The Landa UX

Revolutionizing the Press Operator User Experience for Breakthrough Productivity.
Executive Summary

Searching for profitability

Many industries are in a fight for survival. The Darwinian theory of “survival of the fittest” originally referred to species struggling to preserve their very existence. Today, contending with what some call “Digital Darwinism” – i.e., rapidly changing technology and global demographics – numerous businesses and even entire industries face a similar threat to their survival. ¹

The global printing community is no stranger to the forces of Digital Darwinism. The industry today faces the most daunting trial in its 1,000-year history. Worldwide page output is flat, while the speed and quality of offset production is stagnant. Although digital pages are steadily growing, they have yet to exceed 2% of total page output.

As part of its effort to avoid Digital Darwinism, the print industry could find help from a source it has never tapped: the user experience, or UX, designed into the equipment.

The UX revolution

It is estimated that we use our smartphones on average 150 times per day.² We’ve grown fully accustomed to touch-based control and the instant gratification offered by our mobile devices. Many industries – computing, automotive, healthcare, financial services, and others – are radically redesigning their product UX.

Products with today’s “new” UX offer consumers and operators a multitude of new benefits. They deliver intrinsic rewards to the user, such as satisfaction, pride, pleasure, and other emotional and psychological rewards. In the business environment, this translates into a greater sense of job mastery, enjoyment, and productivity.

The “touchscreen generation”

We’re witnessing – and actually participating in – a revolution in UX. Many industries – computing, communications, automotive, healthcare, financial services, and others – are re-engineering their products’ UX with touchscreens. Touchscreen technology has disrupted entire industries and business models.

The print world has been slow to come to the party. Press operators haven’t been exposed to the full potential of 21st century UX technology. As a result, the productivity of both operator and press presents significant room for improvement.

Landa alters the UX landscape

Based on hundreds of conversations with operators worldwide, Landa UX designers have developed an innovative UX design that redefines operator engagement and boosts press productivity. The fully reconfigured design positions the operator in the Landa Operator Cockpit. Central to the Cockpit is a large touchscreen display, allowing operators to control all functions of the press.

The Nanography™ technology, the brainchild of Benny Landa, is turning the page in print technology – literally and figuratively. It combines the quality and speed of offset with the flexibility of digital. The Landa Nanography process also bridges a vast profitability gap for printers that neither offset nor digital print has been able to fill.

The Landa S10 Nanographic Printing® Press features a completely re-imagined UX. Physically, the press fits seamlessly within current production environments. It operates side-by-side with offset presses – no special rooms, media or workflow. Positioned at a 45-degree angle to the delivery end of the press, the Landa Operator Cockpit places users within easy reach and eyesight of all press controls as well as output trays.

The placement of the Cockpit is not happenstance. It is intentionally meant to create a more efficient, effective operator. In the words of Steve Jobs, “Design is not just what it looks like and feels like. Design is how it works.”

Figure 1: The Landa S10 Nanographic Printing® Press.
Searching for Profitability

The printing industry, like many others, is in a fight for survival. The global market generated about $901 billion in revenue in 2013, according to Smithers Pira. Emerging economies and added-value digital print applications will help grow the industry, but only about 2% annually through 2018.

Reduced paper output is seen primarily in developed markets (e.g., North America and Europe), where digital media is increasingly replacing print form. Growth in developing markets (e.g., Asia-Pacific and Latin America) has somewhat compensated for global revenue declines.

In the age of the Web and 24/7 access to digital online information, the market shows no signs of decreasing its demand for faster print turnaround, personalized output, and short runs. If anything, the need is steadily increasing. Accustomed to the standard of quality set by offset production, print buyers and users also still have expectations of high print quality.

The burden of streamlining the entire print process – and rebuilding profitability – falls on manufacturers and print providers.

While reliably profitable for lengthy static runs, offset technology is clearly unprofitable for short runs. Since its inception in the early 1990s, digital printing has proven effective for short runs, print-on-demand and variable print. Digital print recently produced its one-trillionth page and continues to grow. Overall output, however, represents only two percent of the total worldwide page volume.

