

Cyber *is* the Great Equalizer Across Financial Services and Banking Organizations (FSBO's)

The future value proposition of cyber solutions and ecosystems are accelerating as a result of tip-of-spear innovations creating chasms of opportunities, which FSBO's must capitalize on against nimble competitors who are leveraging their investments in data, technology, and personnel. FSBO's must challenge the tradition and the answers against emerging questions and market trends.

Moving forward utilizing advanced, iterative cyber and data solutions requires that as industry leaders, the questions asked are as equally important and the prescriptive answers given to retain consumer relevancy.

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Content adapted from the published article series, "Beyond Digital Transformation" and "The Demise of the Contact Banker"

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Cyber Shifts and Trends Started Before the Pandemic

Just as in the aftermath of the Great Recession of 2007-2009 (GR), we sought a "new normal"—a phrase coined by many industry leaders anticipating a return to customary operating guidelines. Today, many media personnel and industry leaders are labeling their challenges and opportunities as the "next normal" all within the largest advancements of cyber innovations in history as the acceleration of Moore's Law reaches a zenith.

In examining the decade of subsequent recovery, we can agree that it was anything but "normal" with some pre-GR markets segments never recovering (e.g., private MBS securitizations, Alt-A, subprime). Additionally, and for the last 25 years, historical **FDIC** trends have continued unabated with an industry average of 240 banks lost each year—with current levels now standing at just over 5,000 institutions. Since the GR, domestic asset concentration of the top nine FSBO's was under 15% prior to the GR—now it exceeds 50%.

The big have gotten huge, and banking generally has been turned into, due to compliance and political interference, regulated public utilities delivering commodity offerings wrapped in advanced technological wrappers.

In general, FSBO's are seeking to be financial technology companies, while many of those seeking to capture their marketshare already have the cyber competencies needed to scale and build customer loyalty.

With the fading of those dreaded IBM green screens starting in the 1980's, management advisors and corporate leaders within the financial services and banking organizations have been struggling with digital transformation during the last several decades. The early cyber efforts were obviously needed to transform manual processes and paper-based delivery systems. Additionally, prior to digitization efforts, FSBO's experienced significant rework, widespread inefficiencies, and data and financial errors, which were pervasive and costly.

Now, after decades of layered cyber initiatives (often point based and eschewing enterprise integrations), the acceleration of innovation (e.g., networking, apps, cross-industry linkages, big data, 5G, IoT, AI) has fragmented the approaches and segmentations recently viewed as a core competency by FSBO's and their consulting partners.

Some educational institutions and consultants now advocate we have entered a post-digital world driven by layered cyber advancements. Perhaps. However, what is more likely outside this smart branding slogan, is that we are just using continuous innovation and large digital data volumes, cloud storage, and sophisticated analytics to move us into the leveraging of digitalization programs. Let us be a bit crass when it comes to cyber innovation today—process, technology, data, summarization, analytical, cash and currency, payments, security, privacy, compliance, synthetic intelligence—would we subscribe to anything but layers of integrated digital and cyber solutions if given alternative choices?





We have expanded beyond monolithic, flat solutions into layered ones using emerging data sciences and technologies. Digital transformation using advancing cyber solution sets is no longer something we do because we are in a FSBO and it helps our efficiencies and quality. Being digital and integrated across our enterprise is mandated by consumers seeking value-added benefits to aid their lives.

As risks increase due to consumer, political, and financial shifts, have we defined how our traditional digital investments are able to be leveraged moving forward? What are we expecting from them tomorrow?

And, are we confusing digitization (i.e., data being in digital format) with digital transformation (i.e., the value proposition impacting processes, business models, partnerships, and insights)? Are we confident FSBO's can leverage complex, layered cyber investments?

Is Covid-19 the primary shift for consumer and business investment changes? Is the underlying rationale for the shifts attributed to a once-in-a-hundred-year event, or if we examined the data points across the FSBO supply chains would we conclude different forces in play? Have we been building to a point where the next "iteration of digital" is now setting the stage for leveraging of data assets? If digital leverage is now in demand by products and business models, do we have the infrastructure, personnel (and skills), systems, partnerships, and broad ecosystems of delivery needed to anticipate consumer changes and demands?

