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Daniel Burrus'

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TECHNOTRENDS[®] NEWSLETTER

*The biggest ideas that are
changing everything*

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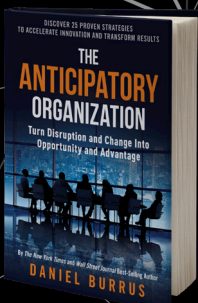
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The Immeasurable Value of Intellectual Capital

By Daniel Burrus, CEO of Burrus Research

Your most valuable business asset may not be the raw materials, cash reserves, or even the technology found within your company. It's the knowledge of the people on your team. Yet a good number of executives overlook the value of this collective knowledge, commonly called Intellectual Capital.

Brand recognition is very important, but there are other things that are even more valuable to a company's health and longevity.

Case in point: Several years ago, I attended a meeting with executives and managers from one of the largest automobile manufacturers in the world. One of the top executives stood before the large crowd and exclaimed that their most valuable asset was their brand recognition. At that point, I knew this company was heading for trouble.

As I watched the business news headlines over the next couple of years, I could see how this icon of American manufacturing struggled to survive and, ultimately, lost its foothold.

The lesson: Brand recognition is very important, but there are other things that are even more valuable to a company's health and longevity. One of those things is something less tangible but extremely impactful.

Intellectual Capital Can Be Leveraged

Intellectual capital is a term used in business school to teach executives the importance

of taking into account the value of intangible assets. The three dimensions of intellectual capital are Human, Relational and Structural.

These are all exactly how they sound – human resources are your company's people; relational capital is composed of your relationships with customers, vendors and other constituents; and your business structure includes infrastructure, processes, and databases of information. An example of structural capital is intellectual property.

Over the past 30 years, I have observed that the most valuable assets of an organization tend to be the knowledge, talent, experience, capabilities, and vision of the people within the organization. These, coupled with the value of their patents, customer bases, and good will, equal what is called their intellectual assets.

Managing Intellectual Capital

When leaders understand how to formalize, capture, and leverage their intellectual capital to produce higher-valued assets, your profits tend to soar. There is even an emerging business strategy that focuses on creating, shaping, updating and taking "stock" of intellectual capital.

It requires having the strategic vision to blend all dimensions of intellectual capital (people, relationships, and structure) to develop a management system that is measurable yet pliable enough to change how the intellectual

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TECHNOLOGY NEWS HIGHLIGHTS

Water from Thin Air

Access to fresh, clean drinking water may be one of the most pressing issues we will face in the future. So scientists are looking toward a relatively untapped, yet abundant, source of water to address this problem – the atmosphere.

In areas of high humidity, devices called fog catchers are already being used to turn water vapor into drinkable water. But in arid places, they're virtually ineffective.

Operating on the premise that solutions to many problems can be found in nature, a team of researchers began studying how certain species of beetles survive in some of the driest deserts on earth.

The researchers found that the Namib Desert Beetle has tiny grooves on its abdomen that, when oriented toward the wind, capture water particles that are then channeled into its mouth.

Building on this model, the team created an electrospun polymer with grooves as small as tens of nanometers apart. This generates a large surface area in a very compact space, making the polymer extremely effective at capturing condensation from the atmosphere.

The concept is small, inexpensive to produce and more scalable than desalination and other harvesting techniques. The device could take many forms – from a backpack to roof-mounted panels – and the team is currently seeking funding to develop working prototypes for field testing.

For information: Shing-Chung Wong, University of Akron, College of Engineering, Auburn Science and Engineering Center 59, Akron, OH 44325; phone: 330-972-8275; email: swong@uakron.edu; Web site: <https://www.uakron.edu/engineering/>

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Smart Golf Grip



Road Messaging

There's no question that advanced analytics are changing the sports landscape. Now the power of big data and artificial intelligence (AI) has made it to the golf course with a "smart grip" that contains its own AI caddie.

Powered by Microsoft Azure cloud computing service, the Arccos Caddie 2.0 combines AI logic with an integrated GPS and smartphone app to track stats on every shot you play.

