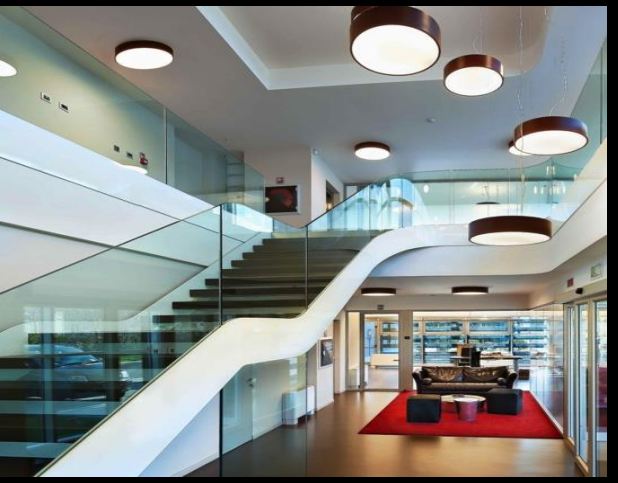


lumenpulse™
GROUPE

Virtual Process to Reality…!

lumenpulse institute

Agenda

1. Who we are….
2. Context
3. The challenge….
4. Virtual Process
5. Achievements
6. Conclusion

Qui sommes-nous….?

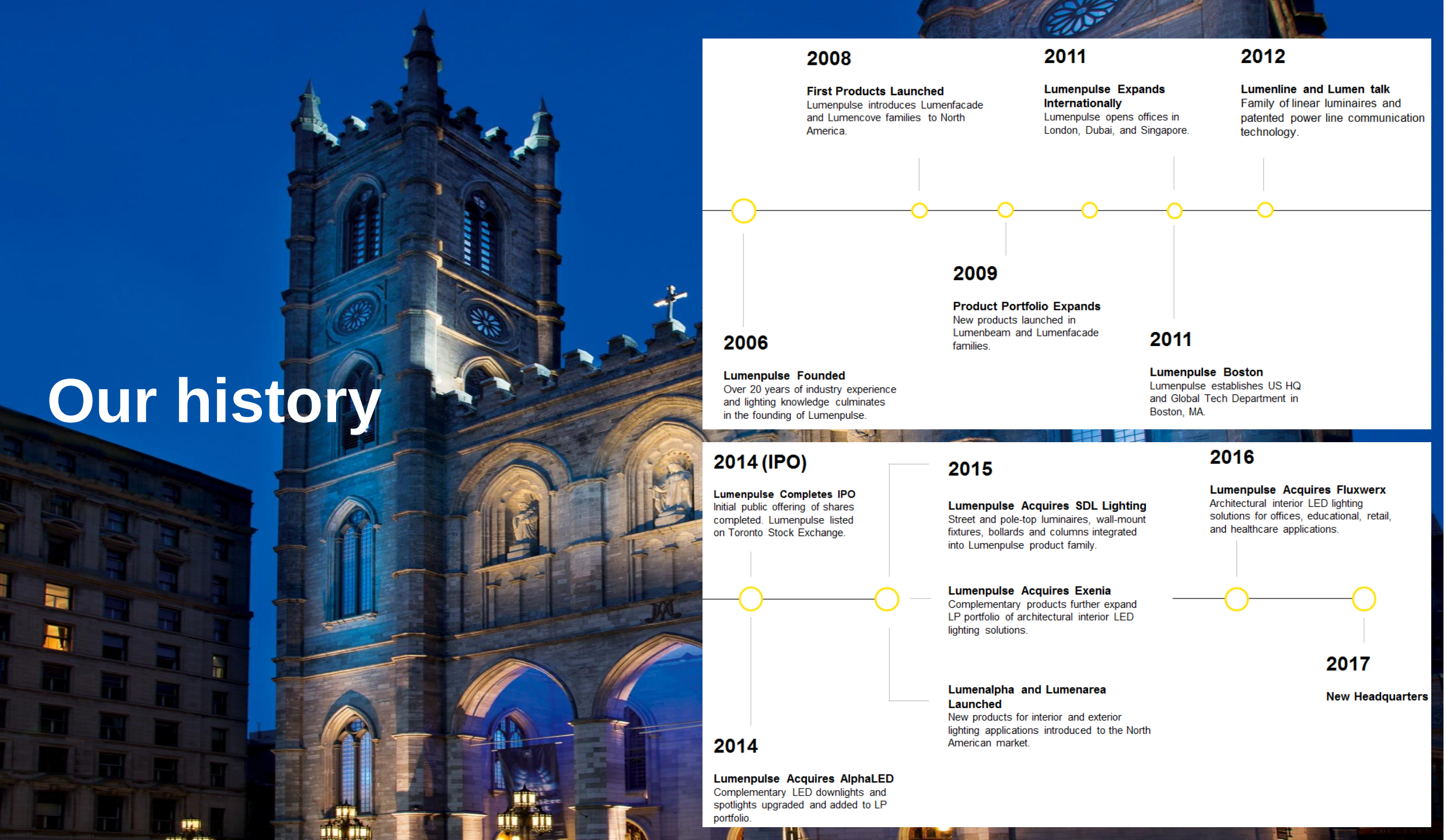
- The Lumenpulse Group designs, develops, manufactures and sells a wide range of high performance and sustainable specification-grade LED solutions for commercial, institutional and urban environments
- Embodying a design philosophy that respects the aims of lighting specifiers and the needs of the end-user, Lumenpulse offers *complete portfolio* of lighting solutions to the architectural specification market

- Our success factors :
  - ✓ Combine a cutting-edge technology with a design of higher device.
  - ✓ The Lumenpulse Group currently has more than 104 patents granted and 56 patents pending for innovations resulting from intensive investment in its R&D strategy
  - ✓ But while maintaining a technical edge is part of Lumenpulse's success, so too is its attention to the design aspects that make its products simple and straightforward to work with.

New Headquarter Longueuil , Montréal, Canada

The vision

To Become the World Leader in Architectural Specification-grade LED Lighting Solutions



Our history

2006

Lumenpulse Founded
Over 20 years of industry experience and lighting knowledge culminates in the founding of Lumenpulse.

2008

First Products Launched
Lumenpulse introduces Lumenfacade and Lumencove families to North America.

2009

Product Portfolio Expands
New products launched in Lumenbeam and Lumenfacade families.

2011

Lumenpulse Boston
Lumenpulse establishes US HQ and Global Tech Department in Boston, MA.

2011

Lumenpulse Expands Internationally
Lumenpulse opens offices in London, Dubai, and Singapore.

2012

Lumenline and Lumen talk
Family of linear luminaires and patented power line communication technology.

2014

Lumenpulse Acquires AlphaLED
Complementary LED downlights and spotlights upgraded and added to LP portfolio.

2014 (IPO)

Lumenpulse Completes IPO
Initial public offering of shares completed. Lumenpulse listed on Toronto Stock Exchange.

2015

Lumenpulse Acquires SDL Lighting
Street and pole-top luminaires, wall-mount fixtures, bollards and columns integrated into Lumenpulse product family.

Lumenpulse Acquires Exenia
Complementary products further expand LP portfolio of architectural interior LED lighting solutions.

Lumenalpha and Lumenarea Launched
New products for interior and exterior lighting applications introduced to the North American market.

