



مدیریت کسب و کار در صنعت ساخت (Construction Business Management)

ماژول ۲: مدیریت کسب و کار

بخش ششم: مدیریت فناوری اطلاعات

ارائه دهنده:

سید محمدرضا علوی پور

(PhD, PMP, CMIT)

CMAA Authorized Trainer

دانشگاه Illinois Tech آمریکا



What we will learn?

- ☐ Technology
- ☐ Reticence about Adopting Technology
- ☐ First Things First
- ☐ Emerging Trends
- ☐ Virtual Construction
- ☐ Measuring the ROI of Your Technology Investment
- ☐ Compelling Business Reasons to Invest in Technology
- ☐ Information Management
- ☐ Information Requirements
- ☐ Hardware and Infrastructure
- ☐ Software
- ☐ Security Systems
- ☐ Company Security Policy
- ☐ Company Websites
- ☐ Exercises

Technology

- ☐ The **construction industry** is highly fragmented, with many companies doing **many different things** and many companies in **competition to win** the same work.
- ☐ Most contractors are “**wildcatters**”; they don't seek collaboration with other peer firms.
- ☐ **Business practices** are also **fragmented**.
 - ❖ There are **few standards** as the industry **lacks a few dominant players**.

Prepared by Dr. Alavipour
DO NOT DISTRIBUTE

❑ However

fragmented the industry may be,

your construction company's business operation should never be fragmented.

❖ **Fragmentation** is inefficient and inefficiency results in lower profitability.

Prepared by Dr. Alavipour
DO NOT DISTRIBUTE

❑ Taking **advantage** of the latest technology to **handle your data**

makes the **business cycle** of

1. Work acquisition,
2. Building work, and
3. Getting paid for that work

far more cost effective and efficient.

It allows you to do the following:

❑ **Access information** in real time without tying up a second person to provide it to you when you phone.

❖ **Calling only** when you really need something

1. Allows your employees to **concentrate more fully** on their essential work and
2. Improves your relationships by keeping annoying “drop everything” **favors to a minimum.**

Prepared by Dr. Alavipour
DO NOT DISTRIBUTE

❑ **Accurately gather complex data and analyze** it in ways far more detailed and cost effective than would be practical **if it were done by humans.**

- ❖ Disseminate information in **real time throughout your firm**
- ❖ Facilitate **timely** billing and tracking of payments
- ❖ Automate the **bid process**
- ❖ Speed up business **communications**

Prepared by Dr. Alavipour
DO NOT DISTRIBUTE

❑ **Eliminate** costly errors and rework.

❖ This assists in **accurate projections** of needed materials and labor by **allowing virtual building** before actual work begins.

Simply put, technology can enforce discipline and improve efficiency and cost-effective practices.

Firms with these characteristics out-perform their peers.

Accounts payable (A/P) processing may represent one of the greatest potential time savings for office personnel. Reviewing and streamlining the invoice handling and payment process can be a leverage point. If you have a dozen projects, you may be processing hundreds of A/P invoices each month. Using technology and processing take wasted time out. Don't forget, consistent mistakes by a supplier should be grounds for a penalty. Keep the A/P area from distracting your focus on installing work.

Reticence about Adopting Technology

Reticence about adopting technology

- ❑ If **you grew up** with **computers** on the desktop, you may be surprised to learn that **some people are still slow** to adopt technology.

Prepared by Dr. Alavipour
DO NOT DISTRIBUTE

Reticence about adopting technology

❑ If you are **older**, you may have **sensed** the possibility that technology could give **construction a real boost**.

❖ However, you remember how **poorly managed most technology companies** were in the past two decades.

Prepared by Dr. Alavipour
DO NOT DISTRIBUTE

Reticence about adopting technology

- ❑ Just as **significant** was the **poor financial management** that technology companies practiced.
- ❑ They spent **venture capital at enormous rates**. Why?
 - ❖ Many of us still don't know.
 - ❖ **Confidence** in tech companies in and out of the **construction industry** has **decreased**, not increased.
 - ✓ Many contractors still take a **wait-and-see attitude**.

Prepared by Dr. Alavipour
DO NOT DISTRIBUTE

Reticence about adopting technology

❑ Through the **integration** of the Internet and project-management systems, tasks can be accomplished better, faster, and cheaper.

❖ **Internet-based systems** also offer easily searchable archives for retrieval and reference purposes.

❖ **Improving communication** between project participants, increasing accountability, and streamlining the development process from site selection to design, construction, and operation,

project-specific websites (PSWs) reduce the costs incurred by change orders, claims, and record maintenance, as well as minimize or eliminate delays.

Reticence about adopting technology

As-built drawings have great value to owners. Keeping a retrievable system of project documentation is essential. The law of repose makes contractors responsible for being able to produce these documents for more than a decade in some states. Also, questions about previous work arise and demand accurate, verifiable answers. Contractors need a failsafe, organized retrieval system. Electronic filing systems fill this function well.

First Things First

❑ Investing in technology is an **expensive proposition**.

❖ Over time, it will **save** you time and money.

❖ If you discover **only after making your initial investment** that the system does not meet your needs,

migrating to any other system is a **costly** proposition.

✓ **Making prudent choices** from the start is key.

Prepared by Dr. Alavipour
DO NOT DISTRIBUTE

Define your business process

- ❑ Technology is of **little value** if you **don't define** your business process up front.
- ❖ **Computers** only process data that **human beings input**.
- ❖ **Adding technology** first without such scrutiny and refinement is just “paving the cow path.”
- ❖ **Nobody moves faster**, but their feet are cleaner and they are more comfortable.

Prepared by Dr. Alavipour
DO NOT DISTRIBUTE

Determine the What and How Much You Need to Get the Job Done

❑ Keep in mind that to **have too much technology** is as problematic as having too little or none.

❖ **Computer applications** that are too complex for your employees to use competently can **confuse them**.

✓ The **results produced** by the computer can only be as **accurate as the data** your people feed it.

○ With our **low margins and high risks**, be very careful.

We **don't have room** for grand experiments.

Size Your Technology to Your Firm

❑ To illustrate with an absurd extreme,

a firm that **consists of only a single person** would have no need for a computer network designed to **disseminate information** among many employees.

❖ On the other hand, **even a small firm** with only a few employees and one billing person **cannot operate efficiently** with a single computer to share.

✓ As soon as you **increase your number to more than one**, you need to think about **networking to keep everyone connected** to each other.

Hardware should come from well-established firms

- ❑ This hardware should have **excellent records** of customer service and warranty service.
- ❖ Most of these firms will be glad to assign a **single point of contact person** to you to ensure that **navigation through their system** is efficient and painless as well as discounts for business purchases.
- ❖ In addition, these firms can ensure that the **software placed** on the machines is **customized to your business**.

Prepared by Dr. Alavipour
DO NOT DISTRIBUTE

Compatibility is key

❑ Make sure all your **hardware is compatible**.

❖ As an example of the **trouble incompatibility** can cause, in the early days of the **BlackBerry device**,

some construction firms discovered much to **their dismay** that the **devices were not compatible with the wireless service** provided by the **telephone company** they had already contracted to provide their service.

✓ Consequently, they **could not send data** input onto the BlackBerry **through the Internet** to the **construction office**.

○ **Costly modifications** to the hardware were required; this also **resulted in costly delays**.

Email, text messaging, and voice mail are key communication tools. Having a dependable service provider cannot be overemphasized. No bells or whistles are needed, just consistent delivery of messages in a timely manner. Failing here has rippling negative effects throughout a contractor's business.

You can't use what you don't understand.

❑ A **small software firm** in start-up, for example,

1. May lack satisfactory customer support,
2. Fail to provide training,
3. Offer no or expensive upgrades, and
4. Have bugs in the software that can cost you expensive delays.

Prepared by Dr. Alavipour
DO NOT DISTRIBUTE

Technology to have and master – Networks

❑ Obviously, if it is helpful for

1. Each employee to have access to a computer with internet access,
2. Each employee having real-time access to every other employee is even more helpful.
 - ❖ Setting up a **network** allows you to connect **multiple computers** and peripherals—printers, scanners—and to have them **all share Internet access and access to your business data.**

Prepared by Dr. Alavipour
DO NOT DISTRIBUTE

Wireless or Ethernet: that is the question

❑ **Wireless network** connections have become **more economical** and allow even better data sharing.

❖ For example, a **craftsperson in the field** can send a communication from a **handheld device to all others** involved in the project,

❖ some of whom may **read it on their handheld device** and

others, who may **access it from their desktop computers**, have it **printed out in the office** without ever going in to the office to do so.

Wireless or Ethernet: that is the question

- ❑ All of the major operating systems have networking capabilities built into them.
- ❖ A wireless setup in your office space creates a **more attractive and safe environment (fewer wires tangled all over the place)**.
- ❖ It allows far more flexibility where you place your desktop computers, laptops, and peripherals.
- ❖ It also enables you to **offer customers and other visitors Internet access and hotspot facilities for their laptops,**
which allows them to access their business data **during your business meetings.**

Wireless or Ethernet: that is the question

❑ On the other hand, **Ethernet-based, hard-wired networking** can still be more advantageous than wireless systems

because they are **more reliable, lower in cost**, and offer **faster Internet connection speeds**.

❖ Wireless signals **can vary** depending on placement in the office, thickness of walls, and sometimes even the weather.

Prepared by Dr. Alavipour
DO NOT DISTRIBUTE

Data backup

- ❑ Whether they be estimates, schedule narratives, cost reports, billing, or company process documents, all are critical.
- ❖ Tracking revisions and ensuring that you have **ready access to the most recent revisions** is crucial.
- ❖ Your **bookkeeping and accounting records**, as well as your building plans, bids, and every other documentation of your business are as important to you as your building machinery, materials, and employees.

Without them, you have no business.

Emerging Trends

Touch screen and voice activation technology

- ❑ Touch screens make **optimal use** of icons, which are small graphics on the screen that communicate the function they perform.
 - ❖ It **precludes** the use of a **mouse or touchpad** to interact with the computer.
 - ❖ This technology can be helpful for users who **don't speak English fluently** or those not **conversant in complex computer operations**.
- ❑ Bookmarking and thus hardwiring a path to a website, program, or form is a **smart way to lead people directly** to a needed computing task.

