As an employee of a large international courier and shipping service, Bill Wiley met almost every day with many companies that shipped and received packages. He was frequently asked if his company could deliver local packages on the same day. Over several months, he observed that there appeared to be a substantial need for courier services in the city in which he lived. He decided that he would form his own courier delivery company called On the Spot to fill this need.

Bill began by listing his mobile telephone number in the Yellow Pages. He also sent letters to all those companies that had requested same-day courier service that his prior company had not been able to serve. He hoped that, through good service and word-of-mouth advertising, his business would grow. He also began other advertising and marketing activities to promote his services.

At first, Bill received delivery requests on his business mobile phone. However, it was not long before his customers were asking if he had a Web site where they could place orders for shipments. He knew that if he could get a Web presence he could increase his exposure and help his business grow.

After he had been in business only a few short months, Bill discovered he needed to have additional help. He hired another person to help with the delivery and pickup of packages. It was good to see the business grow, but another person added to the complexity of coordinating pickups and deliveries. With the addition of a new person, he could no longer “warehouse” the packages out of his delivery van. He now needed a central warehouse where he could organize and distribute packages for delivery. He thought that if his business grew enough to add one more delivery person he would also need someone at the warehouse to coordinate the arrival and distribution of all the packages.

The details of the package pickup and delivery process are described here.

When Bill got an order, at first, only on his phone, he recorded when he received the call and when the shipment would be ready for pickup. Sometimes, customers wanted immediate pickup; sometimes, they were calling to schedule a later time in the day for pickup.

Once he arrived at the pickup location, Bill collected the packages. It was not uncommon for the customer to have several packages for delivery. In addition to the name and address of the delivery location, he also recorded the time of pickup. He noted the desired delivery time, the location of the delivery, and the weight of the package to determine the courier cost. When he picked up the package, he printed out a label with his portable printer that he kept in the delivery van.

At first, Bill required customers to pay at the time of pickup, but he soon discovered that there were some regular customers who preferred to receive a monthly bill for all their shipments. He wanted to be able to accommodate those customers. Bills were due and payable upon receipt.

To help keep track of all the packages, Bill decided that he needed to scan each package as it was sorted in the warehouse. This would enable him to keep good control of his packages and avoid loss or delays.

The delivery of a package was fairly simple.

Upon delivery, he would record information about when the delivery was made and who received it. Because some of the packages were valuable, it was necessary in those instances to have someone sign for the package.

On the Spot courier services grew and changed over the years. At first, Bill received requests for package pickups on his mobile phone, recorded that information in a log, and would then drive around to retrieve all the packages later in the day. However, he soon discovered that with another driver, it was difficult to coordinate pickups between the two of them from his van. It was not long before he reorganized his business and turned the warehouse employee into a driver. Then, he stayed in the warehouse himself, and his two employees made all the pickups and deliveries. This worked well because he could control and coordinate the pickups and deliveries better. It was also easier for him to receive pickup requests working at a desk rather than trying to do it while driving a delivery van.

As he thought about how his business was growing and the services he provided to his customers, Bill began to itemize the kinds of information he would need to maintain.

Of course, he needed to maintain information about his customers. Some of his customers were businesses; some were individuals. He needed to have basic address and contact information for every customer. Also, for his corporate customers, he needed to identify a primary contact person. It was mostly his corporate customers who wanted to receive monthly statements listing all their shipments during the month and the total cost. Bill needed to distinguish which customers paid cash and which wanted monthly statements. In fact, for those that paid monthly, he needed to keep a running account of such things as when they were last billed, when they paid, and any outstanding balances. Finally, when payments were received, either for individual shipments or from monthly invoices, he needed to record information about the payment: type of payment, date, and amount. Although this was not a sophisticated billing and payment system, Bill thought it would suffice for his needs.

Next, he started thinking about his packages and shipments. At the time that a request for a pickup came in, he needed to keep track of it as some type of delivery request or delivery order. At that point in time, Bill mostly needed to know who the customer was, where the pickup location was, and what date and time the package(s) would be ready for pickup. He also recorded the date and time that he received the order. A delivery order was considered “open” until the delivery van arrived at the pickup location and the packages were all retrieved. At that point, the delivery order was satisfied.