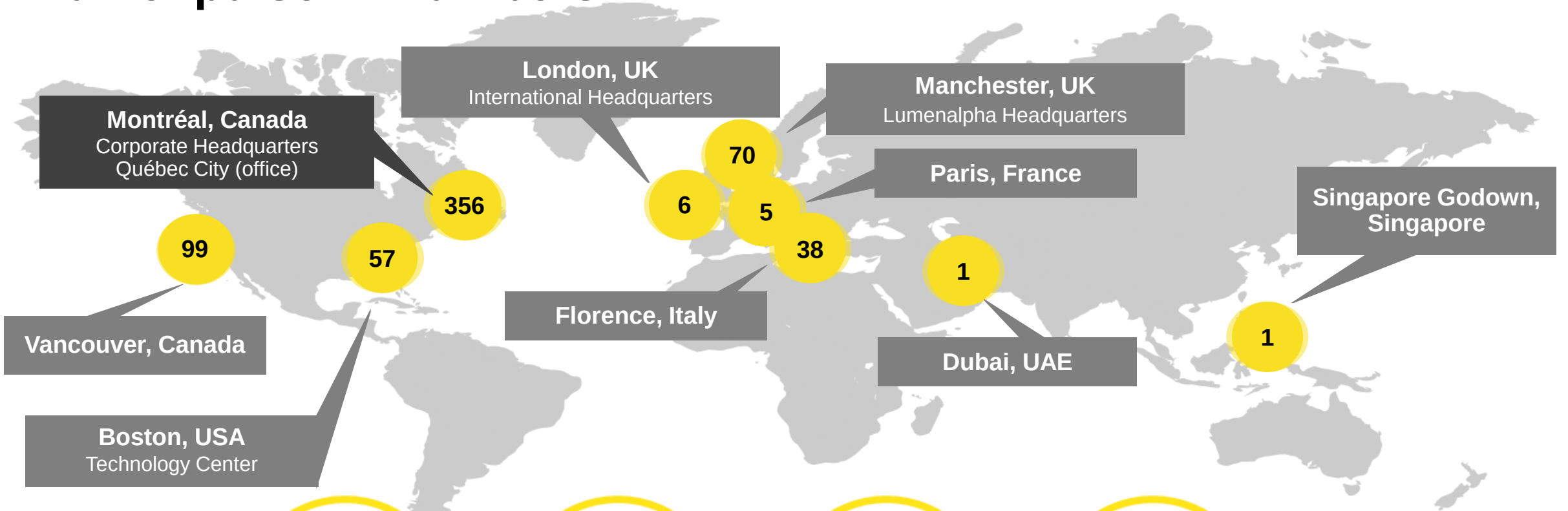
2016

Lumenpulse Acquires Fluxwerx
Architectural interior LED lighting solutions for offices, educational, retail, and healthcare applications.

2017

New Headquarters

Lumenpulse in Numbers



600+
Employees

9
Global Locations

25,000+
Completed Projects

50
Countries Served

lumenpulse™ GROUP

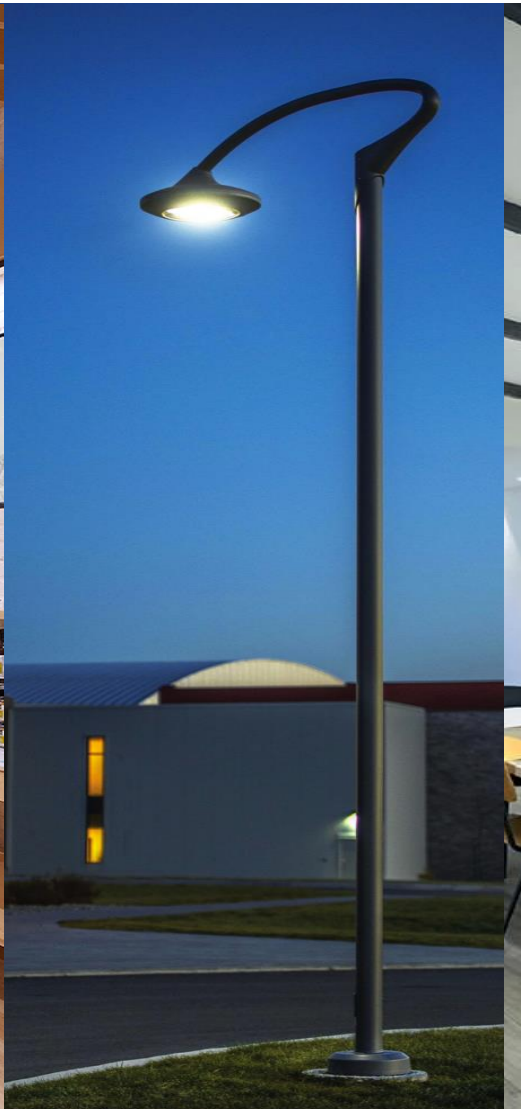
2. Context

LUMENPULSE
Hôtel de Ville de Boston, Boston, MA, USA

One Group, Five Distinct Brands

lumenpulse™ lumenalpha™ lumenarea™ eXenia FLUXWERX.

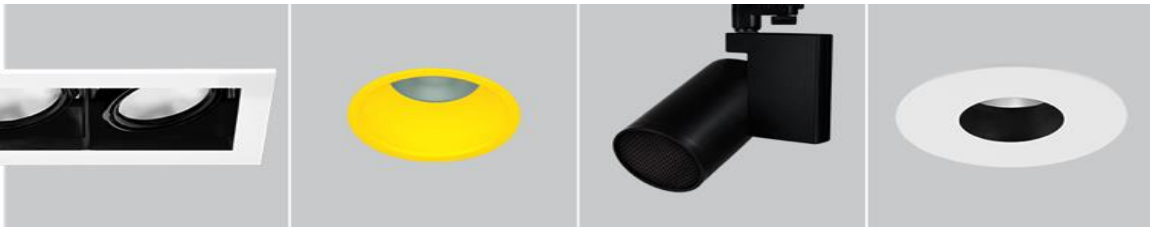




lumenpulse™

Indoor, Outdoor

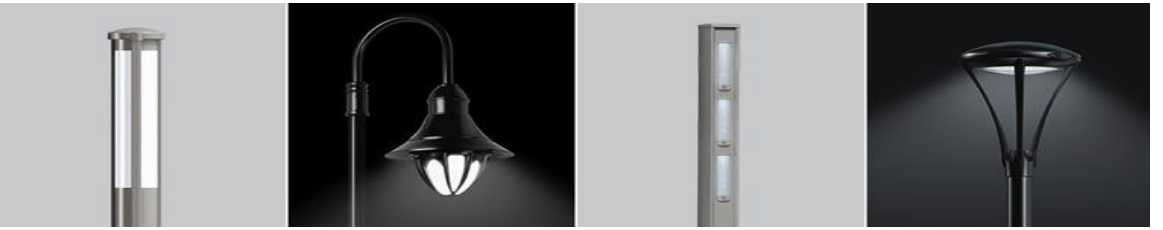
Commercial, institutional and urban environments



lumenalpha™

Indoor

Commercial, residential, retail and hospitality



lumenarea™

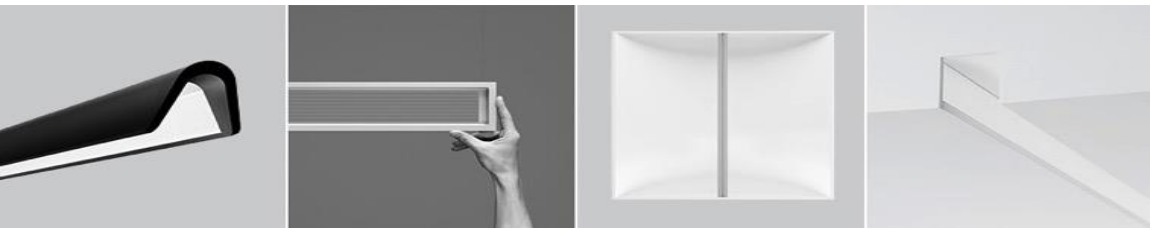
Outdoor

Urban, area, professional landscape

exenia

Indoor

Hotels, museums, shops and offices



FLUXWERX.

Indoor

Commercial, workplace, education and healthcare

Lumenpulse group product portfolio

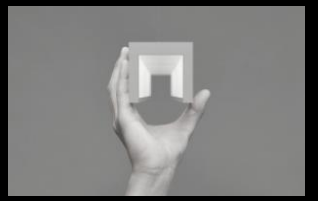
A Sample of Our Growing Portfolio


Lumenline Family

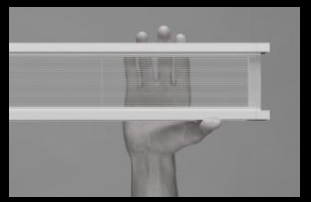

Lumenbeam Family

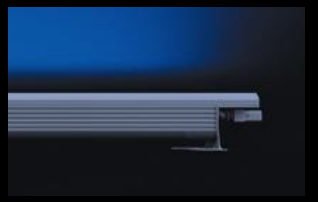

Lumenfacade Family


Lumenarea Element


Fluxwerx Profile

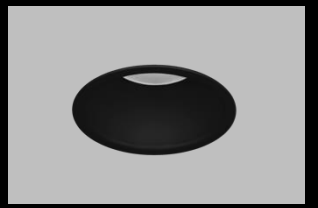

Lumenarea Pure Family


Fluxwerx View


Lumencove Family


Lumenalpha Soft Family


Exenia Suspensions


Lumenalpha Discreet Family


Exenia Downlights

40+

Product Families

400+

Products[1]