Touch screen and voice activation technology

- ❑ Similarly, voice activation technology allows **voice input without** the use of any **keyboard** or other data interaction devices.

Prepared by Dr. Alavipour
DO NOT DISTRIBUTE

Virtual Construction

- ❑ We are on the verge of the **virtual construction age**.
- ❑ **Virtual construction merges** one of the oldest businesses with one of the newest business trends.
 - ❖ This marriage has the **potential to minimize** some long-standing construction problems.

Prepared by Dr. Alavipour
DO NOT DISTRIBUTE

❑ To be clear, **computers won't build** anything, **people will**.

❖ **But computers** can make the process of building more efficient and safer with higher quality results.

Prepared by Dr. Alavipour
DO NOT DISTRIBUTE

- ❑ Virtual construction allows contractors to **plan and build** a project on a computer **before embarking on it in actuality**.
- ❑ **Whether** estimating, bidding, pre-job planning, or monitoring construction activity, you will spend less time traveling to the project and on the project site if **you do it first in virtual construction**.
- ❑ Construction professionals will be able to **visualize every step** of the project, the equipment, labor, and materials needed, and **share it with everyone involved** before investing any funds in what might turn out to be wasted effort.
- ❑ **Last-minute pricing or availability changes** can be factored into the equation in **real time**.
- ❑ **Any questions** that arise or problems that the computer detects can be **resolved before starting work**.

- ❑ With **wasted time of labor** still around 30 percent, it is logical and rational to start there in our quest for **better project outcomes**.

Prepared by Dr. Alavipour
DO NOT DISTRIBUTE

Data used in virtual construction

❑ **Typical data collection** used in virtual construction includes

1. Material tracking, on-site or installed
2. Labor tracking, by cost code and person
3. Equipment tracking, by cycle time, fuel consumption, and hours used

Prepared by Dr. Alavipour
DO NOT DISTRIBUTE

Data used in virtual construction

❑ **Typical data analysis** used in virtual construction includes

1. Daily production against budget
2. Result against schedule
3. Function against best practices improve planning in a way to optimize assigned labor, and improve productivity, safety, and quality during the real-time construction.

Prepared by Dr. Alavipour
DO NOT DISTRIBUTE

Data used in virtual construction

□ **Typical information transfers** used in virtual construction includes

1. Virtually detailed building plans and specifications for pricing and constructability comment
2. (After the above step) extensively detailed plans and specifications for planning and scheduling
3. Real-time construction data from field operations to supervisors and executives
4. “What-if” scenarios as a way to propose solutions to schedule problems, constructability issues, and other situations

Data used in virtual construction

- ☐ In **virtual construction**, software will perform the calculations of time and cost as well as quality and safety.
- ☐ The supervisors, managers, and executives **then use that result** to investigate, plan, and troubleshoot.
- ☐ The **computer assumes** the role of clerk and **does** collection, calculation, and dissemination of data, **faster** than any human clerk could.

Prepared by Dr. Alavipour
DO NOT DISTRIBUTE

Real-time tracking

- ❑ In **virtual construction**, as we do in **actual construction contracting**, we track.
- ❖ Having a **current idea of where** we are in the **process** allows for timely completion of tasks.

Prepared by Dr. Alavipour
DO NOT DISTRIBUTE

Measuring the ROI of Your Technology Investment

Measuring the ROI of your technology investment

The construction business is not about technology.

- ❖ However, construction is **helped greatly** by technology.
- ❖ **Your competitors** will **race past** you and then **lap you** as you use paperwork as a means of planning, communicating, measuring, and adjusting.
- ❖ You have to **use some basic forms of technology** to stay competitive and to keep functions executing quickly.

Prepared by Dr. Alavipour
DO NOT DISTRIBUTE

Measuring the ROI of your technology investment

❑ However, **when talking with software and hardware vendors**, they sound as if it is the **major thing in construction**.

❖ What they are really saying is, *without their technology, you will perish*.

- ✓ We know you will have to make a choice of technology.
- ✓ You might choose theirs or someone else's, but you have to choose.

When you do, how do you make sure it delivers a high ROI?

Prepared by Dr. Alavipour
DO NOT DISTRIBUTE

Measuring the ROI of your technology investment

Let's start with what we know:

- ☐ We know that **technology changes rapidly**.
- ☐ We know that **technology companies often merge or go out of business**.
- ☐ Technology companies try to **differentiate themselves** from their competitors.
- ☐ We want a **uniform approach** so our system can **communicate freely** throughout our company and with others such as clients, suppliers, and funders.

We need to keep technology focused closely on those.

Otherwise, scope creep will happen and costs will rise.

Measuring the ROI of your technology investment

*We increase ROI by **lowering cost** and/or **increasing profits**.*

- ❑ The **easier** of the two to measure is the cost, which includes **labor productivity**.

If technology can **substitute for the clerk** function then,

it becomes just a **matter of cost**.

Prepared by Dr. Alavipour
DO NOT DISTRIBUTE

Measuring the ROI of your technology investment

- ❑ With these factors, we can create a rough calculation of return on investment.

$$ROI = \frac{(\text{Savings} - \text{investment}) \times 100}{\text{Investment}}$$

Prepared by Dr. Alavipour
DO NOT DISTRIBUTE

Measuring the ROI of your technology investment

- ❑ Any serious discussion about ROI takes into account the **nature of the construction business**.
- ❑ **Payments** for software (cash flow) have to be **part of the equation**.
 - ❖ Having serious discussions about the amount, timing, and continuity of payments with technology vendors is wise.
 - ❖ **Our time horizon** for pay-off on technology has to be **short**, say two years.
 - ✓ Two years is a **long time** as technology changes and **software companies combine** or cease existing.
 - So, the **two-year rule** places pressure on everyone, including the **technology company** who trains you and the employees who insist that your firm needs it.

Measuring the ROI of your technology investment

- ☐ Be insistent on payoff proof upfront and payoff results at the beginning of the third year.
- ☐ We like the ratio of dollar of gross profit **per** dollar of technology as a metric.
 - ❖ This squarely measures whether the field is being aided by the technology in your firm.
 - ❖ **Trending this over five years** will tell you something about **how your hardware and software is performing** in regards to the largest area of risk and reward—building work.

Compelling Business Reasons to Invest in Technology

Compelling business reasons to invest in technology

- ❑ We should have a compelling reason for any major new direction in a business, construction or otherwise. We have **three reasons** for investing in sound technology:

Prepared by Dr. Alavipour
DO NOT DISTRIBUTE

Compelling business reasons to invest in technology

1. Hardwiring your business processes standardizes them and assures timely monitoring.

- ❖ As a result, compliance to those predicable processes will increase meaning **greater discipline**.
- ❖ My observation is that **well-disciplined firms** continue to **outperform their less-disciplined** brethren.
- ❖ Taking labor effort out of collecting and disseminating information **frees up more time for analyzing** it and then **acting** on it.
- ❖ **Approximately 90 percent** of all cost overruns on projects are **due to labor**.
- ❖ The **earlier we know of any problem**, the better the outcome.

Compelling business reasons to invest in technology

2. The highest and best use of any professional's time is negotiating.

❖ It has the **highest monetary payoff** per hour.

✓ A **virtual construction protocol**, once set up, **frees up more time** for each manager, supervisor, and executive in a firm to **negotiate more things**.

○ This means a **higher per-hour payoff** of middle managers and executives' efforts.

Prepared by Dr. Alavipour
DO NOT DISTRIBUTE

Compelling business reasons to invest in technology

- ❑ Further balancing this expense is the potential savings.
- ❖ Taking into account **30+ percent wasted labor time** in both the field and the office makes the **economic model work better**.
- ❖ In addition, the **“long tail” of safety** liability adds to the value of virtual construction.
- ❖ **Each firm** must calculate the **particular financial equation**, but these are substantial **potential savings**.
- ❖ As **qualified** craftspeople and managers are **harder to find**, helping the **existing ones** be more productive is a **rational plan**.

Information Management

Information management

- ❑ Just as a **construction company** needs **financial resources** to finance its business activity and human resources to provide customer service,
it **also needs information** to support its decision-making processes and to provide historical records.
- ❑ The needed information must be accurate, accessible, relevant, timely, and complete.
 - ❖ Thus,
 1. The collection,
 2. The analysis,
 3. The storage, and
 4. The retrievalof information are essential functions of a construction company.

Information management

❑ To **perform this essential function**, some construction firms are hiring chief information officers,

whose responsibilities involve **integrating information technology** to meet company business objectives and to serve users within the company.

❖ Other construction firms have chosen to outsource this function to consulting firms.

Prepared by Dr. Alavipour
DO NOT DISTRIBUTE

- ❑ If we look at a construction firm as a system, we see that the **information infrastructure** is a critical component, as illustrated in Figure 8.1.

