

PRINTING TECHNOLOGY & INNOVATION DAYS FOR FLEXIBLE PACKAGING

July 2019
Istanbul, Turkey



PRINTING TECHNOLOGY & INNOVATION DAYS FOR FLEXIBLE PACKAGING

HOSTED BY:

Janoschka



PRINTING TECHNOLOGY & INNOVATION
DAYS FOR FLEXIBLE PACKAGING

COLOR MANAGEMENT 4.0

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Siegwerk

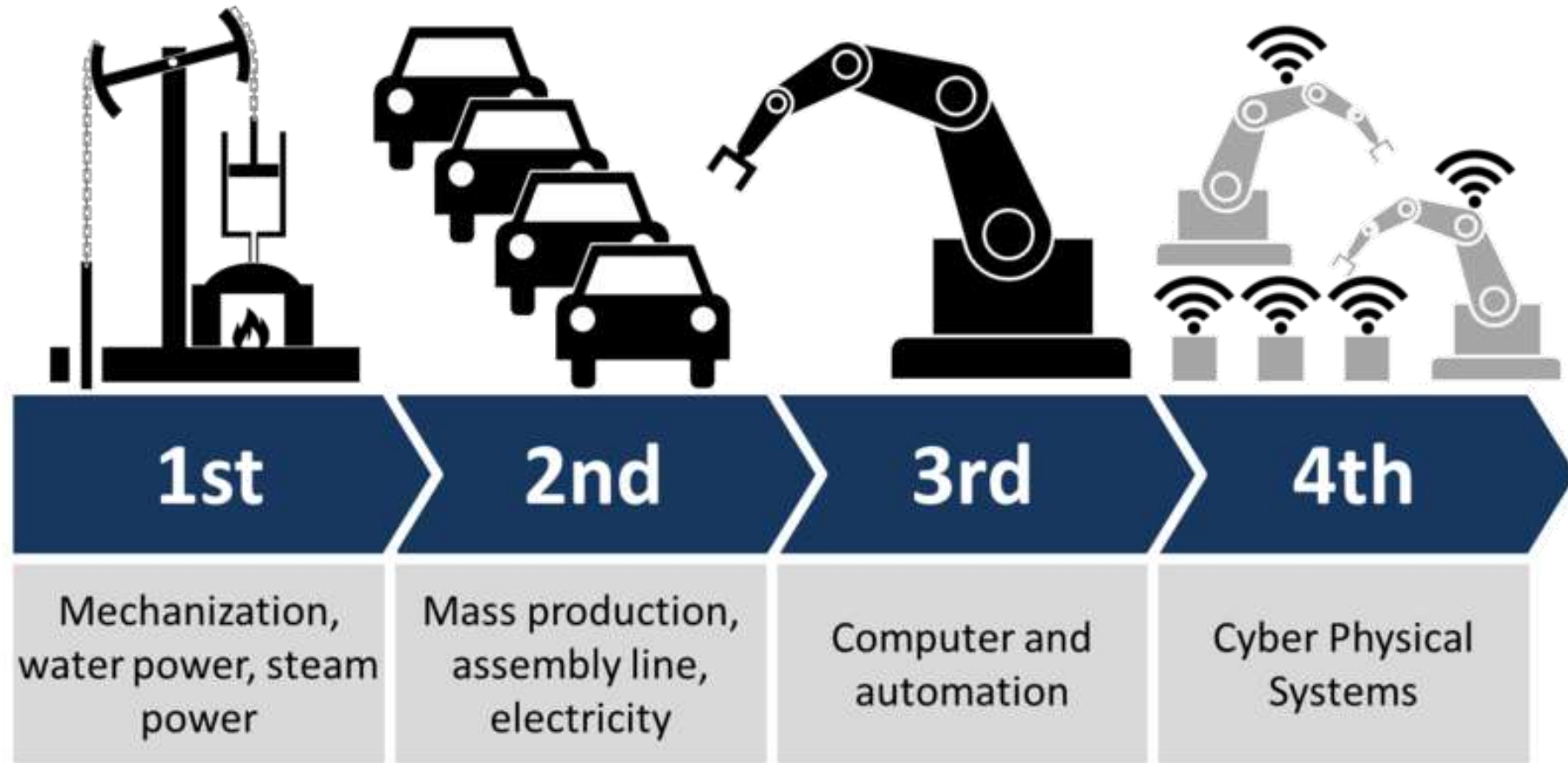


Agenda

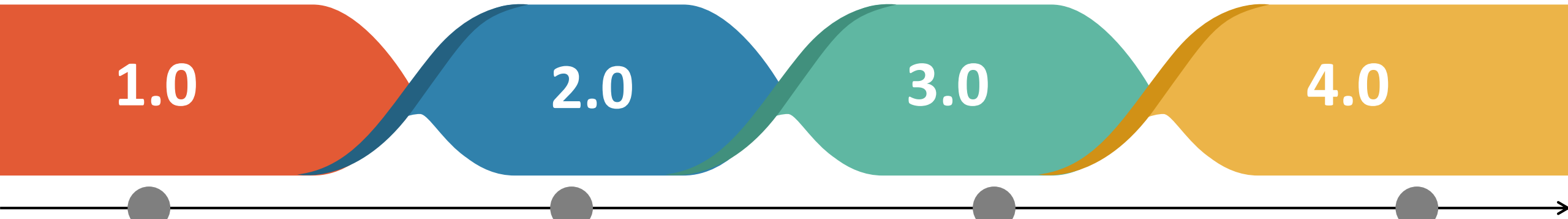
- Introduction – Color Management 4.0
- Workflow
- Technologies
- Expanded Color Gamut (ECG) Printing
- Summary



Industry 4.0



Color Management 4.0



1.0

2.0

3.0

4.0

1970

1990

2010

2030



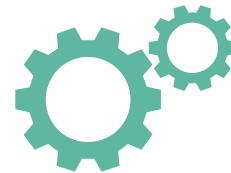
Basic Science

Visual color to measured color
Density, CIELAB, spectral...



Application

Closed/proprietary applications
Open architecture – ICC



Systems

Digital technologies, proofing,
on-press measurements
ISO standards, FOGRA, G7, CxF...



Interconnection

System integration
Seamless & automated CM
Cloud-based systems, iccMAX...

