Faculty of Science and Engineering

DEPARTMENT OF COMPUTING

Session 2, 2024

ASSIGNMENT 2

Tashi Wangmo	47692855	ITO1
Gino Sunny	47814403	ITO2
Rabita Chhantyal	47959991	ITO3
Tony Dominic	48001171	ITO4

Group 23

COMP8780: Enterprise Management

Executive Summary

This report provides a comprehensive analysis of Sony Corporation, focusing on the company's market niche, strategic use of IT, and its future potential through a detailed SWOT analysis. The report also presents four IT opportunities (ITOs) aimed at fostering Sony's growth in key areas such as entertainment, imaging, sustainability, and smartphone technology.

Company Overview and Market Niche

Sony Corporation, founded in 1946, is a multinational conglomerate known for its diverse product offerings in electronics, entertainment, gaming, and financial services. The company operates through several segments, including Game and Network Services, Music, Pictures, Home Entertainment, Imaging, Mobile Communications, and Semiconductors(Forbes, n.d.). Sony's current strategy, known as the "Creation Shift," focuses on enhancing three primary areas: content, products and services, and semiconductors, particularly CMOS image sensors. This strategic shift is designed to "fill the world with emotion through creativity and technology," maintaining its competitive edge in a dynamic global market (Sony, 2024).

Effective Use of IT in Recent Years

Sony has effectively harnessed IT to drive innovation and create synergies across its business units (Sony, 2019). Some key examples of its successful use of IT include:

- **PlayStation Network (PSN):** Originally a gaming platform, PSN has evolved with AI and cloud computing to enhance content delivery, user engagement, and cross-platform accessibility.
- **Entertainment Technology:** Sony employs AI, 3D scanning, and virtual reality in filmmaking, enabling immersive user experiences and reducing production costs.
- **Financial Services:** AI and data analytics are used to offer personalized insurance solutions, reflecting Sony's ability to cater to customer needs in a competitive industry.
- **AI and Robotics:** With its AI integration across products like the Aibo robot dog, Sony demonstrates its leadership in creating intelligent consumer products.

Overall, Sony's strategic use of IT has not only driven product innovation but also improved operational efficiency and customer engagement across various sectors.

SWOT Analysis

Strengths:

- **Diversified IT Application:** Sony effectively leverages IT across different sectors such as gaming, financial services, and entertainment.
- **Innovative Product Development:** AI and machine learning play critical roles in enhancing Sony's product portfolio, such as human-like AI opponents in games (Sony AI, 2024).

Weaknesses:

- **Cybersecurity Concerns:** Sony has experienced cyberattacks in the past, making it vulnerable to data breaches despite recent improvements in cybersecurity measures.
- **Limited Software Ecosystem:** Compared to competitors like Apple, Sony's software integration lags, impacting customer experience (Pereira, 2024).

Opportunities:

- **Investment in AI:** There is scope for Sony to further integrate AI in its products to enhance user experience and efficiency.
- **Expansion in Robotics:** Building on products like the Aibo robot, Sony can capitalize on the growing smart home market.

Threats:

- **Intense Competition:** The consumer electronics market is highly competitive, with players continuously innovating, which can erode Sony's market share.
- **Technological Change:** The rapid pace of technological innovation requires ongoing investment in research and development to stay relevant (Bhasin, 2024).

1. ITO1: AI-Enhanced Film Production

1.1. Business Case and Expected Outcome

1.1.1. Business Case

Sony Corporation entered the world of music and film entertainment by acquiring CBS Records Inc. and Columbia Pictures Entertainment in the 1980s (Birkinbine et al., 2017). Since then, Sony has released a multitude of acclaimed films and television series, establishing a significant presence in the industry. However, as the entertainment industry continues to evolve it is crucial for Sony to also integrate advanced technologies in its systems and processes to stay ahead of the competition.

The proposed opportunity aims to integrate AI technologies into Sony's film production processes, revolutionizing filmmaking from pre-production through to post-production. In the pre-production phase, AI will be employed in the storyboarding stage to efficiently visualize scenes, enabling better planning of shot compositions and lighting setups (Townsend, 2024). During the production phase, AI will enable filmmakers to add high-quality and more realistic visual effects in real-time, reducing the need for extended post-production timelines and significantly lowering costs. For example, AI-equipped cameras with digital image enhancement features will be able to parse actors' facial models, allowing for more efficient de-aging compared to traditional visual effects techniques (Li, 2022). Additionally, in post-production, AI's deep learning models will automatically translate and dub actors' dialogue into multiple languages using realistic voice models (Yingmin, 2023). This approach will streamline localization, maintaining the original meaning and enabling quicker releases in multiple regions without the need for lengthy manual voice adaptation.

1.1.2. Expected Outcome

The integration of AI technologies in Sony Film production is expected to lead to significant cost and time savings, ensuring enhanced efficiency throughout the production process. By reducing the production timeline and improving the quality of film with more realistic CGI elements, Sony can produce more high-quality movies and television (Spair, 2024). Additionally, the ability to quickly localize content for global markets will expand Sony's audience reach, potentially increasing revenue streams.

1.2. Estimated ROI and Benefits

1.2.1. Tangible Benefits

1.2.1.1. Cost Efficiency

The adoption of AI will streamline film production processes and significantly lower personnel costs. By handling tasks such as real-time visual effects, storyboarding, and dubbing, AI reduces the need for manual labor (Grove, 2024). This leads to lower overall resource expenditure, resulting in substantial cost savings. According to Connelly (2023), AI can reduce production costs by 25% throughout the process, including a reduction of four weeks in production time.

