正在加载 视频播放器。静音字幕倍速超清4.26.mp401:02:1200:00:00播放视频超级会员高速播放通道 立即开通4.26.mp4视频AI看课件文稿 选集01:32:304.23.mp4未观看01:34:434.25.mp4未观看01:35:104.26.mp4正在播放01:33:334.28.mp4未观看00:42:114.30上.mp4未观看00:44:274.30下.mp4未观看01:45:485.10.mp4未观看01:49:255.11.mp4观看至38%01:39:255.14.mp4未观看01:44:475.16.mp4未观看01:41:425.17.mp4未观看01:43:005.23.mp4未观看01:41:035.24.mp4未观看01:44:595.28.mp4未观看01:36:275.30.mp4未观看01:37:285.31.mp4未观看01:42:095.7.mp4未观看01:36:175.9.mp4未观看01:31:546.11.mp4未观看01:26:256.13.mp4未观看01:34:576.14.mp4未观看01:36:466.4.mp4未观看01:35:516.6.mp4未观看01:29:346.7.mp4未观看嗯。开始录制了嗯，我看到了行好的OK。good morgen professor hah good morgen呃ya good morgen t。顶替的。now it's not niche his yah speak,an AR bent.李晨东哥。然而，胸发西蒙，舞闹情绪的我们。there's this any harrows for the room em,so there i'ma hy ton of fighter to the fabric plan nock.一样。as over gergestenerderge stones HON dong hong hong ho nen dong ho nen nen den den den ghone nd hond hond hond hond h.and then inducifere nt news there in the niche wider ET cetera.like that,you ask to knowing.嗯，happy a。啊，this thing you have an in，I have aen be favoured to to the under for for。OK mhm ss doc afternoon.before afternoon.t.and the vanished by merely fo yo maan coke iss.安卓第一滚，哪来第二个？嗯，that's my MI national does's here。I.and'mf is too no fuss at hell here odour erm fine wigan s,no I.其实你已经看出来了。my你不知道？are you too together?诺那处理where are you？what?啊艾米，where are you？are you at school？no,I'm not at school and uh uh,I'm working at home but uh,but professor noah is at school.so we can see again the food screen,right?yes,OK ay.so at last time when we have gone through these slides over here,there will have we have made some comment sum and um this comments were in the direction of er.saying,yeah,we are having different stages,eh? and here we have a maybe AH in the stage two or a system technology planning.eventually,simulation eventually,we have um.um,we have here.哦。well,Lndian,here we have more a very general structure,factory structure.but in the next step,we are coming closer to the to the detailed planning s where we have some technical.or technological solutions and trying to find so here with the planning concepts.um,system take system technology planning here,it's just wrath.er,but in the next step specification of processes,the it simulation performance specifications.em,yeah. and a presentation of the overall design em and I wanted,I think yesterday.I have shown some special a photo which is more related to the.which was related to the mode to the pan off or to the railway station.we have here in the TT moon and then I was checking again a little bit because maybe it is interesting also to see what happens with other TOPICS here as well.嗯，怎？I wanted now to.嗯。enter into the.it do the for the time.it was wrong again. this is because I should always enter into the presentation mode,and then I tried to share.otherwise,the system becomes confused.um,so we now she share this again.好的，我们上几节课呢？也是给大家分享了，就是关于我们这个factory planning这一块，对吧？我们的。呃，工厂它的设计以及它的这个呃呃，不同的阶段不同的这个步骤要做一些什么工作那？呃，上节课呢？呃，教授也是给大家讲了呃几个案例啊，如果说我们在这个呃实施阶段，比如说呃产生的一些问题或造成的一些。这个呃，后果对吧？呃，那我们也是举例了呃，这个包括我们在呃是呃，在这个呃detailed plan的这个阶段，我们会出一些这个视觉效果图啊之类的，对吧？上会给大家举例的这个多图。蒙多火车站这个呃，这个所谓的这个egg对吧？蛋鸡蛋的这么一个造型，然后它的呃一个功能设计，那它这个呃，除了我们的具体的方案呢，最后的一个展示的。它也是呃，也是比较重要的一个。一个环节eras to immuno gnised with tho he had to be shared about to had his fetish from now he did have the point only is it ha BS no reg avar tet of。thokehvileyhere UN greif vice nighhubungreshited if vice nigh obstinate obscure.yeah,yeah,OK,now yeah,last time I have shown this.and on the on the railway station,this special design solution and I found them even better.er,let's say dia of sketch or diagram or drawing of this er. and here you see the this x so,the architects were.having here the rail station and on top,they put it like an UFO er er,its unknown er flying object er.so it was funny that people in the city were discussing exactly who has landed over here and what will happen. it was never constructed,so it is not.er necessarily urura fear,but this was a as it was intended to be a very big shopping mall.the people in the city were fearing that all the business is then in the rail stations nowadays.AH,but I have another or er system here. this is mango er,and here it explains also very good how it behaves. mango is er company.a selling textiles in the centers of the city May be in in jewish city could be,or some wells.but here it's very famous because they are having textiles from all over the world and like Sarah eventually a little bit smaller than Sarah the company.and they have built a new Warehouse in Barcelona and er.what we see here on this on the on moment,what we see like to use the laser pointer.what we see here on this side is the complete system which has to be which will be desired,but what you see is you don't see the conveyors.you just see blocks,somehow blocks er,we'd try to give an impression about what for type of objects could be.but in the end,we have designed blocks.no wer here for the customer,it is er only interesting to see in principle.a sketch of the solution so in an early planning stage er,we just try to er to to build such blocks.here it is a Warehouse for textiles and the textiles are oh i explained this part,eventually first.AH,here we have the receiving area,so I normally here we have trucks,but we didn't draw the trucks. it's not important,it's just only to get an impression.and then the trucks are unloading their puzzles here on this kind of belts we have here. additionally.further unloading stations,this is because its textiles,these are some kind of one ways conveyors for hanging clothes.so here we have only boxes with folded clothes. here we have a hanging clothes.this is also one of the discussions which has to be done before hand to know which