, there, **the**, in this pyramid, it says that - the physiological need is the best that is the bathing, food, water, sex, sleep, homeostasis, excretion, etcetera, the physiological need. Then comes the safety security of body employment resources, mortality, **the** family health property.

Then comes love belongings: his friendship, family, sexual intimacy etcetera. Next the esteem: self-esteem, confidence, and achievement, respect of others, and respect by others. Self-actualization: mortality, creativities, spontaneity, problem solving, lack of prejudice, acceptance of the facts, design aims works at this area, but it is effect comes to all the levels.

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Now, pleasure with products as joy in use, then what is the pleasure? A feeling of satisfaction or joy, sensuous enjoyment as an object of life. A poorly designs cellular phone, as an example, user-interface may not cause an accident, but it may well cause great frustration on the part of the consumer and result in a marketplace driven business failure; means, it may not a harm or it may not cause an accident, but if I cannot operate it properly, then the frustration comes, means, we have to consider the users limitations, the context specific application should be there.

A poor interface design on industrial automated equipment, though, may result in decreased production and quality, or even a life threatening accident. So, we must consider the interface, means, what, **the**, I want, and whether I am getting that thing at that the mental match.

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Now, the innovation, now we will see some of the figures that clarifies some of the issue that we are going to discuss. Now, in this case, this is an advertisement of LIC and the figure associated with this life; so, what is happen, what it says to its viewers? LIC is a different business, this myth is a different aspect, but what is the link we are achieving here. After seeing this figures that innovation when ideation and application come together, with this letterings and this figure and it is a link with the LIC with this, that easy relation to be found out.

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Now, this is an advertisement that this Marie biscuit to give it is a natural feeling; how it is giving. And now, the association comes association is that one product is associated with another product that aspect; here going closer to the original with the nature the feeling, and the biscuit and tea has a good combination; so, it is given like this.

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So, now people can associate the products usefulness; another aspect this is here, the used vehicle tires are being modified, for this type of seating arrangements, seating things design. Now, the thing is that this one has usability, but it is context specific usability where to use this type of products. After seeing this, it quickly come to your mind that where I can use this type of products, and accordingly the context relevance or relation, we can look at and find out.

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Another thing is that how we can associate with the symbols and etcetera; like in this advertisement, it is said that - here that buy one get one, now here one, it is a single one mentioned, but while reading quickly I can associate buy one and get one. So, one is a common feature of the both, one can associate, but in certain cases that difficulties are also there; so, in such cases, we have to analyze the context here. The product it says that a soan papdi, a sweet packed in a small package and these are the little brittle pieces are there.

So, it is supposed to open up like this, this is the smallest pieces are like this, but how to take out this one? No information is given, though it appears as a physical challenge, the physical match, but psychologically it says that - how to open it without breaking? As this provision is not there, arbitrarily it will still start with one corner break, at least one piece, if they break taken can granted; second piece they want they take as a full whole piece, they want to take, because the space is created; now, for this we do not need to trained how to open it, but still people find its own way; we have to honor, this decision making capability or aspect or of the users. If not specific instruction is given, the total safe formation in such a way that users can find its own way to use it.

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In this figure, it is in a night condition, this figure is taken. It is pani puri **wala**, here a one small basket is here, that to drop all the garbage or the waste material here, but still it is lying here, and there all the garbages why it is happening? Is it due to disability users or the location of this product? In such a way that it is not visible or it is not easy to use it, that aspect we need to find out. And accordingly the location has to be decided and its visibility has to be worked out.

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Another issue a commons very difficult psychological issues, is that, in almost for the public building staircases, people spit; this is the problem. Now, some people have decided to use the god figures, while climbing up and climbing down, some god figures they used. Now, there are some people who do not believe in these motives or symbols, so they still spit on this corners of the walls.

Then some people started writing do not spit, do not throw waste etcetera, but still it does not work. Then some people have taken it granted, that people will spit here, and this god and etcetera, it is not good; so, they put some kind of garbage bin, kind of thing, sand bin inviting people to spit on it, but still people instead of spiting here, they spit on the walls.