1.2.1.2. Time Savings

AI has the potential to automate repetitive visual effects tasks, such as compositing and rotoscoping in filmmaking, enhancing efficiency and significantly reducing production timelines. Traditional techniques like matte painting, character animation, and environment creation require extensive manual labor, often leading to lengthy timelines (Kang, 2024). Additionally, actors spend hours in special makeup and undergo extensive post-production processing for transformations. However, AI can capture facial movements and generate realistic animations, minimizing the need for repetitive shoots and accelerating the entire production process.

1.2.2. Intangible Benefits

1.2.2.1. Enhanced Creativity

AI will enhance creativity and quality in filmmaking by enabling the creation of complex or unrealistic scenes that are challenging to achieve with traditional visual effects methods. For instance, NVIDIA AI-powered painting app can convert basic sketches into realistic landscapes using generative adversarial networks (Jasaui et al., 2024). Sony can also utilize similar AI tools to experiment and create more innovative content.

1.2.2.2. Stronger Global Reach

AI-based dubbing will enable seamless localization of Sony movies and digital content, enhancing global distribution and audience engagement (Kurian et al., 2024). By efficiently streamlining localization and

translation processes, Sony can expand its global audience and strengthen its brand presence across multiple markets.

1.2.3. ROI Estimate

Total Investment Cost (AI Technology + Pilot Project Implementation): $20 million

Total Production Cost: $116 million (Sony's movie "Venom" production cost has been considered as a reference for this estimate (NIS, 2018))

Estimated Reduction with AI: 25% reduction of production costs (Connelly, 2023)

25% of $116 million = $ 29 million

Net Profit (Annual Cost Savings – Total Investment Cost)

$29 million – $20million = $9 million

Estimated ROI (Net Profit/ Total Investment Cost) ×100

 (9 million / 20 million) ×100=45%

The estimated ROI of 45% for a single movie indicates that the investment in AI-enhanced film production is expected to yield substantial financial returns, making it a highly attractive opportunity for Sony Corporation.

1.3. Upgrade or New Capability

This proposal represents an upgrade of current capabilities. While Sony already has established film production processes, integrating AI technologies enhances existing workflows rather than creating an entirely new area.

1.4. Project's Process Model

1.4.1. Project Initiation

- Establish clear project objectives focusing on enhancing efficiencies across all phases of Sony's film production through the integration of AI technology.
- Conduct technical operational, and financial feasibility of integrating AI into existing production workflows.

- Perform an initial risk analysis to identify potential risks related to technology limitations and impacts on the production quality. Outline preliminary mitigation strategies.

1.4.2. Project Planning

- Detail the specific areas of AI integration including storyboarding, visual effects during production, and post-production localization.
- Identify and allocate necessary resources such as AI technology, software, hardware and personnel required for project investigation.
- Prepare a detailed budget and timeline associated with the project.

1.4.3. Project Execution

- Integrate and deploy prototype AI technologies across various production phases within a selected Sony film project. For instance, AI-enabled cameras will be used during filming to focus on specific scenes for pilot testing to facilitate detailed analysis.
- Conduct thorough testing of the AI tools on the production set, as well as in pre-production and post-production activities, to identify the issues and areas of improvement.

1.4.4. Project Monitoring and Control

- Make iterative refinements to the AI tool based on the testing reports, addressing identified issues and enhancing AI capabilities.
- Collect insights and feedback from the production team to assess the effectiveness of the model.
- Continuously assess and manage the risk across the pilot project.

1.4.5. Project Closure

- Document the outcome of the pilot project, detailing the lessons learned and recommendations for further AI integration based on pilot experiences.
- Develop a roadmap to scale the use of successful AI applications in future Sony film projects, based on the lessons learned from the initial pilot program.

2. ITO2: AI-Powered Real-Time Image Processing in Cameras

2.1. Business Case and Expected Outcome

2.1.1. Business Case

Sony Corporation faces fierce competition from Canon, Nikon, Fujifilm, and emerging brands like Xiaomi in the imaging technology space and to sustain and grow its market share, Sony must innovate continuously. Leveraging AI-powered image processing offers a strategic opportunity to differentiate Sony's cameras by providing real-time, on-device processing that enhances the user experience for both professionals and consumers. The demand for high-quality, instant content creation on platforms such as Instagram, YouTube, and TikTok is rapidly increasing. In 2024, the global camera market is valued at around $8 billion (Cognitive Market Research, n.d.), with the professional segment expected to grow significantly due to the rise in social media, journalism, and film production. Users seek fast, efficient devices that reduce post-production workflows, enabling them to meet tight deadlines and deliver high-quality content quickly.

The proposed ITO is an AI-powered real-time image processing solution that integrates Edge AI, which involves implementing AI algorithms and models directly on the physical devices (NVIDIA, n.d.), and Neural Processing Units (NPUs) into camera hardware. This integration enables advanced features like AI-driven noise reduction, color correction, dynamic range adjustment, and facial and object recognition directly within the device. These capabilities allow professionals to produce high-quality content immediately, even in dynamic environments quickly.

2.1.2. Expected Outcome

The implementation of AI-powered real-time image processing in Sony cameras is expected to yield several significant outcomes and they are as follows.