As pandemic responses continue to impact consumer purchases, behaviors, and expectations, FSBO's are struggling to get ahead of what is coming and how the vast troves of digital data buried in the clouds, locally, and across partners can be leveraged to address "what is next?" The panel below underscores the trends.

During the last 15 years, FSBO's have come to accept their role of an emerging technological force—privacy, security, compliance, Apps, straight-through processing, and data repositories. Now consumer trust has changed the equilibrium driving budgets and delivery objectives forcing FSBO's to embrace disruption with organizational cultures inexperienced and unwilling to accept their emerging functionality.

- FSBO's have experienced an outstanding recovery post Great Recession and over the last decade their ROC has exceeded 14%, but their ROE at under 10% is 20% off historical measurements.
- FSBO's are struggling with the divergent tangents expected
 of them by their consumers and are operating within
 innovative payments, technologies, and data with skilled
 individuals shunning industry employment.
- Without a roadmap, what should be leveraged?

55%

of all consumer assets controlled by top 11 FSBO's nearly 20%+

of bank workforces dedicated to risk mitigation, governance, and regulations

- Profit pillars—wealth management, investment banking, corporate banking—are fracturing against nontraditional competition and cross-market leaders seeking new revenue streams at the expense of the traditional FSBO business model.
- Legacy technology and the budget spend it consumes continues to reduce the innovation impacts as sunk cost investments do not provide scalability or adaptability.
- Organizational resistance slows progression and quality.

, \$17.5 T

in 2020

in FSBO Assets

over \$800 B

of CLO's outstanding with 35% held by FSBO's much of which is off-balance sheet

The Rationale for the Cyber Banker and Offerings

The leverage of all things digital is here. However, digitalization is NOT digital transformation let alone digital leverage. As finance firms and their target markets reach their cycle peaks, the leverage of digital is a requirement most banking leaders have not incorporated into their forthcoming budgets and operations.

Back around 2000, the contactless banker model was tried, adjusted, and retried, but its share of the market was limited to "technology junkies" who liked the premise that FSBO transactions should be comprehensively digital (e.g., Egg Banking). For many, their efforts resulted in M&A's, assets sales, or liquidation. In the ensuing two decades, these pioneering users became advocates with their methods transferred or cloned by competitors.

Today consumers transmit their data, their money, and their payments using secure electronic connections. They check balances, photocopy checks, apply for loans, trade stocks, buy bonds, purchase gold, research alternatives, and even pay for college all on their smartphones using the latest in secure cellular networks. FSBO's across all financial supply chain segments have digitally automated processes using RPA, they have accumulated data internally and externally on nearly all aspects of a consumer's life, while developing Al and machine intelligence to mine information for opportunities and liabilities. Indeed, it is a brave new world with increasingly capable intelligent offerings.

Those who started this contactless banker model with a vision of a comprehensive digital delivery, likely thought if the back-office was digitized, then efficiencies would lead to greater margins, improved quality, and higher profitability. Another data point was with the launch of Bitcoin over a decade ago. It was thought highly improbable that it would usher in hundreds of additional "coins" (i.e., cryptocurrencies) all having core components of software, hardware, security, and users (e.g., miners). Bitcoin was after all, a dark web payment method preferred by illicit operators.

With these cryptocurrencies came a robust use case for the now familiar blockchain (i.e., ledgers), and additional "spoof-proof" advanced cryptography, which is compartmentalized and layered to reduce burdens and risks. Born in mathematics and underpinned by computer sciences, a decade of digitization of "currencies" is providing one of the last architectural foundations for another round of financial innovation. As standardized "e" solutions for transactions expand for signing, loan documents, and even notarization, contactless delivery is becoming the norm for all types of residential and commercial loans.

Do these cyber and digital artifacts represent the "next normal" for lenders and securitizing agencies as part of the due diligence "bundled" with every loan?



