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I mean,ninety eight.to fifty e height is quite high,so em this is the old th problem that.the yer they say in and in kind of assemblasse mbl women can do the job better but ill.the other point is,what's about the let's say more relevant functions like more?eh,your management functions there,we find do not find them so.in production,we have mostly male people while in a in the assembly. we have female people.the same a little bit the same as here in administration where we have maybe AA lower level.好yeah，special level and female。are more considered over here,so that's a kind of d is equilibrated system here where we have to consider how to.manage better the distribution of work employees between male and female and staff members.嗯，好的，那我们上一节课呢，也是给大家讲到对吧？不仅我们可以用呃，这个三基图来分析我们的这整个物料流对吧？呃，那然后呢？我们也可以就是。呃，在这个呃basic data analyzer里面，I analyze里面呢，我们还有一块，就是对我们的整个员工进行一个结构的分析呃。那我们看到像这边呢呃呃，包括我们这个底层的这种操作的啊，或者说是我们的这个呃呃，厂房的一线的员工啊，这个呃，操作工人和我们的这个雇员。的一个分配比例对吧？在不同的啊，不同的工作区域，以及这个男性和女性的员工的一个这个不同的比例啊，那我们可以看到它这边的。呃，男女呃，雇员的比例还是不太均衡，对吧？就女性雇员呢，大多数都集中在装配线和。呃，这个啊，主要是在一些嗯，这个管理工作对吧？这个等于说是一些。行政类的岗位上啊那呃，这个呃，所以说呢，它这边的这个啊，女性员工呢呃，数量也比较少，然后。呃，包括它的分配也不太均匀，对吧？那这些呢？都是我们可以啊来分析出来的。now the next pointer in this database,er investigational examination area is the other processing.and in the other processing,which we talk about er AH,yeah,how to do the production,planning and control of production processes?t this is a quantity time has to be somehow made,uh uh.I made it line dw here for detailed scheduling.AH and eh,we have to consider sequences,so there are a lot of activities which are dealing with the product itself.and I think you have got this impression already in the first lessons we have had when we talked about a production.eh system shop floor production,hmm.好的，那我们呃就是呃来看啊，就是我们呃analyze和database的第呃后面的一个这个呃区块对吧？就是order processing，也就是说我们的订单的整个流程。呃，那我们关于订单的流程呢？呃，它呢？呃，描述了我们整个的这个生产呃，生产进程的啊，包括我们的规划和呃，我们整个规划和控制，对吧？啊，包括它里面涉及到的数量啊，时间啊，包括呢呃，细节的这个呃，流程和我们的呃，物料流对吧？在在呃在我们如果说要把这些呃这个order processing再管的细一点的话，包括一些精精细的排程，对吧？包括我们的生产计划以及生产。呃，生产的这个流程呃，都会在呃，我们的这个呃，这呃这块里面。e ander this er task normally is not done directly by the people I mean.it's a lot to do. and so we have typically an ERP system like here this one.8 does it right？北汽瑞鹰。stiff ED thirteen th rate.AH,yeah,so we have to repeat.ERP system.and there we have a ppc,which is a principal production control which is part of the EP.and mes,which is manufacturing execution system which is for the operation site in order to make sure.that the macheets are getting their pieces,that once the finished goods are ready that a forklift is taking them and.bringing the pieces into our Warehouse,so here we have. let's say a kind of er er.operational control system which is underlying the complete production process.嗯，好的，那我们在这个详细调度中呢？生产计划在时间方面，包括我们的呃，就是定详细的定义了，整个的生产过程，并确定呃，每个执行生产订单的顺序。呃，那这一块呢？在大多数公呃公司里面呃，这个工作不太会用手工来进行，大部分现在都是用啊，我们的软件系统对吧？就比如说像啊。呃ERP的一些呃系统这种管理软件来做，那我们呃之前在上学期在这个别的一些课程里面，我们也给大家介绍过，对吧？ERP就是enterprise resource。planning啊那然后呢呃，大部分。如果是关于呃production process的，我们是用它的这个ppa ppc的模块对吧？这个呃，然后呢？另外呃，关于生产这块呢？我们是用mes系统对吧？manufacturing effective system。呃OK，那我们呃这个呃，所以说呢，我们的这个呃，这一块order processing呢，也是我们呃在呃收集和分析这个数据库的这个基本信息里面非常重要的一块。and of course,in these,uh,activities we have several tasks to do first is the lot sizing.so uh,the the the size of a lot,how big should be at?yeah,ii see eri should take another colour at this.嗯I take great。eh ita lot size it can be.AH,difficult because we have to. we know how many pieces are,are are consumed.but er,and this we will see later in another lesson er that the lot sizes are can be sometimes very big.er but on the other side,when we have production systems and a lot is covering,let's say a week machines a week. then all the other products cannot be produced.so lot sizing is a compromise between the price,the costs and on the other side the supply of the goods to the customers and.in the end.the bigger a lot,the more we have to er to have in the Warehouse because.and this is quite clear when I try to bring bring it here. this is ur the lord's eyes over time.so what I have a lot.like that,and I have a consumption.defer lot.so i produce again and a consumption and a lot and a consumption.this is then a bringing US to a mean in the Warehouse,sometimes very much,sometimes very low,but.瓦特本子。if we would er reduce the lot's size er,let's say reduce to the colour rate.so like this.er,maybe we cannot er er,we have to produce more of more frequent.but you see that the the lot is er not covering so much in the war.and the mean number of pieces in the wells is certainly reduced.so that's the working process,then which is important for the company to know,because everything which is produced and is in the war,but not being sold.is in the end呃呃money which is missing for other activities。嗯，好的，那我们首先呢？这个呃在整个的这个生产呃，就在我们的这个呃。规划里面对吧，这个流程规划里面的呃，我们需要分析的就是主要是以下这个三方面的第一块呢，就是我们的这个lot sizing就是我们之前也跟大家说过，对吧？这个颗粒度所谓的颗粒度呢就是。我们呃，在生产的时候一个批次呃，要生产多少件产品对吧？定的这个量，那我们把它升为呃，称之为lot size就我们来。确定这个lot就是这个批次的size的大小，对吧？这个啊，它的一个批次，它要生产多少量的大小？那我们呃，这个呃，之前我们在呃。这个呃，上学期在别的课里面其实也跟大家说过，就确定这个颗粒度呃批次的大小其实是很重要的一件事情，因为呃，你如果说比如说你的lot选的比较大的话。那我们。那我们就要呃就是呃唉，你的生产资料就要被占用，对吧？就比如说啊，你的机器，你的人工就要被占用，那你在这个时间段里面就不能做别的事情？另外呢，那你如果要生产这么呃多的东西对吧？如果你的lot定的大，那我这个呃仓库里面或者说我的原材料也得备好，对吧？那我得呃。准备好这些材料来生产呃，我的这个呃，这些产品那这个是第一个，第二个呢，就像呃，刚才教授也说到的，像我们一般的这个需求图对吧，我这边有一个需求，然后。呃，这个订单来了，或者说我的这个需求来了，然后呃我这边卖掉了，然后呢，我这边订单又来了，我这这个呃我。生产对吧，然后又下降，那我中间呃有一个这个大概的呃，这个拉一条线对吧，这是我的一个需求量，那如果说是。