2.1.1.1. Enhanced User Experience

Users will be able to experience faster, real-time editing capabilities directly on their cameras. This feature will be especially valuable for professionals in fast-paced environments, reducing the time resource spent on post production workflows.

2.1.1.2. Market Differentiation

By offering real-time AI-driven features, Sony will be able to differentiate its products from competitors, creating a unique selling proposition in the high-end camera market. While competitor brands like Canon are advancing in AI-assisted autofocus (CanonWatch, n.d.), Sony's approach to real-time, on-device processing will position it as a market leader in this segment.

2.1.1.3. Increased Market Share

The implementation of this technology will increase sales of high-end models, especially among professional camera models. According to various digital market reports (IMARC Group, n.d.), the professional photography market is projected to grow by 4.5% annually, with AI features expected to drive adoption. This could result in an 8-12% increase in sales in the first three years following implementation.

2.1.1.4. Customer Loyalty and Brand Leadership

A recent study by Fujitsu (Fujitsu Blog - Global, n.d.) showed that customer satisfaction improved among users who adopted AI-driven technologies in professional workflows. By offering cutting-edge, AI-powered features, Sony will not only attract new customers but also increase satisfaction and loyalty among existing users.

2.2. Estimated ROI and Benefits

2.2.1. Tangible Benefits

2.2.1.1. Increased Sales and Revenue

Studies (Global Market Insights Inc., n.d.) forecast around an 18% increase in demand for cameras with AI technologies in the next 10 years. With Sony's 22-25% market share in this segment (Sony Corporation, 2024), the company is positioned to capitalize on this trend. The global professional camera market is expected to reach USD 15 billion over the next three years (Global Market Insights Inc., n.d.).

An estimated 10-15% increase in sales of Sony's premium AI-enabled models would generate an additional 110-187.5 million USD annually, resulting in an estimated total revenue boost of USD 330-560 million over three years.

2.2.1.2. Reduced Post-Production Costs for Customers

Case studies from Adobe (Adobe, 2024) and Photoroom (PhotoRoom, n.d.) show that users who integrated AI processing reduced editing time by an average of 40%. By incorporating AI-driven real-time processing, professional users could reduce their post-production costs by 30 - 50%. This is particularly important for professionals in journalism, wedding photography, and content creation, where speed is critical.

2.2.2. Intangible Benefits

2.2.2.1. Brand Leadership in Innovation

Sony's investment in AI-powered image processing will reinforce its position as a leader in the professional camera market. AI technologies enable companies to introduce novel features and services, which enhance their competitive edge (Naeem, Kohtamäki, and Parida, 2024). Additionally, companies that leverage AI for product innovation are seen as more advanced and customer-centric, which improves brand perception and long-term value (Krishnan et al., 2022).

2.2.2.2. Enhanced Customer Experience

Studies (Huang & Rust, 2018) show that AI integration in customer-facing products improves user experience by automating repetitive tasks and delivering faster outcomes. For instance, AI-enabled tools have been found to increase customer satisfaction by streamlining processes and providing personalized support, leading to higher customer retention (Puntoni et al., 2021). Moreover, this enhanced experience drives repeat purchases and strengthens customer loyalty (Lemon & Verhoef, 2016).

2.2.3. ROI Estimate

The ROI for this initiative is based on projected product sales increases over three years post-implementation.

Initial Investment: The estimated total investment in R&D, hardware integration, and marketing for such an initiative is USD 400 million, based on industry benchmarks and Sony's R&D expense plan (Sony Corporation, 2024).

Revenue Estimate: An estimated USD 560 million revenue based on the compound annual growth rate (CAGR) of the professional camera market and Sony's current 22-25% market share in this segment as highlighted earlier.

ROI Estimate: $(\text{560 million} - \text{400 million} / \text{400 million}) \times 100 = 40\%$

The estimated ROI for this initiative would be approximately 40% over a three-year period.

2.3. Upgrade or New Capability

This ITO represents a significant upgrade to Sony's existing imaging capabilities. Sony already integrates AI into its autofocus and object-tracking systems in its Alpha series cameras (Sony Electronics, n.d.), but real-time AI-powered image and video processing will push these capabilities further.

2.4. Project's Process Model

2.4.1. Initial Research and Feasibility Study

- Conduct a detailed feasibility study on integrating AI-powered processing into existing camera hardware. This would involve research into NPUs and their efficiency in handling real-time image processing.
- Engage with key stakeholders, including R&D teams, product engineers, marketing departments, and external AI vendors, to assess the technological feasibility and potential market reception.
- Benchmark against competitors like Canon and Nikon, identifying potential risks and areas for differentiation.

2.4.2. Prototyping and Development

- Develop prototype algorithms for AI-powered image processing. Focus on core features like noise reduction, color correction, and dynamic range enhancement.
- Collaborate with hardware partners to integrate NPUs into the camera's architecture, optimizing AI models for real-time processing.

2.4.3. Risk Assessment and Mitigation Strategies

- Identify risks such as hardware limitations, power consumption, and overheating during real-time processing.

- Develop mitigation strategies including improving power management through adaptive AI algorithms that optimize energy use during high-demand tasks like 8K video capture.

2.4.4. User Testing and Feedback

- Conduct extensive user testing with professional photographers and videographers. Gather feedback on usability, performance, and specific needs to fine-tune AI features.
- Pilot the technology in high-demand environments such as sports photography, and low-light conditions to ensure robustness.