The AI algorithms are based on more than 100 million shots and over 400 million GPS data points from more than 40,000 golf courses worldwide.

The system brings the caddie experience to more players by providing real-time strategies and club recommendations on every swing, while taking into consideration the user's shot history as well as weather, wind, hole geometry and other factors.

The grips retail for \$150 with an annual subscription fee of \$100.

For information: Arccos, 700 Canal Street, Stamford, CT 06902; phone: 844-692-7226; email: starter@arccosgolf.com; Web site: <https://www.arccosgolf.com/>

Mercedes recently released its new DIGITAL LIGHT HD headlights, which can project images onto the road directly in front of the car.

Each headlight is composed of over a million micro-mirrors that reduce road "dazzle" by adapting to ambient lighting conditions with greater precision than typical LED designs. But perhaps more importantly, they work with the vehicle's onboard cameras, sensors and navigation system to enhance driver assistance systems.

For example, when other vehicles, people or objects are detected, the appropriate information is displayed within the driver's field of vision and without taking their eyes off the road.

Assistive graphics also include monitoring driving lanes, blind spots and speed limits as well as warnings about poor road conditions and construction sites.

The system is currently available in limited quantities only on Mercedes-Maybach S-class sedans. In the future, particularly as the industry trends toward autonomous driving, DIGITAL

LIGHT will be able to communicate with other vehicles to further improve traffic safety.

For information: Mercedes-Benz, Stuttgart, Germany; Web site: <https://www.mercedes-benz.com/en/> or <https://www.mercedes-benz.com/en/mercedes-benz/innovation/digital-light-headlamps-in-hd-quality/>



Hybrid Planes

An aviation startup has plans to revolutionize regional air travel with gas-electric hybrid planes that capitalize on currently underutilized local airports. The initial fleet of 100 aircraft will employ technology similar to that used in consumer cars, with modular batteries in the wings supplemented by a gas turbine generator.

The hybrids will be quieter than their gas-powered counterparts and require about 40 percent less runway than larger planes, with a take-off distance of only 2,200 feet. They have a maximum range of about 700 miles at a maximum cruise speed of 340 miles per hour.

Between flights, the batteries can be swapped out quickly and easily, reducing turn-around time to as little as ten minutes. And the pilot is

optional, as all of the new planes will be drone-ready.

With a seating capacity of up to 27 passengers and an operating cost of only 8 cents per seat per mile (about \$250 per hour) the company is poised to fill a critical void in air travel – frequent, short haul flights – while avoiding large, congested hubs.

The company hopes to have planes in the air by 2022.

For information: Zunum Aero, 19820 North Creek Parkway #201, Bothell, WA 98011; phone: 425-968-1378; email: info@zunum.aero; Web site: <https://zunum.aero/>



Injury Forecaster

Preventing injuries on the field is a high priority for any sports team, so it's no surprise that systems for predicting when a player is at high risk are in high demand, particularly in contact sports like soccer, cricket and football.

Last year, Microsoft introduced its Sports Performance Platform to predict player risk by tracking their recent performance and recovery

time. It analyzes a variety of physiological measurements (including heart rate, diet, sleep, muscle soreness) and performance metrics (such as speed, acceleration, deceleration).

Machine learning and artificial intelligence (AI) algorithms are used to gauge training levels and recovery intervals, with the ultimate goal of improving individual and team performance.

Another system, recently developed by data scientists in Italy, utilizes GPS sensors to measure similar performance factors, but also includes data on impact forces (with the ground and other players), as well as demographic data, their role on the field, past injury history and previous playing time.

The system was able to predict injuries with an accuracy rate of about 60 percent. The developers are investigating whether integrating physiological data, including heart rate and perspiration levels, can increase prediction accuracy even further.

The systems are currently being used by several professional teams throughout the world, and while specific results are likely to be kept confidential, it appears that big data can have a positive impact on reducing sports injuries.