fraction of all the pieces which are sold or which are received.are hanging and which of them are folded because the technology for folded er for folded products is very different to those.er to was hanging for er.hanging for clothes now when we look into the into the design of the folded clothes also in boxes.we first have here em.a receiving area.I'm trying to figure out yeah a receiving area and then we have a very big er war which is er.partially for for for paler.yea,what we see here is in principle,there is a pallid Warehouse. this is this,this one and so in this direction,here we have a pallid Warehouse where the pallid sa restored.so pellets receiving here are entered here. then we have a carton a and here we have finally a shuttle.a shuttle area I think from this side we can see better. this is a shuttle area where we have boxes and in the boxes we have the clothes,and here we have sorting areas.with sorting machines,so we have a lot of sorting capacities over here.but we don't specify exactly how the sorting is done. we have maybe some index we have also.we see here some how like a like a street entering going to the to the pallid war.but we don't look very much in detail what happens here in the middle. is there is some conveyors where we do the socalled decanting first. it's a deep pala ti zing,but from the curtains we.we take the curtain pieces and put them into boxes maybe for one cotton. we need two or three boxes,and these boxes are stored here.and here,then,with high speed,they go to the sorting. and then they return back to their to this war,so we have.here,different speeds here,we talk about er pellets per hour,May be on a pellet we have twenty boxes.so we have here if we say,when we say we have hundred pallets in an hour,we have then in reality.er er,two thousand boxes. so here we can handle hundred pallets in an hour,here we have to handle two thousand boxes in an hour.eh so this is multiplied and in the shuttle side it's even more because here we can end up with sorting twenty thousand boxes. so there's a speed um.upgrade along the.along the the flow of the of the goods.yeah,but these are the ras diagrams we show our customers in stage two,so not detailed,and when we then go further,we can space.this is by the way also such a outside view of another Warehouse er. here it's a washing er for washing,producing washing p.we have here the layout. this is the factory,these are site companies,we have the municipal street um.and we have placed now this u house on top of the planning. and here the people can get also an impression,how it looks like where the trucks will be loaded and unloaded.here is weller some.specification sandur yeah,this is the way er people deal in the stage too.without going into the details of the material flow of the racks of the forklifts of the machines of the robots.this is er then in an later stage.啊，如果如果是俺们处留。哎呀，给老妈说爱呢，否认错误。粗略好的，那我们我们呃在上一节课的时候呢，也给大家呃看了啊，就在不同阶段呢，我们的这个呃factory planning，我要给大家呃要给这个。嗯，给出不同的这个阶段性的一些方案，对吧？那呃，这边我们之前也说了在后呃，这这个detailed planning的阶段呢？我们也是需要出一些效果图，对吧？那上一上次也给大家看了啊，就是这个多特蒙德火车站，它其实到目前为止就一直说要改建，一直说到改建，但到现在还没有改建嘛啊，上一节课的时候给大家分享了它最。这个早两年的一个设计方案是一个鸡蛋型，对吧？但后来教授回去找了一找，在一九九七年的时候，那个时候还有一个这个呃工厂设计的公司给大家。提供的一个方案就是做成一个UFO型的呃，搞搞得像那个这个外外外星的飞行器这么一个形状对吧？就是但是它的设计理念其实。还都是一如既往的，就是想把它这个呃涵盖了一个shopping mall的这么一个概念，对吧？能够辐射到这个城市里面。OK,uh,Nice to fall in bed.好的，那我们呃，前面也是给大家说到了，就是我们呃，在这个工厂设计的这个把它分为几个阶段的工作，那在我们的前期出方案，包括出这个早草案，就是在这个detail。planning之前这个stage two的时候对吧？那我们大致的就是哎，包括整个概念出来以后呃，我们要知道这个工厂它的职能是什么，对吧就？比如说像这个案例里面呢，也是教授他们呃，这个亲身经历的一些项目对吧？这个mango是呃，一家西班牙的做女装的，做衣服的牌子应该。呃，我们有一些同学，如果是呃，早早些年他还比较红的，这两年应该也还好，就是叫呃mango啊x2啊，这些牌子对吧它？呃mango，这家也是做的很大，这边呢是它这个西班牙巴塞罗那的一个欧洲总仓库，那当时呢，它要有的一些职能是什么？对吧？它大体的要划分为几个区域？啊，它包括处理的这个衣服，它有的是这个。啊，有有一些高档的衣服，它是呃要挂着的，对吧？呃，然然后呢？有的有的衣服就比如说T恤这种呢？它是折叠的，那像这些呢？在我的这个自动仓库里面，我用到的技术包括的存储方式也都不同。然后我们可以看到它这个嗯呃，左边的这个图啊，在在这个左后方的这些高立库呢，它里面是以货版的形式来存放货物的，然后。呃，这个棕色的这个部分呢？是以这个呃，我们所谓的这个箱子对吧？就直接一箱一箱的这个堆叠在那边的，那我们大致呢也是呃，包括前面的这个区域就是这些蓝色的线条。它就是我们呃，这个呃卡车对吧？进出的一些区域，那我在group planning就是在粗略的这个设计的这个过程中呢，我是。会要把这个工这个我要做所建造的这个工厂大致的这个职能，包括它每个区域去进行一个design，对吧？要进行一个划分，要进行一个这个细化。那但是呢，我并不考虑说哎，我里面比如说呃，我的例库对吧？我里面是传送带是怎么样子的？或者说是具体的这个箱子是怎么对这个我不care对吧？在这个阶段，但是呃，大体的一个layout，包括它。它的职能在这个第二，这个第二个阶段就是我们所谓的这个呃大体设计的时候，group planning的时候是要做的。oker denys for a biter,maybe I would like to add here a comment because eri forget,well,i didn't forget,but iii realized it would be eventually interesting for the students.here we have the entry point for the garments hanging garments,then we have here a preparation area where these goods are checked only as a block we don't say exactly how.but all the other blocks here,these are then areas where the hanging garments are stored,and we see that they are minimum five levels and we see also that we do not see but in the end when.with detailed planning,we saw this is round about one hundred kilometers of conveyors inside,so this is for the fraction of the hanging garments and here hint is here back is folded garments.but there,that's maybe the the key splitting,also so the customer gets a very early stage already a wrath idea how the the structure of the of this complete war looks like.嗯，好的，那我们呢？呃，之前也给大家说过啊，就是在工厂设计，第一个就是我们这个方案出呃，就是我要做这件事情，以后呢，我就要开始给我的客户出。呃，大致的一个嗯呃，粗略的方案对吧？那在这个group planning的阶段呢？就比如说像这呃，就是要出类似像这样子的一个方案那呃，比如说我们刚才也是给大家说到了啊，在我们。的这个嗯呃，这个服装行业，它有一部分呢是就是呃，它的仓库就分为哎，这个挂起来的这个衣物和这个折叠的衣物对吧？那我们看到这个右上角的这个。图它的嗯，它的这个嗯。它的这个呃，左边的这一块是呃，是放这个所谓的hin就说是挂起来的，就包括它这个呃里面的嗯。呃，包括它的这个准备区对不对？棕色的这个准备区，然后包括后面这个白色的一大块，这一大块呢，全部是来放呃，到时候来运送，包括来呃储存我们。呃，就是挂用衣架挂起来的这个呃，这个衣物的那像这些衣物呢，就是到时候那我现在这个阶段我其实是也不care说它里面的具体的有哪些传送带系统什么，但是。呃，其实我们也可以看到啊，它这个当时去规划这一块，实际上也是呃，规划的非常的呃，大的一个区域啊，就是有这么呃，五层的五层楼的空间对吧？要包括它里面，如果大家可以想象一下这个里面的传送带啊，如果是要要这个挂着这个衣服的那种传送带，它就有可能要几千米几万米的这个传送带在里面，对吧那？那我们可以看到右下角的这个图里面，那我就可以知道诶，我的这个在呃粗规划的阶段就。要把这个哎，我的哪个是呃卡车的这个停放区哪些是放呃挂着的衣物的，哪些是放这个折叠的衣物的存储区，对吧？