[1] As of July 31, 2016

3. A Crayon Box of Options

Mountings

Control

DMXrdm

DALI

LUTRON EcoSystem Enabled

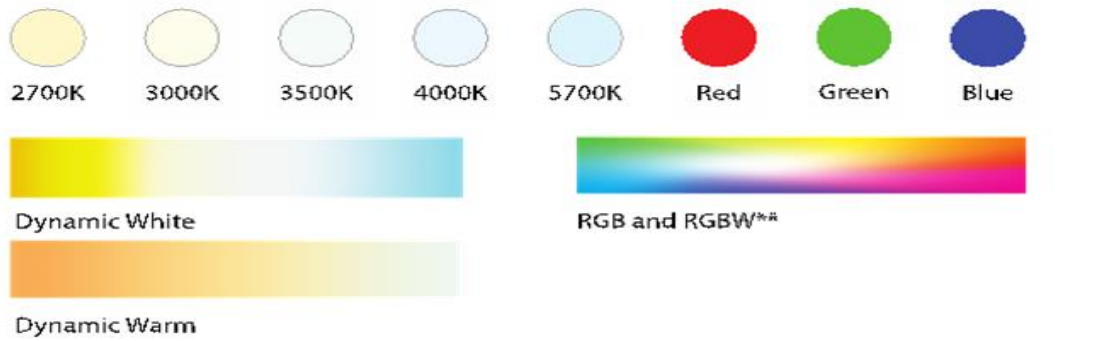
0-10V

DMX

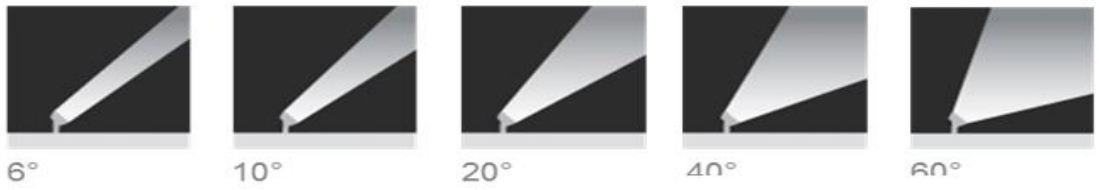
talk™

Dtw
Dim to warm

Colors / Couleurs



Optics / Optiques



Finish

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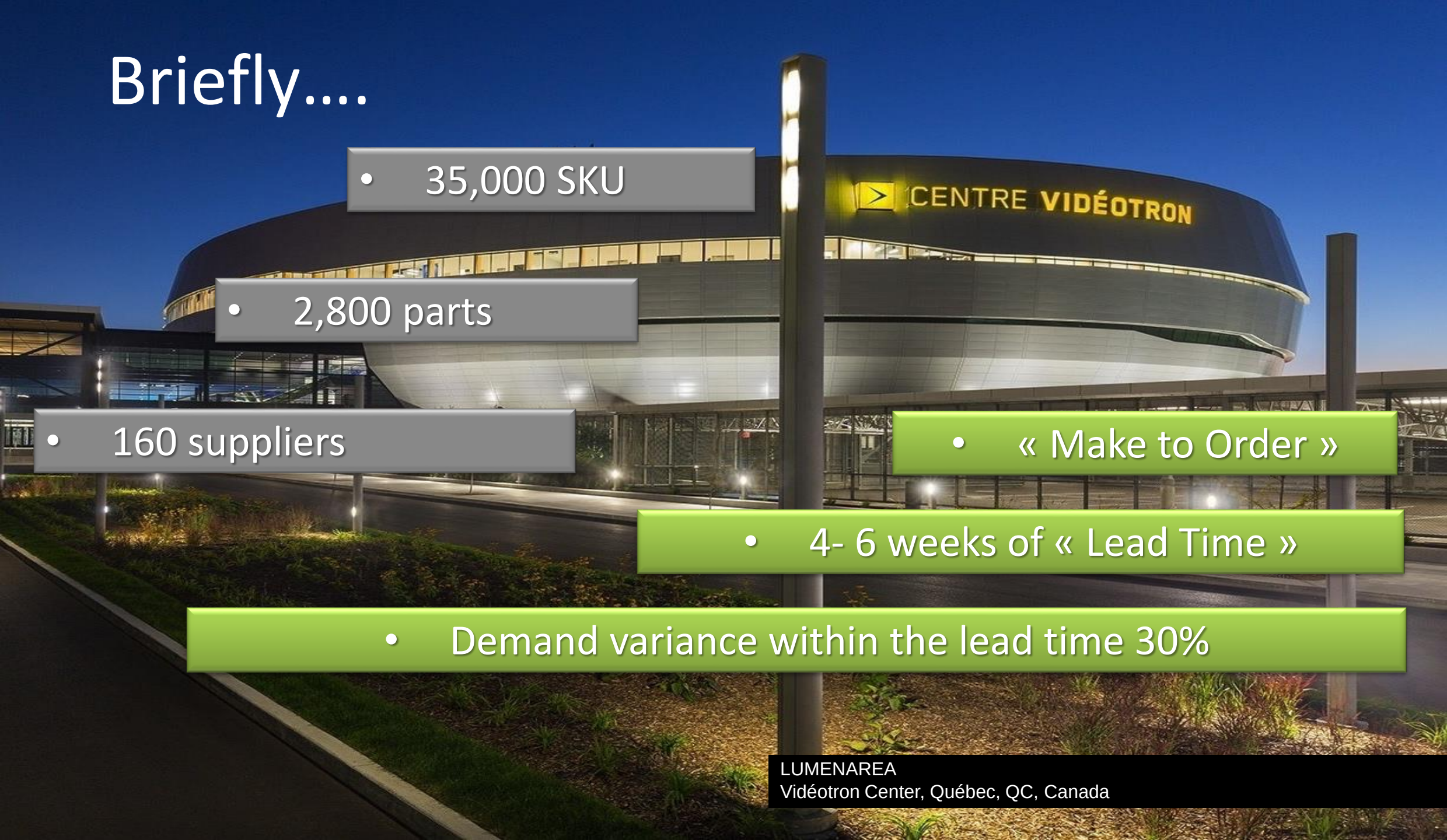
Briefly….

- 35,000 SKU
- 2,800 parts
- 160 suppliers
- « Make to Order »
- 4- 6 weeks of « Lead Time »
- Demand variance within the lead time 30%



LUMENAREA
Vidéotron Center, Québec, QC, Canada

3. The challenge ….

Musée de l’enfance Victoria & Albert, Londres

The challenge ….in our shop

- Flexible manpower
- Responsive Shop Floor Control
- Machine capacity
- Agile industrialization

Always deliver on time

- Consistencies / regulatory
- Feature / settings
- Traceability

a quality product,

at a competitive cost

- Efficiency
- Investments
- Continuous improvement
- System that are flexible and could evolve

To achieve all that is require ….. A MES/ Manufacturing Execution System

lumenpulse™ GROUPE

The challenge ….in our shop (and more…)

- Create work instruction an automate their generation by family structure :

  - ✓ Have agility / facility to generate them, to respond to the current and future markets, and business operational need..
  - ✓ At lesser cost / with minimum time and hardware investment.

- Better ***control and monitoring*** our manufacturing process :

  - ✓ Assembly / Functional, mechanical and Burn-in test.
  - ✓ To increase visibility and transparency (on time)/ decision making
  - ✓ To optimise all factory assets / increase efficiency (process).

- Simplify and delegate ***Shop floor control***.

