

# CSC 213

## Introduction to Digital Creativity and Productivity Tools

COMPREHENSIVE SUMMARY LECTURE NOTES

Academic Year 2024 / 2025 | Department of Computer Science

*These summary notes distill the key concepts, tools, terminology, and frameworks from all 16 units of CSC 213. Ideal for quick revision and exam preparation.*

<b>Course Code</b>	CSC 213
<b>Units Covered</b>	Units 1 – 16 (All Units)
<b>Document Type</b>	Summarized Lecture Notes
<b>Focus</b>	Key Concepts, Tools, Definitions & Comparisons

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# Introduction to Digital Creativity & Productivity

## 1.1 What is Digital Creativity?

Digital creativity is the ability to generate original ideas, content, and solutions using digital technologies. It spans graphic design, audio/video production, animation, programming, and digital writing — amplifying human imagination through software, cloud platforms, and connected devices.

■ *Digital creativity is not limited to art. It includes business problem-solving, innovation, and development of new digital products and services.*

## 1.2 What are Productivity Tools?

Productivity tools are software applications that help individuals and organizations accomplish tasks efficiently, manage time, collaborate seamlessly, and organize information. They automate repetitive processes and facilitate real-time collaboration.

## 1.3 Creativity vs. Productivity Tools — How They Intersect

Creative tools (Illustrator, Premiere Pro) produce compelling content. Productivity tools (Drive, Slack, Asana) ensure that content is organized, managed, and shared. Together they form the modern digital workplace pipeline.

## 1.4 Historical Context

1950s–60s: Computers used for scientific calculations. 1980s: Personal computers bring WordPerfect and VisiCalc. 1990s: Internet expands collaboration. 2000s: Web 2.0 and social media emerge. Today: Cloud computing, AI, and real-time collaboration define the frontier.

## 1.5 Key Terminology

KEY TERM	DEFINITION
<b>Digital Tool</b>	Any software app or online platform used to accomplish tasks digitally.
<b>Productivity</b>	The efficiency with which tasks are completed and goals achieved.
<b>Digital Creativity</b>	Using digital technologies to generate or communicate original ideas.
<b>Cloud Computing</b>	Delivery of computing services (storage, processing, software) over the internet.
<b>Digital Literacy</b>	The ability to effectively navigate, evaluate, and create information using digital tech.
<b>Workflow</b>	A defined sequence of tasks required to complete a project or goal.

# Digital Creativity Tools: Google & Microsoft

## 2.1 The Two Dominant Ecosystems

Google and Microsoft dominate digital productivity. Most institutions and businesses operate within one or both ecosystems. Microsoft leads with desktop-first tools while Google pioneered cloud-native, real-time collaboration.

## 2.2 Microsoft 365 Key Applications

KEY TERM	DEFINITION
<b>Word</b>	World's most widely used word processor. Rich formatting, templates, track changes, mail merge.
<b>Excel</b>	Powerful spreadsheet for data analysis, financial modelling, pivot tables, charts, and VBA macros.
<b>PowerPoint</b>	Presentation software with design templates, animations, transitions, and multimedia embedding.
<b>Outlook</b>	Email + calendar + contacts + task manager. Backbone of corporate communication.
<b>Teams</b>	Unified platform combining chat, video conferencing, file sharing, and app integrations.
<b>OneDrive</b>	Cloud storage (1 TB+) with seamless Microsoft 365 integration and real-time co-authoring.
<b>SharePoint</b>	Web-based intranet portal for document management and team collaboration.

## 2.3 Google Workspace Key Applications

KEY TERM	DEFINITION
<b>Google Docs</b>	Web-based word processor with real-time collaboration, auto-save, comments, and version history.
<b>Google Sheets</b>	Online spreadsheet with formulas, charts, pivot tables, and real-time collaboration.
<b>Google Slides</b>	Online presentation tool with collaborative editing and PowerPoint compatibility.
<b>Google Drive</b>	Central cloud hub — 15 GB free, stores any file type, granular sharing controls.
<b>Google Meet</b>	Secure video conferencing integrated with Calendar. HD video, screen sharing, captions.
<b>Google Forms</b>	Survey/quiz creator. Responses auto-collected in Sheets for analysis.
<b>Google Calendar</b>	Scheduling tool integrated with Gmail and Meet. Supports shared calendars, reminders.

## 2.4 Microsoft 365 vs. Google Workspace — Comparison

Feature	Microsoft 365	Google Workspace
Cost	Subscription-based; limited free versions	Free tier available; paid plans for business
Collaboration	Good (real-time in web versions)	Excellent — built-in real-time from the start
Offline Access	Strong (desktop apps)	Limited — requires offline mode setup
Storage	1 TB+ via OneDrive	15 GB free via Google Drive
Best For	Enterprises, advanced formatting needs	Education, startups, collaboration-first teams

# Graphic Design Software

## 3.1 Raster vs. Vector Graphics

Aspect	Raster Graphics	Vector Graphics
Composition	Grid of pixels	Mathematical equations (paths, curves)
Scalability	Loses quality when enlarged (pixelated)	Scales to any size without quality loss
Best For	Photos, detailed artwork	Logos, icons, illustrations
Formats	JPEG, PNG, GIF, TIFF, BMP	SVG, AI, EPS, PDF
Tools	Photoshop, GIMP	Illustrator, Inkscape

## 3.2 Key Graphic Design Software

KEY TERM	DEFINITION
<b>Adobe Photoshop</b>	Industry-standard raster editor. Layers, selection tools, retouching, colour grading, filters. Used by photographers and designers.
<b>Adobe Illustrator</b>	Leading vector editor. Pen tool for paths, shape tools, advanced typography. Ideal for logos and scalable artwork.
<b>Canva</b>	Cloud-based drag-and-drop platform. Thousands of templates. Ideal for beginners and non-designers. Free + Pro tiers.
<b>GIMP</b>	Free, open-source Photoshop alternative. Cross-platform. Powerful for education and budget-conscious users.
<b>Inkscape</b>	Free, open-source Illustrator alternative. Native SVG support. Great for academic and non-profit settings.
<b>Adobe InDesign</b>	Desktop publishing for multi-page documents — magazines, books, brochures. Master pages, typographic refinement.