那个白色的部分是？hen eclac los后面的这个palette和kato on那它这个呃成货版和这个这个呃包括棕色的这个呃箱子，那它是主要的是。来处理和存放我这个折叠起来的衣物的，那在这个阶段呢，我要给客户展现的呢，就是说诶呃，你你大概的土地对吧，然后呢，你的这这个工厂或者说你的仓库的这个职能的一个。呃，大致的一个规划是什么OK？and the next one was er here. this one er,which is also just the sketcher,and we used as a base the laya layout of blueprint in principle of the area.i placed it with our graphical tools. I think it's sketch as ketchup,which has been used here to draw this building.对，那除了就是说是出我们呃，具体的工厂或者说是这个呃，仓库的这个呃，里面的职能划分的这个草图对，或者说是蓝图以外呢？那我们呃之前也给大家说过啊，在这个呃前期的阶段里面呢，我们也要结合这块土地所处的位置，对吧？周包括周围的一些交通情况啊，包括周跟。呃，你的占地的周边的哎，是临着哪条街对吧？那我周围还有哪些工程等等的？那要出一个总体的跟周围的匹配的。这么一个布局图对吧？那这个呢？也是在我们这个前期的这个group planning的阶段去做的事情嗯。um,I also wanted to show when after this rust planning we can enter into a phase of detailed planning or systems. in principle,its systems planning.er and I will share May beer kind of er.看读书啊嗯。web web page just to show how it works。嗯，好的，那前面给大家分享的是在我们的这个就是呃，第一阶段的出方案的时候对吧就是。呃，在在这个不用这么精细，对吧？第二阶段是出一个大致的planning图，那第三阶段这个detailed planning就是细节。呃，规划的时候大概是怎么个样子？我们呃也是可以给大家看一下啊，就是这个就是刚才说到的哎，如果说你这个衣物是。挂起来对吧？有的是折叠的，有的是挂起来挂起来的衣物，它在这个仓库内部大概是长的什么样子嗯？and ii don't know if you see now the conveyors,but these are a variety of conveyors which er.um,i don't know it's not open. it doesn't open,but we see here on the side how this conveyors look like,and this is then the real er. let's say design come and US in that's when he's done.OK,and here we see the different options how the conveyors can be built. here we see the pooch sorta s because.and we do not have only a hanging clothes,as we have also,and these are bags,hanging bags and in the hanging bags we can put.a shoes we can put AH AH uh AH AH suitcases we can put accessories.er cosmetics,whatever so we have more mop items which should be then stored in such a system.but in the end,these are technology decisions which is done in stage three,and here a competition in our case with mango. there will have been two companies competing.and finally,ap sb has one,I think we have no psb solution here,but one of the famous ones is DIR kopf. you see the name DIR kopf.t which are doing,I have more than fifty percent of the solutions um also.a kind of worldwide here,there is another solution which is competing with which isis is the chaffer which is also such a con litty.company producing a technology AH,conveying technology AH here of psb as though they were competing psb and dirk of it at the time in mango.and finally,psb has won.this competition race,this competition race is the next step where the awarding happens.and finally,one of the of these companies can can win. yeah,and this convey US here,they to put all of them together. it was wrong about a hundred kilometres.of lengths,so these are really big system sander,the decision which structure for which type of and on which level which we have to store which goods. this is then done in all the details.the planning steps，嗯，好的，那我们呃，前面也是说了啊，第二个阶段呢，我们是做了一个草呃，这个呃，大致的这个规划图对吧？那第三个阶段在我们detail的planning的时候要做什么呢？就是那我就要更进一步的去呃细化，对吧？包括哎，我前面说了这个区域是放置的这个嗯，所有的都是这个挂着的，这些衣服对吧这边？教授也给我们google了一下啊，就是呃，这个给大家有一个直观的这个感受啊，这个所谓的hanging system conveyor是怎么样的？就是呃，内部的这个传送带，然后呢？是来处理这个挂着的物品。那像我们这些挂着的物品呢，它现在的这个比较先进的解决方案就说不是像呃，这个老呃，这个你看这像我们这边有一些图示，它是老的，就是衣架，然后下面是挂件衣服这种模式，而是。用这种袋子的模式对吧？这是一个呃封闭的袋子，那它的优点呢？就是说是我这个里面可以放这个不同的物品，不一定是衣服鞋子裤子也可以放鞋子，对吧？也可以放。呃，围巾也可以放各种不同的哎，化妆品什么都可以放，那这个系统呢？就可以有进一步的扩展那呃，那像这个detail的plan的时候呢？那我就要去选择说哎，我哪些系统？哪些的这个传送带系统企业内部我要去哎，实现这个功能对吧？我要去给它规划，具体的去规划那呃，规划完了以后呢呃，就是刚才教授也是说了像这个h system它的conveyor在我们芒果。的项目里面啊，整个的传送带在呃那个仓库里面就要建100多公里啊，这是非常非常不可思议的，这么一个这么一个大的项目。那呃之后呢？他这边呃在第四阶段的时候对吧？我们呃就哎比如说我现在呃也需要这个hen es ist on，那就有两个公司开始竞争对吧？呃那我我这边。有这么多的公司可以来给我提供这个解决方案，那我第四阶段就要开始招投标，对吧？像刚才呃教授说这个在mongo的项目里面也是这个du co和这个psb两家公司来竞争。最后是psb的公司呃，赢得了这个大项目，对吧？那呃，这个过程中呢？呃，那我们也是可以看到啊，就是在现实的生活中，在现实的案例里面。我们也是这样子，一步一步的遵循着这个我们的这个factor planning的这个理论来进行的这个工作OK？hmmm,cut manding friends in.或者一会甲体能扑射的。this,this is the same video film into sdi.呀OK。ya er er,so he will see them the the the this conveyors also operating because maybe.when we see them only in pictures,we cannot figure out how these,how these systems finally are are used and assorted. we see here the sorting process.er,and what we see as well,and that's very important here that we never send only one hanging er object into the system. we always send.let's say twenty thirty forty um to to the destinations. this also makes the throughput very slow because.we have to make sure that once the um the the a bunch,let's say a lot of hanging garments is underway.it is not interrupted by other garments who are eventually crossing the way,so that's a quite complicated,a later complicated material flow. but here.at in this stage in the awarding stage,the come in the final in the detailed planning.er compete the competitors offer er solutions and finally the customer decides which one of these competitors will win.and it depends,of course,on on the presentation as well.OK，好的，那我们也可以看到啊，就是这个在这个YouTube v呃这个视频里面可以看到这个呃。呃，我们服装行业很多的，就是用这样子的一个solution对吧？呃，去呃里面的这个传送带，包括它这个呃，它这个袋子里面是它是挂着的这个呃，系统啊，就是所谓的h system。那它可以来处理的东西，对吧？就是刚才我们也说了，它现在呃，这样子的一个设计呢，它可以节省立体的空间，然后呢，它这个里面袋子里面也可以放各式各样的，不仅是像衣服，对吧？我可以放。鞋子啊，可以放各种零零碎碎的东西啊，然后它这个呃，它这个传送带实验室这个都是挂着的，这么去动的，这样子的一个系统。OK嗯OK。ya now I have to stop the movie.which is still running in the b.OK.嗯。but as these are now the individual steps of the planning and we would like now to continue.呃v4f。with呃呃呃这呃刚才的几个案例呢，也是给大家呃大概的再呃举一个例子啊，就是我们上一次说的这个六个不同的阶段。那他每个阶段要做一些什么事情啊，用几个小的案例来给大家做一个说明。AH,we have no honour for tim in alton.came if he might get a smile trying in gold lard in its nascent time.嗯，好的，那我们这样。one moment的I if。but it is so that this system is always asking for a click here and a click there.嗯。do we see the full screen do?35度。啊不也是一个呃doctor买卖的。OK.嗯呀。