Digital Capabilities Descriptors

JOURNALISM

Digital capabilities descriptor for journalism		
1: Coding domain		
We define coding as the knowledge and skills required to write and to organise instructions to direct a computer to achieve specific tasks using machine-readable languages. We do not propose that journalism graduates need to be able to code. While it is obviously advantageous for them to have this ability, we do not see technical scripting and 'debugging' skills as essential skills within this domain. These skills are easily and increasingly outsourced; automation, especially for the generation of boilerplate code, is increasingly common; coding is taught in schools i.e., there is diminishing value in attempting to teach graduate-age journalists foundational coding skills. Rather, we propose that journalists need to be fluent in the principles, language and potential of code, so they can direct coding projects, interact with specialist and generalist coders and use the potential of scripted computing power for research and storytelling. Coding can add value to the adaptive affordance level for creating something new. Overall, there is a role for being the 'translator', 'explainer', the 'go between' – from the realm of the technical world, to the realm of the narrative storytelling and text-based world of the working journalist.		
Functional affordance	**Perceptual affordance**	**Adaptive affordance**
Language of code: Name and define programming concepts; name the principles and limitations of automated processing and define them appropriately. *Relationship between code and journalism:* Name and define programming concepts; articulate ways in which code can be used to support journalism.	*Language of code:* Use concepts appropriately in communications with programmers; and in communications with others about coding. *Relationship between code and journalism:* Employ code directly, or employ programmers, in the most effective way to perform journalism and to tell stories.	*Language of code:* Use concepts to direct programmers strategically to achieve journalistic outcomes; experiment with new forms of storytelling; and conceive of new editorial products. *Relationship between code and journalism:* Explain the influence of code (and automation) on the production and consumption of news; translate into journalism.

2: Data domain

We differentiate between coding and data capabilities. We treat coding as technical, computer-control skills, whilst data handling is underpinned by the knowledge required to identify, process and interpret qualitative and quantitative data (representing, in sum or in part, news value). At present, these domains (coding and data) often seem to be confused, which we would argue makes pedagogical scaffolding difficult. Data capabilities are far broader than technical coding capabilities – they require statistical knowledge, familiarity with empirics, and the use of software programmes to organise and process datasets. Within industry, data is used to understand what audiences want and do and thus guide editorial decision making — and it is increasingly used to make actual data stories and create new narratives. This duality may lead to a level of confusion in the news room. For the sake of clarity, data journalism should mean someone who uncovers patterns in data to unearth insights about the world in which we live; whereas someone who interprets and analyses data is in essence part of an 'insights' team. They seek to understand what audiences are doing online and how best to serve them.

Functional affordance	**Perceptual affordance**	**Adaptive affordance**
Statistics: Name basic statistical concepts and perform basic statistical calculations.	*Statistics:* Interpret statistical findings to identify news value; use statistical findings in support of stories.	*Statistics:* Select appropriate statistical tools to investigate data sources, to identify news value and to illustrate news value in innovative ways.
Data processing: Operate data processing software packages; control user interface.	*Data processing:* Produce analysis and visualisations to support a story.	*Data processing:* Select software appropriate to data and to news value; support new forms of storytelling in collaboration with design, business/IT, PR, advertising, marketing, sales.

3: External communication domain

We argue that the two domains of external and internal communication reflect different journalistic responsibilities and therefore require different knowledge and skillsets. External communication tends to require visibility, transparency, network building and audience engagement. In other words, external communication refers to the relationship between a journalist and her publication-audience and her personal public (Schmidt 2014).

Functional affordance	**Perceptual affordance**	**Adaptive affordance**
Social media software: Identify and operate a range of social media software packages relevant to audiences; establish connections; publish content. *Networked audiences:* Name and define concepts and actions related to networks and engagement.	*Social media software:* Direct social media applications to fulfil journalistic requirements: select platforms appropriate to both stories and audiences; engage interactively; build personal following; disseminate stories to audience; develop content and storytelling techniques appropriate to medium. *Networked audiences:* Interpret audience and traffic data; interpret social metrics and engagement measures; distinguish between good and bad strategies.	*Social media software:* Differentiate strategically between platforms: tell stories in ways that maximise the potential of different platforms – media and audiences. *Networked audiences:* Make strategic decisions based on network knowledge and news value, in collaboration with advertising/marketing/PR, design, business/IT, to increase audience engagement with stories.