嗯，我的lot定的呃呃，就是生产的这个批次啊，就是跟我的需求量不符合的话，就比如说我是生产的过多，那我就会变成积压库存，对吧？如果说我的lot定少了，然后我生产的过于频繁，那我可能也是呃满足不了我的这个呃这个订单的需求，那你lot过定的过小或过大都不好。过大可能造成库存积压，对吧？这是工厂的损失，过小我满足不了客户的需求，所以说定这个所谓的lot sizing啊，这个是很多公司就是要定这个颗粒度大小或我们叫批次量的大小呢。是一个一门比较呃，每个公司都会去认真的去对待的一个事情OK？umm,the other point is.is the continuous scheduling what we have here,continuous scheduling. this means we should not start,let's say,in extreme,in the beginning of a month to do the scheduling of the complete months.also,not of the week we should have a scheduling which product to produce at which time.er in a continuous way er,this means eventually having a kind of forecast,but the ner determining to a certain extent maybe a week.the scheduling in RUSS.inr steps,but then continuously adjusting this ur the production plan to their demand.嗯，好的，那我们第二块呢？就是我们的连续排程对吧？就是我们呃，如果说是要对呃，生产计划进行一个这个呃，做一个scheduling对吧？做一个排班表，我们不可能说哎，今天。呃，今天生产完了，然后再去看明天的，我们肯定是要呃，至少有一个周期，对吧？可能不会说唉，就已经排了一个月。或怎么样？但是基本上呢啊，现在呃，现代的工厂基本上的它的这个呃，排程计划你。至少要做一周的，对吧？这个连续排程那啊，基本上能规定好，说我下一周比如说要呃生产哪些东西要生产多少？我的机器占用率是什么？对吧？我要duang少的原材料？我要生产哪些东西？满足哪些订单？那这个呢，就是我们所谓的continuous scheduling。of course,the people in the companies always want to have a scheduling. let's say for a longer period,let's say a week where they know everything,what they have to do on the different days.and then they are happy because this er,this programme production,production programme,they would like to go through.but what happens when we are fixing it like that,and there is an exception,maybe one exception could.could be a breakdown of a machine,but could be also an exception that customer cancels an order,so what can we do when the all,when the schedule the programme?production problem is er fixed and a customer's schedule,schedule er.pencils and order should we then still continue to produce,so we have experienced that the production word is very volatile.so there sometimes we have customers who are ordering more or ordering less who are postponing some due dates. we have machines which are broke.we have people who are eventually ill and they are important for the production because they have special skills so when we look on all of that uncertainties of life.era fixed scheduling is a kind of disaster,so what we have to achieve is kind of a continued scheduling.好的，那我们呃就是呃呃，一般刚才我们也说到了，对吧？一般的公式。厂它会呃，对我们下周的一个呃生产计划进行一个安排，对吧？那呃，就是但是这个规划呢，并不是说是已已经呃固定死的，对吧？已经是fixed不是这个。不是说一定是固定词的，而是要根据哎，可能情况的变动，我们进行一个所谓的连续性排程哎，比如说像呃，我的计划虽然说呃，就是我们之前也说了，对吧？我们根据ABC xyz它。它的这个呃分析法我们可以来进行一个focusing，对吧？进行一个预测，那我们根据预测的量呢，我们比如说规划未来一周的，我们的这个生产的。计划，但是如果说呃，万一我们的机器出现了呃，一个breakdown对吧？出现了一个机器的呃，比如说某台机器坏掉了，然后让我整台新生产线瘫痪了，或者说呢呃我。我的客户突然间把把一个单子取消掉了，对吧？那我不可能说哎，我这个还是根据之前的这个计划走，对吧？那我肯定是要适时的去调整。调整我的这个planning，我的schedule对吧？那所以说呢，我们这个叫连续排程，就是根据我们的呃，这个生产实际的生产，我们有一个预期，有个规划，但是也可以经信。呃，就是根据实际的情况啊来进行一个呃连续性的排程，就所谓的这个啊，随时去调整这个对吧啊，那让这个这个呃生产过程呢，还是能够顺利的进行下去？well,normally it sounds to be good to do this er scheduling more continuous er continuously.but er the experiences also shown that there are some challenges er one experience was that er.the people have produced something and then there was a rescheduling ander,yeah,they rescheduled the product,but they forgot to reschedule the.the packaging materials so in principle when they produced suddenly they were they have had the wrong packaging materials.and the complete production stopped because somebody in the packaging didn't notice that a rescheduling has happened.so the more we change er,let's say production orders or sequences,the more we run also eventually into trouble because er.especially when we have complex products where we have different er ingredients,different mixtures and finally different packaging materials.eh sensing can easily go wrong,and and when the packaging materials are not directly in the in the in the factory,maybe they are.erin a certain distance maybe one hour drive and then the packaging materials are stored in another Warehouse,then indeed the continuous scheduling can be a challenge because the ner.a waiting time might happen because people have to remove old packaging materials or previously plant marked packaging materials and bring in again new the new packaging materials.好的，那我们在这个呃呃排程，刚才前面也说了啊，对，就比如说如果是客户把订单取消掉了，对吧？或者说机器坏掉掉了，我们现在要重新进行一个排程。那呃，我们一旦进行了这个呃，这个新的规划或进行了这个重新的排程呢，我们也会面临呃，这个不同的问题啊，就刚才教授也是举例了，就比如说。呃，我们这个做了一个重新的安排呃rescheduling了对吧？然后呢？我我们发现诶，这个东西已经生产完了，但是它的这个因为我们新生产的呃，新安排生产的这个产品。和之前要生产产品，它可能所需的包装是不同的，对吧？那有可能这个包装呢？呃，这个呃，现在在我这边的厂区，我没有对吧？我现在在产线上，没有我要呃，要从。呃仓仓库里面去调，或者说呢，它可能现在还不在呃，我这边的仓库，它可能是在别的仓库里面放着，那有可能就是因为这么一个。这个没考虑到的，这个小的呃，最后的这么一个环节，那它可能就导致呃，那我最后的这个产品呃，它不能呃，不能变成成品，对吧？我得等着。呃，这个旧包装换掉，然后新包装再运过来，对吧？我才能最后把它呃包装好，然后出厂那呃，像这种问题呢就是。呃，不仅会出现在这个像我们刚才说的这个包装线的呃上，也可能就是你越是有更有多的变动啊，越是多的这种rescheduling，或者说是我的哎，机器坏掉，我就先换成生产别的。呃，如果你这边变动多的话呢，就会产生越来越多的问题，因为你这个呃往系统里面增加的变量就越多了，对吧？有可能诶，你呃生产不同的东西，我需要的原材料不同，对吧？或者说的我的配。地方哦，我混合的比例不同，等等的呃呃，各种各样的问题，或者我们刚才说的包装不同，等等问题嗯。yeah,and then here is the sentence of the word capacity scheduling. what is capacity scheduling? well,we have to see that.嗯，那我们就是如果万一出现这个啊，就刚才我们说的就是rescheduling，以后有这些不适应的情况出现以后呢，那我们现在就出现了第三个词啊，就是叫capacity scheduling。就是所谓的我们呃，我们的这个呃，要考虑它的这个呃产能，或者说它在能力范围内的一个呃重新的排程嗯。the capacity scheduling is addressing more the let's say the different capacities like machine capacity or.a staff qualification capacity and sometimes these machines or these special skills of uh individual persons in a factory are.critical,so what is done is then doing this,seeing them as limiting a capacities.ander and trying to schedule in a way that they are all the time busy or that they can be as effective as possible.so here these capacities are then,of course,the customer wants to get the order in time,but sometimes we have to make sure that the capacities are not waiting,especially when the capacities are critical.