## 3.3 Core Principles of Graphic Design

KEY TERM	DEFINITION
<b>Alignment</b>	Elements have visual connection — creates order and cohesion.
<b>Contrast</b>	Differences in colour/size/shape make elements stand out.
<b>Repetition</b>	Repeating elements create consistency and unity.
<b>Proximity</b>	Grouping related items reduces visual clutter.
<b>Balance</b>	Distributing visual weight — symmetrically or asymmetrically.

<b>Hierarchy</b>	Guide the viewer's eye and signal importance of information.
<b>White Space</b>	Deliberate empty space improves readability and professionalism.

# Audio Production Software (DAWs)

## 4.1 Core Audio Concepts

KEY TERM	DEFINITION
<b>DAW</b>	Digital Audio Workstation — software for recording, editing, producing, and exporting audio.
<b>Sample Rate</b>	Audio samples captured per second (Hz). 44,100 Hz = CD quality. Higher = better quality.
<b>Bit Depth</b>	Dynamic range of audio. 16-bit (CD) or 24-bit (professional recording).
<b>MIDI</b>	Musical Instrument Digital Interface — protocol allowing instruments/computers to share musical data.
<b>Mixing</b>	Combining multiple tracks: adjusting volume, panning, EQ, and effects.
<b>Mastering</b>	Final optimization of the mix for playback on various devices and distribution.
<b>Plugin</b>	Software add-ons extending DAW capabilities (EQ, reverb, compression, virtual instruments).

## 4.2 Major DAWs Compared

KEY TERM	DEFINITION
<b>Audacity</b>	Free, open-source, cross-platform. Ideal for beginners and podcasters. Record, edit, noise reduction, multi-track mixing.
<b>Adobe Audition</b>	Professional multitrack editor. Spectral noise removal, broadcast/podcast/film audio. Integrates with Premiere Pro.
<b>GarageBand</b>	Free Apple DAW for macOS/iOS. Best introductory DAW. Large instrument library, MIDI, loops. Used extensively in education.
<b>Logic Pro</b>	Apple's professional DAW. Advanced MIDI, Dolby Atmos support, huge sound library. Used in professional music and film scoring.
<b>FL Studio</b>	Popular for electronic music and hip-hop. Intuitive pattern sequencer and piano roll. Lifetime free updates policy.
<b>Ableton Live</b>	Unique Session View for non-linear, live performance. Favoured by DJs and electronic music performers.

## 4.3 Audio File Formats

KEY TERM	DEFINITION
<b>WAV</b>	Uncompressed, high quality, large file size. Standard in professional recording.
<b>MP3</b>	Lossy compressed, small size, widely compatible. Best for distribution and streaming.

<b>FLAC</b>	Lossless compression — full quality at reduced file size. Preferred by audiophiles.
<b>AAC</b>	Lossy; Apple format. Better quality than MP3 at similar bit rates.
<b>AIFF</b>	Apple's uncompressed format — similar to WAV. High quality, large files.

# Video Editing Software

## 5.1 Core Video Editing Concepts

KEY TERM	DEFINITION
<b>NLE</b>	Non-Linear Editor — software allowing video editing without a fixed sequence. Industry standard.
<b>Timeline</b>	Visual layout in an NLE where clips, audio, and effects are arranged chronologically.
<b>Cut</b>	Basic edit — instantaneous transition between two clips.
<b>Transition</b>	Visual effect bridging clips (fade, dissolve, wipe).
<b>Frame Rate</b>	Frames per second (fps). 24fps=film, 30fps=TV, 60fps=sports/gaming.
<b>Resolution</b>	Video dimensions in pixels. 1080p=Full HD, 4K=3840x2160.
<b>Color Grading</b>	Adjusting colour and tone of footage for aesthetic or corrective purposes.
<b>B-Roll</b>	Supplementary footage intercut with primary footage to provide visual context.

## 5.2 Major Video Editing Software

KEY TERM	DEFINITION
<b>Adobe Premiere Pro</b>	Industry standard. Flexible timeline, advanced colour tools, audio mixing, After Effects integration. Supports all video formats.
<b>Final Cut Pro</b>	Apple macOS exclusive. Magnetic Timeline, optimized for Apple Silicon, fast rendering. Used in TV and documentary.
<b>DaVinci Resolve</b>	Free + paid Studio version. World-class colour correction. Full post-production suite (edit, VFX, audio). Hollywood standard.
<b>iMovie</b>	Free Apple consumer editor. Easy to use, themes, templates, direct social media sharing.
<b>Shotcut</b>	Free open-source editor (Windows/macOS/Linux). Wide format support, multitrack timeline, filters.
<b>CapCut</b>	Free, mobile + desktop. Developed by ByteDance. Popular for social media — templates, auto-captions, TikTok integration.

## 5.3 The Video Production Workflow

Phase	Description	Key Activities
Pre-Production	Planning before filming	Script, storyboard, scheduling, location scouting, crew

Production	The filming phase	Directing, camera operation, audio recording, lighting
Post-Production	Editing and finishing	Import, rough cut, colour grade, sound design, export

# Animation Software

## 6.1 Types of Digital Animation

KEY TERM	DEFINITION
<b>2D Animation</b>	Movement in a 2D space. Frame-by-frame or rigged digital characters. Used in cartoons, explainer videos, mobile games.
<b>3D Animation</b>	Objects in a 3D space. Involves modelling, rigging, animating, rendering. Used in films, games, architecture.
<b>Motion Graphics</b>	Animated graphic design — text, logos, shapes brought to life. Used in broadcasts, titles, marketing.
<b>Stop Motion</b>	Physical objects photographed frame-by-frame and played in sequence. Aided by tools like Dragonframe.

## 6.2 Major Animation Software

KEY TERM	DEFINITION
<b>Adobe Animate</b>	Vector-based 2D animation for web, TV, and games. Supports frame-by-frame, motion tweening, bone rigging, HTML5 export.
<b>Adobe After Effects</b>	Industry standard for motion graphics and visual effects. Compositing, broadcast graphics, integrates with Premiere Pro.
<b>Blender</b>	Free open-source 3D suite — modelling, rigging, animation, rendering, video editing, Python scripting. Professional quality.
<b>Autodesk Maya</b>	Dominant professional 3D tool for film/TV/games. Advanced rigging, rendering, fluid simulations. Requires significant training.
<b>Toon Boom Harmony</b>	Leading professional 2D animation used by major studios. Frame-by-frame and cut-out animation techniques.
<b>Powtoon / Vyond</b>	Cloud-based platforms for animated presentations and explainer videos without traditional animation complexity. Popular in corporate training.