4: Internal communication domain

Internal communication capabilities are required to source, research and prepare a story for publication. The emphasis is frequently on privacy, security, anonymity and small team coordination with fellow specialists and different specialists (i.e., including cross-functional teams). Consequently, it makes sense to treat internal communication as a separate domain.

Functional affordance	**Perceptual affordance**	**Adaptive affordance**
Collaboration: Name and define internal communication and project management principles and tools.	*Collaboration:* Apply those principles and tools to support journalistic practices.	*Collaboration:* Adapt established principles and tools to emergent contexts to increase productivity and minimise risk; work with different specialists; be a connector, explainer, translator across parts of the organisation/business units
Security: Name and define security concepts and tools: anonymity, encryption, virtual private networks (VPNs)	*Security:* Employ tools appropriately during journalism to ensure privacy and security for all participants: journalists, stringers and sources.	*Security:* Respond to emergent security threats by employing available tools appropriately; develop new approaches to enhance security for vulnerable stakeholders.

DESIGN

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April 2018

Digital Capabilities Descriptor for Design		
1: Persuasion		
Persuasion relates to recognising the inherent rhetorical value embedded in a design and communicating its story to a variety of audiences through a variety of techniques. Designers need to choose and use appropriate media, technology and tone to persuade effectively.		
Functional capabilities	**Perceptual capabilities**	**Adaptive capabilities**
Storytelling: Name and define narrative approaches; visualisation, interface design, using software to illustrate/present/argue. *Presentation:* Present individually and as a team; present online and in person; use sound, light, images and demonstrations to present online; record and archive live presentations; notetaking, sharing; copywriting skills.	*Storytelling:* Develop content using techniques appropriate to a range of media; analyse data to tell stories; critically evaluate stories. *Presentation:* Interpret the power of visual, audio, text and atmospheric dimensions from an audience perspective; present the same ideas in different ways and multiple locations to suit the audience, context and purpose.	*Storytelling:* Tell the right stories to the right audiences; bring future histories and futures into stories about the present; use complex visual language to tell stories in multisensory ways; translate and adapt transmedia storytelling; make worlds and ecologies of stories; shape futures using stories of future scenarios; work with generative systems, AI and machine learning to tell stories, developing new tools and platforms (or new uses) to tell and disseminate stories. *Presentation:* Synthesise the tonal needs of different contexts and show how different exchanges matter in the context of a bigger picture (eg. pitching a part of a bigger project); present experience to audiences, and explore multiple potential outcomes (using clickable prototypes or virtual reality).

2: Collaboration

Designers need to be able to work effectively in teams with diverse skill sets, learning needs and communication styles. Effective collaboration involves being aware of this diversity and knowing how to best operate within a team, both in terms of personal involvement and how others are working. Contingencies to do with time constraints and work life balance also ought to be factored in.

Functional capabilities	Perceptual capabilities	Adaptive capabilities
Project management: Share documents, Gantt charts, spreadsheets, calendars; schedule meetings and projects; organise files using agreed naming conventions; implement version control systems; archive conversations. *Working with different specialists:* Discuss disciplinary knowhow with various strata of tech and business, engineering, science etc.; name and define different roles in production processes; use communication etiquette.	*Project management:* Make decisions collaboratively; manage workflow (including production); use a variety of tools (sometimes simultaneously); use differing levels of file security; write and edit collaboratively; theme conversation streams and pick them up at different project stages. *Working with different specialists:* Negotiate; determine where design fits in production processes; record key details of specialists (name, company, specialities).	*Project management:* Define and develop relationships, taking account of cross-cultural dynamics, professional and disciplinary differences, socio/economic and political context of project; combine different tools in response to the collaboration; determine when text or audio visual communication is appropriate and productive (telepresence); create new types of projects and new types of project management (try projects in different contexts with different combinations of people); assemble project fragments and iterations; self-initiate projects; work out new forms of design collaboration rather than follow a set methodology; acknowledge the impact of design work (accountability). *Working with different specialists:* Advocate for design within productions; communicate the big picture; integrate different disciplinary knowledge and learning and communications styles for better outcomes; connect your team to relevant expert knowledge in response to design iterations (e.g. using online platforms); create cohesion from diversity; expand the scope of design collaborations (e.g. researching Indigenous designers in Australia)*;* learn to collaborate with machines and data (machine learning, artificial intelligence).