嗯，好的，那我们这边的capacity对吧？它这个呃涉及到的，它可能是很多方面的，对吧？就是涉及到产能的，比如说哎，我们机器现在是不是？呃呃，有一些机器是不是可以能够复合使用对吧？然后呢？它现在还有多少台空余机器可以呃，让我来做这个rescheduling的，然后是不是啊？这包括员工对吧？哎，这个员工是不是也能？啊，比如说他既能负责这个，又能负责那个，然后他现在是不是有空对吧？或者说他能不能呃，就是从刚才的这个呃，这个产线撤下来，我们现在做新的东西，对吧？啊，那包括我的一些的一些原材料啊，等等的，那我的这个所谓的capacity scheduling就是在我的现在的产能范围内，对吧？能力范围内是不是还有这个宽容度让我来做？呃，不同的这些排程。宝贝。嗯。lead time ratio of processes um.the discussion we are having is in fact that er the processes have a lot of different.um activities we see here the setup time. this is first,we have to do a set up we have to prepare a machine.then we have to operate.then we have to ya.reset the machine eventually clean it. we have to transfer some goods to a next machine.a maybe there is a kind of waiting time,and we can say rest time,then we have a new setup execution and so on.so er the lead time is the time when from one machine to the next er,so when we are starting here.until ya maybe then from one setup to the next,sir,this would be then the completely time.of such a process and this,is then sometimes very long compared to the pure execution time the execution time sometimes is really,really short.but all the other process elements are very laya extended Lndian.嗯，好的，那我们来观察一下啊，就是我们的这个要呃，就是我们完成一个订单，对吧？完成一个订单呢，我们的这个lead time是？呃，我们把它称为这个呃，整个的这么一个过程的时间对吧？那我们可以这么来呃，理解啊，就是呃，比如说我现在有一个订单要在机器里面生产。那我首首先呢要啊，在生产之前我要对这个机器做一个这个啊，就是在这个工作之前要做一些准备工作，对吧？这个我们叫set up time。就比如说，在set up time里面，经典的就是我，比如说呃呃，要对对机器进行一个清理呀，或者说比如说我前面刚刚生产过啊，别的这个。制式的一些工件对吧？现在我可能要重新要调一下它现在的一些啊，就比如说像我们的车床什么我要重新去调一下它的刀口的这种间距啊或之类的，对吧？那它这个就是叫setup p。那只有在set up，完了以后我才能真正的进行这个execution，对吧？就是执行或者说真正的生产，那这个实际上才是有效的时间，对吧？然后呢？生产完以后也就是说在生产过程完了以后呢？那我。机器要呃，可能要停下来休息一下，那它可能呢？还要有一个过度的调度的时间，对吧？那我可能机器呃，我要这个放到别的地方去，或者说我现在要调性。新的原材料过来，它有所谓的这个transfer对吧？那transfer完了以后呢？在这个下一个流程之前呢？呃，又会有一个这个所谓的整备的时间对吧？一个休息的整备的时间。这边呢，是after process，这边呢，是before process，然后呢，完了以后呢，这个休这个在嗯，在这个呃，休息完以后呢，我又开始下一轮的新的生产流程。我又再开始set up，对吧？那我们就把呃从呃这个上一个流程就是呃这个从这个时候开始set up到下一个流程的。在它开始的这段时间，整的整的一段时间，我们把它称作为立炭，对吧？然后呢？这个立炭中间真正有用的时间execution只占了这个一小部分。其他杂七杂八的时间对吧？准备啊，好休息也好，这个运输时间也好，那它呢？呃，都是算到我们整个粒炭里面，那我们现在就要看啊，就是说我们的execution就是真正的。呃，执行的时间占整个立碳的这个比率是怎么样的？嗯。now we go to the next.嗯，slide。this is a very interesting slide because it depicts another challenge and this is always the challenge of.嗯。or the value the added,so the the added value the in principle how much money do we have to invest into a finished good?of course,the people want to invest ought to put in as as late as possible the money,so when we start with a production,we mostly have only just to buy.the raw materials May be then er we start with operation er we add some value by either operating it or.let doing an activity this can be of course mostly its manufacturing process.but it can also be a coating or could be a ripening process but in the end it is costing kind of money.and though the value it,the product itself gets a stepwise,more and more value.for the pieces get more and more value,then we have SUP assemblies which are then eventually.they created until we finally get the final assembly that the final assembly has indeed later.as a kind of value which is.good fraction of courser raw material but the most higher fraction mostly is in fact.the the value added with the with yeah,the work process which has been performed and done.嗯，好的，那我们这边这个图里面大家也可以看一下啊，就是在我们的这个制造呃，这个或者是在我们制造和装配的这个领域啊，它的。呃，生产附加值呃，这个和资本投入的这么一个过程，那我们看到从红色的部分呢，是我们的呃，这个原材料对吧？原材料的投入。啊那呃，这个绿色的部分，这个绿色的这条这个曲线呢，是我们的整个的增值的这么个过程，对吧？那在raw material的时候，它并没有发生任何的增值。呃，那在我们把这个raw material它把它切成这个呃，一块就是相相应的啊，把它弄成呃pieces的时候对吧它？呃，就开始了增值的过程，那我们在呃预安装对吧？预安装的这个啊，预装配的阶段呢，那它的增值啊，就开始发生比较大的一个增值的变化，对吧？然后呢，最后到最后的这个啊，组装成功，或者说是装配完了以后呢，那我们的呃整个的。嗯，这个production cost到100%对吧？我的整个增值到啊，它的这个最大值，那我们中间也可以看到它中整个生产流程。的一个进行过程，包括它的这个呃进程，以及它中间的呃一个呃，包括我们这边也是写到这个呃，黑色的呢，是它的production的真正的生产的。过程对吧？然后呢？呃，这个红色的呢？是它的啊啊，它的这个内部的就是因为我们其实啊，内部之间的物料调动我们。叫purchase part in house，就是说内部的这个互相之间的采购的流程啊，那呃，这个呢，是我们这样子垂垂直方向的一个。呃，资本的投入以及它的这个增值的这么一个图嗯。what we see here is very interesting representation of the of the challenge we have,so we have some pieces which are produced in house.er sir er,I hear these two. this has to be produced earlier,also in house,and this is also in house,but.they have to be ready at the same time because then we want to.from that time on,we want to build a kind of as assembly. May be we do not start with the s assembly production,we see this here very beautiful that it starts later.and and yeah,we are waiting in principle because of maybe a capacity problem,but AH,the pre requirement is always we need all the pieces which are then flowing into the.t assembly here,we have an another example where we have also own production early own production.here we have some some pieces which have to be purchased at all production. we produce immediately after everything is available and let it weigh.eight for the next process step.好的，那我们来看一下这个图啊，就是说呃黑色的线呢，是我们自己生产的部分对吧？然后呢？红色的这个线呢，是我们呃这个采购的部分，也就是说是外包的部分，对吧？呃，那我们在这个呃生产的这个线上面，我们也可以看到啊，就是。嗯，它呃，这边有i对吧？它有等待的时间，什么意思呢？就是说比如说我们在这个呃预安装的时候，那呃它呢？subassembly呃它它要等到我们。我们的这些PS对吧？不管是你是自己生产的啊，还是这个采购的对吧？那我们来看这个案例，那它比如说像这些组件儿对吧？它要等到它都生。生产完了以后，但是呢，还没有呃，还没有能组装对吧？他要等等，等到这个时间点，然后呢，把这些把这些的这个他所需的材料对吧，都集齐，然后呢，一起进行呃，预安装对吧？