*For information: Microsoft; Web site: <https://www.microsoft.com/en-us/garage/wall-of-fame/sports-performance-platform/>
Alessio Rossi, University of Pisa, Department of Computer Science, Largo Bruno Pontecorvo, 3 56127, Pisa, Italy; phone: +39-050-221-2700; email: alessio.rossi@di.unipi.it; Web site: <https://www.unipi.it/index.php/english>*



Crowd Bots

Users of crowdsourcing platforms (such as Amazon's Mechanical Turk) are battling a new enemy – an army of bots. These crowdsourcing platforms utilize human intelligence to perform tasks that machines are unable to handle reliably, including tagging and classifying images, audio editing, human translation services and completing surveys (to name just a few). But researchers have noticed a surge in the number of questionable responses and other tell-tale signs that bots are corrupting their data.

For example, in one survey, a researcher reported that half of the 578 respondents had GPS coordinates that were identical to another respondent. Fifty of them were traced to a statue in Buffalo, New York, and several others to the middle of a lake in Kansas. Disturbingly (but perhaps predictably) the problem is growing quickly – from 5 to 10 percent a few months ago to more than 50 percent today.

All of this means that we need to get smarter when it comes to these tools and the data we collect from them. As always...it's not the technology, it's how you use it!

For information: Hui Bai, University of Minnesota, College of Liberal Arts, Johnston Hall, 101 Pleasant Street SE, Minneapolis, MN 55455; phone: 612-625-2020; email: baixx062@umn.edu



Made to Measure

A Japanese firm has come up with a new way to ensure that the clothes you buy online will fit. The Zozosuit is a skin-tight, full-body garment that incorporates 350 reference markers to accurately record your measurements.

Customers put on the suit and rotate slowly while taking a series of photos with their smartphone. The images are used to create a 3-dimensional scan from which the company can make a variety of recommendations – from custom-made suits to literally thousands of premade clothing items.

At a cost of about \$9 to manufacture the Zozosuit, the company figures it can distribute them free of charge to its customers and still be profitable by drastically reducing the frequency of costly returns.

Originally launched for the Japanese market, the developers are looking to Zozosuit to expand their markets abroad as well.

For information: Start Today, WBG Maribu West 15-16F, Nakase 2-6-1, Mihami-ku, Chiba-shi, 261-7116, Japan; Web site: <https://www.starttoday.jp/en/>



Synthetic Cells Fight Disease

As bacteria continue to develop resistance to traditional antibiotics, there is a critical need to uncover new treatment approaches. To that end, one team of researchers has designed a system for constructing artificial cells that seek out and destroy specific pathogens.

The cells are built from the ground up using liposomes – tiny spheres of phospholipids that can be used to carry drugs or nutrients to tissues and cells – as a membrane. The internal components (cytosol, proteins, DNA and metabolites) are selected to respond to the chemical signature of the target bacteria. The components were also optimized to function in a non-nutrient-rich environment, which greatly expanded their overall potential.

The concept has been demonstrated to be successful in detecting, attacking and destroying e. Coli bacteria in laboratory experiments. The hope is that artificial cells will one day be effective against some of the toughest antibiotic resistant strains of bacteria.

For information: Cheemeng Tan, University of California-Davis, Biomedical Engineering, 451 East Health Sciences Drive, GBSF Room 2303, Davis, CA 95616; phone: 530-752-1033; email: cmtan@ucdavis.edu; Web site: <https://bme.ucdavis.edu/tanlab/>

Both/And Thinking: The Best of Both Worlds

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capital dimensions are blended.

There is more to the process than will fit into this one article, but the concept is this: By using a multiple stage process that is governed by evolutionary logic, the intellectual capital management includes four interconnected sets of practices: Strategic alignment, exploration and exploitation, measurement and reporting.

The Knowledge Era Made Way for Intellectual Assets

One important part of capitalizing intellectual capital is to keep the knowledge pipeline full. One of the best ways to do that is to convert information into knowledge.

