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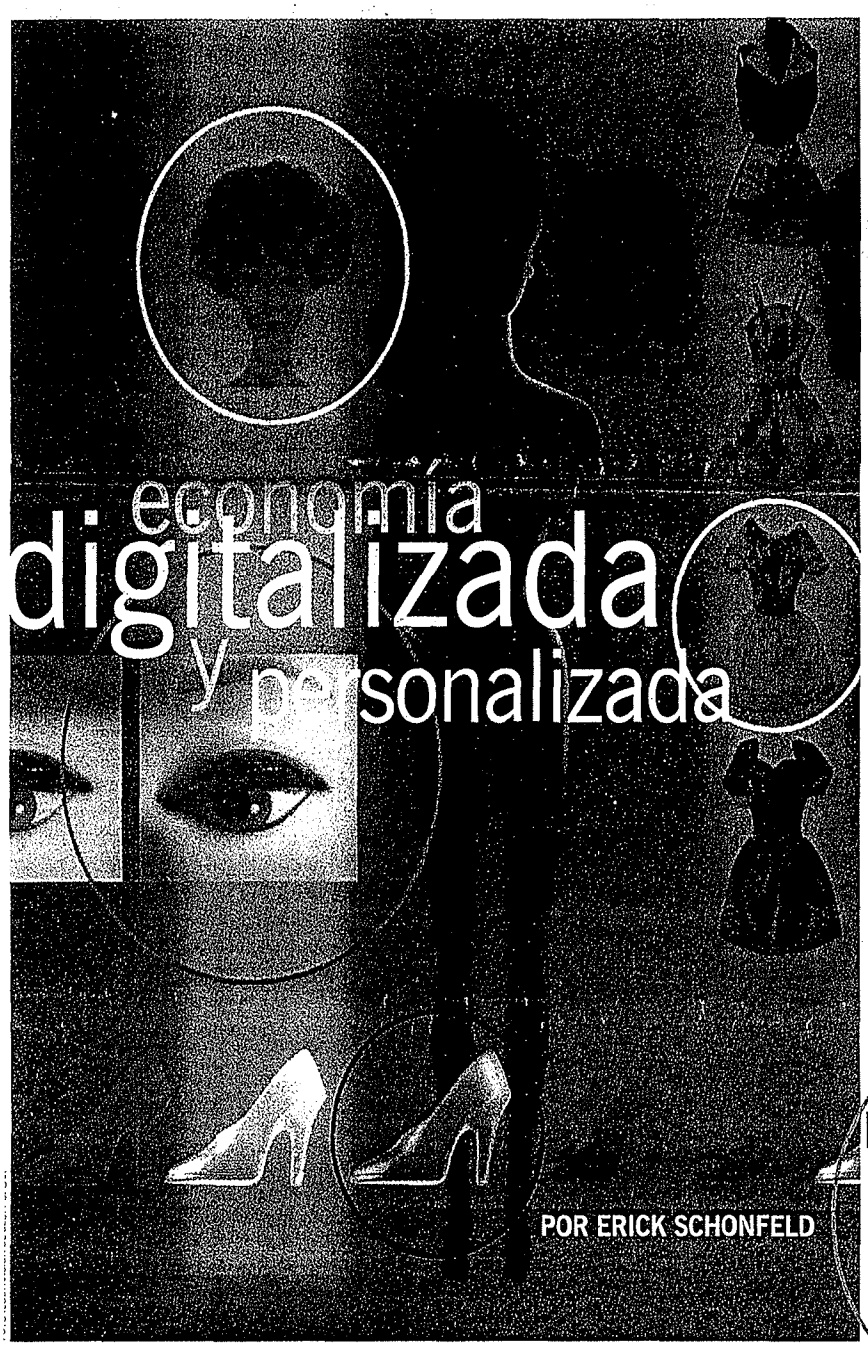

economía digitalizada y personalizada

POR ERICK SCHONFELD

Una revolución silenciosa está transformando el modo de fabricación de los bienes y la distribución de los servicios. Empresas que cuentan con millones de clientes están comenzando a fabricar productos diseñados especialmente para usted. Ya es sabido que puede comprar una computadora Dell ensamblada según sus especificaciones exactas. Y que es posible comprar *jeans* Levi's entallados a la medida de su cuerpo. Pero ahora también puede comprar píldoras que combinan exactamente las vitaminas, los minerales y las hierbas que usted quiere; lentes que se amoldan a su cara a la perfección; discos compactos con sus temas musicales preferidos; cosméticos mezclados que combinan exactamente con su color de piel; libros cuyos capítulos han sido seleccionados por su profesor; o simplemente un préstamo ajustado estructuralmente a su perfil financiero. ¡Ah!, y si a su hija no le gusta ninguna de las 125 muñecas Barbie de Mattel, pronto va a poder diseñar su propio modelo.

Bienvenido al mundo de los productos masivos personalizados, donde los bienes y servicios de los mercados de masas se adecuan específicamente a las necesidades de los compradores.

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EN ESTE NUMERO:

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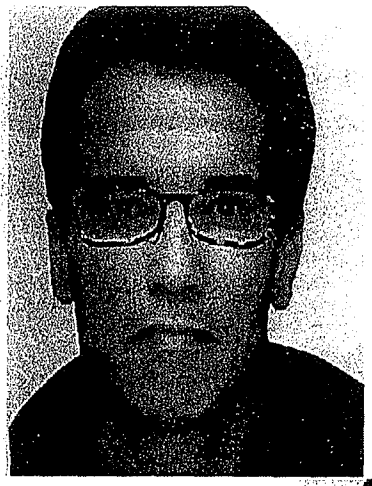
hacer el pedido directamente a través de la red que se comunica a la planta fabril.

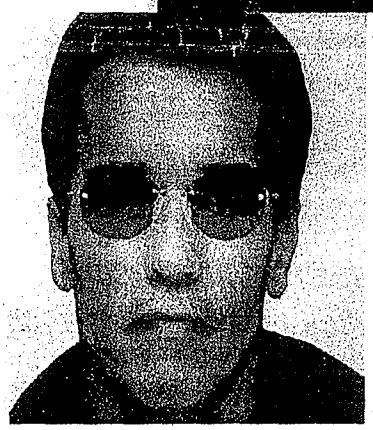
Los clientes podrán hasta darle un nombre a su creación: por ejemplo, "rebelde", para un par de *jeans* negros. Dos o tres semanas más tarde el pantalón llegará por correo, con una etiqueta sellada en el bolsillo que contiene el código de barras con las medidas, para así facilitar nuevas compras. Hoy, una tienda de Levi's completamente aprovisionada puede ofrecer unos 130 modelos diferentes listos para llevarse puestos. Con los "Personal Pair", las opciones son de hasta 430. Y con el "Original Spin" se ofrecen hasta 750 posibilidades. "Lo fundamental es elegir bien las alternativas a ofrecer —dice Sanjay Choudhuri, director de producción masiva personalizada de Levi's—. Una cantidad ilimitada crearía ineficiencias en la planta".



Rollins, de Dell, está de acuerdo: "Cada vez queremos ofrecer menos componentes". Para ambos, la producción personalizada no consiste en alternativas infinitas, sino en ofrecer una variedad de partes estandarizadas que se pueden combinar en miles de formas. Esto da a los clientes la sensación de que tienen una posibilidad de elección ilimitada, a la vez que mantiene la complejidad del proceso de producción dentro de los límites de lo manejable. Levi's cobra un pequeño recargo por los *jeans* a la medida, pero lo que a Choudhuri realmente le gusta es que mediante este proceso Levi's se convierte en su "asesor de *jeans*". La venta de *jeans* comunes en una tienda no permite prolongar la relación con el cliente. La venta personalizada propicia en cambio el inicio de una relación duradera: al cliente le gusta cómo le queda el *jean* y está dispuesto a seguir comprando en el futuro, dejando su nombre y dirección en caso de que quieran mandarle ofertas promocionales. Además, Levi's puede aplicar lo que ha aprendido de sus clientes a la producción en masa para el resto de nosotros. Si su experimento da resultado, otros fabricantes de ropa van a seguir sus pasos. En un futuro no tan distante, la gente podrá simplemente entrar en cabinas que escanean el cuerpo y mediante un baño de luz blanca se determinará con exactitud su estructura tridimensional. Una compañía sin fines de lucro llamada [TC]2, que se financia a través de un consorcio de compañías entre las que se encuentra Levi's, está desarrollando esta tecnología. El año pasado, algunos estudiantes de la escuela de negocios de MIT propusieron una idea similar para una compañía de sostenes a medida llamada "Perfect Underwear".

Tu imagen

Si fuera cliente de Paris Miki, una versión digitalizada como la de Arnold Schwarzenegger, le mostraría cómo le quedarían los lentes a la medida. Adiós a los lentes que le quedan mal.



El sistema de producción masiva personalizada crea productos que se adaptan a las necesidades individuales mejor que lo que cualquier intermediario tradicional puede conseguir. LensCrafters, por ejemplo, ha hecho que ya sea común la producción rápida y en la misma tienda de lentes personalizados. Pero Paris Miki, una empresa basada en Tokio, está llevando el proceso un paso más adelante. Mediante el uso de un *software* especial, pueden diseñar lentes y marcos que se adecuen a la forma del rostro del cliente y que tengan las características elegidas por el comprador (lentes informales, de sol...) El cliente puede observar en un monitor las distintas alternativas sobreimpresas sobre una imagen escaneada de su rostro. Una vez que elige los anteojos que más le gustan, se hacen y se colocan los cristales. Mientras que uno tiende a pensar en la automatización como un proceso que elimina la necesidad de interacción humana, la personalización convierte la relación con el cliente en el aspecto más importante.

Los hoteles que quieren que sus clientes regresen, están usando *software* para hacer que sus estadías sean más personalizadas. Todos los hoteles Ritz-Carlton, por ejemplo, están conectados a una base de datos que tiene las peculiaridades de medio millón de clientes. Cualquier botones o conserje puede averiguar si usted es alérgico a las plumas, cuál es su periódico preferido o de cuántas toallas extra le gusta disponer.

Wells Fargo, el mayor proveedor de transacciones bancarias vía Internet, ya permite a sus clientes solicitar préstamos inmobiliarios *online* estructurados específicamente para ellos y obtener una respuesta en tres segundos. Gran parte de la tecnología invisible hace que esto sea posible, como, por ejemplo, las conexiones en tiempo real con oficinas de crédito, las bases de datos con historiales de cuentas bancarias y la tasación de propiedades, y un *software* capaz de desarrollar análisis de liquidez. El banco también usa un programa similar en su división de préstamos a pequeños negocios. Según dice el vicedirector Terri Dial, Wells Fargo solía dar la espalda a pequeños negocios rentables: la cantidad de los préstamos era demasiado insignificante como para que se justificara el tiempo que tardaban en hacer los análisis de crédito. Pero ahora la empresa puede recopilar una serie de detalles claves sobre los solicitantes, personalizar un préstamo y aprobar o denegar el crédito en unas pocas horas. "La alternativa es: o invertir en tecnología o retirarse del negocio", dice Dial.

Si se combina la posibilidad de pedidos personalizados que permite el *software* con la omnipresencia de Internet, se obtendrá una situación capaz de amenazar la existencia misma de Wells. Si los clientes se acostumbran a diseñar sus propios productos, ¿confiarán en compañías y proveedores de servicios con nombres de marca o los cambiarán por algún nuevo tipo de intermediario?

Frank Shlier, director de investigaciones del Gartner Group, se imagina que van a aparecer intermediarios por toda la Web para ayudar a la gente a elegir entre las miles de opciones existentes. ¿Qué es lo que haría que uno se decida por Levi's, si se puede visitar un sitio de Internet de venta de ropa que almacena sus medidas digitales y donde se puede hacer un pedido de pantalones a la medida, y al mejor precio posible? Pehong Chen, presidente ejecutivo de la compañía de *software* para Internet BroadVision, reflexiona: "El ideal es que dada la cercanía de los clientes, se pueden satisfacer todas sus necesidades. Incluso aunque usted no sea el que hace el producto, al menos mantiene una relación".

Amazon.com mantiene este tipo de relación con tres millones de clientes. Vende libros vía Internet y ahora se está diversificando hacia la música. Cada vez que uno compra un libro en su sitio de Internet, Amazon.com se entera de sus gustos y sugiere otros títulos que le pueden interesar. Cuanto más sabe Amazon, presta un mejor servicio a sus clientes y cuanto mejor es el servicio, más leales son. Cerca de un 60% son compradores asiduos.

La elección es más importante que la marca en EE.UU.

Las compañías de producción personalizadas quieren mantener a sus clientes, al ofrecerles un producto que no se puede comparar con el de sus competidores. Acumin, por ejemplo, mezcla vitaminas, hierbas y minerales según las instrucciones de sus clientes. Comprimen hasta 95 ingredientes en sólo 3 ó 5 pastillas. Si algún cliente precisa agregar un nuevo suplemento, todo lo que Acumin necesita hacer es incluirlo en la mezcla.

La intención de Acumin es tener en cuenta lo que el pionero de la personalización Joseph Pine llama "el sacrificio del cliente": ese compromiso al que todos llegamos cuando no podemos obtener exactamente lo que queremos. El presidente ejecutivo Brad Oberwager fundó la compañía hace dos años, cuando su hermana, que era sometida a radiaciones para combatir el cáncer, no podía encontrar un complejo multivitamínico sin iodo. Según el presidente ejecutivo de Artuframe.com, Bill Lederer, "la producción masiva personalizada todavía es algo novedoso. Mañana será lo común".

O al menos eso es lo que se prevé. Por ahora, las empresas luchan por dar los primeros pasos hacia la producción masiva personalizada. Los que ya adoptaron el sistema, han estado trabajando en el proceso durante muchos años. Matthew Sigman es un ejecutivo de R. R. Donnelley & Sons, una editorial digital que imprime libros de textos a pedido de profesores universitarios. "El reto —advierte Sigman—es que si uno fabrica unidades individuales, su margen de error es igual a cero". ☐

FOTOGRAFIA ORIGINAL DE ARMANDO GALLO—RETINA

Viene de la página 1

Compañías tan distintas como BMW, Dell Computer, Levi Strauss, Mattel, McGraw-Hill, Wells Fargo y una serie de empresas dedicadas a Internet están adoptando la producción masiva personalizada para mantener una ventaja competitiva. La producción masiva personalizada puede llegar a ser el principio organizativo empresarial en el próximo siglo, a igual que la producción a gran escala lo ha sido en éste.

Ambas filosofías no podrían ser más diferentes. Mientras que la producción masiva establece una relación de uno a muchos, la producción masiva personalizada requiere un continuo diálogo con los clientes. La producción en masa depende de la relación entre costos y eficacia. Pero la producción masiva personalizada es una técnica flexible de manufactura que permite reducir los inventarios. Además, este último procedimiento tiene dos enormes ventajas sobre la producción masiva: está al servicio del cliente y usa al máximo las tecnologías de vanguardia.

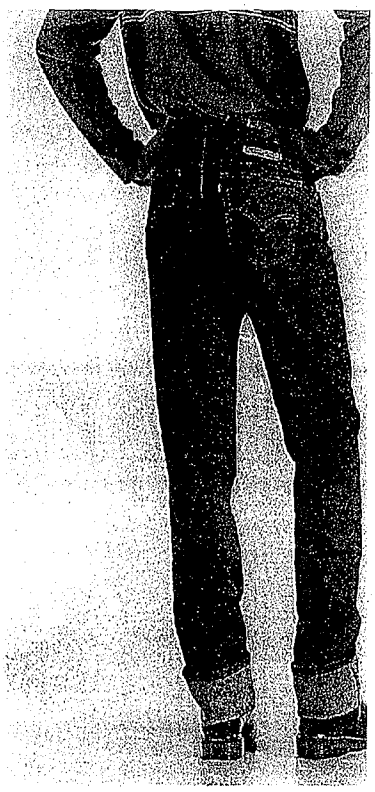
Los equipos de manufactura controlados por computadora y los robots industriales facilitan el reajuste rápido de las líneas de montaje. La proliferación de los códigos de barra permite seguirle la pista prácticamente a cada pieza y producto. Las bases de datos almacenan billones de bytes de información, incluyendo todo tipo de predilecciones individuales de los clientes. Las impresoras digitales facilitan el cambio de emba-laje sobre la marcha. Los *software* de logística y de gestión de cadenas de suministros coordinan la producción y la distribución. Y finalmente está Internet, que permite relacionar todas estos aspectos tan dispares. Joseph Pine, autor del libro pionero sobre la producción masiva personalizada, dice: "Cualquier cosa que usted pueda digpaq). Mientras otros fabricantes de computadoras luchan para obtener ganancias, Dell continúa registrando cifras récords: en el último trimestre sus ventas aumentaron un 54% y las ganancias un 62%.