- Ease « DATA mgt »

- An MES that provide easiness to export.

lumenpulse™ GROUPE


VIRTUAL PROCESS
QUALITY
REGULATORY
TRACEABILITY
AGILITY
PRODUCTIVITY & AGILITY
SCHEDULING

VIRTUAL PROCESS

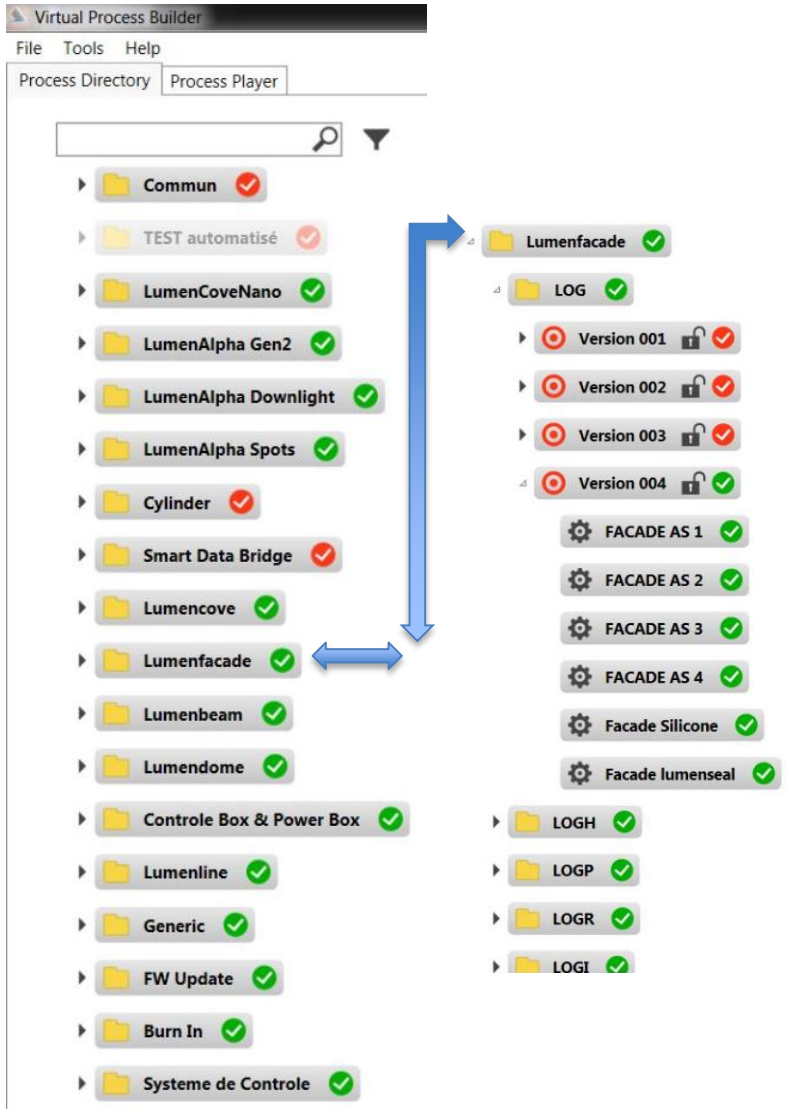
lumenpulse™ GROUPE

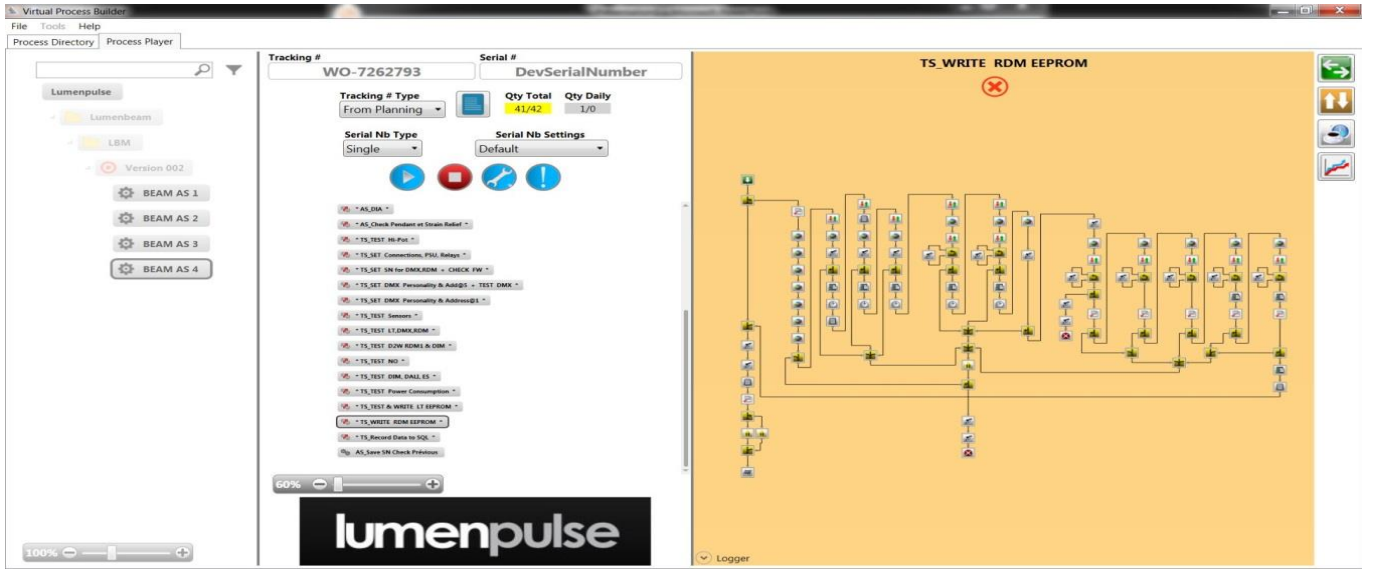
Codeless Platform

- **NPI Increased agility and Time-to-market (10 to 20 times faster)**
- **Less Engineering support**
- **No software programming experience required**

Virtual Process in our shop

Work instructions …..Create and support





- Ability to generate
  - ✓ *3 months* First family of product
  - ✓ *5 months* Overall portfolio
  - ✓ *2-4 weeks* for a new family intro (NPI)
  - ✓ Engineering change or temporary deviations *the same day*
- The Team…..
  - ✓ Industrial Engineer/ Product structure et governance/(20%).
  - ✓ Electrical Engineer/(20%)
  - ✓ A Leader with 4 crew member /(30-50%)