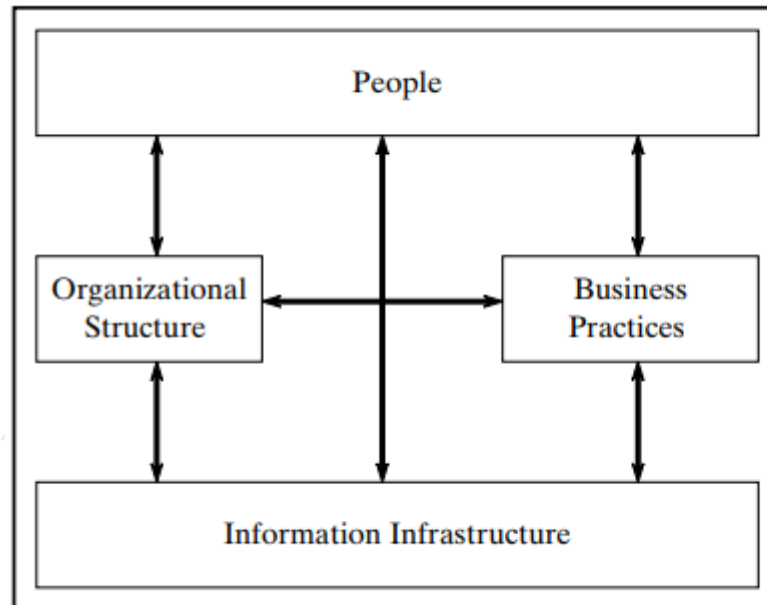


FIGURE 8.1 System View of a Construction Company

Information management

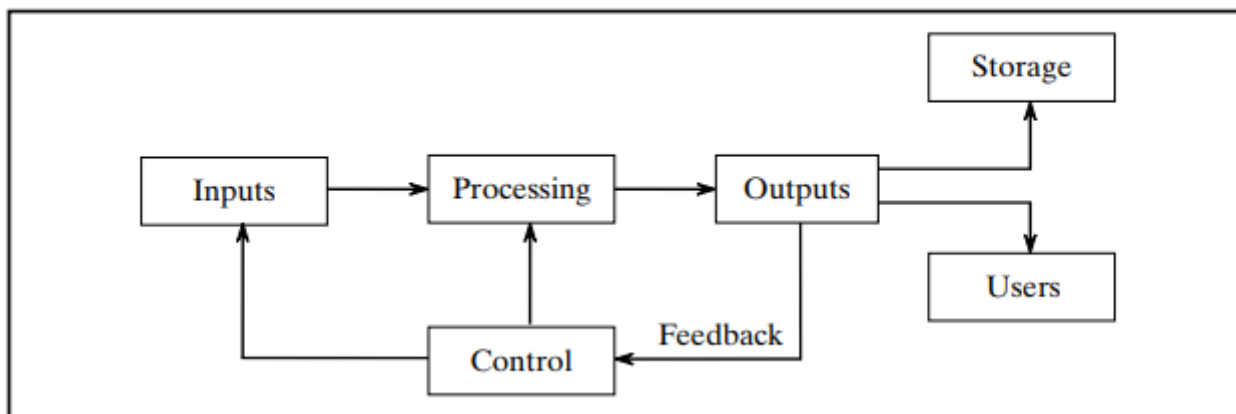
- ☐ The business practices **determine**
 1. Information requirements, as well as
 2. Information collection techniques.
- ☐ The organizational structure influences the **decision-making processes** by
 1. **Defining relationships** among the employees and
 2. **Establishing** information-reporting procedures.

To be effective, the **company's business practices** must be **compatible** with the **company organizational structure** and corporate **culture**.

❑ An information management system

collects, processes, stores, analyzes, and disseminates information as illustrated in Figure 8.2.

FIGURE 8.2 Company Information Management System



Information management

☐ The **information collected** becomes the historical record

that can be used

1. To **assess** the **accomplishment** of the company's business plan and
2. For **making adjustments** in resource allocation among the company's various departments.

Prepared by Dr. Alavipour
DO NOT DISTRIBUTE

Information management

❑ **Company leaders must ensure that**

1. There is a **business need** for all the **information collected** and
2. The **stored information is organized** in a structure that facilitates efficient **retrieval**.
 - ❖ The **test of a good system** is the ability of employees to **locate and retrieve** needed information **quickly**.

Prepared by Dr. Alavipour
DO NOT DISTRIBUTE

Information management

- ❑ The **major components** of a **modern company information management system** are illustrated in Figure 8.3.

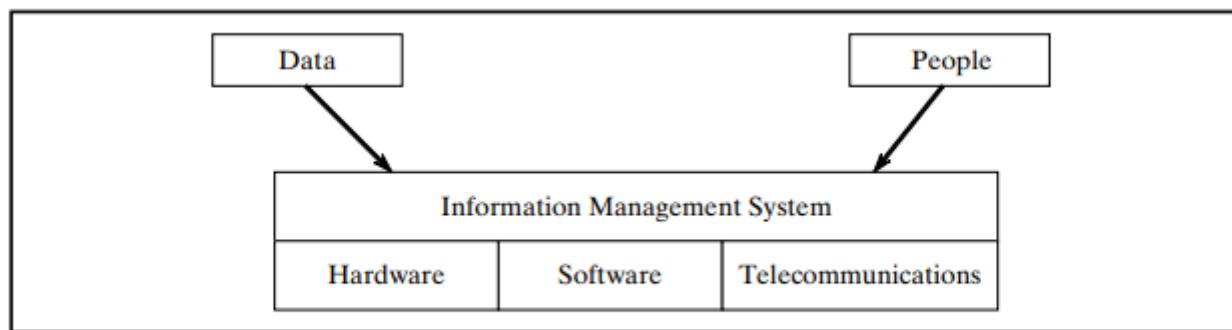


FIGURE 8.3 Components of Company Information Management System

Information management

- ☐ **Investments** in information management technology should be addressed in the development of a company strategic plan.
- ☐ Such investments should be considered as **ongoing regular expenses**, **rather than** one-time costs.
- ☐ In addition, there will be a **continual need** to invest in employee information technology literacy training.

Prepared by Dr. Alavipour
DO NOT DISTRIBUTE

Information Requirements

Information requirements

❑ In general, the **primary business processes** of a construction company can be grouped into the following categories:

- ❖ Accounting processes
- ❖ Business development processes
- ❖ Contract management processes
- ❖ Cost-estimating process
- ❖ Customer relationship management process
- ❖ Equipment management processes
- ❖ Financial management processes
- ❖ Human resources management processes
- ❖ Procurement processes
- ❖ Project cost control processes
- ❖ Project management processes

Information requirements

- ❑ The amount of **detail required** by company decision makers varies depending on their location within the **company hierarchy**, as shown in Figure 8.4.

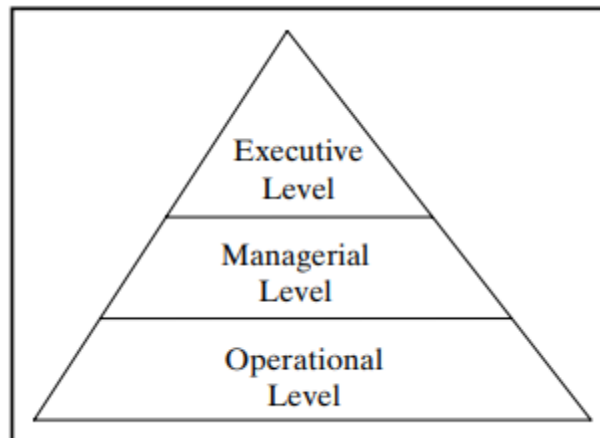


FIGURE 8.4 Decision-Making Levels within a Company

Information requirements

- ☐ At the **operational level** where **routine decisions** are made and interactions with customers and suppliers occur, detailed information is needed.
- ☐ The **functional managers** at the managerial level need summarized information to execute their oversight responsibilities.
- ☐ **Company executives** need aggregated information focusing on the **company strategic goals and objectives**.

Prepared by Dr. Alavipour
DO NOT DISTRIBUTE

Hardware and Infrastructure

Hardware and infrastructure

- ❑ As shown in Figure 8.3, **two of the primary components** of a modern information management system are the hardware and the telecommunications networks.

Prepared by Dr. Alavipour
DO NOT DISTRIBUTE

Hardware and infrastructure

□ The **primary hardware** components are

- ❖ Input devices such as keyboards and scanners
- ❖ Output devices such as monitors and printers
- ❖ Storage devices such as hard drives, DVD, CD, and flash memory
- ❖ A central processing unit and random-access memory
- ❖ Connecting devices such as networks or routers

Prepared by Dr. Alavipour
DO NOT DISTRIBUTE

Hardware and infrastructure

- ☐ The backbone of a company's information management system is the computers and other electronic devices that are linked by **telecommunications networks**.
- ☐ The **connections** allow users to access information stored in **multiple locations** and to **communicate with others**.

Prepared by Dr. Alavipour
DO NOT DISTRIBUTE

Hardware and infrastructure

- ❑ **One type** of such networks is known as a local area network, which allows computer users in a single area or department to share information and peripheral devices, such as a printer or a scanner.
- ❖ **Application software** may be stored on the local area network for use by **multiple users**.
- ❖ Such networks typically use computers, **called servers**, to deliver information and software to **other computers linked** in the network.

Prepared by Dr. Alavipour
DO NOT DISTRIBUTE

Hardware and infrastructure

- ❑ Company computers may also be connected to a global network environment, known as the **Internet**.
- ❖ Some companies have also developed **intranets**, which are **web-based networks accessible only** to company employees.

Prepared by Dr. Alavipour
DO NOT DISTRIBUTE

Hardware and infrastructure

- ❑ In addition, some companies **link portions** of their intranets to those of their business partners over networks known as **extranets**.
 - ❖ Companies often create project **extranets** to facilitate collaboration among **project participants**: owner, designer, subcontractors, and suppliers.
 - ❖ Access to company intranets and extranets is usually controlled by the use of **passwords**, which will be discussed in the section “**Security Systems**.”

Prepared by Dr. Alavipour
DO NOT DISTRIBUTE

Hardware and infrastructure

- ☐ **Websites** that provide **access** to company **intranets** and **extranets** are known as company portals.

Prepared by Dr. Alavipour
DO NOT DISTRIBUTE

Hardware and infrastructure

❑ It is recommended that **purchasing** and **maintenance** of hardware be based on overall company policies,

rather than to let **each department** establish its own policies.

❖ This is to ensure that all hardware purchased is **compatible with the company's information technology policies**,

1. Is supported by appropriate maintenance contracts, and
2. Meets company information management requirements.

Hardware and infrastructure

- ❑ The **telecommunications networks** allow employees to telecommute to **their office** by allowing them to work from home or remote locations.
- ❑ Such networks allow access to company intranets and communication by electronic mail.
 - ❖ Some construction companies purchase **specialized equipment** to create a capability for **video-teleconferencing** among people located at diverse locations.
 - ✓ Such capabilities are used to hold **virtual meetings**, avoiding the need for employees to travel to a **central location** to attend a meeting.

Software

- ❑ **Software** allows the information management system to perform the many **desired functions**.
- ❑ Various types of software are shown in Figure 8.5.