A number of years ago, I predicted organizations worldwide would create new economic value by converting information into knowledge, sharing that knowledge internally to increase its value, and then selling it in non-competing industries to a global client base. When the icon-based, user-friendly World Wide Web spawned a new digital industry in a short amount of time, organizations began to want their intellectual property formalized, captured and leveraged for higher values. And they wanted it online.

It became known as the Knowledge Era or Knowledge Age in contrast to the Industrial Age. The end of the 21st century saw an advanced form of capitalism, one where ideas and knowledge stimulated economic growth even more so than labor, land, money or other tangible resources.

Around the same time computer companies saw their profits shift from hardware manufacturing in the 1980s to software creation in the 1990s, businesses of all sizes and in all industries started using web-based technology to leverage the talents, knowledge and wisdom of employees to create high-margin products.

Three Must-Have Components to Create Intellectual Capital

When I consult with executives today, I walk them back through the components that were necessary to leverage a process for monetizing intellectual capital.

1. Everyone in the organization must see the tremendous opportunity and added value in going beyond the current activity of converting data into information, to higher levels of value by creating and delivering knowledge and wisdom, which clients can quickly act upon. In addition, auditing and valuating intellectual assets must be seen as a strategic direction.

2. Everyone in the organization must see that its technology infrastructure and organization are the keys to unlocking the vast wealth the Knowledge Era had to offer, both for the organization and your clients. Knowledge increases in value when it is shared within the organization and that means the Communication Age could not have come at a better time. Informing someone of your knowledge is very different than communicating with them. That's why a knowledge-sharing technology strategy, focused on fostering two-way communication and dialog, is so crucial to organizations achieving their goals.

3. Everyone in the organization must see the importance of his or her own participation as essential to building a strong foundation for the enhancement, sharing and delivery of knowledge. You get the behaviors you reward;

there must be a rewards system for sharing knowledge. I like to remind my consulting clients that there are many ways to reward people, and not all have to involve money.

At this point in time, technology is no longer a barrier to creating a Knowledge Era enterprise. Below is a case study about a knowledge-based product that was created in the midst of this era and serves as a great example of the value of intellectual capital.

Mayo Clinic's First Knowledge-Based Product

In the 1990s, one of the largest health systems in the country, Mayo Clinic, was looking at a future of decreasing reimbursements for Medicare and Medicaid and increasing losses in its emergency rooms. For the Mayo Clinic and other health systems, the future looked bleak.

In a consultation with their executives, I asked a simple question: "Why don't you sell your knowledge?" Though their initial response was skeptical, further thinking led them to put Mayo Clinic knowledge on a CD. Any time, day or night, people who purchased the CD could put it in their PC and determine if, for example, their child's rash and fever required just aspirin or a trip to the emergency room.

The Mayo Clinic put a \$100 price tag on its CD product when it first came out, and in the first year I was told it sold 670,000 copies. A light went on for the clinic executives; leveraging internal knowledge could create value.

It was its first-ever knowledge-based product and it was a precursor to not only MayoClinic.org, but a host of other online consumer health information portals. One side benefit it discovered was the impact on the Mayo Clinic brand; by using knowledge as an asset, Mayo Clinic developed a new and powerful image in the healthcare marketplace.

Knowledge Is (Branding) Power

In the past, in order to get help from the Mayo Clinic, you had to go to one of its locations. But with a CD of knowledge that was then translated into French, German, Spanish, and Japanese, the clinic could help people anywhere around the world at any time. And, keep in mind, this was long before the phrase 24/7 accessibility became popular.

From there, Mayo Clinic decided to customize the knowledge product for various audiences, including elementary schools, high schools, medical schools, and nursing homes.

The result was new value and new revenue; it had opened its customer base up not only to people who are geographically close, but to the world. And in the case of the Mayo Clinic, the name recognition isn't regional or national anymore; it became international.

Are you leveraging the most valuable assets in your organization?

If not, what are some ways you can convert information to knowledge and then productize it for revenue? If you get stuck, I recommend using your Anticipatory Organization skills to determine what intellectual assets will be important to your consumers in the next 5 years and beyond.

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—Alan M. Webber Co-founder, Fast Company Magazine

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