The Four C’s of Digitizing Construction Workflows

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Part 1

The Digital Revolution
In 2014...

The case for apps and mobile devices

#AppAlchemy
We have been part of a digital revolution!

Digital Revolution in Construction

The Smartphone is the fastest adopted tech…

# Years it takes Technology to be adopted by X% of US Population

Source: BI Intelligence estimates based on historical data from PwC, MIT Review

Note: Market penetration is a percent of US households (telephone, electricity, radio, TV, internet) or percent of US consumers (smartphone, tablet)
This revolution has created opportunities…

Software Applications for Construction

The Challenge for Construction in 2019

Who will make the most of this digital revolution?

What is the smartphone’s impact on construction?
The Power of the Smartphone

Digitally-Based

Calls / Video Conferencing
Text Messages
Photos / Videos / AR
Apps (productivity)
“The global app economy will be worth $6.3 trillion by 2021, up from $1.3 trillion last year, according to a new report this morning from app analytics firm App Annie. During that same time frame, the user base will almost double from 3.4 billion people using apps to 6.3 billion, while the time spent in apps will grow to 3.5 trillion hours in 2021, up from 1.6 trillion in 2016”

App Annie ——— App Analytics & Market Trend Firm
Craft workers have carried hand tools for decades. 

Tools meant for driving nails, turning screws or cutting material.
The Digital Toolbelt

Foreman now need digital tools and a collection of construction field applications that capture data to share real time jobsite conditions.
Part 2

The Digital Journey
The Digital Journey

Your Contech Journey

01. Digitize Field Paperwork
Make your field personnel more efficient

02. Improve Process Efficiency
Use data to be more productive and efficient

03. Gain Competitive Advantage
Use your data to make better decisions
Define the field data you need.

Capture field data where it matters.

Build field workflows around data.

Gain stronger insights from real-time field data.
The Case for Digitizing Paper Workflows

- Information Only (nothing to analyze)
- Inefficient (easy to loose)
- No details (photos or videos)
- Labor intensive (double and triple entry)
Paper Forms
Ways of Capturing Field Data

Written
Crews create notes on forms or apps to document site conditions, issues and changes.

Spoken
Crews can record voice notes using apps to document site conditions, changes and issues.

Photos
Crews can take photos of project areas to document current field conditions or non-conformance issues.

Scan
Crews can scan project areas to generate a point cloud to use in 3D software.
Common Forms of Field Data

**Spreadsheet**
Spreadsheet can help people with computational work like project budgets, takeoff lists and even schedules. However, it is difficult to utilize separate spreadsheets across a company.

**PDF**
PDF forms are better than paper, as they can be stored on a computer drive or a local server so easier to find. Fillable forms are easy to fill out and view on mobile devices.

**Apps**
Mobile based apps allow users to generate data at the source of work in the field. Structured data is organized on a web based platform and allows users to filter, sort and analyze.

**Software/Platform**
Web based software allow users to better access data in one central platform. Company data is organized on a platform and allows users to compare project data and develop overall trends for a company as a whole.
Goals of Field Level Data Capture

**Visibility**
Need better ways to understand production rates in the field. How to get dashboard view in real time on product metrics.

**Schedule**
Tracking progress is necessary to validate the agreed up schedule and any deviations or delays to it.

**Weather**
When storms or rainy condition create delays or issues, project data can help determine best course of action moving forward.

**Inspection**
Once materials have been installed they must be inspected for quality and conformance.
# Freeing Your Data from the Carbon Locker

## PAPER-BASED
- Information only
- Text only
- Hard to find
- Hard to share (folders)

## DIGITAL-BASED
- Rich Data
- Photo and Videos
- Easy to locate, leverage
- Easy to share (cloud)

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The Carbon Locker → The Virtual Gold Mine
**Virtual Gold Mine**

**Field Data**

SAFETY NOTES ARE FOR RECORD KEEPING ONLY. INFORM CO-WORKERS ABOUT SAFETY CONCERNS IMMEDIATELY.