Once the packages were retrieved, each package needed to be uniquely identified. Bill needed to know when it was picked up and which delivery person picked it up. Other important information was the “deliver to” entity name and the address. He also needed to identify the type of delivery. Some packages were high priority, requiring same-day delivery. Others were overnight. Of course, the weight and cost were recorded so the customer could either pay or have it added to the monthly invoice.

In the courier and delivery business, one of the most important information requirements is the date and time stamp. For each package, it is important to know when it was picked up, when it arrived at the warehouse, when it went back out on the delivery run, and when it was delivered. When possible, it is also important to have names associated with each of these events.

As On the Spot Courier Services continues to grow, Bill discovers that he can provide much better services to his customers if he utilizes some of the technology that is currently available. For example, it will allow him to maintain frequent communication with his delivery trucks, which could save transportation and labor costs by making the pickup and delivery operations more efficient. This would allow him to serve his customers better. Of course, a more sophisticated system will be needed, but Bill’s development consultant has assured him that a straightforward and not- too-complex solution can be developed.

Here is how Bill wants his business to operate.

Each truck will have a morning and afternoon delivery and pickup run. Each driver will have a portable digital device with a touch screen. The driver will be able to view his or her scheduled pickups and deliveries for that run. (Note: This process will require a new use case—something the Agile development methodology predicted would happen.) However, because the trucks will maintain frequent contact with the home office via telephony Internet access, the pickup/delivery schedule can be updated in real time—even during a run. Rather than maintain constant contact, Bill decides that it will be sufficient if the digital device synchronizes with the home office whenever a pickup or delivery is made. At those points in time, the route schedule can be updated with appropriate information.

Previously, customers were able to either call On the Spot and request a package pickup or visit the company’s Web site to schedule a pickup. Once customers logged in, they could go to a Web page that allowed them to enter information about each package, including “deliver to” addresses, size and weight category information, and type of service requested. On the Spot provided “three hour,” “same day,” and “overnight” services. To facilitate customer self-service, On the Spot didn’t require exact weights and sizes, but there were predefined size and weight categories from which the customer could choose.

Once the customer entered the information for all the packages, the system would calculate the cost and then print mailing labels and receipts. Depending on the type of service requested and the proximity of a delivery truck, the system would schedule an immediate pickup or one for later that day. It would display this information so the customer would immediately know when to expect the pickup.

Picking up packages was a fairly straightforward process. But there was some variation in what would happen depending on what information was in the system and whether the packages were already labeled. Upon arriving at the scheduled pickup location, the driver would have the system display any package information available for this customer. If the system already had information on the packages, the driver would simply verify that the correct information was already in the system for the packages. The driver could also make such changes as correcting the address, deleting packages, or adding new packages. If this were a cash customer, the driver would collect any money and enter that into the system. Using a portable printer from the van, the driver could print a receipt for the customer as necessary. If there were new packages that weren’t in the system, the driver would enter the required information and also print mailing labels with his portable printer.

One other service that customers required was to be able to track the delivery status of their packages. The system needed to track the status of a package from the first time it “knew” about the package until it was delivered. Such statuses as “ready for pickup,” “picked up,” “arrived at warehouse,” “out for delivery,” and“delivered” were important. Usually, a package would follow through all the statuses, but due to the sophistication of the scheduling and delivery algorithm, a package would sometimes be picked up and delivered on the same delivery run. Bill also decided to add a status of “cancelled” for those packages that were scheduled to be picked up but ended up not being sent.