Figure 2: The Profitability Gap

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Falling between the two primary print technologies – offset and digital – is a glaring **profitability gap**. Neither is capable of producing runs of 5,000 to 7,000 sheets and turning a sustainable profit. With nearly half of all orders now falling within this range of short- to medium-length runs, the opportunity is ripe for the taking by the right solution.

To achieve profitability, the challenge for print manufacturers and providers is clear: increase press productivity substantially. The right formula will include faster throughput, reduced operator expenses, and lower overall total cost of ownership.

**Landa targets the print mainstream**

Nanography™, the Landa Nanographic Printing® process, is aimed squarely at this print profitability gap. The Landa S10 Nanographic Printing Press, for example, features throughput up to five times that of other sheetfed digital print devices – reaching 6,500 sheets per hour.

Working side-by-side with other offset presses – and not isolated in a separate room or clean environment – the Landa S10 Nanographic Printing® Press prints on the same off-the-shelf substrates, uses the same prepress and production workflow systems, while its printed media is folded and cut on the same finishing equipment.

Another area where Landa has redefined printing is in the user experience. While technology has advanced steadily throughout the history of print, the press operator’s experience has gone largely unchanged or relegated to an afterthought.

The opportunity for improving productivity is now being pursued by Landa Digital Printing. Within the print industry, Landa is the first to engineer a new UX from the ground up in order to help reinstate profit into printing’s business model.
The UX Revolution

If there’s one lesson to be learned from Apple, Samsung, Google, Amazon, Twitter, Tesla Motors, and other firms renowned for their innovation, it’s that customers expect a user experience (UX) that’s not just incrementally better. It has to be different, easy, and fabulous. A great UX also tends to redefine its respective industry – or give birth to entirely new ones.

Usability, user interface (UI), and user experience (UX) are three separate features of a product. Usability refers to a product’s learnability and ease of use. The UI includes the elements with which users and machines interconnect to control the product’s operation.

The user experience is different still. UX designers focus their attention on human physiological and psychological factors. It answers the question: How does the user experience affect individual behaviors, attitudes, and emotions towards a particular product? And, what impact does a great UX have on productivity, satisfaction, and brand loyalty?

Increased focus on UX is causing disruptive market upheaval worldwide, according to author and digital analyst Brian Solis. He expects the importance of customer and employee experience to trigger a revolution.

In addition to mobile marketing, big data, millennial behavior, and “connected consumerism,” Mr. Solis predicts that decisions about UX will soon escalate in importance to the C-Suite of corporations.5

The intrinsic benefits of UX design

Great UX design allows the human-machine interaction to be sensory, meaningful, and experiential. The best UX invites users to learn quickly and grasp intuitively simply by doing. It rewards them with important intrinsic rewards, like a sense of control, mastery, productivity, efficiency, performance, accomplishment, and even fun.

To get an idea of the impact of UX in the world, it’s estimated that we use our smartphones on average 150 times per day.6 We’re empowered by touch-based control and instant gratification. Good UX in any device gives us greater product control and personal satisfaction, which results in higher productivity and enjoyment.

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The Touchscreen Generation

The signature feature engineered in many new UX designs is the touchscreen display. Ten years ago, few would have imagined that we’d be using touchscreens to operate telephones, much less refrigerators, hairdryers, vending machines, watches, DJ remix boards, ticket dispensers, retail signage, etc. While the widespread adoption of touchscreens has driven down their cost, some applications are more technically challenging and may require innovative custom development.

We’re witnessing – in fact, we’re participating in – a revolution in UX. In addition to computing and communications, many other industries are radically redesigning their product UX with touchscreen interaction. According to the most successful, innovative car manufacturers, healthcare providers, and other businesses, UX is now a critical factor for all products across nearly all industries.

We’re witnessing – in fact, we’re participating in – a revolution in UX.