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VIRTUAL PROCESS

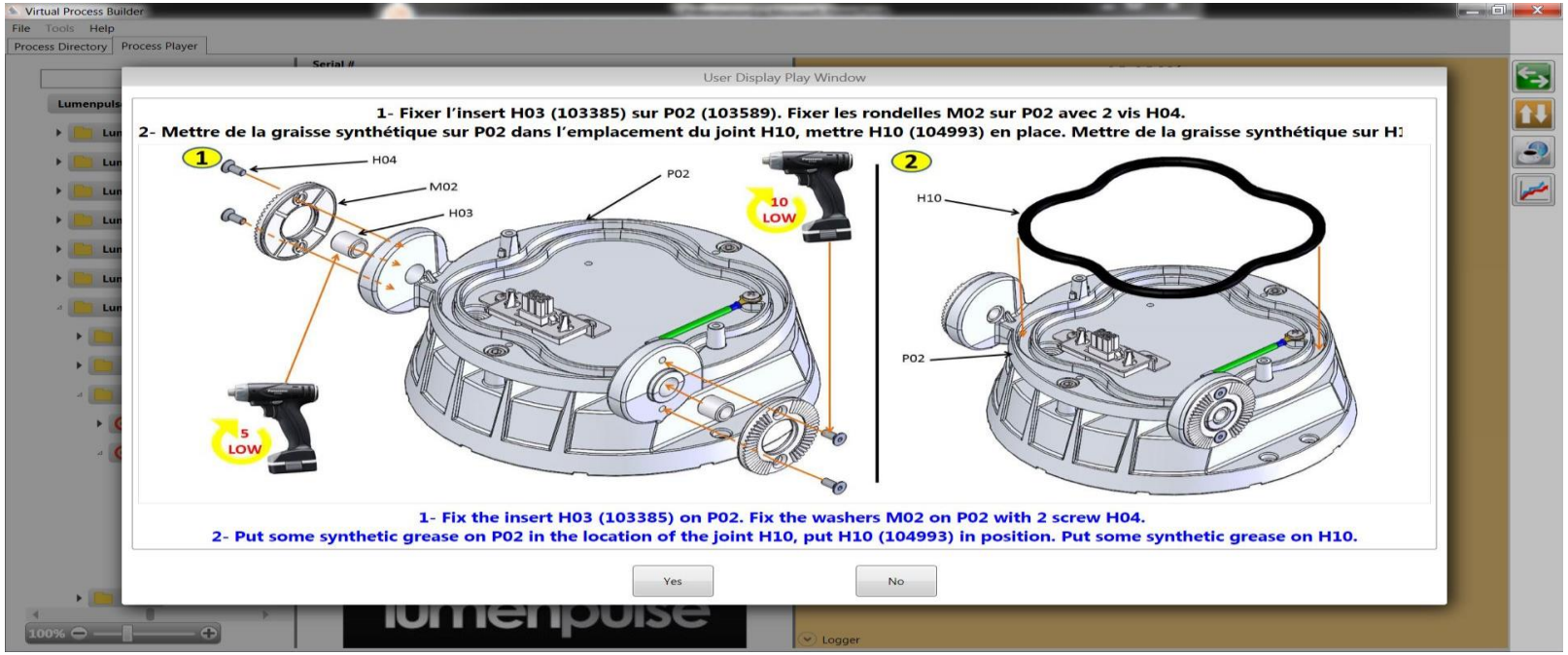
lumenpulse™ GROUPE

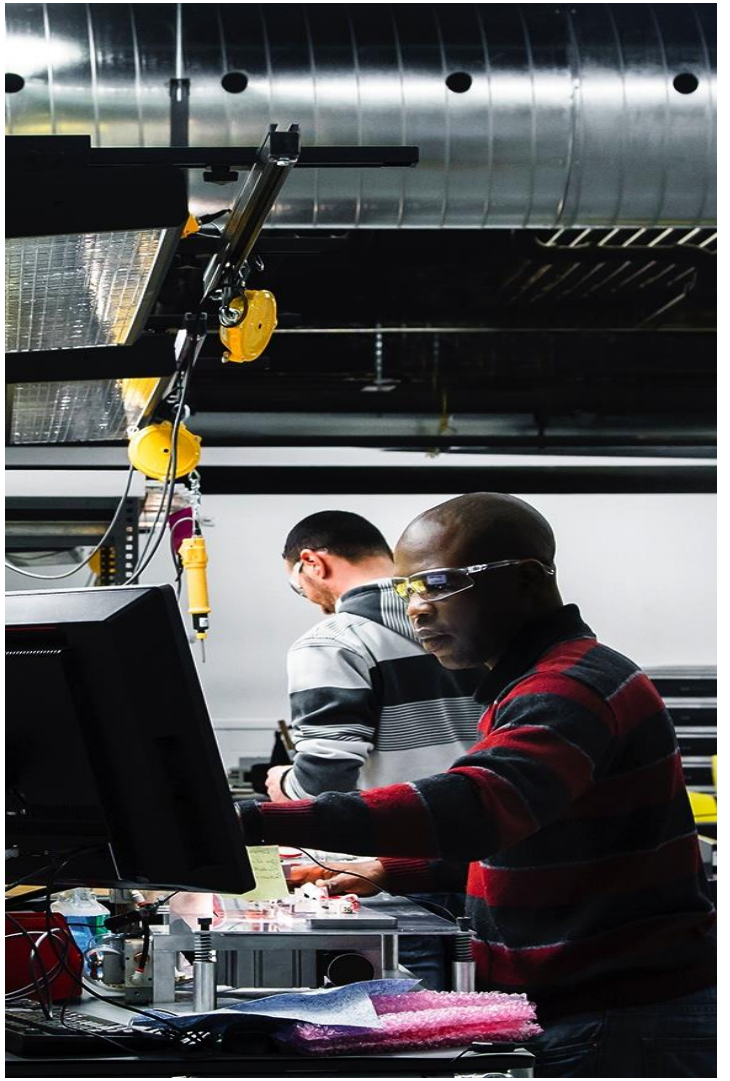
EWI
(Electronic Work Instruction)
connected to remote equipment

- Leverage on your employees know-how
- Faster learning curve; more flexible force and consistency
- **10 to 30 % reduction on labor costs**
- Support to achieve regulatory compliance
- Paperwork reduction or elimination
- Decreased time to implement changes
- **Improvement in customer-received product quality (from 10 to 30 %)**

Virtual Process in our shop

Work instructions …..





- Consistency and discipline / regulatory compliance .
- Improvement in our quality (at final inspection) *6%.*
- *2 weeks to 3 days*…Time required for the integration of the temporary workforce
- Reduce paper on shop floor (works instruction / in process inspection / ESD).

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VIRTUAL PROCESS

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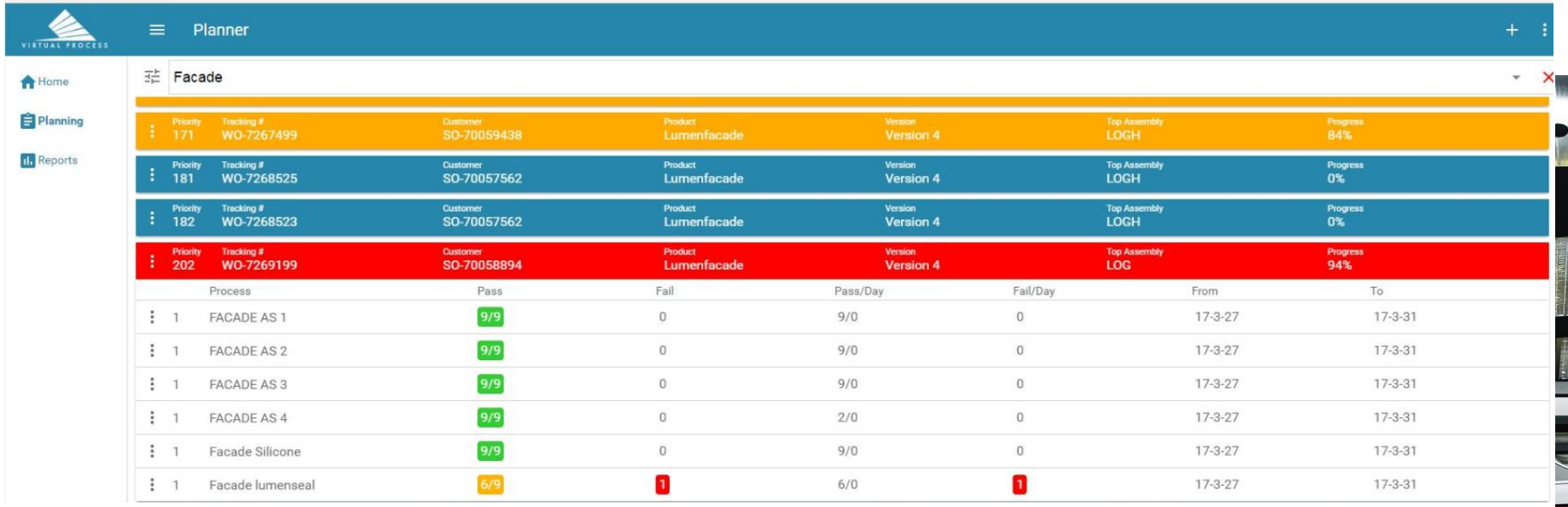
Planning

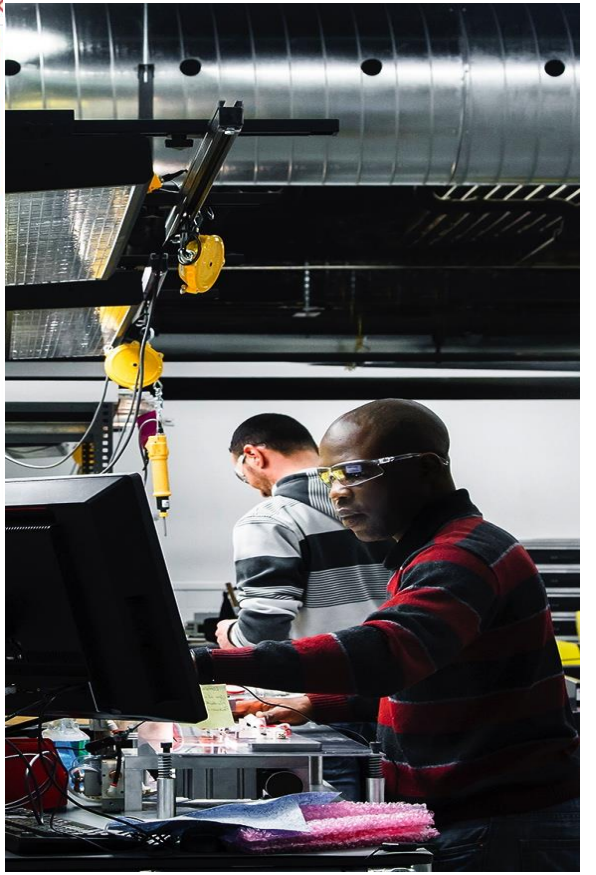
- 10 to 20% improvement in scheduled commitments
- Management can organize and schedule all shop floor tasks remotely and instantaneously

Virtual Process in our shop

Planning « Shop Floor Control »



	Process	Pass	Fail	Pass/Day	Fail/Day	From	To
1	FACADE AS 1	9/9	0	9/0	0	17-3-27	17-3-31
1	FACADE AS 2	9/9	0	9/0	0	17-3-27	17-3-31
1	FACADE AS 3	9/9	0	9/0	0	17-3-27	17-3-31
1	FACADE AS 4	9/9	0	2/0	0	17-3-27	17-3-31
1	Facade Silicone	9/9	0	9/0	0	17-3-27	17-3-31
1	Facade lumenseal	6/9	1	6/0	1	17-3-27	17-3-31



