

Digital Matrix Group



Enterprise Vendor Management Platform

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Option: Indefinite Delivery

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1. INTRODUCTION

Digital Matrix Group (DMG), in conjunction with Precision Property Management, have released our Enterprise Vendor Management Platform (EVMP). The genesis for EVMP came after lengthy discussions with financial institutions, US government agencies, government sponsored enterprises, investors and hedge funds whom required a cradle-to-grave Asset Management System. A universal Graphic User Interface (GUI), allows all parties to interact with an Asset through a refined and granular set of access permissions. To that point, EVMP is the only HTML 5 platform which does not require a phone application for mobile delivery of asset disposition

1.1 PROBLEM STATEMENT

Element	Description
Identify Labor	Establish repository pool of vetted Contractors, Subcontractors, and Realtors.
Identify Assets	Establish repository pool of Assets which meet Investor criteria.
Seamless Integration	Allow all parties to interact with respect to the Asset according to clearance.
Pool Capitalization	Pools and technological infrastructure created with minimal initial investment.

1.2 BACKGROUND

A newly released CoreLogic report estimates that 6.9 million homes could be at risk of hurricane storm surge damage in 2018, with more than \$1.6 trillion in potential reconstruction costs at stake. According to the National Centers for Environmental Information (NCEI), natural disasters caused more than \$300 billion in damages during 2017, a year that encompassed several damaging hurricanes, as well as wildfires and mudslides in California. The \$309.5 billion total for 2017 set a new record, easily surpassing the previous U.S. annual record cost of \$219.2 billion from 2005, which included Hurricanes Dennis, Katrina, Rita, and Wilma.¹ Given the acute construction labor shortage that was already at play before these disasters, reconstruction and its repercussions in residential real estate could pose yet another disaster. Building upon this,

¹ <http://dsnews.com/daily-dose/05-31-2018/hurricane-storm-surge-1-trillion>

Digital Matrix Group has begun to create a technological bridge co-joining all parties within the asset lifecycle.

1.3 NEEDS STATEMENT

The technological backbone of the Mortgage Field Service Industry (Industry) is built upon an antiquated, Common Business Oriented Language (CoBOL)² based, hodgepodge of proprietary systems which are lacking in both the ability to nimbly inter-communicate as well as woefully inadequate security protocols. CoBOL has not been taught in college for years and even the attempts to convert to the extremely insecure Java platforms were obsolete before they ever began. Firms such as Mortgage Contracting Services (MCS)³ and other National Association of Mortgage Field Services (NAMFS)⁴ members, an Industry trade association, are spending tens of millions of dollars attempting to keep their platforms on life support. To a fault, Industry platforms remain in the HTML 4 days and each are dependent upon third party phone applications to move data from the field to server-based systems. To this point, third party platforms such as Property Preservation Wizard (PPW)⁵, present with a wildfire of liability built in. Let's start with the fact that your data *is not* your data. PPW states, in their Terms of Service (ToS), that,

*During the term of this agreement, Customer **may extract some of the data** using the export and reporting features within the Service. Upon request and **for a fee of \$500 (up to 8GB)**, PPW will send Customer most of its files and images from within the Service via a DVD, or other media.⁶*

PPW continues, in their ToS, that you may only *extract some of the data*. Add to this that if you want to pull anything larger than apparently your company name, you need to send Five Hundred Dollars and then only up to Eight Gigabytes. If you are involved in a large-scale operation and need to present before, during, and after photos to defend against litigation the service is worthless. And in today's audit driven landscape, PPW would be impractical as a platform qualifying with respect to any Request for Bid – Technical Proposal required by a financial institution, US government agency, or otherwise.

PPW is very blunt in the fact that they are re-packaging and potentially remarketing your data. Here is what their ToS has to say on the subject,

We may provide aggregate and non-personally identifiable information to third parties.⁷

² <https://en.wikipedia.org/wiki/COBOL>

³ <https://www.mcs360.com/>

⁴ <https://www.namfs.org/>

⁵ <https://www.propertypreswizard.com/>

⁶ <https://www.propertypreswizard.com/control.php/login/login/?event=license> at 2) – a)

⁷ <https://www.propertypreswizard.com/control.php/login/login/?event=license> at 5) – e)

More terrifying, though, is the caveat that if PPW should catastrophically collapse --- no fault of your own --- the are only liable for **ONE HUNDRED DOLLARS**.⁸ I want that to sink in for just a moment. Even the smallest of ma and pa providers could potentially be on the hook for millions of dollars in damages.