For many FSBO leadership teams, the discussions of cyber and digital is viewed as "been there, done that." And that may be true for the 90% of organizations who have digitized manual processes, employed cyber solutions, and eliminated data entry. Sarcastically, some might say that this form of digitization, cyber solutions, and "digital transformation" is analogous to "paving the cow paths."

However, the current and future challenges that have not been addressed in strategy or implementation is what should be done with those digital assets and cyber initiatives beyond their silos of efficacy? How will these expensive and culturally changing solutions (increasingly cloud based) transform not just product and service processes, but also increase customer loyalty, mitigate risks, and reduce the expenses of financial solutions (now part of larger ecosystems of layered and compartmentalized technologies)?

Cyber and digital transformations were, adhering to initiative goals and slogans, representing industry and enterprise programs and projects designed to eliminate paper, deliver STP (straight through processing), automation, process improvements, forecasting, householding, cross-selling, and generally improve efficiencies and margins at the expense of waste and redundancy. Implicit in all these FSBO initiatives spanning the decades and costing untallied billions were

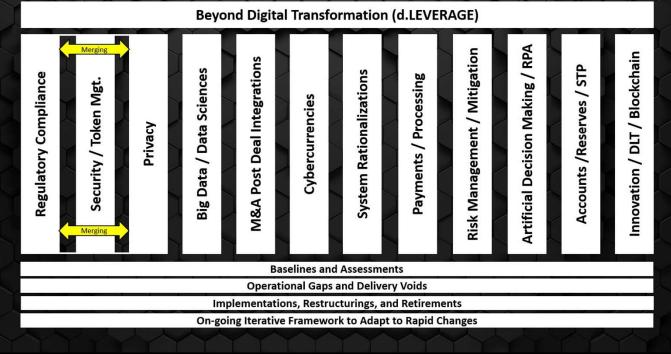
quality of information, customer loyalty and insight, risk management, corporate compliance, and yes, profitability.

However, that was before the arrival of the Fourth Industrial Revolution (4IR), global health crisis, privacy and security of information (and widespread breeches), layer of innovation and cloud services, and economic chaos magnified by broken supply chains and sovereign self-interests. For FSBO's as a collective industry, their cyber supply chains are globally linked, fueled on fungible money, and often opaque to all but those who created them.

With the rise of vast data oceans, FSBO's in an "age of cyber" found themselves possessing rapidly declining consumer financial information estimated to be just above 35% of transactions. FSBO's became less of a trusted source (and viewed with equal suspicion as the legal profession) post Great Recession supplanted by non-traditional firms who were not burdened with historical ideals. These newly minted competitors who started with digital and technology—there was no need to transform processes, systems, skill sets, and integrations. These new entrants had innovative thinking which was "frame separated" from dogmatic institutions who had alternative views of customer loyalty, needs, satisfaction, and capability.

An Umbrella of Leverage Anchored in Cyber Advancements

Looking forward, the functional scope cyber leverage will encompass various verticals some of which will be undergoing their own consolidation due to data advancements and technological progression.



The world of cyber innovation is now moving to meet its surrounding external environmental surroundings. Consumers and enterprises that use your products and services expect that those whom they partner with, spend time and money with, and share their trust and thought capital with, also move in their environmental timeframes and reactionary pressures. FSBO's will have to adapt. Compliance Compliance Compliance

Cyber innovation in this time of innovation marvel and chaos, has little to do with who you are, where you came from, your education, or even your social media presence. It has to do with internalization of principles and finding the relevance for cyber solutions you are seeking to adopt your need, while mitigating the implementation risks. The external events experienced in 2020 and 2021 will likely be a watershed moment for many enterprises resulting in a realization that point-based cyber offerings dogmatically accepted in the third-industrial revolution will fail when leverage and cross-platform data are ignored.

But consumers, as we have learned, are resilient. Bankers we know can adapt, as they have over the last 15 years with a dwindling control of consumers financial information, which now stands at just over 40% of all financial data created (and shrinking). Technological innovation in this era of the Fourth Industrial Revolution (4IR, 2016-present) is forcing bankers to grapple with operational transformations not in years, but in weeks and months as non-competitive innovations force change into their industry delivery plans.