Figure 3: Tap-and-swipe touchscreen creates an intuitive experience.7

Figure 4: Using touchscreen technology to maximize UX.8

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8. Image source: wikipedia.org/wiki/New_York_City_Subway
Tesla puts UX in high gear

Tesla Motors, the American electric car manufacturer, has become a household name. Capturing the imagination of the public with the first fully electric sports car, the company went public in 2013.

The company’s second car, the Model S, was not only acclaimed by car enthusiasts, but it captured the attention of car analysts as well. In naming the Tesla Model S as the 2013 Car of the Year, Motor Trend wasn’t merely focusing on its electric engine technology or road performance. The author made a point of noting, “… all judges were impressed with the Tesla’s unique user interface.”

Tesla’s user experience derives in large part from the giant 17-inch touchscreen in the console. The touchscreen enables driver adjustments in the climate, infotainment, brakes, suspension, and countless other functions.

Figure 5: Tesla features an all-digital touchscreen and dashboard.
Healthcare adds UX to the prescription

Naomi Fried is Chief Innovation Officer at Boston’s Children’s Hospital. She cites several clinical innovations that involve new UX design to improve patient care.

Touchscreen mobile apps have enhanced the hospital’s workgroup collaboration. Replacing grease pen white boards, digital smartboards display patient information electronically on monitors. The data is accessible anytime, anywhere by doctors, nurses and the care team to enable faster patient attention.

The hospital’s “Beapper” app is similar to Twitter, enabling the multi-user exchange of brief patient data notes on a mobile device. It also delivers real-time online lab results for patients and caregivers.

Seeking a 21st Century Solution

Devices with touchscreen control abound. Everywhere we turn we see touchscreens in action, providing a user experience that is intuitive, adaptive, simple, fast, and responsive to the touch.

Outside of the workplace, today’s press operators interact regularly with touchscreen-driven devices. On the job, however, operators use equipment, (i.e., printing presses and finishing equipment) that hasn’t evolved very far in UX design. Today’s operators haven’t been exposed to the full potential of 21st century technology. In the realm of printing UX alone, operator productivity presents significant room for improvement.

An inefficient routine

The prevailing environment for press operation is not radically different than it was 20 years ago. Production printing, including digital print, has traditionally been an industrial activity. Printing to date has been largely a manufacturing function, with scant attention placed on form or ergonomics.

Similar to working on an assembly line, operators typically walk from one end of the equipment to the other – from the feeder to the keyboard monitor to output trays and back again. Along the way, they also spend a fair amount of time
In hundreds of discussions with operators, Landa engineers learned that operators spend nearly 90% of their time watching paper come off the machine. “under the hood.” If operators are not checking on parts, supply levels, and other processes, they’re troubleshooting problems occurring some distance away from the main controls.

In hundreds of discussions with operators, Landa engineers learned that operators spend nearly 90% of their time watching paper come off the machine. If some other function needs their attention, it requires a trek to another area of the press. The issue or problem is typically not one they can see, diagnose, or remedy from a distance.

The current, inefficient operator routine ultimately makes it all but impossible for operators to manage more than one press at a time. A typical printing environment includes heavy machinery, constant forklift movement, and ad hoc operator areas, with paper, tools, ink and other materials in and around the operators’ workspace. It’s not necessarily an environment that fosters maximum productivity.

Figure 6: The location of the inspection area impacts productivity and the operator’s control over the press.
Landa Alters the UX Landscape

Since the launch of Landa Digital Printing more than a decade ago, founder Benny Landa stressed that his “second digital printing revolution” would have two facets: Nanography™ technology, and “the perfect work environment” for press operators to perform their jobs.

To make that workplace vision a reality, Landa engineers designed a UX for the Landa S10 Nanographic Printing® Press that delivers, for the first time, an extremely human-centric approach. The design incorporates the most current understanding and expertise related to the user experience.

The Landa S10 Press is designed to create an integrated, highly efficient work environment that manages short- to medium-run lengths (i.e., the jobs that comprise a significant portion of current print orders). It’s the first press with a user experience that accommodates operator psychology and anthropometry, the science of accommodating human physical variations.