- Automatic ***« Upload »*** of release Work orders.
- Daily alignment by line Coordinators.
- Step by step follow up on manufacturing process
- Easiness to Access

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VIRTUAL PROCESS

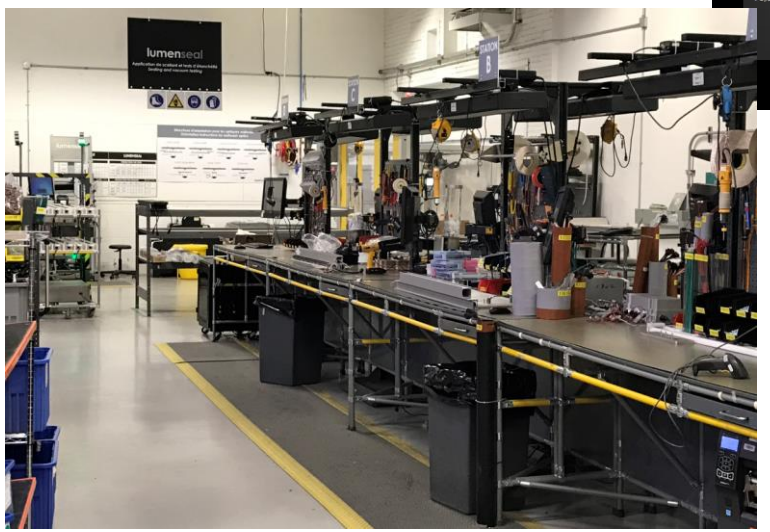
lumenpulse™ GROUPE

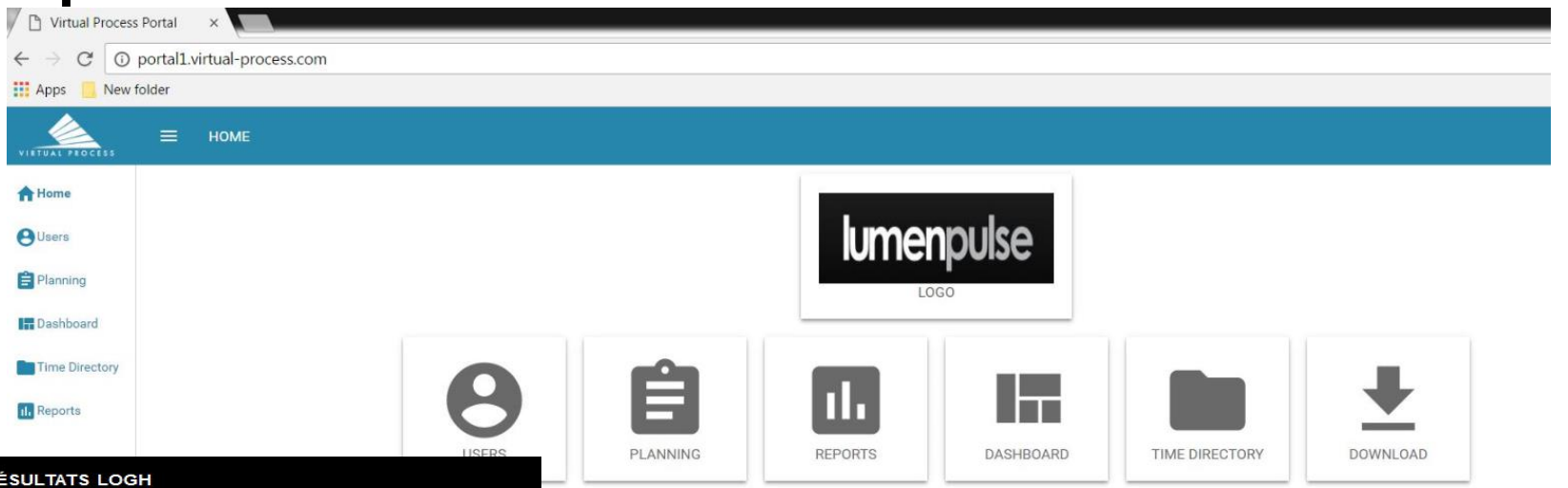
Real-time reports and costumed reports

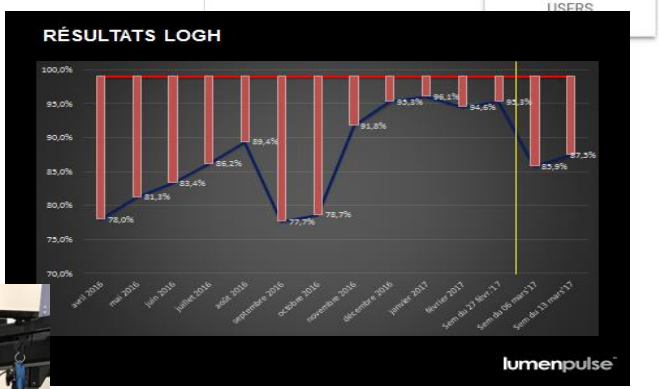
- **Better visibility & decision-making**
- **80 to 90% error reduction of most of the manual data collection**

Virtual Process in our shop

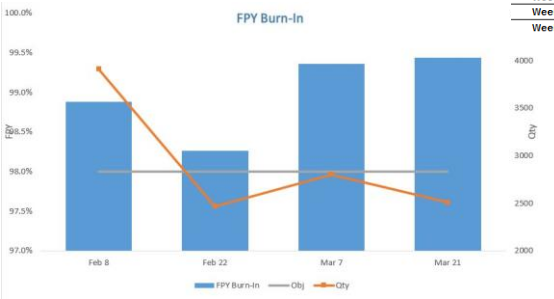
« Reporting et Dashboard »







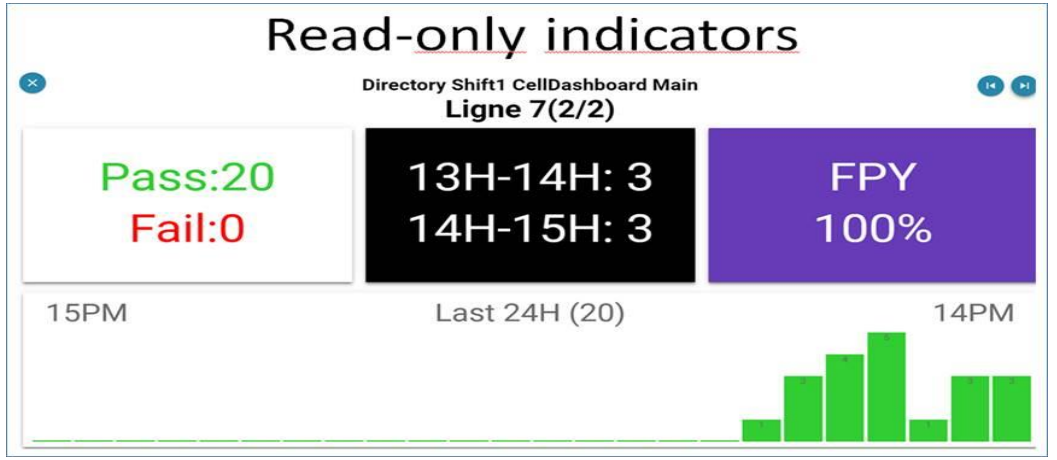
	INDOOR					OUTDOOR				
	LCN	LCS2	LumenAlpha	LOGI	Lumenline	Lumenfacade (except LOGI)	Lumenbeam	Boites de contrôle et d'alimentation	LXT	Objective
May-15	99.1%	99.6%	100.0%	98.1%		95.7%	98.8%	100.0%	96.8%	
Aug-15	100.0%	99.8%	100.0%	99.1%	99.8%	94.8%	96.1%	100.0%	99.7%	99%
Sep-15	100.0%	99.5%	100.0%	97.0%	100.0%	95.9%	96.8%	100.0%	98.6%	99%
Oct-15	99.7%	99.1%	99.8%	99.0%	100.0%	97.6%	98.9%	96.4%	88.5%	99%
Nov-15	99.8%	99.2%	99.9%	98.1%	99.8%	97.0%	98.1%	98.0%	92.4%	99%
Dec-15	99.8%	99.9%	100.0%	97.4%	99.7%	96.0%	98.4%	99.8%	96.7%	99%
Jan-16	99.9%	99.2%	99.9%	99.2%	100.0%	98.0%	98.5%	100.0%	99.2%	99%
Feb-16	100.0%	99.5%	100.0%	99.3%	100.0%	98.2%	98.5%	100.0%	98.6%	99%
Mar-16	99.4%	99.7%	99.9%	98.9%	99.8%	98.4%	97.7%	100.0%	96.4%	99%
Apr-16	99.7%	97.3%	100.0%	97.0%	99.8%	97.4%	98.3%	99.7%	99.5%	99%
may-16	99.7%	99.8%	100.0%	98.9%	100.0%	98.6%	95.9%	97.4%	97.3%	99%
june-16	99.7%	99.5%	100.0%	99.7%	99.8%	99.3%	99.0%	97.4%	99.7%	99%
july-16	99.5%	99.6%	99.9%	99.6%	99.9%	99.1%	96.2%	99.8%	98.7%	99%
August-16	99.1%	99.6%	99.9%	97.2%	99.7%	96.5%	98.5%	98.9%	100.0%	99%
Sep-16	97.6%	98.4%	99.9%	98.5%	99.7%	96.7%	96.9%	99.2%	98.7%	99%
Oct-16	98.6%	99.3%	99.9%	98.6%	99.1%	98.6%	98.0%	97.7%	98.6%	99%
Nov-16	99.7%	98.7%	99.9%	99.1%	99.7%	97.2%	98.3%	98.0%	91.3%	99%
Dec-16	99.7%	100.0%	99.9%	99.9%	98.0%	99.4%	98.1%	100.0%	100.0%	99%
Jan-17	99.8%	99.9%	100.0%	98.4%	98.3%	99.6%	97.5%	99.9%	99.6%	99%
Feb-17	99.7%	99.7%	99.9%	97.5%	95.6%	97.7%	98.3%	99.9%	99.7%	99%
Week 1 Mar-17	98.2%	100.0%	99.8%	99.5%	86.4%	95.6%	99.8%	100.0%	100.0%	99%
Week 2 Mar-17	99.9%	100.0%	100.0%	100.0%	100.0%	100.0%	99.5%	100.0%	100.0%	99%
Week 3 Mar-17	99.4%	100.0%	99.4%	99.6%	100.0%	99.5%	96.0%	100.0%	100.0%	99%