The days of brands being able to ride out the latest "fad" due to their size has passed as those that are huge will be under constant regulatory oversight resulting in offerings that are like "electricity"—can the consumer really tell the functional difference besides the price? Small firms seeking to emulate the large ones will likely be the fastest to fall. Commoditization is a slow, death spiral for FSBO's.

The brick and mortar customer offerings, loyalty programs, and innovation offerings developed along departmental boundaries, have created the acceptance that the ecosystems of cyber innovation once controlled internally is beyond the capabilities of in-house infrastructures. The result is extensive use of digital bridges built to just meet rapidly changing consumer behaviors due to the non-linear complexity of solutions interfacing with one another. To solve the growing complexity crisis across functional solutions (e.g., security, privacy, currencies, collateral and assets), FSBO's must employ **orchestration** to increase customer responsiveness.

Tech giants and social media firms are launching or exploring their own (cyber) currencies, while leveraging their vast insights and predictions for their users to purchase products, anticipate demand or even upsell options to fit lifestyles and personal events. Couple the leverage of cyber solutions and digital assets now appearing with the release of sovereign cybercurrencies, FSBO's, their technology, and personnel will experience unprecedented changes.

As **Oracle** stated recently implying the leverage of data and investments, "A true bank of tomorrow must instead be a value facilitator in the life of its customers. And the bank will need deliver the relevant information, assistance and services to customers anywhere, anytime across multiple touch points, both physical and digital, all while maintaining high levels of security and trust."

In the FSBO cyber solution world, implementations were previously defined in months and years—now we move in weeks to months.

Within the FSBO orchestration umbrella resides the implied core competencies of cyber and data leverage where existing or planned investments are compartmentalized into building blocks of functionality and arranged and reassembled into iterative offerings. Isolation and compartmentalization improves auditability and transparency, while improving operating efficiencies and quality of delivery. Let's examine a few of the factors:

- Cyber innovation and digital leverage is no longer about "going it alone."
- To achieve relevancy while leveraging traditional brick and mortar principles, FSBO's have partnered with cross-industry leaders to tap into data assets and customer behaviors.
- To achieve a "one-stop shop" for financial products, which lead to the expansion of offerings, services, and investments since 2000, FSBO leaders have struggled to turned their enterprises into technology firms offering financial solutions.
- As FSBO's accept that digitization is not an end state, but merely a transitory stage, the search for consumer information and the demand to anticipate needs has led to costly, reactive programs of work.
- FSBO's have become dependent on API's to scrape information needed to feed their systems and analysis from third-parties.

- To secure customers and profits, FSBO's have been forced into hastily arranged partnerships with retailers, payment processors, large IT firms, and even their outsourcing providers.
- Strains on the workforces and the skill depth needed to operate efficiently has launched new ancillary industries such as FinTech with 60 of these firms (which did not exist prior to 2007) now valued at over \$1 billion each.

Once focused on labor arbitrage to deliver against rising cyber and digital processes, FSBO's relied heavily on workforces outside domestic shorelines—now with national interests rising, reshoring is changing the underlying business models and technology. Smaller FSBO's comprehensively linked to singular vendors or platforms will struggle being at flexible and nimble with innovative offerings due to the cost of integration and the ability to compartmentalize innovations as part of layers (within an ecosystem of cyber delivery).

Today, customer experiences are being dynamically redesigned even before the arrival of global healthcare crisis impacting economic and employment models. Digitization is assumed. Digital transformation is part of business as usual. Yet, the next innovational demands are emerging leaving many FSBO leaders without a cyber roadmap of what is next and potential alternatives.

While advice and directions concentrate on the "next normal" inflicted by Covid-19, the underlying challenges facing financial services and banking organizations have been building long before its arrival. If banking and mortgage leadership is to adjust to an altered consumer and investment future, they must quickly determine how to build core competencies with digital leveraging—or risk becoming a statistic.