El triunfo de Dell no es tanto tecnológico, sino organizativo. Dell mantiene altos márgenes de ganancias al reducir sus inventarios. Los componentes de computadoras pierden su valor a un ritmo de un 1% semanal, por lo que Dell prefiere no acumularlos. La clave del sistema reside en garantizar que se trasladen las piezas y los productos adecuados al lugar apropiado en el momento preciso. Para lograr esto, Dell usa un *software* muy sofisticado que recopila la información de los clientes y la distribuye a las divisiones de la empresa que la requieren. Cuando se recibe un pedido, los datos se transmiten rápidamente, por ejemplo, a los proveedores de discos duros o a la planta de la fábrica, donde los ensambladores configuran la computadora deseada por el comprador.

El resultado es una organización entera controlada por los pedidos de los consumidores individuales, una organización que realiza más operaciones vía Internet que ninguna otra. El futuro de Dell no depende de chips o módems más rápidos. Depende de la destreza en el uso de la producción masiva personalizada y de la agilidad con que se transmite el flujo de información.

No es sorprendente que una compañía tecnológica líder como Dell esté usando los recursos que ofrecen el *software* o Internet de una manera tan innovadora. Lo que es asombroso es el grado en que otras compañías de otros sectores están adoptando los procedimientos de la producción masiva personalizada.

Observe el caso de Mattel. A partir de octubre las niñas van a poder visitar el sitio de Internet barbie.com



El poder ahora está en manos del cliente y no del fabricante.

italizar, puede hacerse a la medida".

Gracias a Internet, las compañías pueden muy fácilmente transmitir un pedido realizado *online* a la planta fabril. Internet también permite una comunicación directa entre manufactura y marketing. Pero, sobre todo, Internet facilita a las compañías la comunicación individual con sus clientes, para poder saber cuáles son sus preferencias y poder complacerlos. Y viceversa. Internet también es a menudo el lugar por excelencia para que los clientes averigüen qué empresa les ofrece lo mejor: si no les convence lo que ofrece una compañía, su competidor se encuentra a sólo un "click" de distancia con el ratón. Combínelo con la producción masiva personalizada, y la naturaleza de la relación entre una empresa y sus clientes habrá cambiado para siempre. Gran parte del poder que antes estaba en manos de las compañías, ahora ha pasado a los clientes. Si una empresa no puede vender productos hechos a la medida, tiene problemas.

Hoy en día los competidores pueden copiar las innovaciones más rápido que nunca. Mientras tanto, los consumidores están exigiendo más opciones. El gurú del marketing Regis McKenna declara: "En Estados Unidos, la posibilidad de elección se ha convertido en algo más importante que la marca". Ya no son las grandes marcas como Coca-Cola y Microsoft las que copan el mercado, si no aquellas que se podrían agrupar bajo la clasificación de "otras". Hoy las compañías están tratando de producir algo particular para cada uno de nosotros. El ejemplo mejor y más conocido de la producción masiva personalizada es Dell Computer, que tiene una relación directa con los clientes y hace sólo computadoras personales a pedido. Todos, desde Compaq hasta IBM, están luchando por copiar el modelo de Dell.

Y tienen buenas razones para hacerlo. En el último trimestre, Dell superó a IBM, arrebatándole el segundo lugar en la cuota de mercado de las PC (detrás de Com-

y diseñar su propia amiga para Barbie. Podrán elegir el color de piel, de los ojos, el peinado, así como el pelo, la ropa, los accesorios y el nombre de la muñeca (en un principio habrá 6.000 variantes). Incluso podrán llenar un formulario con preguntas sobre las preferencias de su muñeca. Cuando el pedido llegue por correo, las niñas verán el nombre de la muñeca impreso en el paquete, junto con un párrafo generado por computadora sobre la personalidad de su muñeca.

Ofrecer un producto así hubiera sido casi imposible sin Internet. Al igual que Dell, Mattel debe usar un *software* de manufactura y logística de alta precisión para poder asegurar que los pedidos recibidos en la red sean distribuidos a las divisiones de la compañía que los precisan. "La personalización es un sueño que hemos tenido durante muchos años —dice la vicepresidente de marketing Anne Parducci, que piensa que las Barbies hechas a la medida puede convertirse en uno de los juguetes más atractivos del año que viene—. Vamos a crear una base de datos con los nombres de estas niñas para establecer una relación directa con cada una de ellas".

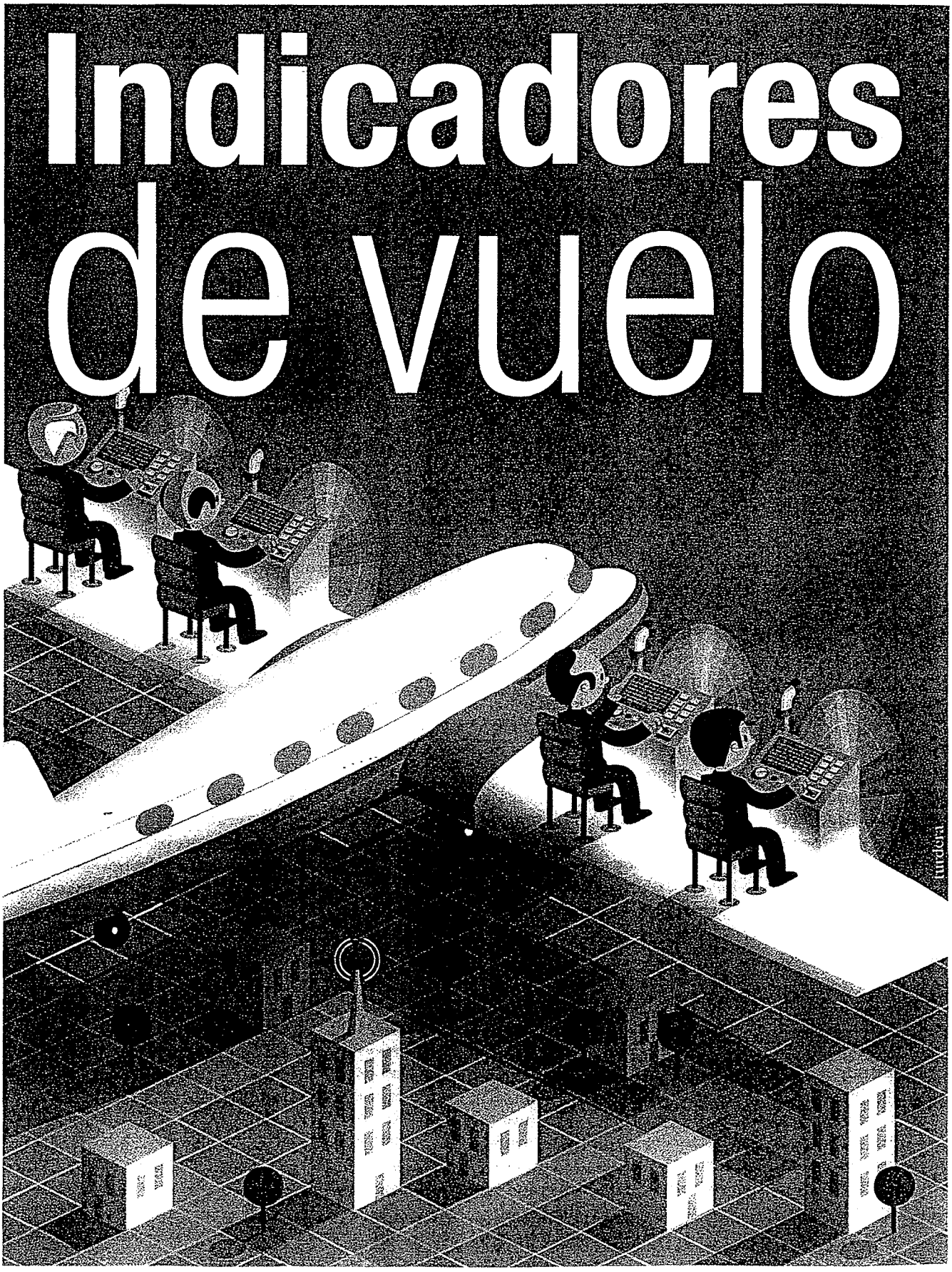
A Levi Strauss también le gusta dar a sus clientes la posibilidad de jugar a ser diseñadores de moda. Con el lema "Personal Pair", hace ya cuatro años que la empresa fabrica *jeans* ajustados al entalle de las mujeres. En octubre, Levi's lanzará una versión más amplia llamada "Original Spin", que ofrecerá más opciones y *jeans* para hombres. Con la ayuda de un asistente de ventas, los clientes podrán crear los *jeans* que deseen, a partir de una selección entre seis colores, tres modelos básicos, cinco aperturas de pierna diferentes y dos tipos de bragueta. Luego se medirán la cintura y la entrepierna. Más tarde se probarán un modelo básico para asegurarse que les gusta cómo les queda, antes de

Tu entalle

Levi's le ofrecerá 750 versiones de jeans. Los clientes pueden combinar seis colores diferentes, tres cortes, cinco aperturas de pierna y dos tipos de bragueta para crear los pantalones perfectos.

FOTOGRAFIA DE LAURIE STEINER

Indicadores de vuelo



El Balanced Scorecard es la información de que disponen, en su cabina de mando, los pilotos de una empresa. Pero, si bien la conducción es responsabilidad de pocos, la estrategia es una tarea de todos. **Entrevista con David Norton, por Stuart Crainer.**

El Balanced Scorecard (BSC), conocido en español como Cuadro de Mando Integral, vio la luz a principios de los '90. David Norton, cofundador de la consultora Renaissance Solutions, y Robert S. Kaplan, profesor de la Escuela de Negocios de Harvard, dieron forma al concepto en un trabajo de investigación patrocinado por KPMG, como resultado del cual publicaron en la *Harvard Business Review*, en enero de 1993, el artículo "The Balanced Scorecard". El mensaje que enviaban a los gerentes era sencillo: lo que miden es lo que obtienen.

Kaplan y Norton compararon la conducción de una empresa con el pilotaje de un avión. Un piloto que cuenta con un único indicador no vuela seguro, necesita disponer de mayor información. El BSC les permitía a los altos ejecutivos considerar todos los indicadores operacionales importantes en conjunto, y comprobar si las mejoras obtenidas en un área lo eran a expensas de otra.

Se trataba, esencialmente, de "balancear" cuatro elementos: la perspectiva del cliente (cómo percibe éste a la empresa); la perspectiva interna (en qué debería sobresalir la compañía); la perspectiva de la innovación y el aprendizaje (si se puede seguir mejorando y creando valor), y la perspectiva financiera (cómo nos ven los accionistas).

Cuando toda la energía, la atención y los indicadores están al servicio de estas cuatro dimensiones, y los indicadores se aplican a la estrategia de la compañía, el negocio empieza a ser impulsado por su misión y no por el rendimiento financiero de corto plazo. Esta era la idea central.

Más de una década después, ha surgido alrededor del BSC toda una industria. Los libros de Kaplan y Norton—*The Balanced Scorecard, The Strategy-Focused Organization, Strategy Maps y Alignment*— son auténticos best-sellers, y Balanced Scorecard Collaborative, división de la empresa de consultoría, investigación y educación Palladium, que ayuda a las compañías a utilizar el BSC, tiene oficinas y afiliadas en todo el mundo.

Stuart Crainer, editor de *Business Strategy Review,* conversó con David Norton sobre estos temas.

¿Cuál es el aporte de *Alignment*, su nuevo libro, respecto de sus trabajos anteriores?

La idea básica es que las organizaciones carecen de sistemas para gestionar la estrategia. Y esto se debe, sobre todo, a que no tienen un marco para describirla. Lo que logramos con el BSC fue resolver este primer problema de cómo describir la estrategia de una organización. Así, nuestro libro *The Strategy Map* indica el camino, y *The Balanced Scorecard* lo convierte en un esquema de medición. Nuestro tercer

Un consultor enamorado de la gestión

DAVID P. NORTON fue el creador, con Robert S. Kaplan, del concepto de Balanced Scorecard (BSC), que ambos dieron a conocer en un artículo publicado en 1993 en *Harvard Business Review*, y explicaron con mayor profundidad en *The Balanced Scorecard: Translating Strategy Into Action* (Harvard Business School Publishing, 1996).

En su destacada trayectoria como consultor, Norton encabezó diversas firmas. En 1988 lanzó en Holanda, en sociedad con Richard Nolan, la consultora de IT Nolan, Norton & Co. Tras la venta de esta empresa a KPMG, Norton fundó, en 1993, Renaissance Solutions, Inc. y, ya a fines de la década, Balanced Scorecard Collaborative, Inc.

Actualmente comparte con David Lubin la presidencia de Palladium, una compañía especializada en ejecución de la estrategia.

Stuart Crainer es el editor de *Business Strategy Review.*

libro, *The Strategy-Focused Organization,* toma el esquema de medición y lo vincula con la forma en que se gestionan la organización, el presupuesto, los objetivos de la gente y su compensación salarial, alineando todo esto con la estrategia.

Alignment es una pieza importante del sistema de gestión estratégica. El gran tema subyacente es el diseño organizacional. Si uno se retrotrae a la teoría clásica de las escuelas de negocios, el argumento es que la estructura sigue a la estrategia. En el 2000 surgió una nueva economía que estaba, estructuralmente, en disonancia con todo lo anterior. La subcontratación, el capital intelectual, la centralización en el cliente, requieren diferentes tipos de estructuras. La estructura es probablemente el mayor impedimento para el cambio. No se puede conseguir que una organización se reorganice sólo para ejecutar una estrategia. En nuestro "Hall de la Fama" tenemos unas 60 compañías que ejecutaron su estrategia y utilizaron el enfoque del BSC, pero muy pocas se reorganizaron para llevarlo a cabo. Bob Kaplan y yo empezamos a preguntarnos por qué, si la estructura sigue a la estrategia, las compañías no se están reorganizando.

¿Cuál es la respuesta?

Aceptan a la organización tal cual es, porque hay razones para que exista y hay mucho de bueno en ello. En vez de jugar con la estructura, están jugando con el sistema. Están definiendo un proceso de planificación y de compensación por incentivos que atraviesa toda la organización. Por lo tanto, todo lo relacionado con la gestión de la estrategia en estas compañías exitosas tiene que ver, básicamente, con la manera de penetrar las estructuras de poder y atravesar los silos. *Alignment* es el enfoque de la organización: cómo ejecutar la estrategia sin reorganizarse.

¿Lo sorprendió el enorme éxito internacional del BSC?

Por supuesto. Muy pocas ideas se imponen. Uno las examina y se pregunta qué hay alrededor de ellas. Y creo que para que una idea tenga un poder duradero, debe surgir en el momento oportuno y en el lugar adecuado. El momento oportuno fue la nueva economía, que tornó obsoletos los sistemas de gestión y medición que utilizábamos, porque eran jerárquicos y generaban silos, y lo que la nueva economía requería era que fuéramos multifuncionales y holísticos. De modo que había una necesidad. Y el lugar adecuado fue el sistema de medición.

"La gestión de la estrategia en las compañías exitosas tiene que ver, básicamente, con la manera de penetrar las estructuras de poder y atravesar los silos."