likely forty nine at this most under skin there,there had this nichicon omen. they click ha dane chico no men,this mother's book.now should be full screen.um,yeah,OK,here we talk about tasks factory typologies resources of efficient factories and.content and produce a procedure of effective planning.well,the meaning of the tasks or relevance of tasks we could also say instead of the.I remember,I recall.here in principle,a factory and all the elements which are entering into the factory and um.they are well in principle the connection to outside world like here with the materials,energy and information in general as RUSS. let's say input.好的，那我们进入这个呃呃，这个第二章节的这个学习啊，就是我们的这个basic basics of factory planning，那在这个里面呢，会给大家讲第一块就是。它的我们要处理的主要的这个meaning and task，对吧？它的这个呃，我们的这个呃职能，然后呢？包括它的这个拓扑学，然后呃，包括它里面的我们想要做的这些事情，对吧？啊，那这一章讲义呢？当时我们在呃导论的时候也给大家讲了，对吧？呃，我们的整个的factory或者说我们整个的工厂。呃，是作为一个整体的系统呃来呃，作为一个系统工程来做的嗯。嗯。t.operations and here in um this um,this production factors this has been done um according to em.people who have structured this and one of the names with this relevant fru struct in GIS erie ku TT enberg.who made a differentiation of operational production factors in business admitted administration.so in principle,it's the question,what are the elements? the key elements and one er when we talk about production reflectors is resources.so or production production funds，if you like also嗯machines and。er tools er,it could be also land and buildings. it could be supply systems,it could be transport and office equipment.er so resources are er a lot of elements which have to be planned and which are the relevant factors for the.um for the factory planning,we have also additionally materials where,whereas yams chr eg us but ourselves um.好的，那首先呢，我们在这个呃呃要去理解啊，它这个production或者说是我们整个生产过程里面会有哪些要素是我们需要关注的，对吧？在一九五八年的时候呢，那个古登堡对吧？埃里克古登堡呢？它也是提出了在企业管理中的呃运行的生产要素的一个区分是吧？那这个呃它的提出的这个生产要素的区分呢？对于我们描述工厂的功能和结构呢，是非常有帮助的，首先呢，我们呃说这个所谓的production resources，也就是生产资料或生产资料。的这些资源对吧？那它呢？呃，主要是指的什么呢？就包括公司它呃，执行这个它的服务也好，它的生产活动也好，所使用的所有的技术设备。对吧，那包括呢，我们呃涵盖的诶，它里面的机器对吧，各种工具不同，不要呃不同的对吧，然后呢，包括呃。土地，然后这个它的这个工厂的建筑本身，然后它整个的供应系统，运输系统，办公设备，所有的都会包含到我的这个所谓的生产资料。里面对吧那呃经营资源的这个总和呢，就是我们公司的资产负债表中的有形的这部分，就是说我们有形的固定资产。OK,so these are the let's say like translating machines here,we have materials like raw materials.em operation materials er and er,so this is on one side. let's say more that fixed elements here,we have the movable elements.and finally,as a very important point,is the human work performance,and we have of course to understand how they can be planned.em,but it is the the everything dealing with the object related work emi ti se mem.嗯。in a difference maybe to the managerial work where we have the so called dispositive production factor.er,where people tell other people what they have to do.ander,another resource in such a sense is the er or another element,a production factor is the information.em,so we have to provide the correct information in order to let such a system em.flow or or to to to yet to structure in a way the complete,the complete um factory um.rectory design.嗯，好的，那呃，根据这个古敦堡的这个区分呢啊，它的这边的我们所谓的这个用于呃生产的呃不同的factor对吧？生产要素呢？呃，除了前面第一块，我们说的resources对吧？它的这个呃固定的一些生产资料，我们也可以把它理解成这个固定资产对吧？呃，前面也跟大家说了，包括一些土地啊，包括一些机械设备啊等等。那第二块呢，就是我们所谓的materials那呃，这个呃材料对吧？包括各种原材料也好，辅助材料也好，就是用于这个呃。呃，运行工作operation materials对吧？就是这些操作材料也好，那以及一些额外购买的部件，组件等等都是属于这个，我们在这边叫做这个。呃呃，就是它不是固定资产，而是它是经常因为呃，这个material它是可以经常被变动的嘛，对吧啊？就是采买进或出等等的，那第三块的话呢就是。呃叫呃human work performance对吧？就是呃员工的一个工作绩效，那它呢？也是呃。作为这个呃决定性的这个生产要素重要的组成的部分，好吧，那有的呃这个呃，那我们这三大部分呢，就组成了我们的所谓的这个production factors。OK,now when we sum up in principle,the operational production factors can be divided into.basic factors and so called dispositive factor s May be calling it in general information.and the basic factors,materials,humans operating funds and on the other side the dispositive factor information,which means the management.some kind of organization in the bank which or offices planning departments a controlling departments were being involved in aspects like monitoring.嗯，好的，那在这个古登堡的，它对于我们的production factor的这个呃，整个架构里面呢，就是在呃关于生产操作方面呢，我可以把它把我们可以把它分为两大部分。一块呢，叫basic factors对吧？基本的基础的一些要素，第二块呢，就是所谓的这个呃呃dispositive factor s就是决定性的生产要素，我们也把它前面也说了啊，就把它称为所谓的information，就是一些信息。那在basic factors呢？又可以把它呃，就是呃，我们的这个呃，人力和我的这个原材料这两块分组啊，对吧？然后information这一块呢，就包括哎，我中间牵涉到的这个管理啊。呃，我的计划啊，我的组织呀，包括我的监管啊，等等的对吧？都可以呃，把它作为这个所谓的嗯呃，一些dispositive的这个呃，或者说是信息要素，我的这个呃。这个呃，决定性呃，就是呃辅助的，或者说是我的这个辅助层面的信息层面的要素OK？well,those two fact,those elements or those two factors interact. so human efficiency depends also on how the management can happen or organization.how the itis finally used in order to plan materials but made planning of materials finally deliver something like.e sizes of warehouses or sizes of receiving and and shipping areas,yeah,so it we can not just only plan one part and say,OK,we do the second one.they are strongly interacting,and so the design of a factory always is done in a joint link.or in a very close link between those two factors，嗯，那我们这个基本要素和我们的这个信息要素之间呢？它并不是说是各管各的对吧？而是它互相之间是互相影响，互相交互的。哎，那比如说我这个基本要素里面的这个human efficiency对吧？人力的这个嗯呃，它的这个效率的，它适合我们的，比如说我的management，我的整个管理呀，包括我的这个组织啊等等。呃，都是相关的，对吧？我的这个管理层越好，或我的组织形式越好，那我可能员工的效率就会越高，那包括我们这个呃materials对吧？这个哎，我要用哪些原材料，那我才能去更好的计划说哎我。哪个区域要规划哪些东西，然后我的整个生产流程是怎么进行的？那我可才可以呃，知道这些信息以后我才可以做更好的planning对吧？所以说这个两者结合共同的来。呃，就是对我的这个生产工作来进行影响OK呃，马航Vietnam and poison no OK，那我们先休息五分钟，然后呃。一会回来。好休息五分钟。嗯，好的，中间的话，大家也签一下到啊。嗯。as a band,as haps uh go da do ga flag as haps your dog and a.t.then,amid fog up,MID fog then had a fire tag.when the mitt was done,a stuck fighter,but i've gone out I glish of some saturn dantes after fer oon's heister story the folism.t hmmm tag MA ham via the di nga donors tag tag the sh mer er er ther ther ther tared.eg lo bem mais d zi mo latt unda Emma is d fabric plank.yeah,nahf you go know me,uh,act all know what the eyes is on,uh,fabric plan on,I'm not met now,now it is over yes to decide yeah me,the switch window.