In the "Land of Cyber" the Conductor is King

A key distinction between the banking pioneers of prior decades, is that the base of consumers advocating for digital delivery was small (< 2%). Today, to succeed and to anticipate competitive reactions, innovative digital delivery is an unspoken rationale with constantly evolving implications. It took two decades to go from 2% to 10% of users regularly utilizing virtual banking. In 2020, it took three months to go from 10% to over 90%.

How many banking leadership teams believed just a few years back that the as a new decade approaches, China would seek to dominate currency markets and be piloting a digital sovereign currency (i.e., CBDC, central bank digital currency) as the United States is occupied with debt issuance, payments, and politics? Will the mainstreaming of **CBDC's** be yet another catalyst that marginalizes non-innovation leading firms as 2020 turns into 2021? Will banking become increasingly contactless as the money itself used to conduct transactions becomes just ones and zeros?

And, in the world of contactless banking, do you have an in-depth assessment of where your skill depth resides? As world events alter banking offerings, what skills will be the most in demand to ensure customer contact and solution provisioning (i.e., systems)? What skills will be the hardest to find for your current and future innovation initiatives? As you examine what is needed and compare that against the skills already obtained, where do you see

the gaps, and how do you anticipate achieving innovation in the face of uncertainties and skill voids?

To clear up a point of confusion caused by context assumptions, all FSBO's--large, medium, and small—will be impacted. The transformation ability to take advantage of contactless banking will be a continuum that may only be 6 to 12 months long. This duration will be likely defined by those institutions that have or partner to integrate the skills needed for contactless innovation delivery. It should be anticipated that the catalysts itemized above will spur significant M&A actions as enterprises lacking capabilities will be forced to join with those who have them. Being an average innovation delivery institution in an age of contactless banking will not be profitable—and may not be survivable.

Cyber and digital disruption (e.g., exploration versus exploitation) will be the norm for all FSBO's during the next decade. As consumers move their lives to a full digital model, and as banking innovation moves decision making (and approvals) to data driven AI enabled intelligence, the need for physical documents, exchanges, and review will be eliminated. Consumers are accustomed to purchasing most products and services without setting foot in a store or speaking in person to a business representative. This lack of virtual acceptance has increased the marginalization of consumer loyalty for their bankers—only kept in check by regulations and traditions.



With the rapid convergence to digital ecosystems and cross-organizational partnerships necessitating data exchanges and trusted data roles, innovation acceptability for younger demographics requires that FSBO's operate as a partner within a greater supply chain delivering a "value proposition" to the consumer that may be outside traditional financial offerings.

- Payments are a valued and iterative components of many FSBO operations, yet with the move to mobile and P2P exchanges, delivery models are being adjusted operate in smaller, compartmentalized financial supply chains.
- The customer experience is about not just meeting but anticipating consumer behaviors—and nearly 70% of those under 40 do not believe FSBO's represent innovation leadership in financial services.
- With central banks (e.g., U.S. Federal Reserve, Bank of England) exploring sovereign cybercurrencies, the

- challenge for legacy systems, payment processors, data aggregation, and regulatory compliance, now requires leverage digital transformations beyond traditional program prescriptions of implementation and operation.
- FSBO's that embrace commoditization under the disguise of technology refreshes (i.e., just staying competitive) risk being comprehensively marginalized, becoming M&A targets, or an asset exodus representing a dwindling consumer base.

To capitalize on cyber and digital leverage solutions, FSBO's must have a plan of attack. First, digital leverage begins with defining the end-state—what you want from those traditional digital initiatives that focused on single layer or LOB offerings? Sounds simple, but it frequently involves business model adjustments and iterative roadmaps that align to the customer rather than the traditional approach being aligned with investors.