La herramienta que todo gerente utiliza para organizar su programa de gestión del desempeño son los indicadores que establece. Unimos estos dos conceptos, y llegamos a la idea de balancear los indicadores financieros y no financieros. Y, por supuesto, el nombre fue el apropiado, ya que hablaba de balance y de puntaje; decía claramente lo que era. Pero lo que lo hizo funcionar fue el pensamiento subyacente. Inicialmente, la idea de balancear se vinculaba con cuatro cosas y sólo una era financiera. Luego se enfatizó en la relación causa-efecto entre esas cuatro cosas. Lo que realmente describe el BSC es cómo se puede crear valor. Clientes felices generan accionistas felices. Entonces, ¿cómo complacer a los clientes? Esto se logra a través de procesos; investigando y desarrollando mejores productos, y atendiéndolos mejor. ¿Cómo obtener mejores procesos? La respuesta está en las habilidades de la gente y la confianza en el clima. Un buen clima lleva a desarrollar buenos procesos y esto conduce a clientes felices y, finalmente, a accionistas felices. Este modelo causa-efecto se sostuvo en el tiempo. Las empresas pueden ahora describir sus estrategias, algo que antes no podían hacer. Intentaban gestionarlas pero no podían describirlas; era como disparar en la oscuridad.

¿Quién creó la expresión "balanced scorecard"?

Bob Kaplan y yo liderábamos el grupo de investigación que empezó con el objetivo de encontrar un mejor camino para gestionar. Las compañías occidentales en general, y las norteamericanas en particular, estaban siendo duramente derrotadas por las japonesas, y se hablaba mucho del cortoplacismo norteamericano y su foco en las finanzas trimestrales. Era nuestra preocupación central. Buscábamos un camino mejor. Nuestra primera conclusión fue que no se podía tirar por la borda lo financiero, porque es la savia, pero había que encontrar la forma de orientarnos también al largo plazo. La idea de balancear llegó naturalmente. Estábamos balanceando el largo plazo y el corto plazo, los indicadores de tendencia y los de resultados.

¿Cuál fue la respuesta que obtuvo en las distintas regiones?

Bain realiza una encuesta sobre las herramientas que utilizan los ge-

rentes. La más reciente dice que, en los Estados Unidos y Europa Occidental, el 60 por ciento de las empresas emplea el BSC. Creo que en América Latina es un 40 por ciento, y en Asia alrededor de un tercio.

Ahora tenemos el "Hall de la Fama" del BSC, en el que hay más de 60 empresas de todos los rincones del planeta. Incorporamos a nuestro enfoque algunas presunciones culturales, como por ejemplo que la estrategia es una tarea de todos y debería involucrar a toda la fuerza laboral. Yo tenía algunas dudas respecto de cómo caería esto en Europa Occidental, donde los sindicatos son tan fuertes, y en sociedades más jerárquicas, como las de América Latina. Pero descubrimos que es lo suficientemente flexible como para adaptarse a las diferencias culturales. Al señalar que la estrategia es una tarea de todos, no estamos diciendo cómo hacerlo, sino indicando la importancia de que el proceso abarque a la fuerza laboral.

Recuerdo que, durante una charla que di en Sudáfrica, alguien me dijo que el 40 por ciento de sus trabajadores eran analfabetos. ¿Cómo vamos a educarlos en la estrategia?, me preguntó. Antes de que yo balbuceara una respuesta, otra persona levantó la mano y explicó que en su compañía tenían el mismo problema, y sin embargo habían aplicado exitosamente el enfoque. Elegían otros medios para comunicarse con las personas analfabetas. De modo que es posible adaptarse.

Cuando ve estadísticas que dicen que el 60 por ciento de las empresas está utilizando el BSC, ¿cuál es su reacción? Seguramente le preocupa la posibilidad de que un 80 por ciento de ellas no lo esté haciendo de la manera adecuada.

Así es. Se estima que el 50 por ciento está haciendo las cosas en forma incorrecta. Cuando hablamos de BSC nos referimos a un sistema para gestionar la estrategia que usa el BSC como marco organizativo. Un 50 por ciento de las empresas que dicen estar utilizando el BSC está tratando de hacerlo bien, pero el resto lo está haciendo de otro modo. Mi mayor temor es encontrarme algún día con un artículo que diga que el 70 por ciento de los usuarios de BSC fracasa. Eso le sucedió a la reingeniería, pese a que tenía bases sólidas. La reingeniería se relacionaba con reestructurar, es decir con un proceso más que con una visión funcional de las compañías. Pero después empezamos a ver informes que decían que estaba fracasando. Cuando alguien hablaba de "reingeniería", nadie se atrevía a aclarar que en realidad la reingeniería era otra cosa. Nosotros defendimos el Balanced Scorecard como marca, al mantenerlo asociado a nuestros nombres. Y creamos una organización capaz de ejecutarlo en la forma correcta. Esto nos permite, además, aprender de nuestros clientes, en un camino de doble vía.

> "Me preocupaba cómo caería esto en Europa Occidental, donde los sindicatos son tan fuertes, y en sociedades más jerárquicas, como las de América Latina."

Creo que los creadores de la reingeniería escribieron el libro y probablemente se sintieron sobrepasados por la respuesta. Nosotros empezamos con un marco de mediciones y luego, cuando vimos que se lo utilizaba para gestionar la estrategia, nos dimos cuenta de que estábamos ante algo más grande, que no era un marco sino un sistema de gestión. Creo que hicimos un buen trabajo alrededor del rol del capital humano en las organizaciones. La alineación y los mapas estratégicos están basados en la idea original. Nos permitieron avanzar y hacer que todo fuera más flexible. Llevamos el enfoque a los nichos y desarrollamos, al mismo tiempo, un cuerpo de conocimiento.

El "Hall de la Fama" del BSC es lo que aleja mis temores. Allí hay más de 60 compañías que hicieron las cosas bien. Entonces, aunque mucha gente fracase, si tengo 60 compañías alrededor del mundo, de todas las industrias y nichos, del sector público y del sector privado, que lo hicieron exitosamente, el mensaje es claro: se puede lograr, si uno sabe cómo. El Ministerio de Defensa del Reino Unido está en el "Hall de la Fama", al igual que la Real Policía Montada de Canadá, la Real Fuerza Aérea de Noruega y el Ejército de los Estados Unidos.

¿Cuál es la diferencia cuando lo utiliza el sector público?

La principal diferencia está en el beneficio. En el sector privado, el beneficio es financiero, es el retorno sobre la inversión para los accionistas. En el sector público, en cambio, las organizaciones ponen el foco en la misión. El objetivo primordial es diferente; pero, una vez definida la estrategia, hay procesos, clientes, personas y tecnologías que deben funcionar para que ese objetivo se alcance. De modo que es exactamente lo mismo.

¿Eso significa que hay un amplio espacio para el crecimiento del concepto en el sector público?

En cierto sentido, la idea se adapta mejor al sector público, ya que en el privado uno puede volverse descuidado y aún así no perder el con-

trol de su organización, porque la disciplina financiera lo obligará a poner las cosas en orden. En el sector público, si clarifica su misión y la vincula con los indicadores que impulsan las acciones, esto resulta muy poderoso. La nueva disciplina consiste en preguntarse: ¿cómo mido el cumplimiento de mi misión? Lo obliga a considerar esto. El idioma de las mediciones es muy poderoso para ello. Si mi tarea es la prevención de la diabetes, ¿cómo sé que el dinero de las donaciones está siendo bien utilizado?

A las empresas aún hoy se les critica su cortoplacismo y su excesivo énfasis en el valor para el accionista.

Sí, el informe trimestral sigue siendo el ciclo de vida de las organizaciones, especialmente en los Estados Unidos. Por lo tanto, la batalla todavía no se ganó. Cuando estalló la burbuja de Internet, muchas organizaciones abandonaron la senda de crecimiento, volvieron al modo de supervivencia y recortaron costos. En aquellos días les pregunté a algunos directivos si también se habían desprendido del BSC, para ahorrar costos, y si lo consideraban sólo una herramienta de crecimiento. Su respuesta me sorprendió agradablemente. Los directorios les reclamaban programas consistentes de reducción de costos. De no haber tenido el BSC, hubieran debido analizar los items del presupuesto y recortar todo lo que fuera discrecional, incluyendo la mitad de las iniciativas requeridas para la estrategia de largo plazo.

Creo que el BSC demostró ser lo suficientemente flexible como para permitir que una organización se mantenga balanceada, aun bajo las presiones de corto plazo.

Una de las cosas en las que estamos trabajando es el vínculo entre estrategia y presupuesto. La estrategia necesita fondos para funcionar, pero se trata de procesos prácticamente incompatibles. La estrategia es visionaria; se vincula con objetivos desmesurados, tales como duplicar las ventas en tres años. El presupuesto es conservador; nadie quiere presupuestos que digan que se duplicarán las ventas, porque esto puede suceder o no. Los presupuestos registran por separado los programas de capacitación en los que gastamos, y los sistemas de computación con los que nos capitalizamos. Los sistemas estratégicos dicen que esto va junto, porque si capacitamos a la gente y no le damos nueva tecnología, fracasará, y también a la inversa.

"El objetivo es diferente, pero, una vez definida la estrategia, hay procesos, clientes, personas y tecnologías que deben funcionar para alcanzarlo."

Por eso estamos trabajando en una idea que se basa en los conceptos económicos de Opex (gastos operativos), Capex (gastos de capital), y lo que nosotros llamamos Stratex (gastos estratégicos). Es una idea que provino de una de las empresas que investigamos, en Finlan-

dia. Se trata de aislar, en el sistema de gestión estratégica, las iniciativas y las inversiones necesarias para respaldar la estrategia. Hay un nuevo ítem, llamado Stratex, que se considera y gestiona por separado, tal como se hace con I&D. Stratex es responsabilidad del comité ejecutivo de la organización, que es el que aprueba el presupuesto. Lo interesante aquí es la creación de un nuevo concepto dentro del presupuesto. Habrá que lograr que los directores financieros vean el valor que encierra, y sean capaces de aislar sus inversiones estratégicas. Poder gestionar esto como entidad única, dentro del proceso de gestión financiera, es definitivamente el nuevo territorio.

¿Cómo se define usted: como un educador, un consultor o un emprendedor?

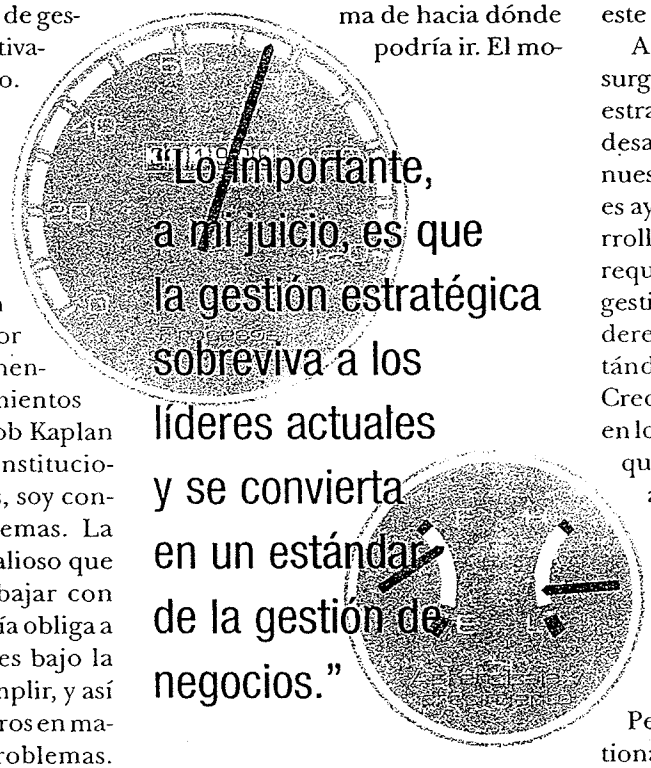
Como una combinación de esas tres cosas. Tengo un doctorado en negocios en Harvard, y por eso poseo la estructura mental y el marco de conocimientos requeridos, y mi socio Bob Kaplan hizo toda su carrera en instituciones académicas. Además, soy consultor y resuelvo problemas. La mayor parte de todo lo valioso que aprendí provino de trabajar con mis clientes. La consultoría obliga a resolver problemas reales bajo la presión de tener que cumplir, y así obtiene lo mejor de nosotros en materia de resolución de problemas. Tener una organización permite repetir esto muchas veces, ampliar el alcance al mundo entero, y entender lo que está pasando en Corea, Brasil o Europa.

Tal vez la reunión de estas tres cosas sea el secreto para que una marca crezca, junto con las ideas. Si no tuviéramos raíces académicas, no podríamos pensar en el cuerpo de conocimiento, ni desarrollar y capacitar a las organizaciones. Si no fuéramos consultores, no podríamos comprobar los resultados de las ideas. Y si no tuviéramos una organización, careceríamos del alcance necesario para ser relevantes. Hay un cuarto punto, al que personalmente me dedico poco, que es la investigación. Si usted está en la vanguardia, debe preocuparse porque sus ideas evolucionen. De manera que si combinamos estas cuatro cosas, tenemos una receta para desarrollar el capital intelectual que ayudará a resolver los problemas del mundo real y a crear verdadero valor.

¿Cómo ve al BSC de aquí a diez años?

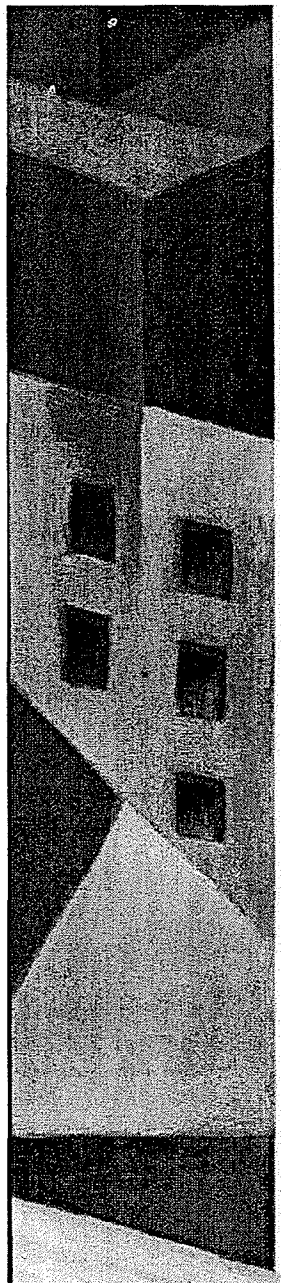
Tengo una visión clarísima de hacia dónde podría ir. El movimiento de la calidad me sirve de referencia. Este tipo de ideas se mueve a través de sistemas, en procesos que duran 25 o 30 años. La calidad es la mejor analogía porque es una idea con fundamentos estadísticos, que creó una ventaja competitiva para las empresas que la supieron aplicar, y se convirtió en disciplina en las organizaciones que requieren un conocimiento especial y la certificación de sus procesos. Por lo tanto, veo paralelos con el BSC en gestión estratégica. El BSC es una idea que surgió en el momento oportuno y en el lugar adecuado, y está creando ventajas competitivas para las organizaciones, pues no es fácil gestionar la estrategia; nueve de cada diez organizaciones fracasan en el intento. Al igual que la calidad, brinda una ventaja y es posible aprenderlo. Me gustaría poder certificar que los ejecutivos de determinadas compañías tienen cinturón negro en gestión estratégica. No importa cómo los llamemos, tal vez "profesionales en gestión estratégica", lo importante es que habrán contribuido a demostrar que, si se lo sabe aplicar, este enfoque funciona.