那呃预装配，然后呢？像这边这个案例呢？这边这个案例是啊，这个自己生产的，包括我采购的，对吧？这个一二三四这四个对吧？呃，也是呃，一起全部到了以后，那我就直接就进行进行了这个下一步的预安装或生产。惨了对吧？那像这个呃呃，这边有虚线的部分呢，实际上它就是等待时间，因为它已已经啊，在这个时间点上已经生产完成了，然后它要等到大家都集齐，对吧？要在这个时间点。大家在一起装配，然后呢？那从我们预装配到装配线呢？也是哎，像这两个都提前生产完了，然后采购是这个时候采购进来的，对吧？然后大家都要等等等。等到我们这边的也一起完成了，以后呢，大家再一起呃，一起进行这个安装对吧？所以说呢啊，我们在这个图里面可以看到哪些是我自家生产的。哪些是呃，这个采购的，然后哪些是呃，这个嗯，就是呃，哪些是等待时间，哪些是生产时间嗯？the next the next example here is also quite clear we have ordered,we have to buy some pieces.er,they are er,they are er,have arrived,but other pieces we have ordered.have arrived very much before and then we have to put them into the Warehouse because we need them to a certain time.and we should find them then in the Warehouse when they are really needed,and then we have our own production. this own production.er starts also erm kind of er early.啊sv嗯。ja,as we see that er this,this might depend,but sometimes er this production starts only when the other pieces are available.here it seems to be that it is possible that we try to plan to have all the pieces just in time available and besides this one,which is of course be fine or there.and start immediately with the production of this s assembly,which then is again waiting for being processed next er.er,this is er because er,this there is in these production steps we've always kind of er.uh,uncertain turn ities and uh or bottlenecks,and then there is a kind of waiting times which,which,which will happen.and this is also very clear. here we have a situation where our own inhouse production starts late,and this is then when this is finished,then the next summer assembly can or the next assembly can start.and all the other sub assemblies are still waiting at it to be processed.yeah,that's the same here. we have the same eru r,this is the probably the bottle necker activity for the li eight ime.嗯，好的，那我们就可以看到啊，在这个中间其实有好多，就是比如说像呃，在这个生产流程中，它呃，这两样已经OK了，对吧就是？呃，然后这样呢，也是已经早就已经在那边了，那只要他们一起都呃齐备了，以后那我就马上对吧just in time production，那像这边呢，它就是实际上就是虽然说东西都已经到了。但是我要等到啊一个，另外要等到一个时间点，我才开始生产，对吧？那它这边啊，就要配合其他的工序一起进行生产，那有的是j set an，有的beng不是，然后呢，我们也可以看到。有呃呃，哪些产品？它是我们整个生产流程中的bottleneck，就是大家都OK了，然后就要等到它完成，对吧？我们才能一起一起开始生产，就比如说。像呃，在这个黑线这条对吧？因为其他的都已经好了，都已经是虚线在等待它了，对吧？只有这条。好，大家在等待它呃那呃，在这个里面呢，我们也可以看到它的这个嗯，生产的需求对吧？互相之间的一个关系啊，等待的时间是什么？生产的时间是哪些？i don't know if you remember in ergonomics or here I have been in ergonomics in the lesson that we have had this production er scheduling a task at the beginning.and we talked about the critical pass. and this is the critical pass here,over here,you see this production here starts at that point.but er there is no interruption anymore,then er we go on and produce the final assembly,so there is no waiting time for exactly this part.pass of production.嗯呀。还是不对对对。their critic ship fought wih and a sled the s in the ergo no my fol ism perhaps.it's just about the network plan。it's private management network plan，嗯，我们如果记得啊，就是上学期我们在上这个。呃，人体工程学的时候，我我们当时一个罗密呃，那个课里面啊，我们当时有一个叫critical path呃，大家如果还记得的话，就是我们所谓的这个。呃，最短的路径对吧？那像从这个节点就是这这条生产路线就是我们的所谓的critical path，因为它是一点点idol，它看都没有，对不对？它这个从。从我开始生产，然后到这个进再进我的这个啊assembly对吧？然后呢？呃，就就就等它了对吧？然后等它完了以后我们就直接进assembly，那实际上这条线。就是这条线就是我们的critical path嗯。yep,it's er interesting to see that er we have erin such a diagram. we can also see very clear the waiting times.which are here,the dashed lines and then always the discussion went to start to produce normally. we should start to produce or try to.bring everything to the end just at for getting started all at the same time.but there are so many uncertainties in the production systems and optimization of possibilities so that it is sometimes better to have waiting times.rather than to be just in time ready,but on the other side.this production here means we add a value to the super assembly which is in the war later.and it has cost money to build it. and in principle,in this time,we pay the interest rates of the product.which is waiting to be processed.好的，那像这边也是就是它事，先是这个外包的采购的一些东西，对吧？然后呢？它等到我们这个呃预安装流程呃呃，等到这三个都集齐了以后进行我们的预安装那。它预安装呢，又是比较早完成，那也要等待呃，这个呃，别的对吧？别的一些组件呃，这个呃，中间件也都完成，我们才可以进入最后的这个总装，对吧？那像这条线呢，它中间就有比较多的这个所谓的等待时间，或者说是我们的一个idle time，对吧？在它的这个啊中间啊，就会有比较多的这个所谓的闲置空闲时间。OK,uh,we make a break five minutes break.好，我们先休息五分钟。i could ly hist is a spirit tim ly ertimly good but wireless er tuma spy HID is a rostov t suva ks,huh?there is helmet try and then gets a hook,then gets white a hook within it,does it dash here?t.t.no,dear,there's this a zu mir foyer guarded so off k uff in help,helped US imma as I won't dispute frist an meet him in his field on fen CON.t.under h inhouse production,as all OK OK first day of mmmm OK,yeah,that's this ench present. did the what ench present here did the raw material as all did it's the.t.呃，stare up我的综艺日out，it had to make a wonder biz ud is a souvenirs daggers ch li cht。but i've fucked amidst RAM dus se in dust is tti le le plex ED the roast of tile le plex ED with at the hundredth var. it accomplice now.你咋吃这么多？yeah,I want a spring coffee bag.呵，good。好的呀，马上就要拜他。你还是个老还好的，我认为。比比兔。pi asked k knoll how da well eh huh ya da eh huh da eh huh huh huh da OK huh be sh.yes,how do can he so good we do is you with US?OK，mmmm，sorry，dass azo sch lich trever coat my呵呵，好的，那我们那个开始这个。呃，下一节课啊呃，那我们前面也是给大家讲了这个呃，前面我们其实是一步一步对吧？从这个product production到material flow staff order processing，我们其实都是在做这个analyze和data。base这一块对吧？那为我们的factory planning呢？做一个很好的这个呃数据的收集和这个分析对吧？我们要有这个很好的一个呃数据基础，或者说要。要有一个这个很好的base，很好的根底，我们才能够呃来进行后面的这个工作OK，那我们下一步呢来看一下cost structure。