Now, some people have started using it that has a spit bin here and a plant in this corner plant. So, people may not like to spit on the plant, but here if we can keep and another basket adjacent to it, then people will feel that here it can be used.

So, the plant then this portion can be removed and cleaned regularly. So, these are the some thoughts that people can generate, based on the context specific requirement. This is not needed at home, but in public place where we do not know, who will be the intended users of this design.

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Another context specific application: this figure **must taken** during election in Assam. Now, the elephant and on the top two persons, and few people are following it, for an

election campaign. Not much people are attracted with this figure, but if this thing is presented in Chennai or Calcutta or somewhere in that place, perhaps people could see this gather around this, because it is not common in that area, but in Assam this is a common. So, it is said that - if a drop of water falls on a lake, it loses its identity, but if a drop of water falls on a lotus leaf, it is sparks like a pearl. So, we have to judge and decide, what would be the context specific requirement, and accordingly give design suggestions, and that depends on a series of psychological issues.

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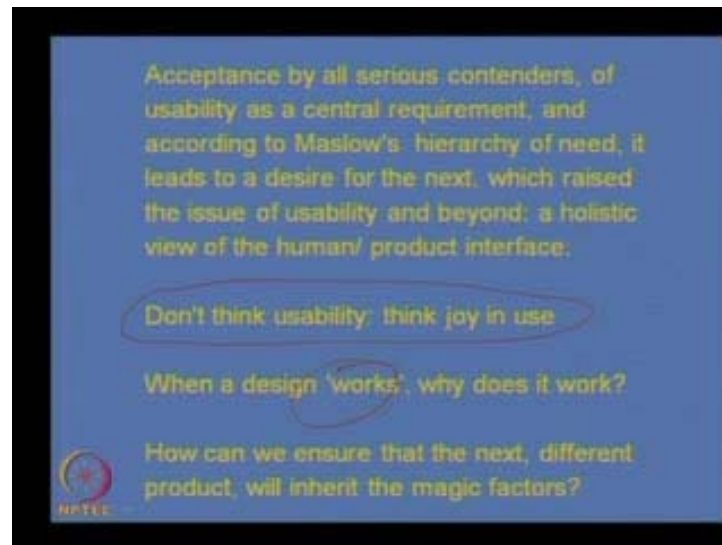
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Another thing, how we perceive thing and the direction? If we see from a distance, this product in a little dark time, not much less, in little less natural light, it gives a feeling of a lizard type of thing. Now, if we try to see from the side, it still from a distance, it gives a lizard feeling, but if we come very close, it loses its lizard feel appeal it is a coconut flower base; it fall from coconut tree.

Now, the thing is that, if it is appear on a clean road, it will distract our mind, we may feel something else, but if it fall available or if it is present under a coconut tree, then people will quickly associate, that it may be lizard may not be lizard, because they are known to this type of things. So, the association and the direction of that product appearance, it has a meaning to understand or to perceive the product form.

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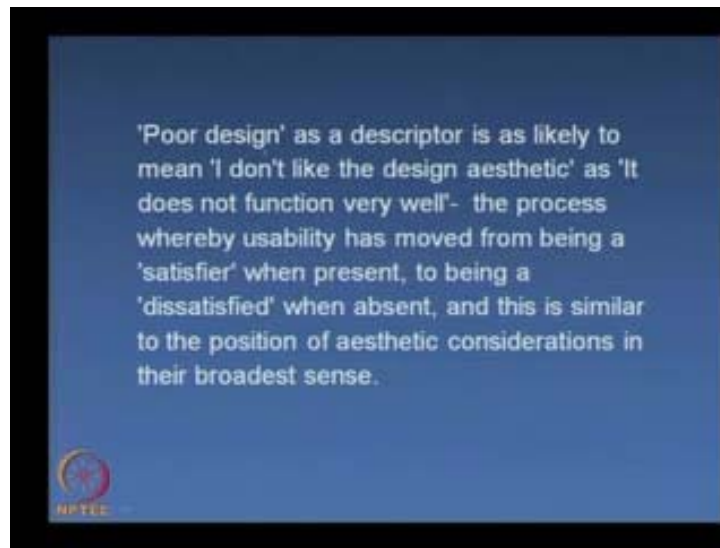


Acceptance by all serious contenders, of usability as a central requirement, and according to Maslow's hierarchy of need, it leads to a desire for the next, which raised the issue of usability and beyond; a holistic view of the human and product interface.