# Project Management Software

## 7.1 Key Project Management Concepts

KEY TERM	DEFINITION
<b>Scope</b>	Defined boundaries of a project — what is and is not included.
<b>Milestone</b>	Significant event in a project timeline marking major achievements.
<b>Gantt Chart</b>	Bar chart illustrating project schedule — tasks, durations, sequences.
<b>Kanban</b>	Visual workflow management using boards and cards to show task status.
<b>Sprint</b>	Short time-boxed iteration (1–4 weeks) in Agile project management.
<b>Agile</b>	Iterative, flexible approach emphasizing collaboration, adaptability, and continuous improvement.
<b>Stakeholder</b>	Any individual or group with an interest in the project outcome.
<b>Risk Management</b>	Identifying, assessing, and mitigating threats to a project.

## 7.2 Major Project Management Tools

KEY TERM	DEFINITION
<b>Microsoft Project</b>	Comprehensive planning — Gantt charts, resource allocation, budget tracking. Used in construction, IT, engineering.
<b>Asana</b>	Cloud-based team collaboration. Views: list, board (Kanban), timeline, calendar. Integrates with Slack, Google, Microsoft.
<b>Trello</b>	Highly visual Kanban-style tool. Boards, lists, cards with drag-and-drop. Popular with creative teams and individuals.
<b>Jira</b>	Dominant tool for Agile software development (Scrum/Kanban). User stories, bug tracking, sprint planning, burndown charts.
<b>Monday.com</b>	Flexible Work OS. Customizable for project management, CRM, HR. Colour-coded boards, automation, integrations.
<b>Basecamp</b>	Simple project management + team communication. To-do lists, message boards, file storage, chat in one place.

# Task Management Software

## 8.1 Task vs. Project Management

Aspect	Task Management	Project Management
Focus	Individual tasks and to-do items	Multi-stage projects with teams and resources
Complexity	Simpler, more personal	Complex workflows, timelines, budgets
Audience	Individuals and small teams	Teams, departments, organizations
Examples	Todoist, Microsoft To Do, TickTick	Asana, Jira, Microsoft Project

## 8.2 Major Task Management Tools

KEY TERM	DEFINITION
<b>Microsoft To Do</b>	Cloud-based, integrated with Microsoft 365 and Outlook. Task lists, due dates, reminders, My Day view. Syncs all devices.
<b>Todoist</b>	Cross-platform, millions of users. Natural language input, priority levels, recurring tasks, sub-tasks, collaboration.
<b>Google Tasks</b>	Lightweight task manager in Gmail and Google Calendar. Simple to-do lists linked to calendar events.
<b>Notion</b>	All-in-one workspace — notes, databases, project management, task tracking. Highly customizable. Popular with students and creatives.
<b>TickTick</b>	Feature-rich with built-in Pomodoro timer, habit tracker, calendar view, voice input. Popular with productivity enthusiasts.

■ *Notion bridges the gap between task management and project management, offering flexibility for both personal and team use.*

# Cloud-Based Storage Solutions

## 9.1 What is Cloud Storage?

Cloud storage stores digital data in logical pools across multiple servers managed by cloud providers. Users access files from any internet-connected device, eliminating reliance on physical media (USB drives, hard disks, CDs).

## 9.2 Key Benefits

- Accessibility — access files from any device with an internet connection.
- Collaboration — share and co-edit files in real time.
- Automatic Backup — reduces risk of data loss.
- Scalability — storage capacity increases easily as needs grow.
- Cost-Efficiency — pay only for what you use; no hardware costs.
- Security — leading providers use encryption and two-factor authentication.

## 9.3 Major Cloud Storage Providers

KEY TERM	DEFINITION
<b>Google Drive</b>	15 GB free (shared with Gmail and Photos). Integrates with all Google Workspace tools. Granular sharing permissions.
<b>Microsoft OneDrive</b>	5 GB free; expanded with Microsoft 365. Integrated with Windows and Office apps. Personal Vault for sensitive files.
<b>Dropbox</b>	Pioneer in cloud storage. Reliable sync, Dropbox Paper, Smart Sync. Popular with creative professionals.
<b>Apple iCloud</b>	Tightly integrated with Apple devices. Auto-syncs photos, docs, contacts, app data across iPhone, iPad, Mac.
<b>Amazon S3</b>	Scalable object storage for developers and enterprises. Accessed via APIs. Part of Amazon Web Services (AWS).

## 9.4 Security Best Practices for Cloud Storage

- Enable two-factor authentication on all cloud accounts.
- Review sharing permissions regularly to prevent unauthorized access.
- Read the provider's privacy policy and understand where data is stored.
- Use end-to-end encrypted storage for highly sensitive files.
- Maintain local backups as an additional layer of protection.

# Digital Communication Tools

## 10.1 Categories of Communication Tools

Category	Description	Examples
Email	Primary formal channel in professional/academic settings.	Gmail, Outlook, ProtonMail
Instant Messaging	Real-time informal communication; group chats, file sharing.	Slack, Teams, WhatsApp, Discord
Video Conferencing	Face-to-face interaction via internet; screen sharing, collaboration.	Zoom, Google Meet, Teams, Webex

## 10.2 Major Communication Platforms

KEY TERM	DEFINITION
<b>Slack</b>	Channel-based professional messaging. Organizes comms by project/topic. Voice/video calls. 100s of integrations. Dominant in tech companies.
<b>Microsoft Teams</b>	Chat + video + files + apps in one. Deep Microsoft 365 integration. Channels, wikis. Dominant in enterprise and education.
<b>Zoom</b>	Reliable HD video conferencing. Virtual backgrounds, breakout rooms, polls, recording, webinars. Rose to household name during COVID-19.
<b>Google Meet</b>	Integrated into Google Workspace. HD video, screen sharing, noise cancellation, live captions. Accessed directly from Gmail/Calendar.
<b>Discord</b>	Began as gaming platform, evolved into general community hub. Text channels, voice channels, video, screen sharing, powerful bot ecosystem.