Ahora estamos presenciando el surgimiento de la oficina de gestión estratégica. Nuestra meta es seguir desarrollando esta capacidad, y nuestro objetivo como organización es ayudar a las empresas a que desarrollen por su cuenta las habilidades requeridas. Lo importante es que la gestión estratégica sobreviva a los líderes actuales y se convierta en un estándar de la gestión de negocios. Creo que hay una tendencia a que, en los próximos tres a cinco años, adquiera una apariencia muy similar al movimiento de la calidad. La lógica dice que hay que gestionar la estrategia. Todos tienen una estrategia. Es responsabilidad de los que conducen ejecutarla; si no pueden hacerlo, deberían cambiar de trabajo. Pero no hay un proceso para gestionar la estrategia. Muchos ejecutivos todavía no comprendieron que no pueden perder algo que nunca tuvieron. Nuestra tarea es llevar este mensaje al mundo. ●



Breakthrough innovations in operations – not just steady improvement – can destroy competitors and shake up industries. Such advances don't have to be as rare as they are.

STEVE BARBARIA



Deep Change

How Operational Innovation Can Transform Your Company

by Michael Hammer

IN 1991, Progressive Insurance, an automobile insurer based in Mayfield Village, Ohio, had approximately $1.3 billion in sales. By 2002, that figure had grown to $9.5 billion. What fashionable strategies did Progressive employ to achieve sevenfold growth in just over a decade? Was it positioned in a high-growth industry? Hardly. Auto insurance is a mature, 100-year-old industry that grows with GDP. Did it diversify into new businesses? No, Progressive's business was and is overwhelmingly concentrated in consumer auto insurance. Did it go global? Again, no. Progressive operates only in the United States.

Neither did it grow through acquisitions or clever marketing schemes. For years, Progressive did little advertising, and some of its campaigns were notably unsuccessful. It didn't unveil a slew of new products. Nor did it grow at the expense of its margins, even when it set low prices. The proof is Progressive's combined ratio (expenses plus claims payouts, divided by premiums), the measure of

financial performance in the insurance industry. Most auto insurers have combined ratios that fluctuate around 102% – that is, they run a 2% loss on their underwriting activities and recover the loss with investment income.

Operational innovation is truly deep change, affecting the very essence of a company: how its work is done. The effects ripple outward to all aspects of the enterprise.

By contrast, Progressive's combined ratio fluctuates around 96%. The company's growth has not only been dramatic – it is now the country's third largest auto insurer – it has also been profitable.

The secret of Progressive's success is maddeningly simple: It outoperated its competitors. By offering lower prices and better service than its rivals, it simply took their customers away. And what enabled Progressive to have better prices and service was *operational innovation,* the invention and deployment of new ways of doing work.

Operational innovation should not be confused with operational improvement or operational excellence. Those terms refer to achieving high performance via existing modes of operation: ensuring that work is done as it ought to be to reduce errors, costs, and delays but without fundamentally changing how that work gets accomplished. Operational innovation means coming up with entirely new ways of filling orders, developing products, providing customer service, or doing any other activity that an enterprise performs.

Operational innovation has been central to some of the greatest success stories in recent business history, including Wal-Mart, Toyota, and Dell. Wal-Mart is now the largest organization in the world, and it owns one of the world's strongest brands. Between 1972 and 1992, Wal-Mart went from $44 million in sales to $44 billion, powering past Sears and Kmart with faster growth, higher profits, and lower prices. How did it score that hat trick? Wal-Mart pioneered a great many innovations in how it purchased and distributed goods. One of the best known of these is cross-docking, in which goods trucked to a distribution center from suppliers are immediately transferred to trucks bound for stores – without ever being placed into storage. Cross-docking and companion innovations led to lower inventory levels and lower operating costs, which Wal-Mart translated into lower prices. The rest is history. Although operational innovation wasn't the sole ingredient in Wal-Mart's success – its culture, strategy, human resource policies, and a host of other elements (including operational excellence) were also critical – it was the foundation on which the company was built.

Similar observations can be made about Dell and Toyota, organizations whose operational innovations have become proper nouns: the Dell Business Model and the Toyota Production System. Each of these three companies fundamentally rethought how to do work in its industry. Their operational innovations dislodged some of the mightiest corporations in the history of capitalism, including Sears, General Motors, and IBM.

These stories are well known for two reasons. First, the stories are worth telling: Operational innovations fuel extraordinary results. But the stories are also repeated because there are, frankly, not many of them. Operational innovation is rare. By my estimate, no more than 10% of large enterprises have made a serious and successful effort at it. And that shouldn't be. Executives who understand how operational innovation happens – and who also understand the cultural and organizational barriers that prevent it from happening more often – can add to their strategic arsenal one of the most powerful competitive weapons in existence.

The Payoffs

For most of its history, Progressive focused on high-risk drivers, a market that it served profitably through extremely precise pricing. But in the early 1990s, the insurer believed that much larger companies were about to enter this niche and emulate its approach to pricing; the company's managers realized it couldn't compete against larger players on a level playing field. So Progressive decided to win the game by changing the rules. It reinvented claims processing to lower its costs and boost customer satisfaction and retention.

The company introduced what it calls Immediate Response claims handling: A claimant can reach a Progressive representative by phone 24 hours a day, and the representative then schedules a time when an adjuster will inspect the vehicle. Adjusters no longer work out of offices from nine to five but out of mobile claims vans. Instead of taking between seven and ten days for an adjuster to see the vehicle, Progressive's target is now just nine hours. The adjuster not only examines the vehicle but also prepares an on-site estimate of the damage and, if possible, writes a check on the spot.

This approach has many benefits. Claimants get faster service with less hassle, which means they're less likely to abandon Progressive because of an unsatisfactory claims

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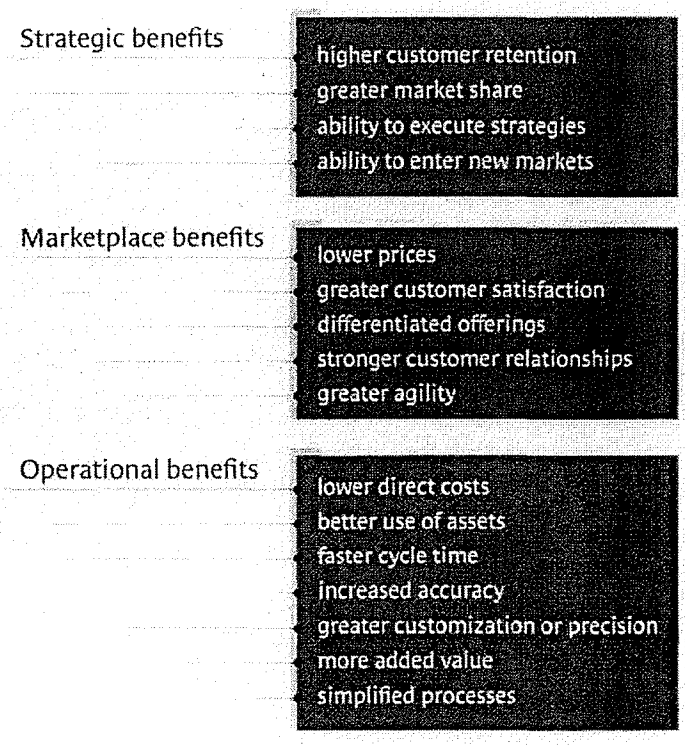
A Powerful Weapon



Innovative operations can result in direct performance improvements (faster cycle time and lower costs), which lead to superior market performance (greater customer satisfaction and more highly differentiated products). And improved market performance yields a host of strategic payoffs, from higher customer retention to the ability to penetrate new markets.

800 number or visit its Web site and, by providing a small amount of information, compare Progressive's rates with those of three competitors. (Because insurance is a regulated industry, rates are on file with state insurance commissioners.) This offer has attracted customers in droves.

The company has also devised even better ways of assessing an applicant's risk profile to calculate the right rate to quote. When Progressive realized that an applicant's credit rating was a good proxy for responsible driving behavior, it changed its application process. Now its computer systems automatically contact those of a credit agency, and the applicant's credit score is factored into its pricing calculation. More accurate pricing translates into increased underwriting profit. Put these all together, and Progressive's remarkable growth becomes comprehensible.

Other companies have made similar performance gains through operational innovations. Beginning in 1994, Eastern Electric, a UK power utility, created a process that reduced the time needed to initiate electrical service by 90% and its cost by 66%. In the late 1990s, IBM invented a new product-development process that caused a 75% reduction in the time to develop new products, a 45% reduction in development expenses, and a 26% increase in customer satisfaction with these new products. In 2002, Shell Lubricants reinvented its order fulfillment process by replacing a group of people who handled different parts of an order with one individual who does it all. As a result, Shell has cut the cycle time of turning an order into cash by 75%, reduced operating expenses by 45%, and boosted customer satisfaction 105% – all by introducing a new way of handling orders. Time, cost, and customer satisfaction – the dimensions of performance shaped by operations – get major boosts from operational innovation.

experience. And the shortened cycle time reduced Progressive's costs dramatically. The cost of storing a damaged vehicle or renting a replacement car for one day – around $28 – is roughly equal to the expected underwriting profit on a six-month policy. It's not hard to calculate the savings this translates into for a company that handles more than 10,000 claims each day. Other benefits for Progressive are an improved ability to detect fraud (because it is easier to conduct an accident investigation before skid marks wash away and witnesses leave the scene), lower operating costs (because fewer people are involved in handling the claim), and a reduction in claim payouts (because claimants often accept less money if it's given sooner and with less travail).

No single innovation conveys a lasting advantage, however. In addition to Immediate Response, Progressive has also introduced a system that allows customers to call an

Organizational Barriers

Compared with most of the other ways that managers try to stimulate growth – technology investments, acquisitions, major marketing campaigns, and the like – operational innovation is relatively reliable and low cost. So why don't more companies embrace it?

The question is particularly significant because operational innovation is needed now more than ever. Most industries today are struggling with low-growth, even stagnant, markets. Overcapacity is rampant, and competition – particularly global competition – is fierce. Virtually

all product and service offerings have become commodities, almost no one has any pricing power, and none of this is likely to change in the near future. In this environment, the only way to grow is to take market share from competitors by running rings around them: by operating at lower costs that can be turned into lower prices and by providing extraordinary levels of quality and service. In other words, the game must now be played on the field of operations.

Mere operational improvement is not enough to win the game. Excellence in execution can win a close game, but it can't break a game wide open and turn it into a rout. The only way to get and stay ahead of competitors is by executing in a totally different way—that is, through operational innovation.

But operational innovation entails a departure from familiar norms and requires major changes in how departments conduct their work and relate to one another. It is truly deep change, affecting the very essence of a company: how its work is done. The effects of operational innovation ripple outward to all aspects of the enterprise, from measurement and reward systems and job designs to organizational structure and managerial roles. Thus, it will never get off the ground without executive leadership. Yet senior managers rarely perceive operational innovation as an important endeavor, nor do they enthusiastically embrace it when others present it to them. Why not? The answers hinge on some unpleasant characteristics of contemporary corporate leadership.

Business culture undervalues operations. I have spoken with thousands of managers from hundreds of companies about operational innovation. Overwhelmingly, they've told me that their senior executives did not understand, support, or encourage it. As one manager said, "In our company, operations is not glamorous. Deals are." Making acquisitions, planning mergers, and buying and selling divisions will get the company's name and the CEO's picture in business magazines. Redesigning procurement or transforming product development will not, even though it might be much more important to the company's performance. Deals are easily explained to and understood by boards, shareholders, and the media. They offer the prospect of nearly immediate gratification, and the bold stroke of a deal is consistent with the modern image of the executive as someone who focuses on grand strategy and leaves operational details to others. The fact that the great majority of deals are unsuccessful does not deter executives from pursuing them.

Operations simply aren't sexy. One business school student recently observed to me, "There seems to be a hierarchy in the business world. Finance and strategy are at the top, marketing and sales occupy the middle tier, and operations is at the bottom." An insurance CEO once quipped that managers work hard at operations so they can be promoted to the executive level, where they can stop worrying about operations. A journalist at a prominent business magazine, assigned to do a story on operations, confessed that he thought it boring. This is the state of our business culture. The core, value-creating work of enterprises has become low status.

Operations are out of sight (and out of mind-set). At its heart, operations is a branch of engineering. It requires a skill set and a mind-set different from those needed in most other executive activities. Most senior managers focus on strategic planning, budgeting, capital allocation, financial management, mergers and acquisitions, personnel issues, regulatory concerns, and other macro issues, very different from the design work at the heart of operational innovation.

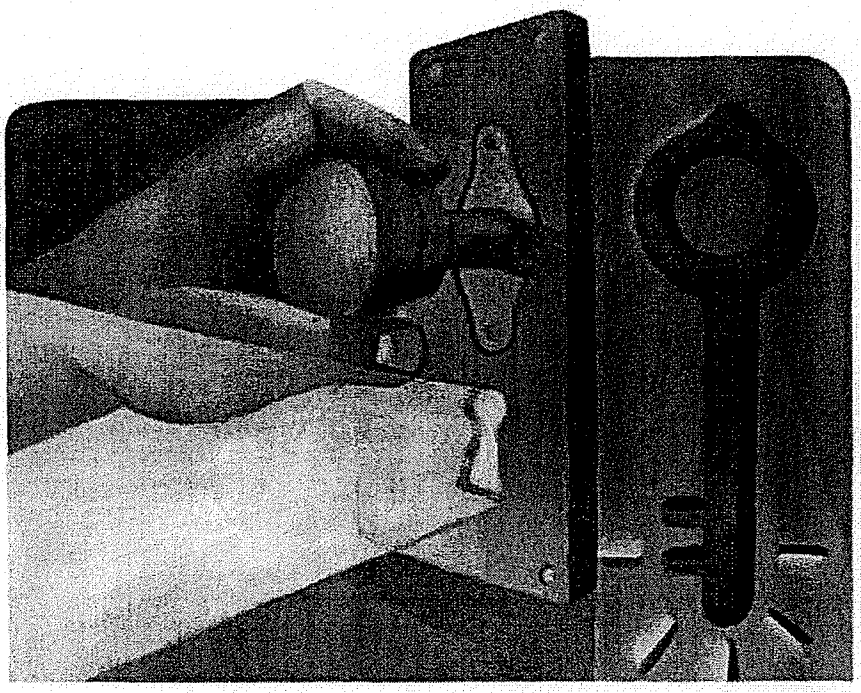
Many top managers are ignorant about operations and uninterested in learning more. They've ascended to the highest levels of the enterprise without ever getting their hands dirty. They enter the organization through finance, strategy, or marketing and build their reputations on work in these domains. When they move into their first general management role, they rely on others – plant managers, engineers, customer service leaders – to mind the details of the actual work. Their role is one of supervision, resource allocation, and direction – all vital, but all perched precariously on a foundation not grounded in the bedrock of the organization's real work.

> Operational innovation is by nature disruptive, so it should be concentrated in those activities with the greatest impact on an enterprise's strategic goals.

At a major semiconductor maker, for instance, a group of middle managers who were frustrated with the complexity and poor performance of their order fulfillment process decided to make a case for change to executive management. They created a two-page diagram illustrating the endless series of steps every order went through, the redundant moves of the product between factories and depots, the accumulations of inventory, and the enormous delays. When members of the company's executive committee saw it, they were incredulous: "We do *this*?"

It should not be surprising that executives without experience in operations do not look there for competitive advantage. The information they usually get does little to focus their attention on the mechanics of operations. How many executives receive data about order fulfillment cycle time, or the accuracy of customer service re-

sponses, or the cost of each procurement transaction, or the percentage of parts that are reused in new products? Indeed, in how many organizations is such information available at all? Financial data dominate the discourse in the modern organization, although operational performance is the driver of financial results.



Nobody owns it. No one holds the title Vice President of Operational Innovation; it is organizationally homeless. It doesn't fit into R&D, where product innovation is based. Functional line managers are too focused on meeting deadlines to have time for or interest in inventing new ways of doing things. What's more, important innovations are not limited to individual departments but involve end-to-end processes that cross departmental boundaries. Normal planning and budgeting focus on investments in new equipment, products, and services and take account of process improvement. It's a rare company whose budget or planning process explicitly looks for process breakthroughs. No wonder operational innovation has a hard time gaining traction in an organization.

