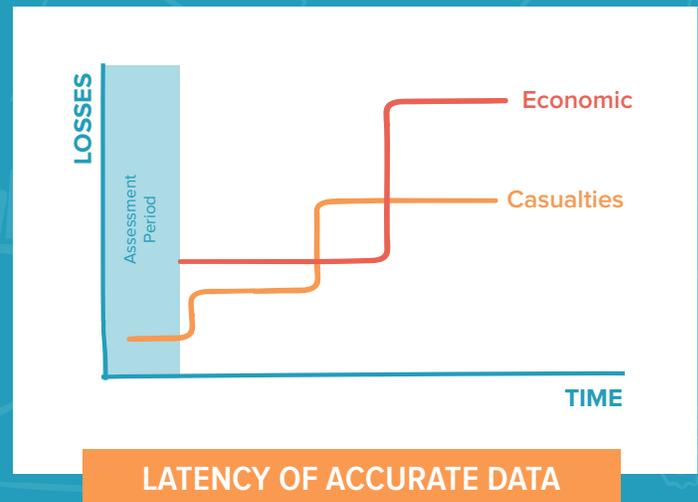


# THE QUAKE THAT ALMOST HALTED THE IPHONE 7

## What Can You Learn from the Taiwan 2016 Earthquake?

The event that caused the scare? A 6.4 magnitude earthquake that struck near the city of Tainan—a special municipality in Southern Taiwan—on February 6, 2016.<sup>1</sup> Few people realize how critical Taiwan is in both industrial electronics and modern consumer electronics. Case in point: TSMC will be the sole supplier of Apple’s A10 processor—to be used in the upcoming iPhone 7.<sup>2</sup> TSMC, a bellwether for the Taiwan electronics industry, gave an initial assessment that the impact to wafer shipments would be “less than 1%”.<sup>3</sup> But as the days passed, TSMC has lowered its wafer shipment estimates after a more accurate assessment of the damage is now being realized.<sup>4</sup> The silver lining? The earthquake acted as a sort of functional disaster recovery drill.