**Type of Safety Hazard**
Confined Space

**Affected Cost Code**
100.200.929

**Location (Limit 50 characters)**
West wing on second floor

**Safety report description (Limit 1000 characters)**
Unsafe conditions due to Pinnacle Mechanical equipment.
Part 3

The Digital Process
The Four C’s to Digitize Construction Workflows

01. Collaborate
02. Convert
03. Communicate
04. Coordinate
01. **Collaborate**

Form a Technology Committee
01. Collaborate

Create Consensus by Committee

1. Organize a group of like minded technology enthusiast.

2. Have an **odd number** of people: need a tie breaker.

3. Agree to **regular meeting** dates, times and durations.

4. Empower your **tech champions**.

5. **Set aside a budget** for new technology purchases.
THE DIGITAL PROCESS

02. Convert

Develop your Requirements Matrix
Develop a Requirements Checklist

1. Big Picture (All Projects)
2. Configurability of Fields (what is locked or required)
3. Push and pull data between other platforms
4. Set Specific Parameters (ex. attach a photo)
5. Reporting (Dashboards) specific to your Company
6. Feedback from multiple users
THE DIGITAL PROCESS

02. Convert

Example 1: Rework Issues in the Field (T&M)
# Convert

Example 1: **T&M Requirements Checklist**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Product 1</th>
<th>Product 2</th>
<th>Product 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Labor</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Material Cost</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Equipment Cost</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Add Photos</td>
<td>✓</td>
<td>✗</td>
<td>✗</td>
</tr>
<tr>
<td>Add Signature</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Outside Approval</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
</tr>
<tr>
<td>Web Dashboard</td>
<td></td>
<td></td>
<td>✗</td>
</tr>
</tbody>
</table>
THE DIGITAL PROCESS

02. **Convert**

Example 1: **360 Cameras**
# 02. Convert

## Example 1: 360 Camera Requirements Checklist

<table>
<thead>
<tr>
<th>Feature</th>
<th>Product 1</th>
<th>Product 2</th>
<th>Product 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Long battery life</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Onboard Memory</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Megapixels</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Video</td>
<td>✓</td>
<td>✗</td>
<td>✗</td>
</tr>
<tr>
<td>Waterproof</td>
<td></td>
<td>✗</td>
<td>✗</td>
</tr>
<tr>
<td>Mountable</td>
<td>✗</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Platform use / files</td>
<td></td>
<td></td>
<td>✗</td>
</tr>
</tbody>
</table>
02. **Convert**

Example 1: **Time Cards**
# The Digital Process

## 02. **Convert**

### Example 1: Time Cards Checklist

<table>
<thead>
<tr>
<th>Feature</th>
<th>Product 1</th>
<th>Product 2</th>
<th>Product 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multiple Crew Entry</td>
<td>☑</td>
<td>☑</td>
<td>☑</td>
</tr>
<tr>
<td>Phase Codes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Equipment Codes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Material Codes</td>
<td>☑</td>
<td>✗</td>
<td>✗</td>
</tr>
<tr>
<td>Shift Extras</td>
<td></td>
<td>✗</td>
<td>✗</td>
</tr>
<tr>
<td>Signatures</td>
<td></td>
<td>✗</td>
<td>✗</td>
</tr>
<tr>
<td>Integrations</td>
<td>✗</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
THE DIGITAL PROCESS

03. Communicate

Develop a Program
### 03. Communicate

#### Develop a Written Program

1. Decide what software will use.
2. Decide what hardware will use.
3. Decide how much data will provide.
4. Develop policies for security.
5. Train employees on program.
6. Update annually as needed.
The Digital Process

04. Coordinate

Develop a Full Digital Process
04. **Coordinate**

**Set Up a Test Project**

1. Pick a small project.

2. Must has at least one Tech Savvy team member

3. Look for an easy WIN – ex. convert a form!

4. Document the current workflow (# steps).

5. Document the new workflow.

6. Compare the number of steps and quality.
04. **Coordinate**

**Get Help with Implementation**

1. Ask your software provider for training.
2. In person is the best!
3. Webinars or Video Calls will work.
4. Phone calls…. not so much…
5. Use buddy system for learning.
**THE DIGITAL PROCESS**

04. **Coordinate**

**Train Your Employees**

1. Use unexpected downtime (rain days or delays).
2. Use mentor system (tech savvy help others).
3. Explain the workflow through the digital tool.
4. Document the training.
5. Update materials quarterly.
Collect **Field Data**…not Documents.

- Inefficient, manual process
- Prone to mistakes and loss
- Data and insights are unavailable to project stakeholders

**Structured Data**
- Fast and easy mobile forms
- Accurate data collected in real time
- Project performance data and insights are available to office and execs
Thank you!

Questions?
Mobile Field App
Easy to use Mobile App that is designed for fast data collection and rapid adoption on the jobsite.

Office (Cloud) Workflows
Web App provides access to a single source of real time data for all stakeholders to make informed decisions.

High Level Workflows

Timekeeping
Special Pay
Production Tracking
Mobile Analytics
T&M Tickets
Custom Forms
Digitized Time & Material Tags

Increase process efficiency and transparency to get paid faster.

Foremen capture Field Data and obtain field verification and approvals.

Data is pushed to the web immediately for automated pricing and retention.

A Dashboard to Leverage with GC’S so you can get paid quicker and in full.
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