This is particularly problematic because operational innovation can easily founder in a sea of competing but smaller change initiatives. It is all too common for enterprises today to have dozens – even hundreds – of operational improvement programs under way at any point in time. Some are technologically based, such as the implementation of enterprise resource planning (ERP), customer relationship management (CRM), or supply chain management (SCM) software systems. Others are centered on specific bodies of improvement techniques, such as Six Sigma quality or lean enterprise programs. Still others are defined in terms of outcomes, such as accelerating time to market or presenting a single face to customers, or focused on improving a particular aspect of the enterprise (procurement or customer service, for example). Each project typically has a narrow scope, a group of experts dedicated to it, and a sponsor whose enthusiasm is tolerated by his or her peers only as long as it is kept within bounds.

This kind of situation can cripple operational innovation because an organization has only so much capacity for change. If people are already juggling a great many improvement projects, they may conclude that they can't handle an innovation effort as well. Indeed, in a company consumed with improvement projects, the distinction between improvement and innovation may be lost. Improvement projects can also get in the way of innovation efforts by appearing to address similar issues. For instance, many companies implementing ERP or SCM systems merely use them to enhance existing processes. Real innovations in order fulfillment or supply chain management are also likely to involve these technologies, but they may be dismissed because, people think, "we're already doing ERP."

Making It Work

How do operational innovation efforts begin if no one is responsible for them and no formal channels for creating programs exist? Most often they start as grassroots movements, fostered by people sprinkled throughout organizations who are passionately committed to finding and exploiting opportunities for operational innovation. These catalysts take it upon themselves to find a leader who can grasp what they have in mind and then spearhead the innovation effort. The executive must have both the imagination and the charisma needed to drive major operational change.

Then the catalysts relentlessly campaign for the cause – confronting the executive with the inadequacies of existing operations and arranging for meetings with peers from other companies that have successfully implemented operational innovations. The campaign will be helped immensely if catalysts can tout existing pockets of operational innovation within their own organization. Maybe one plant implemented a new way of scheduling

production, or a customer service center used a CRM system in a new way, or a sales team created a new way to support customers. Examples like these will help convince a leader that operational innovation can work.

Once the top executive is convinced that operational innovation is worth pursuing, the organization needs to focus its efforts. Because operational innovation is by nature disruptive, it should be concentrated in those activities with the greatest impact on an enterprise's strategic goals.

Progressive, for instance, realized that the key to its profitable growth is customer retention because acquiring new customers through commission-based agents is very expensive. And the key to customer retention is making sure customers have rewarding interactions with the company. That's why Progressive concentrated on streamlining claims; making it a more pleasant experience for customers would directly affect overall performance. Many auto insurers, by contrast, view claims as a nuisance at best because it entails paying claimants. They consider it to be a low-priority activity that doesn't deserve attention.

Or consider how American Standard, the diversified manufacturer, decided where to focus its innovation efforts in the early 1990s. It had just survived a hostile takeover bid by going through a leveraged buyout, and leaders realized that servicing the debt would consume virtually all the company's available cash and starve product development efforts. Because a large amount of cash was tied up in inventories, the CEO mandated that the company would have to drive down its working capital and dramatically increase inventory turns. A program was instituted to transform manufacturing from a conventional push-based system to one pulled by actual demand using a system known as Demand Flow Manufacturing. The innovation paid off and led to a successful IPO a few years later.

Using similar analyses, other companies have pinpointed procurement, order fulfillment, new product development, post-sales customer support, and even budgeting as the place where innovation would have the greatest effect on achieving key strategic goals. While operational innovation need not be confined to just one area, most companies find it prudent to limit their innovation programs to no more than two or three major efforts at a time. To undertake more would probably consume too many resources and create too much organizational disruption.

After selecting the area for innovation, the company must set stretch performance goals. At American Standard, the goal was to triple its inventory turns; at Progressive, to initiate claims within nine hours. Absent such specific targets, innovation efforts are likely to drift or degenerate into incremental improvement projects. Only a daunting target – clearly unattainable through existing modes of operation – will stimulate radical thinking and willingness to overturn tradition.

Inventing a new way of operating that achieves the target need not be simply a matter of crossing your fingers and hoping for inspiration. Following these suggestions should accelerate your efforts.

Reimagining Processes

Dimension of work	Example
What results the work delivers	Progressive Insurance increased market share by informing customers of its competitors' rates as well as its own.
Who performs the work	Shell Lubricants improved cycle time by changing its order fulfillment process so that one person handles all aspects of an order (instead of seven people each working on one aspect).
Where the work is performed	Taco Bell cut costs by preparing ingredients in commissaries rather than in individual restaurants.
When the work is performed	A major hospital responded to physician referrals more quickly by assigning a bed after, rather than before, agreeing to accept a patient.
Whether the work is performed	Wal-Mart cut costs by cross-docking from truck to truck instead of storing goods in warehouses.
What information the work employs	A consumer packaged-goods manufacturer reduced inventory by basing its production scheduling on actual orders rather than on forecasts.
How thoroughly the work is performed	Harvard Pilgrim Health Care cuts costs by carefully analyzing patients to identify those who need intervention before a crisis strikes.

Look for role models outside your industry. Benchmarking within your own industry is unlikely to uncover breakthrough concepts. But techniques used in other industries with seemingly very different characteristics may turn out to be unexpectedly applicable. For instance, in the 1980s, Taco Bell transformed its restaurant operations by thinking about them in manufacturing rather than in fast-food terms. The restaurant chain reduced the amount of on-site food preparation by outsourcing to its suppliers, centralizing the production of key components, and concentrating on assembly rather than fabrication in the restaurants. The new approach lowered Taco Bell's costs and increased customer satisfaction by ensuring consistency and by allowing restaurant personnel to focus on customers rather than production. Harvard Pilgrim Health Care has applied techniques of market segmentation, common in consumer goods but not in health insurance, to identify patients most likely to have a medical crisis and to intervene before the crisis occurs.

Identify and defy a constraining assumption. At its heart, every operational innovation defies an assumption about how work should be done. Cross-docking negates the assumption that goods need to be stored in a warehouse, build-to-order that goods should be produced based on forecasts and destined for inventory. Zero in on the assumption that interferes with achieving a strategic goal, and then figure out how to get rid of it. A major hospital, for instance, recognized that to increase the number of patients admitted for (well-reimbursed) cardiac bypass graft operations, it needed to respond more quickly to physicians who wanted to refer a patient. The reason for the delay in response was the assumption that the hospital first had to assign a prospective patient a bed, a supposition that generated hours of delay and often led physicians to send their patients somewhere else. The solution? Send the patient to the hospital immediately, and assign the bed while the patient is in transit.

Make the special case into the norm. Companies often achieve extraordinary levels of performance under extraordinary conditions; their problem is performing extraordinarily in normal situations. One way to accomplish this is to turn the special-case process into the norm. A consumer packaged-goods maker, for instance, based its production scheduling on sales forecasts rather than on actual customer demand. When demand for a new product wildly exceeded forecasts, an ad hoc process was created that gave the manufacturing division real-time information about customer demand, which in turn allowed them to do production planning and product distribution much more efficiently. After the crisis had passed, the company decided to adopt this emergency mode of operation as its standard one. The results included a dramatic drop in inventory, an improvement in customer service, and a major reduction in the total cost of product deployment.

Rethink critical dimensions of work. Designing operations entails making choices in seven areas. It requires specifying *what results* are to be produced and deciding *who* should perform the necessary activities, *where* they should be performed, and *when*. It also involves determining under which circumstances *(whether)* each of the activities should or should not be performed, *what information* should be available to the performers, and *how thoroughly* or intensively each activity needs to be performed. Managers looking to innovate should consider changing one or more of these dimensions to create a new operational design that delivers better performance. (The exhibit "Reimagining Processes" shows examples of companies that have rethought these various dimensions of work.)

Getting Implementation Right

In *The Innovator's Dilemma*, Clayton Christensen observed that conventional market-analysis tools lead organizations astray when applied to disruptive technologies. In a similar way, conventional implementation methodologies often lead to failure when applied to disruptive modes of operation.

Companies that follow traditional implementation methodologies inevitably take too long. There is so much to be done, and so much that must be integrated with everything else, that years can pass before the innovation is implemented and its benefits start to flow. Furthermore, because every proposed major change in operating procedures is invariably greeted with a chorus of "it will never work," a lengthy implementation period gives opponents an extended opportunity to campaign against it. In fact, even those who aren't aggressively opposed to the innovation will find a protracted transition unsettling and disquieting. As more time passes and more money is spent without the innovation or its payoffs seeing the light of day, organizational support leaks away. Executive leadership then loses heart, and the denouement is inevitable.

> Zero in on the assumption that interferes with achieving a strategic goal, and then figure out how to get rid of it.

Another problem with conventional implementation is that it assumes that the initial specifications for an operational innovation will be accurate and complete. In reality, they will be neither. When envisioning new ways of working, it is impossible to get everything right from the

outset. Ideas that look good on paper don't always work as well in practice; only when a concept is actually tried does one learn what it should really have been in the first place. Companies must be prepared to roll with the punches and learn as they go. An apparel manufacturer had to regroup when the technology underlying its plans for a new approach to production scheduling did not live up to expectations; a consumer goods maker had to scale back an innovation in logistics when its implementation became more difficult than expected.

Companies need to adopt a new approach to implementing operational innovations. This alternative method builds on an idea that is popular in software product development, an idea variously known as iterative, evolutionary, or spiral development. One begins with one's best estimate of the innovation, builds a first version of it, and then tries it out with customers or users. Knowledge gained from these tests is then fed back into a fast-cycle iteration of the next version.[1]

Companies would also be wise not to try to implement an innovation all at once. Breaking a large-scale implementation into a series of limited releases creates momentum, dispels skepticism and anxiety, and delivers a powerful rejoinder to carping critics.

When MetLife, for instance, was implementing a new process for installing coverage of a new customer, it did so in two releases. The first involved the creation of a new role—a case-implementation leader, who was responsible for collecting all the information to establish coverage. In that release, a new project-management tool was also introduced to control the process. That took only a few months and delivered substantial reductions in cycle time, as well as a 15% productivity gain. But it continued to rely on old information systems to support the process. In the second release, a new information system was installed that facilitated data collection and the production of documentation and also offered enhanced reporting capabilities. This second release delivered another 20% productivity improvement, as well as a 20-point increase in customer satisfaction.

Shell Lubricants followed a similar strategy when it transformed its order fulfillment process. The first release brought all the departments involved in the process under a single manager. This easy-to-implement change quickly delivered a degree of performance improvement. The improvements continued when the next release brought people from the various departments together into cross-functional teams. In the final release, each team member was trained to handle an entire order. This was the goal from the outset; Shell simply reached it in manageable steps.

Operational innovation is a step change: It moves a company to an entirely new level.

Is It Sustainable?

Even with all the benefits operational innovation can deliver, some executives may wonder if it is truly worth the effort. Why bother to be the first on the block to develop and deploy a new way of working? Why not let a competitor break that ground and then capitalize on its experiences, doing an even better job? Indeed, where is the real strategic advantage in operational innovation at all? Once one company introduces a new way of doing things, all competitors can follow, and before long all are back on the same level playing field.

In theory, that is a powerful argument, but in the real world, operational innovations have legs. Even today, not all auto insurers offer immediate claims response. And despite Dell's success, build-to-order has not swept the PC industry. At one major PC maker, an effort to do so was suppressed by both the head of manufacturing (who was concerned that it would lead to outsourcing) and the head of marketing (who was afraid of alienating the retail channel), and top leadership was too preoccupied with other matters to intervene. Toyota has confidently opened its factories to visitors from other automakers and yet continues to expand its productivity lead.

There are many reasons why theoretically imitable operational innovations have staying power. Some companies, even when confronted by a competitor's innovations, will not rush to emulate them. Denial of competitor superiority and a disinclination to truck with operations are powerful forces of nature, and so is organizational inertia. Some competitors who attempt to imitate the innovation won't understand it, and others won't be able to implement it. Even those who do follow will be at a disadvantage until they catch up.

Operational innovation is a step change: It moves a company to an entirely new level. Once there, the organization can focus its efforts on a generation of additional changes—refinements of the innovation—that will keep it ahead of the pack until the inevitable time comes for a new wave of innovation.

That's why companies should strive to make operational innovation not an extraordinary project but a way of life. Even areas of the business that have already been rethought can benefit from subsequent rethinking as new technologies and new customer needs make the old innovations passé. Companies that bake operational innovation into their culture make competitors continually scramble to catch up with the changing rules. What's more, they can even develop a reputation with customers

for relentlessly improving performance, a brand promise of extraordinary value.

Progressive has created such a culture; leaving well enough alone is a principle with which the company is systemically uncomfortable. It recently revised its very successful Immediate Response claims process so that the representative no longer attempts to assign an adjuster as soon as the claimant calls. Rather, the representative guarantees to call the claimant back within two hours with specifics about when an adjuster will see the vehicle. This two-hour window gives the company the opportunity to assign the right kind of adjuster given the specifics of the case, so that a junior adjuster is not confronted with a complex accident beyond his level of expertise. Progressive is also deploying in select markets what it calls a concierge approach to claims handling. Here, a claimant simply brings the car to a Progressive claims facility at a convenient time and leaves it there, picking up a loaner at the same time. Progressive then takes responsibility for getting the car fixed. Under this system, the claimant is spared the hassle of dealing with body shops, the Progressive adjuster works in a climate-controlled environment that allows more careful inspection, and the body shop doesn't have to get between Progressive and its customers. By the time its competitors imitate this latest innovation, Progressive will no doubt have moved onto something else.

Operational innovation may appear unglamorous or unfamiliar to many executives, but it is the only lasting basis for superior performance. In an economy that has overdosed on hype and in which customers rule as they never have before, operational innovation offers a meaningful and sustainable way to get ahead – and stay ahead – of the pack.

1. Marco Iansiti and Alan MacCormack describe how this approach was successfully applied in the development of Internet browsers in their article "Developing Products on Internet Time" (HBR September–October 1997).

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To order, see page 143.

ROY DELGADO

"We need to put our faith in consumer ignorance."

Evolutionary Change in Product Management: Experiences in the Car Rental Industry

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Car rental companies offer customers various combinations of car types, rental periods, and pickup and return locations, as well as temporary insurance and refueling options. Hertz developed its yield management system (YMS) to help decide the availability of these combinations of products over time. The YMS integrates information management technology, sophisticated operations research techniques, and information from existing Hertz decision support models that solve the closely-related problems of pricing, fleet planning, and fleet deployment.

The car rental business began in 1918. It was a simple business. Local operators provided a set of standard cars to individuals for a fixed per-day charge plus a per-mile charge. Over time that simple proposition became more complicated. In the 1930s, Hertz created the concept of rent-it-here and leave-it-there. By the 1950s, rental car companies made available multiple types of cars at airports, railroad stations, hotels, and other locations. In the 1970s, companies distributed the rates and availabilities for car rental products (a product is a specific combination of car type, temporary insurance, pickup location, return location, and length of keep) through internal and external computerized reservations systems. In the 1990s, they began using price and yield management systems that allow them to control the price and availability of these products.

In the US, the car rental industry is divided into the travel, lease, and replacement markets. The largest of these is the travel market, and Hertz is a major player in that market. Hertz is a wholly owned

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TRANSPORTATION—ROAD
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subsidiary of the Ford Motor Company. In the US, it has 1,300 locations and a fleet of 250,000.

Over the past decade, the travel-related car rental market has changed dramatically. Deregulation of the airlines changed the number and mix of customers renting cars. The advent of discount air fares in 1977 increased the number of customers needing rental cars and the proportion of leisure renters. Computerized reservation systems (CRS), such as SABRE and APOLLO, facilitated their booking cars and comparing prices among firms.