2.4.5. Pilot Project Rollout

- Launch a pilot project with a select group of professional photographers, using Sony's Alpha series cameras as the test case. Measure success through KPIs such as processing speed, user satisfaction, and adoption rates.
- Expand the pilot to key markets like North America, Japan, and Europe, focusing on professional and semi-professional photographers.

3. ITO3: AI-Powered Automated Disassembly

3.1. Business Case and Expected Outcome

3.1.1. Business Case

The rapid turnover of gaming consoles, driven by frequent product releases, significantly contributes to e-waste, highlighting the need for effective end-of-life management solutions (Quantum, 2023). As a global gaming leader, Sony generates about one-third of its revenue from its gaming segment, which features its renowned gaming consoles, making sustainable practices vital for environmental and business success (Laricchia, 2024). PlayStation consoles are built with valuable materials like copper and rare earth metals, but these resources are often lost due to inefficient recycling methods, resulting in resource loss and environmental harm (Foltran, n.d.). With stricter global e-waste regulations and growing consumer demand for sustainability, Sony must adopt more efficient recycling strategies.

The proposed AI-powered automated disassembly system directly addresses these challenges by using robotics and AI to efficiently dismantle PlayStation consoles and recover valuable components.

Companies like Microsoft and Apple have already demonstrated the effectiveness of automated recycling through their initiatives for hard drives and smartphones (Botwright & Pennington, 2022). Adopting similar technology enables Sony to reduce e-waste, cut raw material costs, and establish itself as a leader in sustainable innovation. This initiative aligns with the "Road to Zero" vision of Sony, which targets achieving zero environmental impact by 2050 (Sony, 2010).

3.1.2. Expected Outcome

3.1.2.1. Increased Material Recovery

The AI-powered disassembly system will enable Sony to efficiently recover high-value materials like copper and rare earth elements from PlayStation consoles. Apple's Daisy robot has successfully demonstrated how automated disassembly can optimize material recovery and reduce dependence on newly mined resources (Sedin, 2022).

3.1.2.2. E-Waste Reduction

Automated disassembly will reduce the number of obsolete PlayStation consoles in landfills, minimizing e-waste and supporting Sony's sustainability objectives by enabling efficient recovery and proper handling of end-of-life products.

3.1.2.3. Cost Saving

AI-based solutions have proven effective in reducing costs by optimizing labor and increasing productivity (Damioli et al., 2021). Implementing an automated disassembly process will streamline Sony's operations, significantly lowering manual labor costs and improving efficiency in recycling.

3.1.2.3. Enhanced Brand Image and Compliance

By adopting AI-powered disassembly, Sony will stay ahead of increasingly strict global e-waste regulations while enhancing its reputation as a leader in sustainable technology, attracting environmentally conscious consumers and stakeholders.

3.2. Estimated ROI and Benefits

3.2.1. Tangible Benefits

3.2.1.1. Cost Savings through Efficient Material Recovery

Implementing AI-powered disassembly systems like Apple's Daisy will allow Sony to recover high-value materials like copper and rare earth metals from PlayStation consoles. Apple's Daisy robot has reduced the need for newly mined resources by reusing critical elements like cobalt and tungsten, achieving substantial cost savings (Calma, 2023). Similarly, Microsoft's Circular Centers use AI-driven robotics to reuse up to 83% of recovered components, significantly lowering raw material procurement costs (Microsoft, 2021). If Sony adopts a similar technology, it can achieve a 20-25% reduction in material expenses, aligning with its sustainability goals.

3.2.1.2. Increased Operational Efficiency

Apple's Daisy robot can disassemble up to 200 iPhones per hour, processing over 1.2 million devices annually (Apple, 2024). Implementing a similar AI-powered disassembly system for PlayStation consoles could potentially handle up to 4,800 units daily (assuming 24/7 operation), significantly increasing monthly throughput. This would reduce manual labor requirements by 20-25%, making the disassembly process more cost-effective and scalable for Sony by lowering per-unit costs and enhancing overall productivity.

3.2.2. Intangible Benefits

3.2.2.1. Brand Leadership in Sustainability

When companies engage in sustainable practices, they are perceived as responsible corporate citizens committed to positively impacting society and the environment (Gong et al., 2023). This positive brand perception attracts customers and builds strong relationships with investors, employees, and other stakeholders, thereby enhancing long-term value. By implementing AI-powered disassembly systems and aligning with its "Road to Zero" initiative, Sony strengthens its commitment to sustainability (Sony, 2010).

3.2.2.2. Enhanced Regulatory Compliance

Implementing AI-powered disassembly systems will ensure Sony's compliance with stringent global e-waste regulations, like the EU's WEEE Directive, which governs the recycling and cross-border movement of electronic waste (European Commission, n.d). This proactive approach minimizes the risk of non-compliance fines and legal complications, safeguarding Sony's operations against future regulatory changes. Implementing advanced recycling technologies allows Sony to minimize legal risks while enhancing its reputation as a responsible corporation dedicated to sustainability.

3.2.3. Estimated ROI

Initial Investment - The cost of AI-powered disassembly systems ranges from USD 200,000 to 300,000 per unit, depending on customization and complexity (Fairchild, 2022). Assuming Sony deploys 10 units, the total investment in robotic hardware is around USD 3 million. Including R&D and setup costs, the overall investment for PlayStation disassembly is approximately USD 10 million.

Revenue Estimate - Recovered materials like copper, gold, and rare earth elements yield USD 3-5 million annually, while labor savings add USD 1-2 million yearly, totaling around USD 12-15 million over three years.