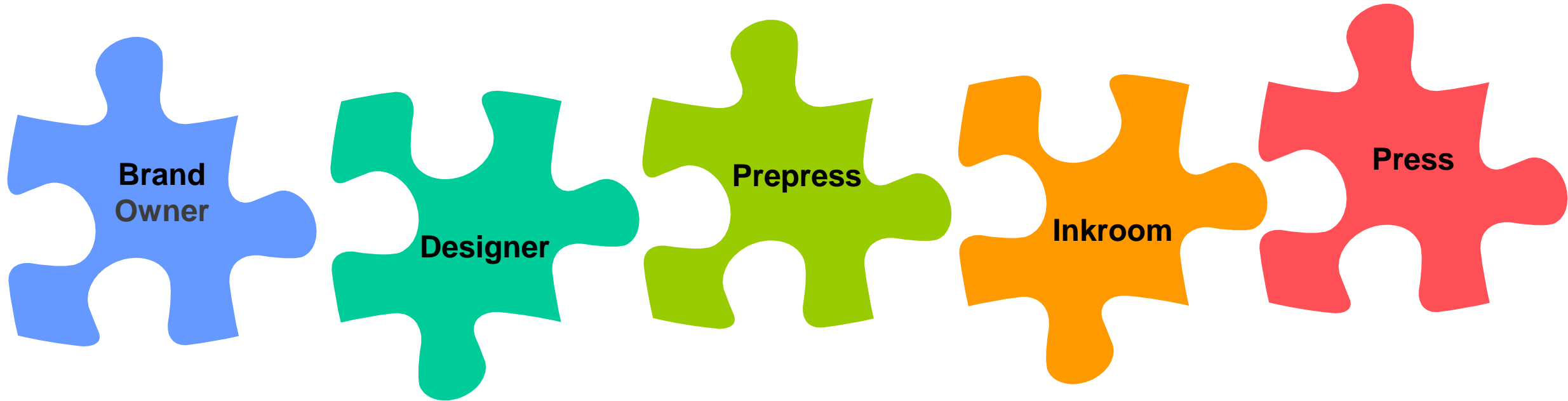


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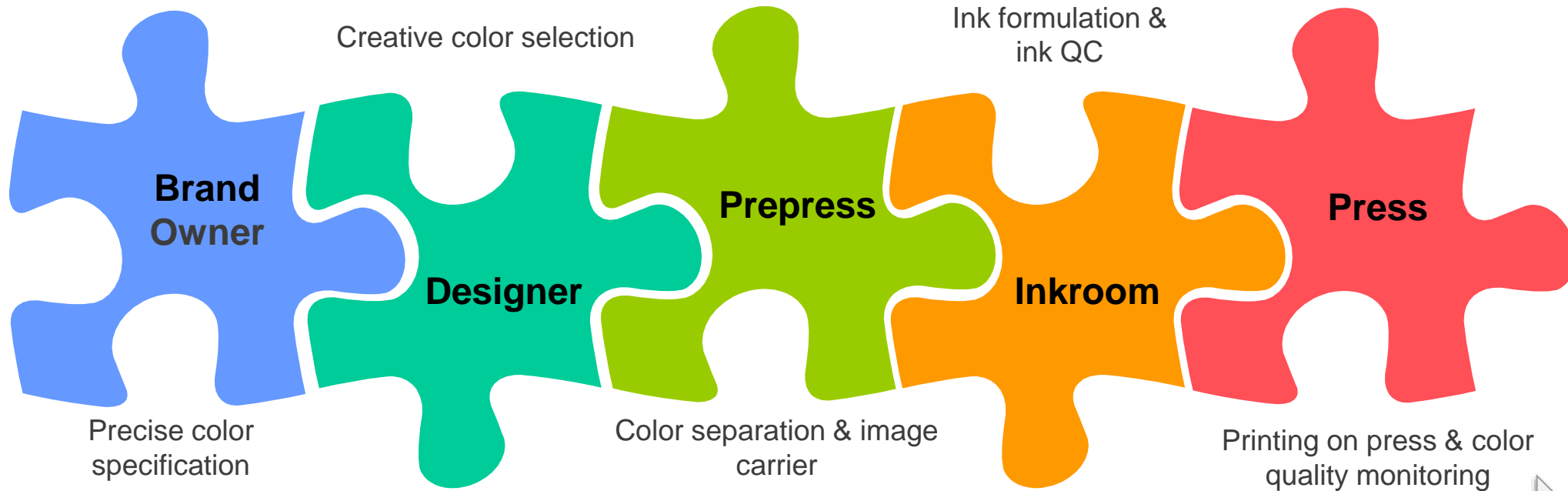
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