

Construction Software & the Internet

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This document discusses the home building industry in relation to computer solutions focusing on software and types of remote devices available (with particular emphasis on Internet use). Walt Mahan of dB Dynamics wrote this paper. Comments can be addressed to the company through contact information found at its end.

Background of dB Dynamics

Founded in 1992, dB Dynamics, Inc. is a software development and marketing company with extensive experience in bringing computer solutions to various industries as both a consulting company and software developer. In 2002 the company took the initiative to create a front-end product for *ACT!*®, the leading contact management system in the world based on number of users, which provided remote access for *ACT!* users via the Internet.

This first product offering of dB Dynamics was soon acquired from dB Dynamics by Interact Commerce Corporation (owners of *ACT!*) in November of 2002, rebranded as *ACT! For Web (AFW)*, and launched by Interact in April of 2003. *AFW* was an immediate success having sold over 40,000 copies by mid 2004.

dB Dynamics decided to develop another Web front-end product in 2003 within the construction industry. In January of 2004, dB Dynamics introduced BuilderBuddy at the International Builders Show in Las Vegas. BuilderBuddy is an add-on to the Master Builder® *construction and accounting software* solution offered by Intuit, Inc. of Santa Rosa, California. Master Builder is a proven solution and industry leader in the mid-tier construction arena.

NAHB Survey Results

The National Association of Home Builders (NAHB) recently did a survey of some 700 builders, which yielded interesting results. To underscore the changes in the construction industry, note the following:

Year	% With Internet Access	% Using Dial-up
2000	85%	86%
2003	+98%	< 50%

Obviously, the more than 98% of the firms with Internet access (mostly high speed) also had one or more computers. There was a significant move from slower, dial-up access to **high-speed access** via DSL or cable, which denotes increased reliance on the Internet.

Consumer usage of the Internet also revealed something interesting—40% of the consumers reported using the Internet when searching for a home. Not unexpectedly, Internet usage

declined as the age of the head of household increased (60% usage for homebuyers younger than 35, while less than 15% usage for homebuyers 65 and older).

The new NAHB survey revealed some other telling statistics by the respondents:

- Average of 8 computers per company (mostly desktop computers)
- Average of 6 office and 9 construction employees
- Nearly two-thirds were linked into a local area network (LAN)
- Over 80% had digital still cameras, almost as many with scanners
- 27% had printers that could print blueprints
- 50% reported at least one laptop computer
- 44% had PDAs (Personal Digital Assistant handheld computers such as Pocket PC, BlackBerry or Palm OS)
- Only 12% of the field supervisors (superintendents) reported using laptops in the field, although 18% reported field use of PDAs (25% of those with laptops and/or PDAs had wireless modems)

The most common use of computers by builders was for financial and administrative operations such as accounting and payroll. The survey reported the following functions as computerized:

Computerized Functions	% Of Respondents
Accounting and Payroll	+75%
Estimating	56%
Sales & Marketing	+33%
Project Management	25%
Purchase Orders	25%

An indicator that reflects the increasing value of the Internet is reflected by the growth in percent of builders with their own Web Site as shown below:

Year	% With Web Site
April, 2000	28%
October, 2000	47%
2003	63%

The survey also covered **commercial software** solutions revealing the following:

- Approximately ½ of the respondents were using QuickBooks from Intuit, Inc.
- Microsoft Project ran about 14%
- AutoCAD usage was about 12%
- 10% used Buildsoft
- Usage of a number of software products ran about 3% including Master Builder, TOM Systems, Softplan, FAST and Fast Track.

The Obstacles

There are several obstacles preventing owners from gaining the benefits of technology in the construction industry.

- 1) **Perception:** The biggest obstacle to builders using computers, software and the Internet to increase productively is perception—the perception that field supervisors (superintendents) do not have the technological savvy to use computers.
- 2) **Cost:** Another significant obstacle to using available technology is the perception that it costs too much. While not inexpensive, the cost of computer hardware and software has been coming down regularly. People always have been—and always will be—the biggest expenditure in properly running the business. A well-managed construction company should ask, “Can I afford to continue to do things as in the past?”
- 3) **Fear:** Another obstacle is fear—fear of change and entering a world that you do not fully understand. Consider bringing someone into the company with technology experience who can help alleviate your fears.