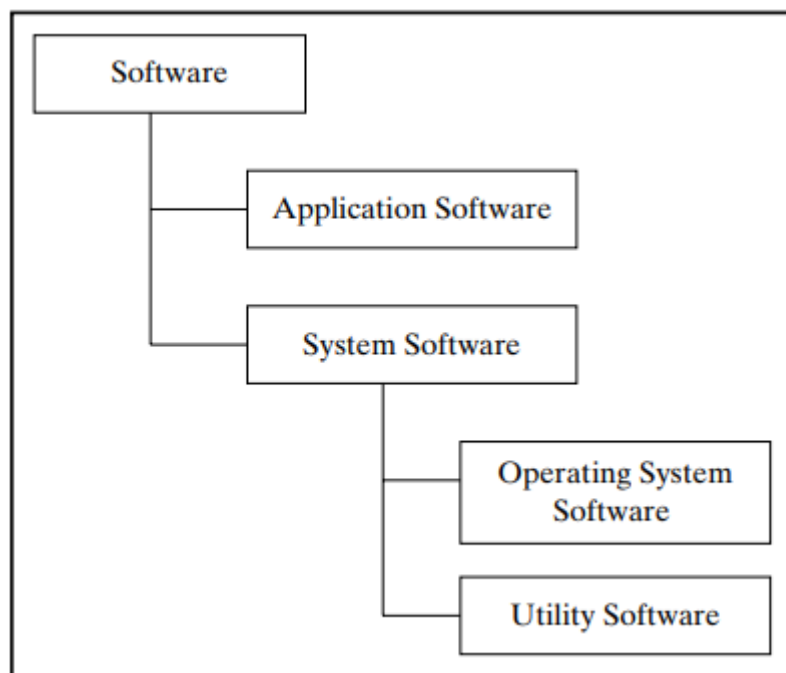


FIGURE 8.5 Information System Software

- ❑ Application software is designed to support specific tasks or business processes, such as **cost estimating or payroll**.
- ❑ Operating system software **controls** the **application software** and manages how the hardware devices work.
 - ❖ An example of an operating system software is **Microsoft Windows**.
- ❑ Utility software provides **extra functionality** to the operating system software.
 - ❖ An example of a utility software is an **antivirus software**.
- ❑ A **key business decision** related to software is when to upgrade to newer versions.
 - ❖ Software manufacturers **continuously upgrade** their products to remain competitive, but it is **not necessary to purchase all upgrades**.
 - ❖ Let the **newer versions** be tested by others and purchase them only if they offer significant performance enhancements.

- ❑ A **key part** of the **information management system** is one or more databases, which are **collections of related data** that have been formatted in a manner to facilitate searches.
- ❑ A database management system is a software application (**such as Microsoft Access**) that is used to organize, store, and retrieve data from one or more databases.
- ❑ **Report formats** are created to
 1. compile data from **databases** and
 2. organize the data into **useful formats** that can be viewed and printed.

*Since databases are used to store essential company information, they must be properly designed and managed to **support company business processes**.*

Security Systems

Security systems

❑ **Security systems** are used to keep computers and information safe from **unauthorized access and damage**.

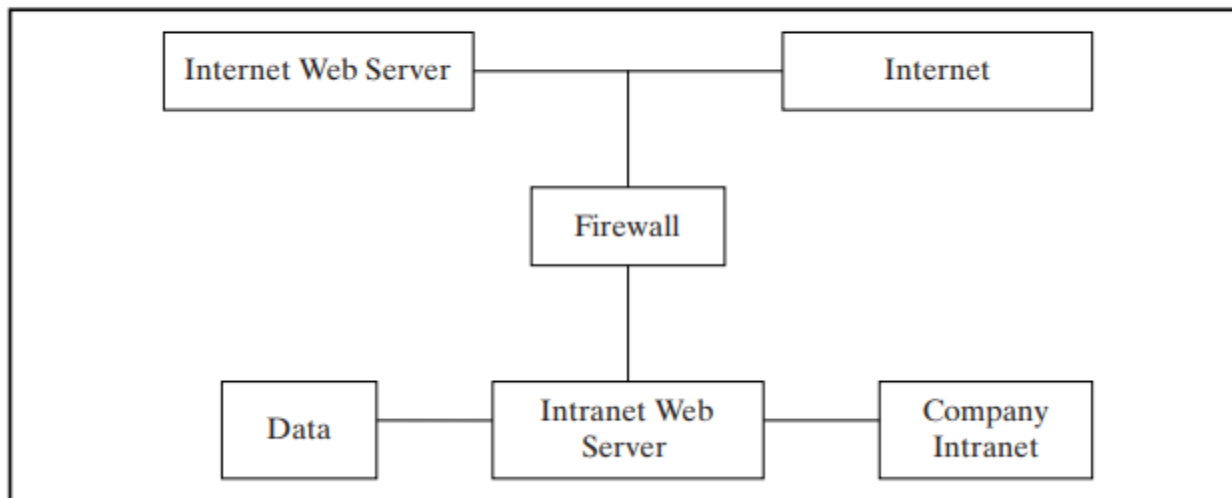
❖ **Passwords** should be required to use company computers and access company networks, such as local area networks or company intranets.

✓ **Firewalls** are usually created to **limit access** to company intranets or extranets.

Prepared by Dr. Alavipour
DO NOT DISTRIBUTE

❑ **Firewalls** are hardware devices with special software, which are placed **between** the Internet and company networks, as illustrated in Figure 8.6.

FIGURE 8.6 Company Firewalls



❑ **Passwords** are used to pass through the **firewall** to access the company **intranet**.

Security systems

- ❑ Company data should be **backed up regularly** and stored in **multiple locations** to protect its integrity.
 - ❖ Data backup is like an **insurance policy** to allow restoration of company files in the event of an accidental corruption or a disaster, such as a fire in an office.
- ❑ **Antivirus software** should be installed to prevent **virus attacks**.
 - ❖ Viruses may be received **unexpectedly via electronic mail or Internet transactions** and may corrupt the system software.
 - ❖ To protect against such threats, antivirus software should be **installed on all computers** to detect the presence of viruses.

Company Security Policy

Company security policy

- ❑ All companies should have a **published security policy** to guide employees in the protection of company information resources and equipment.

An example of such a policy is shown below.

Prepared by Dr. Alavipour
DO NOT DISTRIBUTE

Company security policy

❑ Company Computers

- ❖ Company computers are to be used for **business purposes only**.
- ❖ **Loading** of any programs or downloading of any data onto company computers without company **permission** is prohibited.
- ❖ All data **stored** on company computers or servers is the **property of Western States Construction Company**.
- ❖ The **transfer** of any data from company servers or computers without a business purpose is **prohibited**.

Company security policy

❑ Electronic Mail

- ❖ Our **electronic mail** system is for **official business**.
- ❖ We expect employees to **honor our password protection system** and **not read other employees' e-mail**.
 - ✓ However, please remember that **e-mail** is neither private nor confidential.
 - **Any message** that you send can be **forwarded**.
 - Any **e-mail** including those deleted can be **retrieved**.
 - **All messages** are **company records** and are the **property** of Western States Construction Company.
 - We **reserve the right** to read, use, and disclose e-mail messages.
 - ✓ For these reasons, **e-mail should not be used** for personal or private communication.

Company security policy

☐ Electronic Mail

❖ When **using e-mail**, keep in mind that you are using **company property**.

○ As a result, **your comments** must be appropriate to our business setting.

Prepared by Dr. Alavipour
DO NOT DISTRIBUTE

Company security policy

☐ Internet

- ❖ **Access to the Internet** is provided for company business.
- ❖ Please keep in mind that **Internet traffic** can be **monitored**.
 - ✓ **Avoid Web sites** that may contain information that would **not be appropriate for our business**.
 - ✓ Be sure to **avoid sites** that include content that would be **inconsistent with our policies** prohibiting discrimination and harassment.

Prepared by Dr. Alavipour
DO NOT DISTRIBUTE

Company security policy

❑ Misuse

- ❖ **Improper use** of company communication services or equipment is subject to discipline, including **discharge**.
 - ✓ If you suspect any misuse of company systems, **notify your supervisor**.
- ❖ The company reserves the **right to limit and/or terminate** access to the electronic communications system **at any time**.

Prepared by Dr. Alavipour
DO NOT DISTRIBUTE

Company Websites

Company websites

- ☐ A company Web site is an important **asset for establishing a presence** on the World Wide Web.
- ☐ Web sites provide company information to **interested people 24 hours per day, seven days per week.**
- ☐ Having a company Web site is essential to creating a **modern image** that the company is **technologically advanced.**
- ☐ **Prospective customers** may use the Web site to **examine the types of services offered** and the **types of projects the company** undertakes.

Company websites

- ☐ A good company Web site can be an effective recruiting tool for the **human resources management staff**.
- ☐ Company leaders, business development managers, and human resources managers should have **contact information available** on the company Web site.
- ☐ A well-designed Web site can **significantly reduce the staff time** spent on answering **routine questions** about the company.
- ☐ To be effective, the Web site needs to be **maintained to ensure** that all information contained is **current and correct**.

Exercises

1. You are the chief information officer for a construction company that has a home office and four field offices. Each field office manages three to four separate projects. What combination of intranets, extranets, and local area networks would you establish to provide an efficient information management system for the company? Who would you allow to have access to the company extranets?

Prepared by Dr. Alavipour
DO NOT DISTRIBUTE



مدیریت کسب و کار در صنعت ساخت (Construction Business Management)

ماژول ۳: ارزیابی کسب و کار

بخش اول: امکان‌سنجی و ارزیابی سازمان برای فعالیت در بازارهای بین‌المللی

ارائه دهنده:

سید محمدرضا علوی پور

(PhD, PMP, CMIT)

CMAA Authorized Trainer

دانشگاه Illinois Tech آمریکا

What we will learn?