Figure 7: The location of the inspection table affects the safety of sheet handling as well as ergonomics.
The Landa Operator Cockpit

A groundbreaking “command-and-control center,” the Landa Operator Cockpit uses a design based on extensive, worldwide user research. Located at the delivery end of the press, the Cockpit is the primary work area for the Landa press operator. Its 45-degree position relative to the press offers direct eye contact with the delivery tray while inspecting jobs or performing other press-related activities.

With its ergonomic design, the Cockpit offers easy access to all areas and core functions, including set-up, maintenance, troubleshooting, output trays, and inspection piles. Oversized touchscreen monitors use video feeds, intuitive graphics, icons, and timelines to help manage print jobs and pre-empt disruptions.

The Cockpit’s center panel presents real-time press status and vital signs – including critical information, such as printing speed, countdown times to ink or paper refills, and delivery stack removal. Internal cameras and real-time video feeds let operators monitor key phases of the print production process: paper feeding, image formation, image transfer, and paper delivery. The cameras assist preventative maintenance too, using slow motion views or a streaming history of the substrate’s path inside the press – easing troubleshooting and virtually eliminating the need to open the press.

Figure 8: On conventional presses, operators must divert their attention from the printing process to inspect prints or make color adjustments.
A Job Manager, located within arm’s reach to the right, visually displays print jobs as virtual job tickets along a timeline. Each ticket is color coded, informing operators whether it is ready for printing or requires operator intervention for activities such as changing a substrate, using specialty inks or more.

A large, adjustable, tilted inspection table reduces user strain and enables fast, easy output inspection for busy operators. The close proximity between the table and the paper delivery facilitate a more efficient working environment and the angle of the inspection table. Its dimensions, and the positioning of the lighting have been carefully considered for maximum ergonomic benefits and productivity.

Much like an office setting, the Cockpit also offers cabinets and utility containers – all highly visible and with specialized lighting. The desk area includes slots for holding writing implements, cords, and mobile phones, as well as drawers for tools and even a cup holder to prevent spills.

The close proximity between the table and the paper delivery make for a more efficient working environment.

Figure 9: The Landa Operator Cockpit places all information and functionality related to print production in a single, ergonomically designed workspace.
The Landa S10: Higher Productivity from End to End

The Landa S10 Nanographic Printing® Press has been designed for productivity, from top to bottom. In addition to the UX, the Landa S10 integrates with existing business processes, and offers breakthrough automation.

The Landa S10 Nanographic Printing Press is the industry’s first B1 (41 in. / 1050 mm) digital perfecting press for commercial applications. It reaches throughputs of 6,500 sheets per hour, up to five times the speed of other digital presses, and uses any off-the-shelf media without priming, coating, or drying.

The innovative Landa Nanolink® colorants use nano-sized pigments in combination with the Landa Nanographic Printing Process to produce offset quality images – vivid, sharp, uniform, and consistent from page to page. The press offers four-color CMYK output, expandable to seven-colors (CMYK+OVG), thus eliminating the need for spot colors.

Leveraging current processes and infrastructure

The Landa S10 Nanographic Printing® Press presents an unprecedented opportunity to advance digital production for commercial printers and packaging converters. It leverages all existing business processes, infrastructure, and resources – from substrates to operators.

Figures 10 and 11: The Cockpit displays real-time views of print production and press vital signs.
Unlike other digital presses, the Landa S10 Nanographic Printing® Press fits seamlessly within mainstream print production environments. It resides on the main production floor, adjacent to existing offset presses – no separate rooms or special media are needed. The arrangement greatly facilitates the offloading of work from offset equipment – substantially increasing overall press efficiency.

**Tightly integrated with workflow and other systems**

The unique Landa DFE is high-performance digital front end jointly developed by Landa and EFI and powered by EFI Fiery® DFE technology. The DFE fits naturally into any environment – full offset, digital-only, and hybrid offset/digital – and brings print quality and performance to new heights. The Landa DFE tightly integrates with the Landa press software, ensuring frictionless communication between prepress and print operations. It also connects to the leading production workflow solutions, web-to-print solutions, and ERP/MIS.