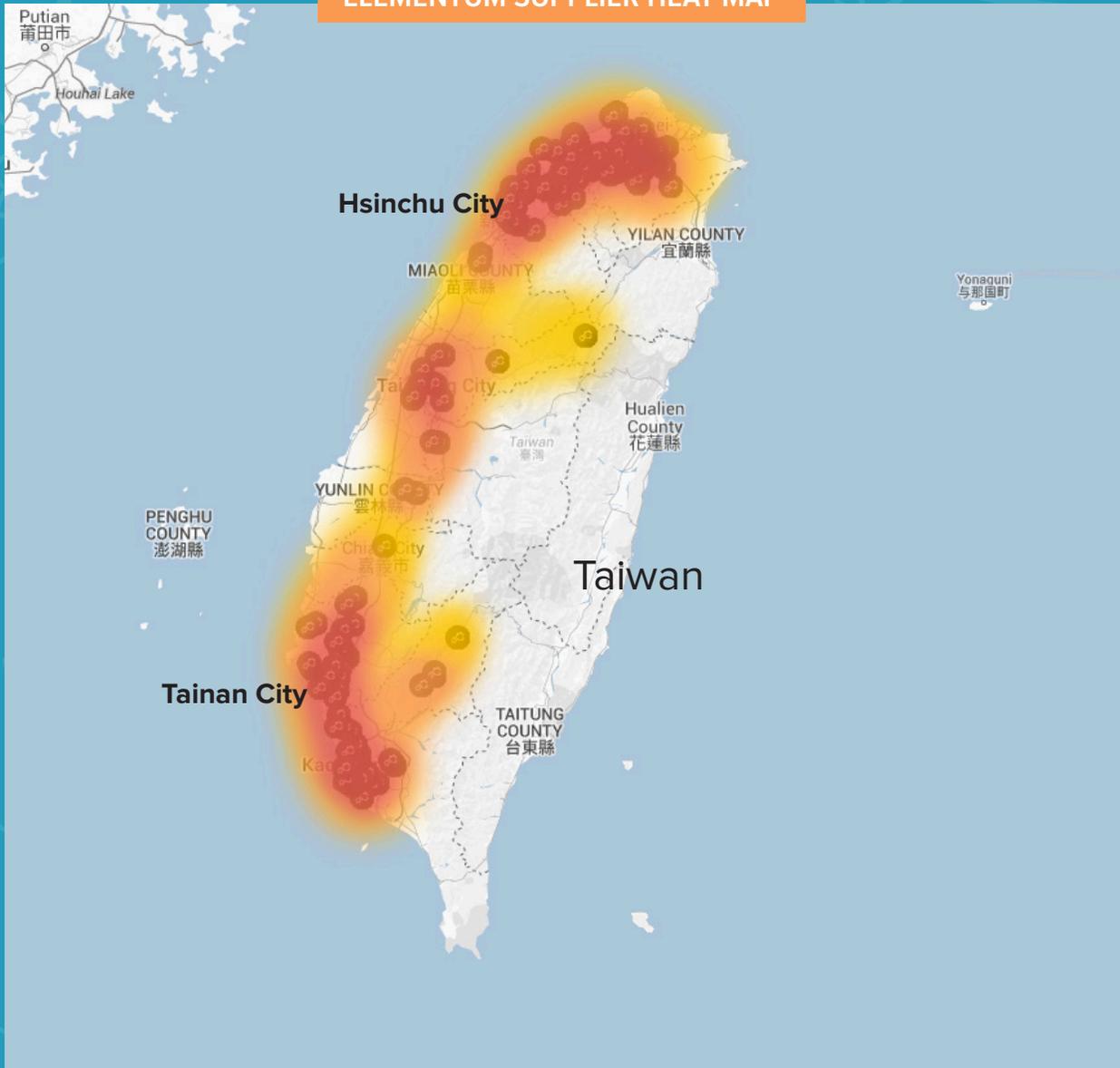


## Taiwan Touches All the Coolest Gadgets

Taiwan is home to the top two global semiconductor foundry “fabs”: Taiwan Semiconductor Manufacturing (TSMC) and United Microelectronics Corporation (UMC).<sup>5</sup> (It’s also the home of Foxconn—the contract manufacturer that makes much of the world’s most famous high-end consumer electronics.) Both TSMC and UMC have state of the art fabs located in Tainan, with the TSMC fab labeled as a “GIGAFab”—because it manufactures ICs using state of the art 12-inch/300mm wafers. These advanced fabs enable TSMC to produce high-end consumer electronics; it’s one of only two makers for Apple’s A9 processor—used in the iPhone 6s.<sup>6</sup> Qualcomm, Altera, and Mediatek are some of TSMC’s other global customers.<sup>7,8</sup>