- ☐ Introduction
- ☐ Implementing the International Readiness Passport Tool
- ☐ Facilitation Notes
- ☐ Home Page
- ☐ Category Pages
- ☐ Results Page
- ☐ Process Generator Page
- ☐ International Readiness Passport Report Page

Prepared by Dr. Alavipour
DO NOT DISTRIBUTE

Introduction

- ❑ Due to **increasing globalization** in the construction industry, companies are performing more work in countries in which they have not worked previously.
- ❑ The **Construction Industry Institute** tasked Research Team (RT) 294 with two objectives:
 1. **Establish** a way to determine whether a **company or project team** is ready to enter a **country** in which it has **little or no experience working**; and
 2. **Create** a process to help companies and project teams improve **their readiness** to work abroad.

❑ To **accomplish** these objectives, the research team **developed**

1. An assessment method and
2. A series of strategies

for mitigating gaps in readiness.

❑ The team **integrated** these processes in the **International Readiness Passport (IRP)**,
an **easy-to-use MS Excel-based tool**.

❑ This implementation resource introduces the IRP tool and provides **step-by-step guidance for its use**.

- ❑ In order to evaluate readiness to deploy **best practices abroad**, the research team identified, verified, and **weighted 62 commonly encountered issues**.
- ❑ These issues represent **various barriers** to the **successful deployment** of best practices in **unfamiliar countries**.
- ❑ The team used the **62 issues and their weightings** to create an international readiness metric.
- ❑ Figure 1 provides a **graphic overview of the process** the team used to develop this metric.

Research Team 294, Deploying Best Practices in Unfamiliar Countries

Phil Barth, U.S. Department of State

William Brittan, Abbott

David Campbell, Air Products and Chemicals, Inc.

George Chronis, SNC Lavalin Pty Limited

Deron Cowan, Zurich

* Jesús M. de la Garza, Virginia Tech

Timothy Horner, Faithful+Gould

* Sara Horsey, Virginia Tech

Alexandre Ikonmidis, Alstom Power Inc.

Mahmoud Khoncarly, URS Corporation

Carlos Mallol, CSA Group

Sean Musick, Wood Group Mustang

Renée Perry, Fluor Corporation

James J. Sexton, The Procter & Gamble Company

* John E. Taylor, Virginia Tech

Laura Vaughn, Chevron

Willis Weatherford, Siemens Energy, Inc.

* Principal authors

Editor: Jacqueline Thomas

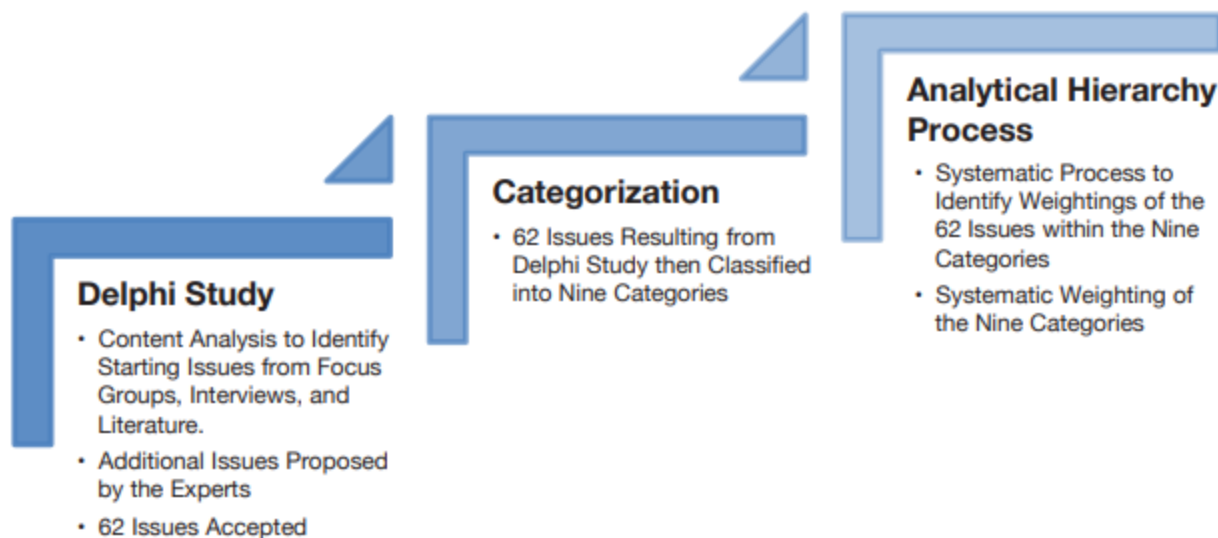


Figure 1. Process for Developing the International Readiness Metric

□ The team categorized the 62 issues into the following nine categories:

- ❖ Business Customs
- ❖ Communications
- ❖ Cultural and Social
- ❖ Geography and Logistics
- ❖ Human Resources and Workforce
- ❖ Legal and Contracts
- ❖ Market and Political Conditions
- ❖ Regulations
- ❖ Safety and Security.

Prepared by Dr. Alavipour
DO NOT DISTRIBUTE

- ❑ RT 294 members weighted and rated **each of the issues** for its importance and for **how unique** it is to international project execution.
- ❑ The categories were also **weighted** relative to each other.
- ❑ **Table 1** provides a listing of all issues and categories, with their weightings.
- ❑ These **weightings** became the **basis of the metric** that determined the IRP scoring system.
- ❑ The score provided by the tool gives a **reference point** for companies to **evaluate** **how ready** they are to deploy best practices in an **unfamiliar country**.

List of issues, categories, and weightings

Category	Weight
Business Customs	8%
Social and Cultural	11%
Regulations	9%
Market and Political Conditions	16%
Geography and Logistics	5%
Legal and Contracts	10%
Human Resources and Workforce	9%
Safety and Security	22%
Communications	10%

Prepared by Dr. Alavipour
DO NOT DISTRIBUTE

List of issues, categories, and weightings

Business Customs	
Issue	Weight
Differing levels of familiarity with best practices and/or their implementation by local entities; such as the labor force or subcontractors	6%
Different understanding of how to treat intellectual property	5%
Differing levels of concern for environmental issues	4%
Differing relationships and interactions with local government and regulators	9%
Differing management styles	4%
Different ethical standards in conducting business.	13%
Differing risk management methodologies, such as commercial, financial, operational, or technical	7%
Different protocol for interactions between companies	4%
Differences in the local business culture, such as how things get done, resistance to change, and cooperation	11%
Differing local norms in the way workers are treated	6%
Different engineering expectations and/or requirements	13%
Different levels of discipline in adhering to project schedules	11%
Different levels of surveillance required for activities of the work force	6%

List of issues, categories, and weightings

Social and Cultural	
Issue	Weight
Differing personal values, ethics, and lifestyles	12%
Differing local sentiments toward project	9%
Differing scheduling considerations based on the workforce, such as prayer times and holidays	9%
Existence of cultural clashes between groups working on a project	15%
Cultural differences in relationships between bosses and employees, such as different hierarchal influences	9%
Cultural differences in interpersonal interactions	11%
Different accommodations due to religious practices of labor force, such as unwilling/unable to wear hard hats	12%
Differing perceptions of your company reputation by locals	10%
Reluctance to consider adopting local practices	13%

Prepared by Alavipour
DO NOT DISTRIBUTE

List of issues, categories, and weightings

Regulations	
Issue	Weight
Different regulations specific to foreign-owned businesses, such as sponsorship, registration, and licensing	13%
Different local building and construction permit requirements and process for acquisition of permits	15%
Differing regulations on materials procurement, such as specific vendors that must be used or "buy local" regulations	12%
Different cost level incurred due to regulatory process	15%
Differences in the local building code from the company's home country codes or international building code	10%
Differing regulations on the importation and exportation of materials and equipment.	12%
Differing restrictions on construction activity at jobsites, such as limitations on hours when construction activities can proceed	11%
Differing regulations relating to the handling of hazardous materials	11%

List of issues, categories, and weightings

Market and Political Conditions	
Issue	Weight
Differing political climate and level of political stability	27%
Dealing with currency exchange rates and currency stability	9%
Differing local economic and market conditions	14%
Different level of local business competition	11%
Differences in the required project currency	6%
Different expectations/requirements for providing infrastructure improvements, such as housing, roads, and schools	15%
Differing availability of local labor	19%

Prepared by Dr. Alavipour
DO NOT DISTRIBUTE

List of issues, categories, and weightings

Geography and Logistics	
Issue	Weight
Different levels of existing physical infrastructure, such as water, power, or transportation	29%
Differing logistics for access to job site	11%
Different support services that need to be provided for expatriate workers	8%
Different level of existing information infrastructure, such as telephone and internet	22%
Differing local availability of materials and equipment	19%
Different climate and weather considerations	10%

Prepared by Dr. Alavipour
DO NOT DISTRIBUTE

List of issues, categories, and weightings

Legal and Contracts	
Issue	Weight
Differing contractual terms and conditions in local market	15%
Differing local laws and legal practices that can affect the project (for example, lack of awareness of local laws)	22%
Different property management laws, such as zoning, ownership regulation, property rights, eminent domain, and squatters' rights	18%
Visa requirements for expatriate workers	9%
Differing understanding of what constitutes a contract, such as scope definition and terms and conditions	24%
Differing insurance and bonding requirements	11%

Prepared by Alavipour
DO NOT DISTRIBUTE

List of issues, categories, and weightings

Human Resources and Workforce	
Issue	Weight
Differing labor laws	19%
Differing pay rates for local and expatriate labor	9%
Differing relationship required with local labor supply and labor groups	15%
Differing technical skills of locally available labor	26%
Different technical capability of locally available engineering workforce	31%

Prepared by Dr. Alavipour
DO NOT DISTRIBUTE

List of issues, categories, and weightings

Safety and Security	
Issue	Weight
Differing safety culture and practices by labor force	22%
Differing needs for jobsite security	13%
Different availability and requirements for worker health and safety, such as predominant diseases, food and clean water access, and healthcare	20%
Different security procedures for travel and living	18%
Differing procedures for reacting to an emergency	27%

Prepared by Dr. Alavipour
DO NOT DISTRIBUTE

List of issues, categories, and weightings

Communications	
Issue	Weight
Dealing with different, possibly multiple, locally spoken languages	35%
Different methods for communication, such as verbal, written, or body language	30%
Different levels of clarification needed to meet expectations and achieve desired outcomes	34%

Prepared by Dr. Alavipour
DO NOT DISTRIBUTE

Process to mitigate identified issues

- ❑ The diagram in Figure 2 illustrates the process a **company would follow to mitigate identified gaps** in readiness.
- ❑ This process is based on **checklists of mitigation strategies** the research team rigorously formulated after conducting a series of interviews and focus groups with subject matter experts. (More detail on the development of the checklist is available in RS 294-1 and RR 294-11.)
- ❑ After a company has used the **checklist of possible issues** to rate its readiness to deploy best practices in an unfamiliar locale, the process would identify any gaps in readiness, and then present the appropriate strategies for gap mitigation.