Workflow



Workflow



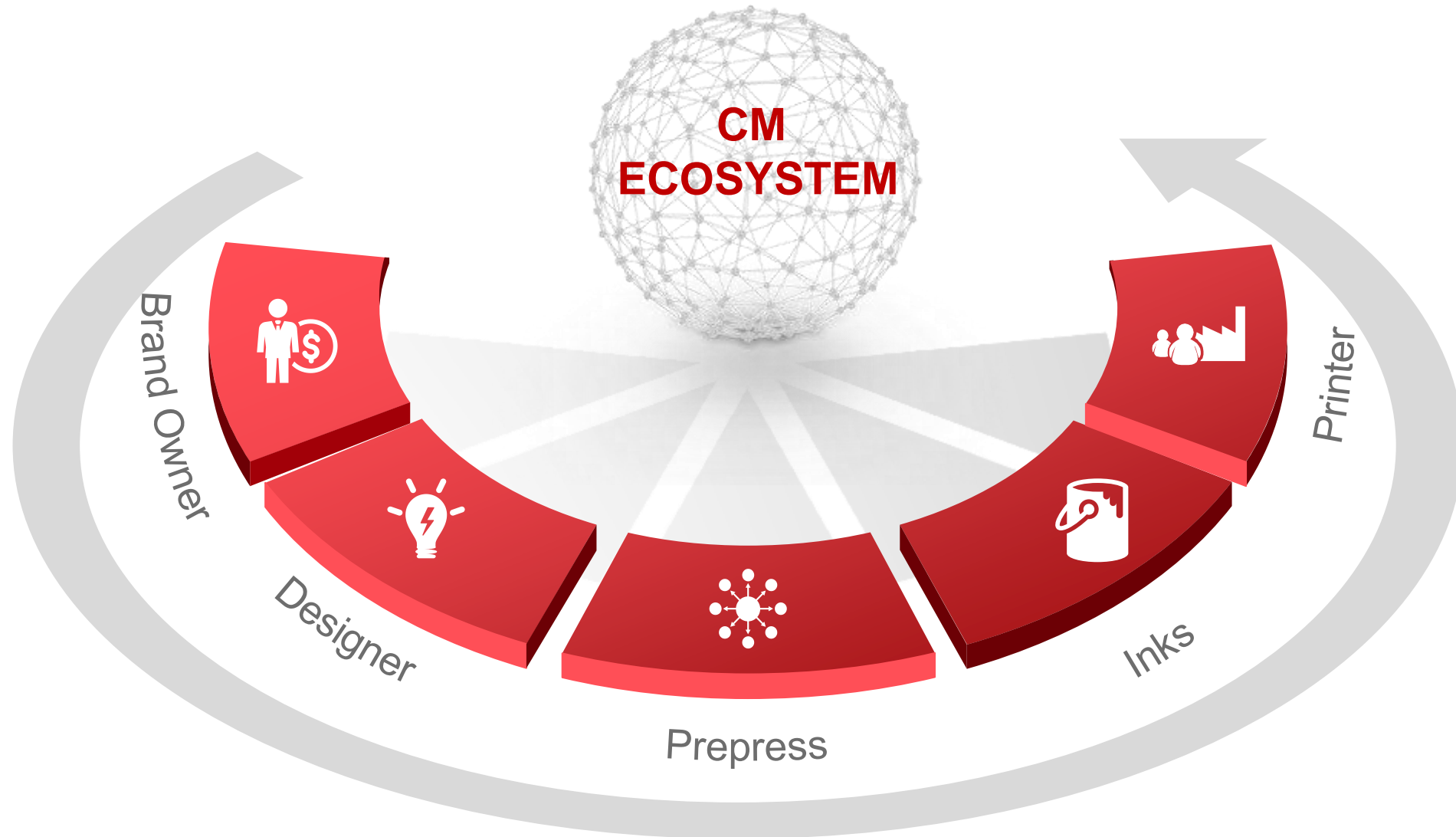
Define the color specifications unambiguously at the earliest stage in the process