Traditionally, software platforms have only been capable of providing a limited means of connecting Field Service Technicians (FST) to Vendors for the express purpose of conducting asset preservation. And even then, this pipeline has been incredibly restrictive almost like a convoluted ballet of Morse code. The inability to properly articulate asset characteristics has been non-existent. For example, there has been no ability to transmit videography. Even more telling is the fact that measurements which an FST records in a cumbersome text only field are prone to error. Today, browser leveraged technologies exist to not only burst transmit videography and Real-Time Augmented Reality Measuring (RTARM) capabilities. RTARM allows for any item photographed to be properly measured. And while many may instantly understand the ability to instantaneously measure bid items such as windows, roofs, lot size and other items, the more important aspect is the ability to accurately determine the cubic yards of debris on a trailer. More on point, though, EVMP ushers in the ability to utilize adaptive machine learning models (MLM) – Model, Parameters, Learner. An example might be the ability to push photos through the system, in real time from the field, and immediately recognize if a water heater was present and documented. EVMP is also capable of taking inordinate amounts of data (think of your entire archive) and creating detailed bid reports to identify items perhaps missed and incorporating RTARM algorithms to provide accurate measurements.

Another problem which the Industry has been confronted with, is the ability to granularly grant or redact permissions to data. In other words, the Industry has relied upon a patchwork of core exterior access parameters which present a security nightmare. EVMP, at its core, with over One Million lines of code, created granular permission-based settings.

Building upon the fact that the Industry has begun entering a time of extreme vetting with respect to the veracity of data, present platforms are spurious, at best, when it comes to interpreting photos. For example, there are only several types of meta data which are captured with respect to photos transmitted from the field to the server: Date and Time stamps, Geographic Location; and User-centric Information. For years, the Industry has been plagued with the manipulation of the data commonly referred to as Exchangeable Image File (ExIF) format. Contractors and Vendors alike have, for years, altered this information to meet deadlines as well as misrepresenting the performance of common and routine services. EVMP solves this problem and goes light years further. Without any added third-party software or licensing, EVMP documents the following,

1. Data from the pitch, roll, azimuth of the camera operator.

⁸ <https://www.propertypreswizd.com/control.php/login/login/?event=license> at 6) – b)

2. Ambient temperature in Fahrenheit or Celsius.
3. GPS location event - latitude, longitude and current accuracy of the sensor, based on whether it is coming from Satellite, Wi-Fi, or Cell Towers. GPS data is being continuously collected and timestamped (vs. EXIF contains only one instance of GPS data).
4. Pinpoint triangulation and identification of Satellite, Wi-Fi, and Cell Towers.
5. Basic EXIF metadata from the capture device including,
 - a. Exposure
 - b. Orientation
 - c. ISO
 - d. Aperture
 - e. Duration
 - f. Height
 - g. Location
 - h. White Balance
 - i. Focal Length
 - j. Make
 - k. Model
6. User-annotations based on Open Data Kit forms and descriptive metadata entered by the user.
7. Open PGP public key fingerprint for the user/app (Fingerprint of device + app instance). This is legally admissible as a Notarized Document accepted by domestic and international courts including the United States.
8. PGP signature of all the sensor data including the UNIX timestamp at point of occurrence coupled with NMEA GPS data stamp.
9. Chain of custody file tracking, cradle-to-grave, including file location, each IP Handshake from operator's device to final vendor server, checksum of all pixel values of the image or video frames (J3M).

One of the largest problems presenting today is the ability to synchronize the Client, the Vendor, and the individual performing the designated service upon the Asset. In fact, the ability to conduct even simple queries for items such as *How Many Assets Are Winterized*, is non-existent. Moreover, though, complex semantic queries are impossible. Exacerbating the problem is the ability to obtain qualified, field level providers.

According to a new survey by [Altisource Portfolio Solutions S.A.](#), restoration and improvement of REO properties is becoming an increasing priority for many industry professionals. Altisource today released additional results from its inaugural Default Servicing Survey, which revealed that 93 percent of the over 200 mortgage default servicing professionals surveyed said that their organization is making an investment to

improve the REO properties under their management. That investment was described as “significant” by 62 percent of those surveyed.⁹

Compounding the problem is that locating Qualified Contractors and a vetted Subcontractor network to perform the required Rehab and Restoration services has become virtually impossible, *at any price*. Hurricanes Harvey and Irene, both of which brought billions of dollars in damages to Texas, Florida, and other US Gulf Coastal regions, taxed an already slim manpower pool.