The Needs

The NAHB survey demonstrated that builders are already using computers and software in the area of finance and accounting. What about financial information and the Internet, and what about other areas of need that might be addressed through more aggressive uses of the Internet?

- 1) **Financial Information:** Most owners do NOT want their financial information floating out there over the Internet—and rightly so. Most of the accounting work should be done in the office without the use of the Internet.
- 2) **Management Reporting:** Executives in the company are empowered by being able to maintain touch on the financial pulse of the company by having access to financial and other key reports. They may want to review key reports from their home in the evenings or weekends, from vacation sites, and while traveling on company business. The right software tool with Internet access makes this possible so information is accessible at anytime, from anywhere.
- 3) **Field Supervisors:** This is the **key area for the implementation** discussed in this paper. Field supervisors play key roles within a construction company (usually from the job sites) such as:
 - ☞☞ Report Activity—Report employee labor hours, subcontract work, equipment used, incidents, meetings, etc.
 - ☞☞ Punchlists—Create and update punchlist items.
 - ☞☞ Schedules—Update schedules for jobs.
 - ☞☞ Change Orders—Create and update change orders.
 - ☞☞ Purchase Orders—Create and update purchase orders.
 - ☞☞ Communications—Create RFIs, RFPs, Submittals, Transmittals, etc.
 - ☞☞ Field Deliveries—Document shipments that arrive at the job site and notify accounting so the company can take advantage of *early pay discounts*.

Using traditional means, all of the activities above either require a trip to the office, or a phone call where you must rely on someone at the office to enter data completely and accurately into the software being used (or writing it on paper). Such an approach adversely impacts productivity because of travel time, relay of information between the supervisor and the office (double entry), and inevitable errors and omissions. There is also the negative impact of the supervisor being away from the job site. Lastly, the inevitable delays adversely impact operations.

- 4) **Vendor Access:** Some companies want to enable their subcontractors and suppliers to access certain portions of the information within their software. For instance, it would be nice for suppliers to access purchase orders. Subcontractors might be provided access to assigned schedules.
- 5) **Client Access:** Still other companies wish to provide access to certain job information for their clients under the premise that an informed client is more apt to be a satisfied client.

The Changing World

Construction personnel are typically characterized as technologically challenged without the wherewithal to deal with computer solutions. This conception is changing, largely through the biblical quote “a little child will lead them”. This generation of children is being educated in a far different way than their parents with computers being used routinely in the classroom—even in elementary school. Furthermore, the culture of this younger generation is highly literate technology-wise. Use of chat rooms and e-mail is almost a requirement to be culturally accepted among peers.

Fathers and mothers are starting to catch up technologically because they see what their children are doing, and they understand that they may be “road kill on the information highway” if they don’t get on board.

Internet Service

The Internet can be accessed in several different ways, as explained below:

- **Dial-Up:** When introduced to the public, the Internet was accessed by use of landlines. This option is still available, however, it provides the slowest speed and response time. Thus, it is an option, but not the best option. Dial-up does provide a usable and low cost option for builders with a trailer on the job site or when working from home.
- **DSL, Cable, T1 and T3:** Many offices and homes utilize these options because they are more reliable, provide high-speed access and better response time. This is generally not feasible for field supervisors from their job sites.
- **Wireless:** Some manufacturers are offering laptop and notebook computers with a wireless connection, which operate significantly faster than dial-up. You can also acquire wireless cards to be used with existing laptops. Computers that are typically sold with wireless include tablet PCs and handheld computers (Pocket PCs, Palm Pilot and BlackBerry). These options will be discussed more in the next section.

The Internet is available in most areas of the country, however, there are holes in service where it is not supported yet. Furthermore, mountainous areas and those with heavy tree cover make service spotty, if usable at all.

These problems with Internet access necessitate the introduction of two terms—connected and disconnected mode. **Connected mode** describes where Internet service is available. Connected mode infers that the remote computer in use has continual access to the host computer back at the office and can update data in real-time. Thus in connected mode, updates are immediately changed in the central office as data is entered.

Disconnected mode is when service is not available for whatever reason. In order to operate in spite of a lack of connection, the remote computer must contain software to be able to capture and store data until Internet access is re-established. This requirement introduces the concept of synchronization to our discussion. **Synchronization** is the process of uploading and downloading data between the host computer and remote computers.