# Google Collaboration Tools — In-Depth

## 11.1 Google Workspace Overview

Google Workspace (formerly G Suite) is a cloud-native productivity suite used by over 3 billion people globally. All apps run in the browser, files auto-save to the cloud, and real-time collaboration is built in from the ground up — no software installation needed.

## 11.2 Deep Dive: Key Google Tools

KEY TERM	DEFINITION
<b>Google Drive</b>	Hub of Workspace. 15 GB free storage. Folder structures, permission levels (viewer/commenter/editor/full access), stores any file type, powerful search.
<b>Google Docs</b>	Real-time collaboration with colour-coded cursors. Suggesting mode (track changes). Comment threads. Full version history. Export to .docx, PDF, plain text.
<b>Google Sheets</b>	Formulas, charts, pivot tables, conditional formatting, data validation. Google Apps Script for automation. Google Forms integration for data collection.
<b>Google Slides</b>	Collaborative presentations. Templates, animations, Q&A; mode for audience interaction. Imports/exports PowerPoint format.
<b>Google Meet</b>	HD video conferencing, screen sharing, real-time captions, noise cancellation, virtual backgrounds, breakout rooms, recording. Integrated with Calendar.
<b>Google Forms</b>	Multiple question types (MCQ, short answer, linear scale, file upload). Auto-collects responses in Sheets. Used in research, quizzes, feedback.
<b>Google Calendar</b>	Creates events, recurring schedules, shared calendars, time zone management. Integrates with Gmail and Meet for seamless scheduling.

## 11.3 Google Workspace for Education

Google Workspace for Education adds Google Classroom — a Learning Management System (LMS) for teachers to create assignments, communicate with students, and give feedback. Classroom integrates with Docs, Sheets, Slides, and Forms for a seamless digital learning environment.

# Ethical & Societal Implications of Digital Tools

## 12.1 Privacy in the Digital Age

Digital tools collect vast user data — behaviours, locations, communications. This data personalizes services but can be misused or exposed through breaches.

KEY TERM	DEFINITION
<b>Data Collection</b>	Most free services collect user data as part of their business model.
<b>GDPR</b>	EU regulation giving individuals control over personal data; imposes obligations on data collectors.
<b>Data Breach</b>	Unauthorized access to confidential user data with serious consequences.
<b>Right to Be Forgotten</b>	Right to request personal data be deleted from digital platforms.

## 12.2 Intellectual Property & Copyright

KEY TERM	DEFINITION
<b>Copyright</b>	Automatic legal right of a creator to control use of their original work (text, images, music, software).
<b>Creative Commons</b>	Licensing system allowing creators to specify how their work can be used, reused, or shared.
<b>Fair Use</b>	Legal doctrine allowing limited use of copyrighted material for education, commentary, and research.
<b>Plagiarism</b>	Presenting someone else's work as your own — an academic and ethical violation.

## 12.3 Cybersecurity Threats & Best Practices

Threat	Description
Phishing	Deceptive emails/messages designed to steal credentials or personal information.
Malware	Malicious software including viruses, ransomware, spyware that damages or infiltrates systems.
Data Breach	Unauthorized access to sensitive information stored by organizations.
Social Engineering	Manipulating individuals into divulging confidential information.

- Use strong, unique passwords and a password manager.
- Enable two-factor authentication on all accounts.

- Keep software and operating systems updated.
- Be cautious about links and attachments from unknown sources.
- Regularly back up important data.

## 12.4 Digital Divide & Equity

The digital divide is the gap between those with and without access to modern digital technologies, existing across geographic, socioeconomic, age, and gender lines. Digital equity — ensuring all people have access to tools, skills, and infrastructure — is a critical social justice issue.

# Digital Literacy & Digital Citizenship

## 13.1 What is Digital Literacy?

Digital literacy is the ability to use ICT to find, evaluate, create, and communicate information — requiring both cognitive and technical skills. It encompasses critical thinking about digital information, safe and ethical online behaviour, and adapting to new digital environments.

## 13.2 Components of Digital Literacy

KEY TERM	DEFINITION
<b>Information Literacy</b>	Identify, locate, evaluate, and use information. Effective search, evaluating source credibility, citing digital sources.
<b>Media Literacy</b>	Access, analyze, evaluate, and create media. Understanding how media messages are constructed and can influence.
<b>Communication Literacy</b>	Communicate effectively in digital environments using appropriate tools, formats, and etiquette.
<b>Technical Literacy</b>	Use digital tools and devices effectively. Basic understanding of how digital systems work.
<b>Privacy &amp; Security Literacy</b>	Protect personal information, recognize threats, and adopt safe online practices.

## 13.3 Digital Citizenship

Digital citizenship is the responsible and ethical use of technology. It covers understanding rights, responsibilities, and opportunities in a digitally connected world. Mike Ribble's nine elements: digital access, commerce, communication, literacy, etiquette, law, rights and responsibilities, health and wellness, and security.

## 13.4 Netiquette — Core Principles

- Be respectful and professional in all online communications.
- Avoid using all-caps (perceived as shouting).
- Be mindful of tone — written text lacks verbal and tonal cues.
- Respect others' privacy; do not share personal information without consent.
- Give credit to original sources.

## 13.5 Digital Wellbeing

Digital wellbeing concerns technology's impact on mental, physical, and social health. Key issues: screen time management, social media effects on self-esteem, cyberbullying, online addiction, and erosion of work-life balance. Requires setting boundaries, taking digital breaks, and cultivating meaningful offline relationships.

# Future of Digital Productivity Tools

## 14.1 AI in Productivity Tools

Artificial intelligence is the most transformative force shaping digital tools. AI is being integrated into virtually every category of productivity and creativity software.

KEY TERM	DEFINITION
<b>AI Writing &amp; Content</b>	LLMs in tools like Microsoft Copilot and Google Duet AI suggest/complete/edit text, summarize documents, translate, and generate reports. Integrated into Word, Gmail, and Slides.
<b>AI in Graphic Design</b>	Generative AI (Midjourney, DALL-E, Adobe Firefly) creates images from text prompts. Adobe Photoshop now includes generative fill and AI-powered masking.
<b>AI in Video &amp; Audio</b>	Synthetic voice generation, automatic transcription/captioning, background noise removal, video upscaling, AI-assisted colour grading.