Measure color at each stage to avoid costly color-corrections at the later stages



Workflow



Agenda

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- **Technologies**
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Technologies

01 Automation

02 Integration

03 Cloud

04 Big data & analytics

05 Disruptive solutions





01

Automation

- Reduce manual intervention/tasks
- Press automation
- Auto color control, inline print inspection
- Automated plate/cylinder making
- Pre-media & workflow automation





02

Integration

- Inter-connected systems & stakeholders
- Press connectivity to system
- Color control system connected to quality monitoring system
- Connected hardware (press, plate-making) and software (prepress, design)
- Cohesive departments, functions & capabilities
- Communication across devices & systems





03

Cloud

- Cloud-based color & recipe database
- Data sharing across locations, stakeholders in value chain
- Brand owners, designers, prepress, proofing, ink formulation, ink mixing, print production, QC, consumer
- Cloud-based color & quality monitoring across workflow
- Data-driven services for print production





04

Big data & analytics

- Collection of color data from multiple sources in the supply chain
- Comprehensive analysis of color & quality data
- Traceability of color & quality throughout the value chain
- Monitoring & controlling of press variables in real-time
- From preventative to predictive model





05

Disruptive solutions

- Mobile-based apps & ecosystems
- Smaller & cheaper color measuring instruments
- Quicker time-to-market
- **Expanded Color Gamut (ECG) printing for Flexo**



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ECG Printing

- Printing with a **fixed ink-set of 5/6/7 inks**
- Objectives: **replace spot color inks** with a fixed ink-set, **enhance vividness** of images
- Also known as: EG (Expanded Gamut) printing, N-color printing, Multi-color process printing, Hi-Fi (High Fidelity) printing, Hexachrome
- Flavors of ECG: 5/6/7 inks, Enhanced CMYK (e.g. XCMYK by Idealliance), ECG + dedicated special inks