exactly next is cost structure.a hander we see that on one side we have the so called production factors which are of course the materials we have seen the raw materials in the previous diagram.er,the work performance of then the operating funds,this I will explain later.and and disposition,and on an operational level,and on an enterprise level,so these are the production factors. and then we see can assign the corresponding costs.well,for the met irs,it's quite simple and clear,because when we buy met irs,we have to pay for it there. there is no doubter.ur the work performance is a little bit more complex because we have to pay the salaries of the people.and the manufacturing staff depends is Lndian. we can call it labor costs um and uh.the difficulty here is what happens when we are having too many people and not enough to do,then there is the labor cost there,but we have not enough.products to where we link these costs later,of course we can say that every product produced is then more expensive.if but from the principal point of view,its labor costs where it's the human who is there working in on the product?then we might have this er the plant depending costs kind of initial costs. this is er.setup costs for a factory or for the machines which have to be bought.t they are typically uh uh this,this,this funds are typically put part into a.right of uh overs of several years.depending on the product on the which is which has to be bought before er and then of course er,we come to this er.operation and enterprise costs.while costs for the factory is planning and controlling,this May be its internal departments.who are trying to check is every thing is going on and the same. of course,when we are looking on to the business,looking for instance is.the customer paying what about the suppliers,do they deliver their products in time?em,what for prizes are they asking for er? what for em lead times are expected?and so on,so there are a lot of different costs,and we can even say that they are kind of hierarchical costs.because on the highest level,of course,we have to disposition costs which are looking for the raw materials which are needed.in reality,it is more complex because we have also some costs for stuff ordering. we have to look for stuff people and somebody has to care and employ the people.巴蒂西亚阿尔卑斯克斯。特贝林是动物。不知道喂是度。sorry sorry OK啊，那我们来看一下啊，就是我们有多少的这个一个企业对一个企业来说会产生哪些不同的呃成本对吧，或者说有哪些不同方面的支支出？那首先呢呃，从我们生产的这个角度来看，最基本的就是我们的这个呃，原材料或者说就是我们的material cost，对吧？那这些呢？都是根据。啊，这个呃生产资料相关的，那我们把它这呃材料成本对吧？就把它称之为材料成本，那第二块呢？呃，是呃，也是比较基本的，就是我们的这个人力成本对吧？label cost。呃，也就是说呢，那我们这边呢，主要是来涉及到呃，跟我们生产相关的这个呃人员，或者说我们跟生产相关的这些。员工呃产生的这些呃成本，我们把它叫做这个label cost对吧？劳动力成本。那啊，第三块呢是我们啊，每个工厂对吧？在初建的时候都有的一些啊，我们叫它运营，或者说是生产的一些。资金啊，一些启动资金启动成本对吧？包括啊，这个工厂相关的一些，就比如说你的场地啊，你的呃，这个机器啊，等等的，那这个都是我们的一些原始的。啊，需要的一些啊，这个支出对吧？那另外呢？在呃呃，或者说我们把它叫做固定支出对吧？那另外的这个disposition这一块呢？就是在真正的业务。范畴内对吧？我们的一个呃业务的运行以及企业运行管理中，比如说呢，我们的这个工厂规划和控制的成本对吧？这个。啊，内部的一些这个啊，流程会产生的一些成本以及呢，我们的啊，这个企业规划和控制成本对于我们在business level对吧，对我们对外的或者说是业务方面的一些。成本。呀呀哦，sorry。this was too much.嗯，对不起。嗯，yea，and these sheets er are looking always a little bit the same like having put here the。let's say the different labor costs the business costs the disposition costs material costs and enterprise disposition costs when we look deeper we see of course that this is a general word,but we have here for.the labor cost production wages then total wage costs and additional costs these are.s put engine,but it is like social insurance May be pension suh. every unemployment costs,so they are not costs we.t somebody gets as a salary,but the companies have to pay for that to the corresponding organizations.ander,this altogether is the nth EU rur. this is then the the the labor cost.嗯，好的，那我们来具具体来看一下啊，就是一个公司它的呃，它有哪些的这个呃成本对吧？那我们啊，刚才也说了对吧，第一块呃是我们的。呃，所谓的这个劳动力成本对吧？劳动力成本那我们的这个嗯，包括我的这个呃，这个。关注于生产的这些对吧？产线工人的这些，他们的呃wages对吧？他的这个呃收入，然后呢？包括我们的呃。呃，所有的人对吧？这第一零一呢？只是我们呃关生产相关的一些呃，这个呃，工资的支出第二块呢？就是不管是生产还是不生产的，对吧？其他总的这些。呃，总的这些工资的支出第三块呢，就是除了工资以外的一些呃，这个呃，我们也是为了劳动呃，劳动力去支出的对吧？那就比如说我们五险一金，三险一金，这些对吧？虽然。不是啊，真正的在算在工资里面，但是呢，像保险啊，或者说一些啊福利啊，那我们就把它称之为这个呃，这是德语啊，这英语叫none wich label cost。啊，就是啊，劳动力成本，但是呢，是不算在工资范围内的嗯。in this case,we can see that here the labor cost is round about eighteen percent. then we have rust ly fourteen percent of business cost at eleven per cent of business disposition costs,but we have round about.fifty percent of material costs so here the balance between the materials and the additional costs.er is extremely higher and er er,so we have very expensive materials we need for our product,for its productive materials.and a kind of material overhead,this depends on how to manage this,but maybe it is kind of operation in war or.in the transport coast.嗯，好的，那我们来分析一下这个企业对吧？它呃，除了这个劳动力成本，然后经营成本，然后呢？啊，包括它的这个外部的一些这个经营以外的一些分配的成本对吧啊，然后呢，它的material cost就是它的原材料成本。呃，以及它的公司的一些别的方面的成本，那总的来说呃，我们如果是1%把它所有的成本算作100%的话，我们看到这儿的material cost。就要占到快50%，对吧？特别是这个production material就是生产资料这一块啊，它占的这个比例是非常的高的啊。啊，那这呃，所以说呢，他们呃，至于这个生产型企业呢呃，这个呃，它在这个原材料或者说在材料成本上面这么。呃，这个它的成本这么高呢？其实我们这边也要去注意啊，第一个就是说啊，说明它的这个材料原材料是非常的昂贵的或非常的重要的呃，那第二个呢？就是我们也要去呃，可能要协协调一下它。互相之间的这个比率。yet that ofcourse er we come to this er business costs where we have cost like the depreciation er rate.t tool costs eventually maintenance costs,energy costs,insurance surances.erin aina transport cost safety aspects in the company er and disposal,there are disposals and there are so many additional costs which are not.directly asai we cannot eh?assigned directly to a product,it is just only the factory is there and posting for all these operations which have to be done kind of daily or weekly.