During and after the housing crash, the number of U.S. residential construction jobs plunged by 1.5 million, and only about half have come back, NAHB says. Many workers left the industry for oil, trucking and manufacturing jobs, says Ken Simonson, chief economist of Associated General Contractors, a trade group. During the downturn, the construction labor force plunged by 25% to 8.9 million people. Despite the partial rebound, the labor force in 2016 was still 1.6 million workers short of the 2007 peak of 11.9 million, Labor figures show.

In an NAHB/Wells Fargo survey in July, about 65% of home builders reported labor shortages, up from about 60% a year earlier. The additional squeeze following the hurricanes has pushed up construction wages by an average of more than 30% in Texas and about 25% in Florida, the states’ builder’s groups say.

At the same time, the Trump Administration’s crackdown on illegal immigrants is reducing the number of foreign workers available. Nearly 30% of construction trade workers were foreign-born in 2015, according to NAHB, but the share was higher in states like Texas and Florida.¹⁰

An additional issue presents with inventory itself. Foreclosure filings decreased 15.44 percent nationally from August to September. According to ATTOM Data Solutions, a firm that tracks foreclosures, this is how the 50 states and the District of Columbia ranked for foreclosure filings during September. The national average for foreclosure filings last month was 1 in every 2,099 housing units. In fact,

Foreclosure inventory fell in August to its lowest point in more than a decade, according to the latest Loan Performance Insights Report from CoreLogic. Nationally, 4.6% of mortgages remained in some stage of delinquency, 30 days or more past due including those in foreclosure. That is the same as July’s levels but down 0.6 percentage points from August 2016’s 5.2%.

⁹ <https://www.altisource.com/News-Articles/Article-Links/2018/02/Industry-Pros-Shifting-Focus-Toward-REO-Restoration>

¹⁰ <http://nahbnow.com/2017/08/builders-report-labor-shortages-on-the-rise/>

As of August, the foreclosure inventory rate, which measures the share of mortgages in some stage of the foreclosure process, dropped to 0.6%. This is down from 0.9% in August 2016 and the lowest inventory rate for the month of August in 11 years, since August 2006 when it was 0.5%.

“Serious delinquency and foreclosure rates are at their lowest levels in more than a decade, signaling the final stages of recovery in the U.S. housing market,” CoreLogic President and CEO Frank Martell said.¹¹

Finally, the ability to find motivated Realtors and Appraisers has become a critical issue with respect to the Rehab and Restoration sector as it applies to the REO and Distressed Portfolio segments.

1.4 OBJECTIVE

Digital Matrix Group will provide the administrative and technological backbone to facilitate real estate asset location and rehab *vis-a-vis* a network of vetted firms. We will accomplish this by automating as many tasks as possible and only using humans when necessary. Ultimately, this will be a cost savings exercise due to reduced costs of the continued purchase of Commercial Off The Shelf (COTS) software, reduced staff costs, and higher productivity.

¹¹ <https://www.housingwire.com/articles/41809-foreclosure-inventory-falls-to-lowest-level-since-housing-boom>

2. TECHNICAL APPROACH

EVMP is designed to manage the entire lifecycle of the Asset by and through distributable access based upon a granular permission-based environment. The system delivers a plethora of new, cutting edge features such as Video 360 and intelligence based photography (IBP). IBP incorporates features such as pitch, roll and azimuth, along with legal notarization of photos to ensure zero duplicity and 100 percent veracity.

One of the most unique features is that, in real time, an Investor is capable of overlapping data pertaining to any feature of the Contractor pool; the Realtor pool; and the Asset itself, onto a map. The visualization of data, in conjunction with Semantically driven data structures, allows the Investor to have complete Command, Control, and Communications (C3), with respect to both the Asset Lifecycle as well as those interacting with it, at the click of a button --- literally.

The EVMP Core is built upon TikiWiki. With over one million lines of code¹², the Core has a real-world valuation of over \$20 Million based upon the requisite of over **274 manpower years to build**.¹³ The EVMP Core is one of the most *technologically advanced*, open source projects on Earth. Additionally, many of its features, such as Elastic Search, are used daily within both the government and financial sectors. In fact, Goldman Sachs, one of the world's most influential investment banks, has turned to Elasticsearch and plans to adapt the open-source software to put it to work for a variety of multinational corporations.

Don Duet, Goldman Sachs Technology Division Global Co-Head, is confident that the software can revolutionize client systems and will add value to major organizations. Elastic is one of the most interesting open-source products we have seen in the last couple of years," he said.

The Goldman Sachs technology division has applied Elasticsearch to a variety of tasks with the bare minimum of work. This includes an application to help the clients track trades, the legal department search for contracts and the software engineering team to track bugs swiftly.