3: Complexity & Systems

Designers ought to be able to understand the implications of their work in a broader social, environmental, political and economic context. This involves an appreciation for the amount, range and relationality of variables that are relevant to a design brief and the opportunities and limitations of design with regard to systematic and enduring changes in this context.

Functional capabilities	Perceptual capabilities	Adaptive capabilities
Making sense: Visualise (graphs, diagrams, pictures, soundscapes); describe how data is generated and by whom. *Rich pictures:* Describe a rich picture including its elements. *Business empathy (digital context):* Identify aspects to be considered in design such as accounting, business planning, data analytics, marketing, sales, branding.	*Making sense:* Use data/visualisation to tell stories to communicate; scrape data from various sources. *Rich pictures:* Make a rich picture; explain when making a rich picture is appropriate and who to consult. *Business empathy (digital context):* Reflect on how design work sits in the context of different kinds of business and relates to commercial imperatives more broadly.	*Making sense:* Generate new insights; link user interfaces with data; bring unconventional data sets into contact; facilitate interaction within the system; use predictive analytics; translate quantitative data to stories in new ways. *Rich pictures:* Make a rich picture that has impact; articulate impact in diverse ways and new contexts. *Business empathy (digital context):* Advocate for design led business strategy; see and pursue possibilities; adapt design for business imperatives in relation to broader social, political and cultural imperatives.

4: Tools & Making

Making is core to a designer's work. Changes in technology have increased the diversity of tools available and designers need to be able to adapt their skills and knowledge of making in this always changing context. This will involve knowing what new tools they will be best advantaged in being able to use, the levels of proficiency required, and how to successfully map enduring design capabilities onto this new context.

Functional capabilities	Perceptual capabilities	Adaptive capabilities
Using software: Demonstrate technical capability in various types of industry relevant software.	*Using software:* Explain who decides what software to use and why; interpret limitations of tools; match tools to project priorities and resources.	*Using software:* Respond to life spans of digital files/tools; anticipate future tools; hack; adapt software to alternative uses; open closed files, tools and systems; scrape data; repair tools and files.

FOCUSED EXAMPLE FOR DESIGN:

Digital Capabilities and Work Practices		
DESIGN: Collaboration Domain, Project Management Focus (using SLACK as a case study)		
Functional	**Perceptual**	**Adaptive**
Set up, use and maintain systems for sharing documents; set up meetings online; archive conversations, use naming conventions. SLACK: set up account, connect with others, share calendars, files, add people to conversation channels.	Manage project workflow (including production), make decisions in online platforms, manage version control using naming conventions; define roles and relationships with a team, knowing when text or audio visual communication is appropriate and productive (understanding telepresence); SLACK: combine with other tools, theme conversation streams, make decisions as a group; know when to add people and when not to add people.	1. Manage cross-cultural dynamics including multi-lingual collaboration; identify and manage professional/disciplinary differences to extend project outcomes. 2. Apply and adapt systems thinking to develop naming conventions appropriate to the project. 3. Adapt to and manage the socio/economic/political context of project; combine different tools in response to the collaboration. 4. Self-initiate projects; manage elements of projects that are off-shoots, extensions, fragments or iterations. 5. Propose and work out new forms of design collaboration rather than following a set methodology; recommend security measures. 6. Create new types of projects and new types of project management (trying projects and tools in different environments, contexts, configurations). 7. Generate data insights and critically reflect on them to demonstrate the impact of design work (accountability). SLACK: connect multiple projects over time; customise tool for group's purposes; use multiple languages; use data generated within SLACK in creative ways (e.g. to demonstrate a group's decision making, make an argument, pitch an idea - text-based conversations could be visualised).