- **Download:** The process in which data is sent from the host computer at the central office to remote devices. This data (valid jobs, employees, vendors, cost codes, etc.) is used to validate transactions entered remotely from the job site.
- **Upload:** The process in which collected data is sent back to the host computer at the office from remote devices. This data may include employee labor, equipment used, subcontractor work, update punchlists and schedules, Change Orders, POs, RFIs, RFPs, and other data collected remotely at the job site.

Remote Device Options

There are a number of device types that can be used to access the construction and accounting information remotely through the Internet. Certain device types have advantages over others as pointed out below:

Desktop PCs: Good old PCs are the ones routinely placed around your office. They are the mainstay of computerized solutions. PCs can still have a place in builder solutions via the Internet. As mentioned before, if trailers are in place at your job sites, you can use PCs remotely by installing them in trailers and using dial-up access. It is slower, but tolerable in most cases. Secondly, you can acquire one of the forms of high-speed access from local providers. Lastly, your management may desire to use PCs in the office to access facilities of software (i.e., BuilderBuddy) through your **Intranet** (internal Internet connection behind your company firewall). Desktops can also be used from home.



Tablet PCs: The tablet PC (about \$1,500) was specifically created to serve the needs of mobile workers. It provides all the performance and features of today's notebook PCs with added features to improve mobile computing, including a natural interface for entering data using a tablet pen, an ultra-light form factor, and advanced handwriting and speech recognition capabilities. Best of all, they are usually packaged with a **wireless** option. They are affordable and lightweight. A tablet PC can be easily mounted in a van or truck to protect them from damage.



Laptop and Notebook Computers: This type of PC possibly is already in use within your company by mobile workers. Like the PC, you can use them in dial-up mode, or you can make them wireless by adding a **wireless card**. They do not share all of the characteristics of the tablet PC. But they are a good mobile option.



Handheld Computers: These Personal Digital Assistants (PDAs) include three major types (**Pocket PC**, **Palm OS** and **BlackBerry**), which are the least expensive of the device types. Their size makes them attractive in that they can easily ride on the hip of the user. These are usually wireless, but share common disadvantages. All have a smaller display area than offered by the devices previous listed. Most use a stylus for inputting data (the BlackBerry has a small keyboard, optional keyboards may be offered on other devices). These limitations make it difficult to support most of the transaction types needed in construction software. Thus, most software providers supporting these devices limit their offerings to employee time reporting and updating punchlists. These three types also require different development platforms, thus each one requires a unique implementation. Another drawback is that they are easily damaged or broken—particularly by construction workers. Ruggedized versions are available, but their cost (\$1,300-\$3,000) usually exceeds that of the more functional tablet PC.

Pocket Pc



Palm OS



BlackBerry



Some of these remote device options provide built-in cameras, scanning capabilities and GPS (Global Positioning System) to further enhance data collection and usability.

Viable Master Builder Solutions

dB Dynamics is one of several software companies with Internet-based solutions that interface to Intuit's Master Builder. The following is a high-level overview of what is offered by each company:

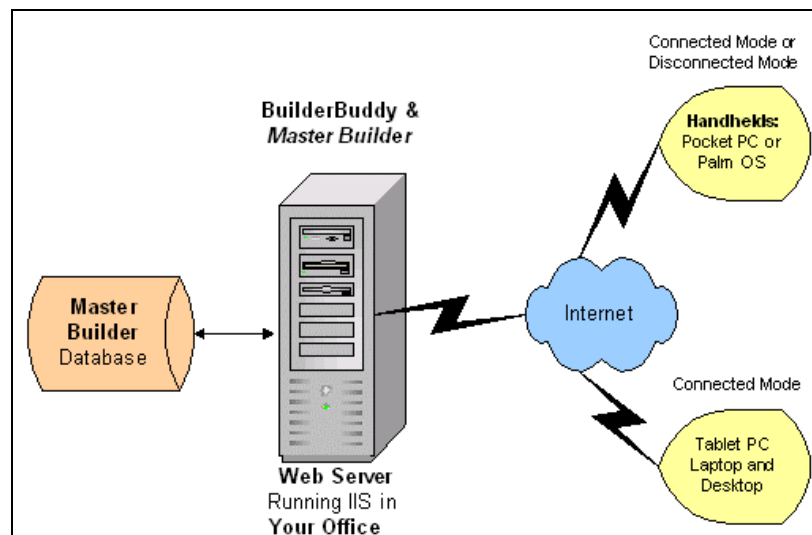
Company	Product Name	Web Site	Comments
dB Dynamics	BuilderBuddy	www.dBDynamics.com	Supports Field Deliveries, Punchlists, Daily Field