作为一个大型国际快递和航运服务的雇员，Bill Wiley几乎每天都会与许多公司运送和接收包裹。他经常被问及他的公司能否在同一天提供当地包裹。在几个月的时间里，他发现在他居住的城市里确实需要快递服务。他决定成立自己的速递递送公司，当场满足这一需求。 比尔开始在黄页中列出他的手机号码。他还寄信给那些要求他以前的公司无法提供服务的公司。他希望通过良好的服务和口碑广告，他的生意能发展壮大。他还开始了其他广告和营销活动，以促进他的服务。

起初，比尔在他的手机上收到了递送请求。然而，不久他的客户就开始询问他是否有一个网站，在那里他们可以订购货物。他知道，如果他能有一个网络存在，他可以增加他的曝光率，并帮助他的业务增长。

比尔做生意才短短几个月，就发现他需要额外的帮助。他雇了另一个人帮忙运送和取货。很高兴看到业务增长，但另一个人增加了协调拾取和交付的复杂性。加上一个新人，他再也不能把包裹从送货车里“仓库”出来了。他现在需要一个中央仓库，在那里他可以组织和分发包裹。他认为，如果他的业务增长到可以再增加一个送货员，他还需要仓库里有人来协调所有包裹的到达和分发。

这里描述了包装拾取和递送过程的细节。

当比尔接到订单时，起初，他只通过电话记录下他接到电话的时间和货物准备好取货的时间。有时，顾客希望立即接机，有时他们会打电话预定当天晚些时候的接机时间。 比尔一到取货地点就收了包裹。顾客有好几件包裹用于送货并不少见。除了送货地点的名称和地址之外，他还记录了拾取的时间。他注意到所需的交货时间、交货地点以及包装的重量以确定快递费用。当他拿起包裹时，他用手提打印机打印出一个标签，他把它放在送货车里。 起初，比尔要求顾客在接机时付款，但他很快发现，有些普通顾客更喜欢每月收取所有货款。他希望能够容纳那些顾客。票据在收到时即到期应付。

为了帮助跟踪所有的包裹，比尔决定，他需要扫描每个包裹，因为它是在仓库里分类。这将使他能够很好地控制他的包裹，避免丢失或延误。

包裹的递送相当简单。

在交货时，他会记录交货时间和收货人的信息。因为有些包裹很值钱，所以在这些情况下有必要有人为包裹签名。

随着时间的推移，现场快递服务不断发展变化。起初，比尔在手机上收到了包裹拾取的请求，在日志中记录了信息，然后在当天晚些时候开车去检索所有包裹。不过，他很快发现，与另一名司机一起，很难协调他们两人从他的货车上接车。不久，他就重组了业务，把仓库的员工变成了司机。然后，他自己呆在仓库里，他的两个员工负责所有的提货和送货。这很有效，因为他可以更好地控制和协调接送。对他来说，在办公桌上接听皮卡的要求也比较容易，而不是在驾驶送货车时试着做。

当他想到他的生意是如何成长的，以及他为顾客提供的服务时，比尔开始逐条列举他需要维护的各种信息。

**当然，他需要维护客户的信息。**他的一些顾客是生意人，有些是个人。他需要有每个客户的基本地址和联系方式。此外，对于他的公司客户，他需要确定一个主要联系人。主要是他的公司客户希望每月收到一份清单，列出他们当月的所有发货量和总成本。比尔需要区分哪些顾客付现金，哪些顾客想要月结单。事实上，对于那些按月付费的人来说，他需要对账单上的账单、付款时的余额以及任何未付余额进行记账。最后，当收到付款时，无论是单独发货还是每月发票，他都需要记录有关付款的信息：付款类型、日期和金额。虽然这不是一个复杂的帐单和付款系统，比尔认为这足以满足他的需要。

**接下来，他开始考虑他的包裹和出货。**在收到一个拾音器的请求时，他需要跟踪它作为某种类型的交付请求或交付顺序。在这一点上，比尔主要需要知道顾客是谁，在哪里捡拾地点，以及什么日期和时间的包（S）将准备迎接。他还记录了他收到订单的日期和时间。在送货车到达取货地点并取回所有包裹之前，送货单被视为“打开”。那时，交货单已经满足了。

一旦检索到包，每个包都需要唯一标识。比尔需要知道什么时候取的，是哪个送货员取的。其他重要信息是“传递到”实体名称和地址。他还需要确定送货的类型。有些软件包是高优先级的，需要当天交付。其他人则是一夜之间。当然，记录的重量和成本，因此客户可以支付或添加到月度发票。