The legal application has saved Goldman Sachs endless man hours, as the only way to find an exact clause in a sheaf of contracts was for a team of lawyers to go through them manually. Now, with Apache Tika, the contracts have been digitized with optical character recognition and content analysis software and they can now be searched in seconds.¹⁴

¹² <https://www.openhub.net/p/tikiwiki>

¹³ https://www.openhub.net/p/tikiwiki/estimated_cost

¹⁴ <http://blog.logit.io/goldman-sachs-turns-to-elasticsearch/>

To say that the EVMP Core is secure, is an understatement. Saving **tens of millions** of manpower hours per year, the open source engine powering EVMP also has the underpinning for blockchain. Speaking to blockchain technology, Don Duet, former Co Chief of Technology and 28-year veteran of Goldman Sachs, now the Chief Operating Officer at Vaper IO, had this to say,

You can see who had it, who owned it, the fact that they actually committed to each other electronically and signed it with cryptology to ensure that it was authorized. You could see all those things, and importantly, again, by having that all being done in a set of digital transactions, it enables it to happen in a much shorter time frame, so it also reduces a lot of what today are the delays which create other types of risk in the settlement cycles, which need to be compensated for in other forms.¹⁵

The reality is that current Mortgage Field Services Industry technology is both archaic and collapsing. In fact, FHA is supported by the most antiquated of computer programming, CoBOL. Linear database formats were directly responsible for the Government National Mortgage Association (Ginnee Mae (GNMA)) collapse only a year and a half ago. CoBOL has not been taught in schools for many years; CoBOL it isn't scalable, and the Industry has no viable replacement language for it. Shorthand: it is crash-prone and desperately in need of replacement. The technological development which is occurring within the open source community which, ironically, powers the internet itself. EVMP, on the other hand, not only solves these problems, EVMP easily converts CoBOL and Java based systems, on the fly, for pennies on the dollar.

2.1 REQUIREMENTS

The EVMP operates with any browser and is accessible via any device including desktop, tablet, and smartphone.

2.2 ARCHITECTURE DESIGN

As discussed earlier, the EVMP is built upon the Core of TikiWiki.¹⁶ It is an excellent tool for a corporate wiki, with all the tools built-in: Lightweight Directory Access Protocol (LDAP)¹⁷, fine-grained permissions, trackers, and a plethora of other, built in, features. While the EVMP, itself, is proprietary, the Core is licensed LGPL¹⁸ (while most projects of this type are GPL) so our Clients may freely integrate with their commercial applications. EVMP has a full range of features to make both a great publishing and collaboration platform. In layman's terms, this means that the Investor may easily interact with the Contractor, the Realtor, and the Asset from one Graphic Users Interface (GUI) in a **real-time** setting! Nearly 75 percent of the EVMP Core is based upon

¹⁵ <http://www.businessinsider.com/goldman-sachs-don-duet-explains-appeal-of-blockchain-2016-1>

¹⁶ <https://tiki.org/Use-Cases>

¹⁷ https://en.wikipedia.org/wiki/Lightweight_Directory_Access_Protocol

¹⁸ https://en.wikipedia.org/wiki/GNU_Lesser_General_Public_License

Hypertext Preprocessor (PHP)¹⁹. It allows for Apache Lucene and harnesses either directory or database storage. Structured Query Language (SQL)²⁰ is the backbone for database structure.

VMP has an extremely flexible template system. You can do an amazing quantity of thing without ever changing a single line of PHP code. Thanks to the theme control center, you can assign a different theme to different parts of your site. This means that you do not have to manipulate a single line of PHP to accomplish the White Labelling of the EVMP while, at the same time, allowing Realtors the flexibility to market Assets under their personal umbrella.

EVMP Core has, arguably, **more features out of the box**, than any other web application. EVMP, utilizing the open source TikiWiki base, is in the top ten percent of all PHP based projects on Earth! In fact, with over *1 million lines of code* and an estimated *real-world* value of over \$20 Million, the equity built in, from Day One, makes the EVMP a no brainer choice. The EVMP Core has over 200 different permissions you can set to any Group, Category, or Object. Virtually any item in the EVMP may have individual permission which may override global permissions, as mentioned, and referred to as object permissions. And, to make management even easier, the EVMP also offers category permissions.