## 14.2 No-Code and Low-Code Platforms

No-code and low-code platforms enable users without programming skills to build applications and automate workflows. This democratizes software development and enables 'citizen developers'.

KEY TERM	DEFINITION
<b>Zapier</b>	Workflow automation between apps — connect Google Sheets, Gmail, Slack, and hundreds of others.
<b>Bubble</b>	Visual web application builder — create full web apps without writing code.
<b>Airtable</b>	Database-powered applications combining spreadsheet simplicity with database power.
<b>Microsoft Power Apps</b>	Microsoft's low-code app builder integrated with the Microsoft 365 ecosystem.

## 14.3 Augmented & Virtual Reality

Technology	Description	Applications
VR (Virtual Reality)	Immersive computer-generated environments	Virtual workspaces, training simulations, 3D design
AR (Augmented Reality)	Digital overlays on the physical world	Manufacturing, healthcare, education, retail, field services

## 14.4 The Metaverse & Digital Workplaces

The metaverse — a network of interconnected virtual worlds — represents a potential paradigm shift in digital collaboration. Early platforms include Meta Horizon Workrooms and Microsoft Mesh for Teams. Still nascent, but significant long-term implications for work and creativity.

# Emerging Trends in Digital Productivity

## 15.1 Key Emerging Trends

KEY TERM	DEFINITION
<b>Tool Integration &amp; Convergence</b>	Separate tools merging into unified platforms (Teams: chat + video + files; Notion: notes + databases + tasks). Reduces complexity but raises vendor lock-in concerns.
<b>Asynchronous Collaboration</b>	Global remote teams need to collaborate without being online simultaneously. Tools: Loom (async video), Notion, Miro (digital whiteboard).
<b>Digital Twins</b>	Virtual replicas of physical objects/processes. Used in manufacturing, urban planning, healthcare. Simulates changes before real-world implementation.
<b>Blockchain in Creativity</b>	NFTs allow digital artists to prove ownership and earn royalties. Blockchain enables decentralized content distribution and tamper-proof document verification.
<b>Edge Computing</b>	Processing data closer to where it's generated (reduced latency). Enables real-time AI features, offline-capable apps, responsive AR/VR experiences.
<b>Quantum Computing</b>	Promises computational capabilities far beyond classical computers. Long-term implications for AI training, drug discovery, cryptography, and climate simulation.

■ *Hyper-connectivity — the era of ever-increasing connected devices (IoT), faster networks (5G), and seamless digital integration — is the underlying driver behind all emerging trends.*

# Application of Digital Tools in Industries

## 16.1 Industry Applications Overview

KEY TERM	DEFINITION
<b>Healthcare &amp; Medicine</b>	EHR systems (Epic, Cerner) store patient data. Telemedicine via video conferencing. AI diagnostic tools. Medical animation for education. Project management for clinical trials.
<b>Education</b>	LMS platforms (Google Classroom, Moodle, Canvas) for online/blended learning. Video conferencing for virtual classrooms. Google Workspace for group projects. Flipped classroom and personalized learning enabled by adaptive technology.
<b>Creative &amp; Media</b>	Film/TV: Premiere Pro, DaVinci Resolve, After Effects, Pro Tools. Music: Ableton, Logic Pro. Publishing: InDesign. Games: Unity, Unreal Engine, Blender, Photoshop. Cloud review platforms: Frame.io, InVision.
<b>Business &amp; Finance</b>	Spreadsheets (Excel, Sheets) for financial modelling. Project management (Asana, Jira). CRM (Salesforce) for customer management. Data viz (Tableau, Power BI) for dashboards. Cloud storage for secure document access.
<b>Architecture &amp; Engineering</b>	CAD software (AutoCAD) for technical drawings. BIM tools (Revit) for building models. 3D visualization and structural analysis. Cloud collaboration for multi-party building projects.
<b>Retail &amp; E-Commerce</b>	E-commerce platforms (Shopify, WooCommerce). Social media management for digital marketing. Canva/Photoshop for product imagery. Analytics for customer behaviour. Email marketing (Mailchimp, Klaviyo). CRM for customer loyalty.
<b>Government &amp; Public Services</b>	Document management and inter-departmental communication. E-government portals for citizen services (tax filing, license applications). GIS tools for urban planning and disaster management. Data analytics for census and public health.

# Glossary of Key Terms

## Master Glossary — All Units

KEY TERM	DEFINITION
<b>Agile</b>	Iterative, flexible project management emphasizing collaboration and adaptability.
<b>API</b>	Application Programming Interface — protocols allowing software apps to communicate.
<b>AR</b>	Augmented Reality — technology overlaying digital information on the physical world.
<b>Bit Depth</b>	Number of bits per audio sample, determining dynamic range.
<b>Blockchain</b>	Decentralized digital ledger recording transactions across many computers.
<b>CAD</b>	Computer-Aided Design — software for precision technical drawings and illustrations.
<b>Cloud Computing</b>	Delivery of computing services (storage, processing, software) over the internet.
<b>Copyright</b>	Legal right of a creator to control use of their original work.
<b>Creative Commons</b>	Licensing system allowing creators to specify how their work may be used.
<b>Cybersecurity</b>	Practice of protecting systems, networks, and data from digital attacks.
<b>DAW</b>	Digital Audio Workstation — software to record, edit, and produce audio.
<b>Digital Citizenship</b>	Responsible and ethical participation in digital communities.
<b>Digital Divide</b>	Gap between those with and without access to digital technologies.
<b>Digital Literacy</b>	Ability to find, evaluate, create, and communicate information using digital tech.
<b>Digital Twin</b>	Virtual replica of a physical object, process, or system.
<b>EHR</b>	Electronic Health Record — digital version of a patient's medical history.
<b>Frame Rate</b>	Number of video frames displayed per second (fps).
<b>Gantt Chart</b>	Bar chart illustrating a project schedule with tasks and durations.
<b>GDPR</b>	General Data Protection Regulation — EU law governing personal data protection.
<b>GIS</b>	Geographic Information System — managing geographic and spatial data.
<b>GIMP</b>	GNU Image Manipulation Program — free, open-source image editor.
<b>Kanban</b>	Visual workflow management using boards and cards.
<b>LLM</b>	Large Language Model — AI model trained on vast text data for language tasks.

