

COVID-19

ANOTHER TECTONIC SHIFT

IN BUSINESS OPERATION MODELS



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Disruptions to business operations are seldom as abrupt as COVID-19 and other comparable tectonic shifts such as World War II, the Oil Embargo, and September 11.

While modularization and the industrialization of the construction industry has been occurring for over two decades, the sudden arrival of COVID-19 will catapult the industry forward in ways we haven't seen before.



COVID-19

Q4

Q1

Q2

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Q1

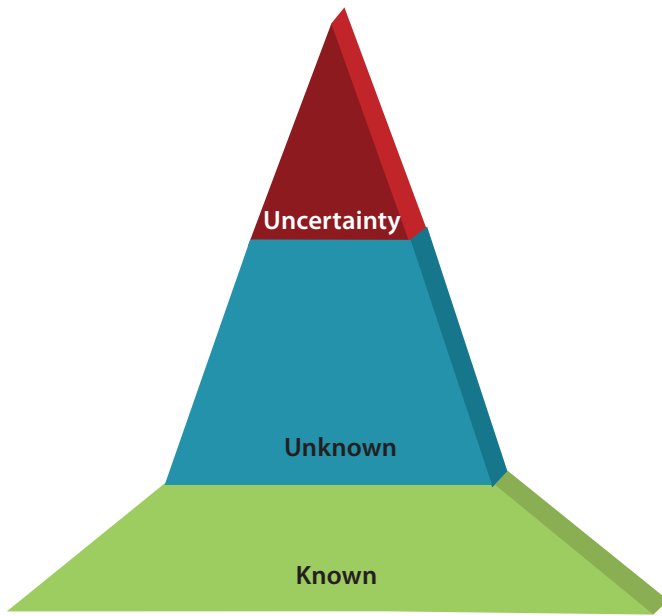
Q2

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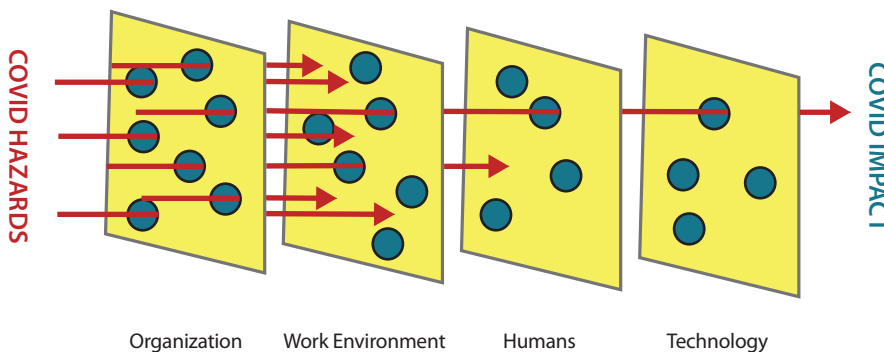
As a follow-up to our article series on modularization earlier this year,¹ this article will make the connection to the imminent need for modularization as the primary means of business recovery from a disaster such as the COVID-19 pandemic. Building on the three articles² and introductory sidebar written for “The Operational Model for Modular Construction” in the May/June 2020 issue, this article will expand on how modularization and the industrialization of the construction industry can manage and mitigate the risks in response to COVID-19.

Exhibit 1: Risk During COVID-19



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Exhibit 2: Risk Management System Error Trapping – The Swiss Cheese Analogy



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Mitigating the COVID-19 Risk

The construction industry has one of the highest exposures to daily risk, and mitigating those risks related to COVID-19 isn’t drastically different than the impact of hurricanes, local flooding, or a weather-related schedule change. The primary difference is its broader impact at the international level, like the tectonic shifts or comparable disruptions previously mentioned.

Mitigation of risk in any event at the job, local, regional, national, or international level has three layers of cadence, which needs to be planned for and managed:

- 1) *Business Risk* – the probability of a difference between the expected and actual financial outcomes of a project.
- 2) *Technical Risk* – the probability of a physical failure of the built environment to function according to customer requirements or structural requirements.
- 3) *Integration Risk* – the probability of failure at the interface of resources required to complete the project, including manpower, material, money, and information.