你那个uh huh by the uh huh I个弄密码还没有出咱们ontfabintan。e.tan dish delson sundan mahan on d and es finder sundan bal h ish no folk.但是他们有个是否很爱我，但是the in her zone will cook en with their be hilton or shuffle。but it helps the folial of knowledge,the powerpoint by it helps yet not the powerpoint by the I feel no dama sof of that honor.AH okey ron was extending ho ek sl add in now.t.我的的power by the Vietnam hypnotist。where he helps him in him,he had the dinner of the plotter from the wooney of him was to mir hilda's mouth慢reginald copi an.u.yes,on the magdalen,I'm the since the concentrators won't break well for him. have you better read it unto to miss gav art as if he looked wholly?the me too was unc on scion ED. the mind is energe izin gour yes's westers in.um,that's what he knew of my cooking,where he helped me the power point. was we die as with the iron Amber,the octaves under head he viced the manhattan IC no mia osborne and DAS mungo by sch pell?ehapturs no schneid zog a fun ges tong azzuksturitishhetemanatrillyostemangofil meyer MA hm kun AH named degan sen zis team technique ambit I ans.在。那黑暗。also,monseigneur I awake this. this is immuno ghe perfect,because im MU nog meer mahan.yeah,tis this light on t.t.嗯OK，that is i I'm missing our problem unless andre is eh es sy sia richton ended the semester's that is his own exhaustion。t.t.kerns and the ED,the happy kind of bar about US with US hinkering others as well soon benzi of sch bett. there,har BA gd ron hilt.and the um,and this is a ha bald accompaniment. so quite vesting and sidle慢er ti ki ni sht is my niche ln.ths can I hit chen zhang is is too too filled to them in the pack act.t.t.yea and bessie and cuck y,it was a million of s elsie's extern ity by the yale stun dreg and now vis sen valved richly he UN enlisted at the up chart,you know?嗯，那OK干。给我们买一台。音乐发展。it helps did the falling off dinner.p day after time，I'm for each death of dinner呃，moody，he unto larder ED。yeah,I give,give,give the a pippy t and by pedia fis sim amy wise money.好的，那我们继续啊，这个呃后呃，这继续前面的这个课程。会结实音吗？呃de ST ST Thailand and d'ts ENT ENT hes ten the sten then then then then then then then then then then then then then then then then then these ST。the rda fison a vers of for keck zack.就业者们。好的，那我们来继续后面的课程。so er when we talk about factory planning,then we have always to see that the factory is in reality a big system.and so the factors we have seen before,and they are important to identify them and to do the planning May be based on those factors.but we have to look for the interaction,and this creates so called services products.and uh,when there is a good collaboration,then the elements when they combine are combined make a good performance.an and a very important point,a human being combines the fact o's material and machinery,and of course by using information and energy.嗯哼，好的，那我们也是说了啊，这个现实世呃世世界里面的这个factory就是我们的工厂呢，它是一个一个复杂的系统，对吧？那我们呢？呃，前面也是根据古敦堡它的这个呃。呃，分解这个不同的factors也可以看到我们这个工厂里面也是存在着不同的这个生产要素，对吧？那呃，包括呢？最终它的目的就是说这些生产要素，它们协同。作用，然后呢，让我们的这个工厂最终能够创造出哎产品不同的产品，或者说是创造出不同的这个service不同的服务，提供不同的产品或服务。那呃如何这个呃来嗯，让这个复杂的系统呃能够运作起来对吧？那其中这个所谓的我们的员工，或者说我们的这个人的。要素也是非常重要的，因为人呢，他是呃连接我的这个生产资料和我的这个包括我的机器啊，我的这个呃原材料等等对吧，让它。还呃，把它拧成一股绳来创造价值的一个很重要的，这个呃生产要素对吧？然后呢？包括呢？也是来结合我们的包相应的能源或信息等等的。啊，那最终呢，能够让我们工厂创造出对应的产值，对应的呃，提供对应的服务或产产产品，对吧？那呃，人类的这个要素呢，也是在中间起了一个纽带的一个作用。h of course here we put the humans and all the other factors,but maybe in the future the factory is also designed a little bit different. we talk about.lights out factory,the so called lights out factory is a factory which where everything works in the dark.and this is because we have no humans anymore er. so the automation of factories is strongly increasing.in the warehouses,we talk about the we talk about the so called dark wars,a dark war saa were.er,we we don't need light no where,so in the factory is the light's out and in the Warehouse the dark factor at the dark Warehouse.are let's say buzz so rare synonymous for future trends,where the humans play a less role?嗯，那我们现在呢？这个现代的很多现代的工厂的设计呢？呃，它现在也是嗯，出现了一些改变啊，就是包括它这个。呃，我们有可能也听说过所谓的这个黑灯工厂，或者说是所谓的这个无人化的这个仓库等等的，对吧？那像这些的新的这些工厂，它的设计呢？就跟我们呃，以前传统。就有区别了，对吧？因为人类它可能在中间的这个呃纽带作用或它的作用呢？也是在呃降低啊，对于这些呃黑灯工厂也好全自动化的这些。呃，工厂也好那呃，因为它为什么叫黑灯呢？就是因为它里面呃，基本上就不需要呃人类进去操作了，那我也不需要开灯，对吧？因为呃，都是机器在那边自动的运行。那这一块呢，也是未来的一个发展的趋势嗯，这这个。这个呢也会呃之后可能教授也会在课程里面给大家来讲解一下啊，就是对于未来的这个呃工厂呃，因为它由于这个趋势，我们以后的这个factory planning来带来的这些变化。um,now why should we builder further? why should we fill built new factories? why should were designer factories?umi thinker when we look into this um explaining of existing factories when we look what has happened in the past when factories have been.planned um it is in fact that there is a change well on one side the factory planning itself but also.um,the the plan n planning of factories if we talk about it's the um,the so called dynamic change of engineering.and when,we talk about BMW. they say they need to produce cars instead of four years in two years or even.faster than in one year,so new car is set up and after one or one and a half years.er,the car is already er May be on the street,it is produced,so there is a very dynamic change in the engineering,but also in the.erecting of a factories,but one of the points is then how to how to manage that because we have to know which components is a factory needing.and how many people but we have seen very similar experiences here in a very short time?were when thetis t ler factory was erected.嗯，好的，那我们这边呢？呃，也是说啊，为什么我们需要来呃，为什么需要这些这个嗯？新建这些工厂或要扩展这些工厂，对吧？那它的这个我们所谓的动力是什么？它的这个impulse是什么？那呃，其实很多的这个生产规划呢？它的呃，因为。嗯，比如说刚才教授也是举例了啊，就是因为它的整个呃，包括我们的这个在engineering这个方面，它整个的工程的发展都是呃动态的变化，包括它的这个生产制造的技术。对吧，都发生了这个革新，包括我的市场需求，包括我的诶，以前的这个生产要素的这个成本啊呃，它发生了改变，或者说是这个呃，市场竞争的这个push你。