<b>LMS</b>	Learning Management System — software for delivering and managing educational content.
<b>Malware</b>	Malicious software designed to harm, exploit, or infiltrate computer systems.
<b>MIDI</b>	Musical Instrument Digital Interface — protocol for electronic music communication.
<b>Milestone</b>	Significant event or achievement in a project timeline.
<b>Motion Graphics</b>	Animated graphic design bringing visual elements to life.
<b>Netiquette</b>	Accepted codes of conduct for behaviour in digital/online environments.
<b>NFT</b>	Non-Fungible Token — unique digital asset verified using blockchain technology.
<b>NLE</b>	Non-Linear Editor — software allowing video editing without a fixed sequence.
<b>Open Source</b>	Software with freely available source code that can be modified and distributed.
<b>Phishing</b>	Cybercrime using deceptive messages to steal credentials or data.
<b>Pixel</b>	Smallest unit of a digital image.
<b>Raster Graphic</b>	Image composed of a grid of pixels.
<b>Sample Rate</b>	Number of audio samples captured per second (Hz).
<b>Sprint</b>	Short time-boxed iteration in Agile project management.
<b>SVG</b>	Scalable Vector Graphics — vector image format based on XML.
<b>Vector Graphic</b>	Image based on mathematical equations, scalable without quality loss.
<b>VR</b>	Virtual Reality — technology creating immersive, computer-generated environments.
<b>Workflow</b>	Defined sequence of tasks required to complete a process or project.

# Review Questions by Unit

## Units 1–5: Foundations & Creative Tools

- 1. Define digital creativity. How does it differ from traditional creativity?
- 2. List five examples of productivity tools and explain their primary functions.
- 3. Why is digital literacy considered a fundamental skill in the 21st century?
- 4. Compare Microsoft 365 and Google Workspace in terms of features, pricing, and ideal use cases.
- 5. What is the primary advantage of Google Workspace's collaborative approach?
- 6. Explain the difference between raster and vector graphics. Give examples of file formats for each.
- 7. Compare Adobe Photoshop and GIMP. When would you prefer each?
- 8. List and briefly explain five core principles of graphic design.
- 9. What is a DAW? Give three examples and describe the target user for each.
- 10. Explain the difference between mixing and mastering in audio production.
- 11. Compare WAV and MP3 audio formats in terms of quality, file size, and use cases.
- 12. Describe the three phases of the video production workflow.
- 13. Compare Adobe Premiere Pro and DaVinci Resolve. What is DaVinci Resolve particularly renowned for?
- 14. What is frame rate and why is it significant in video production?

## Units 6–11: Tools & Collaboration

- 15. Name three major animation software tools and identify the type of animation each is primarily used for.
- 16. What is Agile project management? Which tool is most commonly used by software development teams?
- 17. Explain the key differences between project management software and task management software.
- 18. What are three key benefits of cloud storage over local storage?
- 19. List and describe the major applications within Google Workspace.
- 20. What is Google Classroom and how does it integrate with other Google Workspace tools?

## Units 12–16: Ethics, Trends & Applications

- 21. What is the digital divide and why is addressing it a social justice issue?
- 22. Define digital citizenship and list four responsibilities of a good digital citizen.
- 23. What is netiquette? Give five examples of good netiquette practices.
- 24. Describe two AI-powered applications that are transforming digital creativity tools.
- 25. What are no-code and low-code platforms? Give two examples.
- 26. Describe two emerging trends in digital productivity tools you believe will have the greatest impact in the next decade. Justify your choices.
- 27. Choose one industry and describe in detail how digital creativity and productivity tools are applied within it.
- 28. What is a digital twin? Give a practical industry example.
- 29. Explain the concepts of copyright, creative commons, fair use, and plagiarism.
- 30. Describe best practices for maintaining cybersecurity and personal digital safety.

■ *Exam Tip: Pay attention to comparison questions (Raster vs. Vector, Microsoft vs. Google, Task vs. Project Management) as these are common exam formats. Know at least 3 examples for each software category.*

# Quick Reference Summary Card

## Software Categories at a Glance

Category	Free Tools	Professional/Paid Tools
Graphic Design	GIMP, Inkscape, Canva (free)	Adobe Photoshop, Illustrator, InDesign, Canva Pro
Audio Production	Audacity, GarageBand	Logic Pro, Ableton Live, FL Studio, Adobe Audition
Video Editing	DaVinci Resolve, iMovie, Shotcut, CapCut	Adobe Premiere Pro, Final Cut Pro
Animation	Blender, Adobe Animate	Autodesk Maya, Toon Boom Harmony, After Effects
Project Mgmt	Trello (free tier), Basecamp	Microsoft Project, Asana, Jira, Monday.com
Task Mgmt	Google Tasks, Microsoft To Do	Todoist, Notion, TickTick
Cloud Storage	Google Drive (15GB), OneDrive (5GB)	Dropbox, iCloud, Amazon S3
Communication	Slack (free), Discord, Google Meet	Zoom Pro, Teams, Cisco Webex

## The 5 Most Important Comparisons to Know

KEY TERM	DEFINITION
<b>Raster vs. Vector</b>	Raster = pixels (photos), Vector = math (logos). Raster = JPEG/PNG, Vector = SVG/AI.
<b>Microsoft 365 vs. Google Workspace</b>	Microsoft = desktop-first, enterprise, 1TB storage. Google = cloud-native, real-time collaboration, 15GB free.
<b>Task vs. Project Management</b>	Task = individual to-dos (Todoist). Project = complex multi-stage team work (Asana, Jira).
<b>Mixing vs. Mastering</b>	Mixing = combining tracks, balance, EQ, effects. Mastering = final optimization for distribution.
<b>Copyright vs. Creative Commons vs. Fair Use</b>	Copyright = all rights reserved. Creative Commons = some rights reserved (user-specified). Fair Use = limited use for education/commentary.