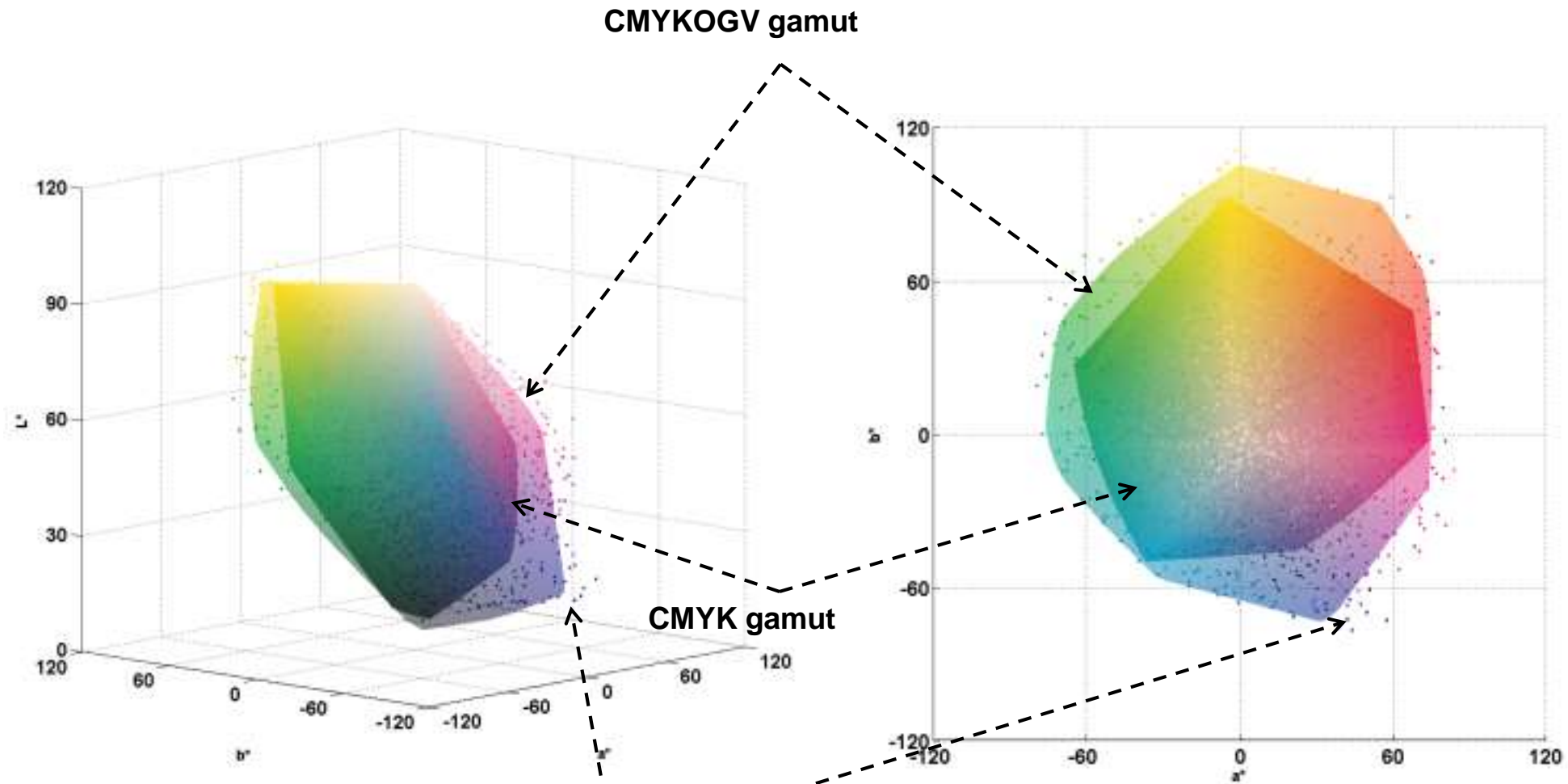


ECG Printing

- What are the drivers?
 - Shorter run-lengths, more product variants (categories, sizes, languages)
 - More wash-ups, increased press downtime, more wastage
- Solution: Print different jobs with a fixed set of inks



ECG Printing - Gamuts



Spot Color Library

Coverage of spot colors
CMYK gamut = 54%
CMYKOGV gamut = 89%



ECG Printing - Complexity

Prepress

ECG color separation, RIP,
Screening, file format,
plates/cylinders

Ink-set

Ink selection – mono pigment
Color gamut

Calibration

CMYK – ISO 12647 (TVI/G7)
OGV – ISO 20654
Spot Color Tone Value (SCTV)



Process control

Registration, inks, substrate, anilox, doctor blade,
mounting tape, press speed
Press maintenance

Target specs

Spot colors – digitization, consolidation,
tolerances CxF/X-4 (ISO 17972-4)