ROI Estimate - ROI = (12 million − 10 million / 10 million) × 100 = 20%

The estimated ROI for this initiative would be approximately 20% over three years.

3.3. Upgrade or New Capability

This ITO introduces a new capability for Sony. While Sony has previously focused on sustainability through energy-efficient designs and eco-friendly packaging, this initiative marks its first use of AI and robotics for end-of-life recycling of PlayStation consoles.

3.4. Project's Process Model

3.4.1. Initial Research and Feasibility Study

Evaluate the technical and financial feasibility of integrating AI-powered disassembly systems for PlayStation consoles. Engage with key stakeholders and benchmark against industry leaders like Apple and Microsoft to identify best practices.

3.4.2. Prototype Development

Build a prototype focusing on AI-driven disassembly of high-value components (e.g., gold, copper, PCBs, magnets). Collaborate with vendors to optimize AI vision and robotic configurations for efficient material recovery.

3.4.3. Risk Assessment and Mitigation

Identify risks, including high implementation costs and regulatory compliance. Develop mitigation strategies such as phased rollouts and modular designs to manage different PlayStation models effectively.

3.4.4. User Testing

Conduct pilot testing using a small batch of consoles, measure key performance indicators (KPIs), and refine the system based on material recovery rates and operational efficiency.

3.4.5. Full-Scale Rollout

Deploy the optimized system in Sony's global recycling facilities, ensuring that it meets long-term sustainability targets and operational efficiency goals.

4. ITO4: AI-Companion for Smartphones

4.1. Business Case and Expected Outcome

4.1.1. Business Case

Sony has long been a leader in hardware innovation, particularly in cameras and displays, but with less than 1 % market share worldwide (Statista, n.d.), it has struggled to compete in the smartphone market against brands like Apple and Google, which excel in software integration. To regain market share, Sony can introduce OpenAI's ChatGPT voice mode as a fully integrated AI Companion across its smartphones.

The global market for conversational AI is expected to reach $18.4 billion by 2026 (Chaturvedi et al., 2023). AI companions, as described by (Chaturvedi et al., 2023), are intelligent virtual agents capable of influencing user behavior, decisions, and long-term engagement through personalized interactions. Similarly, Sony's AI Companion will offer dynamic, personalized experiences at the system level, enhancing user loyalty and encouraging continued device use. The key features are as follows.

- **Native System-Level Integration:** The AI Companion will be built into the phone's operating system, accessible via voice command or button press. This deep integration allows seamless multitasking and interaction with native features like adjusting settings, managing apps, and controlling media.

- **Full Access to Native Features:** Unlike a standalone app, the AI Companion will control native phone functions, enabling tasks like "Adjust the brightness" or "Take a photo in portrait mode." This creates a smooth, intuitive experience.

- **Emotional and Behavioral Support:** The AI Companion will offer emotional support, especially benefiting older users through personalized interactions. Using Conversational AI, it will provide companionship and guidance where traditional resources are lacking (Varghese et al., 2022). Continuous interaction can improve user accountability and promote positive behaviors through empathetic responses and identity cues (Li et al., 2023).

4.1.2. Expected Outcome

4.1.2.1. Seamless User Experience

By being embedded at the system level, the AI Companion will provide users with a fluid, uninterrupted experience, enhancing day-to-day interactions with their phones. This will result in greater user satisfaction and improved customer retention.

4.1.2.2. Increased Device Sales

The AI Companion's unique, fully integrated nature will serve as a key selling point for Sony smartphones. The promise of having an advanced, personal AI companion as a core feature, available right out of the box, will help differentiate Sony's phones from competitors and drive sales growth.

4.2. Estimated ROI and Benefits

4.2.1. Tangible Benefits

4.2.1.1. Boosted Smartphone Sales Through AI Integration

The AI Companion's personalized support will set Sony apart. (Hernandez-Ortega and Ferreira, 2021) highlight that smart experiences drive consumer passion, which could result in a 15-25% sales increase, adding $500 million to $1 billion in revenue.

4.2.1.2. User Retention Through Personalization

The AI Companion adapts to user preferences. (Chen et al., 2024) emphasize that personalization improves interactions, boosting user retention by 10-15%, and increasing customer lifetime value by 20%.

4.2.1.3. Cost Savings via Streamlined Support

Cost Savings via Streamlined Support: The AI Companion will autonomously handle troubleshooting, reducing reliance on customer service. (Katragadda, 2023) highlights that quality support is essential but resource-heavy. This proactive approach is estimated to reduce support costs by 10-15%, potentially saving Sony $10-20 million annually.

4.2.2. Intangible Benefits

4.2.2.1. Enhanced Brand Image

With this fully integrated AI Companion, Sony will be seen as an innovator in AI technology. The brand will gain recognition for delivering a state-of-the-art digital companion that's not available on competing devices. This enhanced perception will help Sony regain relevance in the smartphone market.

4.2.2.2. Customer Loyalty

The AI Companion's ability to adapt to users' preferences will enhance personalization, driving satisfaction and loyalty. (Hernandez-Ortega and Ferreira, 2021) highlight that consumer loyalty is critical in competitive markets, helping firms build strong relationships and gain lasting competitive advantages. As the AI adapts to user needs, it will foster long-term brand loyalty.

4.2.2.3. Increased User Engagement

By integrating seamlessly into every aspect of the phone's operations, the AI Companion will encourage more frequent interaction with the device, creating higher engagement across apps and services. This, in turn, will drive the usage of Sony's ecosystem, including apps, media, and third-party integrations.

