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NoteVault Whitepaper

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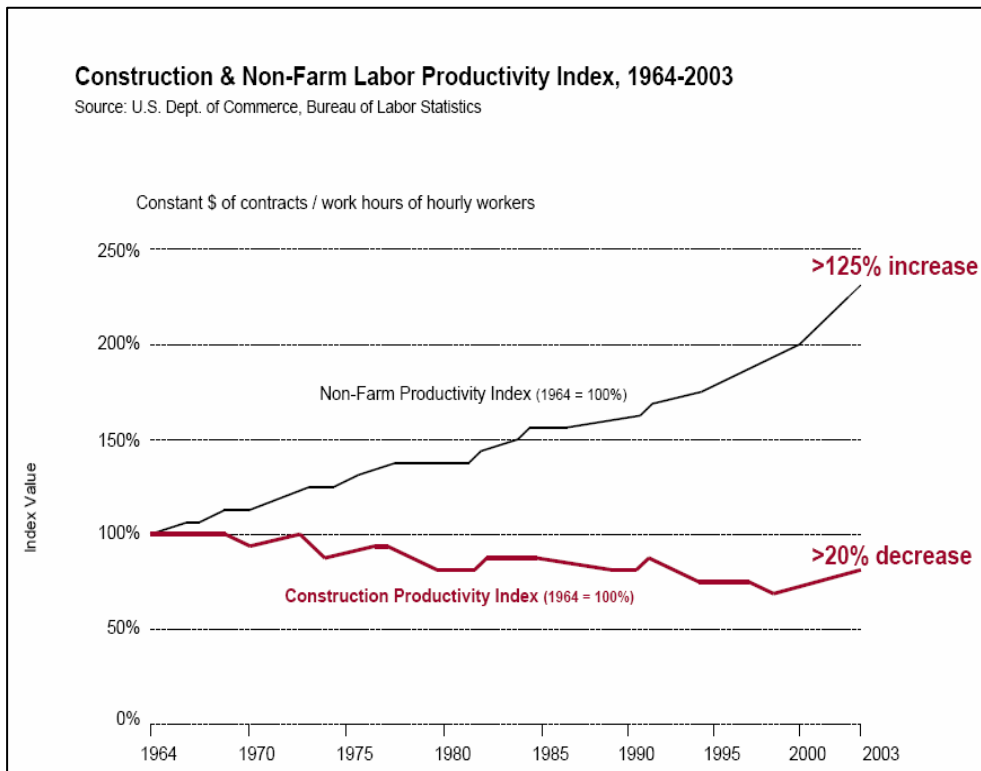


Introduction

The opportunity for new high technology efficiencies in construction is broad. Jobsite reporting is an area that has been overlooked by other players. More specifically, the construction industry is suffering from a bottleneck of getting field data into its back office processes.