嗯，好的，那我们看到这个二零零对吧？呃，就是其实就是一些运营方面的成本，那就算是你这个呃，就是只要公司在那边对吧？呃，它跟生产不是直接相关的，但是你这个企业在那边。你就会产生的一些啊，就包包括是我们的保险啊，包括我们的呃，这个呃，这个一些这个租用成本对吧，包括我们的一些能源的支出对吧，然后一些工。具的成本包括我们的一些这种呃，这个运输的成本啊等等的对吧，包括我们的安全呃，比如说我们有一些要请安保，或者说是他这个呃，这个。呃，这个plant safety对吧？主要管这块地方的一个呃，安保安安防的成本等等的那呃，这些呢？都是在我们的运营成本里面，它虽然不直接跟生产相关，但是只要。啊，我们企业在那边就会产生这个这些business cost嗯。brass ly,we can say even when we would produce no product at all these costs are to a certain extent there. of course,there might be.a kind of AH cost which depend on real production like eventually the energy cost.or eventually also hear disposal costs,uh,but in general these are costs which are always there.嗯，好的，那像这些的成成本呢，就算是我们现在工厂呃关掉对吧？一个东西也没生产，它可能还是会产生这些。呃，这些费用对吧？呃，可能哎，这个能源成本什么稍微低一点，但是它还是会呃产生这些管理啊，或者说是一些。呃，这种安全费啊，或者说是一些这种呃，这个呃，杂七杂八的一些费用对吧？这主要是你公司开在那边嗯。at that,we have these two costs looks here. we can say the business disposition costs and the enterprise disposition costs,both costs for.yes,for organizing the the business here,it is for instance work preparation.manufacturing control operation funds,control operation operating funds means other tools there.is um our empty boxes there and so on then quality eh take the er?er training eventually er and so on so er,there are business disposition costs which are more internal.in order to make sure that the production is running，嗯好的，我们三零零呢，它这个business disposition cost就是呃，它是为了确保我们呃，这个比如说像我们这个。啊，产前的一些准备对吧？比如说供检查一下你的工具啊，或者说这个operation fund control manufacturing control对吧？在你的生产流程中进行一些啊，质量检验或质量安全性啊。啊，那我看看哎，工具是不是全我机器是不是都OK？对吧？那这些呢啊，就是跟我业务呃，这个生产直接相关的一些呃，准备工作对吧？这个啊。呃，包括我的一些这个产生的一些费用嗯。yeah,and then of course,er er,let's call it ex external disposition cos torso enterprise cost.which is dealing with the er,the purchasing,but also with that when we buyer,when we have products which are bought and just only resell ED.then,this reselling price has to be calculated and considered the administration is appoint a studies about maybe market studies a.the ner supports but er what is more interesting is also capital ander.I kind of er interest rates er funds because sometimes they come the companies have too much money and what to do when they have too much money they can.also give this money to the banks and then they get er interest rates and other other money so they can earn additional money besides the product sales.they can also earn earn money and talk about money when they are because it is has to be balanced.er,the same as the materials are also the money can be seen as a kind of resource which has to be managed.嗯，好的呃，那我们这个五零零这一块呢？它是叫enterprise disposition cost对吧？三零零和五零零虽然都是disposition cost。啊，那三零零呢？更多的是跟我的这个企业内部，它的生产相关的，然后五零零呢？它是在我的这个呃，这个呃，企业层面对吧？一个是在生产层面上，三零零是在生产层面上，五零零。临时在企业层面上的这个一些啊，这个运控制成本或运营成本那啊，我们看到五零零里面对吧，就包括我们一些行政成本啊，就比如说像你的这个采购，或者说是。呃，这个市场呃，成本对吧？比如说我的员工培训以及研发的成本啊，包括我的一些投资的成本，对吧？一些杂项，就比如说我的。啊，企业的收入不仅来于我本身的生产，我如果有足够多的钱，我可能做一些投资等等的，对吧？这些杂七杂八的呢，都可以归到五零零里面。嗯now，having all this data，it is in the end also er the base for the er provision of hippy eyes er，and here we have some。er ci pia,as we normally might not have in er in mind,that's the degree of mechanisation.the degree of maintenance.or kind of vertical range of penetration,yet this degree of mechanisation means how much cost do we have for business and how much cost do we have for labor.eh and then we can finally ergetaga ratio for the business cost.and when the mechanisation is high,then we will have very low labor costs when the mechanisation is low.that then we will have a lot of labor costs and the business costs are reduced so that that's let's say a judgment of let's say automation levels of a company.嗯，the same with the dick yup，那我们看到这个有呃，我们现在根据这些，我们对它的业务的。呃，就是我们根据它这些costa data的分析对吧？就是根据它的成本的分析呢？我们可以呃，主要的来研判三个指标对吧？三个KPI那呃，首先呢，就是我们所谓的degree of呃。就是它的机械化程度的呃，这个高低或者说它的机械化程度的啊，一个分析那呃，我们这个主要就是它的这个business cost和l cost对吧，如果它的劳动力成本。是比例占的比较高啊，那我们就是说它的这个degree of mechanism就像。对比较低，因为我是business cost去除以label cost，那如果我的label cost低相对低的话，那我就说我的mechanism比较高，什么意思呢？就是说这个就代表了我的。我的劳动力支出呃，我的劳动力成本的支出，如果呃高的话，那就说明我这个企业的自动化程度不高，对吧？就是很多都还是用呃，这个人工在做对吧？用工人在做我的大部分的这个。呃，支出都是用在人工上面了，对吧？如果说我的劳这个人工支出低的话，那就说明我的整个企业的所谓的机械化程度，或者说是自动化程度就高了嗯。AH,the next key pi is then the degree of maintenance,maintenance costs and in relation to depreciations.because when the maintenance costs a grow,then maybe er,we have to find out if it's better to buy again a new pro a. new maybe a folk lift,for instance,when we have a high.maintenance cost for the forklift and we have to consider on the other side his depreciation cost,then it can be that we sell the old.er forklift ander make a newer buy a new one and then the kip pie eye is drifting to to be unfavorable.and here we have a vertical range which is saying how much cost are we on one side buying for the raw materials or for the materials.and on the other side what are our manufacturing costs in our case before just to remember er.er,we have had erkippie eye which was ra slyer it was.我不许说。here we have had a material cost lastly fifty percent so that the n in this case,AH,this was the yarn sorry.and here the manufacturing costs.and the material costs are then in a,yeah,the material costs are quite quite ly at fifty percent and the manufacturing can be.assigned either to the labor costs and partially eventually to the business costs,so whatever we put into the socalled manufacturing costs,but in the end to a.we have then er we see how much money we have to invest in materials in order to get.things done and in some branches it is really horrible. we have to buy very expensive materials and.um,the money we can get from the market.is very poor in relation to the material costs,this is then eventually because the manufacturing part is becoming smaller and smaller.