就是去逼着你要去进行这个新一代的，这个改造对吧？比如说老的工厂已经不能符合时代的需求了，那像呃，前面这个教授也是举例说啊，像我们这边宝马。它呃也是经常会要来呃呃造一些新的厂区，或者说是呃，甚至说是就是呃，扩展一些工厂，那为什么他们呃呃经常要对我们的工厂进行调整呢？因为它的整个的包括它的。车辆啊，现在的整个更新换代都是非常快的，那它因为它的这个呃车辆的这个换代对吧，然后去倒推说我的整个生产线什么要又要进行重新的这个改装。或者呃，我的厂区已经不符合要求了，那另外比如说像我们这个特斯拉这些电动车的兴起对吧？那它的这个呃。呃，建造这个呃，特斯拉的这个工厂，因为它也是嗯，产能呃，需求也非常大，那我们也是需要去新建这些工厂，包括它跟原有的这个汽车工业，因为它是电动车嘛，它生产的。所需的技术和装备也都合于呃，这个呃，我们说的traditional的这些呃，传统的呃，汽车生产工艺都不同，那它也是需要说哎，我可能要新建一个完全的。新的厂房哎，那像那个宝马奔驰，他们有可能他们生产电动车，他就是哎，把一些老的这些厂区，我可能是进行一个改建或扩建。对吧，那这个呢，就滋生了我们factory planning的这个呃领域的这个土壤呃，因为它的整个的市场需求的变化，对吧？技术的更新迭代，那呃促使了这些。呃，公司要去进行厂区的改造，或者说是新建等等的工作OK，now that this change is all the time happening，it is in fact。um,also the technology now,when we look into the tesla factory,it is in that we are producing electric vehicles.so the electric vehicles are then somehow requiring other types of factories. and here the tesla factory,this is just let's say a photo of.an an early stage,but we have er hear some,let's say when we look into in detail,we have some.e hehe her pressing er area where we build the pieces for the white body with the the paint shop we have here,the white box.if he foggy me,he ahe er than stiff creager.e meh walter and sch tifft by manz it as were shanti can I.yeah,I saw mes le mn dice and a tiger do. yeah,it was this thing,OK,here we have the the white body shop she.here we have even a foundry er. foundry is also an old traditional factory,is not normally in,so here we have this part of the foundry.here we have the the the white body shop. this is a paint shop,this is indeed er always in,in the in the factories,but here we have a pressing area.and in all the other factories,the pressing is maybe a complete different outside production area.not linked closely to the to the white potty side,here we have then the seating the production of seats.that's also really unique because normally we are having a seats from suppliers.em here we have the final assembly and the very new part is the battery factory,which is located over here.so when we see now how this the car production,the car facility,the car factories are built. they are changing over time,and here we have a very extreme change.in the structures of these automotive factories.嗯哼，好的，那我们可以看到啊，这个是特斯拉的，这个在德国的，这个在德国柏林附近啊，叫布兰登堡的，这个哎，它现在在新建的这一这一个厂区。那它这个应该和上海这个工厂差不多时间开开始来呃设计的那呃，我们看到就像呃，现在特斯拉它新造的这个厂跟我们传统的。这个汽车工业以前的这个。呃，生产这个柴油车或呃汽油车的时候，它的整个厂区的规划就有很多的不同的地方了，对吧？那除了就比如说我们这个white body的这个呃，就是车身生车身生产的部分就是。传统的包括我们哎呃，这个喷漆车间对吧？然后呃像嗯，它这边呢呃，还有那些组装车间等等，那这个都是传统车厂也有的，那像它这边呢，就比如说它的这个铸造厂。它也把它就是我们一的这个部分啊，这个德语叫giza high，它这个铸造厂，然后包括诶这个嗯。这个八的这个部分啊，就是叫就是它的这个车座的这个生产呃，也都是融合到了我们的整个厂区的里面了，这个就是比较特别的，因为一般来说啊，在我们传统的。这个呃汽车生产商，他是不太会说把我的铸造厂，或者说是把我的这个呃生产呃汽车座椅的这个部分。呃，放到我的自己的这个OEM里面就是放到这特斯拉里面，它就等于说一般来说我都是诶，可能我找一个代工的，对吧？那我这个呃拿过来直接呃装上就行了，它而不会。自己家再去呃，专门做一块的呃车间去生产座椅或什么的，但是因为特斯拉它自己的座椅的特殊需求，所以说它就把这个座椅的生产也融合到我的整个厂区里面。然后另外一块呢，就是比如说呃，它的这个我们的左边的呃左最左边的部分有一个叫battery fabric，对吧？它那这个也是我们电动车的比较特别的部分。就是呃，那以前的这个呃电池它基本上也都是外包的对吧？但是它现在特斯拉呢，它就是把电池的工厂。也呃射到我的整个总体厂区里面，那这样子呢就可以呃把这个供应链缩短对吧？那因为它这个也是核心部件。ya she glove is also in her son to buy. she is up for song onto foyer there and a gits and her this dinner is also in her son.yes,right life here from FL itz here,yeah,OK,has to have been to.yeah,I think I wanted also to mention that here and with nine we have a socalled logistic centers for new cars,so the new cars are then put here and then they go to the customers.um interesting also that we have a special production facility for the engine production here in ven table as it is electric engines.and then as miss way mentioned here,the two,three,four er,five are service effect service installations like the.e electricity uh uh supply and the third is then wastewater treatment because a lot of waste water is recycled.er,that force is the energy central distribution point for energy er and five the.fire brigade or fire protection eof course,by the way,also a waste area is here.but what I wanted to mention again is嗯the。er,the recycling the water,recycling the number three because the complete area has been constructed or the factory has been constructed in a.in a fire in in a water protected of um ja sa environmental zone.and they are not allowed to take water or not too much water out of the ground. they have to use the water they are having there.and recycle this water.嗯，好的，那我们呃看到啊，就是它这个图片里面的这个呃圆一的这个大的圆圈是我们总的就是最终的它这个呃生产的这个车间对吧？呃，然后呢？呃，但我们做这个呃factory planning厂区规划的时候，并不是说我只关心我的这个生产车间，那我周边的一些配套设施也是在我的，当时我们也给大家讲过啊，在我们的。这个第一第二阶段在我们的strategy或者说在我们的这个group planner的时候，也要把周边的这个配套的这个设施给考虑进去，对吧？那像呃，在这个。呃，工厂呢？除了我们的第呃，就是呃红圈一，它是一个总装生产车间以外呢，那我们还有几个特殊的对吧？第一个就是说我们刚才已经给大家讲到的这个左左左边的这一块的。这个bat bat呃，这个battery factory对吧？它的这个电池的呃，生产的这个呃，车间呃，或者说是电池生产厂，它可能哎，就是比亚迪或什么它让你哎，比亚迪在这儿给我也造一个厂，对吧？它可能不是属于我特斯拉的，但是你也要放到我旁边，对吧？那像七呃红红圈七这个数字呢，它是来专门是生产引擎的，那因为我们知道电动车它的引擎和传统的这个。嗯，这个马达对吧？就是我们传统车辆的这个发动机是不一样的，那它呢？这个呃靠近我们电池厂也专门做了一个这个引擎的这一块的这个。的这个区域是专门生产电动车的呃马达的，对吧？那呃另外的其他的就比如说走的这个部分是？一个物流的中心就是放我的新车的，对吧？它可能就是我的新车出来以后，我就把这个这一块都放到这一块，做一个车辆的呃，这个物流的呃，进出或者说我的最终的一个车辆，甚至可以做一个车辆。展示对吧？你以后就来我这，直接提货就行了，那呃，除了这个大的这个部分，然后中间我们看到二三四五六这几块呢，都不是我们的，跟生产相关的，而是跟我们的这个配套设施相关的。对吧，那我们那天也跟大家说过哎，比如说像三这块是我们的这个废水处理对吧，然后四这块是能源能源的供应哎，我这个供电啊，供气啊等等的对吧？呃，然后五呢？是我们的消防就是整个火警，因为你知道电动车生产过程中哎，可能会出现一些安全的问题啊，火警啊，这些对吧？这个然后六的话，这个圆圈六呢是？来处理我们呃的一些危险品的堆放，对吧？或者说是你生产完以后的一些垃圾的处理，就是危险品和垃圾的这个处理的区域，那这个二到六呢，都是我们的一些职能区域。呃，教授刚才也特别提到，比如说像这个三这个圆圈这边，我们也看到有两个储水罐是吧？因为呃，像我们在德国呢，你可以看到啊，除了特斯拉这边这一块地方专门批给它。周围基本上都是一些森林和绿化，那它这个厂区呢？也是在我们的一个自然保护区里面，所以呢呃，当地的政府也是禁止它，直接的就是呃，从地下抽取水源，或者说直接。去排放到就污水直接排放过去，所以说呢，它这边也是需要有自己的一个储水和处理水的装置来呃，它来处理它这个生产用水。好吧嗯，那我们可以看到啊，就是在这个group planning的时候，其实我们是要考虑到方方面面的啊，它不是呃，只是这个factory或者说我们这个production这个呃工厂。生产车间本身啊，我们也要考虑到周围的一个呃，包括跟生态的一个匹配啊，包括它一些诶呃，这个包括员工呃，前面还不是还有一个就是呃。呃呃，第九，它是这个员工的，这个呃part place对吧？就它的这个呃停车的区域，你来上班，我怎么怎么停车等等对吧？它要考虑到很多跟周边的这个配套。嗯OK。