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# Practical Study Guide & Tool Selection Framework

## How to Choose the Right Tool for Any Task

A key exam skill is matching scenarios to the correct tool. Use this framework:

TERM	DEFINITION/NOTES
<b>Edit a photograph</b>	Photoshop / GIMP — raster tools for pixel-based photos
<b>Design a company logo</b>	Illustrator / Inkscape — vector tools; logos must scale to any size
<b>Create social media post quickly</b>	Canva — template-based; no design experience needed
<b>Record and edit a podcast</b>	Audacity / Adobe Audition — multitrack audio, noise removal
<b>Produce music with virtual instruments</b>	GarageBand / FL Studio / Logic Pro — full DAW with MIDI
<b>Edit a YouTube video professionally</b>	Adobe Premiere Pro / DaVinci Resolve
<b>Quick social media video</b>	CapCut — mobile/desktop, templates, TikTok integration
<b>Create an animated explainer video</b>	After Effects / Powtoon / Vyond — motion graphics
<b>3D character animation for film</b>	Autodesk Maya / Blender — professional 3D pipeline
<b>Manage a software sprint</b>	Jira — built for Agile/Scrum workflows
<b>Plan a marketing campaign</b>	Asana / Monday.com — project boards, timelines
<b>Personal daily to-do list</b>	Microsoft To Do / Todoist / Google Tasks
<b>Store and share team files</b>	Google Drive / OneDrive / Dropbox
<b>Hold a remote team meeting</b>	Zoom / Google Meet / Microsoft Teams
<b>Create an online quiz for students</b>	Google Forms — auto-collects to Sheets
<b>Collaborate on a document in real time</b>	Google Docs — real-time collaborative word processing
<b>Desktop publishing (magazines, books)</b>	Adobe InDesign — multi-page layouts, master pages
<b>Organize notes, databases, and projects</b>	Notion — all-in-one flexible workspace

# Audio, Video & Image Format Quick Reference

## Audio File Formats at a Glance

TERM	DEFINITION/NOTES
<b>WAV</b>	Uncompressed   Highest quality   Very large file   Standard in professional studio recording
<b>MP3</b>	Lossy compressed   Good quality   Small file   Best for streaming and distribution
<b>FLAC</b>	Lossless compressed   Full quality   Medium file   Preferred by audiophiles, archiving
<b>AAC</b>	Lossy   Better than MP3   Small file   Apple ecosystem, iTunes, streaming
<b>AIFF</b>	Uncompressed   Highest quality   Very large   Apple's equivalent to WAV
<b>OGG Vorbis</b>	Lossy   Open-source   Used in web apps and games

## Image File Formats at a Glance

TERM	DEFINITION/NOTES
<b>JPEG</b>	Lossy compressed   Small file   Widely compatible   Best for photographs and web images
<b>PNG</b>	Lossless   Supports transparency   Larger than JPEG   Best for graphics with transparent backgrounds
<b>GIF</b>	Limited 256 colours   Supports animation   Small file   Simple web animations
<b>SVG</b>	Vector format   Scales to any size   Very small   Best for logos, icons, web graphics
<b>TIFF</b>	Lossless   Very large   High quality   Professional print and archiving
<b>BMP</b>	Uncompressed   Very large   Basic raster format   Windows default image format
<b>AI</b>	Adobe Illustrator native vector format   Editable in Illustrator
<b>EPS</b>	Encapsulated PostScript   Vector   Used in professional printing
<b>PDF</b>	Portable Document Format   Fixed layout   Widely compatible   Print-ready files

## Video File Formats at a Glance

TERM	DEFINITION/NOTES
<b>MP4</b>	H.264 codec   Good quality   Medium file   Universal compatibility   Best for web and social media

<b>MOV</b>	Apple QuickTime   High quality   Larger file   Common in Final Cut Pro workflows
<b>AVI</b>	Older Microsoft format   Large file   Good compatibility   Not ideal for web
<b>MKV</b>	Open-source container   Supports multiple audio/subtitle tracks   Common for high-quality video
<b>WebM</b>	Open-source   Optimized for web streaming   Supported natively in browsers
<b>4K/UHD</b>	3840×2160 pixels   Ultra-high definition   Large file sizes   Requires powerful hardware

# Industry Applications — Deep Dive

## Career Fields and Essential Digital Tools

TERM	DEFINITION/NOTES
<b>Graphic / Web Designer</b>	Photoshop (photo editing), Illustrator (vectors/logos), Figma (UI/UX design), InDesign (publications), Canva (quick social media graphics)
<b>Video Editor / Filmmaker</b>	Adobe Premiere Pro (timeline editing), DaVinci Resolve (colour grading), After Effects (VFX/motion graphics), Audition (audio post-production)
<b>Music Producer</b>	DAW of choice: FL Studio (electronic/hip-hop), Ableton Live (live performance), Logic Pro (macOS professionals), GarageBand (beginners)
<b>3D Animator</b>	Blender (free, all-in-one), Autodesk Maya (Hollywood standard), Cinema 4D (motion graphics), Toon Boom Harmony (2D TV animation)
<b>Software Developer</b>	Jira (Agile/Scrum project management), GitHub (version control), VS Code (code editor), Slack (team communication), Confluence (documentation)
<b>Digital Marketer</b>	Canva (social media graphics), Google Analytics (web analytics), Mailchimp (email campaigns), Hootsuite (social media scheduling), Meta Ads Manager
<b>Project Manager</b>	Microsoft Project (enterprise planning), Asana (team tasks), Jira (software projects), Monday.com (flexible workflows), Trello (visual Kanban)
<b>Data Analyst</b>	Microsoft Excel (analysis, pivot tables), Google Sheets (collaborative analysis), Tableau (interactive dashboards), Power BI (Microsoft ecosystem visualization)
<b>Educator (Digital)</b>	Google Classroom (LMS), Zoom/Google Meet (virtual classes), Canva (visual materials), Google Forms (quizzes), Kahoot (gamified learning)
<b>Architect / Engineer</b>	AutoCAD (technical drawings), Revit (Building Information Modelling/BIM), Blender/SketchUp (3D visualization), Microsoft Project (construction management)
<b>Healthcare IT</b>	Epic/Cerner (Electronic Health Records), Telemedicine platforms, Microsoft Teams (internal communication), Excel (data analysis and reporting)
<b>Content Creator</b>	CapCut / Adobe Premiere Pro (video), Canva (thumbnails and graphics), Audacity (audio cleanup), Notion (content planning), Buffer (scheduling posts)