Process to mitigate identified issues

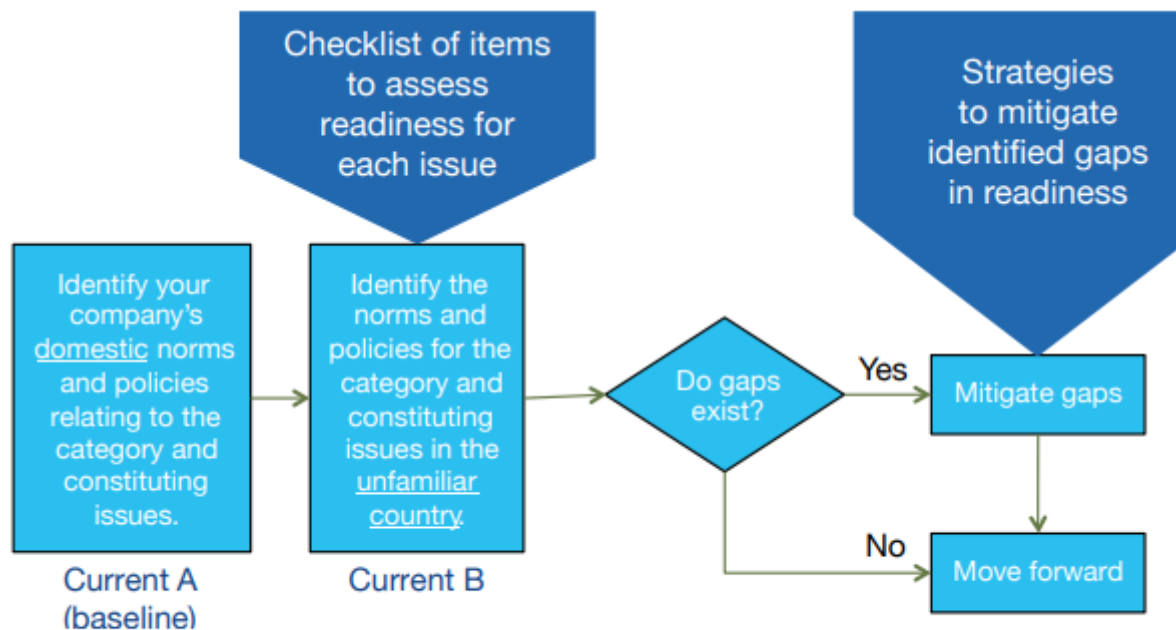


Figure 2. Process to Mitigate Identified Issues

Develop metric and process

❑ Once the team had developed the assessment metric and formulated the mitigation strategies,

it **combined these two parts** of the process in the IRP tool. (See Figure 3.)

Prepared by Dr. Alavipour
DO NOT DISTRIBUTE

Develop metric and process

مدیریت کسب و کار در صنعت ساخت (CBM)

ماژول ۳: ارزیابی کسب و کار

بخش اول: امکان سنجی و ارزیابی سازمان برای فعالیت در بازارهای بین المللی

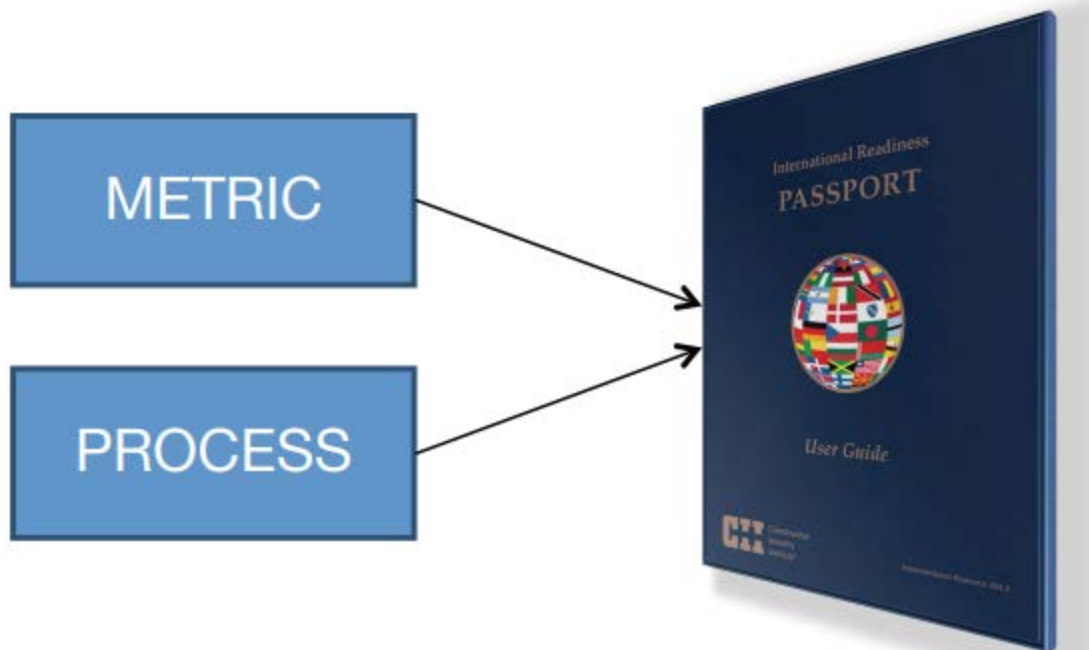


Figure 3. Developed Metric and Process Integrate to Form the International Readiness Passport Tool

How to use?

- ☐ The following sections of this guide explain how to use the International Readiness Passport tool.

Prepared by Dr. Alavipour
DO NOT DISTRIBUTE

Implementing the International Readiness Passport Tool

Implementing the international readiness passport tool

- ❑ The primary purpose of RT 294 was to develop a process to **improve CII member company deployment** of best practices in **unfamiliar countries**.
- ❑ The **process** was to be applicable to any **best practice** in **any country**.
- ❑ RT 294 was thus charged with creating a systematic process, a concrete metric, and a tool that would meaningfully
 1. Affect the effectiveness of best practice deployment and,
 2. By extension, improve the likelihood of success of CII members' global expansion and execution of their strategic objectives (e.G. Company expansion or capital project delivery).

Implementing the international readiness passport tool

❑ The research team **expects the IRP** to provide the **following benefits**:

1. increased company **confidence** in the planning of work abroad; better ability to recognize readiness to estimate and bid work in unfamiliar countries
2. **better identification** of risks, along with **practical solutions** to mitigate those risks
3. **better collection and dissemination** of knowledge regarding best practice deployment in unfamiliar countries.

Prepared by Dr. Alavipour
DO NOT DISTRIBUTE

Implementing the international readiness passport tool

☐ For a **company with more established** operations or a project team that does have **significant experience** in the project **location**,

the tool can serve

1. As a way to **measure and benchmark** their preparations, or
2. As a reminder **checklist to help prevent gaps** in the preparations.

Prepared by Dr. Alavipour
DO NOT DISTRIBUTE

Implementing the international readiness passport tool

- ☐ Use of the tool is recommended **after the decision to move forward** with a project has been made, when it can be used by the **project team**.
- ☐ The IRP is **not intended to replace proper due diligence** in project planning, and should be considered a **tool to help with project planning**

Prepared by Dr. Alavipour
DO NOT DISTRIBUTE

Implementing the international readiness passport tool

- ❑ The tool has been tested and **reviewed by employees** of large and small companies in the **construction industry value chain**.
- ❑ **Among these pilot users** were representatives from some of the largest and most global contractors (e.g., Fluor), owners (e.g., Chevron), and services providers (e.g., Zurich).
- ❑ From this experience, they **determined** that the tool's **results are valid**, that its outputs are helpful, and that it has **long-term value**, both in terms of establishing readiness and conducting **internal benchmarking**.

Facilitation Notes

- ❑ The International Readiness Passport can be used **individually** by a project manager and/or by a project team.

However, RT 294 **recommends** that the assessment be conducted in a facilitated environment and, to

promote objectivity and consistency, that the facilitator be an individual **outside the project team**.

Prepared by Dr. Alavipour
DO NOT DISTRIBUTE

❑ The research team recommends the following **IRP users/facilitation participants**:

- ❖ Project manager (individual or part of project team)
- ❖ Project sponsor
- ❖ End user representative(s)
- ❖ Engineering disciplines
- ❖ Company or third-party resources (e.G., Design representatives, real estate, vendors/contractors).