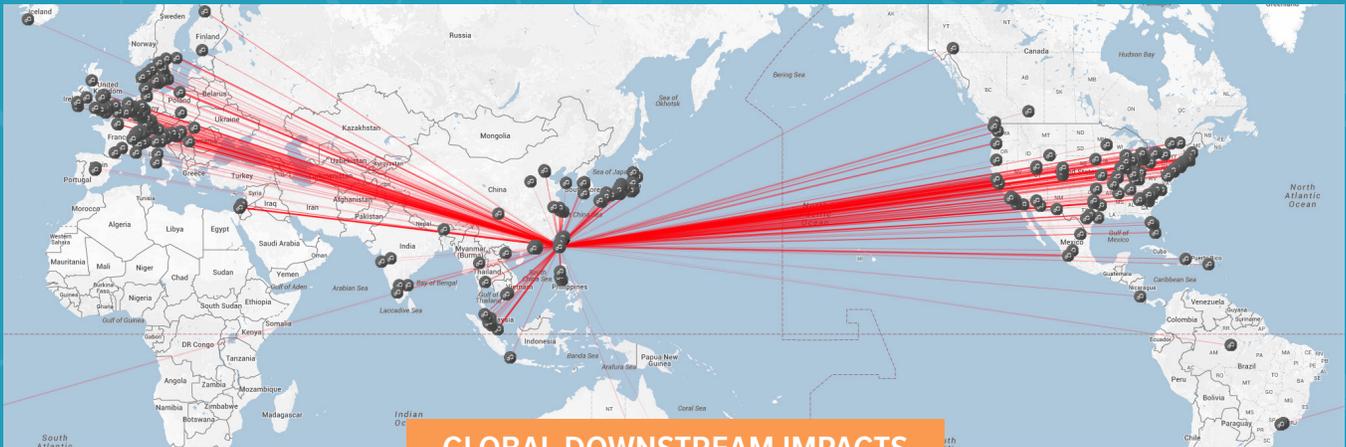
After the initially optimistic assessment that the earthquake impact would be “less than 1%”, a revised update of “greater than 1%” was given.<sup>9</sup> In particular, wafer delivery from Fab 14A will be delayed by 10 to 50 days.<sup>10</sup> In the normal discourse of fab interruption, fab equipment and supplies need to be assessed for damage.<sup>10</sup> Damaged work-in-progress (WIP) wafers need to be scrapped, and fab equipment needs to be repaired, recalibrated, warmed up, pilot run, and brought back online. Another impacted supplier is Innolux—producer of LCDs used in smartphones, tablets, and TVs—and is shifting production of 5" HD panels to China.<sup>11</sup>

## ELEMENTUM SUPPLIER HEAT MAP



## Comparison to the Great 921 Taiwan Earthquake

Compared to the great 921 Taiwan earthquake, the damage from the most recent was not as economically impactful. One reason for this is in the very nature of the earthquake. The 921 earthquake had a magnitude of 7.6 and was located much closer to Hsinchu—where the bulk of Taiwan’s semiconductor fabs are located—and away from Tainan. Furthermore, the timing of the recent earthquake was somewhat fortuitous. Because of the Chinese New Year, fabs were at low production rates, and a slowdown in demand for electronics—combined with high global inventory levels—might have softened the impact of the earthquake.



## Impact by Major Suppliers

### **ADVANCED SEMICONDUCTOR ENGINEERING GROUP (ASE)**

The ASE Group is the world's largest provider of independent semiconductor manufacturing services in assembly and test. ASE reports no impact to the ASE facilities on the island so far.<sup>12</sup>

### **AMKOR TECHNOLOGY**

Amkor is one of the world's largest providers of contract semiconductor assembly and test services. An internal report indicates no structural damage to building or equipment, and all production is fully restored.

### **HANNSTAR DISPLAY CORPORATION**

HannStar specializes in the manufacturing of TFT-LCD products used in notebook computer displays and desktop computer monitors. Internal reports indicate there is an impact from the earthquake and assessment is currently being undertaken.

### **INNOLUX**

Innolux produces a full range of large/medium/small LCD panels and touch-control screens used in consumer, IT, medical, and automotive. External reports indicate a shift in production of 5" HD panels to China. Internal reports corroborate these external reports.<sup>11</sup>

### **SILICONWARE PRECISION INDUSTRIES CO, LTD (SPIL)**

SPIL specializes in backend IC packaging turnkey solutions that include wafer bumping, wafer sort, assembly, and testing. Internal report indicates no structural damage to building or equipment, and that all production is fully restored.