# Ethics Summary & Key Exam Comparisons

## 5 Most Important Comparisons to Know for Exams

TERM	DEFINITION/NOTES
<b>Raster vs. Vector</b>	Raster = pixels (photos, detailed art) — formats: JPEG, PNG, BMP. Vector = math equations (logos, icons, scalable art) — formats: SVG, AI, EPS. Key: Raster loses quality when scaled up; vector never does.
<b>Microsoft 365 vs. Google Workspace</b>	Microsoft 365: desktop-first, enterprise-grade, 1TB+ storage, strong offline access, advanced formatting. Google Workspace: cloud-native, real-time collaboration built-in, 15GB free, ideal for education and startups.
<b>Task Management vs. Project Management</b>	Task management = individual to-dos (Todoist, Microsoft To Do, Google Tasks). Project management = multi-stage team projects with timelines and budgets (Asana, Jira, Microsoft Project). Task tools are simpler and more personal.
<b>Mixing vs. Mastering</b>	Mixing = combining individual tracks, balancing volume, applying EQ, panning, and effects. Mastering = final step — optimizing the complete mixed track for playback across all devices and distribution platforms.
<b>Copyright vs. Creative Commons vs. Fair Use</b>	Copyright = automatic, all rights reserved. Creative Commons = creator specifies allowed uses (share, remix, commercial). Fair Use = limited use without permission for education, commentary, or research. Plagiarism = ethical violation (distinct from copyright).

## Digital Ethics — Key Concepts Summary

TERM	DEFINITION/NOTES
<b>Privacy</b>	Data collection by free services; GDPR (EU data protection law); right to be forgotten; data breaches — unauthorized access to user data.
<b>Intellectual Property</b>	Copyright (automatic protection), Creative Commons (flexible licensing), Fair Use (education/commentary), Plagiarism (presenting others' work as own).
<b>Cybersecurity</b>	Threats: phishing (fake emails), malware (viruses, ransomware), data breaches, social engineering. Protection: strong passwords, 2FA, software updates, careful clicking.
<b>Digital Divide</b>	Gap between those with and without access to technology. Exists across geographic, socioeconomic, age, and gender lines. Digital equity = social justice issue.
<b>Misinformation</b>	Ease of sharing false info online. Responsible citizenship: fact-check before sharing, use reputable sources, understand algorithmic bias, develop media literacy.
<b>Netiquette</b>	Respectful online behaviour: professional tone, avoid all-caps, respect privacy, give credit to sources, no sharing others' personal info without consent.

**Digital Wellbeing**

Managing screen time, social media effects on mental health, cyberbullying, online addiction, work-life balance. Set boundaries and take regular digital breaks.

# Emerging Technologies & Learning Resources

## Emerging Trends — Summary for Exam Preparation

TERM	DEFINITION/NOTES
<b>AI Integration</b>	AI is being embedded into writing tools (Microsoft Copilot, Google Duet AI), design (Adobe Firefly, DALL-E, Midjourney), video (auto-captions, upscaling), and audio (voice synthesis, noise removal). AI is the most transformative force in digital tools.
<b>No-Code/Low-Code Platforms</b>	Tools like Zapier (workflow automation), Bubble (web apps), Airtable (database apps), and Microsoft Power Apps allow non-programmers to build digital solutions — democratizing software development.
<b>AR (Augmented Reality)</b>	Overlays digital information on the physical world. Used in manufacturing, healthcare, education, retail, and field services. Expected to become mainstream in the next decade.
<b>VR (Virtual Reality)</b>	Immersive computer-generated environments. Used for virtual training simulations, 3D design environments, and virtual workspaces. Microsoft Mesh and Meta Horizon Workrooms are early metaverse platforms.
<b>Asynchronous Collaboration</b>	Tools like Loom (async video), Notion, and Miro allow global teams to collaborate effectively without being online at the same time — critical for remote and distributed teams.
<b>Digital Twins</b>	Virtual replicas of physical objects or processes. Used in manufacturing, urban planning, and healthcare to simulate and test changes before real-world implementation.
<b>Blockchain in Creativity</b>	NFTs allow digital artists to prove ownership and earn royalties. Blockchain enables decentralized content distribution and tamper-proof document verification.
<b>Quantum Computing</b>	Promising computational power far beyond classical computers. Long-term impact on AI training, drug discovery, financial modeling, and climate simulation.
<b>Hyper-Connectivity (IoT &amp; 5G)</b>	Increasing number of connected devices, faster wireless networks (5G), and seamless digital integration define the current era — driving development of new productivity tools.
<b>Convergence of Tools</b>	Tools are merging into unified platforms: Teams (chat + video + files), Notion (notes + tasks + databases). Reduces complexity but raises vendor lock-in concerns.

## Recommended Online Learning Resources

TERM	DEFINITION/NOTES
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<b>Google Skillshop</b>	<a href="https://skillshop.withgoogle.com">skillshop.withgoogle.com</a> — Free certifications on Google Workspace, Google Ads, Analytics
<b>Microsoft Learn</b>	<a href="https://learn.microsoft.com">learn.microsoft.com</a> — Free training on Microsoft 365, Azure, Power Platform, Teams
<b>LinkedIn Learning</b>	<a href="https://linkedin.com/learning">linkedin.com/learning</a> — Professional courses on all major digital creativity and productivity tools
<b>Coursera / edX</b>	University-level courses on digital literacy, graphic design, video production, data analysis
<b>Adobe Learn</b>	<a href="https://helpx.adobe.com">helpx.adobe.com</a> — Official tutorials for all Adobe Creative Cloud applications
<b>Canva Design School</b>	<a href="https://designschool.canva.com">designschool.canva.com</a> — Free design fundamentals and Canva tutorials
<b>Blender Manual</b>	<a href="https://docs.blender.org">docs.blender.org</a> — Comprehensive documentation for the Blender 3D suite
<b>Audacity Manual</b>	<a href="https://support.audacityteam.org">support.audacityteam.org</a> — Official guides for all Audacity audio editing features
<b>YouTube (Channels)</b>	Channels: Peter McKinnon (video), Futur (design), Mark Rober (creative tech), Ali Abdaal (productivity)

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