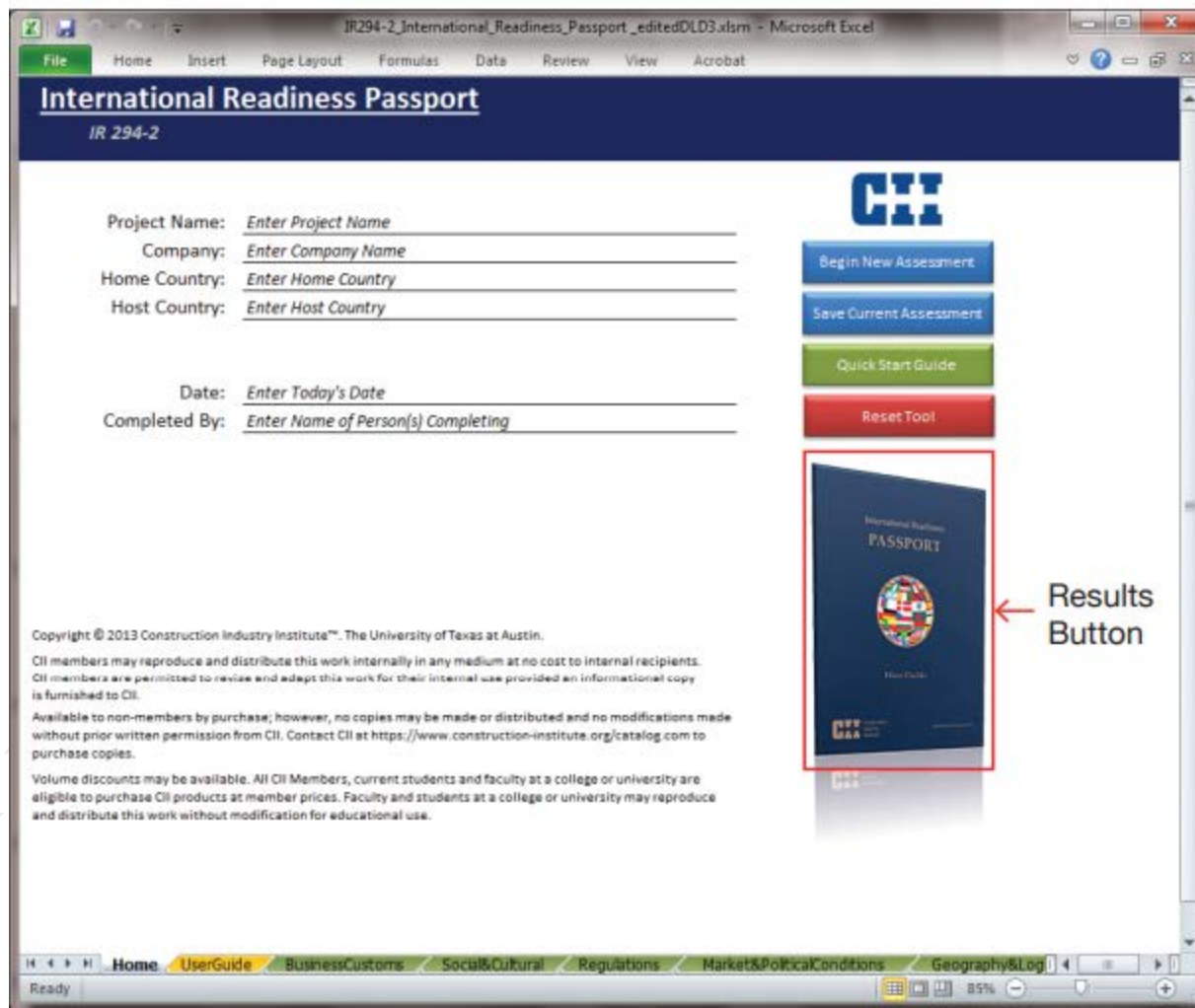
Prepared by Dr. Alavipour
DO NOT DISTRIBUTE

- ☐ When using the tool, the project team should **already have** a defined project scope and plan.
- ☐ It should also **have** all relevant documentation available and **provide** it to IRP users in advance of the readiness assessment.
- ☐ The **responsibilities** of the IRP facilitator are as follows:
 - ❖ Defining the purpose of the readiness session
 - ❖ Providing team members with an overview of the readiness tool
 - ❖ Explaining the scoring mechanism and definitions
 - ❖ Facilitating use of the tool
 - ❖ Capturing key discussion comments
 - ❖ Publishing and distributing the results.

- ☐ An **alternative** to a facilitated session is to
 1. Have key individuals separately use the tool and then
 2. **Meet** to reach consensus.
- ☐ One of the **key individuals** should be **proficient** in the IRP readiness assessment process.

Prepared by Dr. Alavipour
DO NOT DISTRIBUTE

Home Page



Project Name: Enter Project Name

Company: Enter Company Name

Home Country: Enter Home Country

Host Country: Enter Host Country

Date: Enter Today's Date

Completed By: Enter Name of Person(s) Completing

Begin New Assessment

Save Current Assessment

Quick Start Guide

Reset Tool

International Readiness PASSPORT

How To Use

Results Button

Copyright © 2013 Construction Industry Institute™, The University of Texas at Austin.

CII members may reproduce and distribute this work internally in any medium at no cost to internal recipients. CII members are permitted to revise and adapt this work for their internal use provided an informational copy is furnished to CII.

Available to non-members by purchase; however, no copies may be made or distributed and no modifications made without prior written permission from CII. Contact CII at <https://www.construction-institute.org/catalog.com> to purchase copies.

Volume discounts may be available. All CII Members, current students and faculty at a college or university are eligible to purchase CII products at member prices. Faculty and students at a college or university may reproduce and distribute this work without modification for educational use.

Home UserGuide BusinessCustoms Social&Cultural Regulations Market&PoliticalConditions Geography&Log

Figure 4. Home Page

Category Pages

❑ There are **nine categories** into which the **62 best practices** deployment issues are organized.

❖ The nine categories are as follows:

1. Business Customs
2. Communications
3. Cultural and Social
4. Geography and Logistics
5. Human Resources and Workforce
6. Legal and Contracts
7. Market and Political Conditions
8. Regulations
9. Safety and Security.

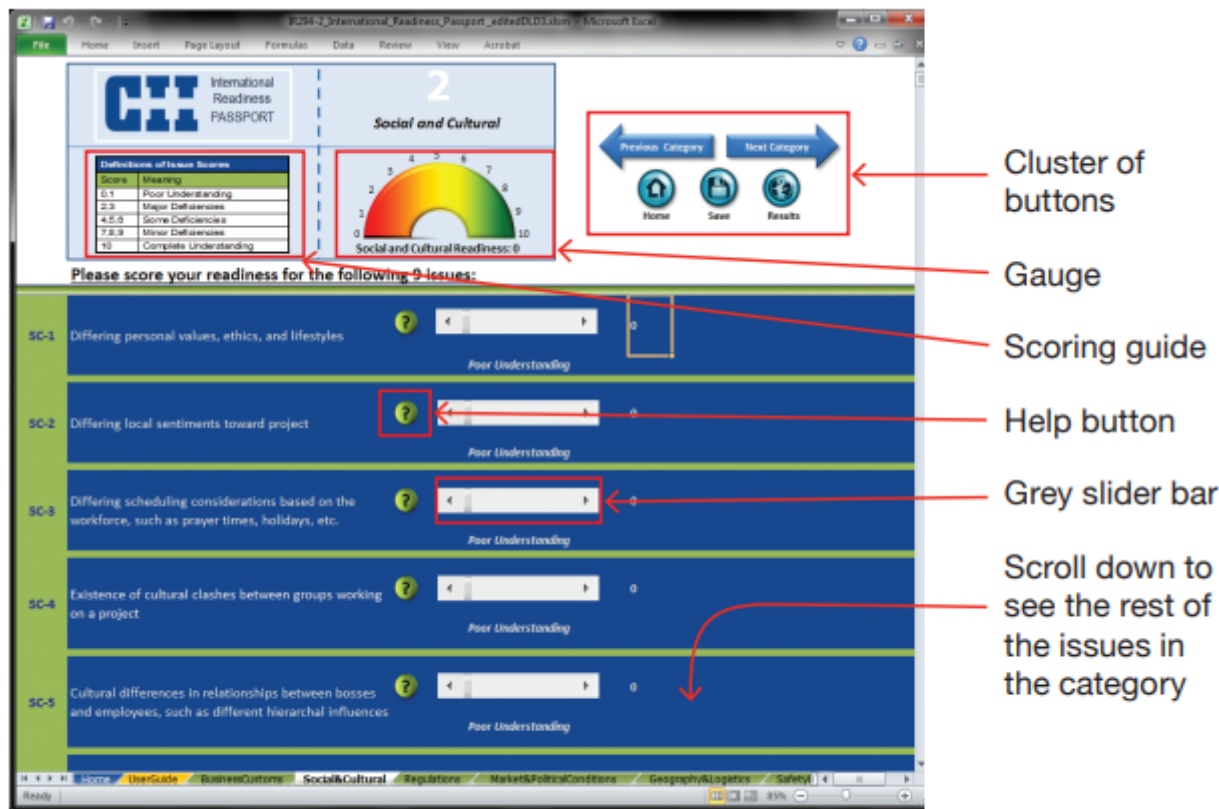


Figure 5. Tool Interface for Scoring International Readiness

- ❑ At the top of each **interface page**, the user will see a **gauge** that represents the current score for the category being assessed.

Prepared by Dr. Alavipour
DO NOT DISTRIBUTE

- ☐ **Table 2** provides the meaning of each **score level**.
- ☐ After each response, the user should **continue to scroll downward and respond** to every issue until he or she has reached the end of the category.