4.2.3. Estimated ROI

Calculating ROI for AI projects is complex and uncertain (Kejriwal, 2023). Based on (Kejriwal, 2023) guidelines, the following factors were considered:

- **Hard and Soft ROI Metrics:** Anticipate a 5-7% increase in smartphone sales, adding $125 million to $175 million in revenue.
- **Leverage domain expertise:** Sony's AI team is working with OpenAI to integrate ChatGPT voice mode, similar to Apple's cost-free deal with OpenAI, where Apple gained AI features and OpenAI accessed a vast user base (Forbes, n.d.). Sony expects a similar low-cost setup, benefiting from advanced AI features and increased user engagement.
- **Data and Infrastructure Costs:** Estimated costs are $5 million to $8 million for integration, plus $2 million annually for maintenance.
- **Flexibility for Uncertainty:** A 10% budget buffer is included for delays.

Revenue Estimate: Expected increases will generate $4 million to $6 million annually, totaling $12 million to $18 million over three years.

ROI Estimate: ROI = (18 million − 10 million / 10 million) × 100 = 80%

4.3. Upgrade or New Capability

This ITO represents a new area for Sony, which has not previously offered a system-level AI-driven companion. While Sony has experience in hardware and some AI features, this project will be the first fully integrated AI experience embedded in a smartphone's core functionality. This positions Sony as a leader in AI-driven user experiences, transforming smartphone assistants from task-oriented tools into personal companions that integrate deeply into users' daily lives.

4.4. Project's Process Model

To launch the AI Companion as a native feature in Sony smartphones, the following phased approach is recommended:

4.4.1. Feasibility Study

- Objective: Assess the technical feasibility of integrating ChatGPT as a system-level AI Companion.
- Tasks: Collaborate with OpenAI to determine API requirements, optimize ChatGPT for Sony's hardware (e.g., microphones, and cameras), and analyze infrastructure needs for real-time AI conversations.
- Outcome: A report detailing technical feasibility and costs.

4.4.2. Proof of Concept (PoC) Development

- Objective: Create a prototype of the AI Companion.
- Tasks: Customize ChatGPT's API for Sony devices, test voice activation, and enable cross-device control with Sony products.
- Outcome: A functional prototype with user feedback.

4.4.3. Pilot Rollout

- Objective: Test the AI Companion on select Sony models.
- Tasks: Collect user feedback and refine the AI's conversational and system-integration features.

- Outcome: An optimized AI Companion ready for full-scale deployment.

4.4.4. Full-Scale Rollout

- Objective: Global launch across all Sony smartphones.
- Tasks: Finalize improvements, launch a marketing campaign, and work with developers to enhance functionality.
- Outcome: A successful global release, positioning Sony as an AI leader.

5. Conclusion

The proposed Information Technology Opportunities (ITOs) for Sony Corporation focus on leveraging advanced AI, robotics, and real-time processing technologies to enhance its operations across film production, imaging, and sustainability. These ITOs align with Sony's strategic goals of innovation and market leadership by optimizing costs, improving product offerings, and driving sustainable practices. Implementing these initiatives will not only generate tangible financial benefits but also strengthen Sony's reputation as a forward-thinking technology leader, capable of adapting to evolving market trends. By embracing these opportunities, Sony can continue to build on its legacy of technological excellence and maintain its competitive advantage in the global market.

6. References

Adobe. (2024) Bringing Gen AI to Video: Adobe Firefly Video Model Coming Soon. Available at: https://blog.adobe.com/en/publish/2024/09/11/bringing-gen-ai-to-video-adobe-firefly-video-model-coming-soon (Accessed: 7 October 2024).

Apple (2024) Apple expands global recycling programs, Apple Newsroom (Australia). Available at: https://www.apple.com/au/newsroom/2019/04/apple-expands-global-recycling-programs/ (Accessed: 09 October 2024).

Bhasin, H. (2024) SWOT analysis of Sony (updated 2024), Marketing91. Available at: https://www.marketing91.com/swot-analysis-of-sony/ (Accessed: 09 October 2024).

Birkinbine, B.J., Gómez, R. and Wasko, J. (2017) Global Media Giants. 1st edn. New York: Routledge. Available at: https://www.taylorfrancis.com/chapters/edit/10.4324/9781315682334-15/sony-corporation-william-kunz.

Botwright, K. and Pennington, J. (2022) Will your next phone be made from recycled materials? These 6 tech giants are working on it, World Economic Forum. Available at: https://www.weforum.org/agenda/2020/09/will-your-next-phone-be-made-from-recycled-materials-these-6-tech-giants-are-working-on-it/ (Accessed: 08 October 2024)

Calma, J. (2023) Apple commits to using more recycled cobalt in its devices, The Verge. Available at: https://www.theverge.com/2023/4/14/23682820/apple-recycled-metals-cobalt-batteries (Accessed: 09 October 2024).

CanonWatch. (n.d.) How AI Technology is Changing Photography and How Canon Cameras are Incorporating AI. Available at: https://www.canonwatch.com/how-ai-technology-is-changing-photography-and-how-canon-cameras-are-incorporating-ai/ (Accessed: 7 October 2024).

Chaturvedi, R. *et al.* (2023) 'Social companionship with artificial intelligence: Recent trends and future avenues', *Technological Forecasting and Social Change*, 193, p. 122634. Available at: https://doi.org/10.1016/j.techfore.2023.122634.