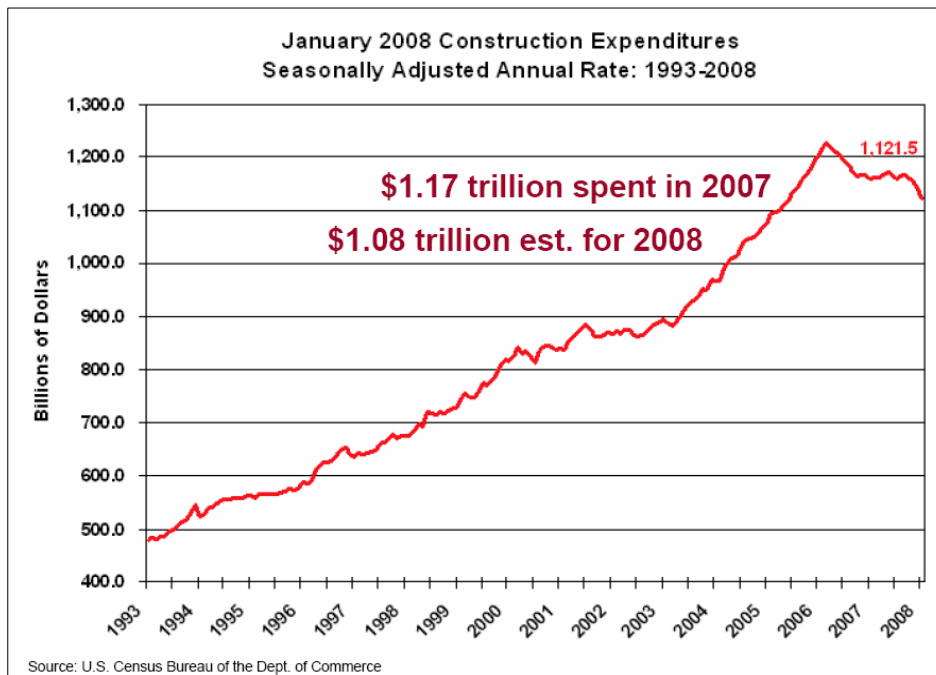
Companies are desperately seeking to increase productivity and mitigate risk by leveraging mobile technologies to provide the critical "missing link" in their project management systems. Furthermore, fewer qualified managers are available every year because fewer people are making the construction industry a career choice. The lack of qualified managers and the unprecedented growth forecast heighten the need for improvements in productivity and risk mitigation

From 1965 until 2003, US worker productivity increased 125% yet, during the same period, construction productivity decreased 20%. (Teicholz, Paul. "Labor Productivity Declines in the Construction Industry: Causes and Remedies." *AECbytes Viewpoint*. Issue 4. April 14, 2004)



A recent Brookings Institution report predicts by 2030:

- U.S. population will increase by 70 million
- 427 billion sq. ft of new building stock will be needed to serve our growing population of which 100 billion sq.ft. of new residential space will be required.
- Half of all buildings in the nation will have been built after 2007.
- By 2030 worldwide urbanization and migration from the countryside to cities will, result in 23new cities of over 10 million people. (Source: Design Futures Council)



Forms are the key to efficient communication about the progress or lack thereof on a construction job. NoteVault has identified the Daily Construction Report as critical, and has therefore targeted its first phase of products at this report. An essential document in construction projects, it records the number of workers/employees, work equipment at the construction site, the exact time the work began and ended, weather, accidents and so on. On no-work days it reports "No Work Today". The Daily Construction Report serves as evidence in the case of disputes.

Getting information into the Daily Construction Report has traditionally been by pen and paper or by typing data into a computer in the office. Consequently, information is missing, late, incomplete, and burdensome to collect. This equates to potentially enormous liquidated damages due to delays.



High Level Solution.

According to results of a survey, Forrester conducted last year, 40% to 60% of businesses in Europe and North America said it is important to increase mobile support for workers and form mobile strategies. This will continue this year because enterprise mobile applications can help companies make their workers be more efficient and productive.

The key here is not to approach mobility as a wholesale re-architecting of infrastructure, but rather mobilizing legacy assets such as the software most companies rely upon to function. Businesses of all sizes can, in fact, save money by mobilizing the resources that they already have (making them more efficient and able to be used in more places by more people).

With mobile device sophistication growing and companies beginning to realize the ways that mobility can allow their employees to work more efficiently we predict that the mobility initiatives should not only prove to greatly enhance workforce efficiency and customer relations, they will also prove to be far less costly and painful than anyone is imagining

Construction foremen are mobile 90% of the time and because of that construction firms are seeking to connect field employees into their project management systems.

Industry sources suggest that 85% of a Project Manager's time is spent on communication, 70% of project documentation is paper based and 50% of all construction projects involve litigation. So, as the project team is consumed in a myriad of paperwork to document the progress, the question remains, who is left to supervise the project?

Because it is easier to talk than to type, construction supervisors will typically provide more detail of events on their project using a voice technology such as NoteVault. In the event of a claim or dispute, users will have better documentation to protect themselves from unwarranted claims. NoteVault can empower your field personal to perform their required field reporting while remaining right in the middle of the action, on the jobsite thus enabling them to expedite project progress and to keep their eye on field conditions to help reduce the risk of accidents and other problems.