yes,I wanted to show the this factory because as it is in the middle of a protected area.I.and that here we have in principle a very big forest and the factory is then somehow in the middle of the forest.and this is the big challenge in respect to the in respect to the utilization of water and other resources,also like the waste treatment.so these environmental aspects plays a very important role when we talk about here. this,this factory and the complete sight with this factory.by the way,at his factory also has a more integration of suppliers on site.and then a other factory,so that's also maybe a new trend.I know that er some big companies are tending to do everything on their own or more on their own.in China,its by deh by d. it's also incorporating a lot of suppliers,as under the umbrella of the byd.and therefore they have,of course,certain type of advantages in the market.嗯，好的，那呃，大家可以看到啊，就是说我们这个特斯拉这个柏林布兰登堡的这个工厂它。它呢呃，前面也是给大家说了，它是在一个自然保护区里面啊，这个图片呃是这个它当时的这个设计建造图呃，就是它的这个在二零二零年的一个状态。它也可以看到，就是它几乎就是在一个森林里面挖了一块地方来造这个，这个特斯拉的这个新的工厂，对吧？那我们也可以看到，那它其实对呃，因为包括德国这边环境保护法啊等。等等的，它都是比较呃，怎么说完善的啊？它这块的话，它其实在建造工厂的时候跟周围呃的一个环境保护啊，水资源的这个保护啊，等等的都会。嗯，需要特别的谨慎，在我们的工厂规划的阶段呢，就要跟相关部门都要去沟通好，那另外呢，就是呃，一个趋势在我们现在现代的工厂的设计里面就是。越呃，越来越多的就像我们的这个呃，整车厂啊，就是呃，就会把一些我的供应商就是我在新建一个工厂的时候，我不仅仅是考虑到我自己，我甚至是要求我的供应商，你也能够。来我这个周边来落地来生根，对吧？这个就是类似我们其实也有一些工业园区的这个概念，就说哎，我这边新建了一个特斯拉的，这个最终的整车厂，那你这个呃就就像刚才那个图里面它的这个。呃，比亚迪对吧？作为我的电池的这个生产商，你你也不要那个把厂放在中国运过来了，你就直接在我旁边也。设一个厂对吧？那这个包括比亚迪，它本身它现在也是会把它的一些下游的这个供应商呃，在它的整个的这个保护伞下，对吧？整合到它这个里面，这个也是一个新的趋势，因为呢？呃，现在这些大的一些这个公司或大的整车厂呢？它是希望在整个供应链的环节，或者说在我的整个生产环节，它能够控制的部分，或者说它掌握在自己手里的这个生产的部分能够越来越多。这个也是未来的，这个工厂设计的一个趋势就是哎，我我做一个大的工厂设计，但是不仅是考虑到我自己，我甚至要把供应商也给拉进来，对吧啊？所以说呢，这个也是我们。呃新的一个以后，未来的这个在我们工厂设计也好，在我们的整个的行业的发展的一个趋势OK？yeah,er,so I switch now again to the lights.yes.er,it was half passing the city in belgium's VIE tiles.er want dusk,dusk clinked iron fork is this our niche wilder m.while there present at john's morrow's Emma like alley,they only acted as much as Emma would ED him.t.嗯OK。有要是没有对象。再讲不有这问问题。好的，那么我们再回到这个讲义啊。好的。er,so it is the dynamic change of engineering,which is one of the challenges why we have to to do something.I tried to get the pencil again the laser pointer so dynamic change of engineering and the te tesla factory is a beautiful example.for for exactly the way they plan and what is in the factory also changed,then the manufacturing technology is also changing over here.specially because and in other factories,the battery production was never never part of the planning.and here it is，being one of the more expensive parts of this，对，那我们可以看到啊，这个为什么特斯拉要这个新建这么一个工厂，对吧？那它这个原因就是就是这非常符合我们。我们这个前两条对吧？它整个的行业的呃，在我们这个呃制造技术上的改变，包括呢，它的整个的对工程的需求改变了，对吧？那就包括像我们的这个电池这个部分。作为电动车来说，它是最关键的组成部分呃，然后呢，那像我们以前的这个传统的柴油车呃，虽然里面也有电池，但它没有这么重要，那所以说它在设计工厂的时候就不会专门把这个。电池的生产这一块放到我的厂区里面，对吧？那像现在的这个电动车就不一样，那这个也是呃呃，根据市场的需求对吧？根据我的这个技术的转变，根据我的行业的。呃，整个的这个发展趋势，所以说呢，我要进行一个新的厂区的规划，或者说我要进行这个厂区的改造嗯。and then we start. we continue with markets because in we are nowadays in a very let's say dynamic economic environment.and we have. we are in Germany building several factories erforer.for fuel cells,so the fuel cells never at times before nobody produced fuel cell or production or machines or.of factories,and nowadays er we have very big investments in these fuel cells and also er because of the time to market we have new.facilities for chip production,which are then investments which are done from a strategic point of view just to have a short distance between production and finally the supply.of chips erin in the come in the car industry and many other industries of course.那呃，第三点这个呃市场需求的这个呃变化对吧？那像刚才教授也是举例说到近几年啊，德国也是新建了很多的呃，这个燃料电池生产的企业。呃，包括它的这个呃，燃料电池的市场需求呢？也是呃，在这几年里面就是呃，以前谁也不知道什么是燃料电池，包括也不知道哎，为什么要生产它，对吧？那但是呢，这几年由于市场需求的变化。也是呃，快速的这个促进了这个，为什么我们会要新建这些工厂，然后另外呢，包括芯片的制造的这些厂家呃，这两年也是呃，新建了很多。那呃，因为呢呃，我的这个呃，这个供应商他有的就是被被要求说唉，你必须在我这个周边设厂对吧，然后让我的这个芯片，因为现在供应也非常紧张，那以前他可能。会远程的从中国啊或台湾啊，或者说是美国啊去呃采购对吧？做全球供应链，但这几年呢，它很多的也都是本地化了，然后在本地设厂，因为呢，是希望说。你的供应商能够近近距离的来服务我，对吧？然后呢？呃，我不希望你搞得这么远啊啊，这个呢？也是一个市场的，这个发展趋势的改变。e then,in fact,cost of production factors,it is really funny that in Germany at the moment some people,some companies are leaving the country and they are.t trying to set up,let's say facilities or enlarge facilities in Switzerland.Switzerland is in the past was always the most desp i cant expensive er country in the world,where to produce something.uh,but they now are,uh,heart,he accompanied for producing uh,uh.electric sauce er steel company steel er,they are now er er honestly thinking about to move production to.um to to Switzerland and other country,other companies are trying to move to Denmark.er also Denmark in the past was always very expensive,but now a days er the the cost factor the production factors have changed.and so ery a new new sites are in consideration in order to produce over there.嗯，好的，另外一块呢？我们刚才也是说了啊，就是说我们的生产资料对吧？production factors它的成本呢？也是会随着这个时间的变化而变化的。那像这几年德国这个很多的公司呢呃，包括因为大家也知道德国这两年它的能源危机啊等等的这个情况啊，就是呃有很多一些德国的这个制造型的公司大企业，它甚至是去考虑说我是不是要。这个把工厂呃换址到瑞士，或者说换址到丹麦啊，这个呃在我们这个呃传统的想法里面也是觉得不可思议，因为以前这个瑞士。瑞士也好，丹麦也好，丹麦属于北欧了嘛，对都是呃，很贵的，成本很高的国家对吧，但是现在比如说有一些特殊行业，它的这个生产资料呃，反而是在。呃，一些特定的国家会呃会相对来说成本是低的，所以说呢，这也是促进了他们诶，可能是厂工厂的搬迁，或者说是这个厂址变化等等，对吧？那像我们。呃，在珠三角可能也会观察到，这两年在珠三角的一些外企也在往外走，对吧？去到东南亚或者是怎么样？那那就是因为为什么呢？就是。呃，它会产生这些新的factory planning的需求呢？因为我的整个的市场环境，包括我的这个生产资料，对吧？我的能源也好，各个方面也好，这个。所谓的刚才我们前面这个讲义里面定义的叫product factor，它的这个成本都改变了，那我们的公司也会呃根据这样子的呃利弊分析去呃转移对吧？去新建工厂也好去。呃，去呃，去换纸也好嗯。and for tesla,it certainly was also kind of reason to investigate and to investigate in the competition they wanted to be close.to their AH companies,they saw as competitors like merci edes,like fogg swain and like odi.the scooter and many others and therefore they they they try to compete on the home market the same way of experiencing.with adidas,aha did a seh where a lot ya maybe sneakers and other shoes can and textiles can be. uh are offered.but on the other side,the french company dick at LAN is therefore investing a lot in the country here.because they want to be close to the competitor and be strong as strong as their competitors.