Designed to support unique requirements from the commercial, direct mail, flexible packaging, folding carton, point-of-sale, and publishing markets, the Landa DFE offers high-speed and scalable processing, from printing a single copy, to versioned jobs, to variable data printing (VDP) and every-page-is-different (EPID) printing. Operating the DFE is transparent to the press operator who will change job properties via the GUI of the Landa Operator Cockpit. In the prepress room, the DFE is accessed through the production workflow system.
The Landa S10 Nanographic Printing® Press applies new degrees of automation to reduce hands-on operator involvement. The automation extends from head-to-toe to enhance throughput and productivity. Automatic paper handling eliminates many of the labor-intensive tasks common to traditional media setup. Automatic paper adjustment enables faster changeover to new substrates and supports continuous print runs. An inline coating unit – unique among digital presses – supports UV/aqueous coatings and specialty colors and is fully compatible with existing post-press procedures and finishing equipment.

Productivity also benefits from innovations in the equipment’s physical design. A touchscreen-based Feeder Control Panel is logically located between the feeder and the bridge and supports full management of the press. With an output delivery unit next to the Cockpit, the operator removes paper piles without interrupting production. An auxiliary delivery tray allows output collection and proof inspection without affecting workflow integrity, even on variable data jobs. Adding further to efficiency and operator productivity, a portable, handheld tablet gives operators the freedom to move around the shop floor without compromising any process or control.

Figure 12: A Job Manager visually displays print jobs as virtual job tickets along a timeline.
Launching the “Flow State” of Production Printing

When athletes, artists, musicians, engineers, and other professionals perform at their highest levels, it’s often said they’re in a “flow state.” A concept first proposed by psychology professor Mihály Csíkszentmihályi, “flow” refers to a mental state in which a person performing an activity is completely immersed and absorbed in a process. The individual operates with a sense of hyper-energized focus and total involvement, as well as thorough enjoyment.

The Landa UX design triggers a similar, positive “flow state” for operators. In redefining operator engagement, the Landa UX helps operators achieve their highest levels of capability. In the process, it addresses key industry trends and demands, such as shorter runs, more personalization, quicker turnaround, and lower costs.

The revolutionary Landa UX approach not only helps printers fend off Digital Darwinism, but also opens the door to supporting new applications, higher productivity, and a return to profitability. In the world of printing, it couldn’t come at a better time.

The Landa UX helps printers fend off Digital Darwinism and opens the door to higher productivity.

Figure 13: The Feeder Control Panel touchscreen offers full press management from the feeder area of the press.
The Nanography™ Process: A New Category of Printing
The Nanography™ process, embedded in the Landa Nanographic Printing® Presses, combines the versatility and short-run economics of digital printing with the low cost-per-page and high productivity of offset printing. The process starts with the ejection of billions of Landa NanoInk® droplets onto a heated conveyor blanket. Each row of ejectors adds a different color. The droplets flatten and dry to create an ultra-thin, 500 nm thick polymeric image – the thinnest of any printing process. When transferred onto on paper, plastics or packaging films, the color image instantly bonds to the media, forming an abrasion-resistant, laminated layer. The process produces exceptionally round dots with super-sharp edges and high gloss fidelity to any substrate. With no pretreatment or post-drying requirements the printed output can be immediately processed right off the press.

About Landa
Landa Digital Printing is part of the Landa group. Its Nanographic Printing® technology bridges the industry's “Profitability Gap” – cost-effectively producing short-to-medium runs. Landa Nanographic Printing® Presses yield the lowest cost per digitally printed page in the industry and combine the versatility of digital with the qualities and speed of offset. Founded by Benny Landa, the Landa Group also includes Landa Labs, its innovation arm that explores nanotechnology for use in alternative energy, drug delivery and other fields; Landa Ventures, which invests in related technology firms; and the Landa Fund, which helps underprivileged youth pursue higher education. Benny Landa continues to add to his portfolio of over 800 patents and applications worldwide, which provide the companies he founded with a solid intellectual property base.

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