Do not think usability; think joy in use, what is that matter, why it is said that do not think usability think of joy in use? Only useful product, it has no meaning if while using it I do not feel joy, I do not feel motivated to use this product. What factors give this in human?

When a design works, why does it work? Why people like those products? How can we ensure that the next, that different product will inherit the magic factors of acceptance? what are the factors? No one can tell as a thumb rule kind of thing, it needs to be studied, it needs to be understood; a good understanding of the need product ideation development and it is intended function has to be closed needed.

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A poor design as a descriptor is as likely to, mean, I do not like the design aesthetic as it does not function very well - the process whereby usability has moved from being a satisfier when present, to being a dissatisfied when absent, and this is similar to the position of aesthetic considerations in their broadest sense.

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Another example of this, this is an, in here, it says that - it is a garba dance mostly performed in Gujarat region, there in autumn season in 9 nights, special dance and religious function. There people dance with 2 sticks; now, these 2 sticks, now it has get,

got male and female figure, aesthetics as well as utility. Now, male and female people they can select it. So, it can be said that the good linking and the 9 is present, in such a way 9 divine nights; so, a whole it gives a total symbol. It says that stick is there male female combined dance is there, 9 nights there, and also it has a divinity, it is also present here; so, all the components of that dance and that festival, all the basic components are presented here, and it is presented in a nicely, neated manner.

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So, identifying the elements is a good task, and we need to present in a design meaningful way; so that everybody can understand symbol, the place location. How with this figure? It says that - so self-explanatory figure of a place, it gives hospitality, hospitable atmosphere with this type of symbol.

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Next comes the class, for whom we would do the design? What to do the factors? From here it says that - this advertisement, this, **ad**, advertisement says that - cutlery for those who choose to live a golden life, means, it is a costly item and for a class requirement.

Now, it is said that - the features, while we are selecting some features, the middle group of a society, they always prefer a time tested product; means, they do not, probably they do not want to experiment with the cost, but the apprehend people, and aristocrat people and etcetera, that type of elite group, for them, they may go for upper end things, where the long live matter may not be required, for them newness is a factor.

So, that has to be, how the newness with sustainability be used, one can think of that; so that, this division of class and etcetera, we may remove it with to design, but there is also concern for business part, that for different sector of society, different, whether different types of designs needed or not, it is a big issue and we need to study on this. Like we cannot say that in rural area either roads and etcetera, and the lifestyle it little rough; so, vehicle and truck vehicle and etcetera, everything will be will look like tractor; in city everything will be very sleek, someone can or go on this, but can we say that the small mobile phone that we are using for a rural user, it should be very rugged and larger size, cannot be. So, certain aspect, certain product we may need to break the barrier, some are knowingly depending on the specific requirement, we may need to design some context specific solutions.

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Now, the image building, with this the snake boat race in Kerala everybody knows it, with this type of figure, it clearly comes to an identity of a culture. How best this thing can be used to represent that population group? We should think about it. Assam symbol, this is a Bihu dance symbol, the graceful movement and is all there, but now this, now has become almost the cultural symbol of Assam, and this region, this northeast region. What are the facts? The posture, the equipment they use, the dress they use, and the dress code and the dress combination, these has become a cultural identity of a locality a region itself.

So, to identify this type of elements, we need to study individual people, small group of people, a larger community based understanding, and such like that, the scope of studies is there; one can study this area and present in various forms.

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Misuse vibration: seeing an misuse, this a railway crossing, in some cases some barriers are provided here, so that, no one can cross when it goes up, this barrier also goes with this, like that. But here, what is happen? If there space is there and one can cross below this bar, they are taking this advantage, accident happens. Why it happen? So, why these peoples are intent to cross like this, because that scope is there; visually the seeing that a space is there, so they can cross it.