Characterization

ECG profiling, test chart, method (LUT lookup
table, Models), accuracy



ECG Printing - Implementation

Project Scope

Objectives
Investment options
Business case



Resources

Instruments, ECG tools
Pre-press & Finishing
implications



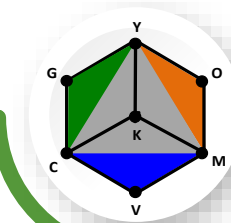
CMYK & Spot Colors

CMYK Fingerprinting, digitisation &
rationalisation of color library



ECG Optimisation

Characterisation
Convert spot colors to ECG



Validation Tests

Color & image quality Key
production-jobs
Final Review

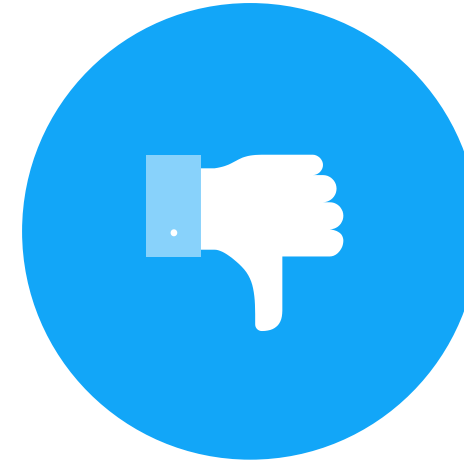


ECG Printing - Implementation



Benefits

- Significantly reduced wash-ups & less set-up time
- Reduced material waste
- Less inventory of spot color inks
- Press capacity gains



Limitations

- Not advantageous in all scenarios e.g. long-run jobs
- Not suitable for certain elements (micro-text simulation, metallic colors)
- Currently no international standard for ECG (work in progress)



Summary

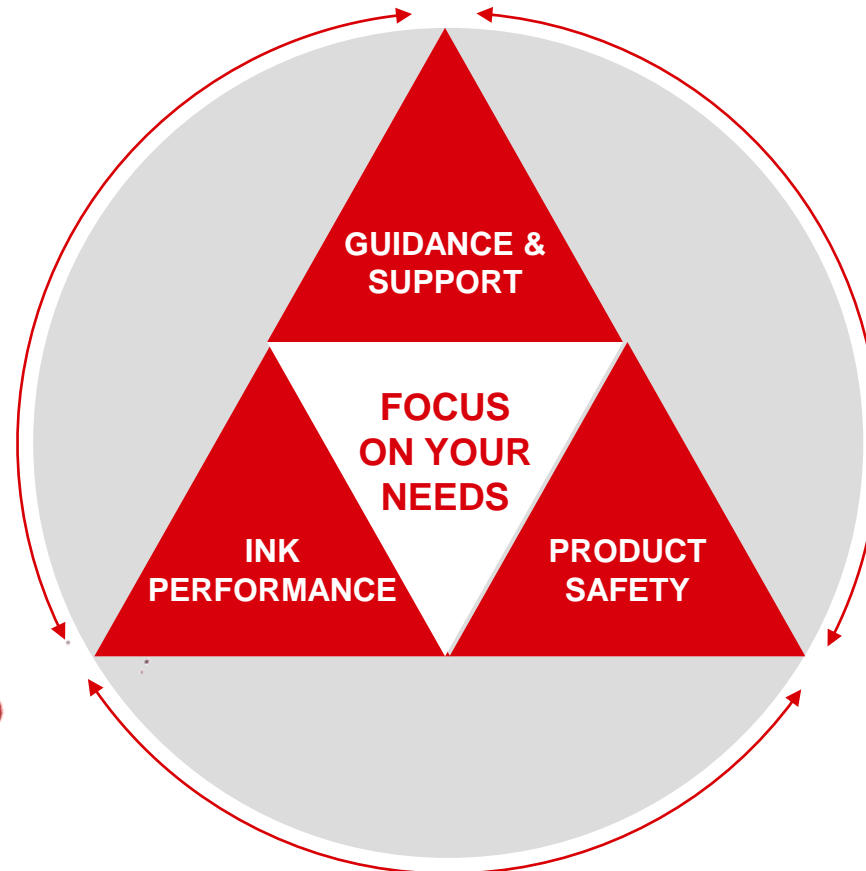
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We guide you to efficient & safe performance



INK, HEART & SOUL



THANK YOU FOR YOUR ATTENTION.

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