Solution Details

NoteVault is a voice to text hosted web service designed for the construction industry. Mobile construction supervisors add transcribed voice notes, photos, videos, files and emails into their account. All data posted is time stamped by an independent third party.

NoteVault is ideally suited to people who are regularly on site and who need to provide reporting on their daily responsibilities. Builders, safety inspectors, insurance investigators as well as labour supervisors use NoteVault to improve their reporting every day.

NoteVault requires paid subscriptions to input voice data to the system. Guests and non-recording team members can be invited to view data for free. NoteVault Integrates with various project management systems, allowing users to route data directly into their end-solution of choice.

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How it Works

Each project in NoteVault receives its own project page with dedicated phone number and email address. When registered users call a project phone number from their registered mobile phone they are prompted to begin speaking. By creating a telephone number for each project contributors can dial directly into each project.

By using Caller Line Identification Presentation (CLIP) the caller is automatically authenticated by NoteVault when calling in, so no further actions are required by the end user to identify himself, or the project he's leaving a message to.

Each voice message is time and date stamped automatically, transcribed, and built into a daily report that can be seen by authorized persons in near real time.

Users can log-in to the web interface at a later time to review transcribed notes and make changes if necessary. Users can also email photos and upload files that are then stored and reported on in the Daily Construction Report. The system authenticates the user's email address before adding data. A project page provides a single interface for the sharing of information across the entire project team.

Transcribed data can also be parsed and inputted into special data repositories. Weather, Manpower, Equipment, and sub-contractors can all be tracked and reported on daily in an easy to view section of the Daily Construction Report. Voice Notes can be categorized or assigned meta-data tags for easy to filter and sort functionality.

Each User has a personal "Dashboard" view of just his or her Note entries making it easy to review and approve their information.

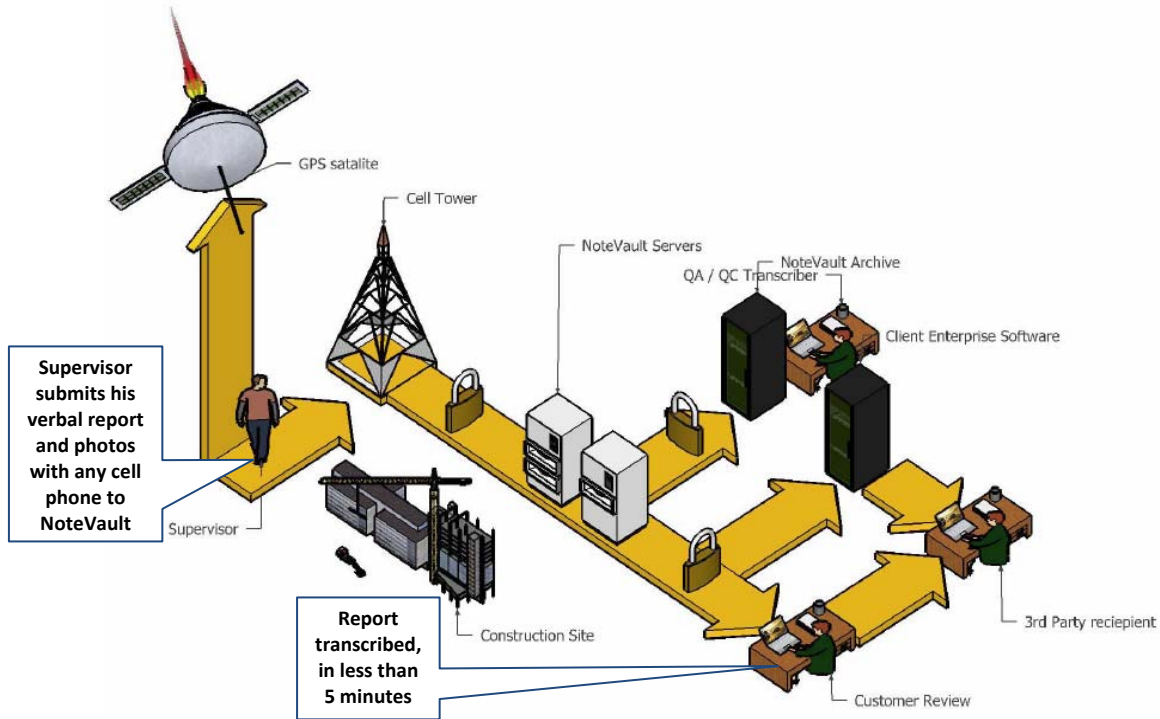
An iPhone application has been developed that allows user to record voice and capture images without having to dial a phone number. The mobile application prompts the user through the required steps and then transmits the data to the web servers when phone is in coverage. Data can be collected and stored on the phone even when out of range. The phone waits until a signal is available and then uploads stored Notes to the user's projects.