嗯，好的，那我们再来看后面的两个KPI对吧？第二个就是我们所谓的这个啊，维护的程度，它的一个啊degree of maintenance这个KPI对吧？呃，那我们就要看我的这个嗯呃，它的一个比率呢？是什么呢？就是我的呃，比如说我现在有一台机器，或者说我有一台叉车，对吧？我要维护它，或者说我要去。呃修塔需要花多少钱对吧？然后呢？那如果说呃它的这个折旧对吧？呃这个它的累积折旧是多少？那它们之间的比率呢？也是决定了我这个我到底是？唉，这台叉车我还能修修再用，还是说我就把它折旧掉，我再买台新的合算啊，这个就是degree of maintenance，那第三个呢是？啊，我们所谓的这个垂直的一个渗透范围就是我们的呃生产成本以及我的原材料成本之间的一个，这个比率那我们看到像这个案例里面，我们前面也说到了啊，它的这个原材料的成本。几乎占了50%，对吧？manufacture cost你就把呃这些呃生呃这个叫什么？就是我们一一零零这个呃直接用在这生产的劳动力成本，加上它的这个business cost什么都加起来。它的比率肯定要远远的低于我的material cost，那这边说明什么呢？就是说明有一些产品。它就是为了它生产出这个最终产品，它不得不买，购买非常昂贵的原材料，但是你的这个呃生产的部分附加在。呃，附加附加值其实就没有这么高，对吧？就是说明呃，你最后的这个呃，你的这个原材料的成本占的比率太高了，然后以至于你可能你最终卖出去，你赚不了多少钱。你赚不了多少钱，所以说呢，像这种时候我们其实也就会要比较警惕，要比较警惕这些啊，如果万一它这个比率比出来啊，就是啊，如果说是我的原材料成本占的过高的情况下。那我就要考虑一下我这个呃，这个行业，或者说我生产这个东西还值不值得？啊的。the point of what is addressed here is a principle on that there exists standards. it is not that everybody can put his calculations just.er and be happy er,and here we have the so called standard er er hippie eyes. er for operation er.for the operation side,so that here these are typical data which are well known,that staff productivity turnover divided by the number of staffs.it is not negative if the if the value is high,it is just only to know which values we are having here and how they are er er.how they are developing over time,er.then we have the manifest ion costs here. it is manifest ion costs in respect to their square meters.er,how many space we need for doing the production it is really funny that in some cases this h,this exactly this factor is very important?eh,I have had a project in in Turkey in istanbul,and it is interesting to see that the.the the salaries of the people is is quite lower,it is not really considerable er.yeah,of course,because of the people that were of their education of the people,but when the company needs more space,more land.then this is very expensive because the city is overcrowded and it is hard to get a new a new working or a new real estate for production.er,and so it is sometimes even better to er look how with the existing.um space and expansion can be done,and this is um.often aaa reason for automation,because with automation you can use the same land,but eventually produce in on several levels more efficient.嗯，好的，那我们呃，另外呢，从从这张这个表格里面对吧，我们呃也还可以得到什么，除了前面的这个三个KPI以外呢？啊，那我们从这边啊，包括它的这个啊，花销以及它的占比，那我们可以来分析呃，更多的东西对吧，就比如说呢，我的员工的他的一个生产力的水平对吧，那我用。啊，他们创造的这些呃价值就turnover去除，以我一共有多少个员工，那就是得到了我的啊，员工的这个生产效率对吧啊？呃，productivity，然后第二个包括我的这个呃呃，生产需要的成本啊，它这个其实是以呃我们这块地方的一个占地面积，或者说是我所需要的。呃，厂房对吧？它的这个就是我的。啊，一共哎，这个生产这些东西我呃产生的这些呃生产产生的这些啊成本去除，以我的总的对吧啊，我需要啊生产所用到的地方对吧，去除以它的这个。area那我们得到的呢？就是呃，每平方米我需要多少的生产成本？那刚才我们教授也举例了啊，这个在很多的城市，特别是一些大城市，我们看到啊，他之前在土耳其的伊斯坦布尔也做过一个项目。那呃，当地的。当地的这个啊，劳动力啊，就是比我们想象中的要便宜很多，它的劳动力成本相对来说比欧洲这边要低很多，但是呢呃，它的这个土地成本。它的这个地价非常的高，特别像伊斯坦布尔，它是一个这个欧亚大陆的这么一个横跨欧亚大陆这么一个城市，它的人口也很多，对吧？所以说。特别是在城里面的一些位置呃，那它的地价是非常高的，那所以呢，有很多的企业，它如果包括工厂，它要做这个改建，或者说是要做扩建呢？它很多的都是希望用呃自动化产线，不是因为它劳动力贵去改用自动化产线，而是因为我的这个。在呃比较有限的单位的占地面积的时候呢，我比如说就就这么一小块地，我可以盖多层，如果我用自动化产线呢，它能够。为我单位平方米产生出来的产值更高，所以说呢，所以说呢，大家他们也就是为什么这个像在土耳其这这边，他在伊斯塔布尔啊，就是我们只限于这种大城市。呃，他呢？就会比较热爱去运用这些自动化的设备的一个原因嗯。yeah,and then of course this can be also divided by the the total production costs and and.direct labor costs,and then we can build a new keep yi ce,but what is more important for me is to eh the.t.and what we can do is we know eventually the complete cost of er production. and then we have different products,product groups,and then we can split.er,these costs according to the poorer group May be group a is fifty percent group bis,thirty percent of turnover.and cis twenty percent,then we can split or assign these costs in the corresponding fraction to the products here,product groups.and of course they are finally determining the price of the product at on the market,because we are putting on to the product also.t.but in the end,it is a question how it is split to the different product groups.嗯，好的，那我们来看啊，就是呃，另外呢，就比如说我们也可以用我们现在的总的这个呃生产呃所花用的费用去比上我人工所花用的费用对吧，然后。也是算出我们的所谓的这个呃人工呃和呃生产就是就是劳动力的一个呃这个所所谓的成这个它的比率对吧，就是我们的。啊，一个劳动力成本和生产成本的一个比率，那这些啊，我们还可以有很多KPI对吧？就是呃从呃。这张表或者说我们前面也说了，我们去收集这些数据对吧？包括前面我们也收集了很多不同的这个数据进行分析，那我们现在就是专注于来看我的成本。我是我收集到的这些我们所谓的stand up bab对吧？我的基础的一些呃基础的一些参数，这个是每个企业都有的，这个是每个企业都有的，这些这个。呃呃，年年均成本对吧？我的这个在呃各方面的一个呃，这个成本支出那？呃，我们其实要从这张表就是我们每个企业有的这种资产表里面呢，我们要出来的就是这些。KPI对吧？我所需的这个KPI那还可以有很多呃，用于我们呃，然后呢？从这些KPI里面呢？我们要对应到这个，比如说。我现在有三个产品，对吧？然后呢？它每个产品它的productivity是多少？它的那它肯定ABC，它可能turnover不一样，对吧？就是它所用到的员工也不一样，它的AA的产品，它可能它的productivity。是50%b是70%c是80%，对吧？那我就要去分析了哎，那哪个产品比较合适？那我是要用这些分析的数据去作用到。就是作用到我的这些不同的领域来去分析，对吧？这边有很多的一些举例，然后呢？用这把这些KPI呢作用，最终作用到我的这个factory planning里面，对吧？作用到我的这个啊，工厂规划里面，所以呢，我们这边其实就是从原始的这些cost data对吧？从原始的这些。呃，这个成本数据里面去找到我们所需要的KPI，然后呢，再转换成我们呃，相关领域我所呃，对我的这个工厂规划所需用的。对吧呃，所需用的这些数据再转化过去OK？yet of course this can be done with all the other data as well,where we have er maybe the the areas or the labor hours.everything can be used as a as a,as a base for kp is. in the end,we can generate,yeah,a lot of kp is.that the discussion with these kip pie eyes is always er what for why should we do a next kippie eye?and and and ii think when we talk about the kippiee,yes,we should always ask,what is the intention of this kip pie eye in order to monitor?something ander,what are the activities we would like to do as a consequence of er? let's say a key pi,which is developing bad.