在快递和送货业务中，最重要的信息需求之一是日期和时间戳。对于每一个包裹，重要的是要知道它是什么时候被捡起的，当它到达仓库时，当它返回到交付运行，当它被交付。在可能的情况下，重要的是要有与这些事件中的每一个相关联的名称。

随着现场快递服务的持续增长，比尔发现，如果他利用目前可用的一些技术，他可以为他的客户提供更好的服务。例如，它将允许他与他的送货卡车保持频繁的沟通，这可以节省运输和人工成本，使拾取和递送操作更有效。这样可以让他更好地为顾客服务。当然，需要一个更复杂的系统，但比尔的开发顾问向他保证，可以开发一个简单而不太复杂的解决方案。 **比尔希望**自己的生意能这样做。 每辆卡车将有一个上午和下午的交货和皮卡运行。每个驾驶员都有一个带触摸屏的便携式数字设备。司机将能够查看他或她的预定的皮卡和运输运行。（注意：这个过程将需要一个新的用例，敏捷开发方法的预测将会发生）。然而，因为卡车通过电话网络接入与家庭办公室保持频繁的联系，即使在运行期间，皮卡/发货时间表也可以实时更新。比尔决定，无论何时取货或送货，只要数字设备与内政部同步，就足够了，而不是保持经常联系。在这些时间点，可以利用适当的信息更新路线安排。 此前，客户可以当场打电话要求提货，也可以访问公司网站安排提货。一旦客户登录，他们可以进入一个网页，允许他们输入关于每个包的信息，包括“递送”地址、大小和重量类别信息和所请求的服务类型。现场提供“三小时”、“同一天”和“过夜”服务。为了方便客户自助服务，现场不需要确切的重量和大小，但有预定义的大小和重量类别，客户可以选择。 一旦客户输入了所有包裹的信息，系统将计算成本，然后打印邮寄标签和收据。根据所要求的服务类型和送货卡车的接近程度，系统将安排一个即时的拾取或一个为以后的那一天。它会显示此信息，以便客户立即知道何时可以取货。

收拾包裹是一个相当简单的过程。但是，根据系统中的信息和包装是否已经贴标签，会发生什么变化。到达预定取货地点后，驾驶员将让系统显示该客户可用的任何包裹信息。如果系统已经有了包的信息，驱动程序只需验证系统中已经有了包的正确信息。驱动程序还可以进行诸如更正地址、删除包或添加新包等更改。如果这是一个现金客户，司机会收取任何钱并将其输入系统。使用便携式打印机从货车，司机可以打印收据为客户在必要时。如果有新的软件包不在系统中，则驱动程序将输入所需的信息，并用便携式打印机打印邮件标签。 客户需要的另一项服务是能够跟踪包裹的交付状态。该系统需要跟踪包的状态从第一次它“知道”有关包，直到它被交付。这样的状态是“准备就绪”、“拾起”、“到达仓库”、“外出交货”和“交付”都是重要的。通常，包将贯穿所有状态，但由于调度和交付算法的复杂性，有时会在同一个交付运行时拾取并交付一个包。比尔还决定为那些计划提货但最终没有寄出的包裹添加一个“取消”状态。

设计系统时，需要通过确定对象、类、业务流程、实体状态变化情况等内容确定需求。问题清单如下：

1. 订单包含有哪些条目？

交货时间、交货地点以及包装的重量以确定快递费用 送货地点的名称和地址之外，他还记录了拾取的时间 确定送货的类型 交货时间和收货人的信息

1. 包裹的运输和寄存流程是怎样的，每个包裹从寄存到取出经历了哪些状态变化？

存入：填写订单，还可以更正地址、删除包或添加新包，被汇总到中央仓库

运输：实时的送货时间和地点

取出：时间

1. 系统是否需要考虑到仓库数量增加的情况？

不需要

d. 需要为用户提供哪些支付方式？

现金

月结款