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So, now, to stop this do we need a hard cover here? Or some kind of symbolic presents of this garden grill, it may not be physically very strong, but psychologically it should give that feeling; that we need to study it. For whom we are designing? This is our population, what is their aspiration? What products they normally use? With that it should go, it should go along with there are present practice. If is totally new thing is given, people may not use it, doubtful is there.

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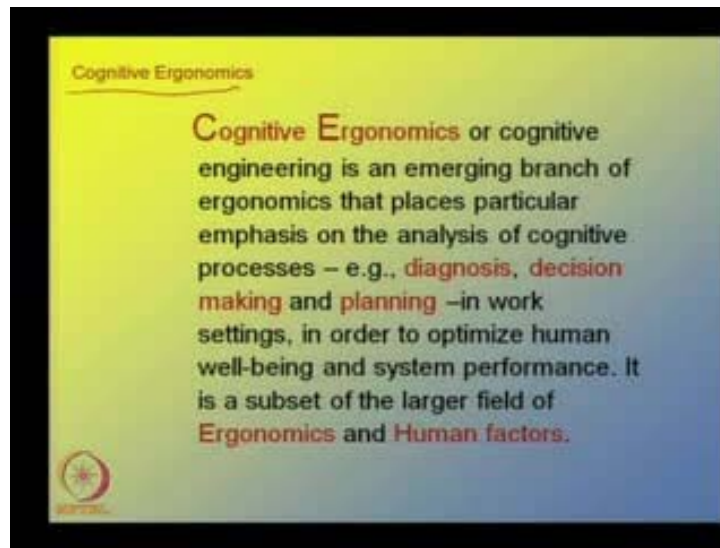
From a long large distance it can be seen that door is closed, but if you come close seeing this structure, one can easily identify that - yes, you can cross over it, cross through this, after a little pulling movement. So, this identity and that identity of a product make you how to behave with this product? Whether to cross directly, like this, or it just push it and get the space here and then go and cross; for product motivates people, how to use? How to behave? Accordingly a design should be done. Now, why we are discussing, these issues? From ergonomics point of view - how people feel? How people think that aspect?

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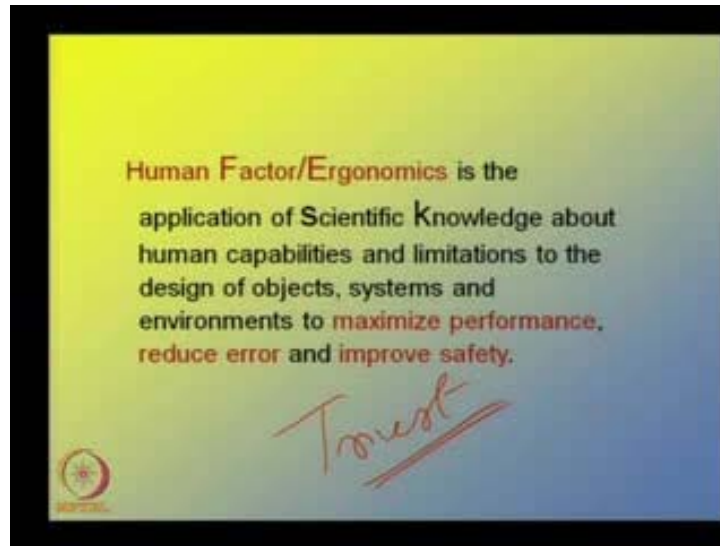
This figure what it says - is it an advertisement for a toothbrush, toothpaste, dentistry, a culture tribal culture, or bangle, or dress what? As a whole; after seeing this, whatever comes to your mind that is the essence of, **the**, this design. What it says, now you think what it says? What it appears to you, what it tells? Totality, a slogan for better living, requirement, happiness, what it comes from this figure, that one need to understand justify.