## Impact by Major Suppliers (continued)

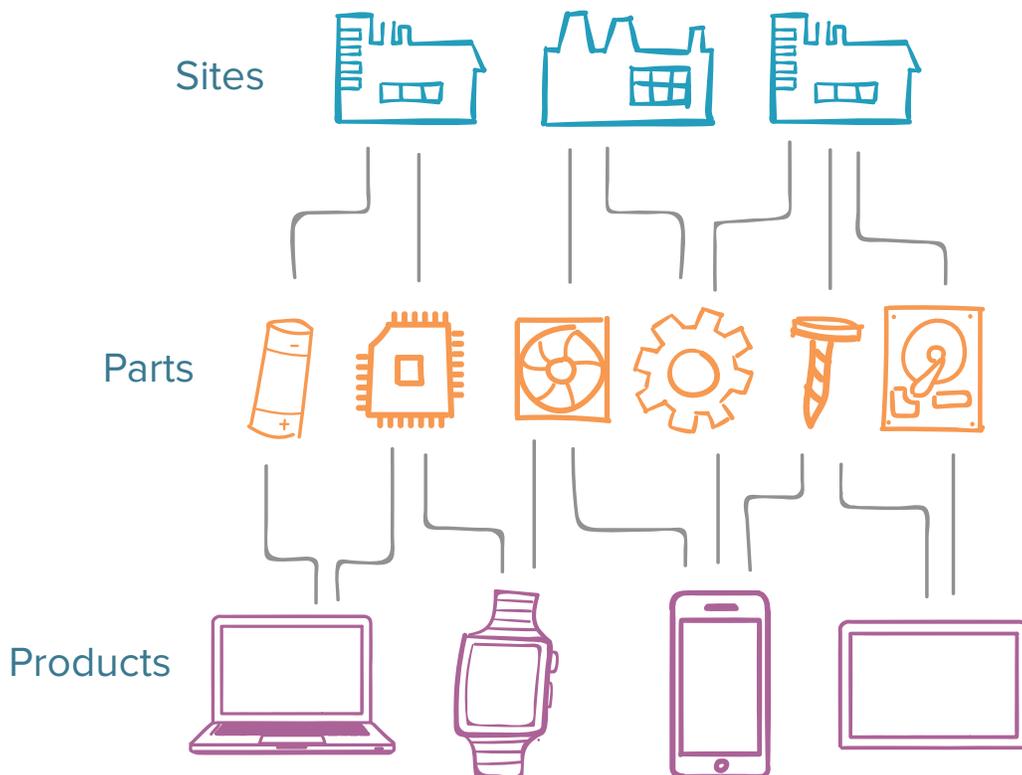
### TAIWAN SEMICONDUCTOR MANUFACTURING CORPORATION (TSMC)

TSMC is the world's top semiconductor foundry by revenue. TSMC manufactures products for various applications covering a variety of computer, communications, and consumer electronics market segments. Damages to Fab 6, 14A, and 14B are greater than initial assessments. As a result, the company now expects first quarter revenue to be between NT\$201 billion to NT\$203 billion.<sup>10</sup>

### UNITED MICROELECTRONICS CORPORATION (UMC)

UMC is one of the leading global semiconductor foundries that provide advanced technology and manufacturing for applications spanning every major sector of the IC industry. The automatic safety measures at Fab 12A in Tainan triggered an equipment shutdown that affected work-in-progress wafers. However, normal operations are resuming and wafer shipments will not be affected. UMC's Hsinchu fabs were not affected, and there will be no meaningful impact on UMC's business.<sup>13</sup>

#### PART / PRODUCT IMPACT



# SO, WHAT CAN WE LEARN FROM THIS DRILL?

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- Start creating a knowledge base today that connects news events to your supplier sites, so that you know the impact to your products—and revenue—when the next earthquake (or storm, typhoon, fire, etc.) strikes.
- Develop the knowledge, people, and process to immediately handle any type of supply chain emergencies. Information should be centralized, access should be immediate, and a clear resolution should be the target.
- Turn any supply chain emergency into a strategic advantage by securing dwindling supplies and securing precious cargo routes to beat your competition.
- During your next supplier review, ensure they have the flexibility to shift resources during an emergency by reviewing their risk contingency plan.
- You can't just monitor your suppliers—you need to make sure that you're monitoring the linchpins of your industry.

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