Secondly, if the data is digitized within a cyber solution set, how can this be compartmentalized and segmented to create building blocks of value that can also be less-invasively replaced or combined as new information and technologies become available. Think of it this way, if you only had ten building blocks as a child to create words or a structure, you were limited. However, what if we gave you 732 that could be combined into a vocabulary, into a shape or into an architecture that can be adaptable as innovations progress? Moreover, what if we were to give you access to your friends building blocks that you did not own but we allowed to use as a repository of "options"? Now you can start to see the potential of digital leverage and cross-cyber linkages.

And finally, how ready is your organization, your management, and your team to not only plan for digital

leverage, but to organize, delver, iterate, and yes, fail, moving forward? Can you remove yourself and your FSBO from the dogmatic frame of reference to think innovatively, execute non-linearly, and assemble and transform technologies and partnerships? Yes, the third step requires that you assemble, disassemble, and remake on a continual improvement, iterative cycle digital leveraging compartments using orchestration—where you are the conductor accountable and responsible for the outcomes.

FSBO's if the economic conditions stabilize or decline, will embark on comprehensive efficiency initiatives, which will push more data outside the enterprise, create more tangential partnership relationships to address innovation voids, and fundamentally and permanently change their profit, margins, and customer base.

Nonetheless, questions with the pictorial below showcases what impacts the innovation fulcrums can have as they propel traditional digital transformation up and into models that are relevant and in demand by clevel leadership (to excel in their markets and demographics). The drawing begs the question, "do both the internal and external events exert similar launch pressure or do must they be skillfully balanced against iterative unknowns?" Who will filter the events of processes, operations, and relationships to arrive at achievable results—including stretch milestones? Where will the roadmaps be created and how will our extensive investments provide the runway for today—and tomorrow?

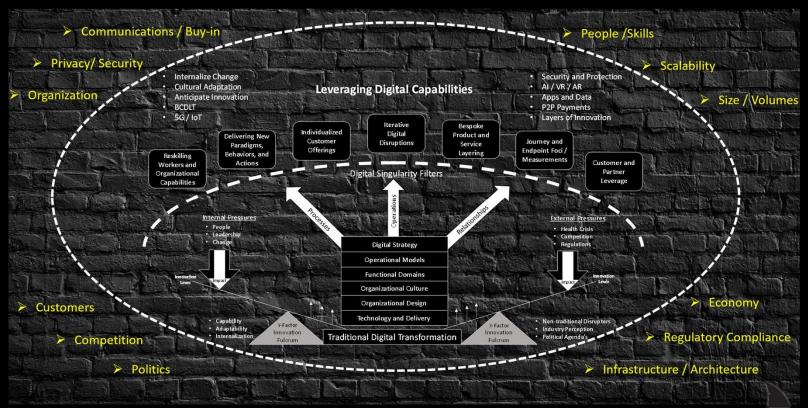
Yet, Q2 2020 is the worst quarter on record for FSBO's since the Great Recession ended. The U.S. Federal Reserve, once the lender of last resort, has become the corporate bond purchaser propping up sales and yields (> \$2.3 trillion committed back in March 2020). Finally, set asides for bank consumer and corporate loans by banks may not be nearly enough as collateralized loan obligations (CLO's, not CDO's of old) held by banks may be more risky (and untested) during prolonged crisis even though the Federal Reserve and Treasury (buyers / backers of these instruments) tout their safety and soundness (as they did with CDO's back in 2007-2009). For an in-depth discussion of this, see "The Looming Banking Collapse", **The Atlantic**, July/August 2020).

The Fourth Industrial Revolution (4IR) is underway created by impacts from artificial intelligence (AI),

machine learning (ML), blockchain, IoT (internet of things), big data, digital trade, smart cities and more. "It is characterized by a fusion of technologies that is blurring the lines between the physical, digital, and biological spheres."

While the industry and regulators even with this "heartburn" insist "there is nothing to see here", the potential losses mount and the contagion spreads impacting multiple banking LOB's. However, will our digitalization efforts of the past decades and years provide the correct granularity and insight for what is coming? Have we grown complacent (as over 90% of FSBO leadership believes they have mastered digital transformation) believing and accepting what is produced and analyzed from our extended cloud repositories as the final word? If we were to review and plan our cyber and digital strategies for the future, where would we even start? Has the profitability of a few LOB's masked unattributed risks due to a digital swagger that "we got this"? Who has quantified our "digital leverage" equations in the face of short-term prosperity surrounding by chaos and uncertainty?