While business and technical risks are more widely understood, integration risk is often the most mismanaged. At the onset of the COVID-19 disruption, the companies with an integration risk policy suffered the least, and those that did not have controlled integration risk management in place experienced higher losses. E-mails were sent from executives throughout the company about what to do and what not to do, and everything was an instinctive reaction to the event without considering the short- and long-term effects and consequences.

The role that the CFO will play is very critical in terms of managing the cost, having access to cash, and meeting governmental response requirements.

Immediate Response & Risk Identification

Good management is a mix of instincts and data; however, in the face of an unexpected emergency, cooler heads prevail. For instance, Navy training teaches sailors to avoid the instinctive reaction of jumping in to save someone who falls or jumps overboard. The training builds a new muscle for “response in

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time of crisis,” by directing sailors to turn the ship toward the person overboard to protect them from the propeller as the first preventable risk. Next is to throw a life raft and attempt a rescue from aboard.

While jumping in may seem like a natural way to take action and help, leaders must think first and sometimes act in unconventional ways to save people. Immediate response requires:

- Clear thinking
- Separating signal from noise
- Decision-making
- Consistent and frequent communication
- Measurement and risk evaluation

DISASTER RECOVERY PLAN

With the expected resurgence of COVID-19, or to be better prepared for other uncertainties, companies should implement a disaster recovery plan.

When a disaster happens, the immediate response items previously listed need to be in focus; therefore, the disaster recovery plan needs to offload as much of the thinking and reacting items as possible. Having a road map and checklists to follow that were created while you were *not* in crisis mode can ensure that the right decisions will be made during the crisis – without wasting additional time and energy.

Exhibit 1 on the previous page shows how much of any job, project, or business plan is known, unknown, and uncertain. Without a disaster recovery plan, the unknowns are left to chance, and the uncertainties can bury the job (or even the business) while management is busy addressing the unknowns that could have been mitigated with a better plan.

RISK MANAGEMENT

Error Trapping Risk Management shown in Exhibit 2 on the previous page has been used successfully in aviation as a model for building a solid plan for avoiding accidents and incidents.

Also referred to as the Swiss Cheese Analogy, each slice represents a layer of a multi-faceted approach that a business can take to mitigate COVID-19 hazards. While each slice may have a few holes, once they are stacked together, the hazards fail to penetrate and affect the business. During COVID-19, MCA, Inc. developed a four-phase approach (Exhibit 3 a few pages ahead) that could help to minimize the impact of the pandemic on businesses, with particular focus on integration risk.

Measuring the Impact of COVID-19 on Construction Jobsites

A critical immediate action in response to any disaster is to quickly evaluate and quantify the risks caused by the disaster. In the case of COVID-19, the impacts to construction work are three-fold: work, effort, and time. Ideally, companies have a measurement system in place to identify the before and after effects of COVID-19 either through accounting or field operations. The following guidelines were established and used on over two million work hours between March 2020 and April 2020 to create the impacts.

WORK IMPACTS

Work impacts include how much additional/new work the project team needs to perform due to COVID-19 risk mitigation, such as following the Centers for Disease Control and Prevention (CDC) and jobsite guidelines as well as individual company policies. A simple work breakdown structure (WBS) of these new work items can help to identify, plan, and quantify impacts. A collection of new work items from across the industry is shown in Exhibit 4 a few pages ahead, which shows an impact of *30-60 minutes per day per technician onsite*.

EFFORT IMPACTS

Effort impacts are the ramifications to planned and scheduled work, which now includes tasks related to COVID-19 (Exhibit 4). Contractors using Short Interval Scheduling (SIS®) (a part of ASTM E2691, Standard Practice for Job Productivity Measurement) were able to categorize the



impacts to scheduled work by incorporating the specific impacts of COVID-19. Since 2003, MCA, Inc. has been collecting SIS® and Job Productivity Assurance and Control (JPAC®) data from thousands of contractors on construction projects totaling over \$3 billion.

The COVID-19 analysis is based on a seven-week study, which includes data from 290 jobs and 13.2 million man-hours of work that occurred during that time. This National SIS® data showed that *absenteeism more than doubled in impact* to scheduled work between the end of March 2020 to mid-May 2020 due to COVID-19, and *45% of scheduled work was not completed* due to these obstacles.³

TIME IMPACTS

Time impacts include the duration or sequencing changes in the project plan due to work and effort impacts. With more coronavirus-related work tasks required and less work being completed on the jobsite, project schedules will likely encounter delays and compression, leading to higher peak manpower loading to complete the projects on time. A summary task should be added to reflect the COVID-19 activities in the project schedule in order to make their impact on the durations and manpower requirements visible.