Chen, J. *et al.* (2024) 'When large language models meet personalization: perspectives of challenges and opportunities', *World Wide Web*, 27(4), p. 42. Available at: https://doi.org/10.1007/s11280-024-01276-1.

Cognitive Market Research. (n.d.) Digital Camera Market Report. Available at: https://www.cognitivemarketresearch.com/digital-camera-market-report (Accessed: 7 October 2024).

Connelly, E.A. (2023) Ai can shave millions from film production costs without replacing creatives, study finds, TheWrap. Available at: https://www.thewrap.com/study-ai-shave-millions-film-production-costs-replace-creatives/ (Accessed: 09 October 2024).

Damioli, G., Van Roy, V. and Vertesy, D. (2021) 'The impact of artificial intelligence on Labor Productivity', Eurasian Business Review, 11(1), pp. 1–25. doi:10.1007/s40821-020-00172-8.

European Commission (n.d) Waste from electrical and electronic equipment (WEEE), Environment. Available at: https://environment.ec.europa.eu/topics/waste-and-recycling/waste-electrical-and-electronic-equipment-weee_en (Accessed: 09 October 2024).

Fairchild, M. (2022) Recycling Robots: How they work & are they worth the investment?, HowToRobot. Available at: https://howtorobot.com/expert-insight/recycling-robots (Accessed: 09 October 2024).

Foltran, M. et al. (n.d) Raw materials in PS4: Raw Materials in PS4: Where are they and how to recycle them. Available at: https://rmschools.isof.cnr.it/wp-content/uploads/2022/04/RawMaterials_PS4_ENG.pdf (Accessed: 08 October 2024).

Fujitsu Blog - Global. (n.d.) AI Powered Customer Experience - Generative AI Transforming Customer Experience. Available at: https://corporate-blog.global.fujitsu.com/fgb/2024-08-05/01/ (Accessed: 7 October 2024).

Global Market Insights Inc. (n.d.) AI Camera Market Size, Share & Forecast Report, 2024-2032. Available at: https://www.gminsights.com/industry-analysis/ai-camera-market (Accessed: 7 October 2024).

Gong, Y. et al. (2023) 'How sustainable marketing influences the customer engagement and Sustainable Purchase Intention? the moderating role of Corporate Social Responsibility', Frontiers in Psychology, 14. doi:10.3389/fpsyg.2023.1128686.

Grove, E. (2024) Artificial Intelligence and filmmaking: Threats and features, Raindance. Available at: https://raindance.org/artificial-intelligence-and-filmmaking-threats-and-features/ (Accessed: 09 October 2024).

Hernandez-Ortega, B. and Ferreira, I. (2021) 'How smart experiences build service loyalty: The importance of consumer love for smart voice assistants', *Psychology & Marketing*, 38(7), pp. 1122–1139. Available at: https://doi.org/10.1002/mar.21497.

Huang, M.-H. and Rust, R.T. (2018) 'Artificial Intelligence in Service', Journal of Service Research, 21(2), pp. 155–172. Available at: https://doi.org/10.1177/1094670517752459.

IMARC Group. (n.d.) Digital Camera Market. Available at: https://www.imarcgroup.com/digital-camera-market (Accessed: 7 October 2024).

Kang, J. (2024) 'Innovations in AI-based visual effect software: Ushering in a new era of filmmaking', Journal of Digital Contents Society, 25(8), pp. 2239–2250. doi:10.9728/dcs.2024.25.8.2239.

Katragadda, V. (2023) 'Automating Customer Support: A Study on The Efficacy of Machine Learning-Driven Chatbots and Virtual Assistants', 7(1).

Kejriwal, M. (2023) 'AI in Practice and Implementation: Issues and Costs', in M. Kejriwal (ed.) *Artificial Intelligence for Industries of the Future: Beyond Facebook, Amazon, Microsoft and Google.*

Cham: Springer International Publishing, pp. 25–45. Available at: https://doi.org/10.1007/978-3-031-19039-1_2.

Krishnan, C. et al. (2022) 'Impact of Artificial Intelligence-Based Chatbots on Customer Engagement and Business Growth', in T.-P. Hong et al. (eds) Deep Learning for Social Media Data Analytics. Cham: Springer International Publishing, pp. 195–210. Available at: https://doi.org/10.1007/978-3-031-10869-3_11.

Kurian, N.S. et al. (2024) 'Transformative Perspectives: AI-Enabled Dubbing Software for Multilingual Content Localization', African Journal of Biological Sciences, 6(10). doi:10.33472/AFJBS.6.10.2024.924-929.

Laricchia, F. (2024) Topic: Sony, Statista. Available at: https://www.statista.com/topics/1917/sony/ (Accessed: 08 October 2024).

Lemon, K.N. and Verhoef, P.C. (2016) 'Understanding Customer Experience Throughout the Customer Journey', Journal of Marketing, 80(6), pp. 69–96. Available at: https://doi.org/10.1509/jm.15.0420.

Li, Y. (2022) 'Research on the application of artificial intelligence in the film industry', SHS Web of Conferences, 144, p. 03002. doi:10.1051/shsconf/202214403002.

Li, Z. et al. (2023) 'Exploring Design Opportunities for Reflective Conversational Agents to Reduce Compulsive Smartphone Use', in Proceedings of the 5th International Conference on Conversational User Interfaces. New York, NY, USA: Association for Computing Machinery (CUI '23), pp. 1–6. Available at: https://doi.org/10.1145/3571884.3604305.