EVMP Core allows for the contribution of code and API's so that separate forks do not have to be rendered. The EVMP is a full-fledged Wiki / CMS / Groupware and it may also be used as a framework to build additional functionality. The EVMP Core runs on standard PHP/MySQL. Clients may easily export and reuse data as desired. The big feature-set and tight integration reduce the number of apps to deploy supported by hundreds of contributors and most assuredly almost the most active open source project on Earth. That translates into free updates for the lifetime of the EVMP Core including all sub platforms and underlying coding languages.

*The EVMP Core bundles Zend Framework, Smarty and jQuery and other External Libraries **all together**, in one package.*

EVMP Core comes with a Wiki, Docs, Screencast, Spreadsheets, Timesheets, Work Order Management and Accounting, Slideshow, Drawings, Database Builder, i18n (for translation), Forums, Inter-User Messages, Maps, Friendship Network, Spam Protection, Workspace UI, User profiles, Organic Groups, Wiki User Pages, Calendar of Events, Polls, Quizzes --- and 190+ other features. All EVMP features are optimized for both global and individual encryption datasets.

¹⁹ <https://en.wikipedia.org/wiki/PHP>

²⁰ <https://en.wikipedia.org/wiki/SQL>

2.3 IMPLEMENTATION DESIGN

EVMP contains everything a Client requires pertaining to the Asset Lifecycle from the Servicer's governmental requirements to the accounting with respect to payments for their Subcontractor network. Additionally, EVMP is equipped to assign material distribution based upon Client directed scheduling. EVMP includes all contractual arrangements and, if so desired, includes a fiduciary history with respect to both manpower and asset rehab and purchasing. EVMP is *incredibly easy* to use and the technical documentation is prepared with the layperson in mind. Digital Matrix Group provides both a written and video manual and chances are that after your first day of use, you will not even need to refer to them again.

Digital Matrix Group, in conjunction with the International Association of Field Service Technicians (IAFST),²¹ the Industry's Premiere Trade Association, brings to bear tens of thousands of vetted General Contractors, Field Service Technicians, Inspectors and Realtors®. We additionally provide access to Hedge Funds, Investors, as well as conventional financial institutions.

The normal six-month phasing in for most proprietary systems requires less than a week depending upon the technological abilities of your firm. One week before a Client's active date, Digital Matrix Group will come in and do *hands on* training. Naturally, there will be a few minor things which the Client's staff will identify and white labeling which the Client will desire. These are incidentals which will be sorted out and corrected, on site.

2.4 QUALITY ASSURANCE PLAN

Each Quality Assurance Plan (QAP) is designed, by direction, of each Investor. QAP is one component, of a multitude, which are maintained in the Investor's Digital Library. All components of the Client's Digital Library, including metrics and encryption, are ISO Compliant. Transparent and anonymized auditing is system-wide available each day and accessible from the EVMP GUI.

²¹ <https://www.iafst.org/>

3. EXPECTED PROJECT RESULTS

Our pricing is set in a way that it you cannot afford not to convert to EVMP! We know that, to both the Firm and Shareholder, this may sound absurd. It is not. When faced with the daunting perspective of \$6 - \$26 per Source Line of Code (SLOC), a typical one million lines of code would cost around \$19 Million and take approximately 28-man years to complete. To distill down on this a bit, there are roughly 220 billion lines of CoBOL in existence. That is roughly 80% of the business internet as of 2009, the same year CoBOL turned 50.²² Conservatively speaking, EVMP will require eighty seven percent (87%) less manpower than other COTS frameworks which will immediately translate into long term profits.

The tracking of all personnel and their interaction upon Assets occurs in a real time setting by incorporation of Digital Matrix Group's recently patented QR – RFID Identification Cards. The geospatial data is capable to be projected on monitor arrays to view anywhere on Earth, at any time.

Asset Acquisition approval with occur within seventy-two hours or less. Material distribution to Rehab and Restoration sites is automatically set into motion within forty-eight hours after closing. The ability to distribute the funding schedule, to Contractors, at the one-third initial; one-third midpoint; and one-third final timelines, all within the first four weeks post material delivery, is accomplished via the EVMP Dashboard.

All required real estate transactional records are archived, in Portable Document Format (.pdf) and Semantically compiled to cross reference anonymized blockchain statistics for ten (10) years. Additionally, the burden of all HR orientated tasks. This includes the initial contractual agreements between Realtors, Contractors and their Subcontractor network and throughout the entirety of the multitude of unique Asset Acquisitions and their Rehab, Restoration, and sale.

3.1 MEASURES OF SUCCESS

To be determined by Client.

²² <https://blog.codinghorror.com/cobol-everywhere-and-nowhere/>

4. SCHEDULE

To be determined by Client.