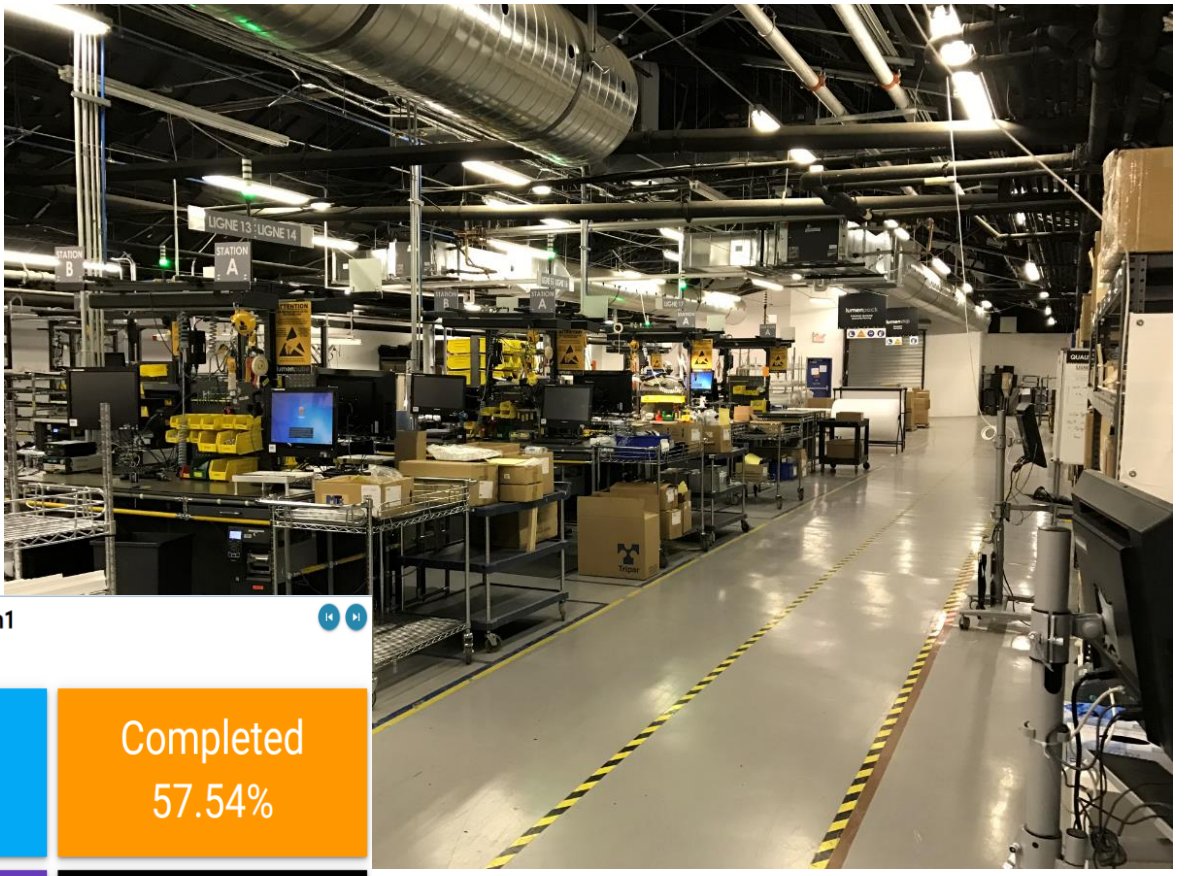


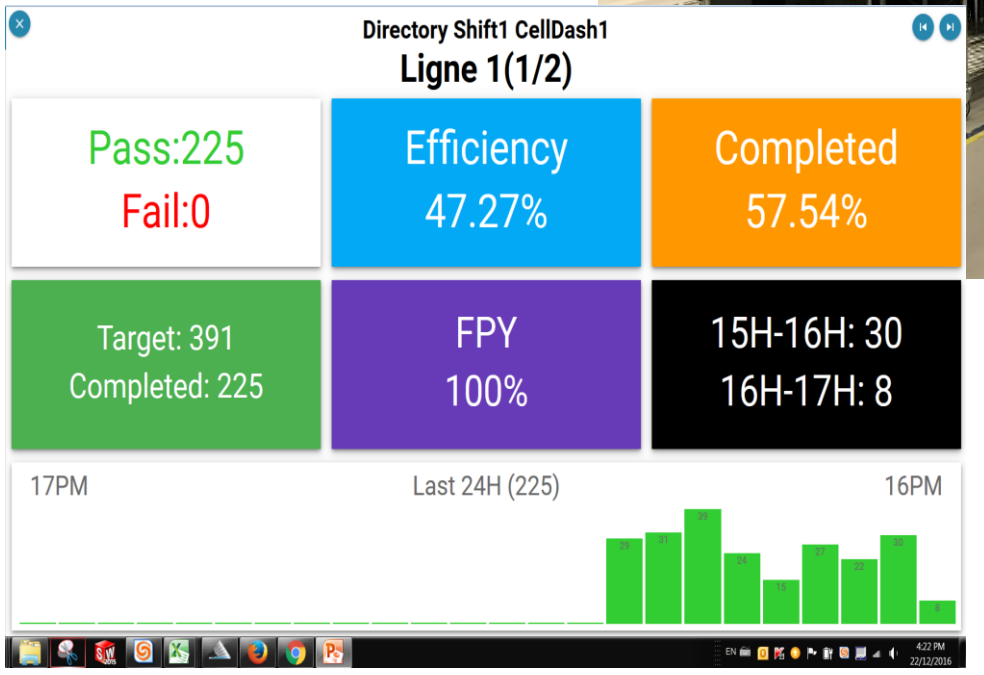
lumenpulse™ GROUPE

Virtual Process in our shop

« Reporting et Dashboard »