嗯嗯，好的，那我们呃呃，前面也是说了对吧？我们从我原始的这些呃，这个cost data对吧？我的这个成本分数据里面呢？我可以呃，这个。来根据我的需求，对吧？你看这边有很多哎，比如说我要呃做工工厂设计，我要看我的这个呃容积比对吧？我多少面积干多少事，然后我的这个物物流成本，这个物流方面是怎么样？我要怎么去设计？我的这个呃仓库，我要怎么来做我的这个manufacture对吧？那我要知道我的这个周转率是多高，那我的这个呃这个。啊，土地利用率是怎么样？那我这些都可以从我刚才的这个。呃，所谓的呃成本分析里面得出我所需的不同的KPI，然后呢，再去指导我来做哎，比如说我现在啊，要求我做一个工厂翻新，或者说要我。做一个扩建对吧？就像刚才我们说到的啊，这个土耳其的这个案例，那我其实就要看他的，唉，我不一定员工便宜我就啊，现在要多招员工，而是我要更好的把这个土地利用起来，对吧？那我就是根据客户不同的性质，然后根据他不同的需求，根据当地的不同的情况，然后我从我的成本数据里面去分析出对应的KPI来指导我最后的p planning的工作。这个就是这样，为什么我们前面说了这么老半天的这个data的整理对吧？那我们怎么最后作用到我们的这个工厂规划里面去？now,er,what happens when the products are getting are the customers are not willing to pay.er more money because there is a strong competition and product a,which was covering maybe fifty percent of this ur costs.is only contributing in the future only forty percent because the market has um has reduced the finally the sales price and of course the profit.what can we do? then we have to look into our total configuration of all the components over here.that we have to look,is it possible to reduce our price as well?by investing May be in automation and that's by the way always that the drive one of the driving forces.eh to go for automation.嗯，好的，那我们这边在分析生产成本以后啊，就比如说现在我们的呃，这个呃a产品对吧，然后我们的客户说哎，你这边定价过高了，或者说是我现在不愿意支付这么高的价格，对吧？那我。我就要先就是要反推回去分析我的KPI，我能不能同时降低呃，我的这个价格，但是呢呃，不影响不影响我公司的这个就我还是能够盈利，对吧？然后呢？那我看在哪边可以缩减成本？唉，是不是在啊？我可以这个增高我的生产这个所谓的productivity对吧？让我的生产效率增高，然后呢？从而降低我的整个的生产成本，让我的这边的售价。虽然降低以后我还可以有盈利，那这个而且经常呢，在这种情况下呢呃是对于企业来进行一个自动化产线改造的。或者说是做一个自动化产线的，很多的时候的一个推动力，或者说一个驱动器嗯。this is exactly the problem we are having in Germany when er the product price is very high and the competing ya companies from other.from other countries are.bringing lower price there therefore in Germany,we have had all the time a high automation,all the time automation was increased er.May beer even that the automation is to a certain extent expensive,but it is more expensive to pay the salaries rather than the the automation or the depreciation because of automation.so that's one point. and the second point,what has happened over time was that we have bought mor er raw materials,this is we have got products from other countries which are we do not produce any more.because our price for this production is too high,so we buy them in on the global world and put them into our products as well.um,the same happens when we are looking into the topic of energy costs. energy is in Germany very expensive,and what happens,then all those products which are needed.a lot of energy sooner or later disappear,they go to other countries where their energy costs are very much lower.mostly they go to Qatar in arab emirates,where the energy of oil and gas is very low because they have. they have it for free almost for free there.嗯，好的，那我们也是看到啊，这个我们呃，这个成本分析啊，用于我们在啊举一个案例啊，顺现德国的整个制造业就是面临的这个情况，首先呢呃，现在很多德国的这个市面上的一些。一些产品呃，相对于呃，比如说像亚洲或者说中国生产的同类产品来说呢，它的价格已经不具有优势了，对吧？因为你的同竞争者。在呃生产同样的产品的话，它的成本要比你低很多，或者说它的售价可以低很多，那所以呢，又有很多的这些中低端的制造业的一些产品呢呃，就渐渐的在德国就呃不复存在了，因为。呃，它很多的，就比如说是像一些原材料或半成品的，它自己生产呃，还不如就是直接问中国买，或者说是直接问别的国家买，对吧？因为它这样子会更便宜。那第二个呢？呃，大家也知道德国的能源危机对吧？前两年呃，然后呢？呃，特别是之前德国的能源成本就已经非常高了，然后在这个能源危机以后呢？现在德国的这个整。整体的能源成本呢，几乎是在全球已经是呃，属于最最高的那一类的呃里面了，那这样子呢，又导致了很多的这个呃，比如说像这种金属加工业啊之类的。他们呢呃，以前德国的这些传统的这种金属加工啊，这些产业都会呃慢慢的消失，因为呢呃，它所需需要的能耗实在是太高了啊，就是那些高能耗产业。也会渐渐的去搬离德国，它会去找一些中东的国家，比如说去卡塔尔，比如说像去这个呃沙特阿拉伯，这些国家对吧？因为像你你比如说举个例子，像卡塔尔。它那边的石油，你如果去做制造业的话，它几乎就像不要不要钱一样，就把它这个石油天然气，它因为是原产地。那所以呢，很多的高能耗的一些生产企业呢，也会渐渐的就呃退出了这个德国市场。and this happens also to a certain extent already in China when we talk about textile production. there are other countries where the labor costs are smaller or lower.then the companies bring the let the put the production to other countries,and then they eventually not the complete production but part of that and then.er,they cut down the costs er,so in fact with this er.with this development,we are able to er look on to the kippiee yes,and then we see which kip pie eye is.has become bad over time and then we can take measures and the measures are always the same. it is either automation,it is either.er outsourcing it is either globalisation,buying the products somewhere else or er what happens also sometimes is that we.t have other companies which are doing the sales,so we we externalize some of these.the services we have done so far.嗯，好的，那我们呢？就是呃呃，也可以从呃，就刚才我们说到这些趋势，对吧？我们在中国也可以看到，比如说像现在啊，我觉得在广广东生活。等你们，你们肯定也是啊，更有体会对吧，像我们以前有很多的这个纺织对吧，服装产业都是在我们广州，或者说是周边的对吧，但现在基本上这个啊，一些低端的这些纺织产业。或者说甚至是呃，一些这种以前的这种呃定制品牌的一些都已经签掉了，对吧？都几乎从中国转移到啊东南亚，别的一些啊，包括它的劳动力和这个能源成本。地价更低的一些地方去，对吧？那嗯，包括一些低端的制造业等等的那呃，像这块呢，就是我们在分最近进行成本分析的时候，我们根据需要去看这些。呃，对应的KPI对吧？如果你分析出来诶，它这边这个KPI过低，或者说它是有问题的话，那我们就要去选择适应相应的解决方案，对吧？那基本上呢，它的这个解决方案就无非就这么几种，第一个就是说哎，可能我要呃上自动化，对吧？进行一个升级呃，第二个呢就是我们呃，在一些成本。我自己的成本，自己做的成本过高的情况下，我就做一个对吧，我就直接买那第三个呢，可能我就要。有顺应全球化的趋势，那我现在呃，我可能就要搬掉了，对吧？我要去别的地方了，我就去，可能我去呃东南亚去了，对吧？我去，这个呃，我不在德国了，我要去这个。呃沙特阿拉伯或者说去卡塔尔了，对吧？这个就是一个globalization，那或者呢？就是哎，有一些的呃，就像我们之前也说的啊，比如说你像物流的一些服务，或者说像我们之前。呃，大家在做这个ABC xyz的这些对吧？就是我对我们的大家，如果还记得的话，对我们的这个呃呃，这个cz的产品对吧？我自己来处理，实在是又呃。呃，消耗我的精力，又占用我自己的空间，那我自己这这块的service我就不做了，对吧？我就直接外包给专业的人去做，让他去赚这个钱，对吧？那我这个直接的就是啊。啊，去用一些外部的service啊，那基本上呢，就是会有这么几个路径来做优化，但是我们呢啊，本质上呢，从我的cost成本分析里面去得出这些KPI对应的KPI呢来。进行我对应的这个factory planning，我后面的针对性的来做这个呃工厂规划，或者说我来针对性的给出这些解决方案OK呃，that's it for today。我们今天就到这里嗯。三个四四个。这个意思是打不写哩。嗯OK OK。好的，那我们这个我看一下，明天见啊。儿子说我。fabric plan on.