Initially, the major car rental firms were Hertz, Avis, National, and Budget. The major firms expanded their base of rentals through the commercial market. They contract with large corporations to provide car rental services to their employees for a fixed-per-day price across all or most locations for a given period of time. The fees normally vary based upon volume and can include alternate levels of insurance protection. Prices by class of vehicle and location are set by contract for a period of time and cannot be managed upward in periods when demand exceeds car supply.

With increased airline competition in the 1980s, more nonaffiliated, small business and leisure customers entered the market. Leisure-oriented firms, such as Alamo and Dollar, took advantage of these changes. These firms relied on low prices, leisure locations, travel agents, and tour operators to gain market prominence.

A major factor in changing the types of firms serving the car rental market was the growing importance of new global distribution channels—computerized airline reservation systems—through which customers can book car rentals. Working with travel agents, the newer car rental firms attracted customers by displaying their low prices prominently in CRS "shoppers displays." These are simple low-to-high rate displays that permit travel agents to base decisions purely on price.

These displays list car rental firms based on the rates they offer for a particular type of car, for pickup at a specific location on a particular date and time, and return on a particular date and time. A standard coding system is used for various car types in the airline CRS, and most car rental firms try to categorize their car models according to this system. The displays typically show rates for rentals exclusive of insurance or such other services as ski racks and baby seats.

Hertz is a wholly owned subsidiary of Ford.

The increase in leisure demand has changed the market shares of rental companies (Figure 1). Today, both the commercial- and leisure-based firms seek a mix of commercial and leisure rentals to sustain growth and improve fleet utilization. Against this backdrop, Hertz began developing decision support tools like the following to help manage market changes: Fleet Planning System, Daily Planning and Distribution Aid, Cost Allocation Model, Competitive Rates System; and the Yield Management System.

In the 1980s, Hertz developed systems to support its decisions about rental fleet levels and the geographic redistribution of vehicles in response to shifts in demand.

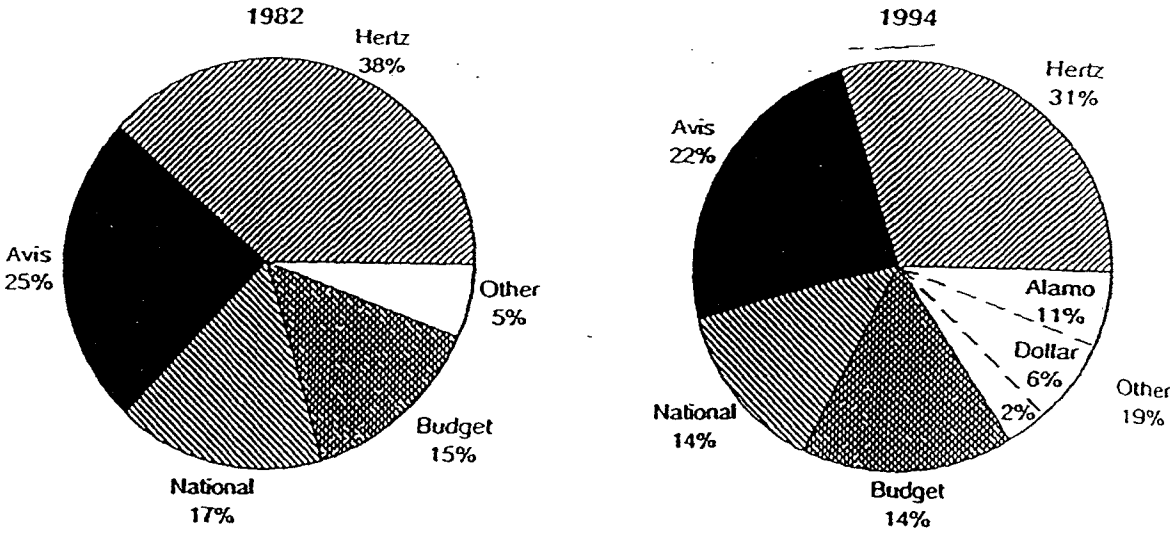


Figure 1: The airport market share of revenue has changed since 1982. Airline deregulation increased the demand for rental cars, especially in the leisure segment, changing company market shares.

For example, in major metropolitan areas, demand in downtown locations spikes on weekends as customers rent cars to pursue leisure or family activities. At airports, demand spikes mid-week in response to business travel requirements. These early systems were designed for use in areas ranging in size from major metropolitan areas with multiple rental offices at airport(s), downtown(s), and in the suburbs (collectively the multiple locations are called a pool) to smaller metropolitan areas with a single airport location. Typically the airport office makes decisions about fleet size for the entire pool and, of course, for smaller areas that have only one rental office or location.

The yield management system Hertz deployed in 1990 extended these systems and responded further to the emergence of leisure-based, low-priced entrants to the market. The challenge for Hertz was to compete on the basis of price for leisure business yet preserve and service its commercial contract business. An additional challenge was developing the capability to display various prices for its products in the internal reservation systems (Hertz reservation centers) and in the external ones (CRSs), where different display limitations exist.

Hertz has developed many of its various decision support systems over time to address four major strategic questions:
(1) How many cars should Hertz have?
(2) Where should it deploy those cars?
(3) What products should it offer? and
(4) What products should it sell?

How Many Cars Should Hertz Have?

Deciding how many cars one should keep in a pool or single-location fleet at any time is fundamental to successful car rental operations. The decision is complicated by three factors: the structure of car manufacturers' purchase plans; disposing of used cars through retail car sales or through wholesale (auction) markets; and the need to meet customer demand for

particular types of cars. Typically, customer demand for different types of cars does not match the least costly mix of cars that could be purchased from the manufacturers. The most desirable cars for retail sales and car auctions also match those demanded by rental customers. Consequently, meeting customer demand for particular car types must also balance holding costs by car type, manufacturers' production schedules, and retail and wholesale car sales needs.

.Hertz makes decisions about fleet size and composition at two organizational levels. It must make corporate decisions about overall fleet size and composition to negotiate effectively with manufacturers and to arrange financing. Given those decisions, it then makes decisions about long-term fleet size and composition and near-term fleet planning adjustments for the pools and single location operations.

From a purely economic standpoint, Hertz can base decisions about fleet size on contribution, defined as the difference between a car's expected revenue generation above the transaction costs and the car's holding costs over a given period. A car should be added to a fleet as long as its contribution over its operational life in the fleet is positive.

The models Hertz uses to establish optimal overall fleet levels are basically a set of linear equations that use historical rental information, the number of customers turned away through the reservation system (called *turndowns*), and estimated fleet utilization to produce aggregate fleet requirements. In Hertz's fleet planning system, the focus shifts from deriving the optimum to the use of these equations to forecast

—Utilization, the percent of the fleet "on rent" in customers' hands per month;

—Turndowns, the expected number of customers to be turned away;

—Vehicle costs that include such holding costs as depreciation and interest, estimated both individually and through a separate business planning model; and

—Revenue per car per month, the expected average revenue as estimated through the business planning model.

These four variables are estimated overall and for pool and smaller individual fleets. Hertz does not exclusively use fleet levels that are optimal from a purely economic perspective, because from a strategic standpoint, it may sacrifice short-term contribution to maintain market share, encourage customer loyalty, and ensure dependable service—three factors that can provide long-term profitability.

Hertz's fleet planning models began as spreadsheets. These tools have evolved to permit Hertz to better evaluate the trade-off between contribution and market share: To what extent must Hertz offset maximizing short-term contribution to expand its share of market revenue in order to sustain longer-term market prominence and profitability? It makes decisions to maintain excess cars (overfleeting) or shortages (underfleeting) relative to these estimated requirements using forecasts of the number of cars on-rent by day into the future (car on-rent patterns) and taking into account its

Demand in downtown locations spikes on weekends.

current revenue share position in a given market (Figure 2). Over a planning horizon extending up to 18 months into the future, Hertz makes decisions to vary its fleet size. In the near term, it can vary the fleet size by accelerating or decelerating acquisitions or deletions or by diverting deliveries to other pools or locations. It must make purchase commitments for the overall fleet with manufacturers 12 months in advance. It now bases these decisions on direct feeds of demand forecast information from the yield management system forecasting modules, including

—The forecasted demand for the fleet, assuming Hertz serves all customers at competitive prices, or unconstrained demand; and

—Forecasted rejected demand, assuming Hertz maintains a selected fleet level at various times during the planning horizon. While rejecting demand may provide short-term profits, it also adversely affects the retention of customers and service levels (service is defined in terms of waits for a requested car or car type that is not available).

Where Should Hertz Deploy Its Cars?

Hertz developed the system to support decisions about the optimal distribution of cars because it needed to better manage the movement of cars within a pool. The decision to move cars among locations within a pool is driven by the patterns of demand for each city. Because demand at different locations can peak on different days of the week, managing movement improves utilization and revenue for the pool, although it may reduce the profitability of a particular location.

Hertz uses the current distribution model, the Daily Planning and Distribution Aid (DPDA) [Edelstein and Melnick 1977], almost exclusively at the pool level. A significant source of complexity is its active rent-it-here and leave-it-there program. DPDA uses actual information about cars on-rent, reservations for pickup in the future, and recent historical rental information about movement of rented cars both within and between pool cities to create movement distributions that it uses to fore-

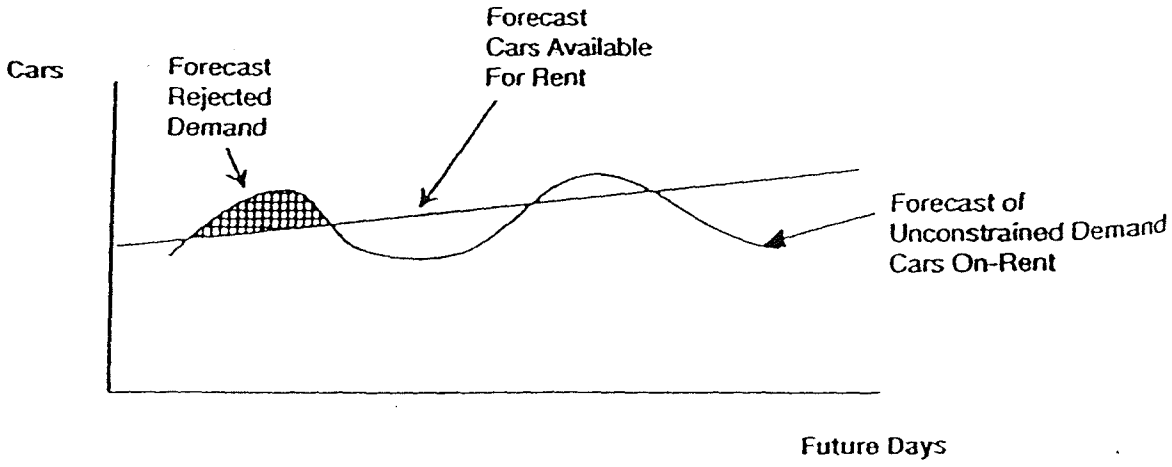


Figure 2: Cars on-rent versus available fleet: A typical car on-rent pattern by day quickly identifies days with excess demand.

cast future vehicle returns or check-ins. DPDA applies its forecasting capabilities in conjunction with projected new fleet deliveries and deletions, interpool moves made at the direction of management, idle vehicle counts, maintenance shop counts, and history-based forecast information to predict dates when each location in the pool will be oversupplied or undersupplied with cars.

Interpool moves are less frequent than intrapool moves, and decisions regarding such transfers are made at intermediate and corporate levels. Generally, these moves are necessitated by a major event, such as the Super Bowl; an emergency, such as a natural disaster; or the need to rebalance the overall distribution of fleet by returning vehicles to "owning pools." In making interpool move decisions, Hertz uses aggregate data from a pool-level DPDA, nationwide fleet tracking, and estimates of improved contribution despite the costs of moving vehicles.

DPDA relies on key variables, which are either input by the user or estimated for the user for each pool location during the planning period (Figure 3). For the first day of the planning period for each location, the user enters an actual count of idle cars (starting idle); subsequently, the DPDA derives this value. Then, the user enters projected net fleet additions and deletions (net adds/deletes), net vehicles scheduled in and out of maintenance (net shop), intercity transfers, and a forecast of future rentals. Given the expected drop-off locations of existing active rentals and patterns for

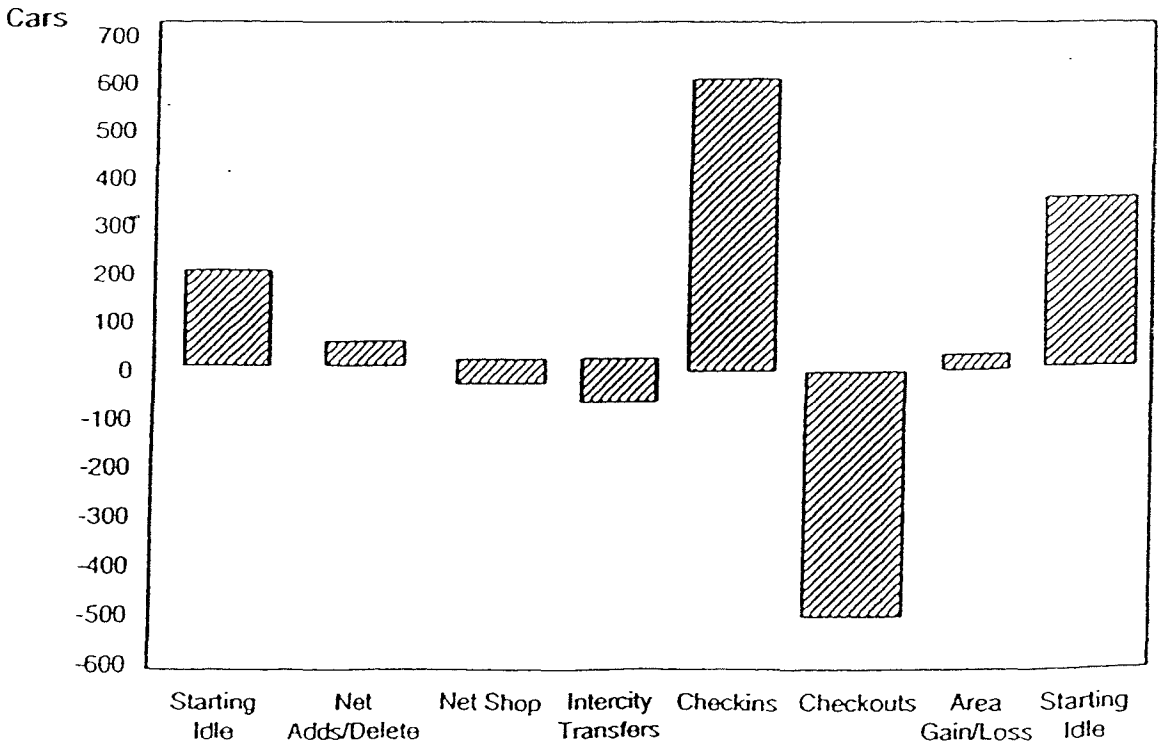


Figure 3: The fleet distribution model uses this underlying logic to calculate car availability for each location in a pool whenever forecasts change.

future booking forecasts, the system derives estimated vehicle returns (check-ins) and shows the number of cars at each location each day. The user can evaluate alternative scenarios by varying each of the input variables. Using these simulations, users can produce alternate forecasts of each location's fleet levels for the purpose of fleet balancing. Users at independent or single location cities can also use DPDA to predict future fleet shortages or imbalances and, in response, accelerate fleet additions or deletions or visits to the maintenance shop.

What Products Should Hertz Offer?

Rental car products are designed to meet the diverse needs of leisure and commercial customers. For commercial customers, Hertz provides fast, efficient car rental service for individual customers, 24-hour road service, liability protection, and efficient accounting for the client enterprise—at a competitive price. Corporate contracts usually require Hertz to make the corporate rate available if it has the type of car requested. For leisure customers, Hertz provides a competitive rate for the size and style of vehicle needed, along with such related services as driving directions and 24-hour road service. Additional services, such as extended liability protection and loss or damage waivers, are available at a slightly higher price. The important distinction between these two broad types of markets is that Hertz can vary the base price (exclusive of additional services) to leisure customers based on market supply and demand conditions.