The Life of a Note

Notes can be added into a user's account several ways. Users can add a note directly on the web application, email to a dedicated project address, send in via a dedicated Smartphone application, or call into a dedicated phone number. When a user calls into a dedicated phone number the voice is recorded and sent along a path that ultimately produces a high quality transcription that is used in daily reports automatically sent out each day.

Notes recorded on any basic mobile phone or the iPhone applications are routed through a two tier transcription process. The first step after capturing the note is to send it to a transcription engine that combines computer aided transcription (ASR) with humans. This first level of transcription is generally completed in less than 5 minutes, and returns a very accurate text rendering of the note. Within 12 hours that same note goes through a round of quality control with construction industry experts who fix any discrepancies in the final text. That text is then ready for the daily report that goes out the following morning.





Business benefits

With NoteVault mitigating misunderstanding and lapses in communication, the ROI is meaningful. Downtime due to lack of communications can hold up an entire work group – typical 8 workers e.g. a one hour delay can cost \$480.

Inability to call in inspections could delay a project costing anywhere from \$1K - \$100K for one day. Many wireless value added service offerings require typing on tablet PC's, which are a burden to lug around. Further, annual depreciation and support is estimated to cost over \$5K.

The key comparison to make is replacing an hour at the end of the day rushing a report versus reporting in the moment and spending 10 minutes reviewing the day. The extra 50 minutes can then be used to execute billable activities that help propel a project forward. Most active users leave between 5 and 10 notes each day.

A hard benefit of using NoteVault is when it comes to resolving disputes that could have ended up being part of the LD or liquid damages seen on most projects. It is estimated that 10% of project's profit spread out over 6 months following the scheduled date of completion are lost to these damages. These can be enormous and on a project that has 20% profit, which threatens half of the profitability. Technologies that allow critical construction personal to gather and send data straight from the field are poised to benefit from solving this

Research shows that the majority of construction projects end up with a dispute over deliverables, timing or cost (or a combination of these). Often it's the party that has the best records that ends

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up in the strongest position in these disputes. By recording in the moment an instruction by a client to divert work, change the scope or change a priority, users protect themselves from a future when a project is off track for reasons that the client has forgotten they contributed to.

Summary

With the estimated increase in population and subsequent construction growth predicted over the next two decades the need for productivity tools is essential for companies to remain competitive and protected from unforeseen events. Investing in completely new untested technologies carries a risk that may preclude the move to greater efficiency. Players who leverage existing technologies such as existing mobile devices and the web will find an easy and cost efficient way to gather mobile documentation. Because construction personnel responsible for that documentation are mobile 90% of the time it is these technologies that will be first to market and solve the growing problem of poor are limited

NoteVault provides that solution requiring no more than a user's existing mobile phone and their ability to speak. NoteVault transcribes the voice and provides a secure on-line repository for the managing and organizing the data. Daily reports containing text, photos, weather condition, and manpower and equipment totals are automatically sent out to managers and supervisors each morning.

Disputes and liquidated damages are built into the cost of doing business. They are constant threat to an ever decreasing profit margin. Accurate and timely field reporting can reduce those threats by over 50% and in some cases be the difference between a profit and loss on a single job.