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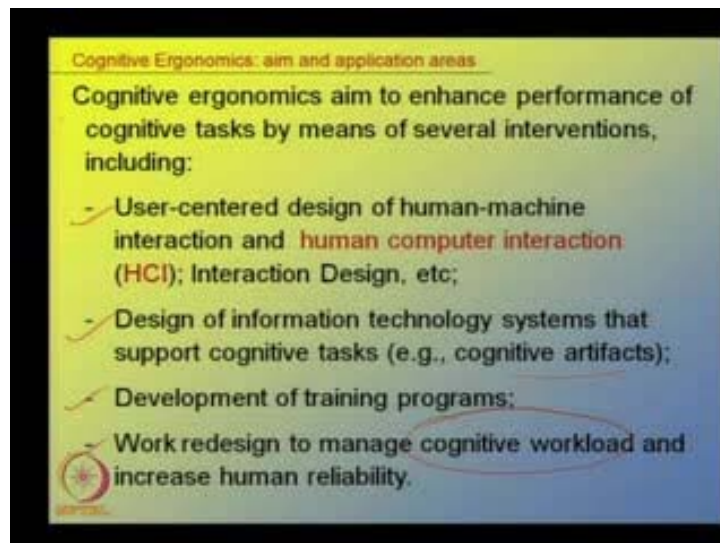
So, whatever we have seen, now with these examples, we can say that we are discussing some points on cognitive ergonomics. What is cognitive ergonomics? What do we want to discuss or we want to retrieve, from this examples? Cognitive ergonomics or cognitive engineering is an emerging branch of ergonomics that places particular emphasis on the analysis of cognitive processes, as for example, diagnosis, what is it, decision making what to do what comes out from that and planning, how to execute it, whether to accept it or reject it - in work settings, in order to optimize human well-being and system performance. It is a subject of the larger field of ergonomics and human factors, that we are trying to get out from this earlier given, all the examples.

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Human factors and ergonomics is the application of scientific knowledge about human capabilities and limitations to the design of objects, systems and environments to maximize performance reduce error and improve safety; that is the overall trust, overall trust.

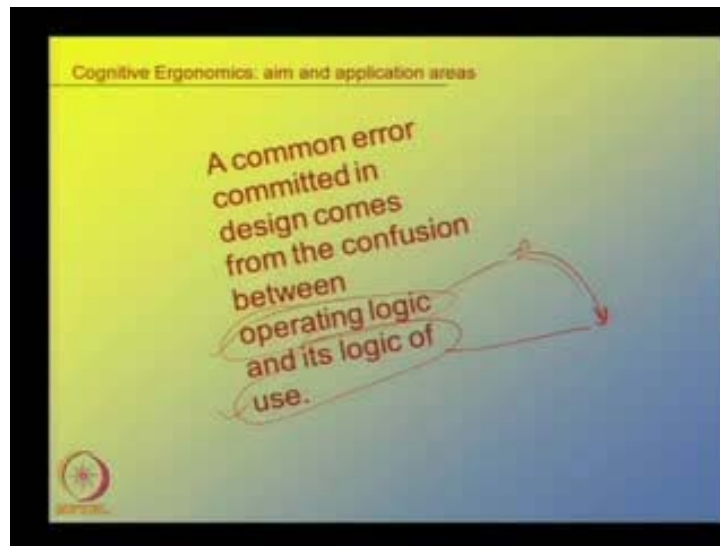
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So, cognitive ergonomics: it is aim and application areas are cognitive ergonomics aim to enhance performance of cognitive tasks by means of several interventions, including: user-centered design of human-machine interaction and human computer interaction that