RESULTING PRODUCTIVITY

These work, effort, and time impacts will eventually affect productivity. However, industry-wide measurements show that productivity *increased* during the initial COVID-19 pandemic outbreak. Using the JPAC® measurements nationally in addition to the other data collected, MCA, Inc. measured a *productivity increase of 5%* from March 27-May 22, 2020.⁴ However, the inputs to the work reduced over the same time, with fewer hours spent and fewer jobs open and working at full capacity.

A potential correlation exists between fewer workers onsite and higher job productivity levels. This is further validated by MCA, Inc.'s annual SIS® analysis that shows trade interference and absenteeism as the top two obstacles to completing scheduled work, respectively.⁵ Fewer workers and trades on the job leads to higher productivity because there are fewer obstacles impacting the work.

Recovery Planning & Long-Term Effects

Your business and the national and global economies will need a recovery period after the COVID-19 crisis. The mid-

and long-term impacts of COVID-19 will mirror those of any other tectonic shift on a micro and macro level. Learning from parallel disruptions, such as September 11, natural disasters, wars, the stock market crash, etc., will help you anticipate the impacts and protect your company.

FINANCIAL CHANGES

On a macroeconomic level, due to the U.S. government's relief efforts for businesses during COVID-19, the cost of and access to money will likely change. The trillions of dollars injected into the economy with minimal turning of capital will require significant recovery and will take a long time. Fiscal policy changes should be expected (quantitative easing, etc.) in order to stabilize the money supply.

On a microeconomic level, cash management is more important than ever, and reliance on your own business operations to generate income is paramount.

Your business may be back up and running, but your company's "lifeblood" most likely took a major hit. Even if you received the Economic Injury Disaster Loan (EIDL) or a Paycheck Protection Program (PPP) loan, the relief is temporary and should not be relied on for mid- or long-term financial planning.

While cash is coming in, it doesn't necessarily mean it is predictable. Similar to other financial crises that the construction industry has lived through, there are three phases that may last potentially into late 2021:

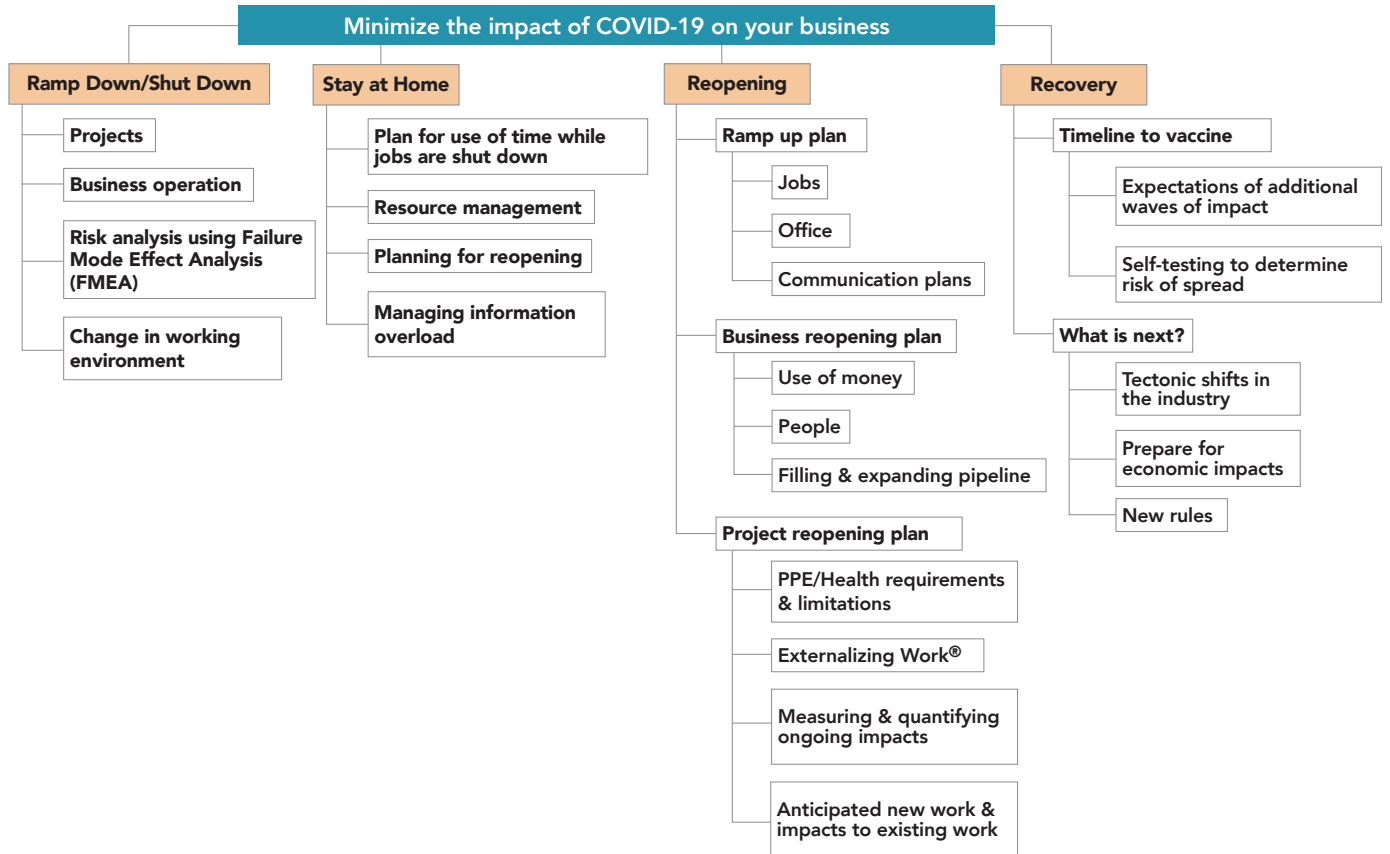
- 1) Delayed or rebid shovel-ready projects coupled with stagnation of the material supply chain impacting long-lead items and overall inventory levels.
- 2) Dedicated capital that is not released, which could lead to delays in design and engineering, and therefore, delays in new construction starts.
- 3) Reduced construction planning and shifts in work type due to regulations and the change in needs for space following COVID-19.

SOCIAL/PSYCHOLOGICAL CHANGES

The face of your workforce, either company-wide or within your jobsites, will change. Companies should expect ongoing impacts, including absenteeism, changes in attitude, and deeper workforce shortage issues. Absenteeism will be the result of ongoing personnel health issues directly or indirectly related to the pandemic, as well as distractions from and changes in family and home environments.

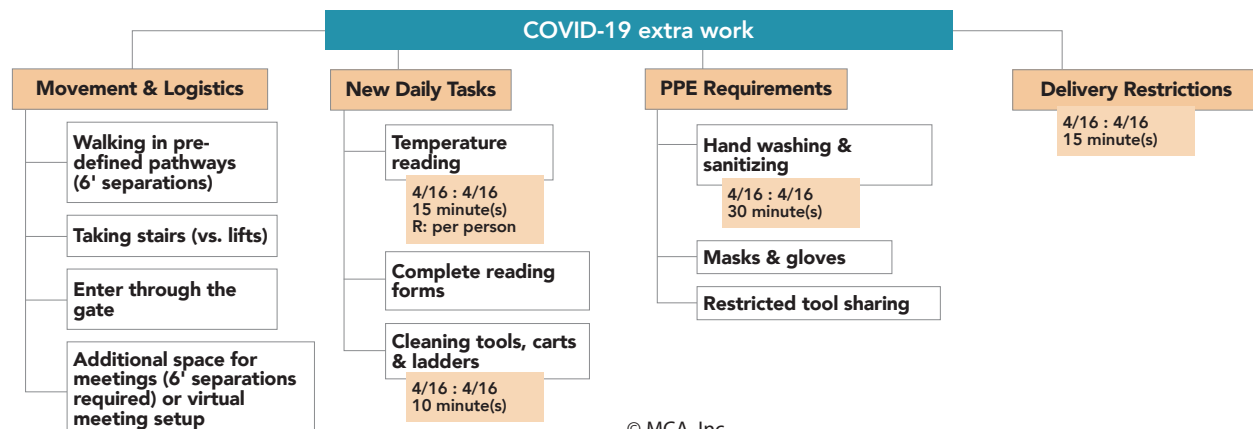
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Exhibit 3: **Planning Phases for Minimizing the Impact of COVID-19 Disruptions**