Company	Product Name	Web Site	Comments
			Reports, Change Orders, Schedules, POs, RFIs, RFPs, Transmittals, Submittals, in addition to the underlying tales (Jobs, Vendors, Clients, Employees, etc.). Targets functions needed by field supervisors from job sites. Supports use of tablet PCs, laptops and desktops for all functions. Supports Daily Field Reports & Punchlists with Pocket PC and Palm OS devices.
FieldRanger	FieldRanger	www.fieldranger.com	Tracks Work Orders and dispatching calls for Work Orders. Supports Palm OS and Kyocera Smartphone devices.
MoriahCom	MoriahCom	www.moriahcom.com	Supports Daily Field Reports with Pocket PC and Palm OS devices.
Bosch Digital Power Tools	mJobTime7 & Punchlist Manager	www.boschtools.com	mJobTime7 supports the Daily Field Reports & Daily Payroll Entry. Punchlist Manager is a separate product that supports Punchlist maintenance. They support Palm OS devices.
BuildLinks, Inc	BuildLinks	www.buildlinks.com	BuildLinks supports the Change Order process, tracks construction tasks & subcontractor schedules. They support laptop and PDA devices.
Ki Systems Inc.	MasterTime	www.kibizsystems.com	MasterTime captures Payroll Time data via FileMaker Pro. They support desktop, laptop and PDA devices.

How Would BuilderBuddy Operate with Master Builder?

The **Master Builder database** contains centralized data entered locally from desktop and laptop computers networked into your Local Area Network (LAN) or Wide Area Network (WAN). With BuilderBuddy, data can be entered over the Internet remotely from the job site or other location & **updated in real-time**. As shown in the adjacent graphic, the *Master Builder* database resides at your company's site just as it does now.

A **Web Server** is a robust computer that runs Microsoft's IIS (Internet Information Services). The Web Server hosts the **BuilderBuddy** software that provides secured, remote access to the *Master Builder* data.



The **Internet** has revolutionized the way efficient businesses operate in recent years because it enables company personnel to communicate and access/update data while out of the office.

The **remote devices** include computers (Tablet PCs, PCs and Laptops) that can display data that consumes an entire screen such as is found on your desktop computer.

Remote devices also include Pocket PCs & Palm OS devices, which have a smaller display. While data input is cumbersome, they are excellent vehicles for applications requiring limited data entry (capturing labor hours & updating punchlists).

Benefits to Construction Companies

The benefits derived by builders are highly dependent on the software solution provided. Therefore, we will address the benefits resulting from using BuilderBuddy from dB Dynamics, which we are more than pleased to share with you.

- The Field Delivery support enables your company to take advantage of early pay discounts, which can result in **\$ savings** in the tens of thousands.
- Owners and management can stay connected to the company wherever they are when access to the Internet is available by viewing selected, strategic reports.
- Improve productivity of field supervisors by permitting them to enter key information as it happens (record labor, note incidents, meeting notes, field orders, update punch lists, etc.). They no longer have to travel to the office or tell someone else what happened. The introduction of the **crew** concept enables time reporting of the entire crew with a single transaction.
- Maximize your IT investment in Master Builder.
- Reduce the cost of operations.
- Improve employee morale because of a more efficient, high-tech toolset.
- Increased customer satisfaction because of improved response time and the ability to immediately respond to their questions.
- Lower cost, higher bottom line.

Summary

The rapid proliferation of inexpensive handhelds, decreasing cost of connectivity, the broader areas of wireless coverage—all stimulate the implementation of the types of solutions discussed here.

While the combination of computers, software and the Internet have not revolutionized the home building industry, their impact is increasing at a significant rate. In particular, the facilities offered through the Internet will become more pervasive as owners become more cognizant of the advantages of operations from the job site using recent technology advancements. We expect increased pressure from field supervisors and project managers as they become more technologically savvy.

Internet solutions discussed in this paper provide the means for key players within construction companies to **stay connected anytime, anywhere!**

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