对呃，那另外一块呢？就是嗯，包括这个我们所谓的竞争啊和竞争者呃，那像特斯拉在柏林这边呃，新建了这么大一个工厂呢，它其中的一个原因呢也是。这个特斯拉当时有说一个理念啊，就是说我希望是在这个呃跟我的竞争者靠的更近，对吧？那像它的呃特斯拉的竞争者在德国就是这些传统的车企，对吧？包括奔驰也好，宝马也好。这个呃那呃，他跑到德国来，就是我要在你的本土能能够呃赢过你，对吧？能够来跟你直接的更近距离的来竞争，那包括阿迪达斯当年也是一样啊，就是。诶呃，他在这个德沃夫呃这边当时也是呃教授他们参与的这个工程呃，也是新建了一个非常大的这个呃。厂区和这个配送中心，那它也是直接要和像sketches斯凯奇啊，包括我们那个法国的迪卡侬啊什么来进行这个欧洲本土的这个竞争对吧？跟跟我的这个competitors就是跟我的竞争者靠的更近来进行一个本土的竞争，那呃，那他呢也会把这个呃工厂再呃放到这个来新建一些新的这个工厂来呃。这个也是其中的一个原因嗯。and of course,er,the changes in ya political economy are especially in economics and ecology. so there is a tendency to go to countries where ecology is not.that much relevant,but of course companies with a good brain brand are not necessarily.the bidding on the ecology of a facto.and another point is that the factory equipment is also subject to natural wear and tear and must be renewed er until end of life.we have experienced this with the paint shops in the automotive companies,the paint shops over the years have got more and more regulations.er,let's say political regulations because of erm,because of environmental hazards.and eh from the initial eh factories where they used special liquids or special chemical products in order to paint.they more and more changed to paintings based on on water based um,water based um.a paints and this was later recycled,so they never used water again. they recycled water.but it means in the end that these paint shops are much bigger than the previous paint shops,so the area where the paint shops in the past have been.erected are not suitable anymore as the paint shop has become larger.嗯，好的，那除了我们刚才上面说到的这个五个呃因素以外呢，另外还有呃，就比如说是出于我们的政治学政治经济背景的考虑，对吧？呃，甚至是一些这个生态的方面的这些考虑。呃，那我可能就也是要换制，对吧？就像我们先刚才举例给大家说到的，就比如说呃，现在有一些呃，我们国内的公司也会去跑去东南亚，或者说之类的。它比如说呃，那边有更好的这个呃，一些经济的政策对吧，甚至它对生态的环保的要求有没有很高，那它可能也会促进促使他说哎我去搬迁。那呃，另外呢呃，还有一个就是基于工厂本身，那比如说有一些呃老的厂区，对吧？它的一些呃设备，老的设备也会。呃，自然磨损对吧？那它呢？呃，在这个受技术这个设备的技术寿命结束之前呢？那我可能也要去考虑进行部分或整体的更新，对吧？那就像刚才教授给我们举的例子就是。呃，他之前也做过一个项目，是给呃呃这个汽车工业，他们的这个呃喷喷车呃喷漆的空呃，这个车间对吧呃，这个油漆车间呢，它因为以前。呃，用的老的这个装备呢，它也是为了避免这个嗯呃污染，或者说是它都是有使用一定的使用寿命的，因为它这个呃喷涂的材料都是有毒有害的嘛。那那之后呢？呃，这些的这个喷喷涂的材料，这些油漆呢？它也是呃，根据呃，我们现在的新型的要求，或者说它也是更换了这个涂料，它现在是很多的，都是一些水基的这个。涂料对吧？那它用完以后呢？它这个呃呃在喷漆过程中用的水呢？它也是会要回收，那它就需要有更大的空间去做这个污水的处理，对吧？然后呢？让这个污水处理完以后呢？又能够。recycle到又能够循环使用，那这样子呢，就本身的这个以前老的厂房或者说老的喷涂车间，它就不够用了，因为它还要需要画一大块的地方来进行我们的这个。呃水循环的处理对吧？那它这样子呢？就需要去考虑说哎，在我这个老的装备呃，这个呃，寿命结束之前我可能就要去画。画一块新的厂区去扩建，或者说我要去搬那，或者说是搬一个新址，我再重新来建这个喷涂空课间。啊，那这个呢？就是我们呃，为什么会有这些需求？它的impulse对吧？它的这个推动力是什么？嗯，为什么会促进我们这个呃？就是大家去做这个工厂的扩建也好，搬迁也好，这个新厂区的设计也好，这么几点的原因OK？and next,the reason why er victories are then erected is when we look into that this dynamic changes. it is in fact market society and technology.and I would like to address here first a get new markets,and when we look into the automotive industry,they try to get new markets. so the companies try to get new markets.erde u's book is one of the biggest automotive ex exporting cities because we don't export here cars like er like you would.e might think it is more that we export the so called cic ADY andes cadi cars,which are completely knocked down cars.and they completely knock down cars means they are sent to the markets in boxes,but in the let's say in Egypt they all have a factory they plunder and all these boxes go to oil.let's say as an example they go to Egypt and there they built,um,they assemble the cars based on the on these pieces in the boxes.and then the yer get also new new components. so with this new Mark,with a factory in Egypt.e merci edes and other companies tried to to to conquer the corresponding local market.嗯，好的，那我们就是总结起来啊，就是为什么我们要呃有哪些的因素去促？促使了我这个factory planning对吧？那总结起来就是主要是三大块对吧？一个是市场，一个是我的这个整个社会society，一个是我的技术的这个发展。那在市场需求这一块呢？呃，那我特别是像特斯拉这些的，对吧？呃，我们刚才都举的例子，那就是因为它的呃，整个的市场需求就是一个完全。呃，不同的呃。这个新的市场了，对吧？或者说呢诶，我的不同的国家，它可能也会有一些不同的需求，那像刚才我们教授也是说到啊，就是呃，像杜伊斯堡，它作为呃汽车出口在德国汽车出口非常重要的这么一个。港口城市它呃很多的这个汽车并不是以整车的形态出口的，而是以这个我们叫CKD啊，就是叫completely呃completely knock down，就是把它这个车辆的整个的。拆成一个个的boss对吧？就拆成一箱一箱的零件，然后呢去运送到呃国外，那像这个呃台湾也是张水给我们举例啊，就比如说是像我们把这些CKD的这个。呃，不同的。嗯，汽车的零部件呃运到呃这个呃埃及，然后再到埃及本地呢，就是这样子，一箱一箱的去呃，拆开来以后去来本地去进行组装对吧？然后呢呃，奔驰呢也是希望。以这种方式来跟呃呃埃及本地的这个呃，它已经现有的这些汽车生产企业进行一个竞争。her other example of which is coming from here is the socalled legislation or environmental regulations here in Germany. a lot of companies have left the country.er,who are producing umer aluminum foundries or aluminium alloys?because aluminum is very energy intensive,so they moved from Germany er to Qatar in arab countries because they have a lot of energy.and they can produce er aluminium alloys and aluminium ya aluminium raw materials to a very low price.那另外的一些这个社会经济因素啊，就比如说像我们这边写的这个呃，一些法律法规啊，或者说一些环境的这个考虑的一些原因。那呃教授也是举了个例子，就比如说现在有在德国很多生产铝制品的这个呃企业都呃考虑要搬迁，或者说是呃搬到一些中东的国家，比如说卡塔尔这些的。因为为什么呢？因为生产铝，它是一个非常耗能的过程，德国现在不是也是缺乏能源嘛，而能源也是成本非常高，所以说呢，像这些企业呃，它就会考虑说去中东的一些国家，像卡塔尔之类的，对吧？因为那那边呢，它的能源很便宜，然后呢，也很充足，那它这样子的话呢，它整个的生产成本也降低了，然后包括当那边呢，可能对环境的这个。保护方面也没有像欧洲这么严格，那对它的这个生产呢？在各个方面呃的优势就会更大，那所以说呢，他们也就会考虑去搬迁，或者说是到别的地方去新建工厂。嗯so，我还没变的话，那么newton马上变粗的是300厚的一个。ya would I he listen of maldi anand for that new quality requirements can be a problem,can be a reason when we er.AH,having regulations,let's say er because of food needs er higher quality,er er er quality standards,and then they are produced in a new country where the quality standards can be met more easily.er,for instance,fish er er er andor nuts,we have experienced it.嗯，好的，那这个嗯，在这些图片上我们也是哎列举了几个关键词啊，就是促成我们有这个呃的工厂呃。涉及的新项目的这些原因呃，那今天我们就先上到这里好吧，今天我们就先上到这里，然后呃，周日的时候再给大家呃来分享呃。另外的一些内容。嗯。把那个线都没有给我啊。好的。行，那大家这边呃视频本地录制，如果OK的话，就呃课代表就分享到群里面，我这边也录了一份，如果有问题的话，也可以再来找我好吧？嗯，那非常好。曹丽怡是不是胖了一些？你是不是胖了？老师，我没有呵呵呵，感觉你脸圆了，呵呵呵。老师，这个摄像头有问题哦，是吧？那你以后搞个美颜摄像头来。呵呵呵，我还以为你你你这段时间吃的好变胖了呢，呵呵呵。他是斜上的，肯定看到自己的下巴还是属于那个角度问题，对吧？是属于这个死亡角度，从上从下到上排人。目标。嘿嘿。