lumenpulse™ GROUPE

VIRTUAL PROCESS

lumenpulse™ GROUPE

Cloud base software

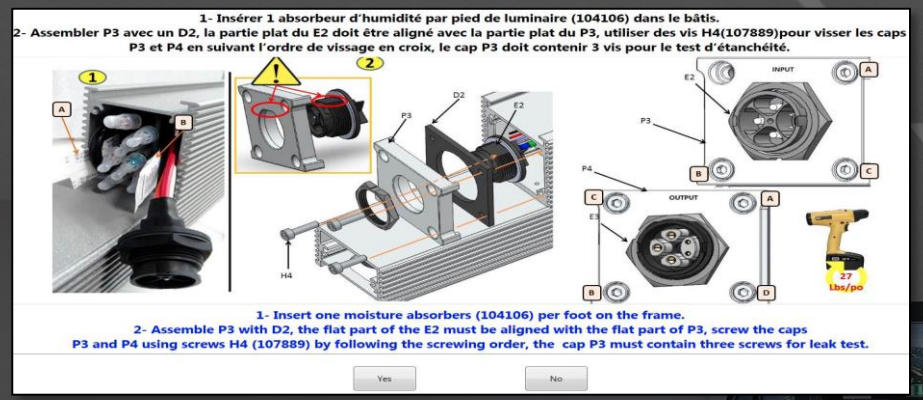
- No infrastructure needed
- Saving on software development and support
- Remote management deployment and tracking
- **Simple “pay as you go” model**
- Currently used in more than 8 countries and present on 3 continents

lumenpulse GROUPE

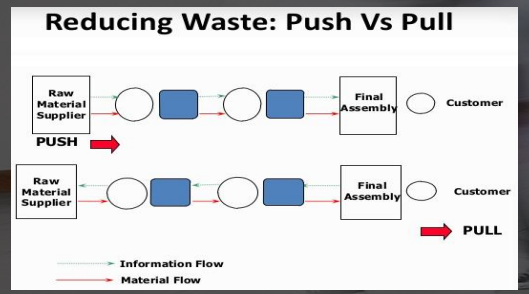
CERTIFIÉ NIVEAU 5 UNE SOLUTION PROACTION

VIRTUAL PROCESS

Work Instructions

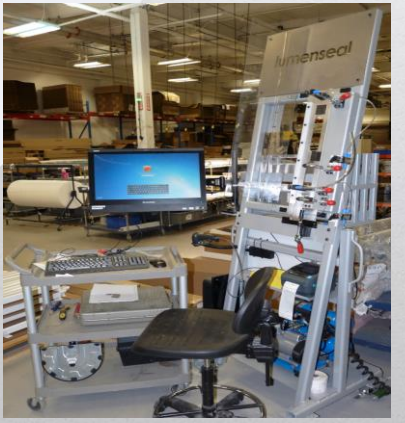


➢ *LumenLean / Flow Mgt.*



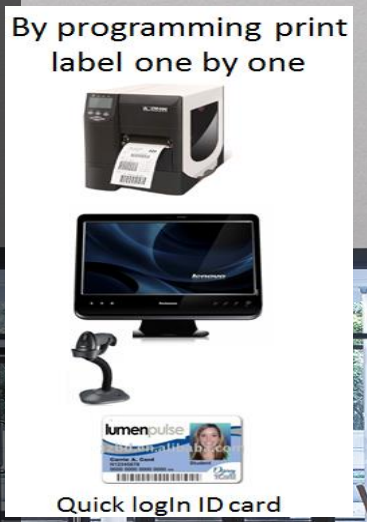
Reporting

➢ *LumenSeal*

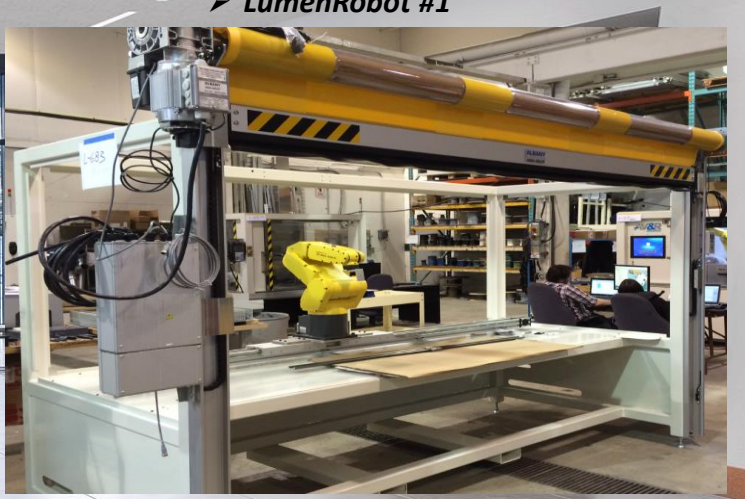


➢ *Test Bench*

➢ *Traceability*

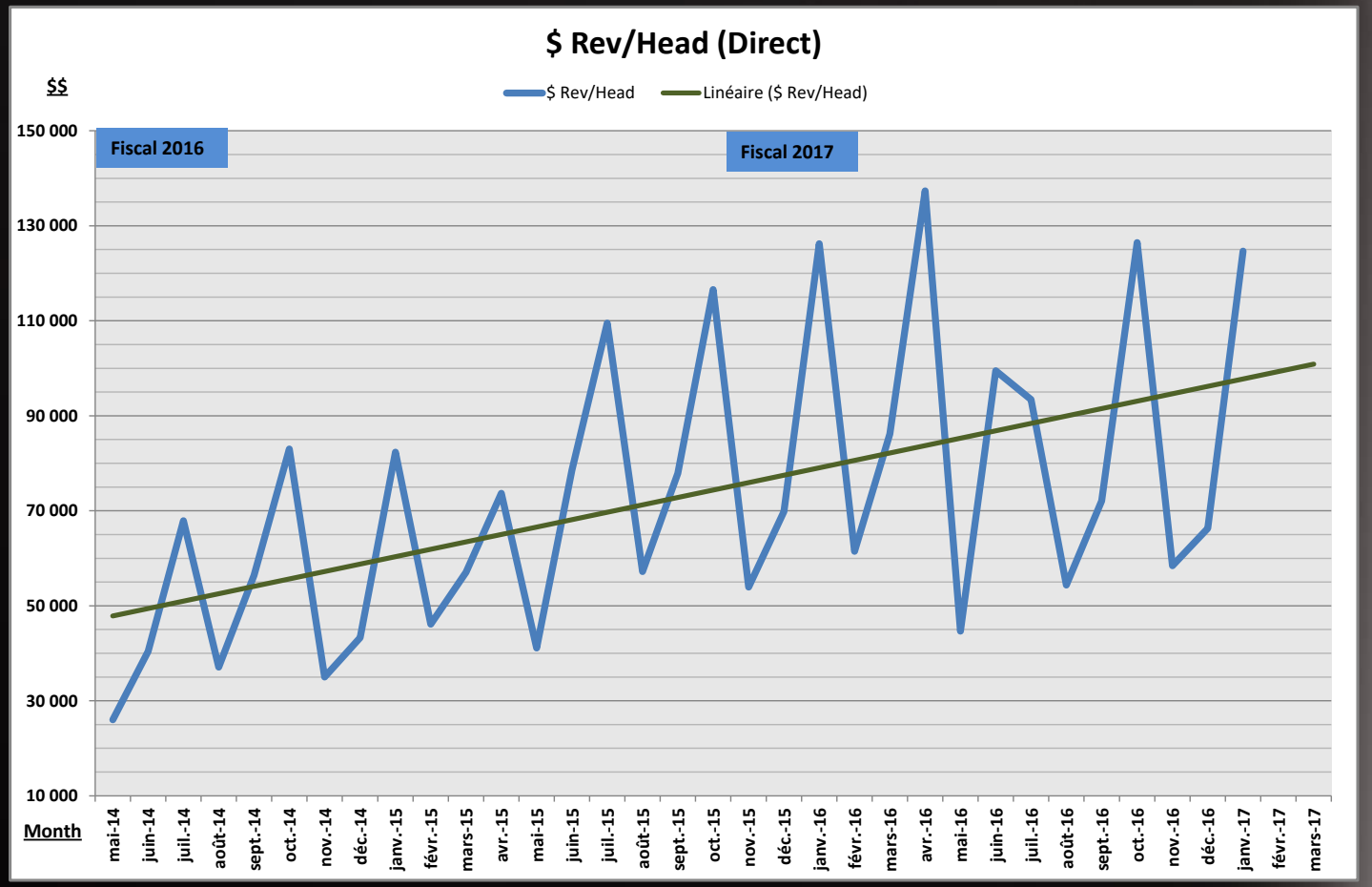


➢ *LumenRobot #1*



5. Accomplissements….

Combine : LEAN gbs +



- % of manpower cost / Revenues : 15% à 6 %
- Time required for the integration of the temporary workforce : 2 weeks to 3 days.

Thanks

lumenpulse™
GROUPE