The illustration below depicts the cyber complexities of merging varied innovations, altering the skill equation, capitalizing on changing business models, and adapting to the continuous advancements FSBO's are culturally unprepared to leverage. Without innovation layers for cyber solution sets, without building blocks to compartmentalize functionality, and without operational and reskilling roadmaps, FSBO's can only hope for the best.



Conclusions

The questions we have raised in this brief lay bare the prescriptive approaches that many cyber and digital transformation professionals fail to understand moving forward—it is not about taking a "pill" or buying into a slogan to efficiently address the forthcoming challenges. **Malcolm Baldrige** proved decades ago that slogans will not provide transformational leadership, nor will it deliver the quality across products and services sought by loyal, behaviorally-driven customers.

The science and discipline of digital transformation is about achieving bespoke leverage. Borrowing an idea from health sciences, we are moving from a blunt prescription of cyber and digital deliveries into one of precision delivered value propositions. For as we finish out 2020 and move into a decade of comprehensive financial disruption and risks, our future is now about digital leverage underpinned by cyber innovations.

Cyber and digital innovation leadership is often tested during times of uncertainty and chaos—this year brings a level few have anticipated, and fewer still effectively prepared. The reassessment for every organization will continue and the aftermath of "watch this space" will witness many brands marginalized. Will you and your company become one of those whose total cost outweighed their total benefit? How will the traditional measures and phrases of innovation adoption iterate as we move forward? Are you prepared for what comes next?

FSBO's leadership can no longer dismiss the value of contactless banking especially in the face of future health events, global terrorism, and yes, social unrest. While the cost of delivery may have been prohibitive for some as the rush to adapt trumped expenses, the old ways of restricting innovation and customer defined banking solutions has been shattered. To participate in consumer's financial needs, FSBO's cannot hope for a return to traditional processes, access, and branch models. Digitalization, comprehensive implementation across all forms of the cyber financial supply chains, has found the defining year to usher in contactless banking. Starting in 2021, there will be **new** FSBO winners and losers who recognized the trends and orchestrated solutions that were iterative, layered, and comprised of reusable building blocks of innovation.

The time is now to revisit how we define cyber costs, opportunities, and innovation adoption. The time is now to assess how individuals and partnerships should be made and managed along with the granularity of management principles. The time is now to decide if being different is enough when faced with external events that threaten corporate survivability. The time is now to forge new relationships, take the path not taken, and to listen to dissenting voices that once were marginalized both inside and outside the corporate walls. The time is now to recognize that just telling consumers to "watch our space" will never again be enough—beware.



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Corporate and Author Information

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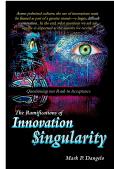
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As Chief Innovation Consultant at BlackFin Group, Mark is responsible for leading and managing innovation led business transformation and technology project engagements, innovation based advisory services, project implementations, and serves as a respected advocate and thought leader to the financial services industry. Mark started his career as a computer scientist and innovator. As a strategist, he has worked globally advising hundreds of companies across the Fortune 50 to the Russell 3000 to privately owned enterprises. His views on innovation are a direct result of his decades of practical experiences.

Mark has worked domestically and internationally on M&A initiatives, operational efficiencies, organizational restructurings, emerging innovations, product and organizational launches, and technology refreshes. In addition, he is a prior c-level executive (e.g., CIO and CTO **Ocwen**) and program manager leading diverse teams and enterprises exceeding 5,000 personnel. Mark has worked in industries including financial services, telecommunications, healthcare, market exchanges, manufacturing, distribution, and high technology. He has been also a principal consultant for **A.T. Kearney, CSC, Stanford Research Institute**, and a senior manager for **Ernst & Young**. His educational foundations include a Bachelor of Science in Computer Science and a Master's in Business.

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