Prepared by Dr. Alavipour
DO NOT DISTRIBUTE

Table 2. Definitions of Issue Scores

Definitions of Issue Scores	
Score	Meaning
0, 1	Poor Understanding – Little or no understanding of the issue and its impact
2, 3	Major Deficiencies – Issue is understood but little preparation has been completed
4, 5, 6	Some Deficiencies – Needs work to complete preparations for this issue
7, 8, 9	Minor Deficiencies – Some gaps may exist but preparation for this issue underway
10	Complete Understanding – The issue and its impact is fully understood

Results Page

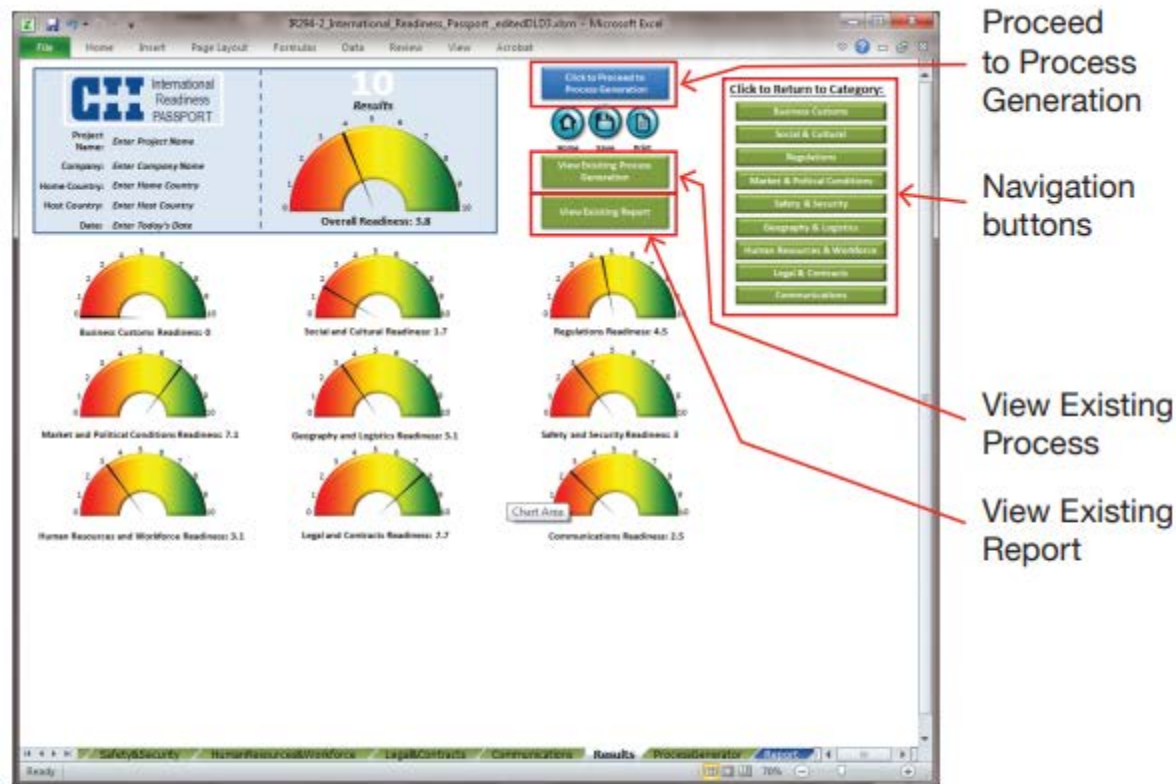


Figure 6. Results Page

Proceed to Process Generation

Navigation buttons

View Existing Process

View Existing Report

Process Generator Page

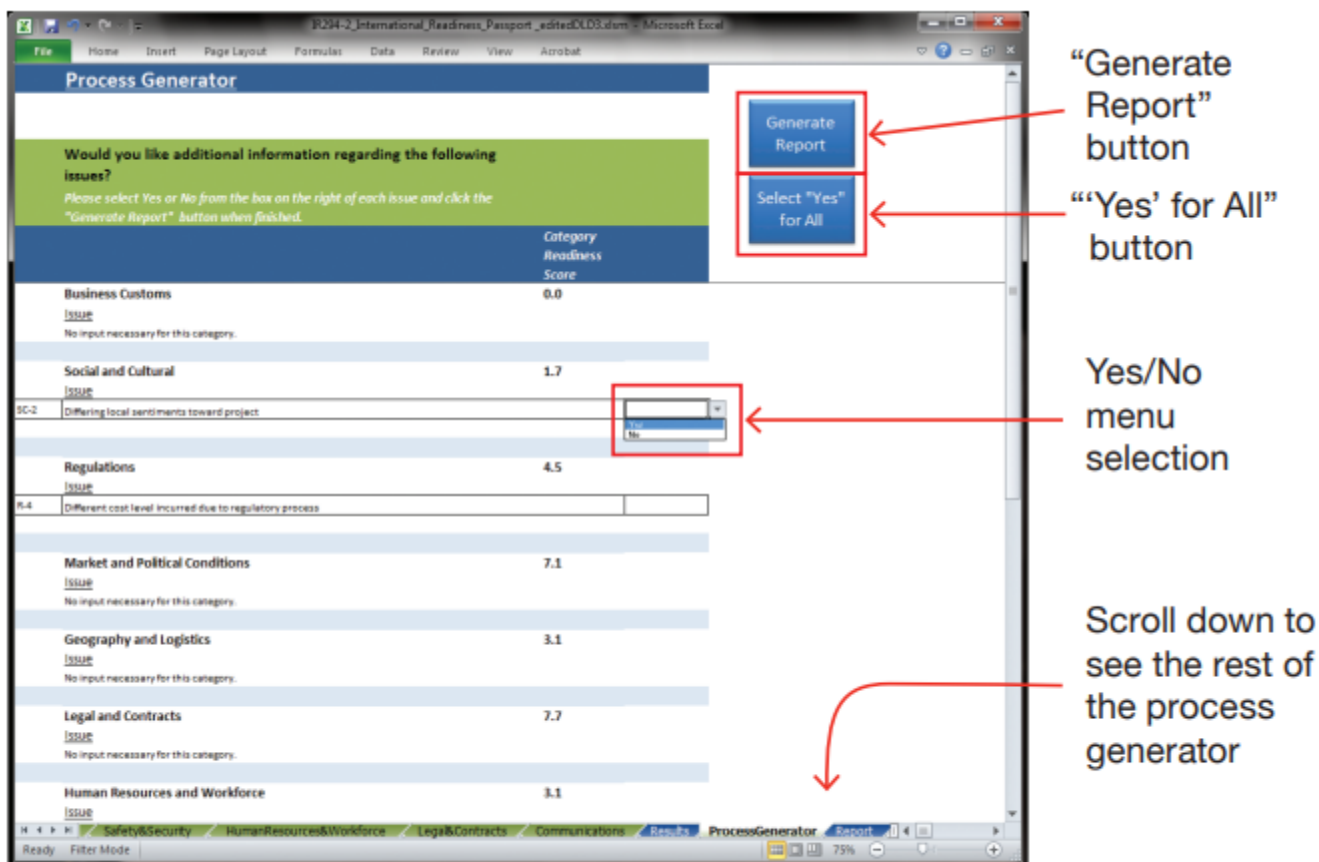
- ☐ The “Process Generator” page allows the user to **customize the report** that the tool produces.
- ☐ This page displays the issues that receive a **score of 4-9** in order to **ascertain whether** the user would like **additional information** on those issues.
- ☐ Issues with **scores of 0-3** are considered **weakness areas**, and additional information is provided automatically.
- ☐ If users have scored themselves with a **10 for an issue**, they are considered **entirely prepared** and therefore do **not need the additional information**.

Process generator page

مدیریت کسب و کار در صنعت ساخت (CBM)

ماژول ۳: ارزیابی کسب و کار

بخش اول: امکان سنجی و ارزیابی سازمان برای فعالیت در بازارهای بین المللی



Process Generator

Would you like additional information regarding the following issues?
Please select Yes or No from the box on the right of each issue and click the "Generate Report" button when finished.

Category	Readiness Score
Business Customs	0.0
No input necessary for this category.	
Social and Cultural	1.7
SC-2 Differing local sentiments toward project	Yes/No
Regulations	4.5
R-4 Different cost level incurred due to regulatory process	Yes/No
Market and Political Conditions	7.1
No input necessary for this category.	
Geography and Logistics	3.1
No input necessary for this category.	
Legal and Contracts	7.7
No input necessary for this category.	
Human Resources and Workforce	3.1
No input necessary for this category.	

Generate Report

Select "Yes" for All

Yes/No menu selection

Scroll down to see the rest of the process generator

Figure 7. Process Generator Page

International Readiness Passport Report Page



CH International Readiness Passport Report
IR294-2

Home Save Print

Project Name: Enter Project Name

Company: Enter Company Name

Home Country: Enter Home Country

Host Country: Enter Host Country

Completed By: Enter Name of Person(s) Completing

Overall Readiness: 3.8

Figure 8. Project Information Section of Report



Human Resources and Workforce

Human Resources and Workforce Readiness: 3.1

Ultra Critical Issues *Issues were scored as having a poor understanding or major deficiencies*

HRW-4 Differing technical skills of locally available labor

Have you considered the following items regarding your readiness?	If you have not considered the item, then the following mitigation strategies should be taken into account:
1- Has a bilateral, value-added relationship been established with local trade schools and associations?	Establish relationships with local trade schools and associations to understand the potential gap in skills and knowledge, and to engage in a knowledge-transfer program to develop future recruits. (1)
2- Has a training program been established to ensure the transfer of knowledge?	Develop a training program to facilitate the transfer of knowledge and training of locals. Training efforts are very important. The transfer of knowledge from expatriate workers to the local workforce is highly recommended. Invest in implementing best practices, cross-functional and cross-regional teams. Select a local leader who can learn from other operations in the company's home country. Web-meetings can be an excellent tool for this purpose. (2)
3- Do you have well-established contacts within the local Department of Labor?	Develop relationships with officials at the local Department of Labor for identifying available resources. They can also assist in identifying similar projects that are closing out, which may provide a source of skilled labor. (3)
4- Have you established an internal inventory of personnel willing to become expatriates?	Develop a recurring survey of in-house engineers to determine who is willing among them to relocate to other countries and accept short- and/or long-term assignments. (4)

HRW-5 Different technical capability of locally available engineering workforce

Have you considered the following items regarding your readiness?	If you have not considered the item, then the following mitigation strategies should be taken into account:
1- Has a relationship been developed with local universities?	Establish relationships with local universities to understand the gap in skills and knowledge and to engage in a knowledge-transfer program to enhance future recruits. (1) Establish a relationship with universities to identify students from the host country where you are establishing a project or operations, this will allow you to identify students who could start working in entry-level positions. (2)

Figure 9. Report Checklist

موسسه مهندسی و مدیریت ساخت علوی پور (ACEMI)

دفتر آموزش



تهران، بلوار فردوس شرق، مجتمع آبگینه، طبقه سوم اداری، واحد C42



+۹۸ ۲۱ ۴۶ ۱۰۰ ۴۴۵



+۹۸ ۲۱ ۴۶ ۱۰۰ ۴۵۰



info@dralavipour.com



www.dralavipour.com



@alavipour_pm



@acemi_social



@alavipour_pm



@IRANACEMI