Microsoft (2021) Microsoft Circular Centers Program achieves 83% reuse, increasing supply chain efficiency and resiliency with Dynamics 365 and Power Platform, Microsoft Customers Stories. Available at: https://customers.microsoft.com/en-us/story/1431789627332547010-microsoft-circular-centers (Accessed: 09 October 2024).

Naeem, R., Kohtamäki, M. and Parida, V. (2024) 'Artificial intelligence enabled product–service innovation: past achievements and future directions', Review of Managerial Science, pp. 1–44. Available at: https://doi.org/10.1007/s11846-024-00757-x.

NIS (2018) Venom - financial information, The Numbers. Available at: https://www.the-numbers.com/movie/Venom-(2018)#tab=summary (Accessed: 10 October 2024).

NVIDIA. (n.d.) What is Edge AI?. Available at: https://blogs.nvidia.com/blog/what-is-edge-ai/ (Accessed: 7 October 2024).

Pereira, D. (2024) Sony SWOT analysis (2024), Business Model Analyst. Available at: https://businessmodelanalyst.com/sony-swot-analysis Accessed: 09 October 2024).

PhotoRoom. (n.d.) Customer Stories: Wolt. Available at: https://www.photoroom.com/customer-stories/wolt (Accessed: 7 October 2024).

Puntoni, S. et al. (2021) 'Consumers and Artificial Intelligence: An Experiential Perspective', Journal of Marketing, 85(1), pp. 131–151. Available at: https://doi.org/10.1177/0022242920953847.

Quantum (2023) A look into the e-waste problem in the gaming industry - Quantum: Itad & E-waste recycling, Quantum. Available at: https://quantumlifecycle.com/en_CA/blog/a-look-into-the-e-waste-problem-in-the-gaming-industry/ (Accessed: 08 October 2024).

Sedin, E. (2022) How Apple uses disassembly robots to work towards full independence from mined resources. Available at: https://scandinavianmind.com/how-apple-uses-disassembly-robots-to-work-towards-full-independence-from-mined-resources/ (Accessed: 09 October 2024).

Silva Jasaui, D. et al. (2024) 'Virtual production: Real-time rendering pipelines for indie studios and the potential in different scenarios', Applied Sciences, 14(6), p. 2530. doi:10.3390/app14062530.

Sony (2010) Sony Group Portal, Sony Global Environmental Plan. Available at: https://www.sony.com/en/SonyInfo/csr/eco/RoadToZero/gm_en.html (Accessed: 08 October 2024).

Sony AI. (2024). *Sony AI Wins 2024 AI Breakthrough Award for Innovative Use of AI in Gaming*. Available at: https://ai.sony/articles/Sony-AI-Wins-2024-AI-Breakthrough-Award-for-Innovative-Use-of-AI-in-Gaming/ (Accessed: 7 October 2024).

Sony. (2024). *Sony Corporate Strategy Meeting 2024*. Sony. Available at: http://www.sony.com/en/SonyInfo/News/Press/202405/24-022E/index.html (Accessed: 7 October 2024).

Sony Corporation. (2024). *Business Segment Meeting 2024*. Sony Corporation. Available at: https://www.sony.com/en/SonyInfo/IR/library/presen/business_segment_meeting/pdf/2024/ISS_E.pdf (Accessed: 7 October 2024)

Sony Electronics. (n.d.) *New Alpha 7R V Camera Delivers a New High-Resolution Imaging Experience with AI-Based Autofocus*. Available at: https://www.prnewswire.com/news-releases/sony-electronics-new-alpha-7r-v-camera-delivers-a-new-high-resolution-imaging-experience-with-ai-based-autofocus-301659688.html (Accessed: 7 October 2024).

Forbes. (n.d.). *Sony*. Available at: https://www.forbes.com/companies/sony/ (Accessed: 7 October 2024).

Sony. (2019). Corporate Report 2019. Sony. Available at: https://www.sony.com/en/SonyInfo/IR/library/corporatereport/CorporateReport2019_E.pdf (Accessed: 7 October 2024).

Spair, R. (2024) The rise of AI in Hollywood: How technology is changing the movie industry #innovation #technology..., Medium. Available at: https://medium.com/@rickspair/the-rise-of-ai-in-hollywood-how-technology-is-changing-the-movie-industry-innovation-technology-0677faa67886 (Accessed: 09 October 2024).

Statista. (n.d.). *Global market share held by smartphone vendors since 4th quarter 2009*. Available at: https://www.statista.com/statistics/271496/global-market-share-held-by-smartphone-vendors-since-4th-quarter-2009/ (Accessed: 7 October 2024).

Townsend, S. (2024) Exploring the impact of AI on film production in 2024, Medium. Available at: https://medium.com/@channelasaservice/exploring-the-impact-of-ai-on-film-production-in-2024-f02da745af00 (Accessed: 09 October 2024).

Varghese Marokkie, S., McTear, M. and Bi, Y. (2022) 'A virtual companion for older adults using the Rasa Conversational AI framework: Conversations 2022', *CONVERSATIONS 2022*. Edited by A. Følstad, pp. 1–7.

Yingmin, S. (2023) 'Realistic problems and innovative path of AI dubbing in the era of intelligent media', International Journal of Frontiers in Sociology, 5(1). doi:10.25236/ijfs.2023.050104.