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Exhibit 4: **Planning & Quantifying the Impacts of COVID-19**



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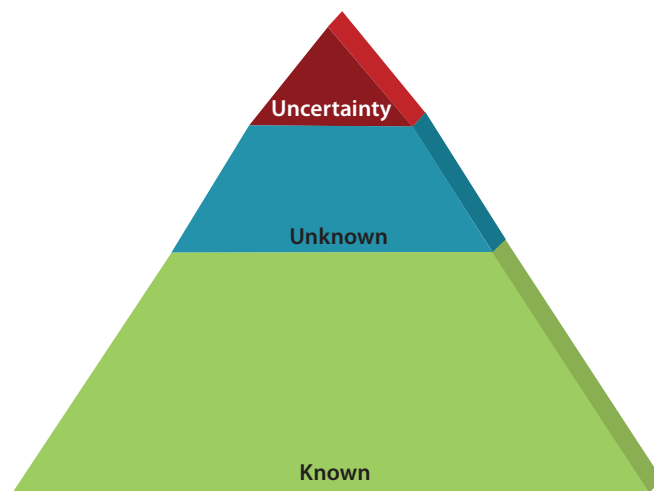
Moments like this typically leave a mark, and people may have a different impression of their personal and work life. Your company and managers, including crew leaders, must be prepared in order for your business to stay resilient and productive during recovery.

OPERATIONAL CHANGES

The impact of COVID-19 on business operations will require implementation of the operational model for modular construction. Given the financial and social/psychological changes from COVID-19, prefabrication may be the only option to perform the work in a safe (socially-distanced) and more productive way in order for jobs to be completed on time and with the workforce available.

During the shutdown phase, companies were encouraged to do more work off-site while working remotely, which would lead to an expectation of higher productivity, and therefore profitability, due to less trade interference. Additionally, standardizing the work will allow for better flexibility when dealing with absenteeism. Should a second wave of COVID-19 hit, the same recommendation is made for both work-in-progress and backlog.

Exhibit 5: Risk Management During Recovery



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It is critical to fill the pipeline and get back to active bidding quickly. The 2-3-month gap in completing work will leave a hole in operating income that cannot be recovered without replacing it with new work later in the year. However, it is important to consider how much of the bid project can be done using prefabrication and to gain an understanding of the work, effort, and time impacts due to COVID-19.

While individual companies throughout the construction industry work toward recovery, the industry itself may reach an inflection point, after which the way of doing construction will never be the same.

Historically, events such as COVID-19 have acted as catalysts for industrialization. In manufacturing, World Wars I and II as well as the Oil Embargo accelerated the pace of manufacturing through the steps of industrialization.

If COVID-19 is that catalyst for construction, it is prudent to be prepared for dealing with the industrialized environment, requiring more data and less reliance on skilled trades to complete the work. We may see levels of 30-50% of work done away from jobsite environments within the next few years. In the end, both the industry and society will benefit by having workspaces, living spaces, and pure shelter at a lower cost, more readily available, and at a higher quality. Sometimes it takes a tectonic shift for an industry to move to the next level.

Conclusion

While disruptions are unpredictable by nature, with better respect for and attention to data and patterns within the data, uncertainty can be reduced as shown below. Just like job profitability can become more predictable with correct measurements, the results of COVID-19 on construction can be predictable if plans and actions are made with long-term recovery in mind.

The micro- and macroeconomic impacts of COVID-19 on businesses and finances will likely take years to recover, and the imminent need to complete significant amounts of work in shorter time spans with less available resources can be met with Prefab Thinking™, including traditional prefabricated assemblies, modular construction, full externalization of work, and ultimately industrialization. COVID-19 may be the catalyst for a drastic increase in pace toward industrialization. ■

Endnotes

1. www.cfma.org/IndConst.
2. www.cfmbponline.net/cfmabp/20200506?pg=33#pg33.
3. SIS® and JPAC® data collected by MCA Inc.
4. SIS® and JPAC® data collected by MCA Inc.
5. SIS® and JPAC® data collected by MCA Inc.

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