To segment commercial market customers from those in the leisure market, Hertz can invoke certain conditions, such as an advance reservation or a requirement that the car be kept over a Saturday night. These conditions or "fences" allow Hertz to offer price discounts for leisure customers in trough periods like weekends, without diluting the prices paid by commercial or midweek renters, whose demand is the primary driver of fleet costs.

Critical in developing products for both markets is the collection and comparison of Hertz's prices and its competitors'. Hertz's competitive rate collection system began as a manual system and has evolved into an automated canvassing device that polls CRSs and other sources regularly. It uses an artificial intelligence logic to align comparable competitive products with Hertz's (Table 1). It then scans the data to detect variances from strategic price gap targets by market and type of product. The report on competitive pricing is available on-line at headquarters and at field locations; it displays Hertz rates by car type compared with its major competitors' rates, along with the advance reservation required for the rate. The report is brought to the attention of headquarters pricing managers when the system detects a price variance outside the limits established by management (the limits represent a desired competitive price position in a particular rate segment—daily, weekly, weekend, or monthly). They can then decide whether to change rates.

In developing its products, Hertz managers also need to understand contribution by product and by mix of products. Hertz developed a cost allocation model that can evaluate the contribution provided at the product, account, market segment, and location levels. A client-server computer ar-

CAR RENTAL

Advance Reservations	Hertz 2 Hours	Avis 0 Day	National 0 Day	Budget 1 Day	Alamo 0 Day	Dollar 0 Day
EXAR	27.99			26.90	26.99	
ECAR	29.99	27.99	31.97	36.90-HO	26.99	33.00
CCAR	32.99	32.99	34.97	31.90	31.99	33.00
ICAR	36.99	36.99	36.97	35.90	35.99	35.00
IDAR	36.99					
SCAR	40.99	40.99	39.97	39.90	39.99	37.00
FCAR	43.99	43.99	42.97	42.90	42.99	37.00
PCAR	52.99	49.99	48.97	59.90-HO		40.00
LCAR	55.99	55.99		60.90-HO	49.99-DI	43.00
SFAR	61.99	55.99				59.00

Table 1: A competitive price report shows Hertz's prices and those of its competitors.

chitecture with a graphical user interface provides this information to decision makers throughout the organization, including marketing, sales, finance staff, and field operators.

What Product Should Hertz Sell?

Since the industry began, car rental firms have used rudimentary mechanisms to control product availability, such as "blackout periods" during major events like the Super Bowl or the Olympics, or seasonal surcharge periods. These control mechanisms became more formalized at Hertz when the offsell system was introduced as part of the reservation system rewrite in 1980. This system provides Hertz managers with the ability to turn off reservations for a specified set of products that could range from all cars to all mid-sized cars to any car with a special feature (like a ski rack) on a particular date. In 1982, Hertz added a rudimentary capacity management system (CAPS). CAPS allowed managers at various levels in the organization to set maximum levels of availability for particular rates and car types. When Hertz reached these maximum booking levels, the system posted a nonavailability or offsell status to internal and external reservation systems. However, CAPS lacked information about car supply and about the impact on revenue of the prescribed capacity controls.

Integrating Strategic Decisions with Yield Management

In 1989, Frank Olson, chairman and CEO of Hertz, and Craig Koch, now chief operating officer, engaged Decision Focus Incorporated (DFI) to apply operations research and computer science techniques to design, develop, and implement a state-of-the-art revenue or yield management system (YMS). Similar to an airline's yield management system, it integrated both supply and demand information. However, from the project's start, Hertz decided not to adapt existing airline yield management technology. While yield management has its origins in the airline industry, its application for car rental is more complex. Car rental systems must deal with a more migratory inventory, a more decentralized management of inventory, and a larger set of customer options than

do airline or hotel yield management systems (Table 2).

In fact, because managing yield was so complex in the car rental industry, Hertz had to decide how to handle the large array of car types. Cars range in size from a two-door subcompact to a four-door luxury model. They also vary in style, including convertibles, four-wheel drive vehicles, mini-vans, and sports cars. Ultimately, Hertz established groupings among vehicle types so that it could handle cars with special styling features differently for yield management purposes.

Conceptually, yield management integrates the four major strategic decisions Hertz faces. These decisions are linked [Boyd and Phillips 1992]:

(1) In planning its fleet levels, given information about the marginal value of an additional car, how should Hertz purchase and dispose of cars over time?

(2) In deploying its fleet, given information on the total available fleet and the marginal value of deploying an additional car at a location, how should Hertz deploy cars within a pool?

(3) In managing revenue or yield, given the available fleet by location, the product offering, and the business environment, what mix of product availability will provide the maximum net revenue for Hertz?

(4) Given the marginal cost of offering more of a particular product and the competitive environment, what mix of services should Hertz offer?

Because of these conceptual linkages, Hertz designed the yield management sys-

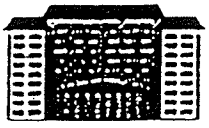
Varying Complexities among Airlines, Hotels and Rental Cars			
Inventory	Seat	Room	Car
Number of Unit Types	1-3	1-10+	5-20+
Total Units By Location	Fixed	Fixed	Variable
Mobility of Inventory	Small	None	Considerable
Rates Per Unit	Many (3-7+)	Few (2-3+)	Many (4-20+)
Duration of Use	Fixed	Variable	Variable
Corporate Discounts	No	Yes	Yes
Inventory Managed	Central	Central/Local	Central/Regional/ Local

Table 2: This comparison of yield management applications highlights some of the reasons why Hertz chose not to adapt existing airline methodologies for its yield management system.

tem from the start to be integrated with its other decision support systems for fleet planning, for daily planning and distribution, for product offerings, and for cost allocation. Information about the total available fleet is input to the yield management system through automated snapshots from the fleet planning system that describe anticipated fleet acquisition and disposition. Information about available fleet by location comes from anticipated fleet movements from the daily planning and distribution aid. The YMS takes data about product offerings from the Hertz "rate engine" that specifies the different types of products, their rates, and their restrictions.

From a systems perspective, this is how the various information flows are integrated into the Hertz YMS (Figure 4). The Hertz counter system provides a daily feed to the YMS describing recent check-outs, check-ins, and no-shows. The Hertz reservation system passes to the YMS all recent bookings and cancellations as well as any non-YMS availability restrictions. The system uses accounting information about various cost categories, in conjunction with a YMS activity-based cost model, to establish the variable costs of rentals so that it can consistently evaluate rentals of different products for different lengths of time. The YMS also passes some of its results to

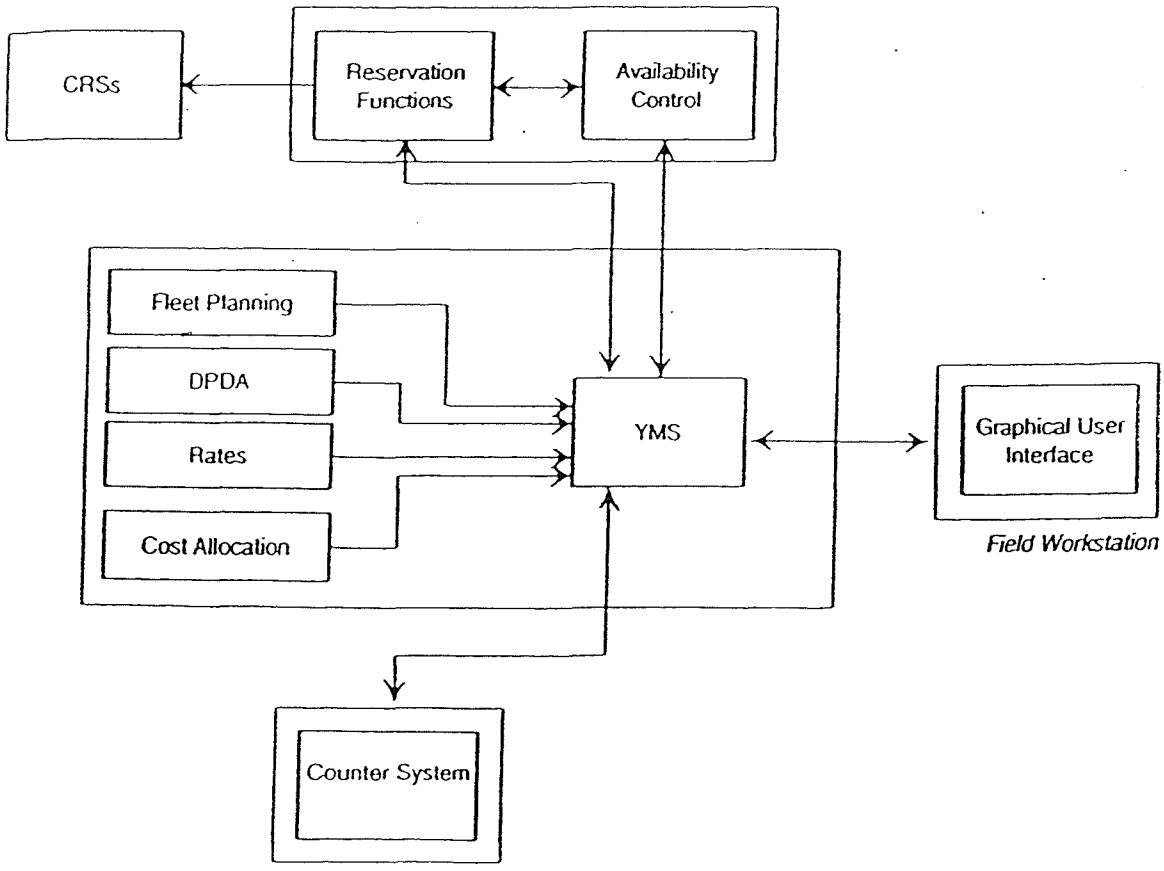


Figure 4: The yield management system integrates data from many other Hertz information systems and provides field personnel with a graphical interface for working with it.

other Hertz systems. It feeds the reservation system availability restrictions that turn off availability by city, pickup date, car type, rate code, and length of keep. Users choose which of these to implement after reviewing the YMS recommendations through a graphical user interface. The YMS also feeds the fleet planning system and the DPDA its forecasts of rental demand.

Rental Car Yield Management at Hertz

The rental car product is a perishable product on any specific pickup date. However, the product is perishable in a strict sense only for the single day of pickup. An unrented car can be used the following day if demand is sufficient. In some instances, Hertz can generate more revenue by saving a car to meet demand on a future date. Customers' varied duration of use also affects the demand for and supply of cars. A car rented for three days is not available until it is returned, and its actual return may turn out to be in two days, or it may be in five days. A car may not be returned to the same location from which it was rented. The Hertz YMS creates, updates, and uses probability distributions on the actual amount of time the car was kept by the customer (length of keep), given the rental length specified at reservation time. This allows the YMS to represent the approximately 10 to 20 percent of customers who change their length of keep after booking. As an additional output, the YMS provides statistics that monitor attempts by customers to circumvent the conditions set by the YMS for a rate by length of keep. Using such information, efforts to circumvent the system can be traced to particular market segments (for example, leisure versus commercial, customer-booked versus travel-agent-booked, and so forth). Once these segments are identified, Hertz can take actions to eliminate violations or alternatively to calibrate the YMS to account for such activity.

The YMS forecasts the capacity of cars available for rent at each location. These locations can be independent or part of a multi-location pool. To establish this capacity, it combines the results of two of the strategic decision processes: long-range fleet planning and short-range fleet deployment. These fleet planning decisions provide quantities for cars and approximate dates for acquisitions and deletions. Management decides on the basic fleet level about a year in advance of rentals, but can make changes about 90 days ahead. Hertz sets the specific dates for fleet acquisitions and deletions 90 to seven days in advance of the deliveries. Decisions to deploy the existing fleet—to move cars from one location to another—are much shorter term and have a stronger impact on the YMS.

Sometimes balancing the fleet within a pool is straightforward. For example, airport locations that serve New York City have midweek demand peaks; Manhattan rental locations have demand peaks on weekends. Cars are transported from the airports to the city locations on Thursdays and Fridays and returned to the airports at the beginning of the week. Within pools, decisions to transport cars from one location to another must take into account the issues of market share, service level, and trade-offs between the incremental revenue available from renting the car at another location and the cost of transporting

it. The YMS provides baseline information to users making this decision by forecasting the projected revenue to be generated or rejected at each location. The decision maker must evaluate other variables, such as transport costs, service levels, and market revenue, using that information.

Hertz segments the market by offering products with differing services, prices, and restrictions. The car rental industry has been less successful than the airlines and some hotels at segmenting customers by requiring advance reservations. However, beginning in the late 1980s, Hertz has successfully used Saturday over-keep and weekend rates to stimulate demand from Thursday noon through Monday, when demand from commercial customers declines.

Hertz is able to segment demand between commercial and leisure customers by type of car, by financial protection coverage, by response to price, by length of rental, and by day of pickup. Commercial customers typically select mid- and full-size vehicles; have financial protection for their firm included in the rate; are not paying for the rental themselves; and rent on weekdays for shorter time periods. Leisure customers are willing to drive smaller cars (or want specialty vehicles like vans and convertibles); are more apt to need financial protection for themselves; are paying for the rental themselves; and rent over weekends and for longer periods of time. The Hertz yield management system supports separate leisure and commercial products. It limits the availability of low leisure rates on days when cars are in short supply. It identifies opportunities when advance reservation low leisure rates should be limited to meet demand for near term commercial rentals at higher prices.

The Hertz YMS includes a comprehensive demand forecasting system. Each day it creates forecasts of unconstrained demand—the total possible rental demand independent of actual fleet levels. It makes separate forecasts of gross booking demand and cancellations. It varies the forecasts by the time prior to the pickup date and makes them for each city, pickup date, bucket (a set of similar products producing similar revenue), and length of rental. The forecasts also distinguish between those customers who reserve in advance and "walk-ups," customers who walk up to a Hertz counter on the day of pickup without a reservation.

To establish the revenue-maximizing set of marginal values and availability restrictions, the Hertz YMS combines two separate forecasts that have very different characteristics. One estimate of demand is based on historical demand for that date modified by user-supplied assessments of changes in the business environment. This history-based estimate provides stability and is generally more accurate than other estimates far in advance of a pickup date and for nonstandard dates, such as holidays. The second estimate is produced by a Bayesian updating model that uses recent observations to update a prior forecast that reflects the pace of bookings and cancellations over the previous one to two months. The model incorporates techniques to

Hertz makes decisions to vary its fleet size.

avoid updating the prior when availability restrictions limit the bookings for a particular bucket. It applies other techniques to buckets for which future booking demand is high that have been found to increase forecast accuracy. The YMS combines the history-based and bookings-based forecasts to produce a forecast whose standard deviation of error is lower than that of either separate forecast. Periodically Hertz determines optimal weights for combining the two forecasts by comparing historical forecasts and the corresponding outcomes. The YMS makes forecasts at a very detailed level, specifying expected future net bookings for a particular city, day of the week, bucket, length of rental, and time prior to pickup. Because we needed this level of detail, we did not use such traditional forecasting methods as Box-Jenkins, which proved less accurate.

Interpool moves are necessitated by a major event.

We incorporated user-supplied forecast overrides in the YMS to allow users (normally local or regional managers) to use their local knowledge of the competitive situation. The YMS forecasts are stochastic and include distributions of forecast accuracy established by analyzing past forecast performance. Forecasts of constrained demand—limited by the fleet available for rental—incorporate estimates of the willingness of different customers to buy-up, that is, to agree to a higher-priced car type or rate level if the one they desire is not available. These state-specific constrained forecasts are used by the revenue optimization to describe a revenue surface over which to search for a global maximum over the entire planning horizon. The YMS can also convert all forecasts for rentals to projections of on-rent patterns for use in fleet planning and fleet deployment decisions.