ENGINEERING

Margaret Jollands, School of Engineering, RMIT University, April 2018

1. Domain: Communications

Technologies: PCs, laptops, tablets, phones, faxes, texts, LMS, group messaging, videos, calendar, other comms apps, social media, virtual meetings
Programs: Email, Word, Powerpoint, VOIP, Facebook, Skype, Google Hangouts , project management, LinkedIn

Engineering communications require conveying concise clear relevant rationale information, messages and questions; reciprocity; transparency; presentation consistent with workplace cultural norms; network building and maintenance; stakeholder engagement; ability to speak in technical or plain English; ability to communicate the meaning of numerical data ("the story").

"Communication skills that contribute to productive and harmonious relations between employees and customers;" DEST (2002) p.7

	Affordance	Use
F	Operate a range of communication tools to send and receive information interactively Publish content using Word, Excel, Powerpoint Engage an audience Deal with technology failures when they occur	Emails, Social media image, Client presentations, Stakeholder meetings Feasibility studies, Project proposals, Project reports
P	Build personal influence through building a network Choose appropriate tools to convey clear information relevant to the recipient/s effectively, efficiently and ethically in familiar situations, maintaining privacy and confidentiality Keep abreast of advances in communication technology Interpret published content and unpublished intel to produce analysis	Professional social media image Influence meeting outcomes Influence business strategy Present complex issues in context Contribute to scoping and funding decisions Contribute to project decisions
A	Devise new communication strategies to create new business value Identify new technology that will change communication strategies	New reporting formats New technology

Domain: 2. Networking

Programs: Excel, Autocad, Fluent, FEA, modelling
Technologies: PCs, laptops, group messaging, videos, calendar, other comms apps, social media, virtual networks
Programs/platforms: Email, Excel, Internet, Facebook, Skype, Google Hangouts, LinkedIn, Twitter

Engineers network to make contacts with future suppliers, customers and prospective employers. Engineering networking requires
1. communication skills:
   - conveying concise clear relevant rationale information, messages and questions; reciprocity; transparency; presentation consistent with workplace cultural norms; network building and maintenance; ability to speak in technical or plain English
2. Use and management of information.
   - Research into companies attending the network event.
   - Maintain professional on-line image
3. Orderly management of self, and professional conduct.

   - Producing a good elevator pitch
   - Dress for the event correctly
   - Show a positive open demeanor

"Communication skills that contribute to productive and harmonious relations between employees and customers;" DEST (2002) p.7

	Affordance	Use
F	Operate a range of communication tools to send and receive information interactively Set up professional website, LinkedIn image	Emails Social media image
P	Build personal influence through building a network Research appropriate topics of discussion with potential new network partners Choose appropriate tools to keep abreast of current networking opportunities Interpret published content and unpublished intel to produce analysis of impactful networks	Professional social media image Publish on issues of mutual interest in context on-line
A	Devise new networking strategies to create new business value Identify new technology that will change networking strategies	New social media platforms New technology

MUSIC INDUSTRY (APPROACH 1)

Ian Rogers, School of Media and Communication, RMIT University, July 2017

1: External Communication Domain

RMIT's Bachelor of Arts (Music Industry, BP047) students are called upon to perform tasks once considered solely the domain of marketing and PR professionals. The contemporary music industries in Melbourne are populated by a network of micro-enterprises that routinely employ or provide work placements for our students. These small team environments need workers with up-to-date knowledge of various social media platforms, an ability to 'self-start' content production and competencies in optimisation and post-publication analysis.

Functional affordance	Perceptual affordance	Adaptive affordance
Social media software: Operate a range of social media software packages relevant to audiences; establish connections; publish content; engage interactively.	*Social media software:* Direct social media applications to fulfil marketing requirements: build personal following; disseminate stories to audience; develop content and storytelling techniques appropriate to medium.	*Social media software:* Differentiate strategically between platforms: select platforms appropriate to both stories and audiences; tell stories in ways that maximise the potential of different platforms – media and audiences.
Strategic marketing: Name and define concepts and actions related to the core rudiments of marketing.	*Strategic marketing:* Interpret audience and traffic data; create semi-automated content curation; time management; understand social metrics and engagement measures; differentiate between good and bad strategies.	*Strategic marketing:* Make strategic decisions based on metrics and value in collaboration with co-workers; clear explanation of strategy.