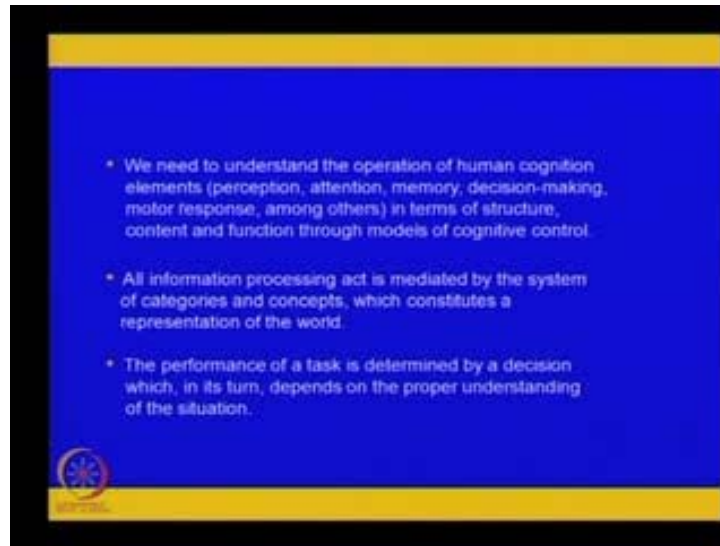
is the HCI; interaction design etcetera; design of information technology systems that support cognitive task, as for example, cognitive artifacts; development of training programs; work redesign to manage cognitive workload and increase human reliability. In next classes, we will discuss this cognitive workload resource.

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Cognitive ergonomics: aim and application areas, if we summarize says that - a common error committed in design comes from the confusion between operating logic and its logic of use. If we can, logic of use and operating logic, if we can match it, then there will be less error, in while using the product or that system. So, this interaction linking between these two that is the issue of cognitive ergonomics, **that in let mean** other classes we will see, it is various aspects.

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We need to understand the operation of human cognition elements - that is perception, attention, memory, decision making, motor response, among others - in terms of structure, content and function through models of cognitive control. All information processing act is mediated by the system of categories and concepts, which constitutes a representation of the world. The performance of a task is determined by a decision which, in its turn, depends on the proper understanding of the situation.

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Now, with this we can say that - the cognitive ergonomics, is a, in a communication model, where we can say whatever we are seeing or using in our surroundings, it that is all the things the design may be manmade or natural appearances, there some kind of message we are putting in it; means, when we are making a pen like this, it is a long one; so, it should not be hold like this way, some message is given here; so that, I have to hold like this not like this way, the way we hold a ball. So, message is already given here in the shape form; so, like that some message is already encoded in a product manmade or available in the surroundings. Through channel and medium, **it**, the message goes to the intended user; so, intended user is supposed to decode the message.

Now, suppose, if two similar ball type of appearance, but with, it look like same, but one is made with a thermocol, very light another, is a iron ball, but look wise the color and etcetera is given in such a way that it same. So, after seeing this, if I want to lift two balls, then it requires different activities, while lifting it one little light, one will heavy.

So, seeing this thing how that message we can decode it; so, if we see this, after decoding, this message that I have to hold like this, because it matches with our physical structure as well, then it will go to destination, means, through eyes and other all other senses it will go to brain and destination; then after judgment will either we will reject this product or accept this product. So, in this case, this region is the main cognitive aspect lies here; how the information goes to inside judgment? While judging this, how we match with our past experience? And then we judge its utility value, and then we react on it, means, through motors skills or some thoughts processes.

This is the cognitive issues, now in this case, we can say that - in this message transmission, some transmitter, inhibitors are there, means, mistakes like I just now said that two ball shape, but one is thermocol, another is an iron ball. The inhibitor is that it does not give that feeling of that weightness; so, that is the inhibiting factor of my action, whether the same action I should do that is the factor. So, multiple noise, this noise is not the sound noise, it is any kind of disturbances; like when I am giving this lecture, this discussion, I am discussing with all of you, the light sources, the my body posture and the presentation and etcetera, it gives whether its suitable for this. These are gives you the transmission inhibition and transmission facilitators, is that, which gives facilities, like in these two balls, if in one ball the color is different, iron ball; if look like iron and

thermocool ball, if we have some other some gravities and etcetera, that gives you the light feeling, it is the transmission facilitators with this.

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Module 5 Behaviour and perception 5

Class 23 Communication and cognitive issues

Next session

Class 24 Psycho-social behaviour aspects, behavior and stereotype

Class 25 Information processing and perception

Class 26 Cognitive aspects and mental workload

Class 27 Human error and risk perception

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So, the next class we will discuss this aspect in details; so, till today, for today we are closing it, and next class we will start with the class number 24 that is psychosocial behavior aspects behaviour and stereotype, that we will discuss; so, till then goodbye, wish you a nice day, thank you.