The YMS sets recommended overbooking levels in a way that optimizes net revenue while maintaining a specified quality service level; this service level is measured in terms of the likelihood that a customer with a confirmed reservation will have to wait for a car. From Hertz's perspective, the customer should not have to wait more than a few minutes for a car. Because of its commitment to quality service, Hertz did not use the traditional airline approach of estimating and trading off the cost of a denied customer against the cost of having left-over fleet [Smith, Leimkuhler, and Darrow 1992]. Instead, we constrained the overbooking optimization by requiring that the likelihood of a customer with a confirmed reservation having to wait for a car or, worse, not being accommodated, is kept below a pre-specified, small probability. The YMS calculates the probability of various overbooking outcomes by convoluting distributions of future booking demand with "show" rates, using information about current booking levels and no-show forecasts.

The YMS calculates the set of product availabilities that maximizes net revenue using marginal values, sometimes called bid prices [Phillips 1994]. The objective function specifies the total net revenue over the planning horizon. The formulation also includes a set of constraints that limit the marginal values to a feasible set

described by the city's available cars over the planning horizon. The solution to this problem provides for the optimal set of marginal values, one for each pickup date. The time periods used by the YMS optimization are different from calendar pickup dates; the marginal values reflect the supply/demand trade-off at the peak hours of the day at each location. Peak hours vary by city and result from hour-by-hour patterns of pickups and returns often determined by airline schedules.

The marginal values also serve as a very concise shorthand that describes hundreds or thousands of revenue-maximizing product availabilities. Since the YMS looks at the revenue generated over the entire planning horizon, it is possible that alternative product availabilities could generate more revenue on a single pickup date. However, the proper longer-term perspective the YMS provides helps Hertz to avoid unprofitable short-term decision making.

The Hertz YMS revenue optimization solves a nonlinear stochastic problem using as primary inputs forecasted distributions (mean and standard deviation) of future net booking and walk-up demand and the corresponding rates over the economically sensible set of marginal values or availability scenarios; predicted fleet levels available to serve future demand; and the recommended overbooking levels calculated using forecasts of cancellation and no-show rates. The explicit uncertainties incorporated into the model include the accuracy of the booking forecasts, the walk-up forecasts, and the no-show rates.

The marginal values are the dual variables of a traditional airline revenue management formulation solving for authorized levels by booking class. A marginal value represents the minimum net revenue Hertz is willing to accept for a one-day rental on that date. In the car rental industry, marginal values are a more effective way to optimize net revenue than calculating authorized levels. They allow rental companies to calculate availabilities by length of rental in a straightforward way, without requiring complex nesting structures that prespecify product desirability. They also allow the optimization to take into account the limitations on yield management that corporate contracts impose, making the rate available if the type of car requested is available. The optimization uses net revenue—total revenue less variable rental costs that are determined using a simple activity-based cost model—to evaluate rentals of different lengths correctly. Because the variable rental costs are associated with the rental transaction itself, three one-day rentals are usually not as profitable as one three-day rental.

Hertz can vary the base price to leisure customers.

Because field personnel understand marginal values and the YMS replicates how they think about the problem of determining product availability, its implementation was smooth. The YMS converts optimal marginal values to optimal product availability recommendations for review by the YMS users prior to implementation (Figure 5). Field personnel accept or reject these YMS bucket availability recommendations that compare the expected net revenue generated by each bucket to the marginal

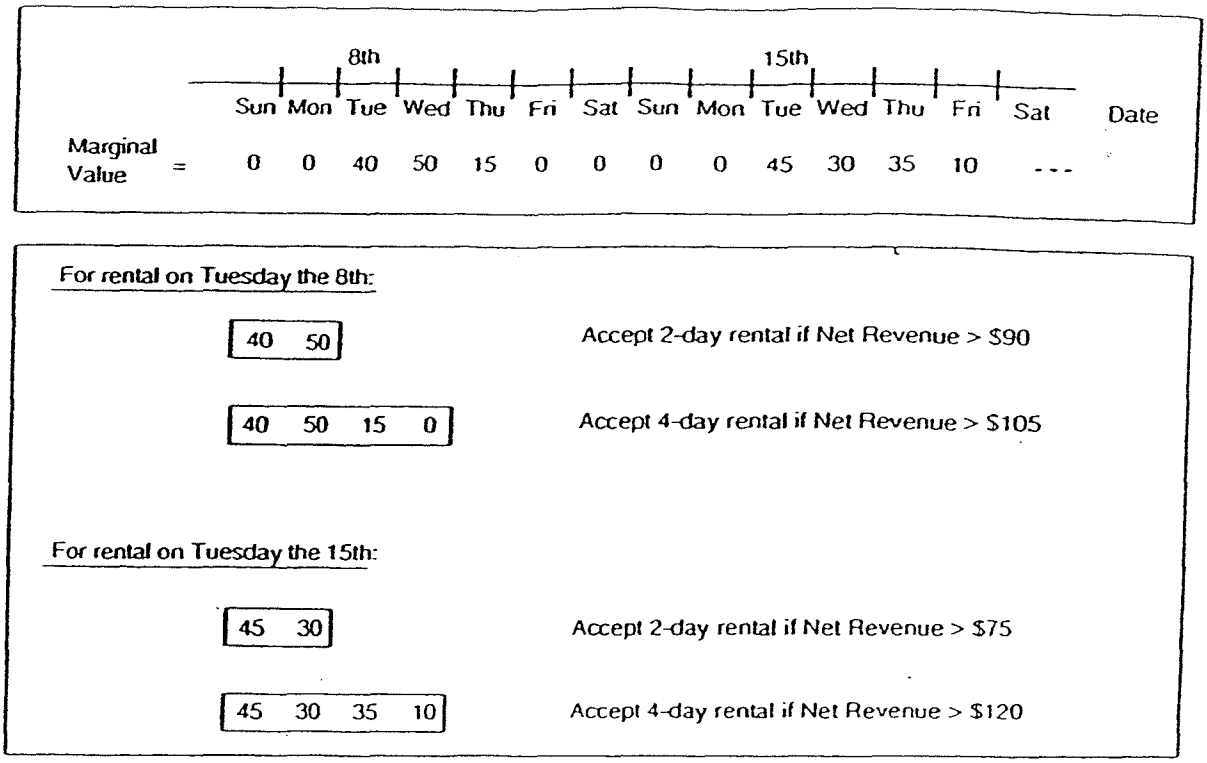


Figure 5: Marginal values for each pickup date are derived by the YMS optimization. Managers review the marginal values and the corresponding availabilities by pickup date, bucket, and length of rental.

values that represent the opportunity costs of the available fleet.

- When field personnel implement their availability decisions through the YMS to the Hertz and external CRS, Hertz reservation agents or travel agents can sell or confirm booking requests only for the products that are available. The travel agent, using a CRS screen, can also see the availability status of each product—sell (s) or closed (c).

The YMS system shows users a set of easy-to-use displays that allows them to understand its recommendations and execute them. Local city managers, regional managers (who are responsible for multiple pools), and headquarters managers have access to the system. Each of these managers can view various user screens, and those authorized to do so can enter data and execute actions. Maintenance and central (headquarters) control and monitoring functions are also available in the system. This functionality and the screen design are critical and proprietary parts of the Hertz YMS.

Yield Management System Development

Hertz based its early methodologies for planning its fleet and its distribution in the 1980s primarily on the operational needs of the field and the available information system infrastructure. It built up its systems and the associated business processes for making decisions over a number of years. It added to systems, modified them, and reconfigured them without paying

much attention to the overall relationship among decisions or to the need for managing yield. The growing use of computers at Hertz reinforced the need for greater integration of business processes and systems. At the same time, rates and rate structures were becoming more complex and airline CRSs were better able to display them. This complexity prompted Hertz field managers to press for integrated planning systems starting with yield management.

In developing the yield management system in 1989, we tried to integrate a number of the existing systems and business processes, allowing the formerly separate systems to share consistent data. The YMS generates detailed demand forecasts and optimal product availability recommendations for future pickup dates using a wide variety of information from other Hertz systems. In developing and deploying yield management systems, we had the opportunity to integrate these systems and reengineer business processes and organization structures related to the four main strategic decisions [Gulden and Reck 1991]. In reengineering our goals, we were able to establish new cross-functional business processes that would support the generation of incremental revenue from the yield management system and to improve the performance of existing Hertz systems for fleet planning, fleet deployment, pricing, and product specification. To help us, we brought in outside consultants (DFI) who did not have a stake in existing systems or processes.

Car rental systems deal with a migratory inventory.

The commitment of senior Hertz managers was vital to the process. It was important initially to expedite the development process and later when deploying the system. At the outset, Hertz established a steering committee to facilitate the collaboration between Hertz and DFI. This committee included Hertz headquarters personnel, MIS department staff, key field personnel, and members of the DFI project team. The varied perspectives of the members of the steering committee provided DFI with a comprehensive understanding of Hertz's strategic goals and directions, field operations, and information systems, and made Hertz aware of some of the issues involved in developing and applying a yield management system. The committee also addressed five issues that arose during system development and implementation:

—Design of the graphical user interface;
—Required enhancements to existing Hertz systems;
—Interfaces between the yield management system and other Hertz systems;
—Review of the modeling approaches for demand forecasting, fleet forecasting, revenue optimization, and implementation of system recommendations; and
—System rollout and user training.

One of our goals in developing the system was to minimize development time, costs, and risks. We faced challenges in two main areas. The first was developing sophisticated models for forecasting future demand and fleet size, optimizing total net revenue over the planning horizon, and applying YMS actions through the Hertz and airline reservation systems. Hertz was

the first company to implement a yield management system that used a marginal value approach to revenue optimization. The second challenge concerned the architecture of the computer system. Yield management for car rentals is most successfully applied locally, at the city level, and at the pool level. To facilitate this local application, the YMS—primarily a batch, mainframe application—uses decentralized field workstations with graphical user interfaces to present information in an organized manner and facilitate use of the system. More than 100 cities use the Hertz YMS; all the city managers and the regional yield managers have field workstations. The field workstations also provide cooperative processing and on-line access to a mainframe database.

Another technique we used to develop the system and to improve user acceptance was rapid prototyping. DFI developed prototype forecasting modules and used them to analyze historical rental data and to evaluate alternative forecasting methodologies. Using these modules, we discovered two techniques that provided effective reservations-based forecasts and demonstrated the circumstances under which the use of each is preferable. DFI used prototype optimization programs to establish the nature of the revenue surface we needed to optimize. After the development team realized that traditional nonlinear optimization techniques would not ensure finding the optimum on the nonunimodal revenue surface, we used the prototypes to investigate the performance of home grown optimization approaches that explicitly accounted for the nature of the problem. By incorporating this sort of learning process into the development activities and by allowing for discovery during prototyping, a skilled DFI development team was able to provide greater functionality and more accuracy, while avoiding the potential pitfalls of unfocused development. As a result, we reduced overall development time and costs.

The graphical user interface also took advantage of rapid prototyping techniques, allowing a number of iterations among a wide audience of potential system users from city managers and regional managers to headquarters managers and executives. Once we had reached agreement about the design of the interface, we proceeded with system development and coding. We established external interfaces with existing Hertz systems, databases, and on-line functionality through formal design, development, testing, and implementation. This process took the development team of DFI and Hertz programmers and analysts about 18 months.

System Implementation

We also took advantage of the rapid prototyping approach in rolling out the system. Hertz chose a paced implementation over 12 months beginning in mid-1990 for initial testing. The YMS evolved quickly as we gradually incorporated useful new features. For the initial testing, Hertz selected five cities whose characteristics represented those of most US cities. They included an independent commercial city, an airport that is part of a large metropolitan multi-location pool with mixed commercial and leisure demand, a major leisure location, and two airport rental locations that are part of smaller city-wide pools that have primarily commercial de-

mand but also some seasonal leisure demand. We rolled the YMS out to the initial test locations over five months, so that we had time to evaluate and incorporate change requests made by users and by the steering committee. The initial roll out indicated that some capabilities required for a large independent city—which can include a very small, nonautomated location—were not needed for pool cities where typically all locations are large and automated. We needed different modeling approaches to forecast the movement of cars within a pool from one city to another and different business processes for pool distribution personnel than were required at independent cities. After the 12-month initial testing, Hertz rolled out the system to the remaining major US locations in three months.

Maturing of the Yield Management System

Hertz first deployed the yield management system in August 1990 and by July 1991 was using it in its largest 55 cities. The system has three groups of primary users. The first is regional managers who oversee multiple pools. They use the system to identify the dates of peak demand and to control product availability by limiting the number of discount products available during the peak and controlling them carefully for length of rental. They also stimulate volume during periods of low demand by making lower priced products available. Regional managers are generally responsible for determining the availability posture for future pickup dates during the six months to several days before rental.

Before Hertz implemented the YMS, regional managers spent a great deal more time canvassing competitive rates. They had only the DPDA system to help them identify future sellout dates and no automated tools to help them decide what availability restrictions to set. They implemented availability restrictions using a time-consuming manual process that included a lot of data entry. They now spend most of their time working with the YMS graphical user interface to review and refine the automated forecasts and the optimal availability restrictions. They also work with managers responsible for fleet and distribution to make decisions consistent with yield management.

The second group of primary users of the YMS is local city managers. They use the YMS to review forecasts, to control product availability, and to stimulate demand, when appropriate, during the few days prior to rental. Since their responsibilities include many other tasks, we designed the YMS to signal to them what pickup dates require attention.

The YMS graphical user interface uses a calendar screen to organize the results and provide users with an overview of a two- to four-month planning horizon. It uses various colors and shadings to indicate days that require management attention. For example, it shows days on which action must be taken to restrict availability due to excess demand (red) or to stimulate demand due to excess fleet availability (green). From this screen, the user can select a specific date using a mouse. For the selected date, the program then shows detailed information about forecasts or availability recommendations. Users take action by entering overrides or inputs to the demand or fleet forecasts, or by implement-

ing desired availability recommendations one day at a time, sending availabilities directly to the Hertz CRS. The system provides help screens throughout the user interface. These are referenced to the users' current screen position and available through an index system. The system also allows users to graph and view many key variables provided by the YMS. A diary function allows users to store pertinent information about dates for historical reference or communication to other users. This feature is particularly useful for managing availability around key events or holidays.

A third group of users is at the headquarters in fleet planning and pricing functions and in the field as regional fleet planners and pool distribution managers. The YMS helped improve communication between these headquarter departments and local region managers. Effective yield management requires information about fleet levels, fleet deployment, rates, and competitive response. More daily interaction now occurs between headquarters and field staff about the intertwined decisions required to plan the fleet, deploy the fleet, and manage yield. In fact, this interaction has created this third group of YMS users.

The rental car product is a perishable product.

Field and headquarters fleet managers now use YMS to plan the appropriate fleet levels 90 days to 12 months in advance; headquarters pricing managers monitor demand activity to highlight periods when Hertz needs to introduce discount products; and pool distribution managers directly integrate YMS and DPDA use. The system provides a focus for the exchange of information that is necessary if managers are to coordinate their decisions rather than making them in isolation. The YMS focuses on the near-term impact on revenue of accepting or rejecting potential rentals. This allows managers to evaluate trade-off impacts systematically in making decisions concerning such issues as market share, service, and value.

Over the first three years of YMS usage, the primary focus was on integrated decision making and user training. Users of the system often went through three phases in understanding the application. At first, they were skeptical of the yield management system and its recommendations. The system differed from the manual and experience-based process they understood and introduced a variety of new terms and capabilities. We encouraged this skepticism as an important part of beta testing and user training so that we could prove to the users the value of the system and get their buy-in. Once they become confident that following the YMS availability recommendations well in advance of a pickup date—as soon as the sellout was identified—still resulted in a sellout, much of their resistance and operational concerns evaporated. They also realized that the system was making consistent economic trade-offs that increased their revenues. At one airport location where the Hertz employees could see the competitors' carwash operations cleaning cars after rentals are checked in, they noticed on a Wednesday sellout that one competitor was washing many more cars than they were. The YMS had recommended allowing very few one-day rentals