2: Meta-Learning Domain

Recent Australian music industries research point to graduates requiring a suite of skills related to employment flexibility and mobility (see Bartleet, et al, 2012). Internal case studies drawn from BP047's internship course and the school's *InPlace* database speaks to a demand for rapid digital skills acquisition and retraining. This is particularly pertinent to music software platforms or sections thereof.

Functional affordance	Perceptual affordance	Adaptive affordance
Training Name and describe a range of training technologies; manage operation of training platforms as a learner; understand workflow in relation to training	*Training* Evaluate training technologies for relevancy; manage for time and attention; apply learning to current workflow	*Training* Curate and rapidly complete training on various platforms; extend learning into experimentation and innovation within workflow

3: Collaboration

The Australian music industries thrive on social capital. It's commercial success stories are, for the most part, long extension out of hobbyist and pro-am practice (Rogers, 2013). As such, an ability to collaborate and operate effectively within highly social or group-based environments is essential to both creative success as well as commercial viability. The various industries that comprise Australian music are vast in their differing skill-sets and aptitudes.

Functional affordance	Perceptual affordance	Adaptive affordance
Project Management: Document sharing, Gantt charts, excel, shared calendars, google doc/drop box;	*Project Management:* Project management software; data sharing and hierarchy; timeliness; automated documentation and record keeping	*Project management:* Iterative processes; customised tools;

MUSIC INDUSTRY (APPROACH 2)

A second Descriptor for Music Industry has been designed for thinking differently about the composition/performance software 'Ableton Live' in terms of affordances. There is clear demand from industry for these skills and the teaching approach has been reconsidered, reflected in the Descriptor below. While software will change, students can learn about its different characteristics and explore possibilities.

In the Descriptor, the first domain is Whole-of-platform application. 'Then Recreate genre-based and/or Artist signatures' was the component of the software and the subject broken out into its own domain (2: Replicate). The aim of the planned teaching intervention is to address the scaffold of affordances of technology, using 'Ableton Live' as a testbed to focus on perceptual and adaptive capabilities. The intervention will take the form of online modules (through Canvas) and workshop exercises, most in the later part of the semester once the students have gained confidence with the 'basics' and have sufficient skills listed under *Operate*.

Digital Capabilities Descriptor for Ableton Live		
1: Ableton Live (Whole of Platform)		
Functional *Operate* Name and define Arrangement/Clip and Session view; Create and manipulate Audio and Midi tracks/clips; Import Audio; Warping Audio; Install Plug-Ins; Select and operate Ableton categories; Perform, Arrange and Edit; Mix and Master; Export	**Perceptual** *Customise* Remix Audio; **Recreate genre-based and/or Artist signatures**; Sample creation; Midi-mapping and basic Live performance /DJing; Max4Live; Workflow optimisation; Operation of Push 2 Controller	**Adaptive***:* *Generate* Creating custom Presets, Racks and Max4Live patches; Generative composition; Customised Live Sets for DJing and Live Performance; Controllerism
2: Replicate		
Functional *Operate* Name and define Arrangement/Clip and Session view; Create and manipulate Audio and Midi tracks/clips; Import Audio; Warping Audio; Select and operate Ableton categories;	**Perceptual** *Customise* Synthesis; drum patterns; loop creation; perform; arrangement; mix; master	**Adaptive***:* *Generate* Recreate genre-based and/or Artist signatures;
Research Critical listening; Name and define sound parameters of specified tracks; Sourcing loops and samples; Sourcing secondary research on specific artists	*Apply* Manipulate Ableton category items to mimic *Research* findings; Build racks; Perform and arrange; Sample use	*Extend* Incorporate and extend applied research into other musical domains; Create custom sample packs, presets and racks for use by others; Teach